



Beaverlodge Institutional Control Inspection Field Guide

Prepared for:

Ministry of Energy and Resources

Government of Saskatchewan

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Issued Date: March 2024

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Appendix D: Long-Term Periodic Checklist for Stainless Steel Covers
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1.0 INTRODUCTION

The Beaverlodge Institutional Control Inspection Field Guide (Beaverlodge - ICIFG) provides a description of the relevant areas and a summary of the key aspects of the decommissioned Beaverlodge properties that will require future inspection as part of the Institutional Control (IC) monitoring program.

1.1 Local Environment

The decommissioned Beaverlodge properties are located approximately 8km east of the northern hamlet of Uranium City, within the Taiga Shield ecoregion which is the northernmost ecozone of the province of Saskatchewan. The area is subject to cold winters and low precipitation and is underlain by the crystalline rocks of the Precambrian shield, with poor soil development, covered in areas by glacial drift. The poor drainage and rolling post-glacial topography result in numerous lakes. Most of the rocky hilltops and upper slopes have a sparse, patchy tree cover interspersed with bare or lichen covered rock. The tree cover is made up of jack pine, aspen, birch, black spruce, and white spruce. The lower hillsides and hill bases often have a denser tree cover composed of black spruce with Alaskan paper birch and green alder in some locations. Undergrowth consists of lichens, grasses, ferns and low growing shrubs.

1.2 Institutional Control Boundaries

During 2016, discussions were held with the Saskatchewan Ministry of Environment (SkMOE) and the Saskatchewan Ministry of Economy (now known as Saskatchewan Ministry of Energy and Resources (SkMER)) to establish the expected Beaverlodge IC boundaries. The boundaries developed during those discussions reflect the expected IC boundaries once all the properties are transferred to IC and are based on areas of historic mining/milling activities requiring long term monitoring or administrative controls to ensure future land use restrictions are maintained. These areas have been identified in the area outlined in red in Figure 1. Appendix A provides the bounding IC coordinates.

IC Boundaries and Inspection Areas

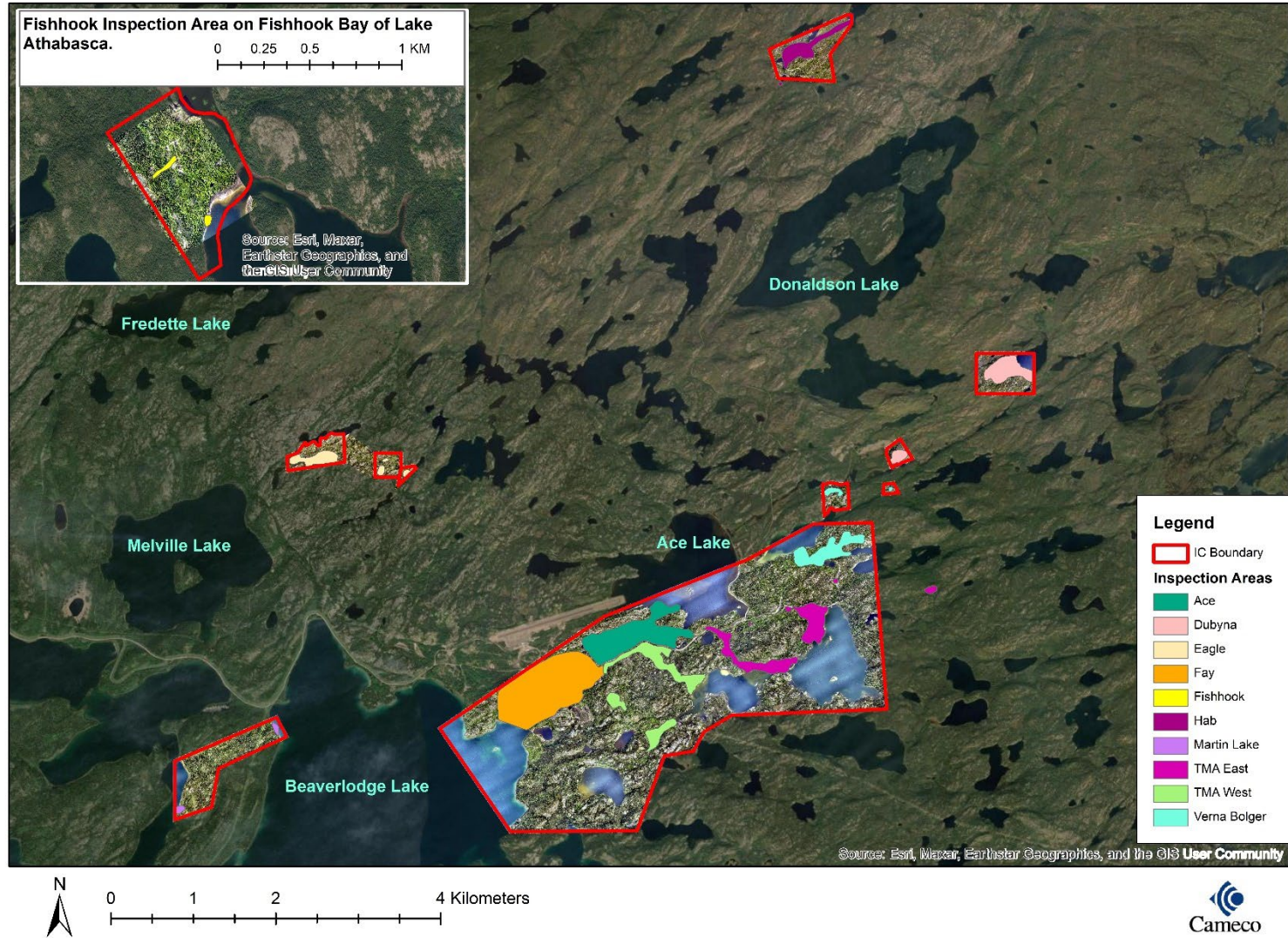


Figure 1. IC Boundaries

2.0 SUPPORTING DOCUMENTS

Additional detail and more information on the properties included in this guide can be found in the following closure reports:

1. Final Closure Report Beaverlodge Mines: K260, 11 Zone, 46 Zone & Eagle Area (September 2008)
2. Final Closure Report Beaverlodge Properties: HAB 3, HAB 6, EXC 2, RA 6, RA 9, EAGLE 1, BOLGER 2, ATO 26, EXC ATO 26, URA MC, EXC ACE 1, ACE 10, ACE 2 & EXC ACE 3 (March 2016)
3. Final Closure Report Beaverlodge Properties: URA 3, URA 5, EXC URA 5, ACE 5, JO-NES, and HAB 2A (March 2018)
4. Final Closure Report Beaverlodge Properties: ACE 1, ACE 3, ACE 7, ACE 8, ACE 9, ACE 14, ACE MC, EXC ACE 15, EXC URA 7, GC 2, NW 3 Ext, NW 3, URA 4, URA FR, EMAR 1, EXC 1, HAB 1, and HAB 2 (January 2021)
5. Final Closure Report Beaverlodge Properties: URA 7, URA 1, BOLGER 1, and Tailings Management Properties (To be posted).

The following appendices in this guide will provide additional information regarding the planned monitoring.

Appendix A: Bounding coordinates for Beaverlodge areas in IC

Appendix B: Borehole Coordinates

Appendix C: Geotechnical Inspection (Doc. No. BVL-EMP-00-00-01)

Appendix D: Stainless Steel Cap Long-Term Periodic Inspection Checklist

Appendix E: As-Built Package – Engineered Covers for Mine Openings

Appendix F: SRK Geotechnical Inspection Checklist for Zora Creek

3.0 MONITORING FREQUENCY

All remedial activities have been completed and the property areas have met the established performance objectives. The properties have been monitored annually since decommissioning was completed (1985) with very little physical change observed. The decommissioned Beaverlodge properties have been transferred to the IC Program following a staged approach, with each stage having their own monitoring program and schedule. The monitoring programs from properties transferred in 2009 and 2019 have coincided with a 5-year frequency.

The Beaverlodge ICIFG is specific to monitoring the physical aspects of the decommissioned Beaverlodge properties. Table 1 provides the frequency of monitoring for the ICIFG. The frequency was informed by inspections completed thus far, and includes inspections conducted every 5 years until 2039, followed by inspections every 10 years thereafter, or at the discretion of SkMER.

Table 1. Monitoring Frequency

Monitoring Year	Monitoring Activities
2029	Physical inspection
2034	Physical inspection
2039	Physical inspection and detailed engineer inspection of the stainless-steel caps
2044	Physical inspection
2049	Physical inspection
2059	Physical inspection and detailed engineer inspection of the stainless-steel caps
2069	Physical inspection
2079	Physical inspection, detailed engineer inspection of the stainless-steel caps, and assessment of the Eagle Shaft Cap condition
2089	Physical inspection
2099	Physical inspection and detailed engineer inspection of the stainless-steel caps
2100	Replace Eagle Cap if necessary (consider replacing with a stainless-steel cap)
2109	Physical inspection
2119	Physical inspection and detailed engineer inspection of the stainless-steel caps

4.0 MONITORING PLAN

Monitoring of the decommissioned Beaverlodge properties should be conducted by a team consisting of technical field staff and a local guide. The field team will be responsible for performing visual inspections and other required activities. Additional details related to the inspections are outlined below in Section 4.1.

4.1 Inspection Tasks

This list provides detailed information regarding the different types of inspection tasks and what is required when the field team is conducting the inspection. This list was developed from the inspection requirements identified in the various property closure reports and were reviewed and accepted by the Canadian Nuclear Safety Commission (CNSC) and SkMOE as properties were previously released from CNSC licensing and transferred to the IC Program. Specific requirements for each area are discussed in Section 5.

1. General site condition
 - i. Unexpected erosion of reclaimed structures or aspects related to former properties within IC boundary.
 - ii. Disturbance to roads (e.g., excavation).
 - iii. Condition of vegetation
 - a. Note general condition of vegetation on site, including age, class, and diversity in comparison to surrounding undisturbed natural forest.
 - b. Take photos at prescribed locations.
 - c. Use photos from previous inspection for comparison.
 - iv. Note presence of wildlife utilizing the sites
 - a. Take photos if applicable.
 - v. Evidence of recent human visitation
 - a. Record signs of visitation and land use (make note and take photos).
 - b. Focus on areas that are easily accessible (i.e., trails, open areas, or power line right of way).
 - vi. Tailings
 - a. Evidence of disturbance to covered or exposed tailings. Record any evidence of anthropogenic activity, such as skidders, or other large equipment accessing areas, or creating new access trails.
 - b. If evidence of disturbance is identified, determine extent of disturbance.
 - vii. Beaver dams
 - a. Condition of dams in the area (make note if they are active or dormant)
 - b. Monitor how they are impacting water levels and potentially downstream water quality.
 - c. Take photos.

- viii. Formerly flowing boreholes
 - a. Record general condition in area around formerly flowing boreholes.
 - b. Record evidence of artesian flow on previously sealed flowing boreholes (e.g., iron staining).
 - c. Take photos at prescribed locations.
 - d. See Appendix B for location details.
- ix. Sand cover for gamma (Eagle area)
 - a. Note any anthropogenic disturbance or erosion of the cover.
 - b. Take photo of cover for comparison.
- x. Pit wall condition
 - a. Record general condition, specifically noting any failure or sloughing.
 - b. Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.
- xi. Waste rock condition
 - a. Record general condition, specifically noting any evidence of subsidence or slope failure (take photos).
 - b. Evidence of anthropogenic disturbance.
 - c. Evidence of acid rock drainage (iron staining of rocks and streams, confirm with lab analysis if suspected)
 - d. Take photos as appropriate to record conditions.
- 2. Condition of access trails and areas adjacent to access trails
 - i. Evidence of anthropogenic activity, such as skidder, or other large equipment accessing areas, or creating new access trails.
 - ii. Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.
 - iii. If evidence of disturbance is identified, determine and record extent of disturbance.
- 3. General geotechnical inspections (Appendix C and F)
 - i. Conducted at the following areas:
 - a. Fookes Reservoir Delta
 - b. Two outlet spillways at Fookes and Marie Reservoirs
 - c. Marie Reservoir Delta
 - d. Ace Stope crown pillar area
 - e. Hab crown pillar area
 - f. Dubyna crown pillar area
 - g. Bolger Flow Path between Zora Lake and Verna Lake
 - ii. Confirm that each is continuing to perform as expected, based on previous inspections and the as-built reports, where applicable. This will be completed every time there is a field team on site.

4. Stainless-steel caps

- i. Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.
- ii. Take photos of caps and any notable concerns (i.e. Deformity, damage, displacement, or loose or missing bolts fastened to bedrock).
- iii. Kova Engineering has prepared a long-term inspection checklist specifically to monitor the stainless-steel caps. Long-term inspection of the stainless-steel caps should be assessed by a qualified engineer every 25 years, unless visual monitoring identifies cause for investigation prior to that (see Appendix D for information on the design of the stainless-steel caps and recommended inspection frequency and requirements).

5. Backfilled mine openings

- i. Monitor and record any subsidence. Look for any evidence of seepage, i.e., increased vegetation, settling or erosion.
- ii. Take photos.
- iii. See Appendix E.

4.2 Drone Imagery

Baseline drone imagery has been collected on all areas within the Beaverlodge IC Boundaries, identified in Figure 1. This data will be provided to the Ministry of Energy and Resources at the time of transfer of all remaining properties to the IC program.

Costs related to ongoing monitoring and maintenance of the Beaverlodge properties have been calculated based on the assumption of physical inspections occurring on the Beaverlodge properties. However, there is potential, as drone technology becomes more widely accepted, the imagery may play a role in future inspections. The drone imagery serves as a baseline for future imagery.

4.3 Water and Fish Monitoring

Surface water quality monitoring and fish monitoring will be conducted under the Long-term Monitoring Program. Informed by over 40 years of monitoring data, community engagement activities, and the goals of the IC Program, the LTMP will be used to confirm the established objectives in areas downstream of the decommissioned Beaverlodge properties are being met (Cameco 2023¹).

Details related to the LTMP have been provided under a separate cover.

¹ Decommissioned Beaverlodge Mine Site Long-Term Monitoring Program. 2023. Cameco Corporation.

5.0 INSPECTION AREAS

The properties within the area designated as Crown Reserve to be managed within the IC program have been separated into 10 areas: (1) Eagle, (2) Martin Lake, (3) Fay, (4) Ace, (5) Tailings Management Area, (6) Verna/Bolger, (7) Dubyna, (8) Hab, (9) Moran Pit, and (10) Fishhook Bay. Each of these areas have properties that require monitoring and/or inspections.

The Moran Pit and Fishhook Bay areas were not subject to CNSC licensing; however, they have been remediated following the same process as the other Beaverlodge properties and will be managed in the IC program with established Crown Reserve areas.

It should be noted that the ten areas identified differ from the original property boundaries identified in the closure reports, and are based on geographical location, accessibility, and the presence of aspects that require inspection.

This guide is focused on areas disturbed as a result of past mining and milling activities, that require future inspection within the IC monitoring program (undisturbed areas do not require inspection). The guide also provides a checklist for conducting the inspections and figures that contain information regarding access points to the areas for inspection as well as the geographic location of some of the key features requiring inspection.

5.1 Eagle Area

The Eagle area includes the former EAGLE, EAGLE 4, and EAGLE 7 properties. The Eagle area included the decommissioned 12 Zone pit, 12 Zone pit Extension, 02 Zone pit, 42 Zone pit, 32 zone pit, and the Eagle underground mine.

A concrete cap was placed over the shaft in the late 1950s after a fire destroyed the head frame (see Table 2 for openings on property area). The 42 Zone pit was mined during 1974 and 1975 along with the nearby 32 Zone pits. Mining of the 02 Zone was conducted in 1979 and resulted in a small horseshoe shaped open pit, which was decommissioned by partially filling with waste rock in June 1985. Decommissioning of the 42 Zone and 32 Zone pits took place in three separate campaigns in August and November 1982, June and July 1983 and April and May 1985, during which the various pits were partially backfilled with waste rock. At the same time various support facilities and associated infrastructure including the freshwater intake in Shaft Lake and associated piping was removed.

The majority of the pit areas have been backfilled, leaving a series of low northeast trending bedrock ridges generally less than 2 m high. The original concrete cap and collar was replaced with an engineer approved cap and collar in 2000. Areas of elevated gamma (typically associated with the open pits) was covered with a layer of sand in 2009 to reduce gamma levels. The areas are accessible by a road, which branches off Highway 962 approximately 1 km west of the airport. See Figure 2 for the Eagle inspection area.

The 12 Zone Pit, 12 Zone extension and 02 Zone were sometimes referred to as the Intermediate Zone in the Beaverlodge closure documents. The 3 pits of the Intermediate

Zone were mined intermittently between 1975 and 1981 and were in-filled with rock blasted on site in June 1985. The closure documents list an adit of unknown size at the Intermediate Zone that was sealed in June 1985. It is assumed this adit was associated with the 12 Zone open pit and was backfilled in the pit that is flooded.

Table 2. Eagle Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12	
			Easting	Northing
Shaft	Vertical	Concrete Cap	639549	6607252
Adit*	Horizontal	Backfilled/Flooded	640379	6607245

*Located in the flooded 12-Zone pit (no inspection required)

5.1.1 Eagle Monitoring Requirements

Monitoring requirements at the Eagle Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Pit wall condition.
4. Waste rock condition.
5. Condition of sand gamma cover.
6. Status of flooded 12 Zone pit (note any changes in water, take picture).
7. Condition of concrete cap (shaft).
8. Note any flow from sealed borehole (59° 34' 50.7" N, 108° 31' 54.9" W)

Eagle Inspection Area

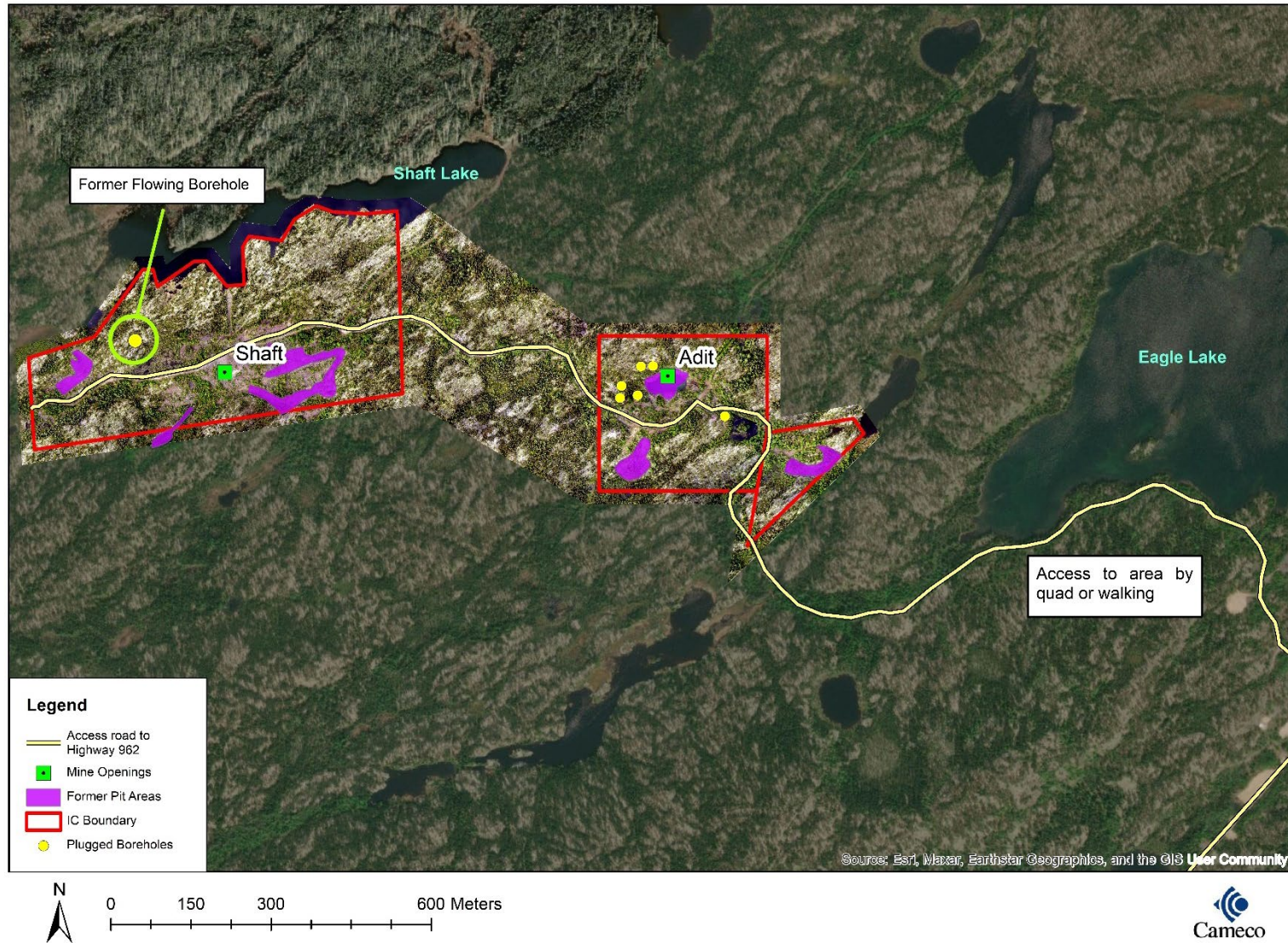


Figure 2. Eagle Inspection Area

Table 3. Eagle Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity)</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photos (at points indicated on figure of area).</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photo locations</i> <ol style="list-style-type: none"> 1. Looking 242° SW at 59° 34'45" N, 108° 31'49" W. 2. Looking 261° W at 59° 34'47" N, 108° 31'33" W. 3. Looking 98° E at 59° 34'46" N, 108° 3'39" W.). 	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<i>Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.</i> <ol style="list-style-type: none"> 1. Eagle 2 Pit: looking 38° NE at 59°34'40" N, 108° 30'35" W, 2. Eagle 12 Zone Extension Pit: looking 118° SE at 59° 34'42" N, 108° 30'55" W. 3. Eagle 4/7: looking 261° W at 59° 34'47" N, 108° 31'33" W. 4. Eagle 4/7 Extension: looking 253° W at 59° 34'48" N, 108° 32'1" W. 	
	<i>Additional comments:</i>	

Condition of concrete cap	<i>Check for any signs of subsidence from around the cap.</i>	
	<i>Photo of cap - note changes from previous.</i> <i>1. Looking 24°NE at 59° 34'48" N, 108° 31'44" W.</i>	
	<i>Additional comments:</i>	
Eagle Property Area sand gamma cover	<i>Note any anthropogenic disturbance or erosion to cover.</i>	
	<i>Take photo of cover.</i> <i>1. Looking 261° W at 59° 34'47" N, 108° 31'32" W.</i> <i>2. Looking 39° NE at 59° 34'47" N, 108° 31'32" W.</i> <i>3. Looking 5° N at 59° 34'50" N, 108° 31'41" W.</i>	
	<i>Additional comments:</i>	
Status of flooded 12 Zone pit	<i>Water level change (yes or no). If yes, provide detail.</i>	
	<i>Take photo of pit.</i> <i>1. Looking 50° NE at 59° 34'45" N, 108° 30'52" W.</i>	
	<i>Additional comments:</i>	
Formerly flowing borehole	<i>Borehole located at Easting 639381.01 and Northing 6607311.13. Record general condition in area around formerly flowing boreholes and record evidence of artesian flow on previously sealed flowing boreholes (e.g., rust staining).</i>	
	<i>Take photos if located.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments</i>	

5.2 Martin Lake

The Martin Lake area includes the former properties RA6 and RA9. The decommissioned Martin Lake mine openings straddle the narrow strip of land that separates Martin Lake from Beaverlodge Lake. The original site of the mine development was the advance of an adit on the east shore of Martin Lake in 1948. In 1952 to 1953, a second adit was developed from the west shore of the north end of Beaverlodge Lake and driven to connect with the previous underground workings and to establish a haulage way for ore. Mining operations in the Martin Lake mine ceased in the 1950's.

The Martin Lake area does not include any mined-out pits or artificially created slopes other than a short slope of waste rock to the lake on the Martin Lake side and the small slope created by the final closure of the adit on the Beaverlodge Lake side. See Table 4 for location of mine openings and Figure 3 for the Martin Lake inspection area.

Table 4. Martin Lake Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12	
			Easting	Northing
Adit (BVL)	Horizontal	Backfill	639081	6603934
Adit (MRTN)	Horizontal	Partial Backfill, Steel Grate	638063	6602968

5.2.1 Martin Lake Monitoring Requirements

Monitoring requirements at the Martin Lake area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Waste rock condition.
4. Evidence of subsidence near (above) adit openings.
5. Condition of backfilled adits and ID sign (Beaverlodge Lake side).
6. Evidence of surface seeps from the adit.
7. Condition of the steel grate on adit and ID sign (Martin Lake side).

Martin Lake Inspection Area

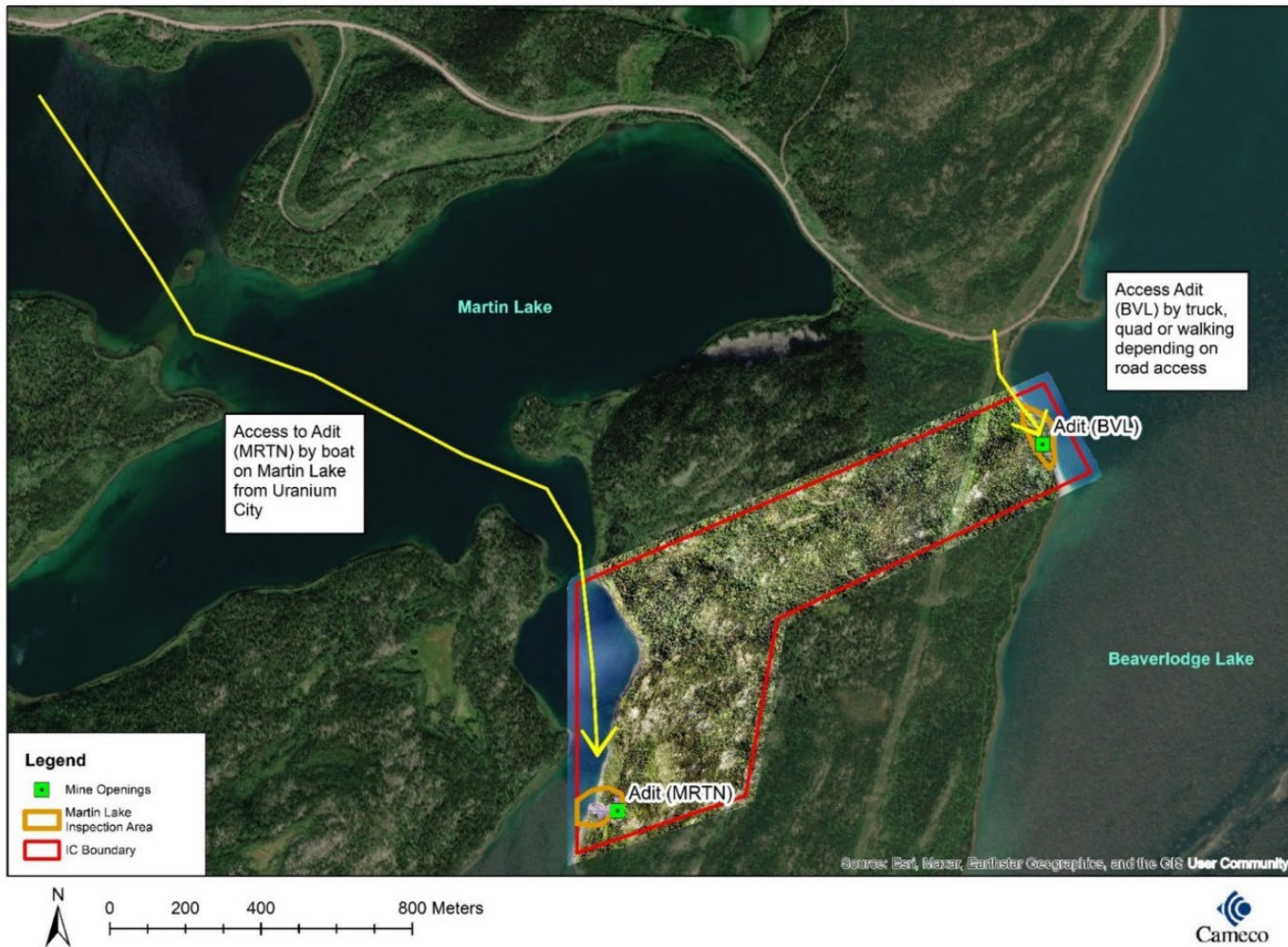


Figure 3. Martin Lake Inspection Area

Table 5. Martin Lake Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (e.g., campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo location Martin Lake Adit (Beaverlodge Lake side)</i> <i>1. Looking 240° SW at 59° 33'2"N, 108° 32'23"W).</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photo location</i> <i>1. Looking 169° S at 59° 33'2"N, 108° 32'23"W</i> <i>2. Also require photos of Martin Lake Adit from Martin Lake side</i>	
	<i>Additional comments:</i>	
Condition of the backfilled adit (Martin Lake side)	<i>Note any subsidence, if present.</i>	
	<i>Photo near adit opening.</i>	
	<i>Additional comments:</i>	
Condition of backfilled adit (Beaverlodge Lake side)	<i>Note any subsidence.</i>	
	<i>Photo location</i> <i>1. Looking 220° SW at 59° 33'2"N, 108° 32'24"W and looking 225° SW at 59° 33'2"N, 108° 32'24"W. Bottom photo is a close-up of the upper left corner of the picture on the top. It is provided as a reference to evaluated if there is any settlement or erosion of the adit cover along the south edge of the cover.</i>	
	<i>Additional comments:</i>	
	<i>Note if there is any evidence of seeps.</i>	
	<i>Photos of any seeps.</i>	

Evidence of surface seeps from the adits	<i>Additional comments:</i>	
Condition of the steel grate on adit (Martin Lake side)	<i>Note condition of the grate, rust, or wear. Check welds and attachment points.</i>	
	<i>Photo of adit.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.3 Fay Area

The Fay Area consisted of URA 7, URA MC, URA 1, URA 4, URA 3, ATO 26, EXC ATO, URA FR, EXC URA 7, URA 5, and EXC URA 5 individual properties. The Fay Area included the Fay Shaft and various support infrastructure (such as the office, mine dry change room, warehouse, hoist house, etc.), various mine openings (see Table 6), mill annex buildings, mill facility, oxygen plant, Lower Fay Pit, bulk fuel storage tanks, waste rock, seeps from waste rock pile, sealed artesian boreholes, and spilled tailings. See Figure 4 for the Fay inspection area. It should be noted, only 11 openings appear on Figure 4 due to Custom Ore Raise also including Custom Ore Bin, and Sorting Plant Bin and Sorting Plant Raise are marked at the same location covered with waste rock.

Table 6. Fay Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID
			Easting	Northing	Plate Coordinates
Shaft	Vertical	Stainless-steel	642676	6604704	59°33'22.51"N, 108°28'31.42"W
Custom Ore Raise	Vertical	Engineered cover using rock	642623	6604658	59°33'21.0"N, 108°28'34.0"W
Custom Ore Bin	Vertical	Engineered cover using rock	642637	6604656	59°33'21.0"N, 108°28'34.0"W
Fay Ladder Access	Vertical	Engineered cover using rock	642606	6604655	59°33'21.0"N, 108°28'34.0"W
CB-1 Access Raise	Vertical	Engineered cover using rock	642558	6604563	59°33'18.09"N, 108°28'39.25"W
Surface Dump Raise	Vertical	Stainless-steel	642595	6604639	59°33'20.5"N, 108°28'36.7"W
Sorting Plant Raise	Vertical	Backfilled	642603	6604520	59°33'16.64"N, 108°28'36.49"W
Sorting Plant Bin	Vertical	Backfilled	642603	6604520	59°33'16.64"N, 108°28'36.49"W
Waste Haul Adit	Horizontal	Backfilled	642638	6604450	
Fine Ore Dump	Vertical	Stainless-steel	642667	6604715	59°33'22.86"N, 108°28'31.96"W

Pipe Drift Raise	Vertical	Backfilled			N/A
25373 Raise	Vertical	Stainless-steel	642253	6604665	59°33'21.77"N, 108°28'58.44"W
24094 Raise (Vent)	Vertical	Stainless-steel	642702	6604631	59°33'20.1"N, 108°28'29.9"W

5.3.1 Fay Monitoring Requirements

Monitoring requirements at the Fay Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Condition of cover on Lower Fay Pit.
4. Pit wall condition.
5. Waste rock condition.
6. Condition of mill cover and note areas of any subsidence.
7. Condition of the previously flowing boreholes BH-001, BH-002, BH-003, BH-004, BH-005, BH-006, BH-007, BH-15, and BH-31.
8. Evidence of disturbance to covered tailings.
9. Evidence of any seepage from former open pit (Lower Fay Pit).
10. Condition of the stainless-steel capped mine openings, engineered rock covered mine openings, and backfilled openings and the related ID plates.
11. Beaver dams (if applicable)

Fay Inspection Area

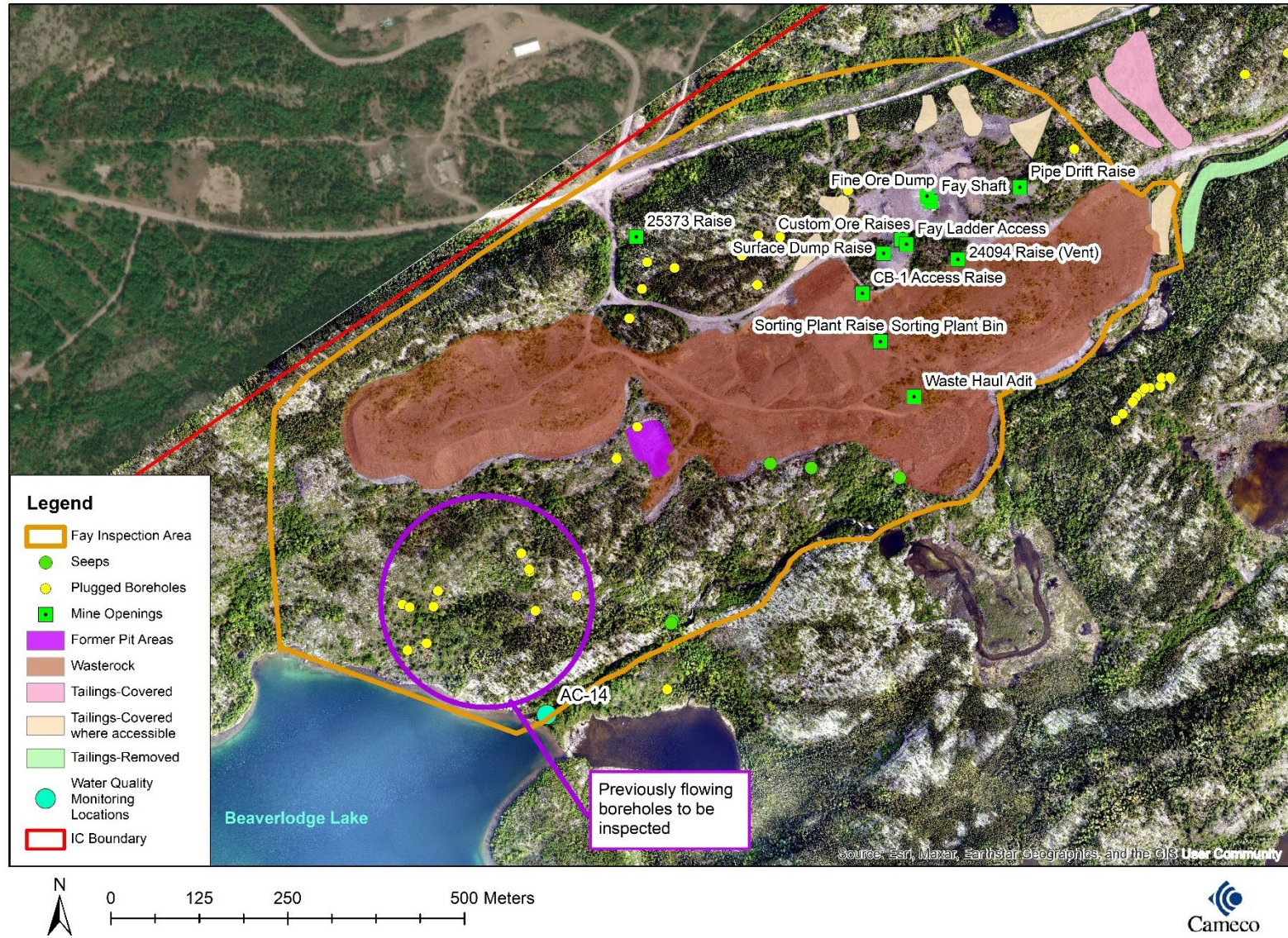


Figure 4. Fay Inspection Area

Table 7. Fay Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity)</i>	
	<i>Additional comments</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photos (at points indicated on figure of area)</i>	
	<i>Additional comments</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photos (at points indicated on figure of area). Note: no image of Seep 1 was available to share.</i>	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<i>Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.</i>	
	<i>Additional comments:</i>	
Condition of cover on Lower Fay Pit and seepage	<i>Note any subsidence of cover or exposed debris. Also note any seepage from the pit.</i>	
	<i>Take photo of cover and any evidence of flow from seeps.</i>	
	<i>Additional comments:</i>	
Condition of mill cover	<i>Note of any areas of subsidence or erosion.</i>	
	<i>Take photo of cover.</i>	
	<i>Additional comments:</i>	

Condition of stainless-steel caps	<i>Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.</i>	
	<i>Take photos of caps and any notable concerns.</i>	
	<i>Additional comments:</i>	
Condition of backfilled and rock covered openings	<i>Note any subsidence.</i>	
	<i>Take photos of opening locations.</i>	
	<i>Additional comments:</i>	
Tailings Disturbance	<i>Note any disturbance to covered tailings.</i>	
	<i>Take photos if disturbed.</i>	
	<i>Additional comments:</i>	
Formerly flowing boreholes	<i>Evidence of any flow from boreholes BH-001, BH-002, BH-003, BH-004, BH-005, BH-006, BH-007, BH-15, and BH-31. Record general condition in area around formerly flowing boreholes and record evidence of artesian flow on previously sealed flowing boreholes (e.g., rust staining).</i>	
	<i>Take photo if there is flow.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.4 Ace Area

The Ace Area includes the former ACE 1, ACE MC, ACE 2, ACE 14, EXC ACE 3, ACE 3, EXC ACE 1, and ACE 10 individual properties. The Ace Area included various mine openings (see Table 8), the dorrlone facility, backfill concrete plant, a freshwater pumphouse and related piping to the Fay freshwater reservoir, and a portion of the tailings line that went between the Fay mill and the Dorrlone, Fay-Verna service corridor, the Ace heating building, an electrical substation, electrical transmission and communication infrastructure (poles, mounting brackets and wire lines), main haul road between the former Fay and Verna mine sites which transects the area, and a portion of the former tailings pipeline corridor to the Marie and Fookes Reservoirs, and spilled tailings as identified in Figure 5.

At decommissioning a borehole was drilled to drain water from the Ace Stope area into the 2157 Raise, before it entered Ace Creek. As the mine workings are now flooded water has been observed flowing into the borehole, or out of the borehole depending on local groundwater levels. As a result, the borehole was sealed in 2021. The sealed borehole (AC-24) is located within a shallow stream bed between the main access road and Ace Creek and may be difficult to distinguish during inspection.

Table 8. Ace Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID Plate Coordinates
			Easting	Northing	
Shaft	Vertical	Stainless-steel	643711	6605394	59°33'43.52"N, 108°27'23.86"W
2157 Raise	Vertical	Stainless-steel	643347	6605117	59°33'35.0"N, 108°27'47.7"W
2157 Finger Raise	Vertical	Stainless-steel	643340	6605107	59°33'34.7"N, 108°27'48.2"W
130 Raise	Vertical	Stainless-steel	643773	6605390	59°33'43.3"N, 108°27'19.9"W
195 Access Raise	Vertical	Backfilled	643512	6605180	59°33'36.8"N, 108°27'37.0"W
195 Raise	Vertical	Backfilled	643512	6605180	59°33'36.8"N, 108°27'37.0"W
105*2 Raise	Vertical	Engineered cover using rock	643584	6605288	59°33'40.2"N, 108°27'32.2"W
201 Raise	Vertical	Backfilled	643615	6605277	59°33'39.8"N, 108°27'30.3"W

The * noted for the opening 105*2 Raise does not have any meaning in the table. It is reflective of the way the name of the raise is listed in the decommissioning documents.

5.4.1 Ace Monitoring Requirements

Monitoring requirements at the Ace Area will consist of:

1. Evidence of recent human visitation
2. Condition of vegetation.
3. Evidence of disturbance to covered tailings.
4. Evidence of disturbance of the waste rock covered tailings.
5. Evidence of crown pillar subsidence
6. Condition of the stainless-steel caps and the covered raises.
7. Waste rock condition.
8. Condition of the previously flowing borehole AC-24 (if located)
9. Beaver dams (if applicable).

Ace Inspection Area

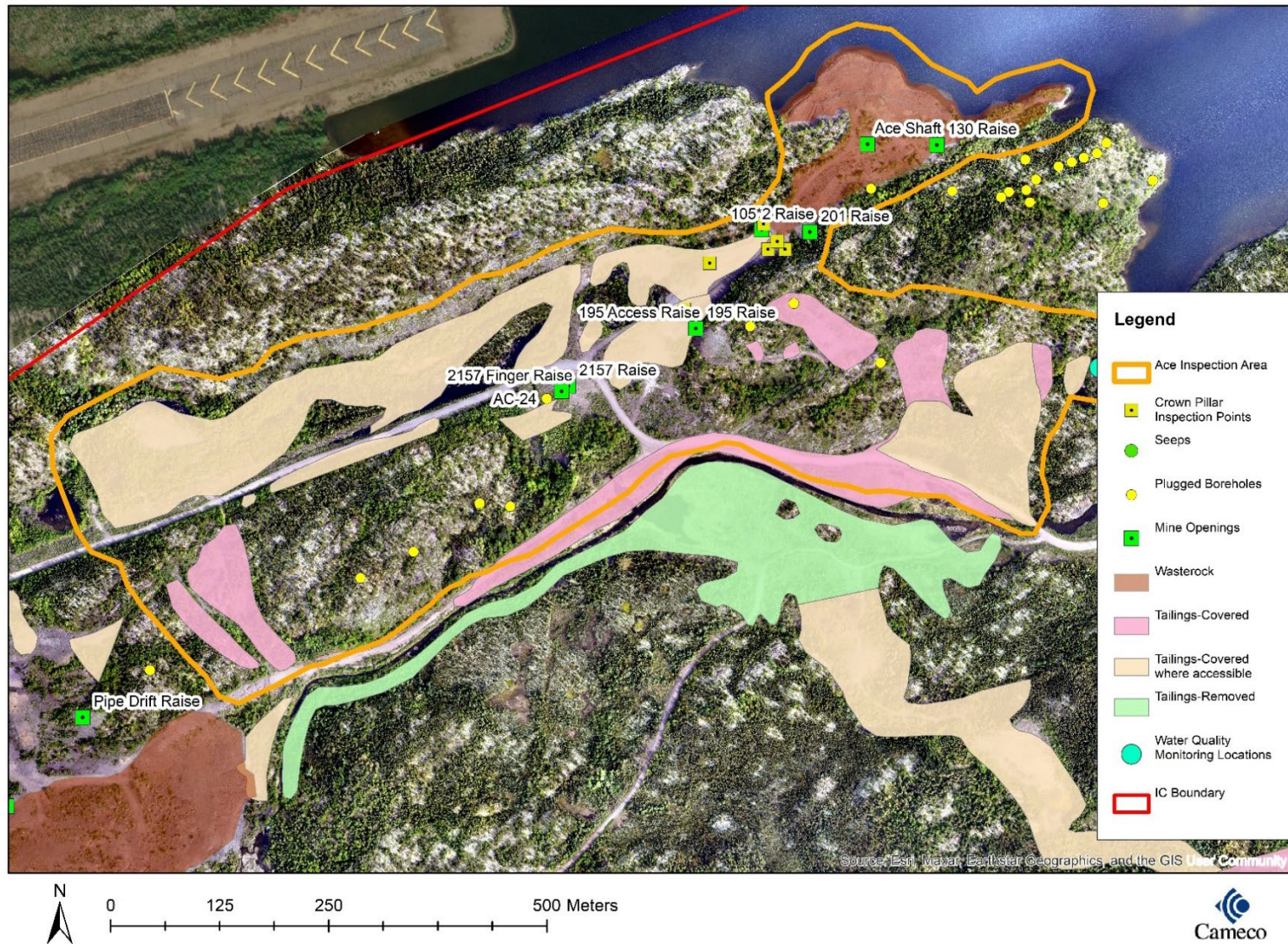


Figure 5. Ace Inspection Area

Table 9. Ace Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of Access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo location</i> <i>1. Looking 290° W at 59° 33'36" N, 108°27'37" W.</i>	
	<i>Additional comments:</i>	
Tailings Disturbance	<i>Note any disturbance to covered tailings.</i>	
	<i>Take photos if disturbed.</i> <i>1. Looking 23° NE at 59° 33'36" N, 108°27'48" W.</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photo location</i> <i>1. Looking 96° E at 59° 33'46" N, 108°27'25" W.</i>	
	<i>Additional comments:</i>	
Evidence of crown pillar subsidence	<i>Conduct geotechnical inspection as per task specific requirement</i>	
	<i>Take photos as per geotechnical inspection guidelines.</i>	
	<i>Additional comments:</i>	

Condition of stainless-steel caps	<i>Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.</i>	
	<i>Take photos of caps and any notable concerns.</i> <ol style="list-style-type: none"> 1. 130 Raise: looking 228° SW at 59° 33'43" N, 108°27'19" W. 2. Shaft: looking 300° NW at 59° 33'43" N, 108°27'24" W. 3. 2157 Raise: looking 256° W at 59° 33'34" N, 108°27'47" W. 4. 2157 Finger Raise: looking 43° NE at 59°33'34" N, 108°27'48" W.. 	
	<i>Additional comments:</i>	
Condition of backfilled and rock covered openings	<i>Note any subsidence.</i>	
	<i>Take photos of opening locations.</i> <ol style="list-style-type: none"> 1. 201 Raise Cover: looking 157° SE at 59° 33'40" N, 108°27'30" W. 2. 105*2 Raise Cover: looking 32° NE at 59° 33'40" N, 108°27'33" W. 3. 195 Raise and 195 Access Raise: looking 127° NE at 59° 33'36" N, 108°27'39" W. 	
	<i>Additional comments:</i>	
Formerly flowing boreholes	<i>Borehole AC-24 located at N 59° 33' 36" W 108° 27' 50.4". Note of any flow on ground (e.g., rust staining). Record general condition in area around formerly flowing boreholes and record evidence of artesian flow on previously sealed flowing boreholes (e.g., rust staining).</i>	
	<i>Take photos if located.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.5 Tailings Management Area

The Tailings Management Area (TMA) represents the area where tailings were deposited from the milling process. The individual properties that made up the TMA were EXC ACE 15, GC 2, GC 3, EXC GC 3, GC 5, GC 1, GORE 1, NW 2, NW 1, LEE 4, GORE 2, LEE 3, EXC LEE 3, LEE 2, EXC ACE 18, EXC ACE 17, ACE 9, ACE 17, ACE 15, EXC ACE 14, GORE, EXC GC 2, GC 4, EXC GC 4, URA 6, EXC URA 6, and ACE 19.

At the start of milling operations in 1953, tailings were deposited in Minewater Reservoir. In 1954, the tailings line was moved to Marie Reservoir, and to Fookes Reservoir in 1957. In 1970 Minewater Reservoir, which originally discharged to Ace Creek, and was used for tailings deposition during the initial milling period, was re-directed to flow into the Fulton watershed as the waterbody was being used as a settling pond for treated minewater from the Fay shaft. A channel was blasted in the bedrock south of Minewater Reservoir following decommissioning to permanently change the drainage of the Minewater Reservoir towards the TMA, making the saddle dam constructed in 1970 obsolete. Dams were constructed at the outlets of Fookes and Marie reservoirs in 1969 and 1971 respectively, to maintain water levels.

In 1976 a water treatment plant was constructed at the outlet of Marie Reservoir, and the Meadow Settling Pond was created by the construction of the Meadow Basin dam (TL-7) in 1977 (Eldorado 1983). The control structure of the Meadow Basin dam was removed in 2021 and only the concrete structure remains.

An area approximately 100 m to the north and west of the Marie Outlet was built up with large angular rip-rap, to prevent water from flowing through an alternate path. Greer Lake has been impacted by historical milling activities and has been included within the boundaries proposed for transfer to the IC Program. The decommissioning of the TMA was carried out between the winter of 1983 and the summer of 1985.

To assist with ease of access for monitoring the property areas, the TMA has been separated into two areas: TMA West (Marie and Minewater Reservoirs) and TMA East (Fookes Delta and Reservoir). See Figure 6 and Figure 7 for the respective inspection areas.

5.5.1 TMA West Area Monitoring Requirements

1. Evidence of recent human visitation
2. Condition of vegetation.
3. Condition of Marie Delta cover.
4. Make note of the ponded water in Ace Uplands (size, extent, take photos for comparison).
5. Evidence of disturbance to the covered tailings delta and tailings line right of way.
6. Condition of concrete structure that was formerly the foundation of the Meadow basin dam.
7. Geotechnical inspection of Marie Outlet structure.
8. Check secondary outlet of Marie and powerline right-of-way.

9. Inspection of Minewater outflow channel for blockages of the channel (sloughing, beaver dams, etc.)
10. Note condition of obsolete Minewater saddle dam.
11. Evidence of obvious and significant erosion of the Ace Creek channel in the Ace Lowlands area (may also be inspected as part of the Ace inspection area).
12. Beaver dams (specifically the outlet of Marie Reservoir, Outlet of Meadow Fen, along Lower Ace Creek).

TMA West Inspection Area

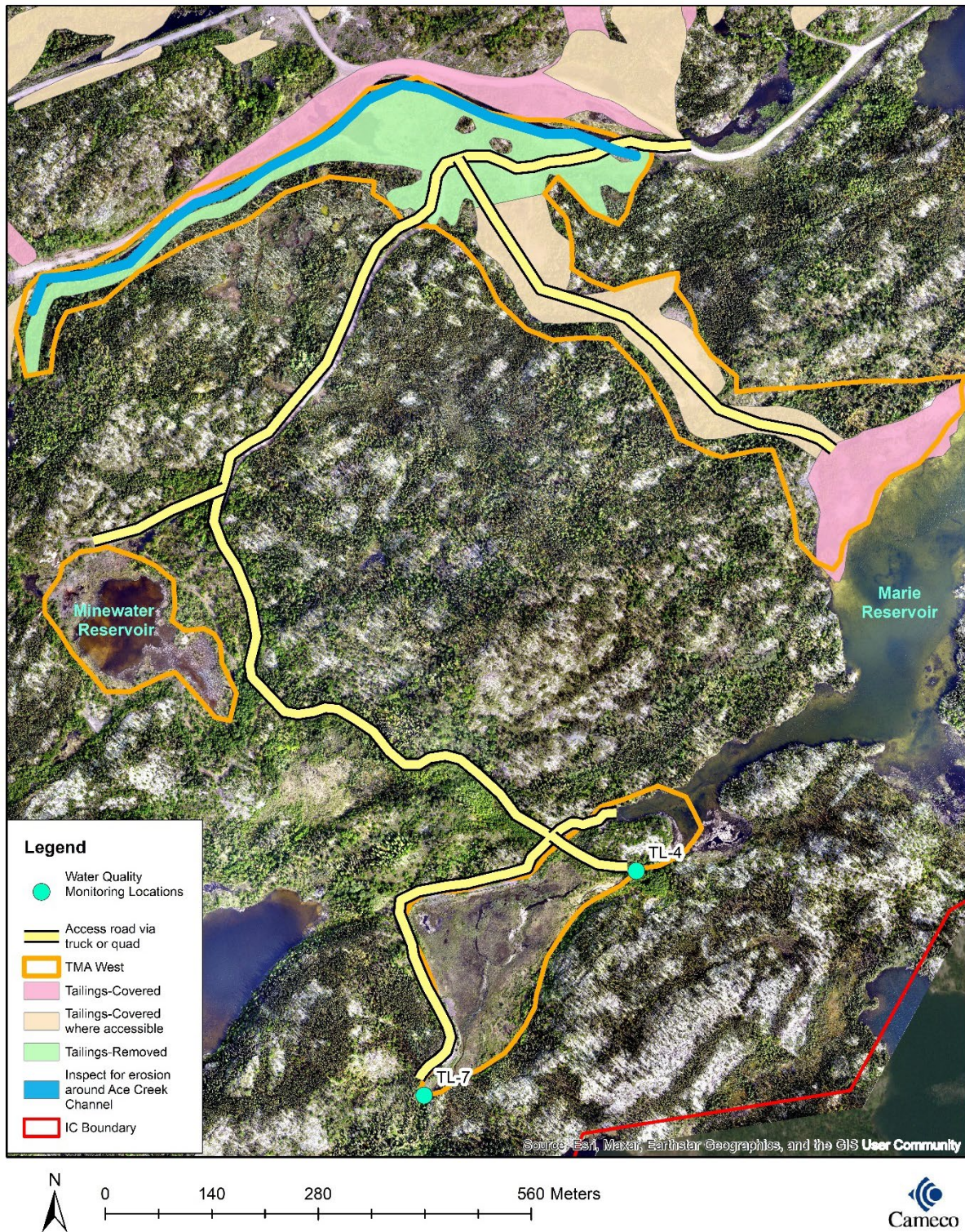


Figure 6. TMA West Inspection Area

Table 10. TMA West Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo locations</i>	
	<ol style="list-style-type: none"> 1. Minewater berm: looking 258° W at 59° 33'4" N, 108°28'4" W. 2. Marie (potential) secondary Outlet: looking 34° NE at 59° 32'59" N, 108°27'22" W. 	
	<i>Additional comments:</i>	
Condition of Marie Delta cover	<i>Note any erosion or disturbance to cover.</i>	
	<i>Take photo of cover for comparison.</i>	
	<i>Photo location</i> <ol style="list-style-type: none"> 1. Looking 28° NE at 59° 33'12" N, 108°27'1" W. 	
	<i>Additional comments:</i>	
Make note of the ponded water in Ace Uplands	<i>Note size and extent of pond.</i>	
	<i>Take photo of pond for previous comparison.</i>	
	<i>Additional comments:</i>	
Tailings Disturbance	<i>Note any disturbance to covered tailings, and tailings right-of-way.</i>	
	<i>Take photos if disturbed.</i>	
	<i>Additional comments:</i>	
Condition of remaining concrete structure at the outlet of the Meadow basin	<i>Note condition of dam (for reference only structure is not of concern).</i>	
	<i>Photo locations:</i>	
	<ol style="list-style-type: none"> 1. Looking 220° NE at 59° 32'49" N, 108°27'37" W. 2. Looking 41° NE at 59° 32'48" N, 108°27'38" W. 	
	<i>Additional comments:</i>	

Geotechnical inspection of Marie Outlet structure	<i>Conduct geotechnical inspection of outlet. Also inspect potential alternate outlet for erosion and powerline right-of-way for disturbance.</i>	
	<i>Check the condition of the spillway channel, with a view to confirming the grout-intruded rip-rap is still in place.</i>	
	<i>Check the condition of the rip-rap on either side of the spillway, with a view to confirming no erosion has occurred due to overtopping associated with an extreme flood event</i>	
	<i>Take photos as per geotechnical inspection guidelines.</i>	
	<i>Additional comments:</i>	
Inspection of Minewater outflow channel	<i>Monitor for any blockages of the channel, including sloughing, beaver dams, etc.</i>	
	<i>Take photo of channel for comparison.</i> 1. <i>Looking 125° SE at 59° 33'4" N, 108°27'53" W.</i> 2. <i>Looking 3° N at 59° 33'4" N, 108°27'53" W.</i>	
	<i>Additional comments:</i>	
Condition of Minewater saddle dam	<i>Note condition of dam (for reference only as structure is not of concern).</i>	
	<i>Take photos of former saddle dam.</i> 1. <i>Looking 291° W at 59° 33'5" N, 108°28'3" W.</i> 2. <i>Looking 338° N at 59° 33'4" N, 108°28'4" W.</i> 3. <i>Looking 258° W at 59° 33'4" N, 108°28'4" W.</i> 4. <i>Looking 358° N at 59° 33'5" N, 108°28'4" W.</i>	
	<i>Additional comments:</i>	
Evidence of obvious and significant erosion of the Ace creek channel in the Ace Lowlands area	<i>Note of any erosion.</i>	
	<i>Take photo of channel for comparison.</i> 1. <i>Looking 64° NE at 59° 33'29" N, 108°27'45" W.</i> 2. <i>Looking 244° SW at 59° 33'29" N, 108°27'45" W.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.5.2 TMA East Monitoring Requirements

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Condition of the 72 Zone Portal plug and ID Plate (59°33'53.03"N, 108°25'07.7"W).
4. Condition of Bored Raise and ID plate (59°33'37.5"N, 108°26'15.8"W).
5. Evidence of disturbance to the covered tailings delta.
6. Geotechnical inspection of Fookes Outlet structure and Delta.
7. Evidence of disturbance of spilled tailings along tailings ROW.
8. Subsidence of waste disposal area.
9. Beaver dam (specifically Fookes Reservoir Outlet)

TMA East Inspection Area

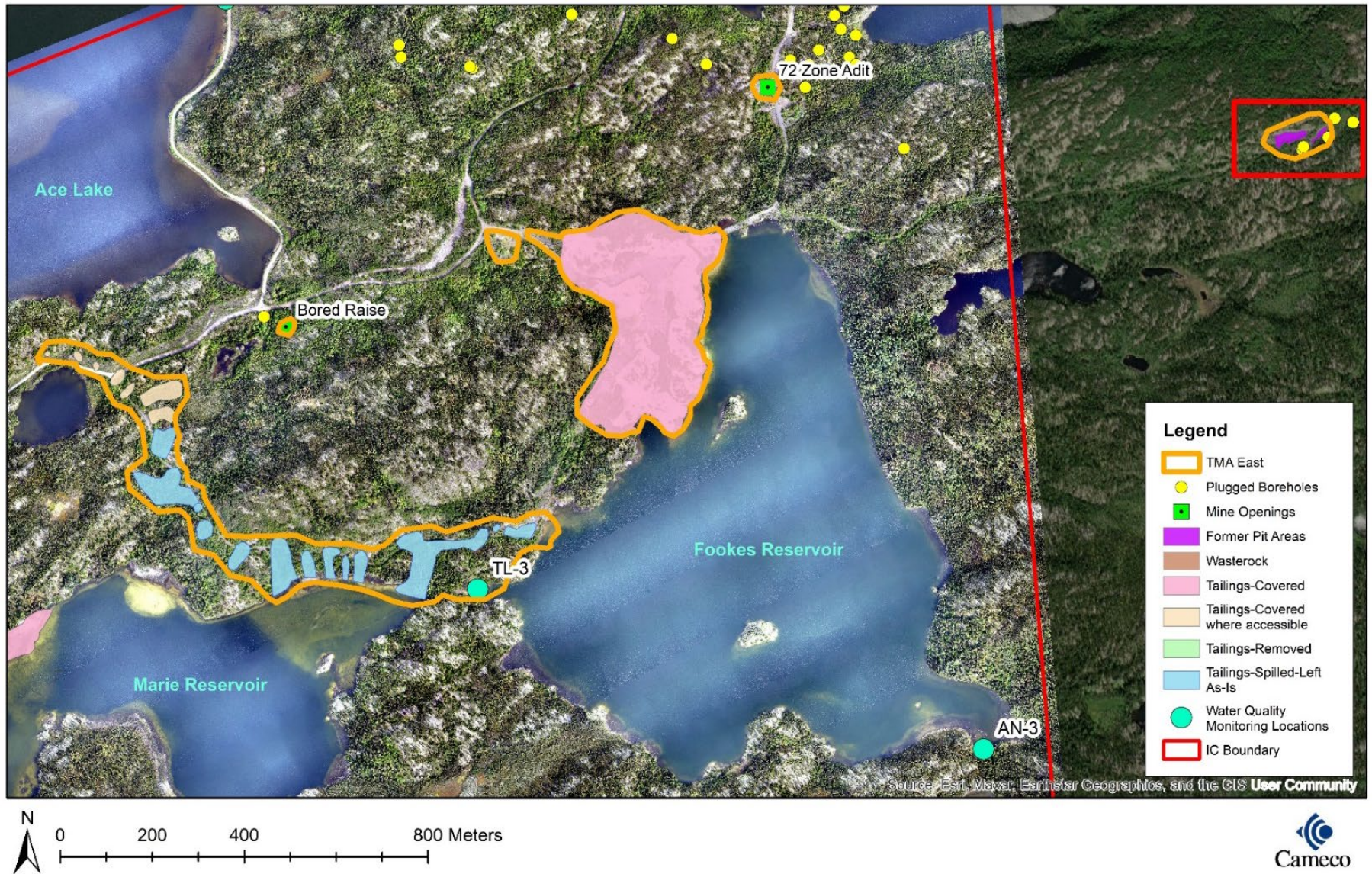


Figure 7. TMA East Inspection Area

Table 11. TMA East Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of Access trails and areas adjacent to access trails	Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.	
	Photos (any signs of activity).	
	Additional comments:	
Evidence of recent human visitation on previously disturbed areas	Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)	
	Photos (any signs of activity).	
	Additional comments:	
Condition of vegetation	Note general condition of vegetation on site.	
	<i>Photo location</i> 1. Looking 286° W at 59° 33'42" N, 108°25'20" W.	
	Additional comments:	
Condition of the 72 Zone Portal plug	Note of any subsidence.	
	<i>Take photos of opening.</i>	
	Additional comments:	
Condition of Bored Raise	Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.	
	<i>Take photos of opening.</i> 1. Looking 183° S at 59° 33'37" N, 108°26'15" W.	
	Additional comments:	
Tailings Disturbance	Note disturbance of tailings along the tailings line corridor (see Figure 7 for tailings extent).	
	Take photos if disturbed.	
	Additional comments:	
Geotechnical inspection of Fookes Outlet structure and Delta	Conduct geotechnical inspection of outlet. <i>Check the condition of the spillway channel, with a view to confirming the grout-intruded rip-rap is still in place</i> <i>Check the condition of the rip-rap on either side of the spillway, with a view to confirming no erosion has occurred due to</i>	

	<i>overtopping associated with an extreme flood event</i>	
	Take photos as per geotechnical inspection guidelines.	
	Additional comments:	
Subsidence of waste disposal area	Note of any subsidence.	
	<i>Photo location</i> 1. <i>Looking 196° S at 59° 33'43" N, 108°25'45" W.</i>	
	Additional comments:	
General observations	Evidence of wildlife or any other activity.	
	Take photos as required.	
	Additional comments:	

5.6 Verna and Bolger

The Verna/Bolger property Area previously consisted of BOLGER 1, BOLGER 2, ACE 5, ACE 7, ACE 8, NW 3, NW 3 Ext, EMAR 19 (11 Zone), EMAR 21 (46 Zone) individual properties.

The area included the Bolger pit and the adjacent spur pit, utility corridors, waste rock piles from the Verna shaft and Bolger Pit excavation, freshwater intake and related infrastructure, and mine openings. The Bolger pit was operated intermittently between 1958 and 1980 and was the largest pit at the Eldorado Beaverlodge site and was partially backfilled with decommissioned mining infrastructure, and capped with waste rock, over a 42-week period in late 1984 and early 1985. The Bolger Pit was also used as a disposal location for debris gathered from the decommissioned properties as they were being prepared for final release. The spur pit was mined during the initial to mid-development phase of the Bolger pit and that no decommissioning waste was disposed of within the spur pit.

During the early years of operation waste rock from the Bolger open pit mine was placed into the area west of the pit, extending across a valley through which Zora Creek historically flowed and connected Zora Lake to Verna Lake, resulting in disruption of flow from Zora Creek to Verna Lake. The flow path of Zora Creek was re-established following construction of a channel through the waste rock pile between 2014 and 2016

The main powerline and a communication line from the Fay site crossed Ace Lake and traveled directly over the hill to the Verna powerhouse. The area also hosts the main road from the Fay site and was the site of two explosive storage magazines located approximately 250 and 350 m south of the Verna Shaft location. The former magazines are accessed by a trail which departs from the main road approximately 340 m south of the Verna Shaft area. There were eight mine openings on the Verna/Bolger Area, see Table 12. All openings, with the exception of the Shaft Adit, were identified and marked during the final preparation of the site for release from CNSC licensing and transfer to the IC Program. The Shaft Adit is thought to be buried under the waste rock pile that surrounds the Verna Shaft and could not be located. See Figure 8 for the Verna/Bolger inspection area.

The area also contains the 11 Zone Pit and a small slash pit located east of the main pit on the backslope of the bedrock ridge that formed the 11 Zone Pit. This pit was operated intermittently from the mid-70's until 1981. The pit was backfilled in 1982, with the most recent cover being added to the main pit area in 2003 to address erosion issues that were noted following a previous cover installation. The slash pit was completely backfilled and does not require inspection.

The 46 Zone property contained an open pit as well as an adit. Mining on this property occurred for 2 years in 1980/81. Both the pit and the adit were decommissioned in September 1982, with the adit being backfilled with waste rock and the pit being partially filled with waste rock.

Table 12. Verna/Bolger Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID Plate Coordinates
			Easting	Northing	
Shaft	Vertical	Stainless-steel	645470	6606022	59°34'1.6"N, 108°25'30.4"W
026594 Raise	Vertical	Stainless-steel	645638	6606025	59°34'1.5"N, 108°25'19.7"W
026594 Finger Raise	Vertical	Stainless-steel	645667	6606030	59°34'1.6"N, 108°25'17.8"W
72 Zone Portal	Horizontal	Backfilled	645836	6605771	Have not recorded
Shaft Adit	Horizontal	Backfilled			N/A
46 Zone Portal	Horizontal	Backfilled	645318	6607236	Have not recorded
Verna Ladder Access	Vertical	Stainless-steel	645669	6606036	59°33'37.5"N, 108°26'15.8"W

5.6.1 Verna/Bolger Area Monitoring Requirements

Monitoring requirements at the Verna/Bolger Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Waste rock condition (note of any subsidence of the Verna Waste rock pile, which may indicate the location of the Verna Shaft Adit).
4. Pit wall condition (Bolger, 11 Zone, 46 Zone).
5. Condition of channel and channel slope
6. Condition of the stainless-steel caps.
7. Condition of backfilled openings, including evidence of instability of crown pillar above portals.
8. Beaver dam.

Verna/Bolger Inspection Area

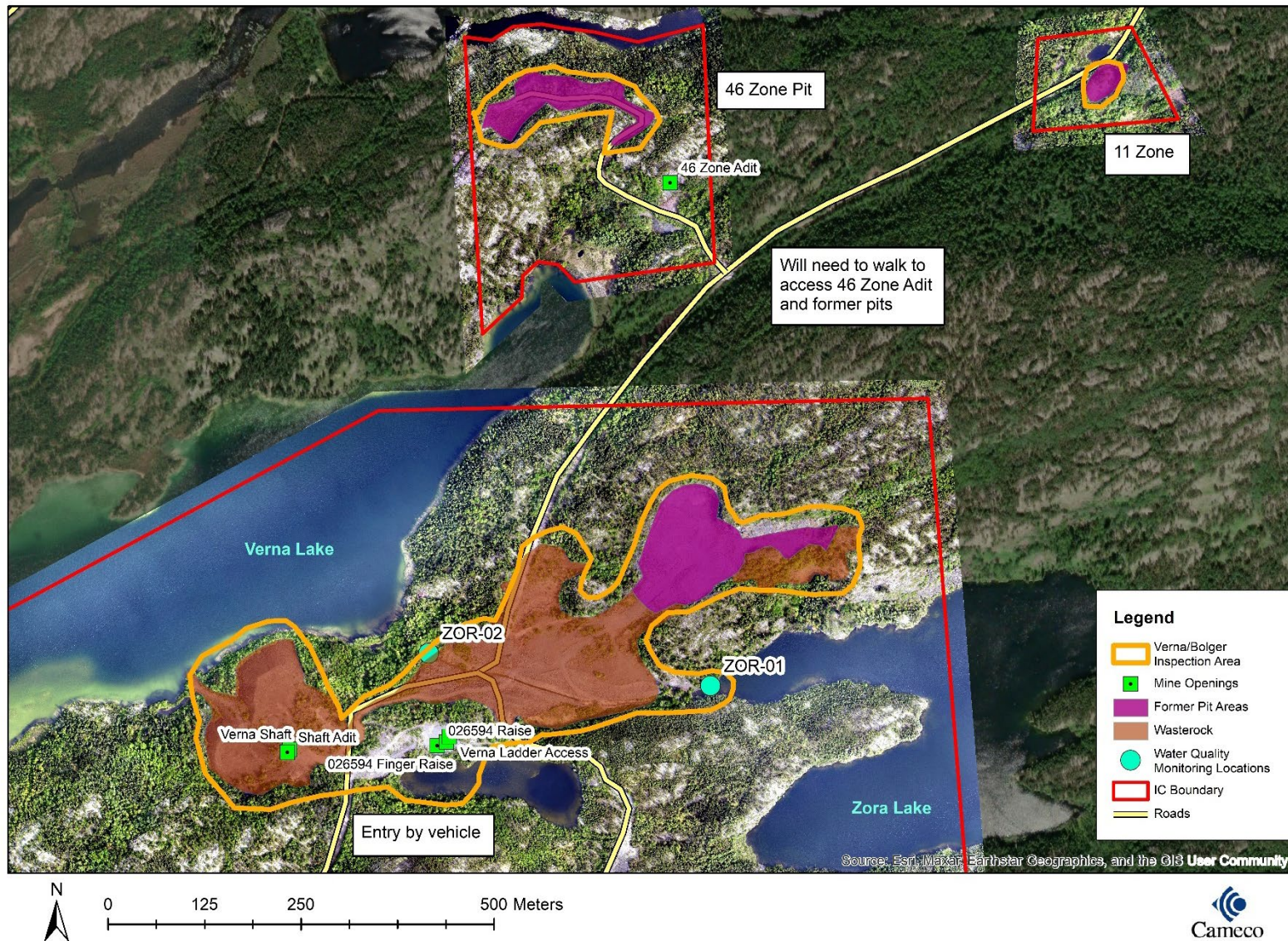


Figure 8. Verna/Bolger Inspection Area

Table 13. Verna/Bolger Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photo location</i> <ol style="list-style-type: none"> 1. <i>Looking 231° SW at 59° 34' 12" N, 108°25'7" W.</i> 	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo location</i> <ol style="list-style-type: none"> 1. <i>Looking 68° E at 59° 34'25" N, 108°24'34" W.</i> 	
	<i>Additional comments:</i>	
Waste rock condition	<i>Verna Waste Rock Pile: Record general condition, specifically noting any evidence of subsidence (which may indicate the location of the Verna Shaft Adit), slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Bolger Waste Rock Pile: Note any subsidence, anthropogenic disturbance, and acid rock drainage.</i>	
	<i>Photo locations</i> <ol style="list-style-type: none"> 1. <i>Verna: looking 3° N at 59° 34' 1" N, 108°25'37" W.</i> 2. <i>Stream reconstruction slope: looking : looking 112° E at 59° 34'4" N, 108°25'16" W.</i> 3. <i>Iron staining at Bolger Pit: looking : 68° E at 59° 34'5" N, 108°25'4" W.</i> 	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<i>Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.</i>	

	<p>1. 11 Zone: looking 192° S at 59° 34'28" N, 108°24'4" W.</p> <p>2. 46 Zone Pit: 59°34'28" N, 108°25'12" W.</p> <p>3. Bolger Pit: looking 31° NE at 59° 34'9" N, 108°24'58" W.</p> <p>4. Bolger Spur Pit: looking 63°NE at 59° 34'9" N, 108°24'54" W.</p> <p>Additional comments:</p>	
Condition of channel and slope	Conduct geotechnical inspection.	
	Photos	
	Additional comments:	
Condition of stainless-steel caps	Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.	
	Take photos of caps and any notable concerns.	
	<p>1. Verna Ladder Access: looking 202° S at 59° 34'1" N, 108°25'18" W.</p> <p>2. 026594 Finger Raise: looking 195° S at 59° 34'1" N, 108°25'18" W.</p> <p>3. 026594 Raise Cover: looking 30° NE at 59° 34'1" N, 108°25'19" W.</p> <p>4. Shaft: looking 347° N at 59° 34'1" N, 108°25'31" W.</p> <p>Additional comments:</p>	
Condition of backfilled openings	Note of any subsidence and evidence of instability of crown pillar above portals.	
	Take photo of openings.	
	<p>1. 46 Zone Portal: looking 84° E at 59° 34'24" N, 108°24'58" W.</p> <p>Additional comments:</p>	
Beaver Activity	Note of condition of beaver dam at the outlet of Zora Lake (if applicable).	
	Take photo of dam.	
	Additional comments:	
General observations	Evidence of wildlife or any other activity.	
	Take photos as required.	
	Additional comments:	

5.7 Dubyna Area

The Dubyna Area includes the former JO-NES, EMAR 1, and EMAR 16 (K260) individual properties.

The area includes the former Dubyna mine site which is located on a ridge separating Foot Bay (Donaldson Lake) from Dubyna Lake. The site is accessible by road and is located approximately 6.4 km northeast of the former Beaverlodge mine/mill facilities. Drainage from this site flows towards Dubyna Lake then into upper Ace Creek, through Ace Lake and Lower Ace Creek into Beaverlodge Lake.

Historic mining activities consisted of a series of three small and shallow open pits and portions of the property overlay sections of the Dubyna underground mine. The open pit development was initiated in 1977 and concluded in 1982 with the pits being partially backfilled. Underground development commenced in 1978 and was completed in 1981 and consisted of an adit with a decline ramp system from surface and two separate ventilation raises to surface (see Table 14). During operations, mine water was treated underground at the Dubyna mine and the treated effluent discharged to Dubyna Lake.

There were previously flowing boreholes that have been sealed but are located within Dubyna lake and therefore will not require inspection.

The area includes a small decommissioned open pit (K260) located approximately 2km, via road, from the Dubyna site. The K260 Pit access point is located approximately 200m south of the main access road to the former Dubyna mine site. See Figure 9 for the Dubyna inspection area.

Table 14. Dubyna Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID Plate Coordinates
			Easting	Northing	
810394 Raise	Vertical	Stainless-steel	647794	6608256	59°35'10.8"N, 108°22'57.0"W
820694 Raise	Vertical	Stainless-steel	647820	6608451	59°35'16.9"N, 108°22'54.7"W
Dubyna Portal (Adit)	Horizontal	Backfill	647806	6608229	59°35'9.92"N, 108°22'56.17W

5.7.1 Dubyna Monitoring Requirements

Monitoring requirements at the Dubyna Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Pit wall condition (Dubyna pits and K260).
4. Waste rock condition.
5. Evidence of crown pillar subsidence.
6. Condition of stainless-steel capped and backfilled mine opening, checking for subsidence or erosion.
7. Beaver dam.

Dubyna Inspection Area

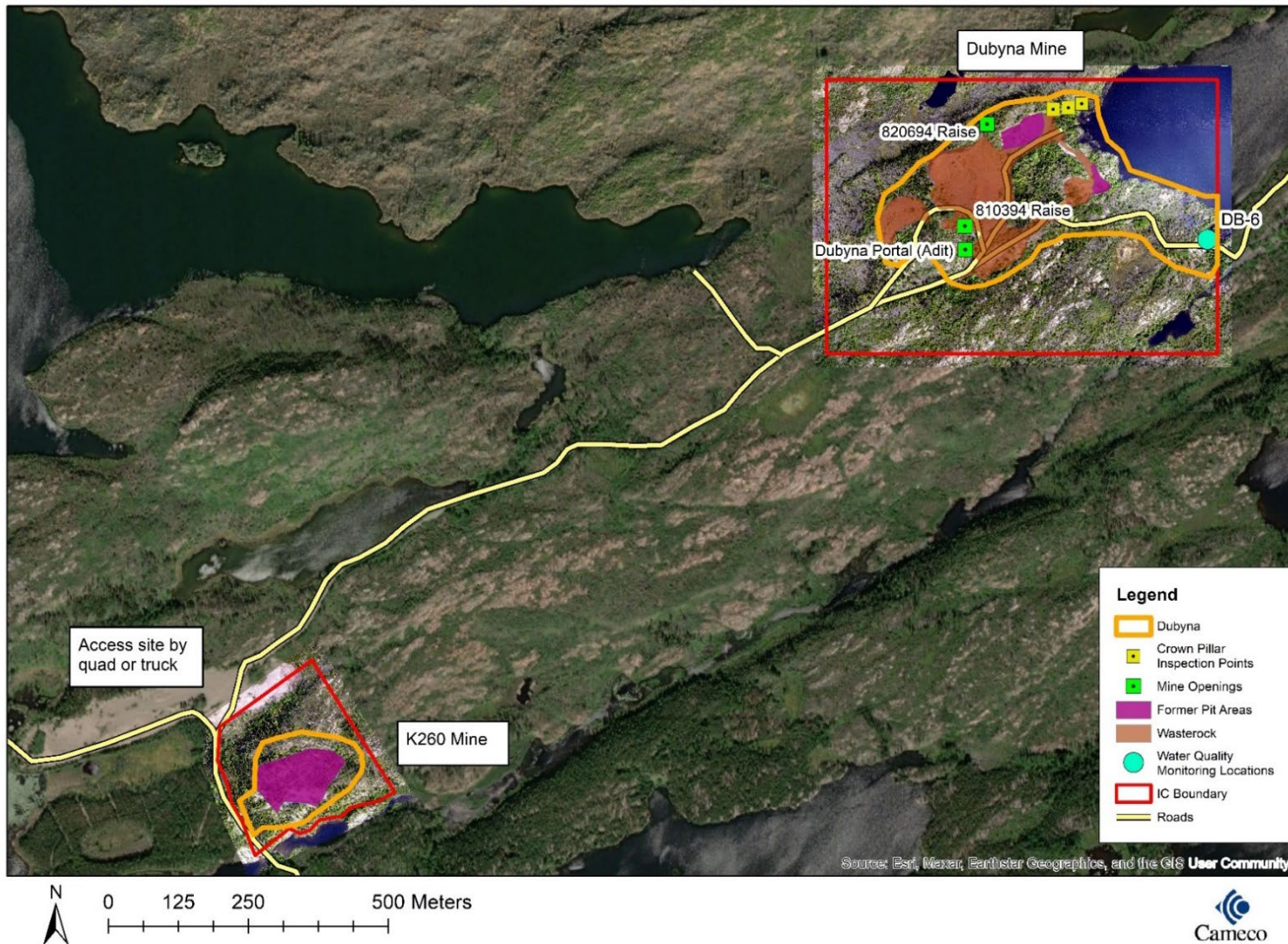


Figure 9. Dubyna Inspection Area

Table 15. Dubyna Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional Comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Record photo location.</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photo location</i>	
	<i>Looking 252° NW at 59° 35'17" N, 108°22'48" W.</i>	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<ol style="list-style-type: none"> 1. <i>Dubyna pit wall: looking 298° NW at 59° 35'16" N, 108°22'50" W.</i> 	
	<ol style="list-style-type: none"> 2. <i>Dubyna minor pit: looking 100° E at 59° 35'14" N, 108°22'42" W.</i> 	
	<ol style="list-style-type: none"> 3. <i>K260 Pit wall</i> 	
Evidence of crown pillar subsidence	<i>Conduct geotechnical inspection</i>	
	<i>Take photos as per geotechnical inspection. guidelines.</i>	
	<i>Additional comments:</i>	
Condition of stainless-steel caps	<i>Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.</i>	

	<p><i>Take photos of caps and any notable concerns.</i></p> <ol style="list-style-type: none"> 1. 810394 Raise: looking 147° SE at 59° 35'10" N, 108°22'57" W. 2. 820694 Raise: looking 264° W at 59° 35'16" N, 108°22'54" W. <p><i>Additional comments:</i></p>	
Condition of backfilled opening	<i>Note of any subsidence.</i>	
	<p><i>Take photos of openings.</i></p> <p><i>Dubyna Portal (adit): looking 306° NW at 59° 35'9" N, 108°22'58" W.</i></p> <p><i>Additional comments:</i></p>	
	<i>Additional comments:</i>	
Beaver Activity	<i>Note the condition of the beaver dam at the outlet of Dubyna Lake (if applicable)</i>	
	<i>Take photo of dam.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.8 Hab Area

The Hab Area was the location of the former satellite Hab mine site. The site was host to an underground operation with 11 mine openings (see Table 16), as well as an open pit and waste rock pile. Ore was hauled approximately 8km from the Hab mine site to the Beaverlodge mill for processing along a paved road. As a result, there are no tailings located in the Hab Area.

Table 16. Hab Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID Plate Coordinates
			Easting	Northing	
13904 Raise	Vertical	Stainless-steel	645227	6612202	59°37'21.5"N, 108°25'30.6"W
13905 Raise	Vertical	Stainless-steel	645248	6612213	59°37'21.8"N, 108°25'29.2"W
13918 Raise	Vertical	Backfill	645304	6612236	59°37'22.5"N, 108°25'25.6"W
13927 Raise	Vertical	Stainless-steel	645296	6612227	59°37'22.2"N, 108°25'26.1"W
13909 Raise	Vertical	Backfill	645338	6612244	59°37'22.7"N, 108°25'23.4"W
13929 Raise	Vertical	Backfill	645381	6612243	59°37'22.6"N, 108°25'20.7"W
13810 Raise	Vertical	Stainless-steel	645561	6611886	59°37'21.0"N, 108°25'12.55"W
Shaft	Vertical	Stainless-steel	645568	6612132	59°37'18.8"N, 108°25'9.0"W
Heater Raise	Vertical	Stainless-steel	645510	6612198	59°37'21.0"N, 108°25'12.55"W
Haulage Adit (west)	Horizontal	Backfill	645505	6612189	59°37'20.7"N, 108°25'12.9"W
Service Adit (east)	Horizontal	Backfill	645519	6612201	59°37'21.1"N, 108°25'12.0"W

A feature on the Hab Area to be aware of during future inspections is that the outflow from the southeastern arm of Beatrice Lake flows down an established channel to the edge of the waste rock pile, where it disappears into the waste rock pile and presumably enters the mine workings and eventually resurfaces in Pistol Lake. This feature is important to recognize as the beaver dam at the outlet of the southeastern arm of Beatrice Lake has the potential to divert outflow to the southwestern arm of Beatrice Lake. This could potentially result in water quality fluctuations at the monitoring station downstream

of Pistol Lake as the surface water would by-pass the Hab mine site. See Figure 10 for Hab inspection area.

5.8.1 Hab Monitoring Requirements

Monitoring requirements at the Hab Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Waste rock trail leading to Milmine Lake. If there is no disturbance of the trailhead near the Hab mine site, it can be assumed that the waste rock used to construct the trail beyond the mine site has not been disturbed. If there is evidence of disturbance at the trailhead then conduct an inspection to document the extent of the disturbance.
4. Pit wall condition.
5. Waste rock condition.
6. Beaver dam. Specifically the condition of the beaver dam at the southeast outlet of Beatrice Lake and evidence of flow from the southwest arm of Beatrice Lake. Also, the condition of the dam at the outlet of Pistol Lake.
7. Evidence of crown pillar subsidence.
8. Condition of backfilled mine openings (checking for subsidence) and condition of the stainless-steel capped mine openings (see Table 16 above).

Hab Inspection Area

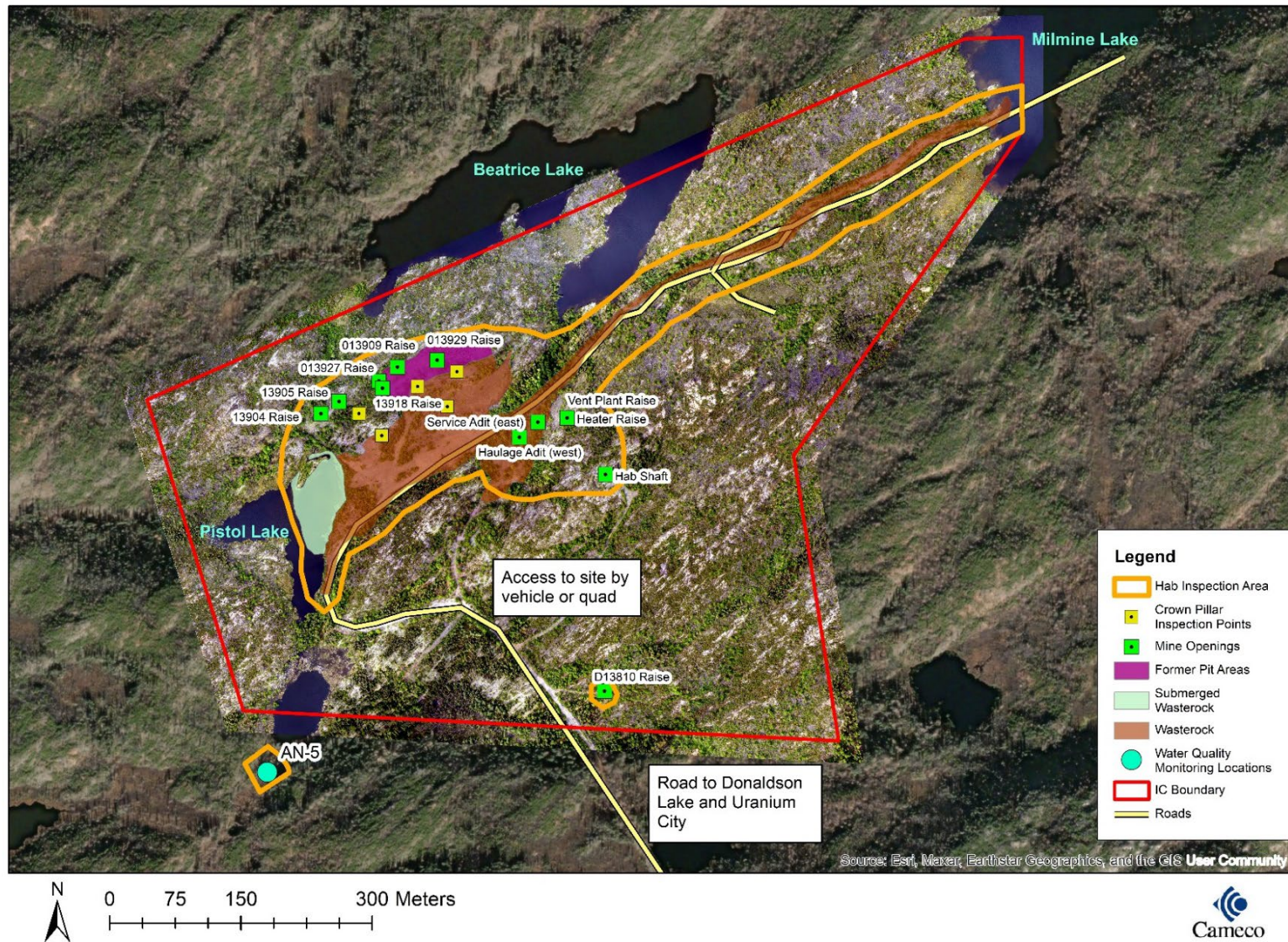


Figure 10. Hab Inspection Area

Table 17. Hab Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity)</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo location</i> <i>1. Looking 55° NE at 59° 37'18" N, 108°25'26" W.</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Waste rock trail leading to Milmine Lake. If there is no disturbance of the trailhead near the Hab mine site, it can be assumed that the waste rock used to construct the trail beyond the mine site has not been disturbed. If there is evidence of disturbance at the trailhead, then conduct an inspection to document the extent of the disturbance.</i>	
	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photo location</i> <i>1. Looking 55° NE at 59° 37'18" N, 108°25'26" W.</i>	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<i>Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.</i>	
	<i>Additional comments:</i>	
Evidence of crown pillar subsidence	<i>Conduct geotechnical inspection.</i>	
	<i>Take photos as per geotechnical inspection guidelines.</i>	
	<i>Additional comments:</i>	
	<i>Note any subsidence.</i>	

<p>Condition of backfilled openings</p>	<p><i>Take photos of openings.</i></p> <ol style="list-style-type: none"> 1. <i>Service Adit (east): looking 165° SE at 59° 37'20" N, 108°25'15" W.</i> 2. <i>Haulage Adit (west): looking 218° SW at 59° 37'20" N, 108°25'15" W.</i> 3. <i>13918 Raise: looking 228° SW at 59° 37'20" N, 108°25'15" W.</i> 4. <i>13909 Raise: looking 271° W at 59° 37'22" N, 108°25'22" W.</i> 5. <i>Hab 13929 Raise: looking 127° SE at 59° 37'22" N, 108°25'21" W.</i> 	
	<p><i>Additional comments:</i></p>	
<p>Condition of stainless-steel caps</p>	<p><i>Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.</i></p>	
	<p><i>Take photos of caps and any notable concerns.</i></p> <ol style="list-style-type: none"> 1. <i>Shaft: looking 285° W at 59° 37'18" N, 108°25'9" W.</i> 2. <i>Heater Raise: looking 98° E at 59° 37'20" N, 108°25'13" W.</i> 3. <i>Hab 013904: looking 3° N at 59° 37'21" N, 108°25'30" W.</i> 4. <i>Hab 13905: looking 61° NE at 59° 37'21" N, 108°25'29" W.</i> 5. <i>Hab 13927: looking 30° NE at 59° 37'22" N, 108°25'26" W.</i> 6. <i>Hab 13810 Raise: looking 301° NE at 59° 37'10" N, 108°25'10" W.</i> 	
	<p><i>Additional comments:</i></p>	
<p>Beaver Activity</p>	<p><i>Note of condition of beaver dam at the southeast outlet of Beatrice Lake and evidence of flow from the southwest arm of Beatrice Lake. Also note the condition of the beaver dam at the outlet of Pistol Lake.</i></p>	
	<p><i>Take photo of dam.</i></p>	
	<p><i>Additional comments:</i></p>	
<p>General observations</p>	<p><i>Evidence of wildlife or any other activity.</i></p>	
	<p><i>Take photos as required.</i></p>	
	<p><i>Additional comments:</i></p>	

5.9 Moran Pit Area

The Moran Pit Area is approximately 1.3 km east of the Fookes Reservoir. The Moran Pit Area was not subject to licensing by the CNSC. Significant vegetation has re-established on the access to trail to the Moran Pit area making it essentially impassable by passenger type vehicles. In addition, large boulders have been placed at the start of the access trail which further restrict vehicular access. There were no mine openings in the Moran Pit Area. Moran Pit is included on Figure 7 TMA East inspection area due to its proximity to the TMA East area and the shared access points.

5.9.1 Moran Pit Monitoring Requirements

Monitoring requirements at the Moran Pit Area will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Waste rock condition.
4. Pit wall condition.

Table 18. Moran Pit Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photos</i>	
	<i>Additional comments:</i>	
Waste rock condition	<i>Record general condition, specifically noting any evidence of subsidence, slope failure, anthropogenic disturbance, or acid rock drainage.</i>	
	<i>Photos</i>	
	<i>Additional comments:</i>	
Pit wall condition	<i>Record general condition, specifically noting any failure or sloughing.</i>	
	<i>Take pictures of pit wall and base of pit from prescribed locations to compare to previous inspection photos.</i>	
	<ol style="list-style-type: none"> 1. <i>Looking W at 59° 33.78' N, 108° 23.88' W.</i> 2. <i>Looking E at 59° 33.78' N, 108° 23.94' W.</i> 	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

5.10 Fishhook Bay Area

The Fishhook Bay Area included the location of an underground mine located approximately 11 km southeast of the Uranium City Airport. Fishhook Bay was not subject to licensing by the CNSC. In 1957, Fishhook Bay property was leased to Black Bay Uranium Mines who sank a shaft. In addition, an adit was developed to connect with the shaft above the first level and provide a haulage way for ore. Operations were suspended in 1958 but were recommenced in late 1959 when the first level was dewatered, and ore was shipped to the Beaverlodge Eldorado Mill. At the end of mining, in 1962 the camp was abandoned with little to no decommissioning. The site was decommissioned by Eldorado in Q1 of 1985. The headframe and buildings were burned, the shaft was bulkheaded with a concrete cap and waste rock was placed in the adit opening.

The original concrete cap on the shaft was replaced with a stainless-steel cap in 2020 (see Table 19). The material in the adit opening was excavated and resealed using regulatory approved methods. The raise was backfilled sometime after the original decommissioning. There has been no evidence if subsidence in the area of the raise and the location has been marked with a plaque on a large rock for future inspections. See Figure 9 for the Fishhook inspection area.

Table 19. Fishhook Bay Mine Openings

Opening	Type	Type of Cover	WGS 84 UTM Zone 12		As-Built ID Plate Coordinates
			Easting	Northing	
Shaft	Vertical	Stainless-steel	646742	6594815	59°27'57.57"N, 108°24'37.69"W
Raise	Vertical	Backfilled			59° 28' 01.42" N, 108° 24' 29.90" W
Adit	Horizontal	Backfilled	646809	6594864	59° 27' 59.58" N, 108° 24' 32.83" W

5.10.1 Fishhook Bay Monitoring Requirements

Monitoring requirements at the Fishhook Bay will consist of:

1. Evidence of recent human visitation.
2. Condition of vegetation.
3. Evidence of a crown pillar subsidence.
4. Condition of stainless-steel caps and mine openings.

Fishhook Inspection Area

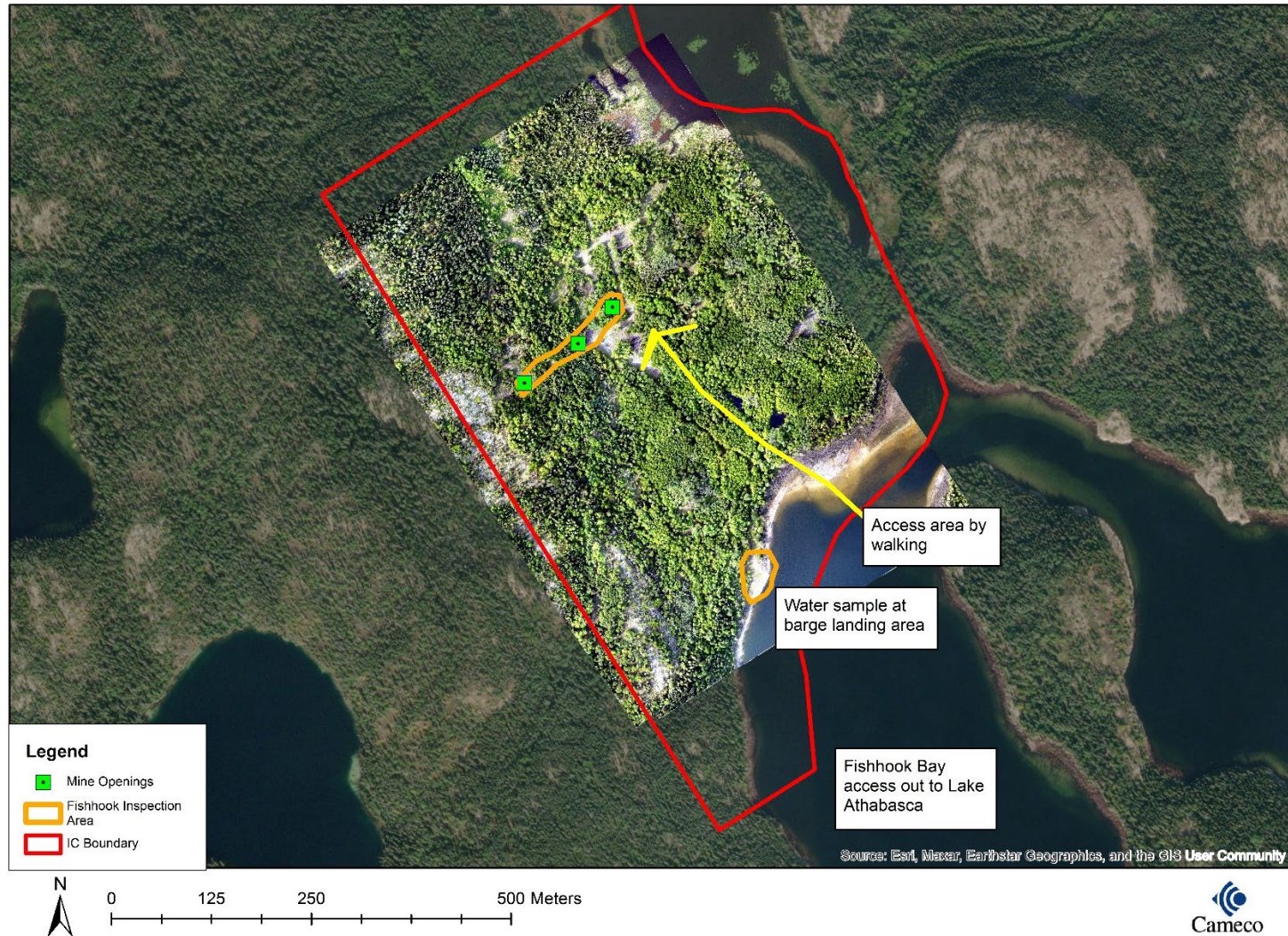


Figure 11. Fishhook Inspection Area

Table 20. Fishhook Bay Inspection Checklist

Inspection Task	Inspection Activity	Inspection Observations and Findings
Condition of access trails and areas adjacent to access trails	<i>Note condition of access road (physical condition and vegetation), to aid expectations for future inspections.</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Evidence of recent human visitation on previously disturbed areas	<i>Recent signs of visitation? (campfires, cut trees, trails, powerline rights-of-way)</i>	
	<i>Photos (any signs of activity).</i>	
	<i>Additional comments:</i>	
Condition of vegetation	<i>Note general condition of vegetation on site.</i>	
	<i>Photo location</i> <i>1. Looking 304° NW at 59° 28'2" N, 108°24'34" W.</i>	
	<i>Additional comments:</i>	
Evidence of crown pillar subsidence	<i>Note any subsidence.</i>	
	<i>Photo location</i> <i>1. Looking 69° E at 59° 28'1" N, 108°24'31" W.</i>	
	<i>Additional comments:</i>	
Condition of stainless-steel caps	<i>Visual monitoring of the stainless-steel caps at every inspection. Inspect caps for general condition of stainless steel including obvious signs of deformity, damage, or displacement.</i>	
	<i>Take photos of caps and any notable concerns.</i> <i>1. Looking 125° SE at 59° 27'58" N, 108°24'37" W.</i>	
	<i>Additional comments:</i>	
Condition of backfilled opening	<i>Note any subsidence.</i>	
	<i>Take photos of opening.</i> <i>1. Looking 260° W at 59° 27'59" N, 108°24'31" W.</i>	
	<i>Additional comments:</i>	
General observations	<i>Evidence of wildlife or any other activity.</i>	
	<i>Take photos as required.</i>	
	<i>Additional comments:</i>	

6.0 EQUIPMENT

The following equipment is recommended for the site inspection:

1. Beaverlodge Decommissioned Properties Field Guide
2. Truck and/or quad rental for accessing sites.
3. Tool (e.g., pickaxe), to remove dense vegetation or beaver activity in certain areas (may require a permit from the Ministry of Environment).
4. Chainsaw for cutting trees blocking access routes.
5. Gamma meter
6. Fully calibrated water field measurement probe (pH, temp, conductivity)
7. Small hand tools to remove vegetation, litter, etc. that may have accumulated on the caps and ID plates.
8. GPS device
9. Geotagged camera for recording site photographs
10. Safety and first-aid equipment
11. Satellite Phone
12. Typical field equipment (e.g., daypack, rain gear, notebook, bear spray, water, first aid kit, etc.)
13. Long-Term Inspection Checklist (stainless-steel caps) when required (and related equipment). See Appendix D for more detailed information.
14. Geotechnical Inspection Checklist. See Appendix C for more detailed information.
15. The inspector should also be familiar with the closure reports indicated in Section 2.0 that provide detailed background information on the properties.

APPENDIX A: IC BOUNDARY COORDINATES

IC Boundary Coordinates

Shape	Name	Type	Easting	Northing	Latitude	Longitude	Latitude	Longitude
Point	Martin Lake	IC Boundary Line	639055.5291	6604116.285	59° 33' 7.904" N	108° 32' 23.164" W	59.552196	-108.539768
Point	Martin Lake	IC Boundary Line	639178.5179	6603882.921	59° 33' 0.220" N	108° 32' 15.889" W	59.550061	-108.537747
Point	Martin Lake	IC Boundary Line	638350.7093	6603495.034	59° 32' 48.680" N	108° 33' 9.464" W	59.546856	-108.552629
Point	Martin Lake	IC Boundary Line	638267.1401	6603028.308	59° 32' 33.705" N	108° 33' 15.874" W	59.542696	-108.554409
Point	Martin Lake	IC Boundary Line	637820.9118	6602876.937	59° 32' 29.346" N	108° 33' 44.611" W	59.541485	-108.562392
Point	Martin Lake	IC Boundary Line	637820.9118	6603586.487	59° 32' 52.263" N	108° 33' 42.954" W	59.547851	-108.561932
Point	Eagle Zone	IC Boundary Line	640250	6607030	59° 34' 40.574" N	108° 31' 0.235" W	59.577937	-108.516732
Point	Eagle Zone	IC Boundary Line	640250	6607320	59° 34' 49.940" N	108° 30' 59.545" W	59.580539	-108.51654
Point	Eagle Zone	IC Boundary Line	640545	6607030	59° 34' 40.217" N	108° 30' 41.452" W	59.577838	-108.511515
Point	Eagle Zone	IC Boundary Line	640565	6607320	59° 34' 49.559" N	108° 30' 39.487" W	59.580433	-108.510969
Point	Eagle Zone	IC Boundary Line	640565.018	6607138.785	59° 34' 43.706" N	108° 30' 39.918" W	59.578807	-108.511088
Point	O2 Zone	IC Boundary Line	640527.7734	6606927.308	59° 34' 36.921" N	108° 30' 42.794" W	59.576923	-108.511887
Point	O2 Zone	IC Boundary Line	640565.018	6607138.785	59° 34' 43.706" N	108° 30' 39.918" W	59.578807	-108.511088
Point	O2 Zone	IC Boundary Line	640726.6069	6607165.745	59° 34' 44.381" N	108° 30' 29.565" W	59.578995	-108.508212
Point	O2 Zone	IC Boundary Line	640746.2164	6607137.656	59° 34' 43.450" N	108° 30' 28.383" W	59.578736	-108.507884
Point	O2 Zone	IC Boundary Line	640527.7734	6606927.308	59° 34' 36.921" N	108° 30' 42.794" W	59.576923	-108.511887
Point	Eagle Zone	IC Boundary Line	639872.0467	6607553.979	59° 34' 57.953" N	108° 31' 23.056" W	59.582765	-108.523071
Point	Eagle Zone	IC Boundary Line	639882.1764	6607212.266	59° 34' 46.904" N	108° 31' 23.223" W	59.579696	-108.523117
Point	Eagle Zone	IC Boundary Line	639192.5662	6607107.478	59° 34' 44.349" N	108° 32' 7.382" W	59.578986	-108.535384
Point	Eagle Zone	IC Boundary Line	639181.3937	6607278.898	59° 34' 49.898" N	108° 32' 7.688" W	59.580527	-108.535469
Point	Eagle Zone	IC Boundary Line	639304.5495	6607318.338	59° 34' 51.024" N	108° 31' 59.753" W	59.58084	-108.533265
Point	Eagle Zone	IC Boundary Line	639395.5739	6607444.01	59° 34' 54.974" N	108° 31' 53.659" W	59.581937	-108.531572
Point	Eagle Zone	IC Boundary Line	639414.6572	6607444.373	59° 34' 54.963" N	108° 31' 52.443" W	59.581934	-108.531234
Point	Eagle Zone	IC Boundary Line	639423.0187	6607412.36	59° 34' 53.919" N	108° 31' 51.986" W	59.581644	-108.531107
Point	Eagle Zone	IC Boundary Line	639491.1169	6607459.49	59° 34' 55.359" N	108° 31' 47.538" W	59.582044	-108.529872
Point	Eagle Zone	IC Boundary Line	639514.2636	6607460.222	59° 34' 55.355" N	108° 31' 46.062" W	59.582043	-108.529462
Point	Eagle Zone	IC Boundary Line	639552.6603	6607413.178	59° 34' 53.790" N	108° 31' 43.729" W	59.581608	-108.528814
Point	Eagle Zone	IC Boundary Line	639585.1631	6607416.122	59° 34' 53.846" N	108° 31' 41.652" W	59.581624	-108.528237
Point	Eagle Zone	IC Boundary Line	639582.8477	6607486.915	59° 34' 56.135" N	108° 31' 41.632" W	59.58226	-108.528231
Point	Eagle Zone	IC Boundary Line	639594.4286	6607506.206	59° 34' 56.744" N	108° 31' 40.848" W	59.582429	-108.528013
Point	Eagle Zone	IC Boundary Line	639655.6721	6607498.344	59° 34' 56.416" N	108° 31' 36.967" W	59.582338	-108.526935
Point	Eagle Zone	IC Boundary Line	639679.2649	6607537.976	59° 34' 57.668" N	108° 31' 35.371" W	59.582686	-108.526492

Point	Eagle Zone	IC Boundary Line	639720.64	6607563.571	59° 34' 58.445" N	108° 31' 32.675" W	59.582901	-108.525743
Point	Eagle Zone	IC Boundary Line	639751.4798	6607552.022	59° 34' 58.035" N	108° 31' 30.739" W	59.582787	-108.525205
Point	Eagle Zone	IC Boundary Line	639810.4012	6607548.396	59° 34' 57.847" N	108° 31' 26.995" W	59.582735	-108.524165
Point	Eagle Zone	IC Boundary Line	639872.0467	6607553.979	59° 34' 57.953" N	108° 31' 23.056" W	59.582765	-108.523071
Point	Main Site	IC Boundary Line	646274.4476	6606475.415	59° 34' 15.231" N	108° 24' 38.051" W	59.570898	-108.41057
Point	Main Site	IC Boundary Line	646455.4929	6604217.251	59° 33' 2.077" N	108° 24' 32.135" W	59.550577	-108.408926
Point	Main Site	IC Boundary Line	644574.7202	6604141.981	59° 33' 2.001" N	108° 26' 31.967" W	59.550556	-108.442213
Point	Main Site	IC Boundary Line	644238.3916	6603940.947	59° 32' 55.926" N	108° 26' 53.855" W	59.548868	-108.448293
Point	Main Site	IC Boundary Line	644107.8617	6603704.659	59° 32' 48.457" N	108° 27' 2.735" W	59.546794	-108.45076
Point	Main Site	IC Boundary Line	643756.3587	6603648.249	59° 32' 47.070" N	108° 27' 25.232" W	59.546408	-108.457009
Point	Main Site	IC Boundary Line	643426.2184	6602741.07	59° 32' 18.180" N	108° 27' 48.436" W	59.538383	-108.463454
Point	Main Site	IC Boundary Line	641891.3395	6602729.202	59° 32' 19.679" N	108° 29' 26.076" W	59.5388	-108.490577
Point	Main Site	IC Boundary Line	641035.225	6603981.293	59° 33' 1.159" N	108° 30' 17.532" W	59.550322	-108.50487
Point	Main Site	IC Boundary Line	643027.0079	6605339.635	59° 33' 42.595" N	108° 28' 7.526" W	59.561832	-108.468757
Point	Main Site	IC Boundary Line	644751.4362	6606024.445	59° 34' 2.575" N	108° 26' 16.105" W	59.567382	-108.437807
Point	Main Site	IC Boundary Line	645562.3903	6606459.591	59° 34' 15.615" N	108° 25' 23.415" W	59.571004	-108.423171
Point	Moran Pit	IC Boundary Line	647130	6605740	59° 33' 50.401" N	108° 23' 45.428" W	59.564	-108.395952
Point	Moran Pit	IC Boundary Line	646850	6605740	59° 33' 50.756" N	108° 24' 3.247" W	59.564099	-108.400902
Point	Moran Pit	IC Boundary Line	646850	6605580	59° 33' 45.588" N	108° 24' 3.646" W	59.562663	-108.401013
Point	Moran Pit	IC Boundary Line	647130	6605580	59° 33' 45.234" N	108° 23' 45.827" W	59.562565	-108.396063
Point	46 Zone	IC Boundary Line	645675.4015	6606944.322	59° 34' 31.127" N	108° 25' 15.023" W	59.575313	-108.42084
Point	46 Zone	IC Boundary Line	645710.3551	6606939.812	59° 34' 30.938" N	108° 25' 12.809" W	59.575261	-108.420225
Point	46 Zone	IC Boundary Line	645738.1636	6606957.683	59° 34' 31.480" N	108° 25' 10.994" W	59.575411	-108.419721
Point	46 Zone	IC Boundary Line	645774.9657	6606961.017	59° 34' 31.542" N	108° 25' 8.643" W	59.575428	-108.419068
Point	46 Zone	IC Boundary Line	645802.305	6606955.816	59° 34' 31.339" N	108° 25' 6.916" W	59.575372	-108.418588
Point	46 Zone	IC Boundary Line	645843.7193	6606950.611	59° 34' 31.119" N	108° 25' 4.292" W	59.575311	-108.417859
Point	46 Zone	IC Boundary Line	645899.8964	6606937.786	59° 34' 30.635" N	108° 25' 0.747" W	59.575176	-108.416874
Point	46 Zone	IC Boundary Line	645984.2775	6606959.772	59° 34' 31.239" N	108° 24' 55.321" W	59.575344	-108.415367
Point	46 Zone	IC Boundary Line	645999.2287	6606652.017	59° 34' 21.281" N	108° 24' 55.132" W	59.572578	-108.415314
Point	46 Zone	IC Boundary Line	645818.0216	6606626.886	59° 34' 20.697" N	108° 25' 6.729" W	59.572416	-108.418536
Point	46 Zone	IC Boundary Line	645796.8025	6606649.274	59° 34' 21.447" N	108° 25' 8.025" W	59.572624	-108.418896
Point	46 Zone	IC Boundary Line	645770.8468	6606653.32	59° 34' 21.610" N	108° 25' 9.667" W	59.572669	-108.419352
Point	46 Zone	IC Boundary Line	645750.7674	6606634.869	59° 34' 21.039" N	108° 25' 10.991" W	59.572511	-108.41972
Point	46 Zone	IC Boundary Line	645749.4892	6606606.606	59° 34' 20.128" N	108° 25' 11.142" W	59.572258	-108.419762

Point	46 Zone	IC Boundary Line	645698.7131	6606559.785	59° 34' 18.680" N	108° 25' 14.490" W	59.571855	-108.420692
Point	46 Zone	IC Boundary Line	645675.4015	6606944.322	59° 34' 31.127" N	108° 25' 15.023" W	59.575313	-108.42084
Point	11 Zone	IC Boundary Line	646417.844	6606941.875	59° 34' 30.115" N	108° 24' 27.764" W	59.575032	-108.407712
Point	11 Zone	IC Boundary Line	646539.5711	6606957.049	59° 34' 30.451" N	108° 24' 19.977" W	59.575125	-108.405549
Point	11 Zone	IC Boundary Line	646600.1432	6606838.05	59° 34' 26.532" N	108° 24' 16.417" W	59.574037	-108.40456
Point	11 Zone	IC Boundary Line	646412.0661	6606822.399	59° 34' 26.264" N	108° 24' 28.429" W	59.573962	-108.407897
Point	11 Zone	IC Boundary Line	646417.844	6606941.875	59° 34' 30.115" N	108° 24' 27.764" W	59.575032	-108.407712
Point	K 260	IC Boundary Line	646618.7964	6607491.55	59° 34' 47.613" N	108° 24' 13.603" W	59.579892	-108.403779
Point	K 260	IC Boundary Line	646767.2201	6607255.707	59° 34' 39.809" N	108° 24' 4.740" W	59.577725	-108.401317
Point	K 260	IC Boundary Line	646739.6093	6607239.895	59° 34' 39.333" N	108° 24' 6.538" W	59.577592	-108.401816
Point	K 260	IC Boundary Line	646688.6496	6607228.019	59° 34' 39.014" N	108° 24' 9.812" W	59.577504	-108.402725
Point	K 260	IC Boundary Line	646631.3545	6607204.967	59° 34' 38.342" N	108° 24' 13.517" W	59.577317	-108.403755
Point	K 260	IC Boundary Line	646616.0763	6607187.563	59° 34' 37.799" N	108° 24' 14.533" W	59.577166	-108.404037
Point	K 260	IC Boundary Line	646597.3064	6607181.022	59° 34' 37.611" N	108° 24' 15.744" W	59.577114	-108.404373
Point	K 260	IC Boundary Line	646578.3241	6607190.194	59° 34' 37.932" N	108° 24' 16.930" W	59.577203	-108.404703
Point	K 260	IC Boundary Line	646517.3136	6607142.314	59° 34' 36.462" N	108° 24' 20.933" W	59.576795	-108.405815
Point	K 260	IC Boundary Line	646493.5482	6607204.298	59° 34' 38.494" N	108° 24' 22.292" W	59.577359	-108.406192
Point	K 260	IC Boundary Line	646475.0099	6607235.292	59° 34' 39.518" N	108° 24' 23.395" W	59.577644	-108.406499
Point	K 260	IC Boundary Line	646468.3644	6607268.574	59° 34' 40.602" N	108° 24' 23.735" W	59.577945	-108.406593
Point	K 260	IC Boundary Line	646449.9388	6607311.68	59° 34' 42.017" N	108° 24' 24.801" W	59.578338	-108.406889
Point	K 260	IC Boundary Line	646454.1062	6607372.563	59° 34' 43.978" N	108° 24' 24.385" W	59.578883	-108.406773
Point	K 260	IC Boundary Line	646618.7964	6607491.55	59° 34' 47.613" N	108° 24' 13.603" W	59.579892	-108.403779
Point	K 260	IC Boundary Line	646671.9091	6607211.652	59° 34' 38.506" N	108° 24' 10.918" W	59.577363	-108.403033
Point	K 260	IC Boundary Line	646653.9858	6607210.029	59° 34' 38.477" N	108° 24' 12.063" W	59.577355	-108.403351
Point	Dubyna	IC Boundary Line	648240	6608530	59° 35' 19.089" N	108° 22' 27.768" W	59.588636	-108.37438
Point	Dubyna	IC Boundary Line	647540	6608530	59° 35' 19.981" N	108° 23' 12.348" W	59.588884	-108.386763
Point	Dubyna	IC Boundary Line	647540	6608040	59° 35' 4.157" N	108° 23' 13.576" W	59.584488	-108.387104
Point	Dubyna	IC Boundary Line	648240	6608040	59° 35' 3.265" N	108° 22' 29.002" W	59.58424	-108.374723
Point	Hab	IC Boundary Line	646029.8945	6612633.444	59° 37' 34.409" N	108° 24' 38.328" W	59.626225	-108.410647
Point	Hab	IC Boundary Line	646030.1333	6612525.791	59° 37' 30.932" N	108° 24' 38.581" W	59.625259	-108.410717
Point	Hab	IC Boundary Line	645768.8101	6612155.292	59° 37' 19.296" N	108° 24' 56.162" W	59.622027	-108.4156
Point	Hab	IC Boundary Line	645820.2653	6611828.732	59° 37' 8.685" N	108° 24' 53.692" W	59.619079	-108.414914
Point	Hab	IC Boundary Line	645139.484	6611863.264	59° 37' 10.655" N	108° 25' 37.003" W	59.619626	-108.426945
Point	Hab	IC Boundary Line	645029.4172	6612218.865	59° 37' 22.276" N	108° 25' 43.142" W	59.622855	-108.42865

Point	Hab	IC Boundary Line	645964.7105	6612631.711	59° 37' 34.435" N	108° 24' 42.488" W	59.626232	-108.411802
Point	Fishhook	IC Boundary Line	647096	6595139	59° 28' 8.075" N	108° 24' 13.929" W	59.468910	-108.403869
Point	Fishhook	IC Boundary Line	647123	6595126	59° 28' 7.640" N	108° 24' 12.256" W	59.468789	-108.403405
Point	Fishhook	IC Boundary Line	647138	6595101	59° 28' 6.797" N	108° 24' 11.369" W	59.468555	-108.403158
Point	Fishhook	IC Boundary Line	647147	6595072	59° 28' 5.872" N	108° 24' 10.900" W	59.468298	-108.403028
Point	Fishhook	IC Boundary Line	647162	6595047	59° 28' 5.029" N	108° 24' 10.013" W	59.468064	-108.402781
Point	Fishhook	IC Boundary Line	647171	6595019	59° 28' 4.127" N	108° 24' 9.492" W	59.467813	-108.402637
Point	Fishhook	IC Boundary Line	647270	6594802	59° 27' 57.000" N	108° 24' 3.737" W	59.465833	-108.401038
Point	Fishhook	IC Boundary Line	647262	6594772	59° 27' 56.016" N	108° 24' 4.359" W	59.465560	-108.401211
Point	Fishhook	IC Boundary Line	647246	6594740	59° 27' 55.020" N	108° 24' 5.439" W	59.465283	-108.401511
Point	Fishhook	IC Boundary Line	647205	6594695	59° 27' 53.606" N	108° 24' 8.119" W	59.464891	-108.402255
Point	Fishhook	IC Boundary Line	647151	6594648	59° 27' 52.179" N	108° 24' 11.660" W	59.464494	-108.403239
Point	Fishhook	IC Boundary Line	647109	6594567	59° 27' 49.617" N	108° 24' 14.557" W	59.463783	-108.404044
Point	Fishhook	IC Boundary Line	647086	6594485	59° 27' 46.979" N	108° 24' 16.185" W	59.463050	-108.404496
Point	Fishhook	IC Boundary Line	647098	6594406	59° 27' 44.416" N	108° 24' 15.620" W	59.462338	-108.404339
Point	Fishhook	IC Boundary Line	647105	6594331	59° 27' 41.985" N	108° 24' 15.375" W	59.461662	-108.404271
Point	Fishhook	IC Boundary Line	646986	6594255	59° 27' 39.697" N	108° 24' 23.135" W	59.461027	-108.406426

APPENDIX B: BOREHOLE LOG

Table 1: Borehole summary including the coordinates of exploration drill holes located to date in and adjacent to the former Eldorado Beaverlodge properties. The table also identifies the condition of each hole when it was initially identified and the year in which each was permanently plugged.

Area	Designation	Coordinate System: WGS 84 UTM Zone 12		Status When Located	Year Remediated	Associated Property	
		Easting	Northing				
Ace	AC 01	644022.013	6605350.955	Dry	2013	ACE MC	
	AC 02	643881.016	6605325.928	Dry	2013	ACE MC	
	AC 03	643969.014	6605393.956	Dry	2013	ACE MC	
	AC 04	643958.014	6605381.941	Dry	2013	ACE MC	
	AC 05	643943.013	6605376.906	Dry	2013	ACE MC	
	AC 06	643929.017	6605371.911	Dry	2013	ACE MC	
	AC 07	643914.011	6605366.988	Dry	2013	ACE MC	
	AC 09	643888.017	6605351.946	Dry	2013	ACE MC	
	AC 10	643876.015	6605374.894	Dry	2013	ACE MC	
	AC 11	643965.016	6605324.914	Dry	2013	ACE MC	
	AC 12	643877.017	6605339.931	Dry	2013	ACE MC	
	AC 13	643857.016	6605337.938	Dry	2013	ACE MC	
	AC 14	643848.015	6605331.908	Dry	2013	ACE MC	
	AC 15	643792.014	6605338.902	Dry	2013	ACE MC	
	AC 16	643560.257	6605183.669	Dry	2017	ACE 1	
	AC 17	644021.3	6604729.1	Dry	2017	ACE 9	
	AC 18	642872.1	6604789.8	Dry	2018	ACE URA 5	
	AC 22	645034	6605863	2 holes/Dry	2019		
	AC 23	645038	6605837	Dry	2019		
	AC 24	643327	6605101	2 holes/1 flowing	2021	ACE 1	
	Lower Ace	BH-001	641929	6604081	Discharging	2012	
		BH-002	641956	6604091	Discharging	2011	
		BH-003	641922	6604146	Discharging	2011	
		BH-004	641932	6604142	Discharging	2012	
BH-005		641966	6604143	Discharging	2011		
BH-006		641972	6604165	Discharging	2011		
BH-007		642090	6604218	Discharging	2011	URA 1	
BH-009		642110	6604137	Discharging	2012	URA FR	
BH-011		642224.883	6604354.110	Dry	2021	URA 1	
BH-012		642224.798	6604351.877	Dry	2021	URA 1	
BH-014		642168	6604158	Discharging	2011	URA FR	
BH-15		642101.665	6604192.497	Dry/past discharge	2016	URA 1	
BH-16		643009.193	6604465.019	Dry	2017	URA 6	
BH-17		642993.852	6604455.146	Dry	2017	URA 6	
BH-18		642995.637	6604466.051	Dry	2017	URA 6	
BH-19		642978.88	6604452.098	Dry	2017	URA 6	

Lower Ace	BH-20	643007.541	6604467.124	Dry	2017	URA 6
	BH-21	642966.862	6604445.757	Dry	2017	URA 6
	BH-22	642959.407	6604439.281	Dry	2017	URA 7
	BH-23	642954.958	6604432.3	Dry	2017	URA 7
	BH-24	642940.515	6604415.339	Dry	2017	URA 7
	BH-25	642930.8	6604406.299	Dry	2017	URA 7
	BH-26	642972.143	6604451.532	Dry	2017	URA 6
	BH-27	643250.316	6604979.231	Dry	2017	URA 5
	BH-28	643113.492	6604895.363	Dry	2017	URA 5
	BH-29	643174.26	6604925.548	Dry	2017	URA 5
	BH-30	643285.271	6604977.469	Dry	2017	URA 5
	BH-31	642101.048	6604195.52	Discharging	2017	URA 1
	BH-32	642260.649	6604592.012	Dry	2017	URA 1
	BH-33	642423.877	6604597.892	Dry	2017	URA 7
	BH-34	642401.708	6604647.831	Dry	2017	URA 3
	BH-35	642268.019	6604629.757	Dry	2017	URA 3
	BH-36	643698.938	6605341.629	Dry	2017	ACE MC
	BH-37	642456.049	6604665.374	2 holes/dry	2017	URA 4
	BH-38	642424.846	6604667.596	Dry	2017	URA 4
	BH-39	643709.725	6605142.015	Dry	2017	ACE MC
	BH-40	642242.735	6604550.461	Dry	2017	URA 1
	BH-41	642296.4	6604025.8	Dry	2017	URA FR
	BH-42	642552.3	6604731	Dry	2017	URA 4
	BH-43	642254	6604397	Dry	Covered with debris	URA 1
	BH-44	642402	6604639	Dry	2019	URA 3
	BH-45	643250	6604981	2 holes/Dry	2019	URA 5
	BH-46	643610.340	6605209.997	Dry	2021	ACE MC
BH-47	642306.845	6604621.952	Dry	2021	URA 1	
Ace-Verna	Ace 01	645193.055	6605813.101	Dry	2016	ACE 8
	EXC 01	644740.299	6605272.359	Dry	2016	ACE 3
	Ace 02	645409.239	6605930.196	Dry	2017	ACE 8
	Ace 03	645627.645	6605877.357	Dry	2017	ACE 8
	Ace 04	645187.707	6605816.337	Dry	2017	ACE 8
Dubyna	DB 01	648069.018	6608350.909	Dry	Not located**	EMAR 1
	DB 02	648021.018	6608416.903	Discharging	2011	
	DB 03	648010.017	6608430.961	Discharging	2012	
	DB 04	648009.018	6608430.921	Dry	2013	
	DB 05	648074.019	6608329.926	Dry	2013	EMAR 1
	DB 06	648059.016	6608350.96	Dry	Not located**	EMAR 1
	DB 07	648060.013	6608305.962	Dry	2013	EMAR 1
	DB 08	648047.018	6608326.964	Dry	2013	EMAR 1
	DB 09	648004.013	6608445.996	Dry	2011	EMAR 1

Dubyna

DB 10	647927.019	6608395.914	Dry	2013	EMAR 1
DB 11	647906.016	6608372.901	Dry	2013	EMAR 1
DB 12	647907.015	6608373.943	Dry	2013	EMAR 1
DB 13	647922.017	6608349.899	Dry	2013	EMAR 1
DB 13A	647937.016	6608388.951	Dry	2013	EMAR 1
DB 14	647942.019	6608319.921	Discharging	2011	EMAR 1
DB 15	647912.017	6608307.923	Dry	2013	EMAR 1
DB 16	648002.017	6608424.96	Discharging	2012	EMAR 1
DB 17	647310.016	6608147.994	Dry	2013	
DB 18	647296.012	6608143.988	Dry	2013	
DB 19	647294.014	6608148.926	Dry	2013	
DB 20	647291.018	6608147.917	Dry	2013	
DB 21	647289.015	6608145.943	Dry	2013	
DB 22	647285.016	6608153.923	Dry	2013	
DB 23	647282.019	6608145.891	Dry	2013	
DB 24	647351.018	6608172.904	Dry	2013	
DB 25	648014.014	6608458.988	Discharging	2011	
DB 26	647374.017	6608190.976	Dry	2013	
DB 27	647379.02	6608180.916	Dry	2013	
DB 28	647715.679	6608234.967	Dry	2017	JO-NES
DB 29	647513.47	6608225.766	Dry	2017	JO-NES
DB 30	647413.386	6608235.144	Dry	2017	JO-NES
DB 31	647411.222	6608290.178	Dry	2017	JO-NES
DB 32	647603.393	6608298.979	Dry	2017	JO-NES
DB 33	646948.652	6608333.328	Dry	2017	
DB 34	645934.9	6607576	2 holes/dry	2016	
DB 35	645991.5	6607578.2	Dry	2017	
DB 36	647421	6608222	Dry	2017	JO-NES
DB 37	647661.2	6608361.3	Dry	2017	JO-NES
DB 38	647561.2	6608066.9	Dry	2017	JO-NES
DB 39	647742.5	6608236	Dry	2017	JO-NES
DB 40	647593.6	6608297.4	Dry	2017	JO-NES
DB 41	647611	6608249.4	Dry	2018	JO-NES
DB 42	647579.4	6608258.1	Dry	2018	JO-NES
DB 43	647579.4	6608255	Dry	2018	JO-NES
DB 44	647585.8	6608256.1	Dry	2018	JO-NES
DB 45	647572	6608231.8	Dry	2018	JO-NES
DB 46	647521.1	6608238.1	2 holes/Dry	2018	JO-NES
DB 47	647572.5	6608251.3	Dry	2018	JO-NES
DB 48	647575.6	6608248.3	Dry	2018	JO-NES
DB 49	647572.3	6608242.3	Dry	2018	JO-NES
DB 50	647558.3	6608239.3	Dry	2018	JO-NES

Dubyna	DB 51	647547	6608230.5	Dry	2018	JO-NES
	DB 52	647578.7	6608236.1	Dry	2018	JO-NES
	DB 53	647427.7	6608225.5	Dry	2018	JO-NES
	DB 54	647419	6608244.3	Dry	2018	JO-NES
	DB 55	647413.4	6608238.8	Dry	2018	JO-NES
	DB 56	647395.2	6608229.4	Dry	2018***	
	DB 57	647406.3	6608226.8	Dry	2018	JO-NES
	DB 58	647417.4	6608225.7	Dry	2018	JO-NES
	DB 60	647613.1	6608506.8	2 holes/Dry	2018	
	DB 61	647683.9	6608518.9	Dry	2018	
	DB 62	647785.2	6608518.5	Dry	2018	
	DB 63	647703.9	6608176.9	Dry	2018	JO-NES
	DB 64	647946	6608148	Dry	2021	EMAR 1
	HAB 01	645518.015	6612550.898	Dry	2013	HAB 1
	Hab	HAB 02	645531.009	6612559.987	Dry	2013
HAB 03		645560.017	6612566.911	Dry	2013	HAB 1
HAB 04		645559.011	6612570.997	Dry	2013	HAB 1
HAB 05		645570.017	6612585.916	Dry	2013	HAB 1
HAB 06		645516.013	6612592.957	Dry	2013	HAB 1
HAB 07		645490.014	6612737.978	Dry	2013	
HAB 08		645473.016	6612730.963	Dry	2013	
HAB 09		645458.015	6612730.938	Dry	2013	
HAB 10		645444.016	6612727.941	Dry	2013	
HAB 11		645428.014	6612729.995	Dry	2013	
HAB 12		645531.017	6612306.94	Dry	2013	HAB 1
HAB 13		645454.012	6612205.961	Dry	2013	EXC 1
HAB 14		645203.016	6612156.978	Dry	2013	EXC 1
HAB 15		645180.016	6612129.889	Dry	2013	HAB 3
HAB 16		645197.013	6612184.948	Dry	2013	EXC 1
HAB 17		645236.014	6612327.921	Dry	2013	HAB 1
HAB 18		645265.016	6612338.968	Dry	2013	HAB 1
HAB 19		645265.016	6612338.968	Dry	2013	HAB 1
HAB 20*		645244.013	6612340.94	Dry	No Remediation	HAB 1
HAB 21*		645216.013	6612306.969	Dry	No Remediation	HAB 1
HAB 22*		645206.015	6612316.948	Dry	No Remediation	
HAB 23		645196.016	6612315.891	Dry	2013	
HAB 24*		645157.014	6612278.93	Dry	No Remediation	
HAB 25*		645195.017	6612271.932	Dry	No Remediation	
HAB 26*		645193.013	6612334.948	Dry	No Remediation	
HAB 27		645199.014	6612341.981	Dry	2013	
HAB 28		645237.012	6612367.979	Dry	2013	HAB 1
HAB 29		645186.014	6612187.977	Dry	2013	

	HAB 30	645196.016	6612166.962	Dry	2013	EXC 1
	HAB 31	645188.016	6612161.97	Dry	2013	
	HAB 32	645188.016	6612161.97	Dry	2013	
	HAB 33	645184.017	6612166.942	Dry	2013	
	HAB 34	645185.015	6612332.966	Dry	2013	
	HAB 35	645170.015	6612318.896	Dry	2013	
	HAB 36	645146.014	6612300.909	Dry	2013	
	Hab 37	645635.866	6611795.114	Dry	2016	EXC 2
	Hab 38	645957.616	6612503.136	Dry	2016	HAB 6
	HAB 39	645944.833	6612429.845	Dry	2016	HAB 6
	Hab 40 & 41	645134.075	6611789.562	2 holes/dry	2016	HAB 3
	Hab 42 & 43	645047.948	6611855.227	2 holes/dry	2016	HAB 3
	Hab 44	645155.8	6612277.4	Dry	2016	
	Hab 45	645120.288	6612036.091	Dry	2017	HAB 3
	Hab 46	645119.989	6612043.82	Dry	2017	HAB 3
	Hab 47	645737.923	6612087.024	Dry	2017	HAB 2A
	Hab 48	645053.768	6611971.583	Dry	2017	HAB 3
	Hab 49 & 50	645291.031	6612001.84	2 holes/dry	2017	HAB 2
	Hab 51	644786.442	6611947.92	Dry	2017	
	Hab 52	645309.971	6612079.678	Dry	2017	HAB 2
	Hab 53	644794.3	6611948.2	Dry	2017	
	Hab 54	645613.7	6611925.2	Dry	2017	HAB 2A
	Hab 55	645670.8	6612093.7	Dry	2017	HAB 2A
	Hab 56	645653.1	6612056.8	Dry	2017	HAB 2A
	Hab 57	645680.6	6612065.6	Dry	2017	HAB 2A
	Hab 58	644798.2	6612050.6	Dry	2017	HAB 2A
	Hab 59	645648.7	6611994.7	Dry	2017	HAB 2A
	Hab 60	645671.6	6612016.6	Dry	2017	HAB 2A
	Hab 61	645622.4	6611980.3	Dry	2017	HAB 2A
	Hab 62	645076.2	6611788.8	Dry	2017	HAB 3
	Hab 63	645737	6612086.1	Dry	2018	HAB 2A
	Hab 64	645685.9	6612061.4	Dry	2018	HAB 2A
	Hab 65	645655.5	6612055.3	Dry	2018	HAB 2A
	Hab 66	645412	6611924	Dry	2019	HAB 2A
	Hab 67	645332	6611876	Dry	2019	HAB 2A
	Hab 68	645631	6612339	Dry	2019	HAB 1
	Hab 69	645276	6612220	Dry	2021	EXC 1
	Hab 70 & 71	645704	6612168	Dry	2021	EXC 1
	VR 01	645583.015	6605976.917	Dry	2013	ACE 8
	VR 02	645612.016	6605959.984	Dry	2013	ACE 8
Verna-Bolger	VR 03	645987.422	6606161.403	Dry	2016	BOLGER 1
	VR 04	644794.274	6611948.222	Dry	2017	

	VR 05	645751.166	6606305.443	Dry	2017	BOLGER 1
	VR 06	645976.488	6606405.551	Dry	2017	
	VR 08 & 09	645934.866	6607575.955	2 holes/dry	2016	
	VR 10	645991.476	6607578.159	Dry	2017	
	VR 11	646037.829	6605999.498	Dry	2021	NW 3
	VR 12	645997.589	6605976.863	Dry	2021	NW 3
	VR 13	646052.176	6605975.309	Dry	2021	NW 3
	VR 14	646001.812	6605948.268	Dry	2021	NW 3
	VR 15	645995.007	6605897.840	Dry	2021	NW 3
	VR 16	645946.764	6605852.599	Dry	2021	NW 3
	VR 17	645885.294	6605830.366	Dry	2021	NW 3
	VR 18	645925.276	6605820.439	Dry	2021	NW 3
	VR 19	645917.392	6605771.530	Dry	2021	NW 3
	VR 20	646013.386	6605836.910	Dry	2021	NW 3
	VR 21	646027.817	6605820.750	Dry	2021	NW 3
	VR 22	646132.041	6605638.424	Dry	2021	NW 3
	VR 23	645702.416	6605821.699	Dry	2021	NW 3
	VR 26	645981.109	6605927.954	Dry	2021	NW 3
	VR 27	646027.259	6605884.492	Dry	2021	NW 3
	EG 01	640289.749	6607204.128	Dry	2016	EAGLE 1
Eagle	EG 02	640322.527	6607209.033	Dry	2016	EAGLE 1
Eagle	EG 03	640292.348	6607226.853	Dry	2016	EAGLE 1
	EG 04	640328.697	6607263.213	Dry	2016	EAGLE 1
	EG 05	640351.111	6607264.052	Dry	2016	EAGLE 1
	EG 06	640486.081	6607170.013	Dry	2016	EAGLE 1
	MC 1	638979.011	6604055.98	Dry	2013	RA 9
Martin Lake	OP 01	647251.597	6607892.5	Dry	2017	
Off Property¹	OP 02	646998.6	6605635.1	Dry	2017	
	OP 03	647108.6	6605695.2	Dry	2017	
	BH-8202	641471	6604205	Dry	2017	
	BH-NW01	641343.6	6604130.1	Discharging	2017	
	AC 19 ²	647069	6605704	Dry	2019	
	AC 20 ²	647055	6605663	Dry	2019	
	AC 21 ²	647001	6605642	Dry	2019	

*Recent exploration activity (Not Eldorado/Cameco)

**DB 01 and DB-06 were found to be dry when first identified; however, boreholes could not be relocated despite extensive searches when remediation equipment was brought to the site.

***Assuming DB 56 was remediated in 2018 with other boreholes.

Note: AC 08, VR 07, and DB 59 have been removed from past records due to coordinate error and are not reflected in the 238 identified below.

Note: Total number of boreholes is 238, this includes 229 remediated (all with an associated year), 6 were not remediated due to being recent exploration (HB 20, Hab 21, Hab 22, HAB 24, HAB 25, and HAB 26), 2 were not located (DB 01 and DB 06), and 1 was covered with debris (BH-43).

¹ The 'Off Property' areas were operated as part of the former Eldorado Beaverlodge activities; however, these areas were not listed in the *Eldorado Resources Limited Decommissioning Approval AECB-DA-142-0*. In addition, these areas do not appear on the current Beaverlodge surface lease or in the Canadian Nuclear Safety Commission licence; however, Cameco intends to prepare these areas for transfer into the IC Program and has remediated the boreholes identified in these areas accordingly.

² Previously listed under the "Ace" area mistakenly. These boreholes are located off Beaverlodge property, in the Moran Pit area.

APPENDIX C: CAMECO GEOTECHNICAL INSPECTION REPORT



Cameco

Beaverlodge

Decommissioned Beaverlodge Mine/Mill Site

2023 Geotechnical Inspection Report

August 2023

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1.0 INTRODUCTION

From May 24 – May 29, 2023, Cameco Corporation (Cameco) personnel were on site to conduct a field test of the Beaverlodge Institutional Control Inspection Field Guide (ICIFG) and the annual geotechnical inspection. As a result, all the Beaverlodge properties, those in the Institutional Control program and those still under CNSC licence, were inspected following the ICIFG to ensure the relevant aspects of each area were inspected and continue to behave as expected and that conditions remain safe, secure and stable. The ICIFG report will serve as a baseline for future IC inspections.

As part of this inspection, geotechnical components were evaluated using the regulatory accepted criterion-based checklist developed with SRK Consultants. The geotechnical inspection completed in 2023 consisted of inspecting conditions at the Fookes Delta, the two outlet spillways at Fookes and Marie reservoirs and the relevant crown pillars associated with the former Hab, Dubyna and Ace mining areas.

The 2015 geotechnical inspection completed by SRK concluded that overall; the Fookes cover, and the two outlet structures were performing as expected. The report concluded that it would be reasonable for Cameco to move towards final close out and a return to Institutional Control for the properties associated with the cover and outlet structures (SRK, 2016). SRK recommended that in the meantime, documented inspections by Cameco and/or regulators should continue on an annual basis. A follow-up inspection was completed in 2020 by SRK, who noted that there were no observable changes to the landform and no concerns identified. Following the 2020 inspection, SRK recommended that Cameco continue with annual inspections using the existing inspection protocols, and that once the properties are transferred to the IC Program that they are inspected every five years for two cycles, then less frequently after that if the areas remain stable.

Figure 1 provides the locations of the Fookes Delta and the outlet structures. Additional details are provided in **Section 5.0**, including **Figure 4**, **Figure 5**, and **Figure 6**, which provide the locations of applicable crown pillar monitoring.

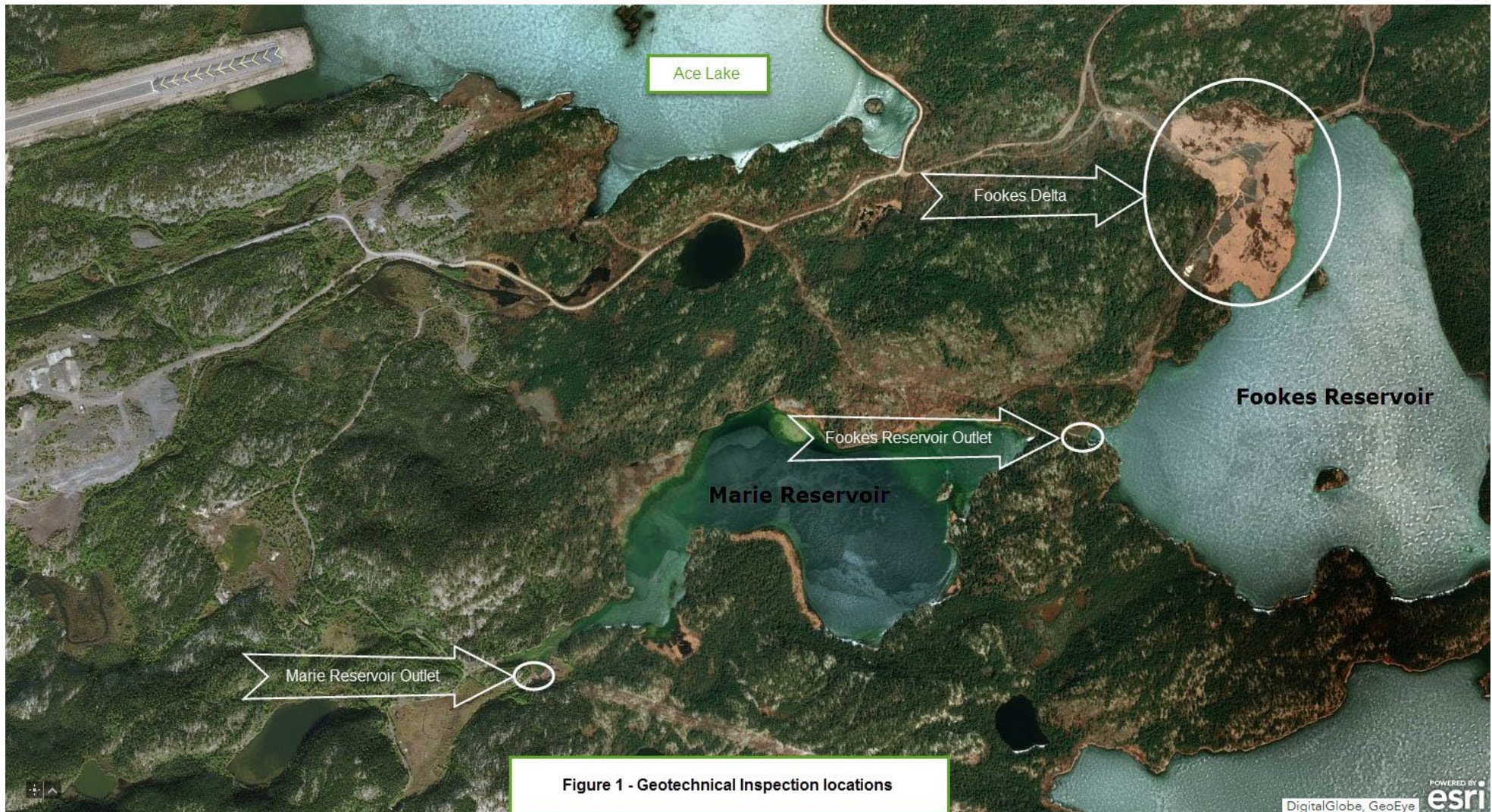


Figure 1. Geotechnical Inspection Locations

2.0 OUTLET STRUCTURE INSPECTIONS (FOOKES & MARIE RESERVOIR)

Both spillway structures consist of a rip-rap lined open channel (with trapezoidal cross-section), which discharge into a rip-rap lined stilling basin. The rip-rap lining in both the spillway channels and the stilling basins was intruded with grout for added erosion protection; however, the rip-rap in the spillway was designed to be stable in the absence of grout intrusion. The spillways are capable of passing a 500-year flood event with a depth of 0.3 m (680 L/sec) and 0.35 m (760 L/sec) at the entrances of the Fookes and Marie reservoir outlet spillways, respectively.

The cracking and displacement of the grout-intruded rip-rap within the two spillways was anticipated in their original designs and does not affect the performance of either outlet spillway. Additional cracking and ice-jacking are anticipated over time, but the condition of the two outlet spillways continues to be satisfactory and is expected to remain so moving forward (SRK 2021).

2.1 General Observations

Local land users have noted water levels have been significantly higher than normal since 2020 and snowpack in 2023 followed that trend, with the last 4 years being the highest snowpacks recorded since Beaverlodge began tracking that information in 2005. However, 2023 saw freshet come early and the snowpack was largely gone by the first week of May. May 2023 was also significantly warmer than May 2022 with the average daytime high being more than 10 degrees warmer in May 2023. Lake Athabasca was completely ice free at the end of May 2023, which is uncommon.

Comparisons of photos between inspection years is presented in **Section 4.0**. Photos taken in 2023 were from late May. Due to the early freshet and the abnormally mild May the vegetation growth is lusher in 2023 than it was in 2022.

2.2 Inspection Checklist for Outlet Structures

The specific elements to be evaluated during these inspections include the following:

- I. Check the condition of the spillway channel, with a view to confirming the grout-intruded rip-rap is still in place.
- II. Check the condition of the rip-rap on either side of the spillway, with a view to confirming no erosion has occurred due to overtopping associated with an extreme flood event.
- III. Document conditions with photographs.

2.3 Marie Reservoir Outlet Inspection

- I. *Check the condition of the spillway channel, with a view to confirming the grout-intruded rip-rap is still in place.*

Previously, SRK identified that the grout-intruded rip-rap is relatively intact, except near the spillway entrance where one large block and several smaller ones on the right side of

the spillway (looking downstream from Marie Reservoir) have been displaced due to ice-jacking.

In addition to the comparison photos provided in **Section 4.0**, photos taken during the 2023 inspection providing photographic record of the condition of the Marie Reservoir spillway channel are included in **Appendix A**. Despite the continued elevated flows over the past 4 years the spillway channel remains in a similar condition as observed in previous inspections.

The observations and photographic record from the 2023 inspection support the observations made by SRK that the spillway continues to perform as designed (*SRK 2021*).

II. Check the condition of the rip-rap on either side of the spillway, with a view to confirming no erosion has occurred due to overtopping associated with an extreme flood event

In previous years it has been noted that higher than normal water levels over the last number of years have resulted in some natural debris and dimensional lumber along the leading edge of the rip-rap on either side of the spillway as well as the edges of the channel. Following the 2022 inspection, all dimensional lumber was removed from the area as part of the final clean-up in preparation for transferring properties to the Province of Saskatchewan's Institutional Control Program. Despite the increased flows the spillway appears to be performing as expected with no erosion of the rip-rap embankment on either side of the spillway. No new debris was noted in the channel in 2023.

Despite the unusually high flows observed over the past 4 years the Marie Reservoir outlet spillway has, in general, changed little since 2004. Photographic comparison to previous inspection photos is provided in **Section 4.0**. The grout-intruded rip-rap is relatively intact except near the spillway entrance where one large block slab and several smaller ones on the left side of the spillway (looking upstream) continued to be displaced due to ice-jacking (**Appendix A, Photo A1**).

As noted in previous geotechnical inspections beaver activity at the outlet of Marie Reservoir has resulted in construction of a small dam. The crest of the beaver dam appears to be similar to previous years, although the water level behind the dam appears to be slightly lower. This condition will continue to be monitored during future inspections. There are currently no plans to remove the beaver dam as it is naturally occurring. A photo of the Marie Outlet structure documenting the beaver dam is located in **Section 4.0**.

2.4 Fookes Reservoir Outlet Inspection

I. Check the condition of the spillway channel, with a view to confirming the grout-intruded rip-rap is still in place

Similar to the Marie Outlet, SRK also identified that the grout-intruded rip-rap along the length of the Fookes Reservoir outlet spillway shows signs of cracking. In addition, there has been some ice-jacking, with the most significant displacements located near the upper

part of the spillway (i.e., on the sides of the spillway, within 5 to 6 m of the spillway entrance) (**Appendix B, Photo B1**). The base of the channel does not show signs of significant displacement, and the middle to lower parts of the spillway remain in good condition.

- II.* In addition to the comparison photos provided in **Section 4.0**, photos taken during the 2023 inspection providing photographic record of the condition of the Fookes Reservoir spillway channel are included in **Appendix B**. Following the 2022 inspection, all dimensional lumber was removed from the area as part of the final clean-up in preparation for transferring properties to the Province of Saskatchewan's Institutional Control Program. No new debris was noted in 2023. *Check the condition of the rip-rap on either side of the spillway, with a view to confirming no erosion has occurred due to overtopping associated with an extreme flood event*

Despite the increased flows the spillway appears to be performing as expected with no erosion of the rip-rap embankment on either side of the spillway. Photographic comparison to previous inspection photos is provided in **Section 4.0**.

3.0 FOOKES DELTA

3.1 General Observations

Historically, the area along the northeast side of the Fookes Delta has contained standing water. The Fookes Delta cover in this area was purposefully graded to establish an overall preferential gradient towards Fookes Reservoir. **Figure 2** provides an overview of the cover design (SRK, 2008), with the surface drainage paths outlined. As per the SRK design for the Fookes cover, the northern drainage ditch area of the delta was never intended to provide fully channelized flow to Fookes Reservoir. As a result, some ponding in higher precipitation years was anticipated and may be expected to occur.

During the 2023 inspection of Fookes Delta, it was noted that the drainage area running along the north side of the delta contained water and was performing as designed, while the drainage channel to Fookes Reservoir was dry. The small amount of ponded water that was observed at the base of the north access ramp on the waste rock cover (**Appendix C, Photo C2**) during the 2022 inspection was dry in 2023.

Generally, the cover was in good condition showing no areas of excessive erosion, despite greater than normal precipitation and the elevated water levels seen in Fookes Reservoir over the past number of years, discussed in Section 2.4. The east and west berms were in good condition with no evidence they have been breached by vehicular traffic. In 2022, there was some localized ATV traffic noted on the Fookes Delta cover, however no new disturbance was noted in 2023. Vegetation is well established within 50 m of the shoreline and the engineered drainage structures. Vegetation continues to gradually encroach and thicken over much of the delta.

Photographic comparison to previous inspection photos is provided in **Section 4.0**. Photos showing the conditions encountered during the site inspection are provided in **Appendix C**.

3.2 Inspection Checklist

- I. Check for evidence of new tailing boils or tailings exposure due to frost action
 - II. Check for evidence of significant erosion of the cover material
 - a. Trench along the northeast edge of the delta (sand flows, erosion of waste rock, slumping, etc.) – maintain photographic and GPS record (identify areas of concern on map).
 - b. Cover limit along its contact with Fookes Reservoir – maintain photographic and GPS record (identify areas of concern on map) where sand from the delta cover extends into the reservoir.
 - III. Ensure erosion-protection devices are performing as expected on former north access road
 - a. Waterbars (chevrons)
 - b. Diversion ditches
 - c. Erosion of cover adjacent to the former access road
-

IV. Ensure earthen berms are in place to limit access to the delta

3.3 Fookes Cover Inspection

I. Check for evidence of new tailing boils or tailings exposure due to frost action

No new boil development was noted on the delta.

II. Check for evidence of significant erosion of the cover material

The shoreline, where the edge of the sand cover contacts Fookes Reservoir, was inspected and was in good condition. Photos taken in 2023 continue to show significant vegetation coverage along the shoreline.

The 2023 inspection showed that water is being captured in the drainage channels as per design and there is no evidence of any significant erosion of the cover. The drainage channel continues to vegetate heavily as can be seen in the photos in Section 4 and **Figure 2**.

The Fookes Delta cover is in good condition and showed no sign of excessive erosion. As vegetation continues to establish on the shoreline, it will increase the stability of the cover.

III. Ensure erosion protection devices are performing as expected on former north access road

As part of the design and installation of the covers in 2005 and 2007, the area considered most vulnerable to erosion was in the area on and below the access ramp at the northwest corner of the delta (SRK, 2010). The general condition of the ramp is very good. Access to this ramp is closed off by a windrow of material at the top of the ramp, except for the small access trail to allow the remediation of the piezometer standpipes. The water bars (chevrons, **Figure 3**) are performing as expected and continue to show little sign of erosion (**Appendix C, Photo C1**).

In addition to the chevrons, run-out structures were installed to carry away excessive water during extreme run-off events. These run-out structures are also in good shape with no observed additional eroded material beyond that observed during previous inspections (**Appendix C, Photo C3**).

IV. Ensure earthen berms are in place to limit access to the delta

Since the earthen berms protecting the east and west access points to the Fookes Delta were repaired and reinforced in 2011 and 2012 respectively, there has not been any new evidence of passenger vehicular traffic accessing the delta. In 2022, there was some localized ATV traffic noted on the Fookes Delta cover, however no new disturbance was noted in 2023. A photo of the berm located on the east access point is provided in Appendix C (**Photo C7**).



Figure 2. Fookes Overview



Figure 3. Fookes chevron and runout structure

4.0 PHOTOGRAPHIC COMPARISONS

Beaver dam construction at the outlet structure for Marie Reservoir

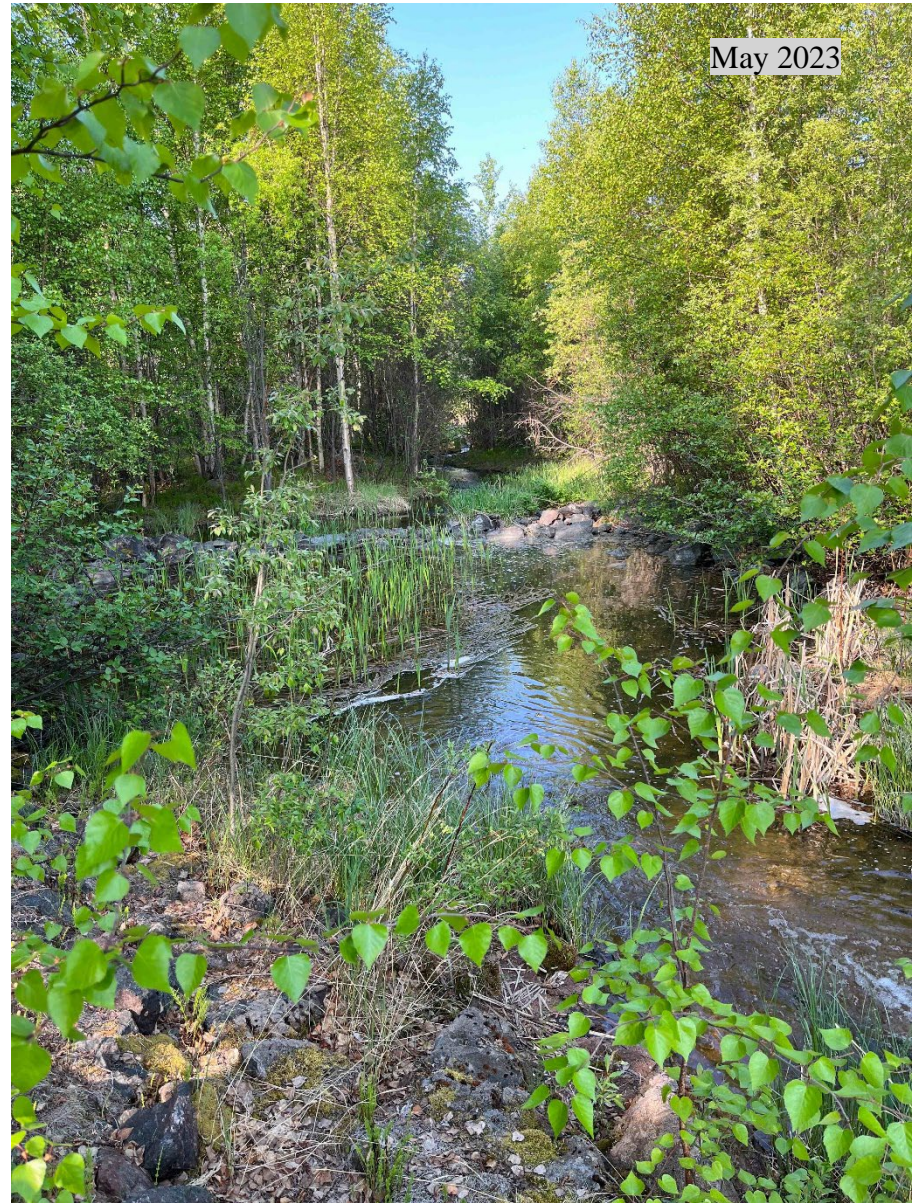




Marie Outlet Structure looking upstream



Marie Outlet Structure looking downstream





Marie Reservoir Outlet Structure
– Ice jacked block of grout intruded rip-rap





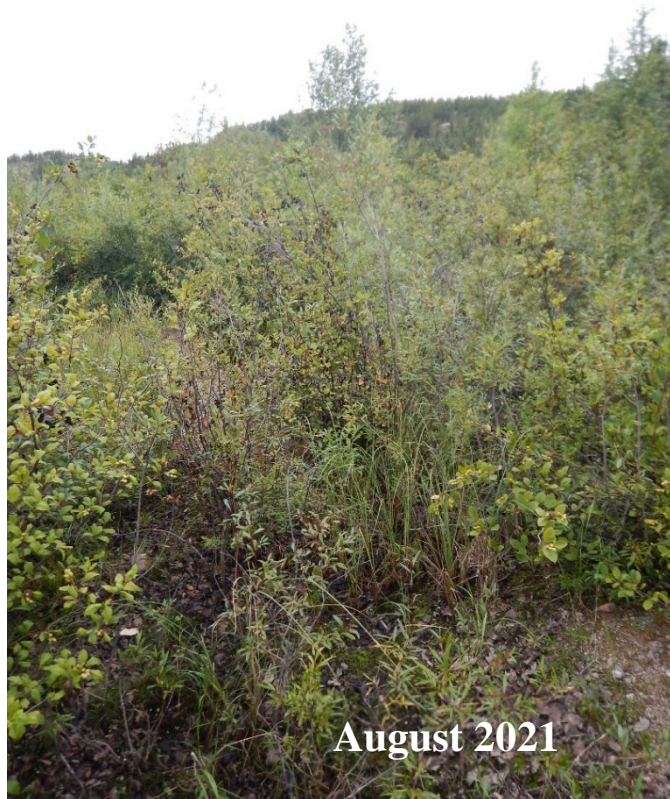
Fookes Outlet Structure looking upstream



Fookes Outlet Structure looking downstream



Drainage area looking NW towards access point on hill



Fookes Cover Shoreline



Note: pictures are not taken from the exact same locations



Chevrons in place on north access point to the Fookes Delta



5.0 CROWN PILLAR AREAS

In 2016, the Geotechnical Inspection Checklist was updated to include the identified crown pillar areas at the Hab, Dubyna and Ace areas as per recommendations from SRK. Cameco committed to perform assessments of the relevant crown pillar locations annually until such time as the properties are transferred to the IC Program, where monitoring will continue under that program. As the Hab, Dubyna and Ace areas had not been transferred to the IC program at the time of the 2023 inspection Cameco completed the inspections of these crown pillars in 2023.

Table 1 and **Table 2** provide GPS points for locations associated with the Dubyna and Hab areas where visual monitoring was recommended. As shown in **Figure 4**, for the Dubyna area, the area between inspection points are expected to coincide with the Level 1 stoping area where crown pillar thicknesses would be expected to be the thinnest. As shown in **Figure 5**, for the Hab area, inspection points are expected to align roughly with the 2nd level workings where stoping of the Hab 039 Zone was conducted. **Figure 6** provides the layout of the Ace Stope Area cover along with the locations of historic subsidence observed in the area, where inspections typically focus.

Table 1. Visual Monitoring Location Recommendations for Dubyna

Location	Position	Elevation (approx.)	Comment
DUB-01	Zone:12 V 647946, 6608477	339 m	In mine waste backfill
DUB-02	Zone:12 V 647973, 6608480	339 m	Near edge of waste rock backfill
DUB-03	Zone:12 V 647997, 6608487	333 m	Close to lake

Table 2. Visual Monitoring Location Recommendations for Hab

Location	Position	Elevation (approx.)	Comment
HAB039-01	Zone:12 V 645272, 6612203	408 m	Near the edge of the mine waste backfill
HAB039-02	Zone:12 V 645339, 6612234	415 m	Covered by mine waste backfill in the pit
HAB039-03	Zone:12 V 645384, 6612251	419 m	Covered by mine waste backfill, near the edge of the pit rim

HAB039-04	Zone:12 V 645373, 6612211	408 m	Approximately above the 2 nd level workings
HAB039-05	Zone:12 V 645298, 6612178	403 m	Approximately above the 2 nd level workings

Inspections of the Ace, Hab and Dubyna crown pillars occurred on May 25 – 29, 2023. Photographs of the covered Ace Stope Area and the crown pillar areas at Hab and Dubyna are provided in **Appendix D**.

At the Ace area, the cover material over the stopes was inspected by walking the toe of the cover material, as well as the interface between the cover material and natural ground. No signs of tensions cracks or visible depressions were observed along the Ace stope cover material in 2023.

The crown pillar monitoring points at Hab and Dubyna were located, and a visual walking inspection was completed at each site. The inspection involved walking between and around the points identified in **Tables 1** and **2**. Observations at both areas did not show any evidence of tension cracks or slumping in 2023.

It was noted at Dubyna that recent beaver activity resulted in significant clearing along the crown pillar inspection area. As well, a beaver lodge was constructed along the shore of Dubyna Lake near furthest extent of the crown pillar.

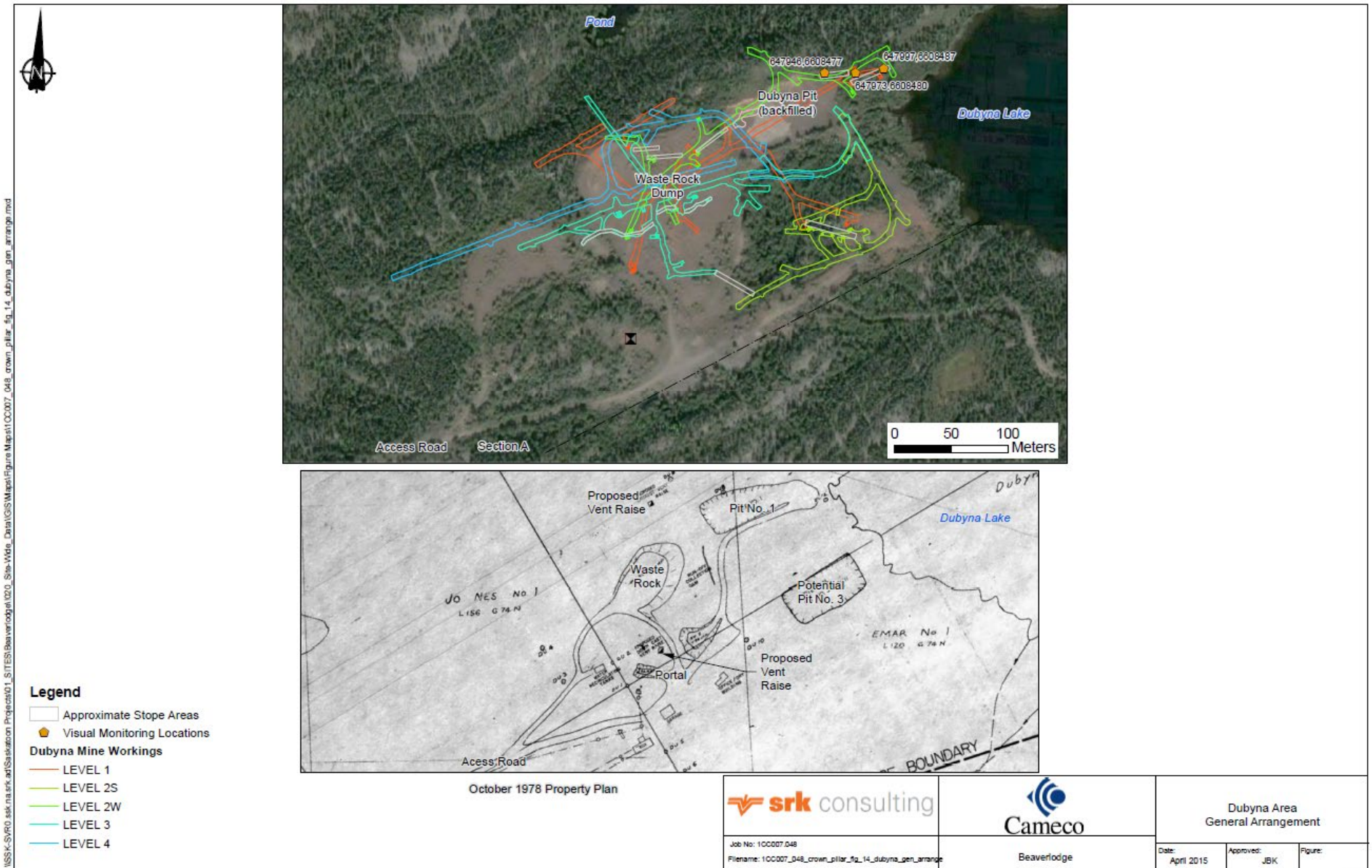


Figure 4. Dubyna area general arrangement

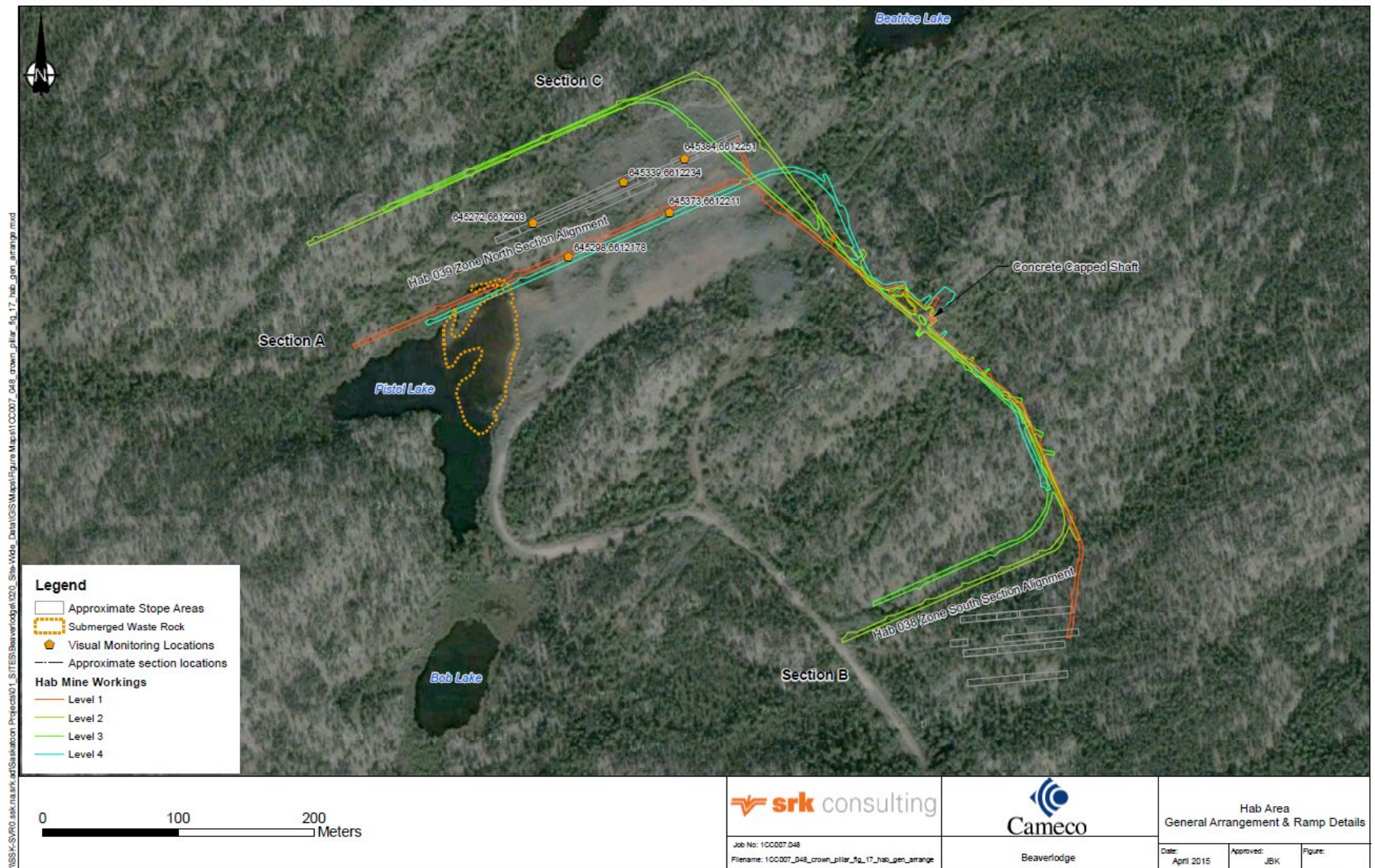


Figure 5. Hab area general arrangement and ramp details

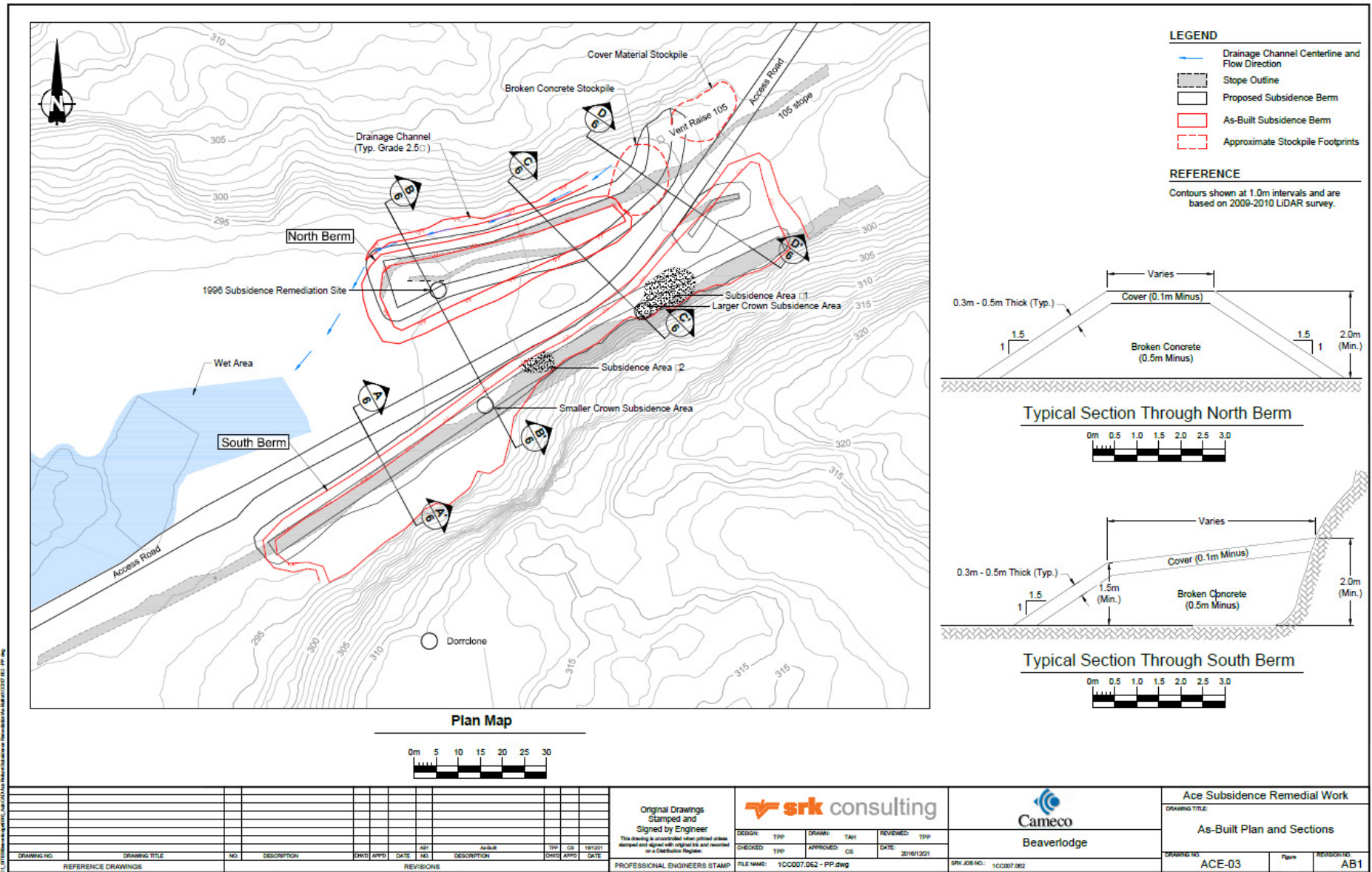


Figure 6. Ace crown pillar remediation

6.0 ZORA STREAM RECONSTRUCTION

Remedial work completed at the Bolger Pit site from 2014 to 2016 included the excavation of a channel through the existing Bolger Waste Rock Pile and the relocation of the excavated waste rock to the Bolger Pit. The intent of this work was to improve water quality, specifically uranium concentrations, in both Zora Creek and Verna Lake and to re-establish a more natural Zora Creek flow path.

In the Zora Creek Design Report (SRK, 2014), it was recommended to complete a geotechnical inspection in each of the first two years following construction. Subsequently, SRK completed geotechnical inspections in 2017 (SRK, 2017c) and 2018 (SRK, 2019) of the reconstructed Zora Creek flow path. Both the 2017 and 2018 inspections found that there were no immediate or significant areas of concern with regards to the performance or geotechnical stability of the reconstructed flow path. Continued monitoring of water quality and the potential presence of accumulated sediment were recommended. In addition, it was recommended that the next geotechnical inspection occur in 2023, or earlier if requested by Cameco (SRK, 2019). Cameco requested a geotechnical inspection for the area be completed in 2020 to align with other geotechnical inspections at the decommissioned Beaverlodge properties.

The 2020 SRK inspection identified that from a geotechnical perspective, it would be reasonable for Cameco to transfer the properties associated with the Bolger Pit and the Drainage Channel to the IC Program. However, in the interim it was recommended that Cameco continue with annual inspections of the area as part of the annual regulatory inspection. It was also noted that involvement by a geotechnical engineer should not be required except in the unlikely event that significant geotechnical concerns arise.

The Zora Creek Stream Reconstruction area was inspected on May 26, 2023. Overall, the conditions observed had not changed from previous years in that water quality results are performing as expected and no significant accumulation of sediment has been observed. The results of the 2023 assessment of the Bolger Pit and the Drainage Channel can be summarized as follows:

- The beaver dam located at the outlet of Zora Lake (inlet to the stream reconstruction) remains intact.
- The embankments along the sides of the channel remain stable with no evidence of sloughing or instability.
- Vegetation along the downstream portion of the channel (near the stilling basin) is now well established and thickening.

Photographic record of the inspection is provided in **Appendix E**.

7.0 REFERENCES

SRK Consulting (2008). Beaverlodge Decommissioning: 2007 Construction Activities at the Fookes Lake Delta. Report prepared for Cameco Corporation, February, 2008.

SRK Consulting (2010). Beaverlodge Project: Inspection of Fookes Delta and Outlet Structures at Fookes Reservoir and Marie Reservoir. Report prepared for Cameco Corporation, September, 2010.

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SRK Consulting (Canada) Inc. (2021). Beaverlodge Project – 2020 Geotechnical Inspection Report - Decommissioned Beaverlodge Mine/Mill Site. Prepared for Cameco Corporation

8.0 APPENDICES

Appendix A – Marie Reservoir Outlet photos

Appendix B – Fookes Reservoir Outlet photos

Appendix C – Fookes Delta photos

Appendix D – Ace and Hab crown pillar inspection photos

Appendix E – Zora Stream Reconstruction photos

Appendix A

Marie Outlet Photos



Photo A1 – Marie Reservoir Spillway looking upstream (May 2023)

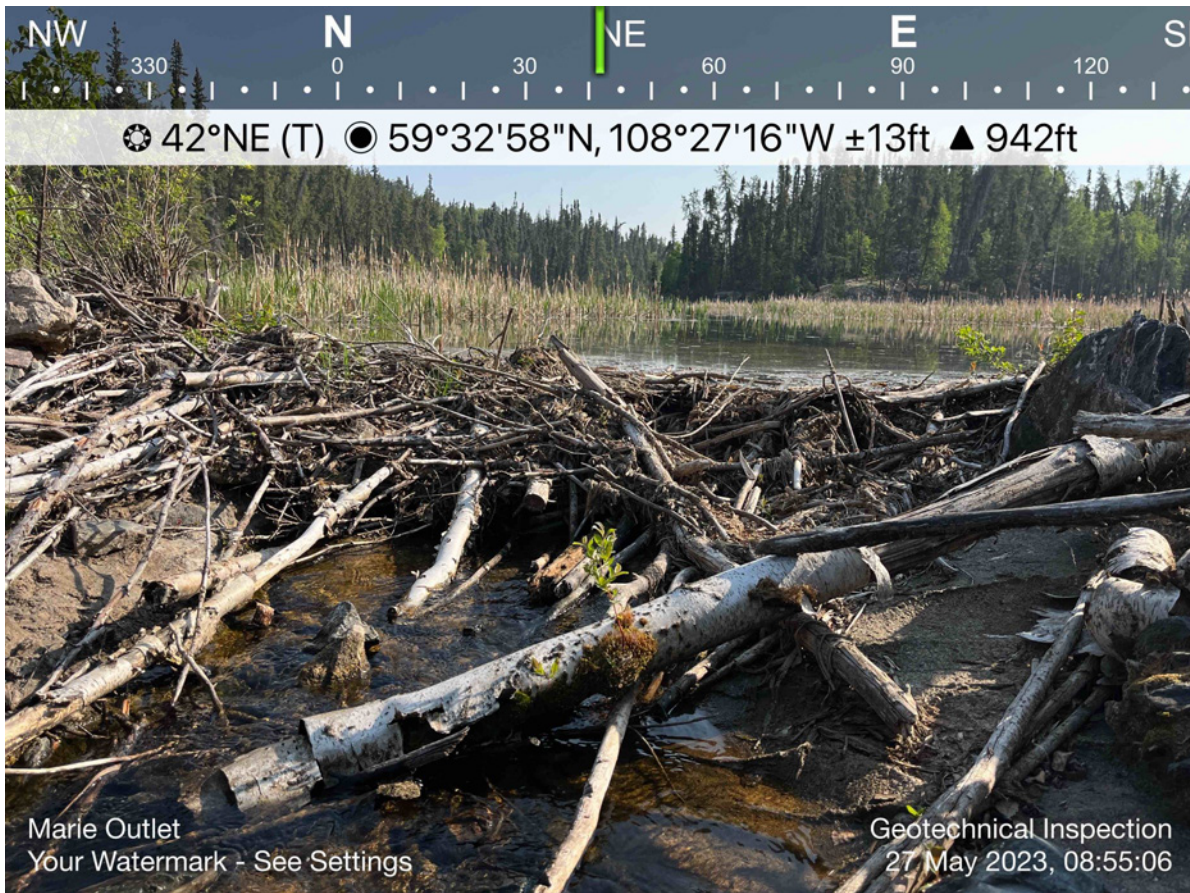


Photo A2 - Marie Reservoir Spillway inlet; beaver dam first noted in 2018

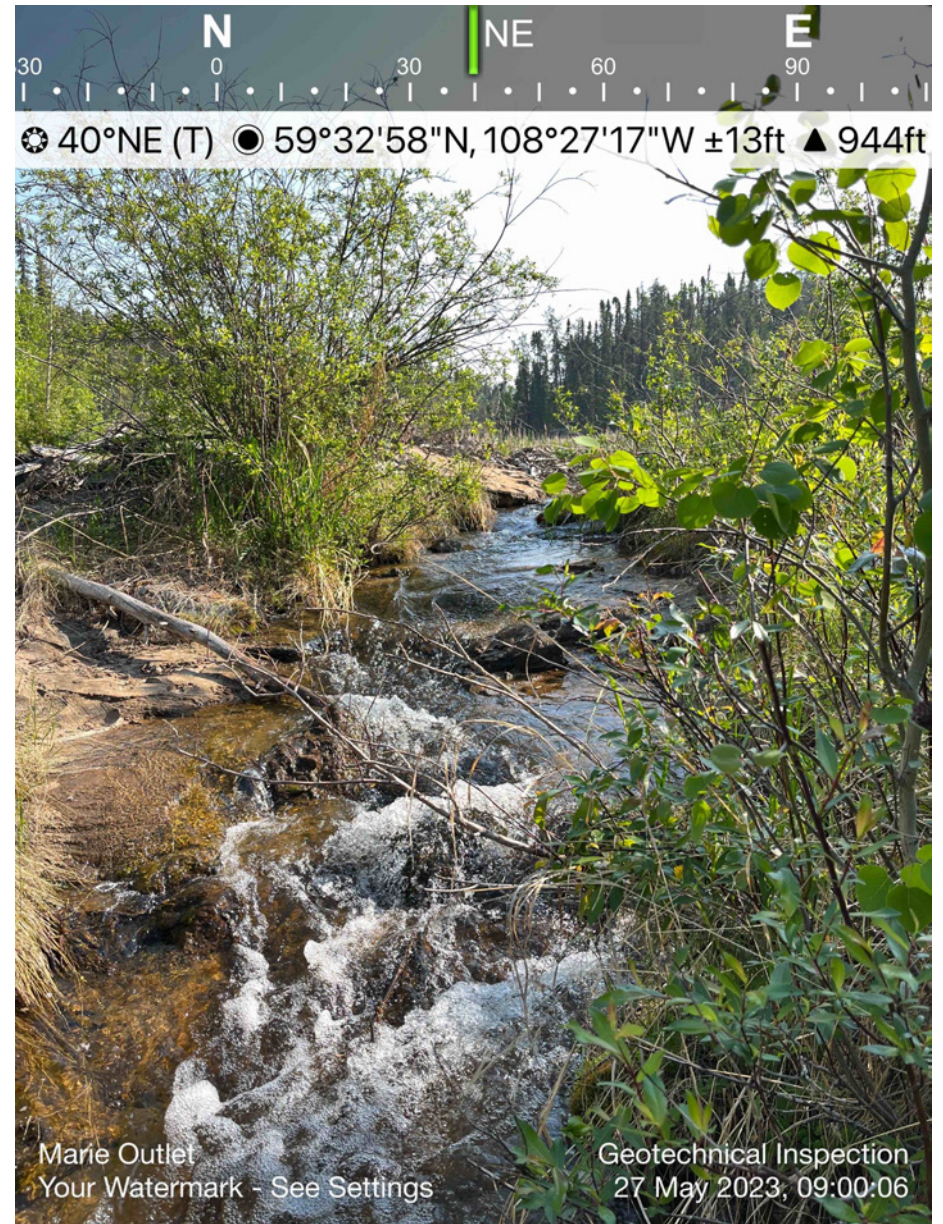


Photo A3 – Marie Reservoir Spillway (water flowing into stilling basin) (May 2023)

Photo A4 – Marie Reservoir Spillway looking northeast (May 2023)

Appendix B

Fookes Outlet Photos



Photo B1 – Fookes Reservoir Spillway looking into Fookes Reservoir

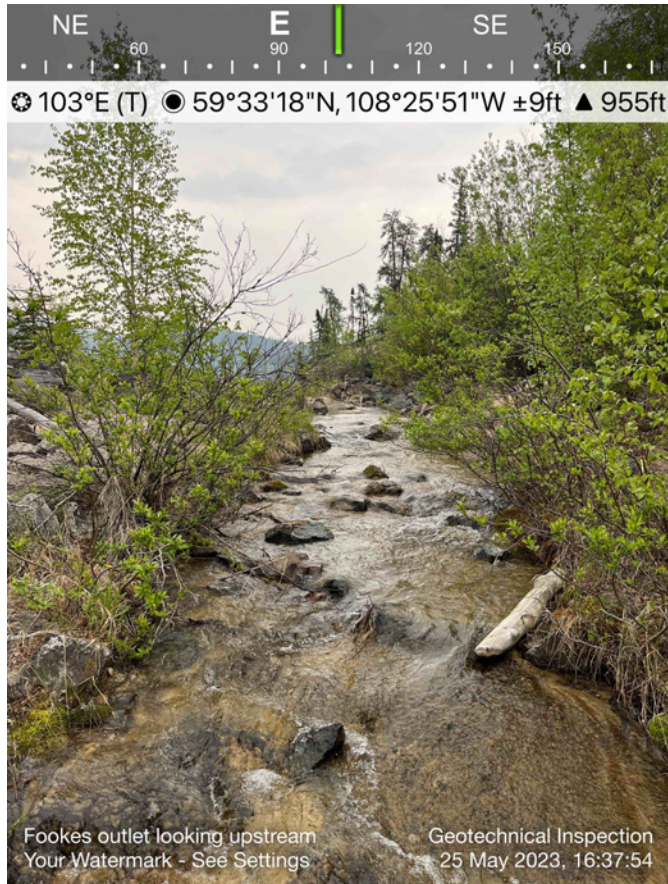


Photo B2 – Fookes Reservoir Spillway looking upstream



Photo B3 – Fookes Reservoir Spillway looking downstream (mid channel)

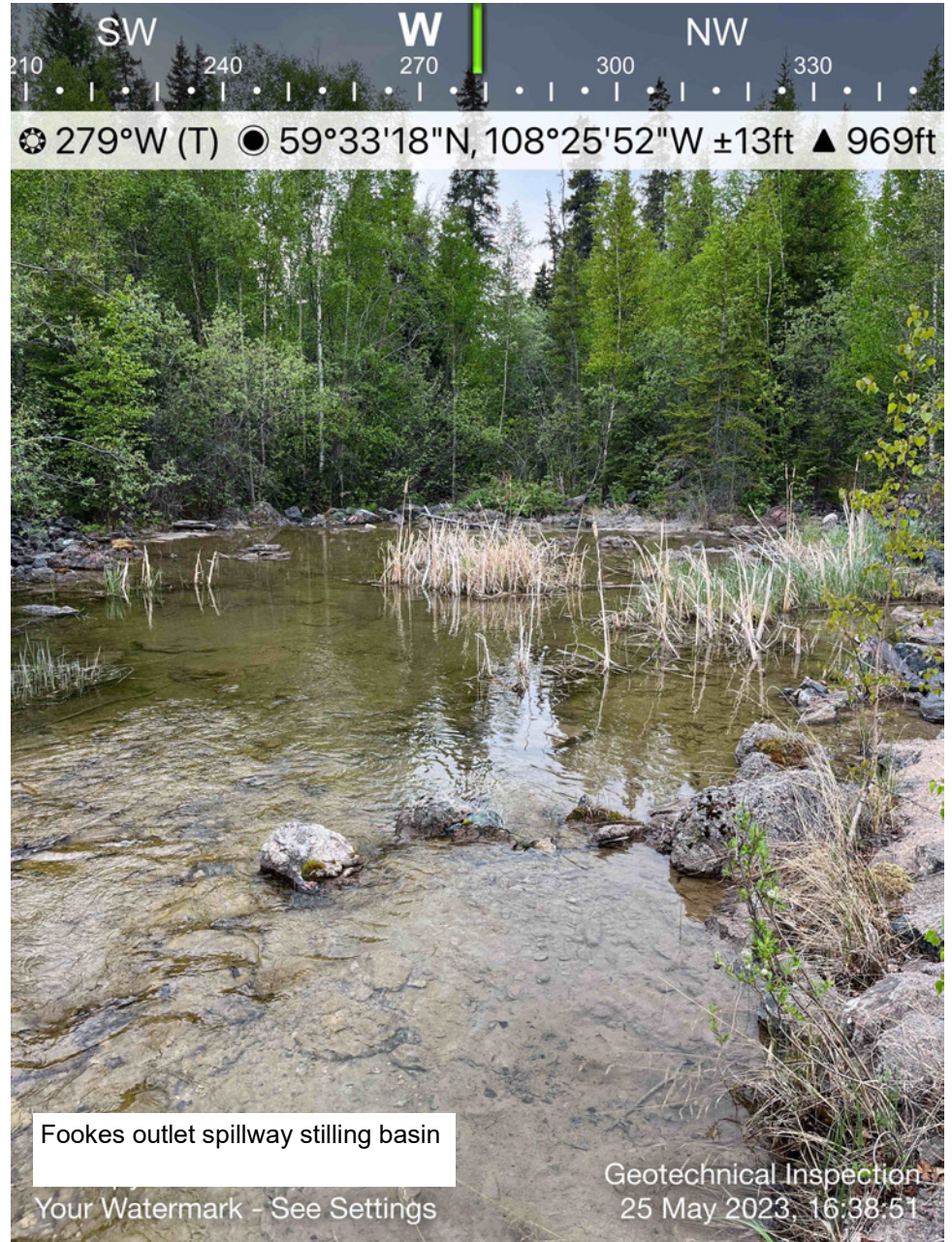


Photo B4 – Fookes Reservoir Spillway stilling basin



Photo B5 – Fookes Reservoir Spillway showing broken rip-rap on north and south sides of channel. Note debris has been removed since 2022 inspection.

Appendix C

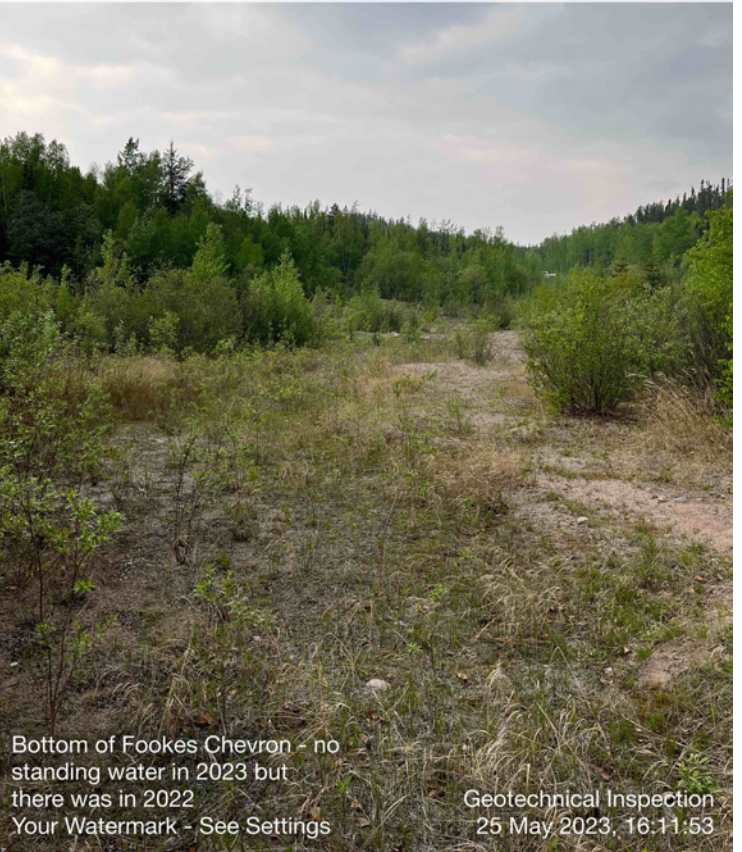
Fookes Delta Photos



Photo C1 – Chevrons in place on north access point to the Fookes delta looking south (May 2023)



Photo C2 – no ponded water (May 2023). This area previously had ponded water on waste rock cover at bottom of hill near north access road during freshet in 2022.



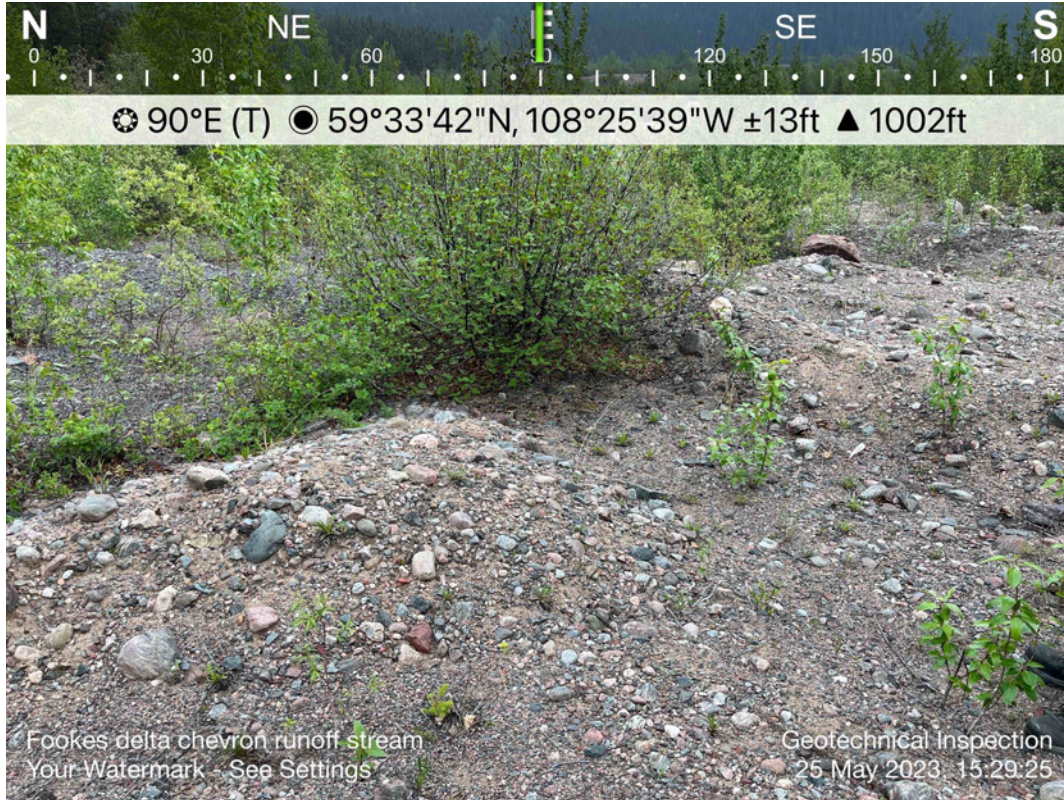


Photo C3 – Chevron run-out structure along north access road



Photo C4 – Drainage collection area on edge of Fookes Tailings Delta approximately 100m from access point



Photo C5a-b – Panoramic views of the Fookes cover (Photos taken May 2023) vegetations is yet to leaf-out

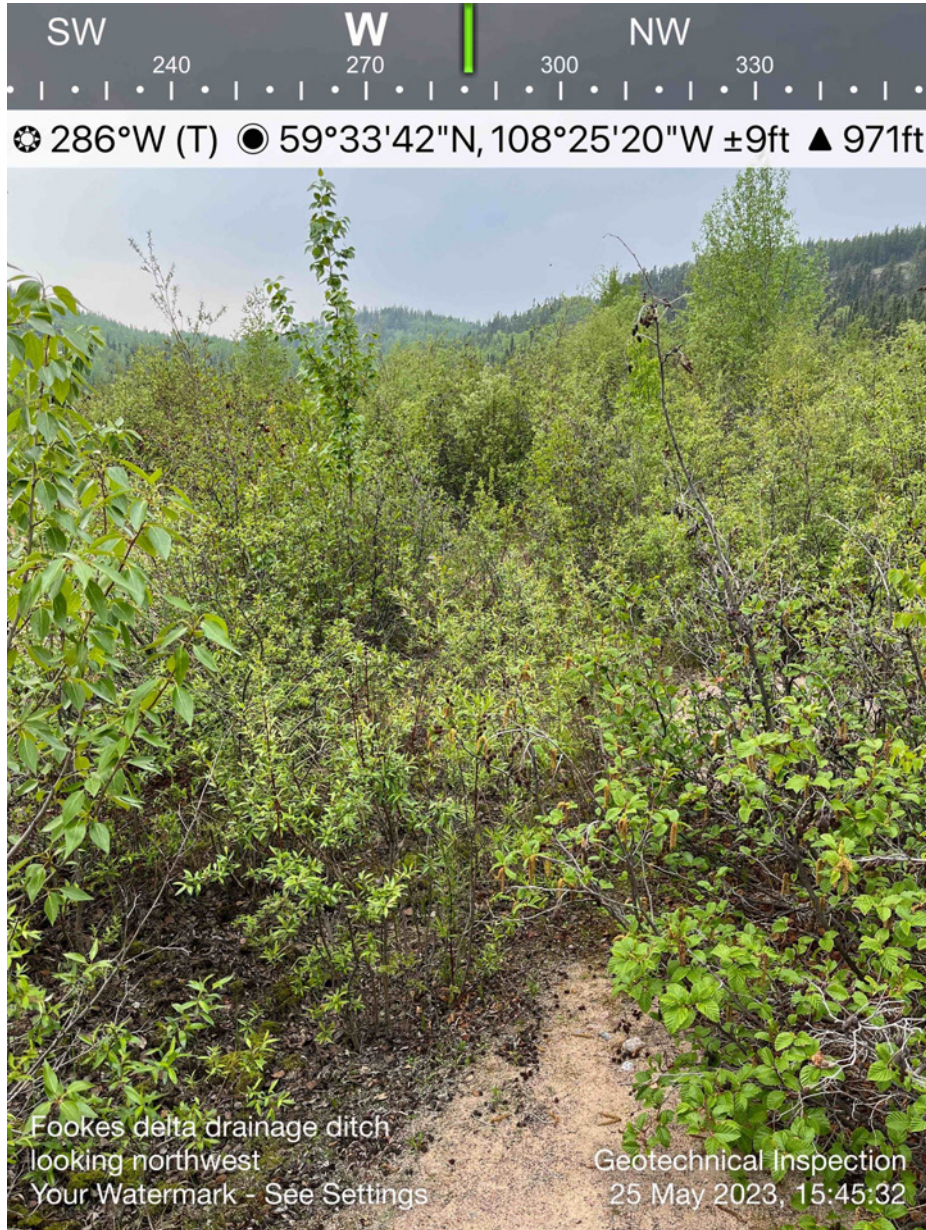


Photo C6 – View of vegetation establishing along drainage channel (May 2023).



Photo C7 – View of east berm looking onto the delta. No evidence of traffic crossing the berm (May 2023).

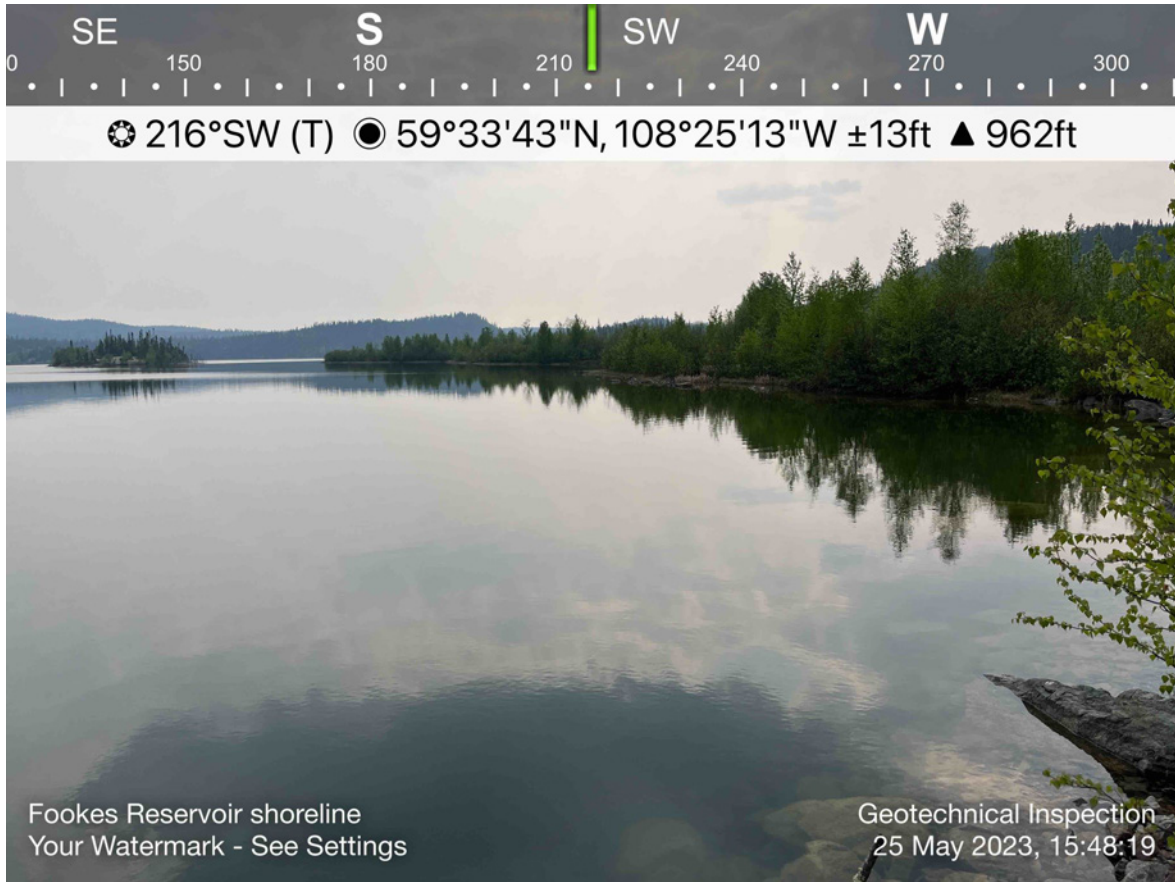


Photo C8—Fookes Reservoir shoreline (looking west) Note vegetation along shoreline is well

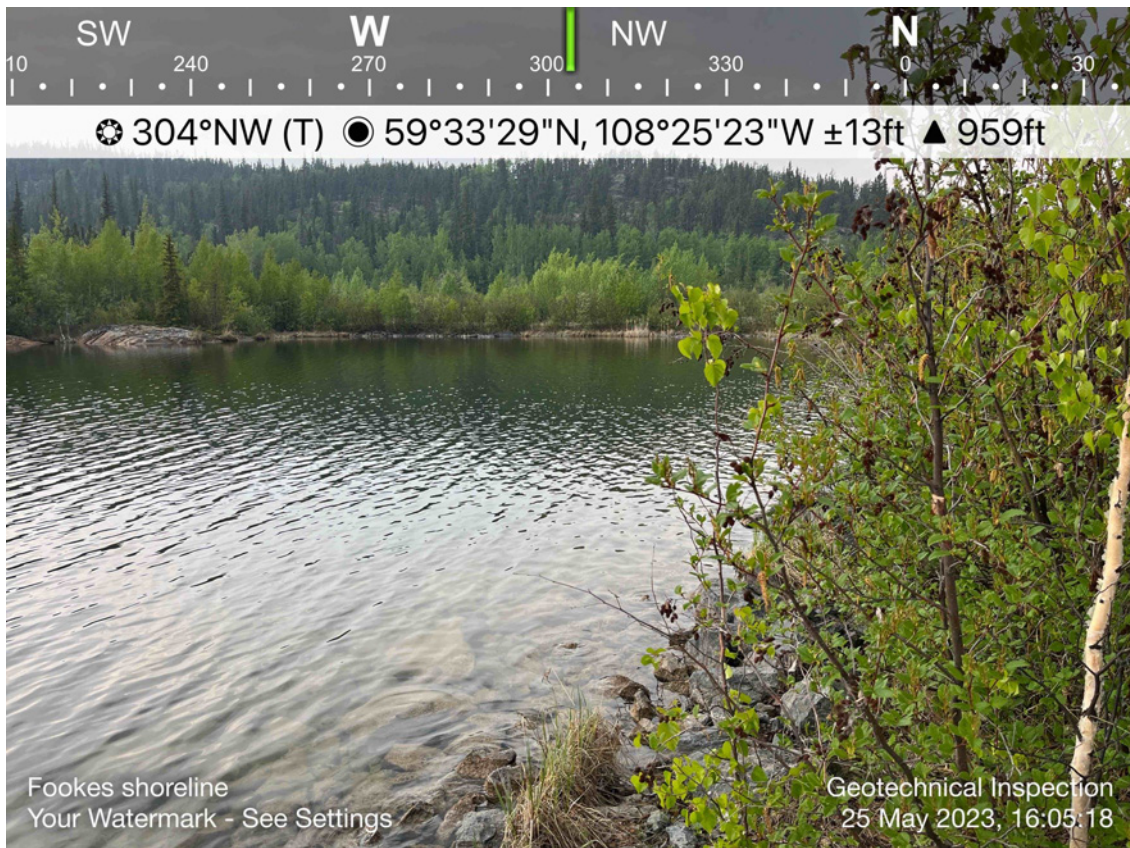


Photo C9—Fookes Reservoir shoreline (looking west).

Appendix D

Crown Pillar Area Photos



Photo D1 - View of the cover placed over Ace 201 Stope



Ace stope crown pillar
looking SW
Your Watermark - See Settings
Geotechnical Inspection
26 May 2023



Photo D2 - view of Ace 105 and 208 Stope cover

Ace stops crown pillar
looking SW
Your Watermark - See Settings
Geotechnical Inspection
26 May 2023, 11:52:21



Photo D3—Dubyna CP-1 location (looking east)



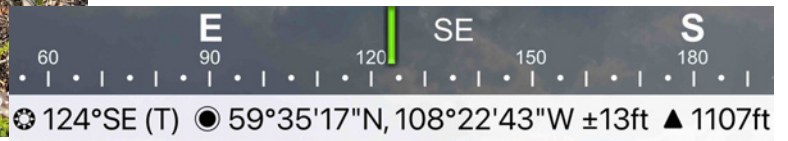
**Photo D4—Dubyna CP- 2 location
(looking east)**



**Photo D5—Dubyna CP-2 location
(looking west)**



**Photo D6—Dubyna CP- 3 location
(looking west)**



**Photo D7—Dubyna CP- 3
location (looking east to
Dubyna Lake)**





Photo D8—HAB039-01 location (looking northeast)

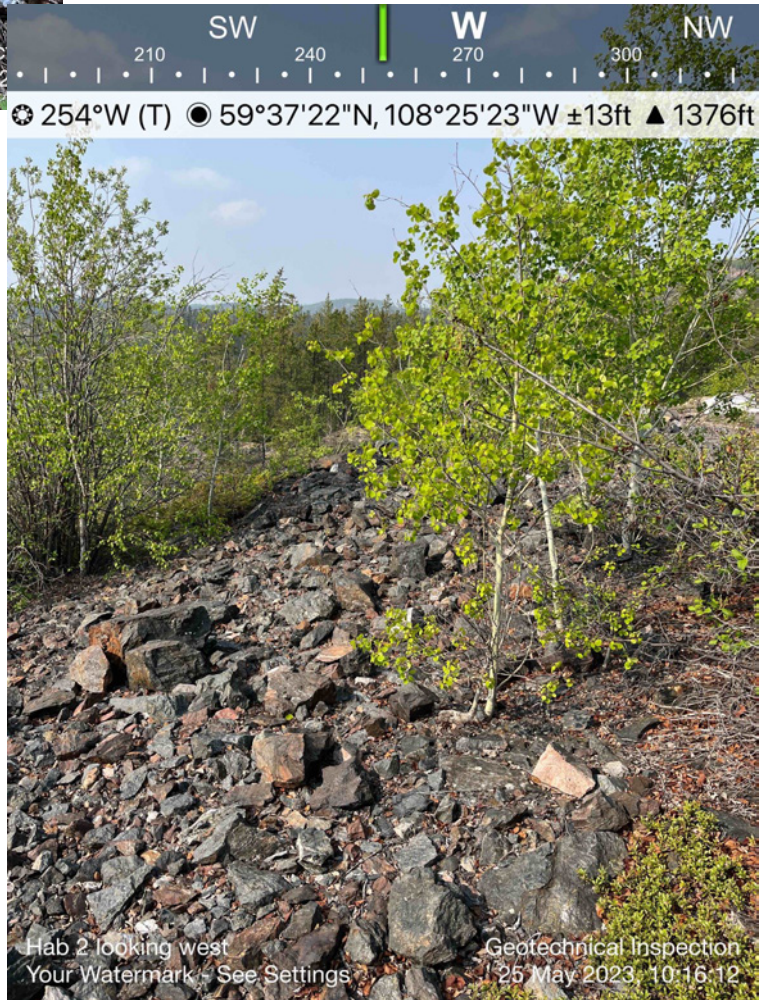


Photo D9—HAB039-02 looking west

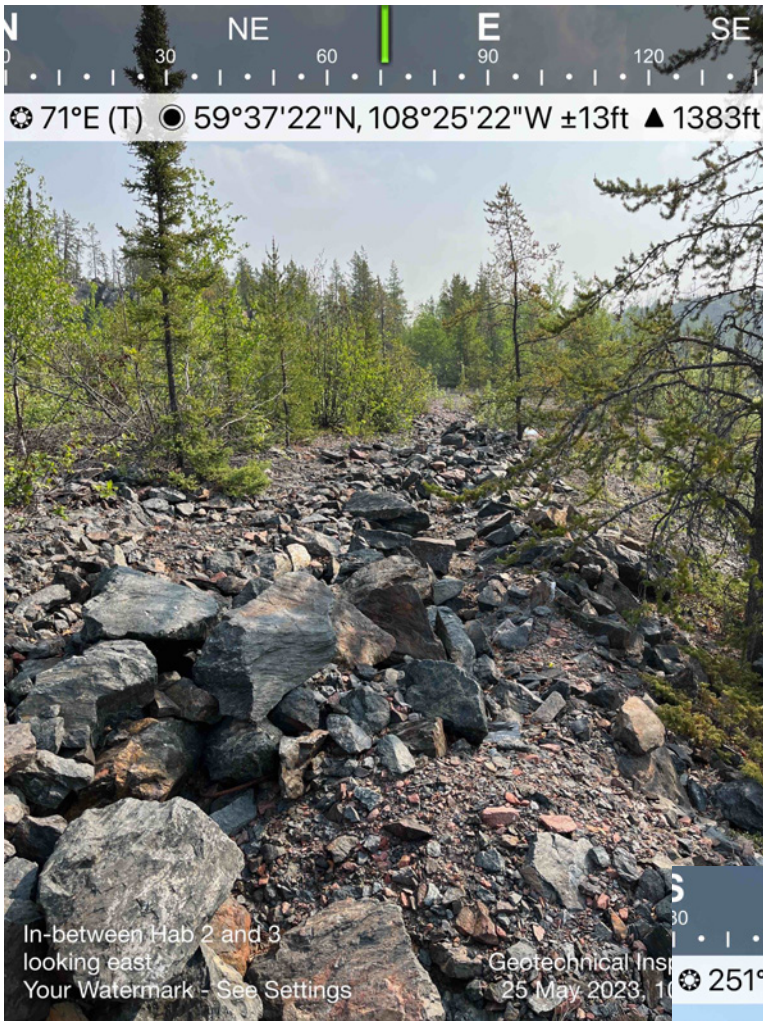


Photo D10—HAB039-02 location (looking east)

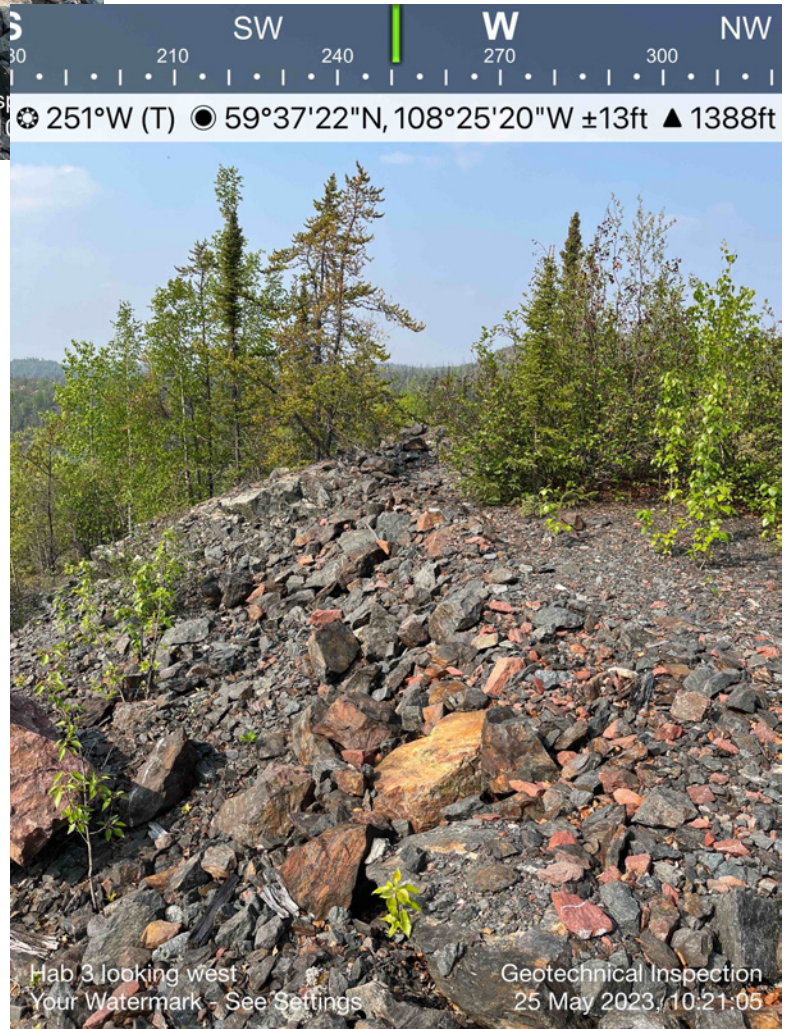


Photo D11—HAB039-03 looking west



Photo D12—HAB039-04 looking west

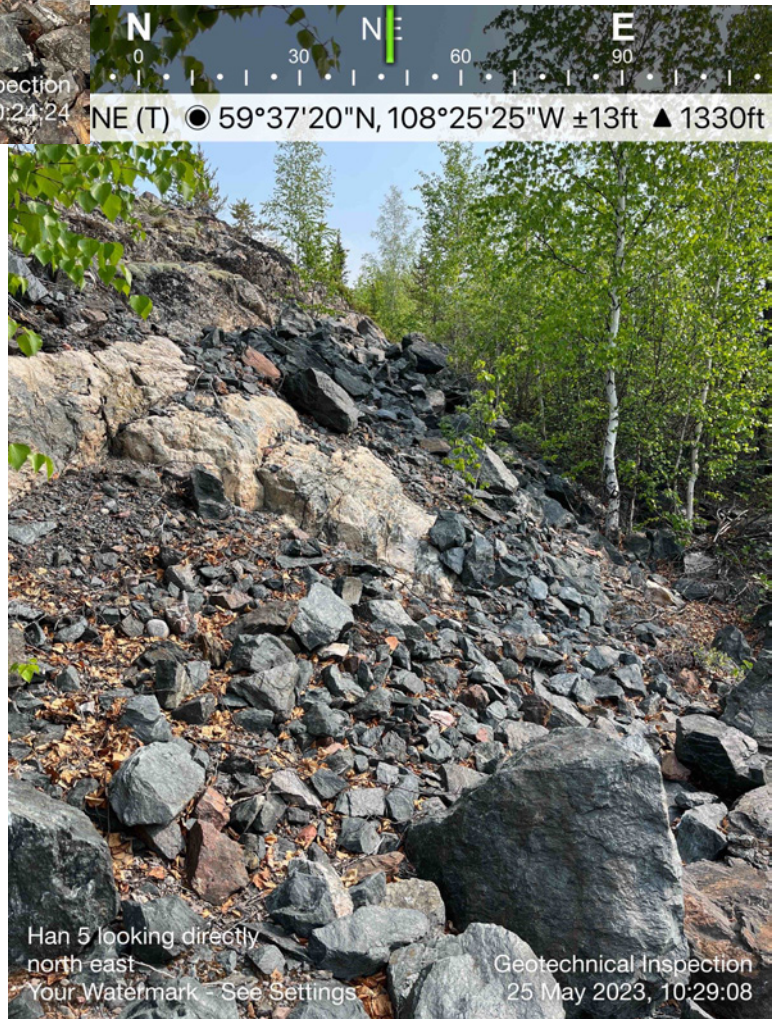


Photo D13—HAB039-05 location (looking east)

Appendix E
Zora Creek Reconstruction Photos

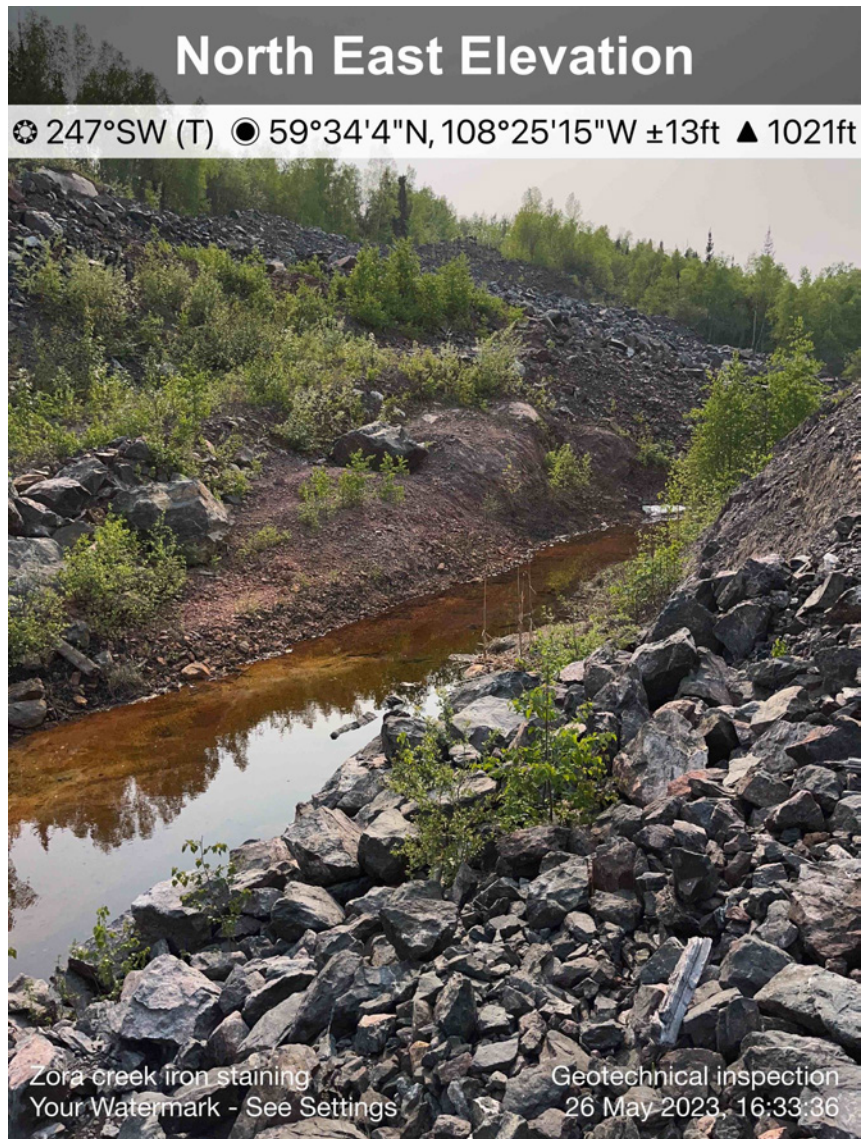


Photo E02—View from level crossing looking upstream towards Zora Lake (May 2023)

Photo E01—View looking downstream towards Verna Lake (May 2023)

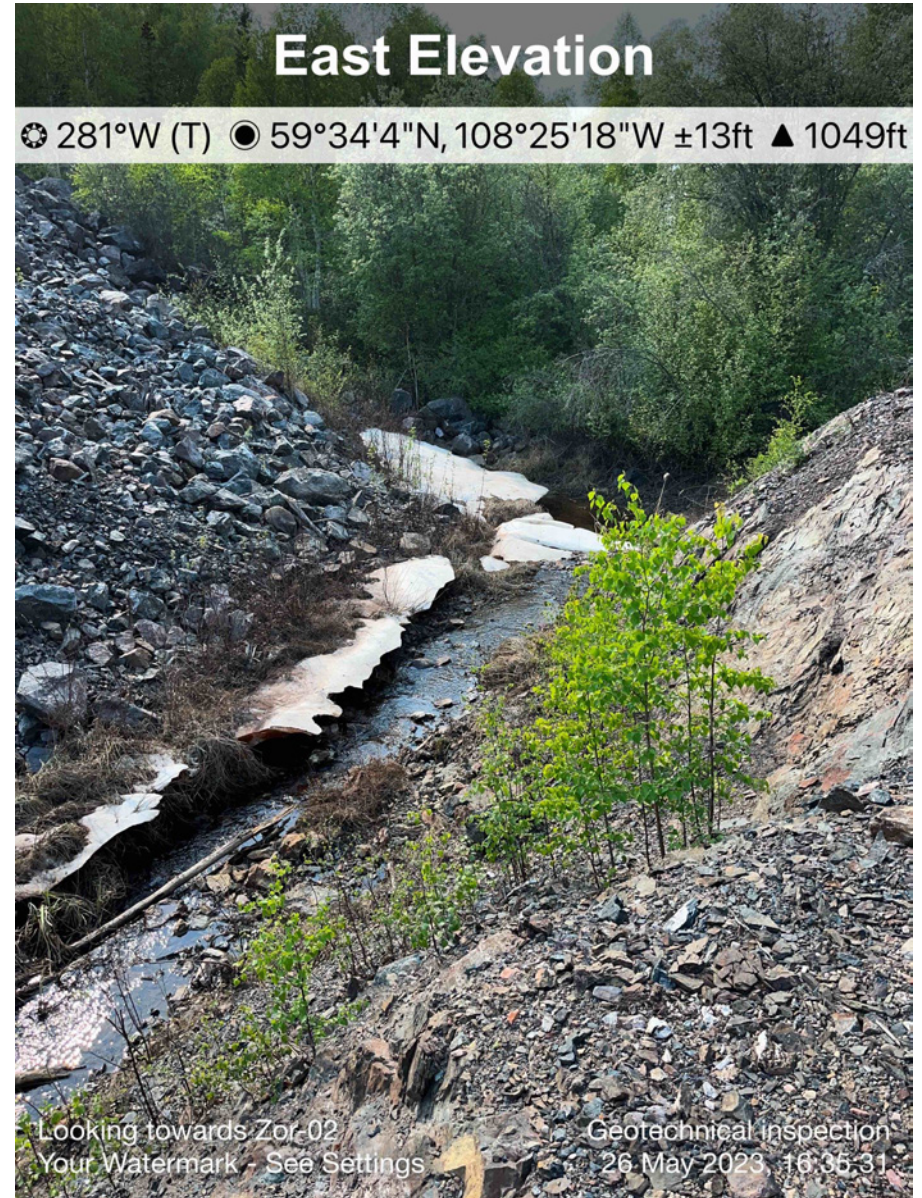
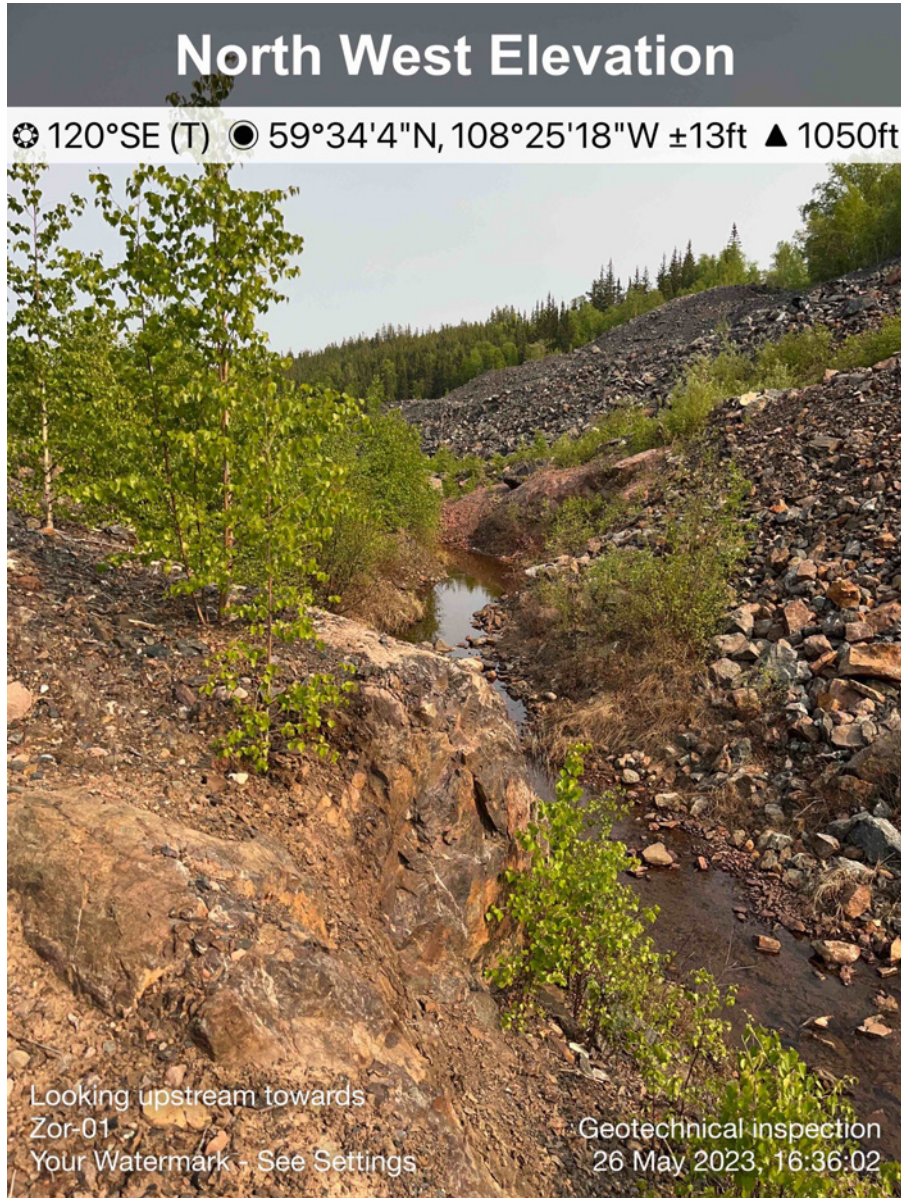


Photo E03—View near stilling basin looking upstream (May 2023)

Photo E04—View near stilling basin, looking downstream at stilling basin (May 2023). Note the glaciation remaining from the late spring



Photo E05—View of well-established beaver dam at the outlet of Zora Lake, looking downstream (May 2023)



Photo E06—View near well-established beaver dam at outlet of Zora Lake, looking across Zora Creek looking south (May 2023)



Photo A1 – Marie Reservoir Spillway looking upstream (May 2023)



Photo A2 - Marie Reservoir Spillway inlet; beaver dam first noted in 2018

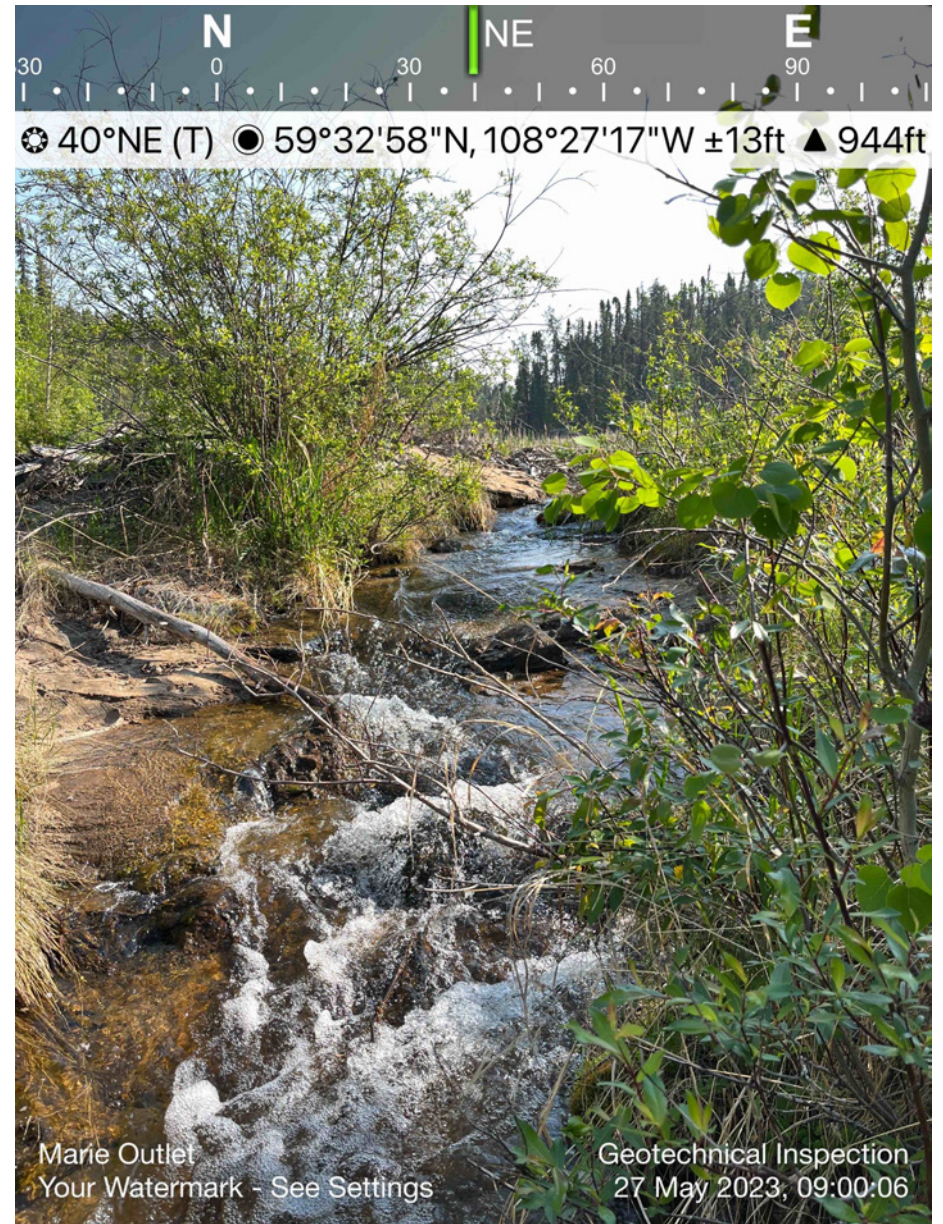


Photo A3 – Marie Reservoir Spillway (water flowing into stilling basin) (May 2023)

Photo A4 – Marie Reservoir Spillway looking northeast (May 2023)



Photo B1 – Fookes Reservoir Spillway looking into Fookes Reservoir

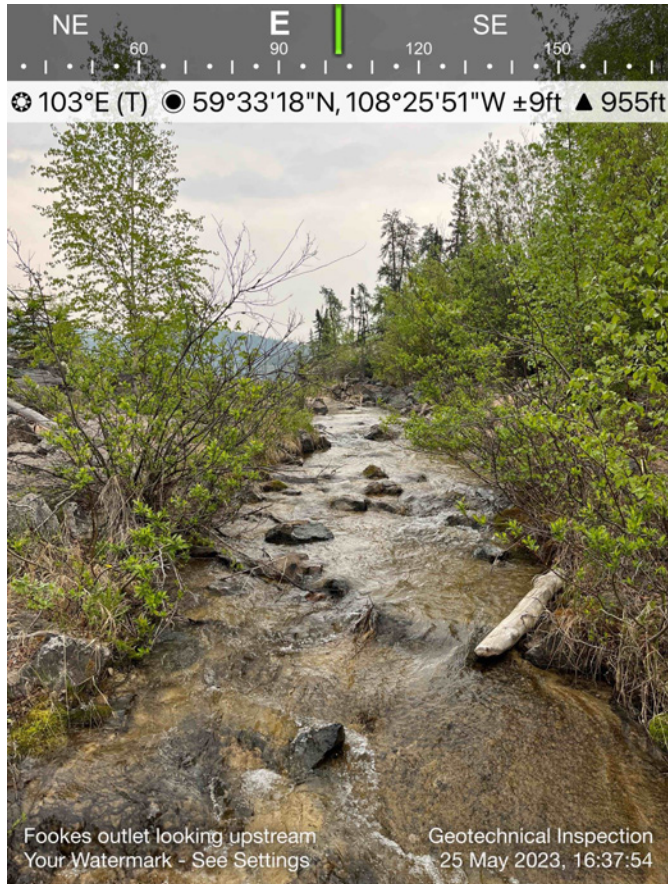


Photo B2 – Fookes Reservoir Spillway looking upstream



Photo B3 – Fookes Reservoir Spillway looking downstream (mid channel)

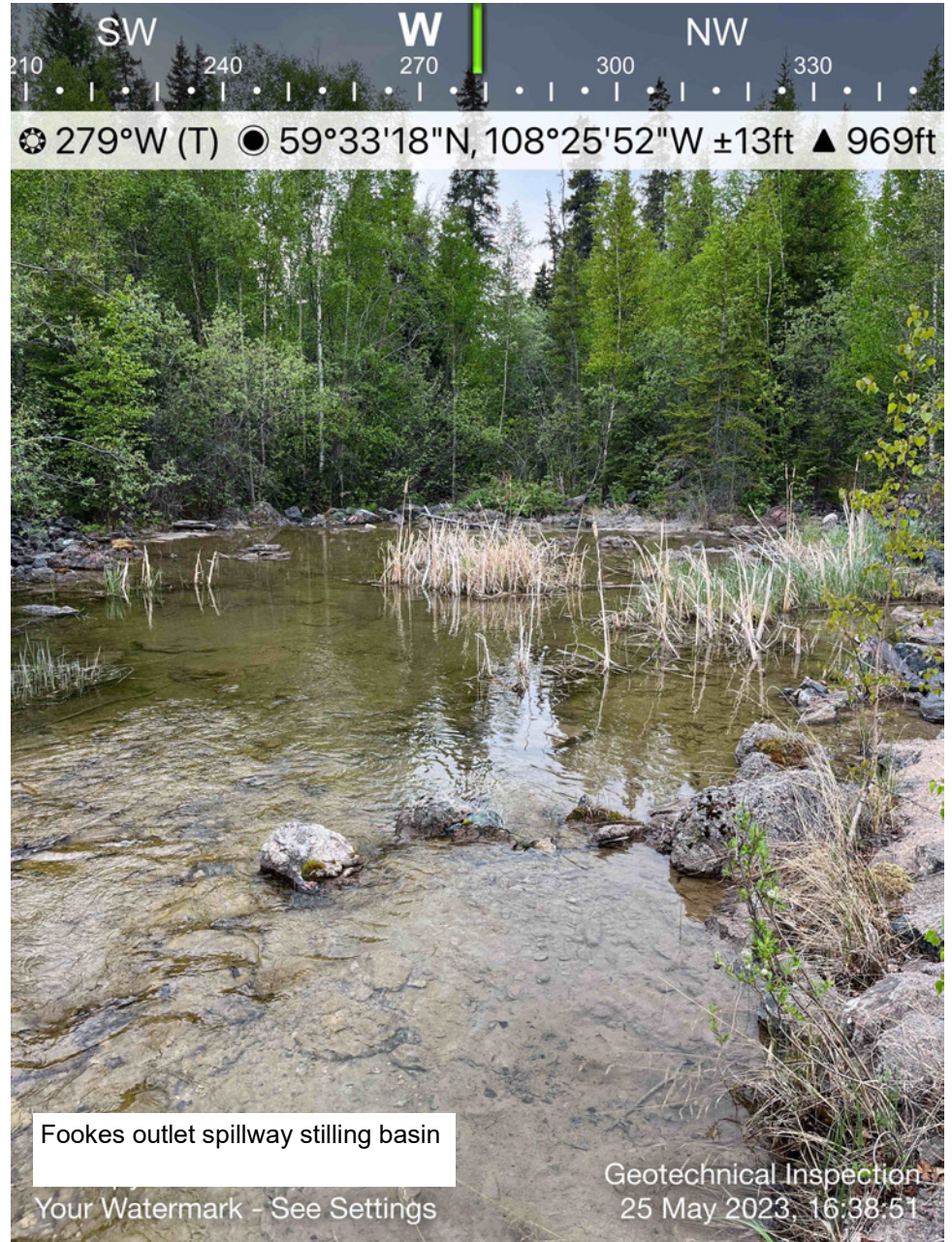


Photo B4 – Fookes Reservoir Spillway stilling basin



Photo B5 – Fookes Reservoir Spillway showing broken rip-rap on north and south sides of channel. Note debris has been removed since 2022 inspection.



Photo C1 – Chevrons in place on north access point to the Fookes delta looking south (May 2023)



Photo C2 – no ponded water (May 2023). This area previously had ponded water on waste rock cover at bottom of hill near north access road during freshet in 2022.

Bottom of Fookes Chevron - no standing water in 2023 but there was in 2022
Geotechnical Inspection
Your Watermark - See Settings
25 May 2023, 16:11:53

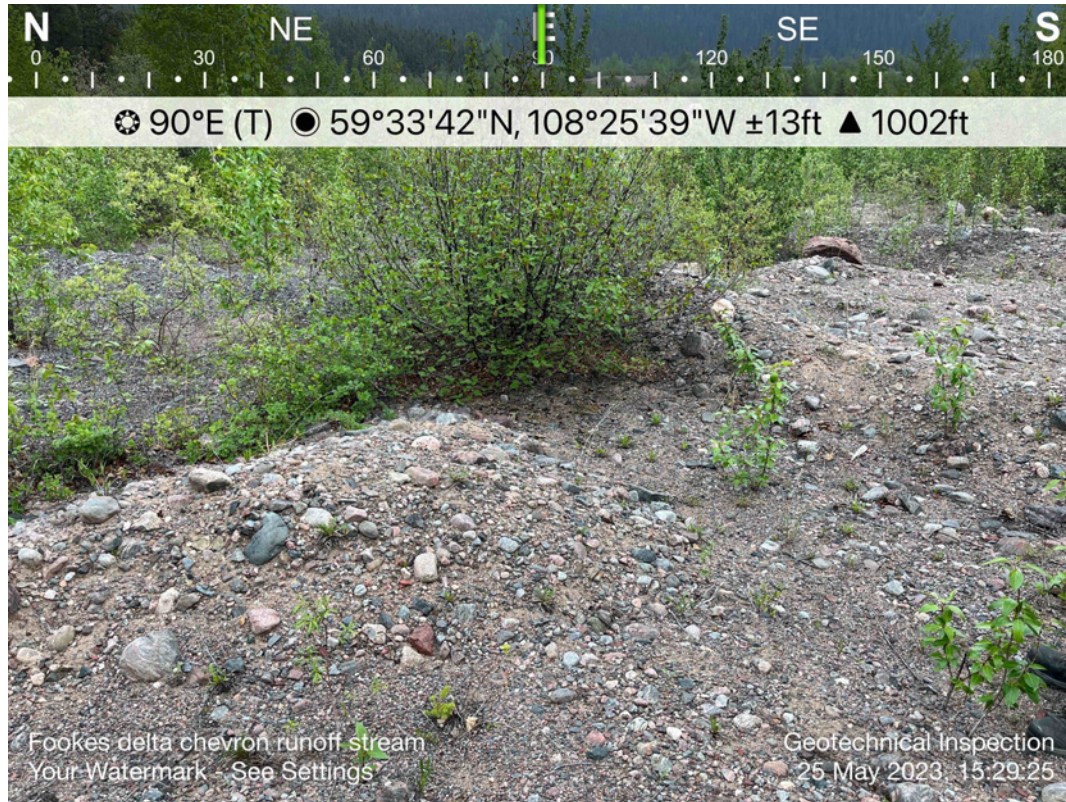


Photo C3 – Chevron run-out structure along north access road



Photo C4 – Drainage collection area on edge of Fookes Tailings Delta approximately 100m from access point



Photo C5a-b – Panoramic views of the Fookes cover (Photos taken May 2023) vegetations is yet to leaf-out

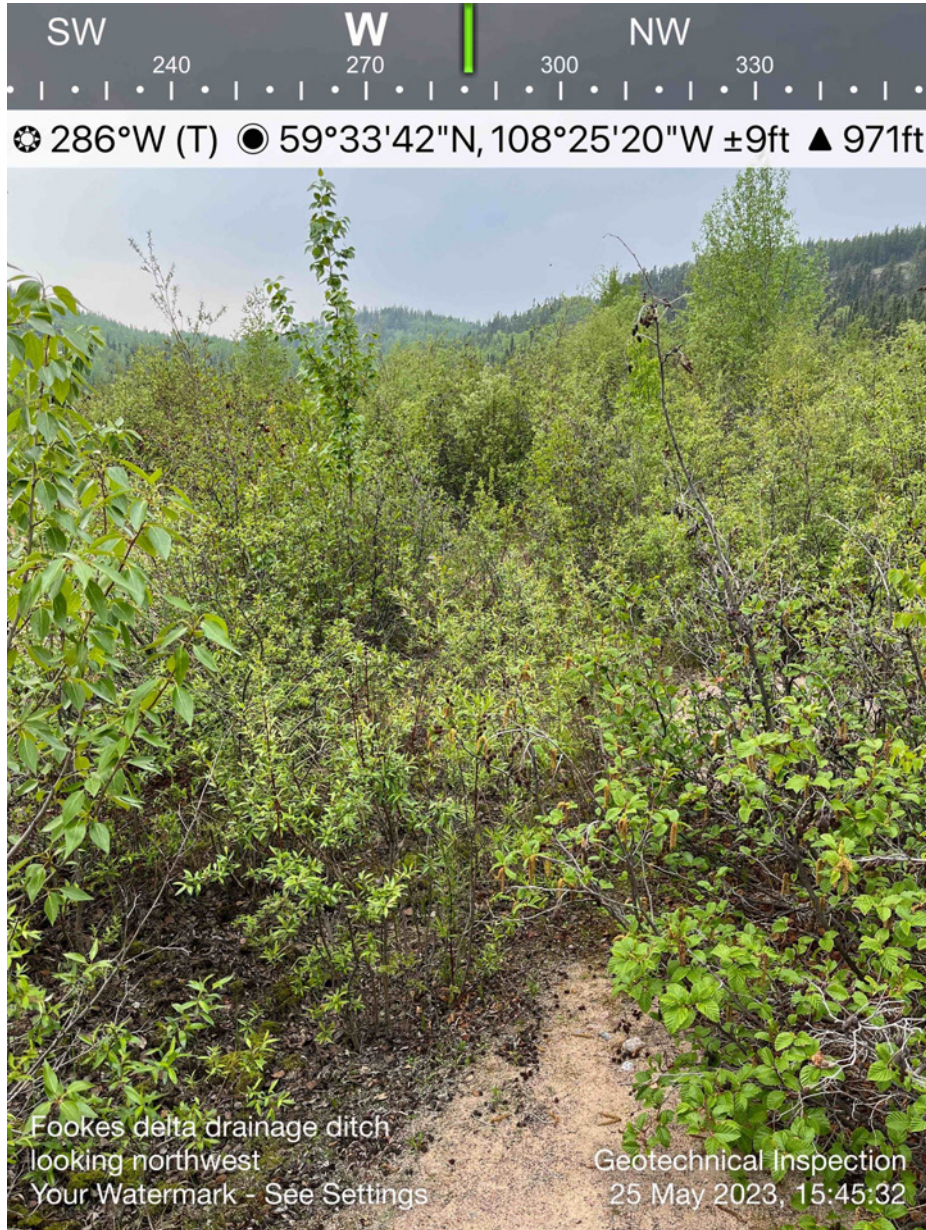


Photo C6 – View of vegetation establishing along drainage channel (May 2023).



Photo C7 – View of east berm looking onto the delta. No evidence of traffic crossing the berm (May 2023).

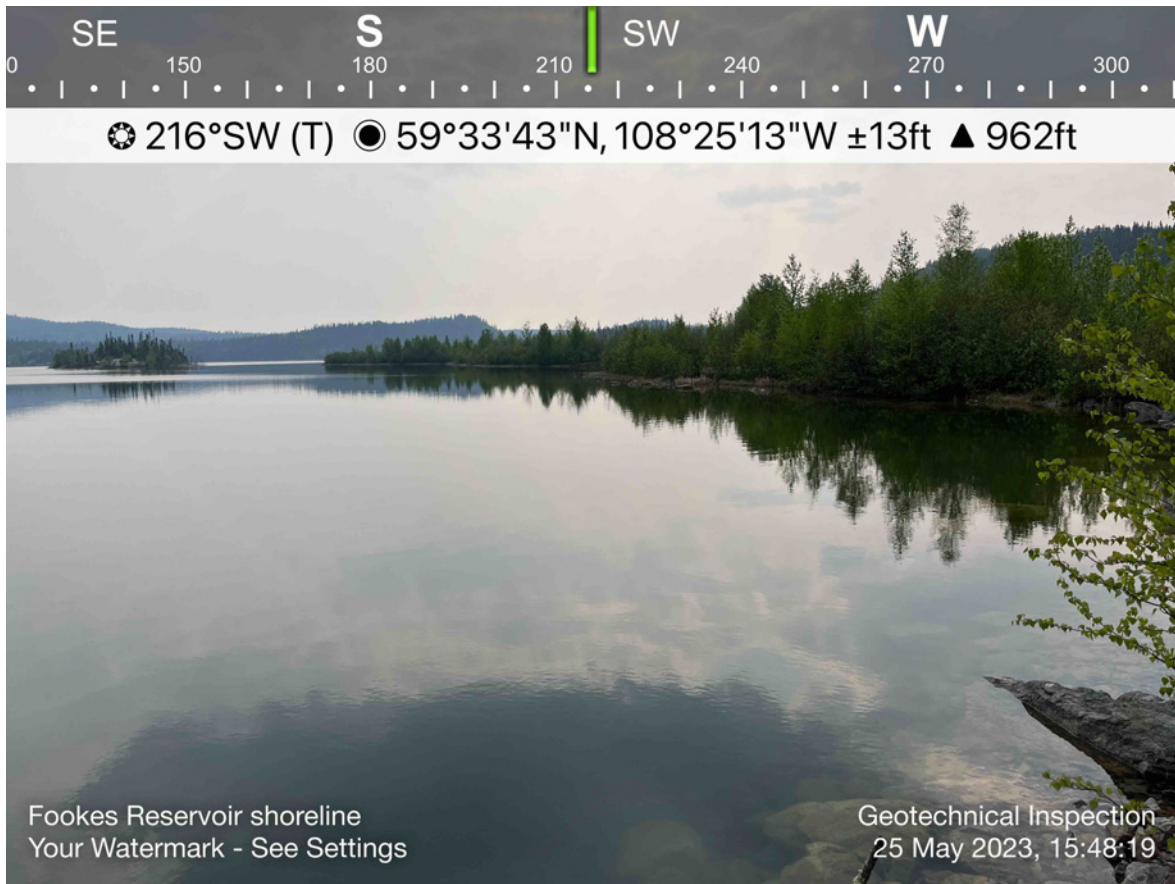


Photo C8—Fookes Reservoir shoreline (looking west) Note vegetation along shoreline is well

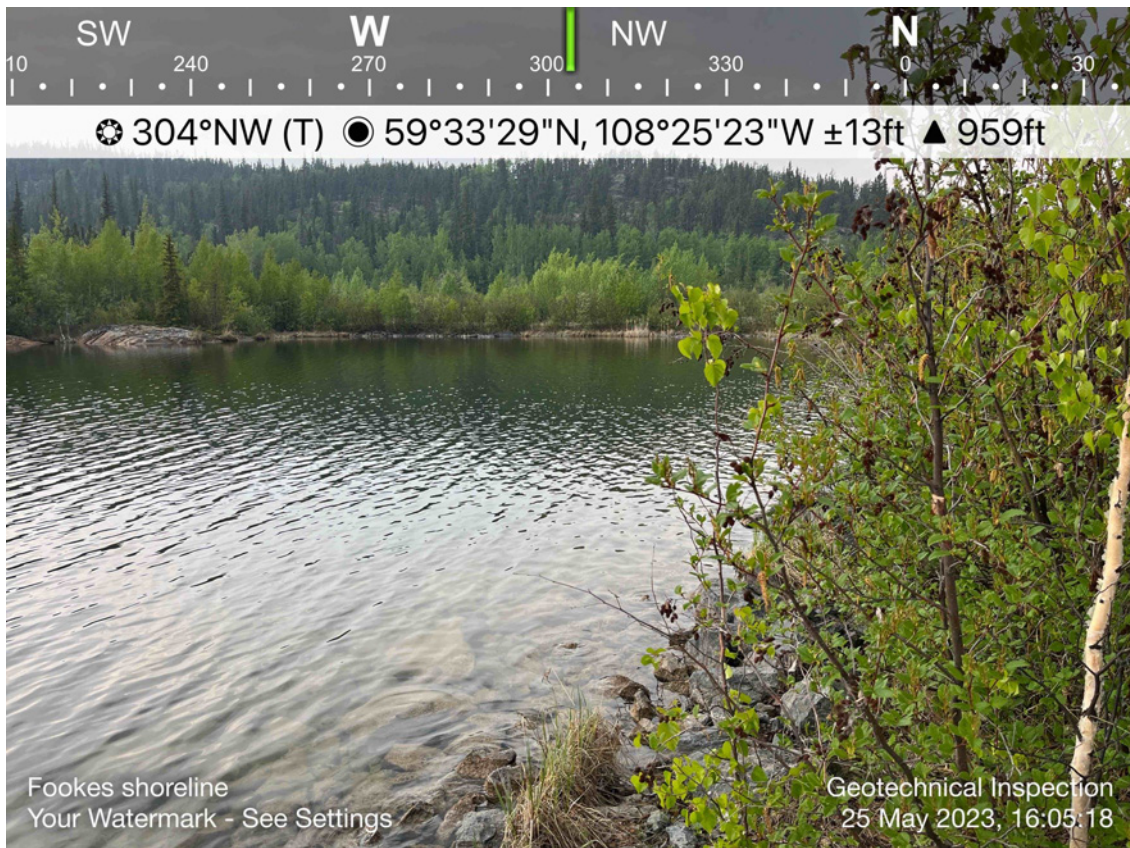


Photo C9—Fookes Reservoir shoreline (looking west).



Photo D1 - View of the cover placed over Ace 201 Stope



Photo D2 - view of Ace 105 and 208 Stope cover



Photo D3—Dubyna CP-1 location (looking east)



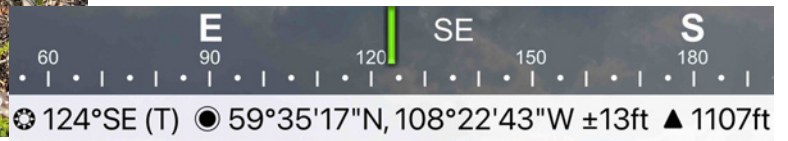
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(looking west)**



**Photo D6—Dubyna CP- 3 location
(looking west)**



**Photo D7—Dubyna CP- 3
location (looking east to
Dubyna Lake)**





Photo D8—HAB039-01 location (looking northeast)

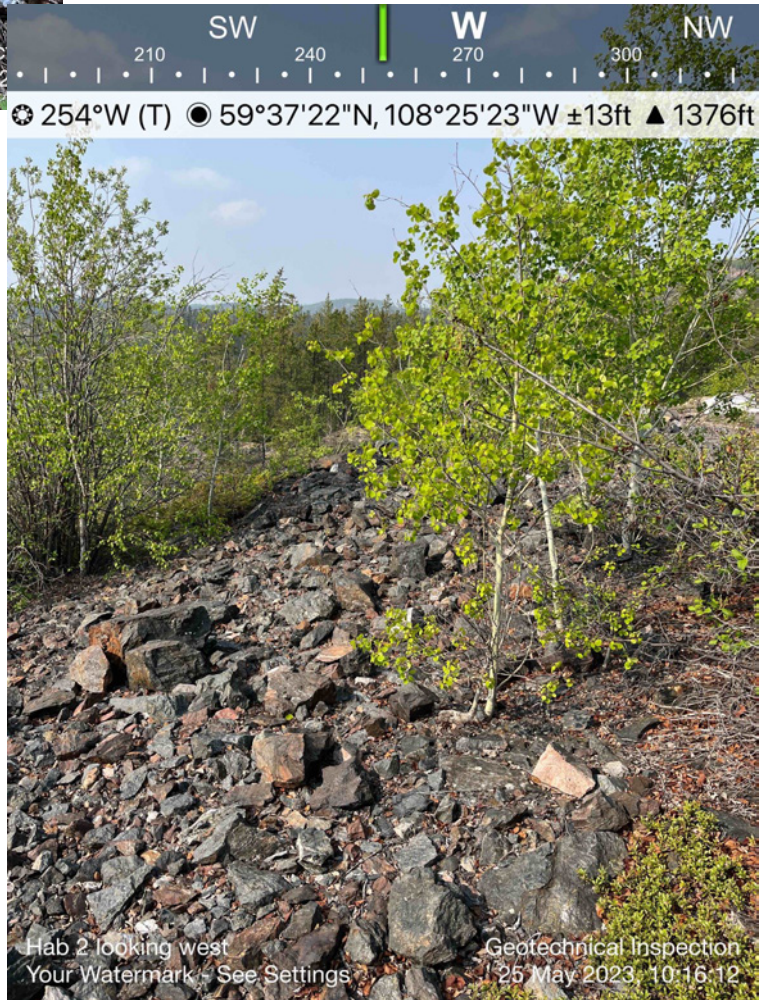


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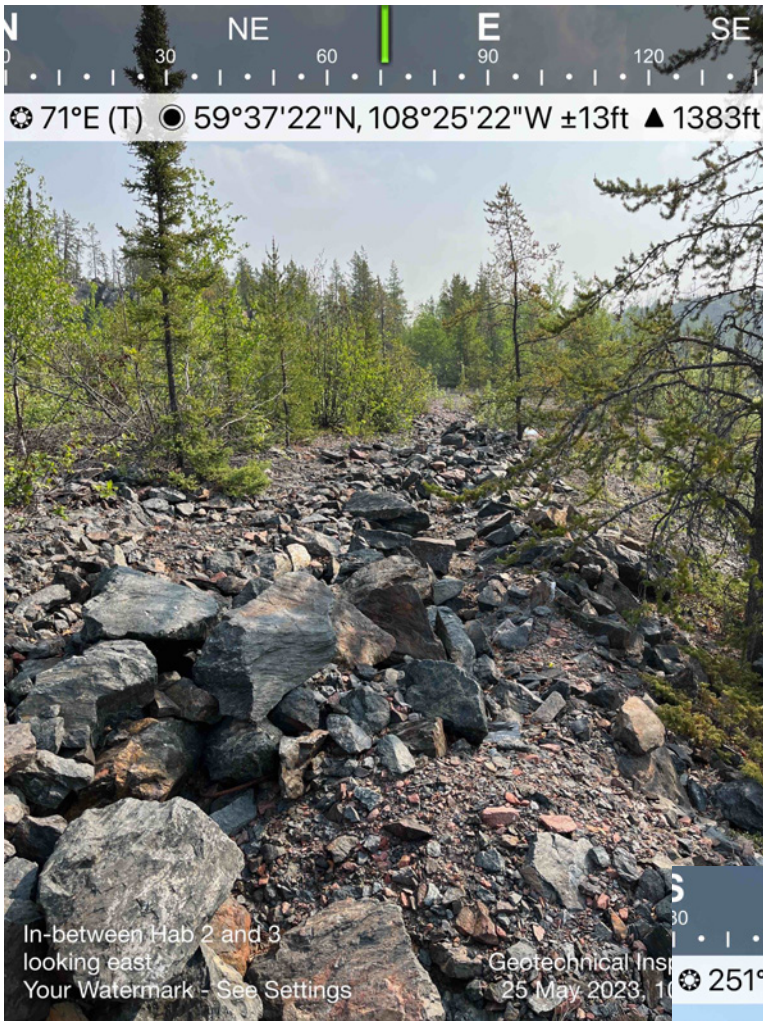


Photo D10—HAB039-02 location (looking east)

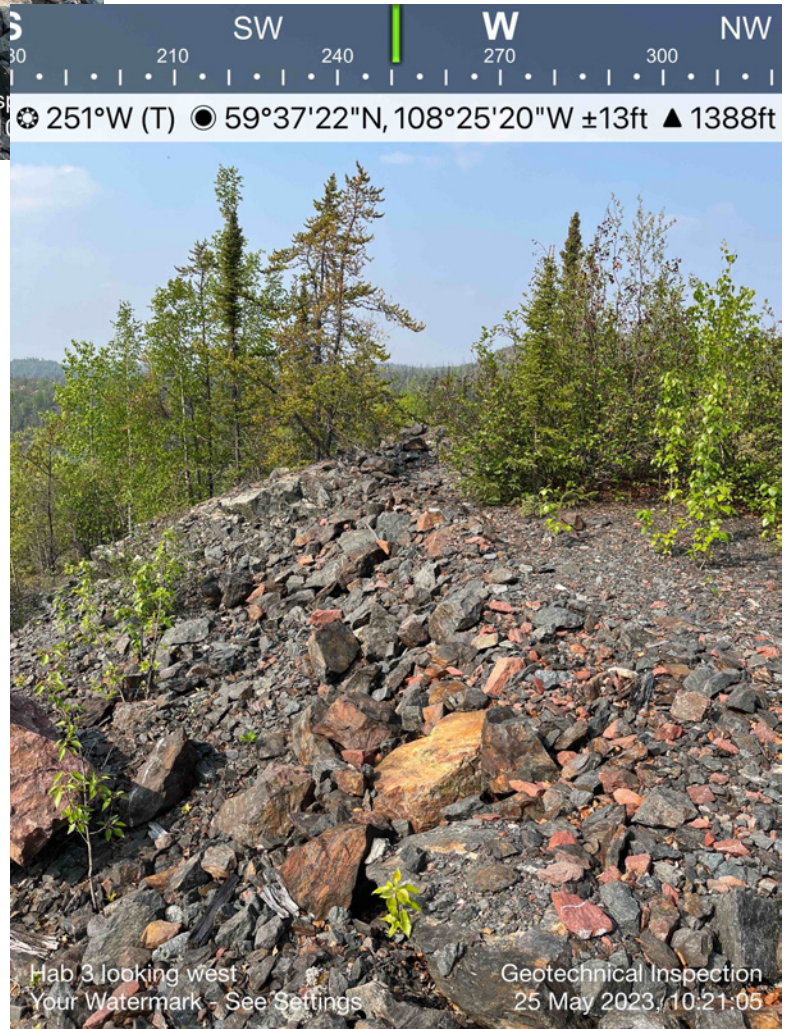


Photo D11—HAB039-03 looking west



Photo D12—HAB039-04 looking west

Hab 4 looking west
Your Watermark - See Settings

Geotechnical Inspection
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Photo D13—HAB039-05 location (looking east)

Han 5 looking directly
north east
Your Watermark - See Settings

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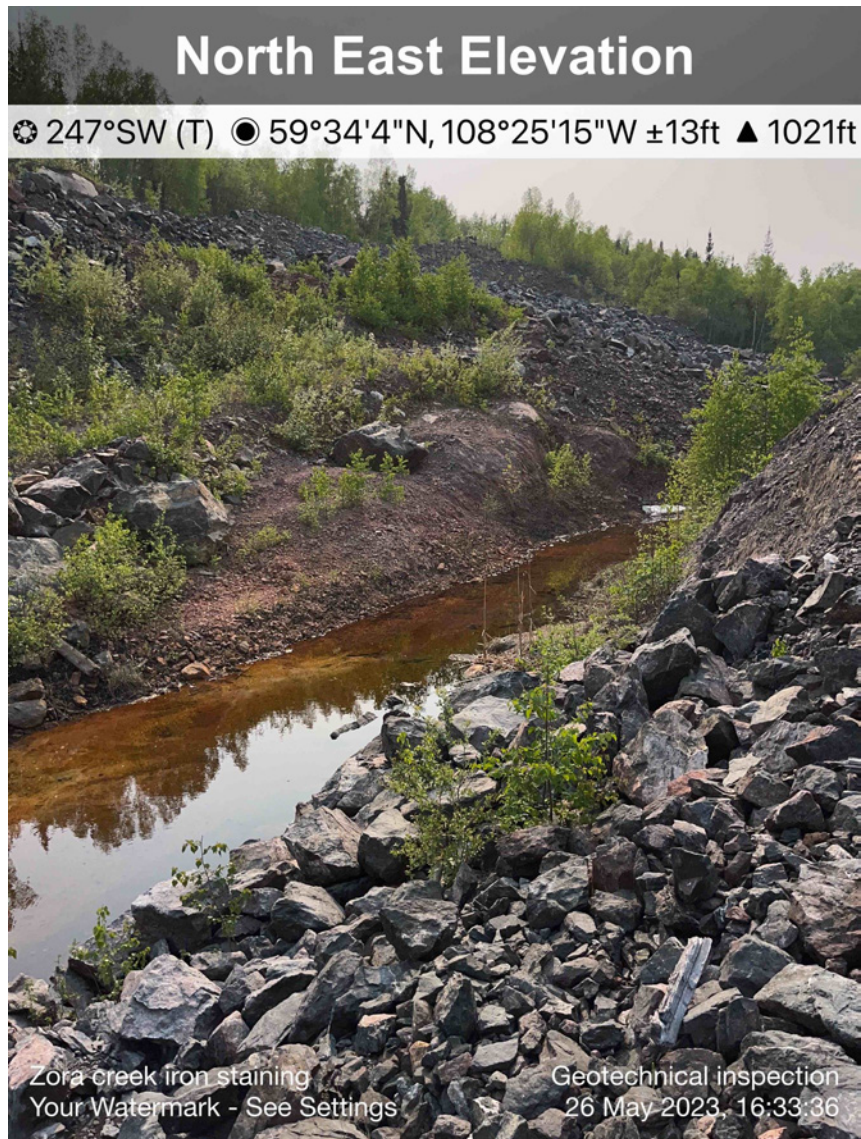


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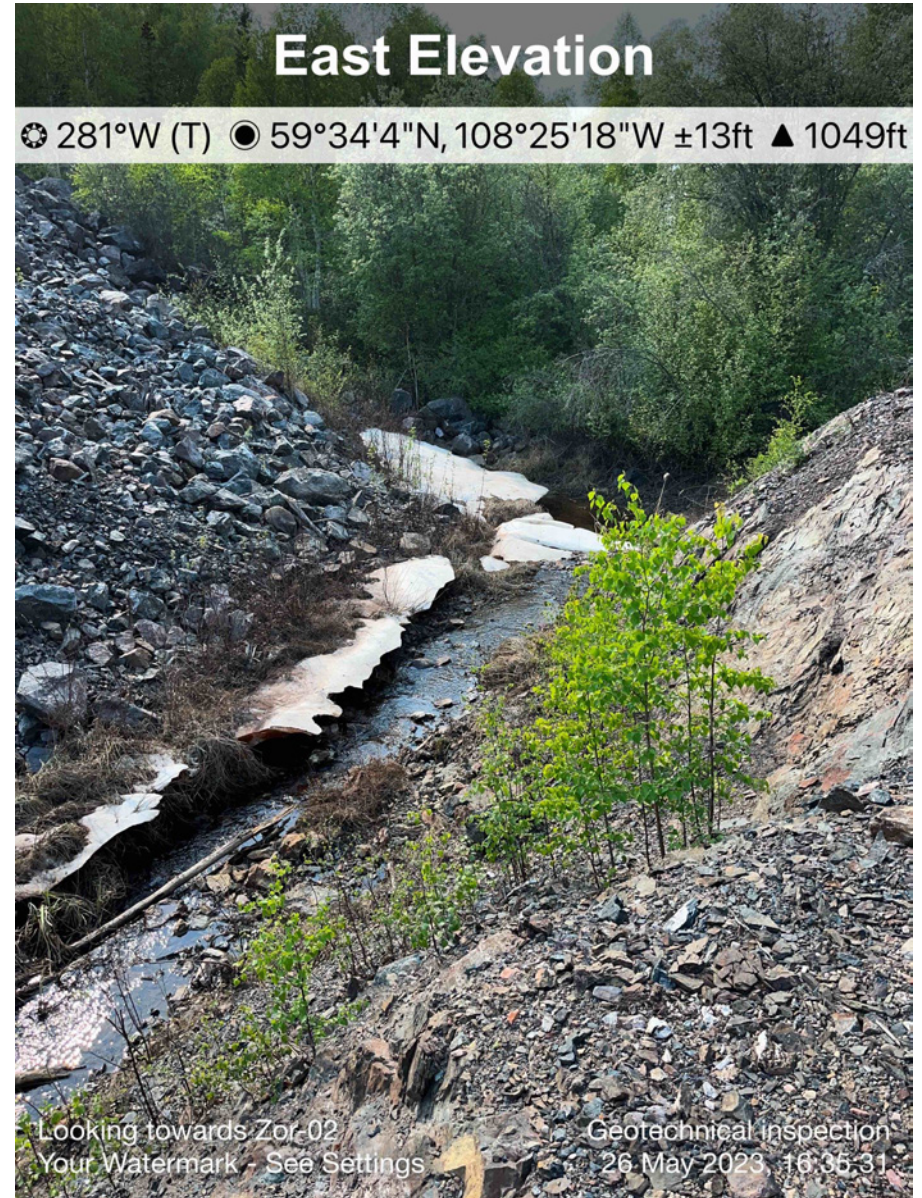
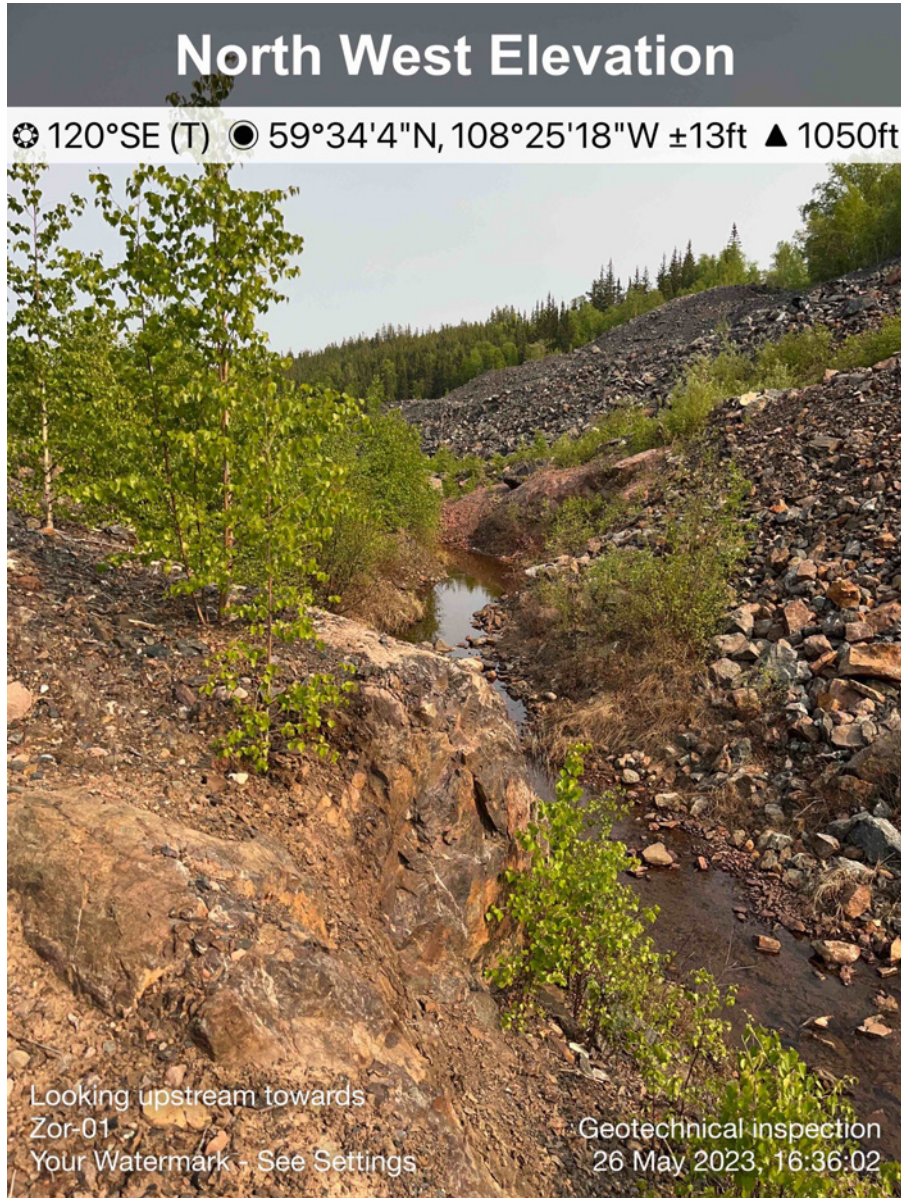


Photo E03—View near stilling basin looking upstream (May 2023)

Photo E04—View near stilling basin, looking downstream at stilling basin (May 2023). Note the glaciation remaining from the late spring



Photo E05—View of well-established beaver dam at the outlet of Zora Lake, looking downstream (May 2023)



Photo E06—View near well-established beaver dam at outlet of Zora Lake, looking across Zora Creek looking south (May 2023)

APPENDIX D: LONG-TERM PERIODIC CHECKLIST FOR STAINLESS STEEL COVERS



Appendix C - Long-Term Periodic Inspection Checklist

This appendix contains the checklist for long-term periodic cover inspections that are to be executed following release of the Beaverlodge property to Institutional Control. Personnel executing long-term inspections are to utilize the inspection checklist and report all findings.



Table C1: Beaverlodge Permanent Stainless Steel Cover Inspection Checklist

Cover Name (on ID Tag):

GPS Location (on ID Tag):

GPS Location (Verified using Field Tools):

Sealed (Year, on ID Tag):

Item Description:	Inspection Recommendation Notes:	Condition Notes:
1) Surrounding vegetation	Visually examine the site and surrounding vegetation. Confirm vegetation roots are not tending to cause rock fractures or increase width of existing fractures in bedrock adjacent to the opening or near the anchor bolts.	
2) Bedrock near the anchor bolts and adjacent to the opening	Review the final field review report photographs, and visually examine the existing rock for any changes to previously-photographed fractures (fracture widening, or relative translation or rotation of one side of the fracture with respect to the other), development of new fractures and material loss.	
3) ID plate	Visually examine the ID plate. Confirm the data on the ID plate concurs with the data on the respective as-built drawing and final field review report.	
4) Anchor bolts	Visually examine anchor bolt nuts for relative rotation with respect to the position shown in the final field review report photographs. Visually examine anchor bolts for changes in relative elevation between column baseplates and anchor bolt nuts with respect to those shown in the final field review report photographs. Apply torque of 20 ft-lb to each anchor bolt nut. Confirm the nut does not rotate with the torque applied. Visually examine for signs of corrosion on the anchor bolt nuts and threaded rods.	
5) Columns and baseplates	Visually examine columns and baseplates for obvious mechanical damage including cracks, gouges, dents, and bends. Measure column plumbness with respect to the orientation shown on the respective as-built drawing set. Visually examine column welds for surface cracks. Measure corrosion by subtracting the originally specified material thickness from the thickness measured. Note any corrosion, and report any corrosion at or in excess of 1.0mm.	
6) Skirts	Visually examine cover skirts for obvious mechanical damage including cracks, gouges, dents, and bends. Visually examine skirt welds for surface cracks. Measure skirt corrosion by subtracting the originally specified material thickness from the thickness measured. Note any corrosion, and report any corrosion at or in excess of 1.0mm.	
7) Perimeter members	Visually examine cover perimeter members for obvious mechanical damage including cracks, gouges, dents, and bends. Visually examine perimeter member welds for surface cracks. Measure perimeter member corrosion by subtracting the originally specified material thickness from the thickness measured. Note any corrosion, and report any corrosion at or in excess of 1.0mm.	
8) Top cover plate	Visually examine the cover's top plate for obvious mechanical damage including cracks, gouges, dents, and bends. Measure top plate member corrosion by subtracting the originally specified material thickness from the thickness measured. Note any corrosion, and report any corrosion at or in excess of 1.0mm.	
9) Interior stiffeners	Visually examine interior stiffeners with the use of an inspection camera inserted through a perimeter member inspection hole. Look for signs of obvious mechanical damage including cracks, gouges, dents, and bends. Mechanical damage will be unlikely to occur without visual signs of mechanical damage on the exterior.	
10) Interior surfaces	Visually examine interior surfaces with the use of an inspection camera inserted through a perimeter member inspection hole. Examine surfaces for signs of discoloration, iron oxide, and other signs of corrosion.	
11) Exterior surfaces	Visually examine exterior surfaces for signs of discoloration, iron oxide, and other signs of corrosion.	



Table C2: Recommended Tools, Equipment and Documents for Inspections

Tool/Equipment/Document	Used for
As-built drawing set for cover	Comparison to inspected condition
Final field review report	Comparison to inspected condition
Small shovel with 316 stainless steel metal components	Potentially excavating soil and other debris from the cover and surrounding bedrock
GPS locating device	Safety and confirming location coordinates match with coordinates on drawings, field inspection report and cover ID plate
Digital camera	Documenting condition for inspection report
Plumb bob or level	Measuring plumbness of columns
Measuring tape	Measuring thickness and relative position of cover components
Calipers	Measuring thickness of cover components and calibrating ultrasonic thickness measuring device
Ultrasonic thickness measuring device	Measuring thickness of cover components
Inspection camera (maximum head diameter of 25mm)	Visual examination of interior components and surfaces
Safety and personal protective equipment	As required for field conditions

APPENDIX E: BVL AS-BUILT PACKAGE

Decommissioned Beaverlodge Properties

**As-Builts for Mine Openings
Sealed After 2000**

Compiled by Cameco Corporation
April 2022

2000 Cover Installation

MRTN 2 - Adit (MRTN)

MRTN 2 - Adit (MRTN)

PANS JV

As-Built Construction Report
Martin Lake Adit
Uranium City, Saskatchewan

Cameco Corporation

S1232.1 28 June 2001

Prepared by:

Clifton Associates Ltd.
a partner in the
Pihkan Askiy/Nih-Soreldhen (PANS)
Joint Venture



PANS JV

• Environmental • Engineering • Constructors

28 June 2001
CAL: S1232.1

Cameco Corporation
2121 - 11th Street West
Saskatoon, Saskatchewan
S7M 1J3

Attn: Mr. Bob Phillips
Manager, Environmental Protection

Dear Bob:

Re: As - Built Construction Report, Martin Lake Adit

We are pleased to present our report regarding the rehabilitation work conducted at the Martin Lake adit.

Thank you for the opportunity to be of service to you and Cameco Corporation.

Yours truly,

PANS JV

Ron G. Barsi, P.Geo.
President
RGB/rb

Distribution: Cameco - 3 copies
PANS - 1 copy
Clifton Associates Ltd. - 2 copies

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3.1 Construction Methodology and Schedule	2
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Table 3.1 Equipment Hours	
Table 3.2 Schedule of Materials Used	

1.0 Introduction

Cameco Corporation engaged the service of PANS to supervise, construct and provide quality assurance quality control (QA/QC) for the sealing of the Fish Hook Bay Adit. The design detail of the sealing of the adit was provided to PANS (Cameco Corporation submission for regulatory approval dated 03 September 1999). Notification to proceed with this work, was given via Purchase Order on 04 May 2000.

This report presents a summary of the construction details for the Fish Hook Bay Adit project.

2.0 Project Management

2.1 PANS Project Management Structure and Responsibilities

PANS is a joint venture between Keewatin/Procon, Clifton Associates Ltd. Athabasca Economic Development and Training Corporation and CanNorth. On all projects, PANS assigns a lead partner who is responsible for the overall project. Other partners may provide services as required under the direction of the lead partner. The Fish Hook Bay adit sealing project required services from two of the four partners to complete the work.

Keewatin/Procon, as lead partner, was responsible for the overall project. This included accessing all available equipment, labour, safety, cost control, daily reporting and communication with Cameco Corporation and the overall execution of the work. Athabasca Economic Development Corporation was responsible for acquiring northern labour and equipment at the request of the lead partner, Keewatin/Procon.

2.2 Project Personnel

Several key personnel were involved in the project. Mr. Jon Braaten, as general manager PANS, was responsible for the overall project, including communication between the partners within PANS as well as with Cameco Corporation. Mr. Dan Derby of Keewatin/Procon was the on site construction supervisor responsible for all

aspects of the project. Mr. Dean Klassen, Athabasca Economic Development Corporation was responsible for the acquisition of northern labour and equipment.

3.0 Construction Activity

3.1 Construction Methodology and Schedule

Construction was performed 23 August to 25 August 2000. The Martins Lake Adit work sequence consisted of the following:

- Tour and mobilize gear to site, scale portal and area above, cut out old screen fence 23 August 2000.
- Move rail into Martin Bay portal, drill, weld, begin closure and begin demobilization 24 August 2000.
- Complete demobilization 25 August 2000

Photographs 1 to 4, appended to this report, document the sequence of construction events.

3.2 Contractor Equipment and Hours

The following is a list of equipment utilized to complete the project.

On-site equipment was:

Uranium City Contracting

- Truck
- Boat and trailer
- Water truck
- Torches
- Torch cart
- Chop saw
- Wheelbarrow

Keewatin/Procon

- Genset welder
- Miscellaneous hand tools (skill saws, hammer drills, shovels, levels, etc.)
- Safety equipment (harnesses, glasses, etc.)
- ¾" electric impact
- 100' weld lead
- Gas plugger
- 2', 4', 6', drill steel
- Chipping, sledge hammer

The equipment and corresponding equipment hours are presented in Table 3.1.

Table 3.1
Martins Lake Adit
Equipment Hours

23 August 2000 Truck Boat Torches	12	Tour site with Mr. Bob Phillips, mobilize gear to site, scale portal and area above, cut our old screen fence, remove existing barrier, haul scrap rail inside adit.
24 August 2000 Truck Boat Hand tools Genset Chop saw Oxy-Acy torches	12	Fuel up at U/C bulk fuel, transport gen set to site, finish moving rail into portal, drill and install rebar with epoxy, cut and weld frame work and welded track rails onto frame, completed closure and moved material back to Uranium city.
25 August 2000 Pluggers Truck Boat	12	Finish demobilize from Martin Lake Adit.

Schedule of materials used is presented in Table 3.2.

Table 3.2
Schedule of Materials Used

10 # rails
Rebar wire
Weld rod (2 boxes)
Chop saw blades
Nails
Fuel
2-10'x4" plates steel
Weld gloves
Leather gloves
Safety (dust masks, ear plugs)

3.3 Martin Lake As-Built

The approved plan (see Page 1, Lines 3 and 4) called for 0.5 inch rebar (12.7 mm). It was decided to use 10 # rail that was located on the waste rock, outside of the adit instead of the rebar. The rail made a heavier more robust bulkhead; in addition the rebar did not have to be hauled to the remote site. The extra rail as well as other materials were picked up and placed in the adit.

3.4 Quality Assurance Quality Control and Safety

Overall quality assurance quality control was ensured by the supervision of the construction supervisor on the project. Detailed field notes were kept throughout the project. The project was completed in accordance with PANS safety procedures. A copy of the safety manual was provided to Cameco Corporation prior to initiation of the work.



Clifton Associates Ltd.
engineering science technology

Photographs



Photograph 1: View of the initial fencing that was removed and replaced with bolted and welded structure.



Photograph 2: Rock bolting and welding on the sides of the structure.



Photograph 3: Debris removed approximately 2 ft. to rock and backfilled on completion at bottom end.



Photograph 4: Structure rock bolted and welded in place.



Photograph 5: View of welds at all cross members.



2001 Cover Installation

EAGLE 1 - Shaft

EAGLE 1 - Shaft

GENERAL NOTES

I CODES AND STANDARDS

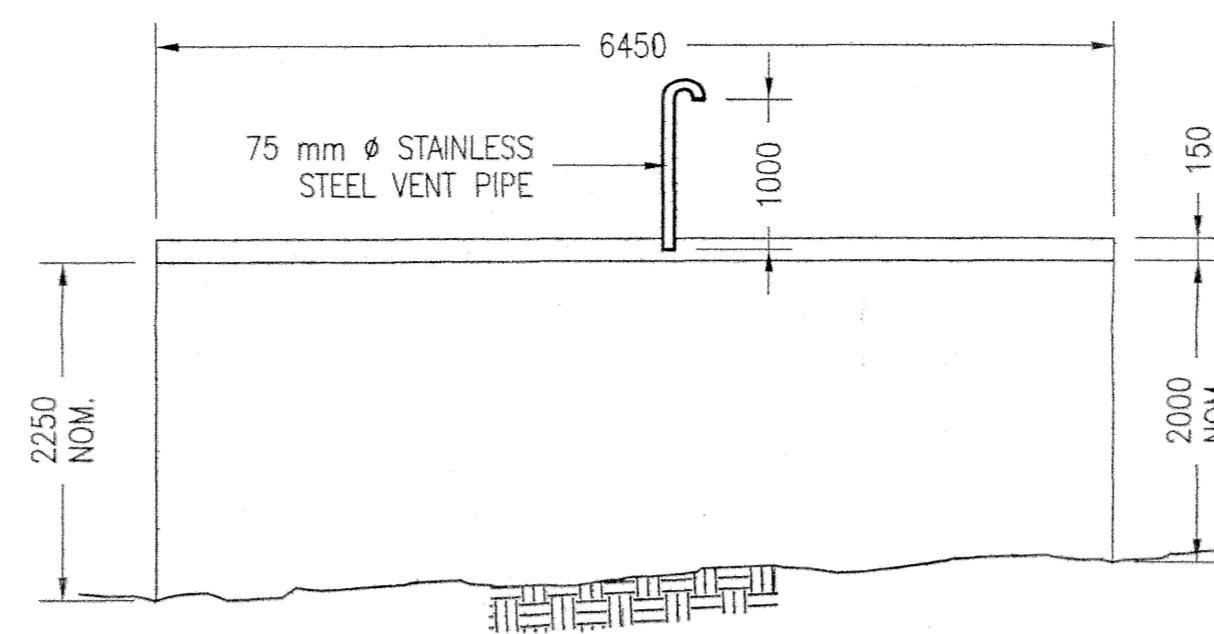
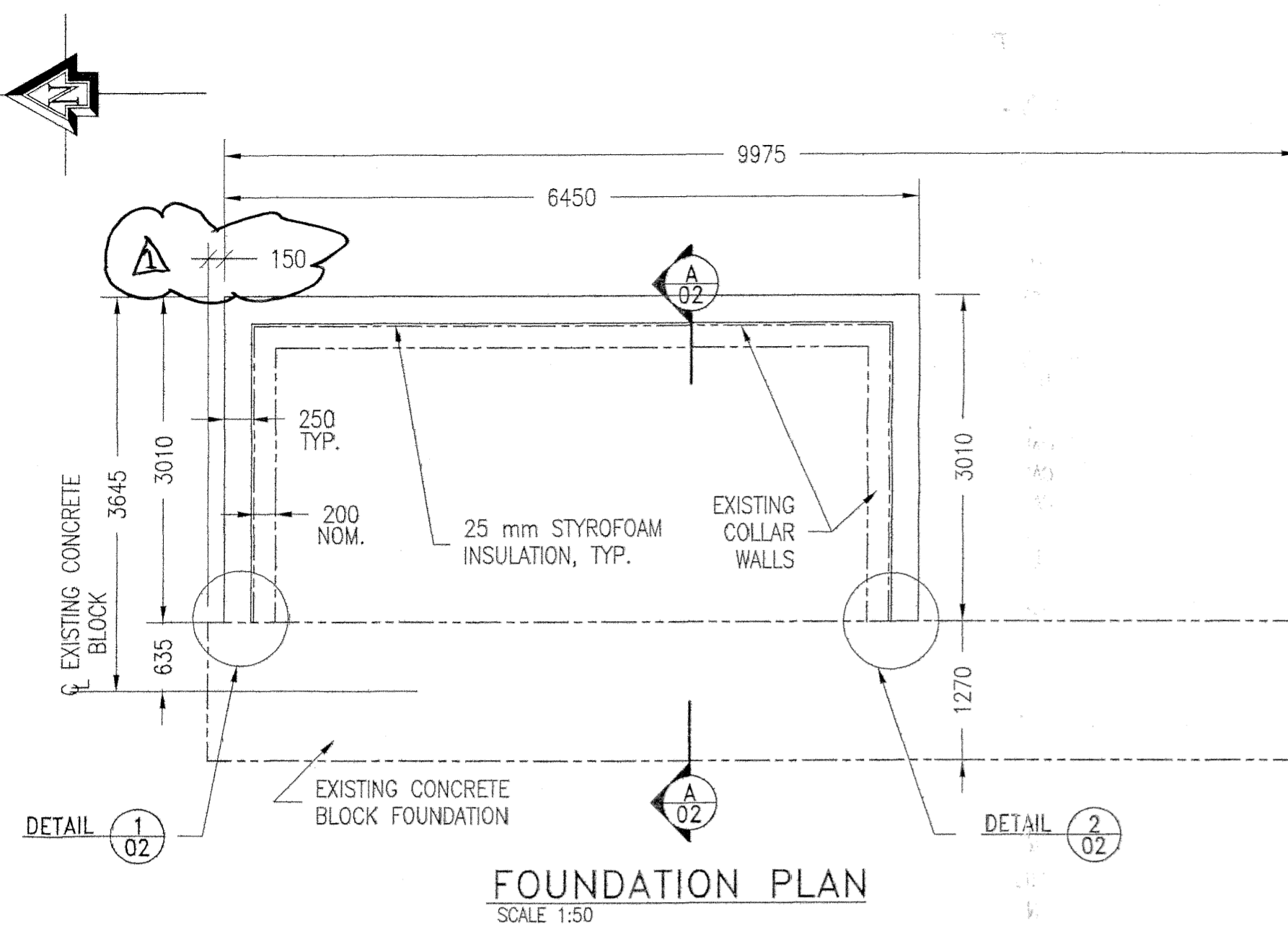
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS INDICATED OTHERWISE.
- ALL ELEVATIONS ARE IN METRES AND DECIMALS THEREOF.
- THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF CANADA AND THE SUPPLEMENT, 1995 REVISION, SHALL APPLY.
- CONFORM TO ALL APPLICABLE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARDS. ALL SHALL BE THE LATEST REVISION.
- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH CSA STANDARDS:
 CAN3-A23.1 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION
 CAN3-A23.2 METHODS OF TEST FOR CONCRETE
 CAN3-A23.3 DESIGN OF CONCRETE STRUCTURES
- ADHERE TO ALL MANUFACTURER'S PROCEDURES AND RECOMMENDATIONS.
- DESIGN CRITERIA:
 SURCHARGE ON BACKFILL = 8 kPa
 LIVE LOAD ON COVER SLAB = 18 kPa
 CONCENTRATED LIVE LOAD = 81 kN OVER 300 mm SQUARE FOOTPRINT
 ACTIVE LATERAL EARTH PRESSURE COEFFICIENT = 0.35
 MAXIMUM WALL HEIGHT = 2400
 WATER TABLE ASSUMED TO BE AT TOP OF EXISTING COVER ROOF

II MATERIALS

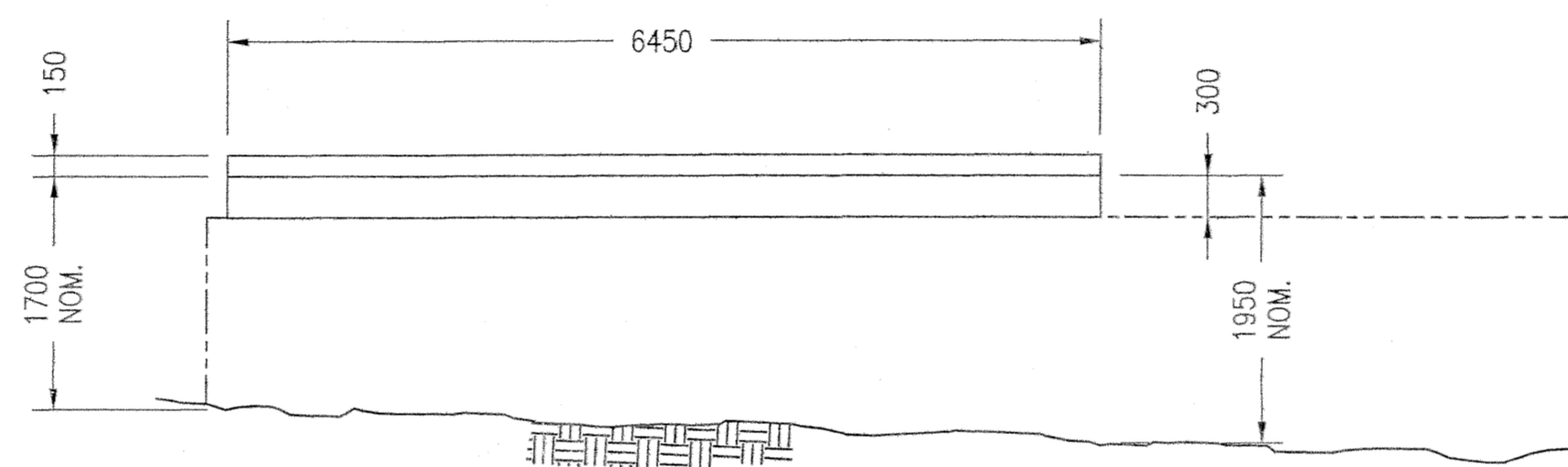
- STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 30 MPa AND A MAXIMUM W/C RATIO OF 0.40 WITH AIR ENTRAINMENT AT 6% +/- 1% AND 12mm AGGREGATE.
- CEMENT SHALL BE IN ACCORDANCE WITH CSA STANDARD CAN3-A5, TYPE 10 NORMAL PORTLAND CEMENT.
- USE SUPERPLASTICIZER AS REQUIRED TO PROVIDE MAXIMUM SLUMP OF 125 mm
- CONCRETE REINFORCEMENT SHALL BE DEFORMED BILLET STEEL BARS IN ACCORDANCE WITH CSA STANDARD G30.18, GRADE 400.
- EPOXY GROUT SHALL BE A HIGH STRENGTH, HIGH MODULUS, NON-SAG GEL ADHESIVE PROVIDED IN SIDE BY SIDE CARTRIDGES, EPOGEL BY SONNEBORN.
- INSULATION SHEET AS AN ISOLATION JOINT FILLER SHALL BE EXPANDED EXTRUDED POLYSTYRENE (STYROFOAM SM) WITH APPROPRIATE ADHESIVE TO EXISTING CONCRETE SUBSTRATE.

III EXECUTION

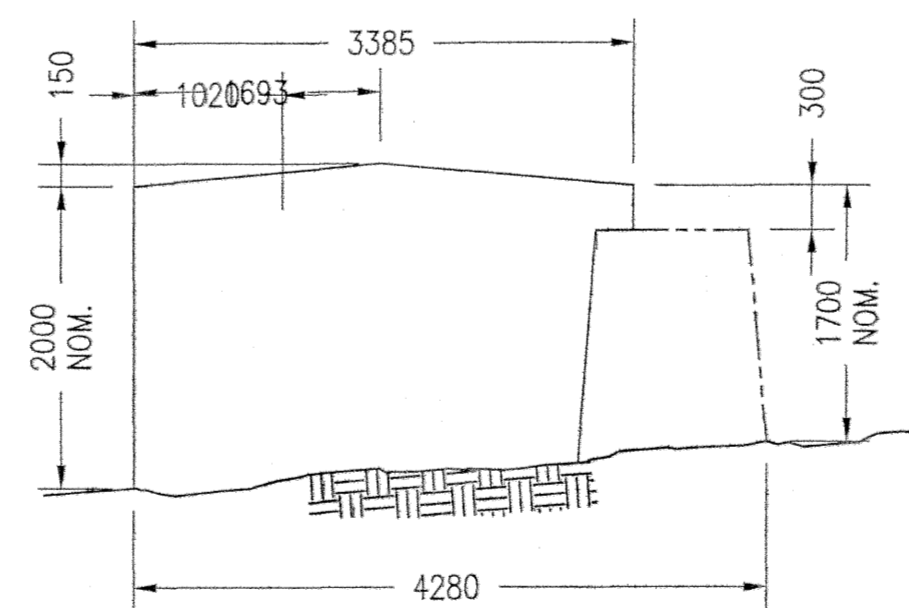
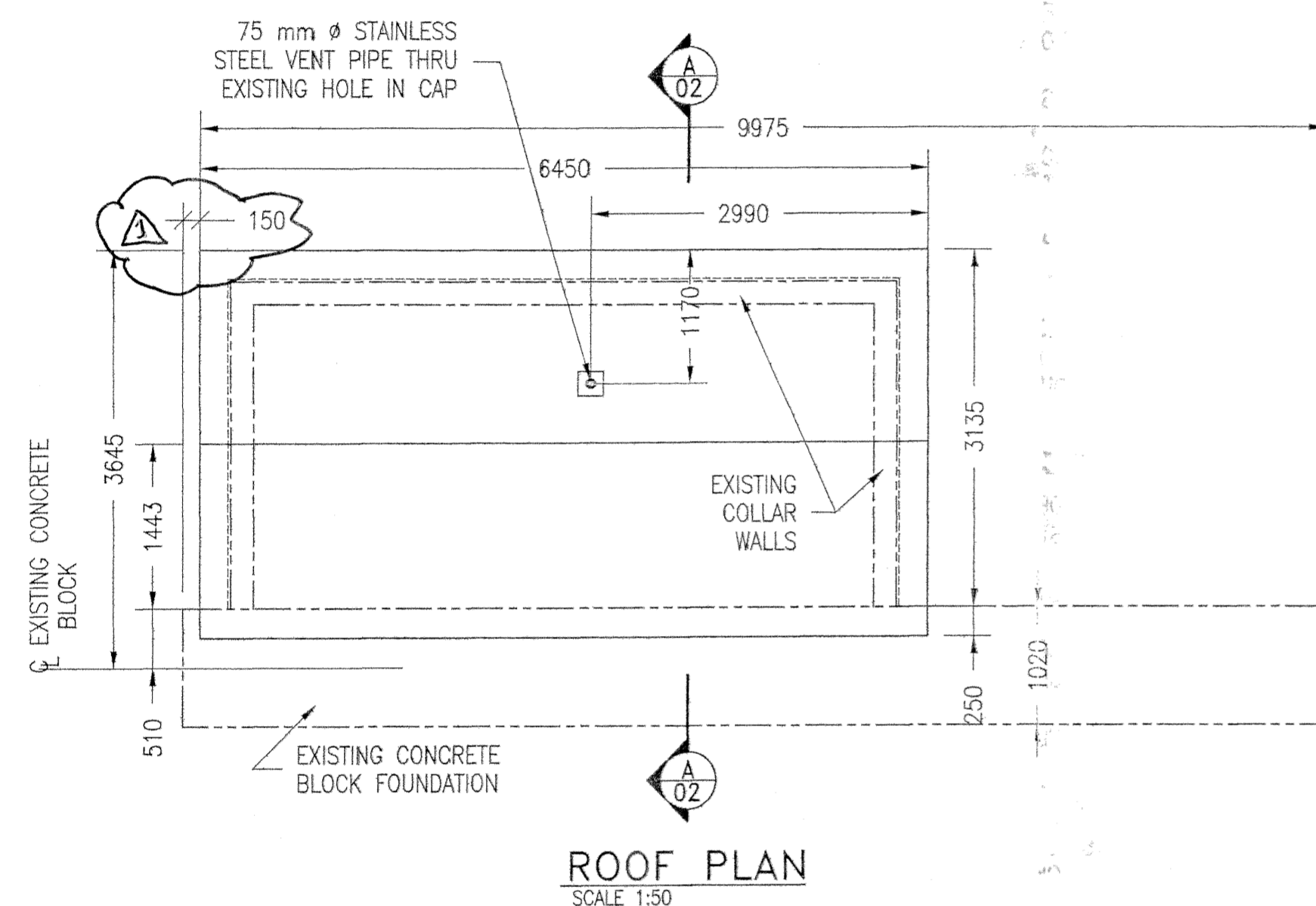
- DETAIL, FABRICATE AND INSTALL STEEL REINFORCEMENT IN ACCORDANCE WITH ALL APPLICABLE STANDARDS.
- LAP SPLICE ALL REINFORCEMENT A MINIMUM LENGTH OF 36 BAR DIAMETERS.
- CONSTRUCT FORMWORK IN ACCORDANCE WITH STANDARDS AND SUITABLY BRACED TO MAINTAIN SHAPE.
- CLEAR COVER TO ALL REINFORCEMENT SHALL BE 40 mm.
- USE CONSTRUCTION JOINTS AT TOP OF WALL IF REQUIRED.
- REMOVE OVERHANGING PORTIONS OF EXISTING CONCRETE COVER FLUSH WITH EXTERIOR FACE OF COLLAR WALLS.
- ROUGHEN EXISTING CONCRETE SURFACE AT CONSTRUCTION JOINTS TO EXPOSE COARSE AGGREGATE AND THOROUGHLY CLEAN.
- PROVIDE 20 mm CHAMFER ON OUTSIDE CORNERS OF ALL NEW CONCRETE.
- PLACE, FINISH AND CURE CONCRETE IN ACCORDANCE WITH STANDARDS.
- PREPARE TWO FIELD CURED CONCRETE CYLINDERS FOR EVERY 2.0 CUBIC METERS OF CONCRETE AND TEST AT 7 AND 28 DAYS.
- FINISH CONCRETE COVER SLAB WITH HAND STEEL TROWEL SMOOTH TEXTURE.



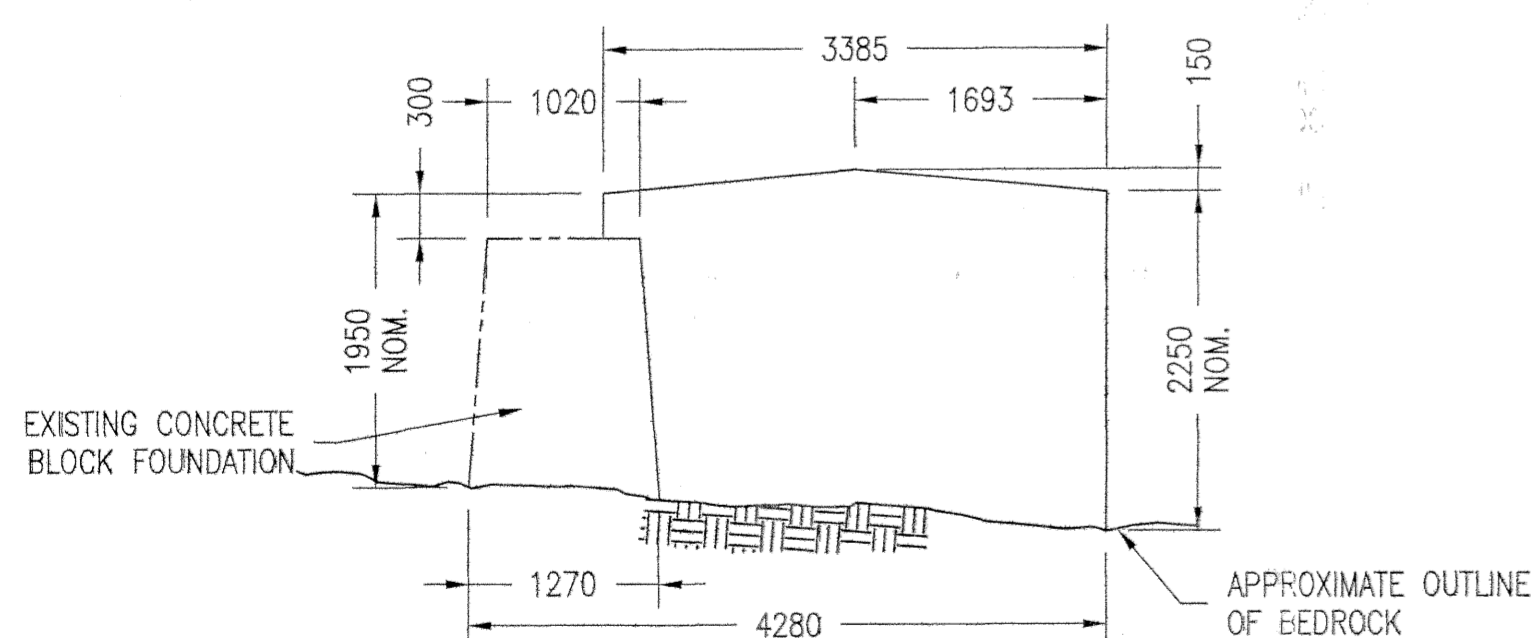
EAST ELEVATION (LOOKING WEST)
SCALE 1:50



WEST ELEVATION (LOOKING EAST)
SCALE 1:50



NORTH ELEVATION (LOOKING SOUTH)
SCALE 1:50



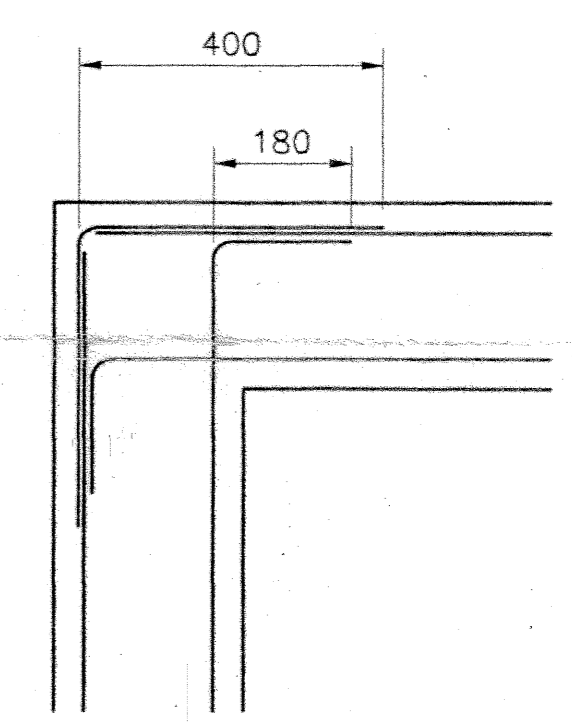
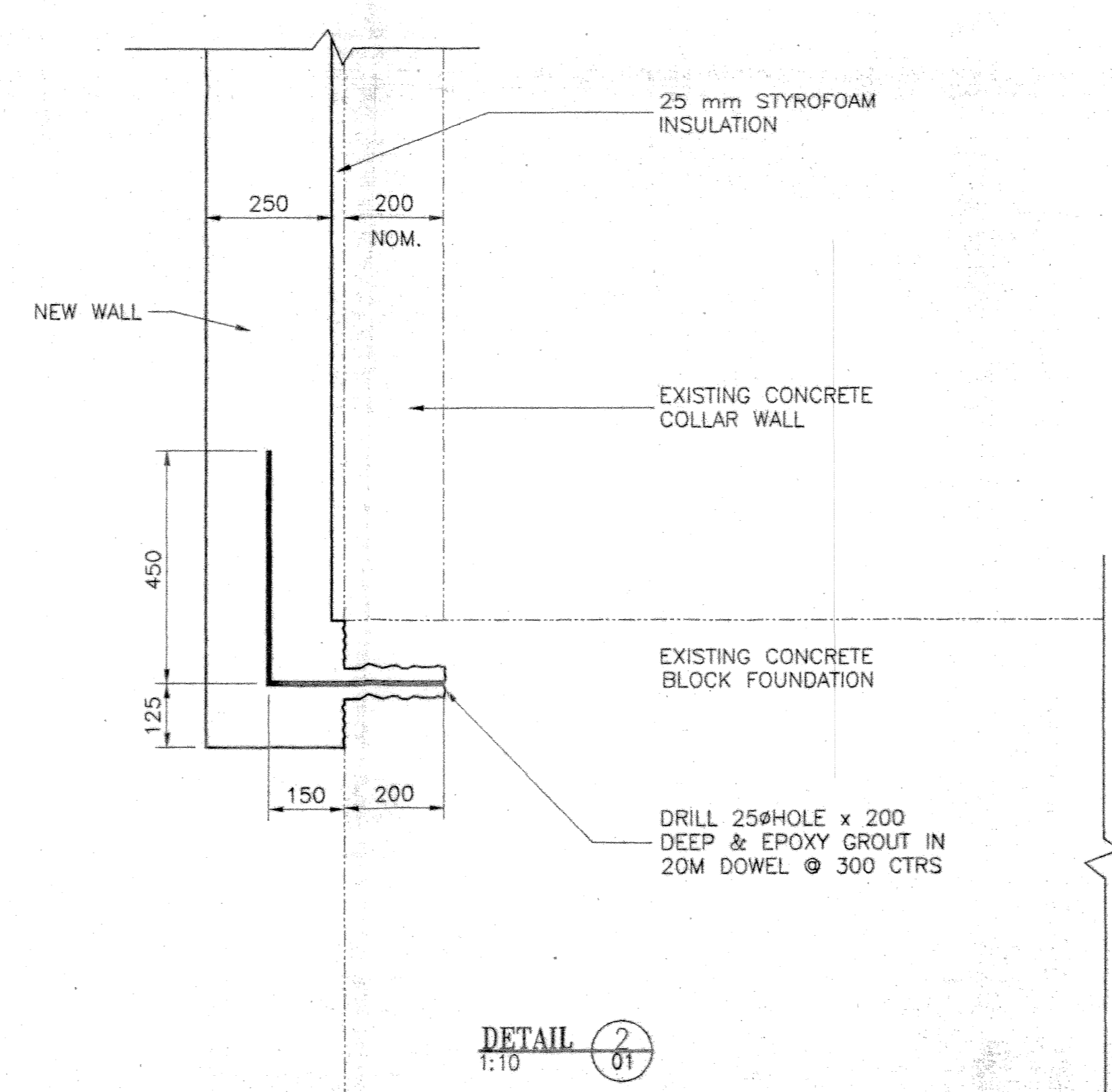
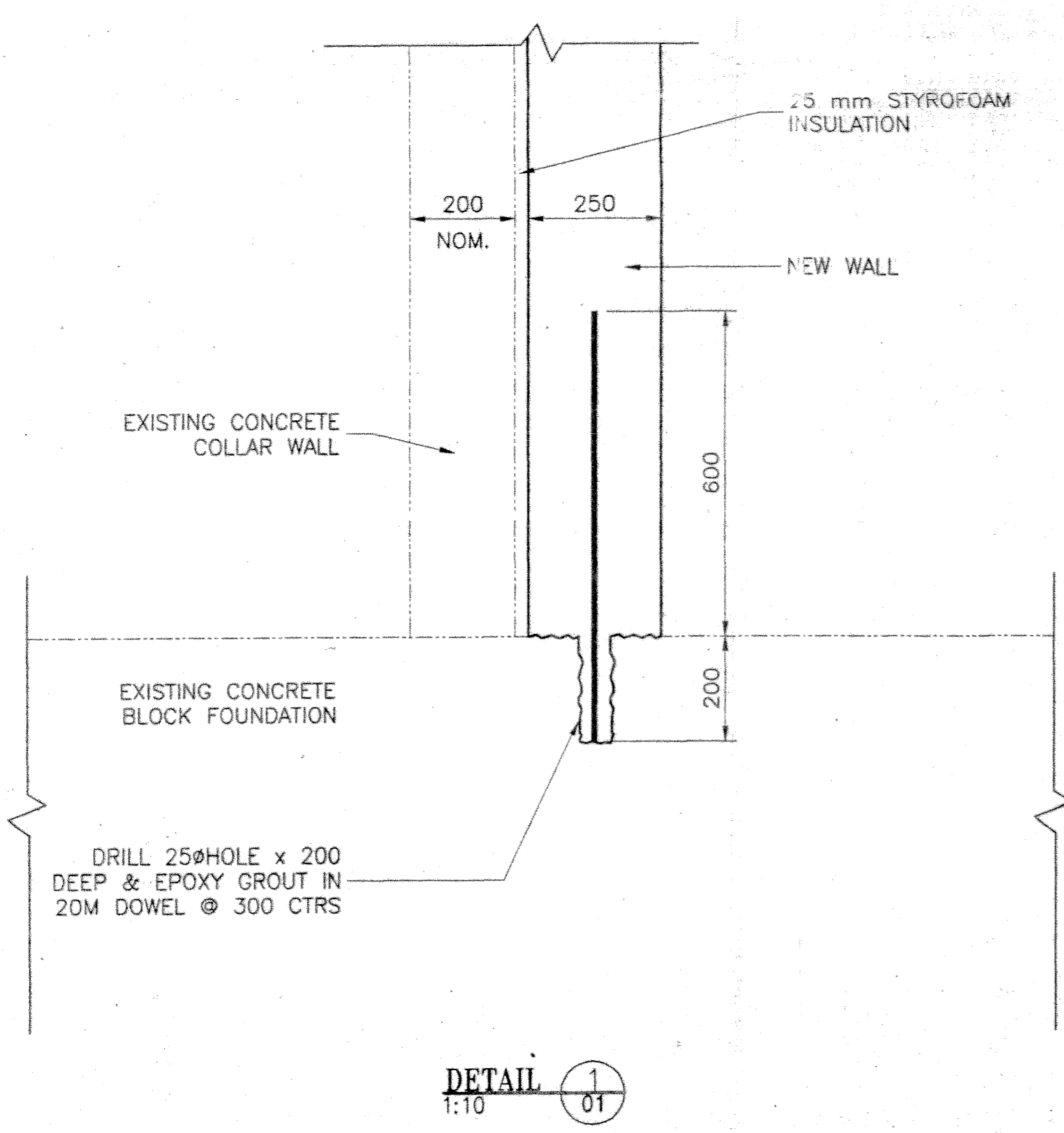
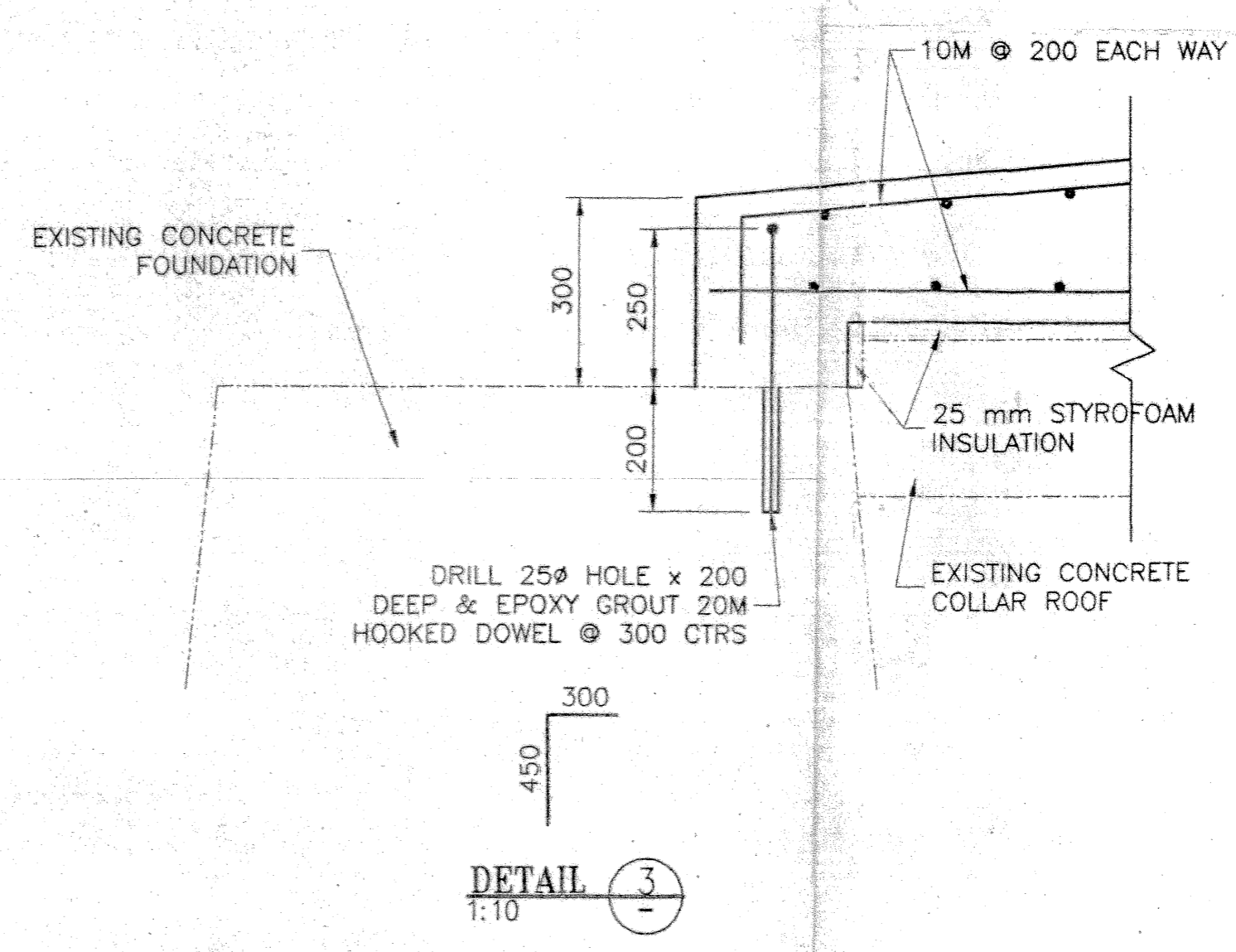
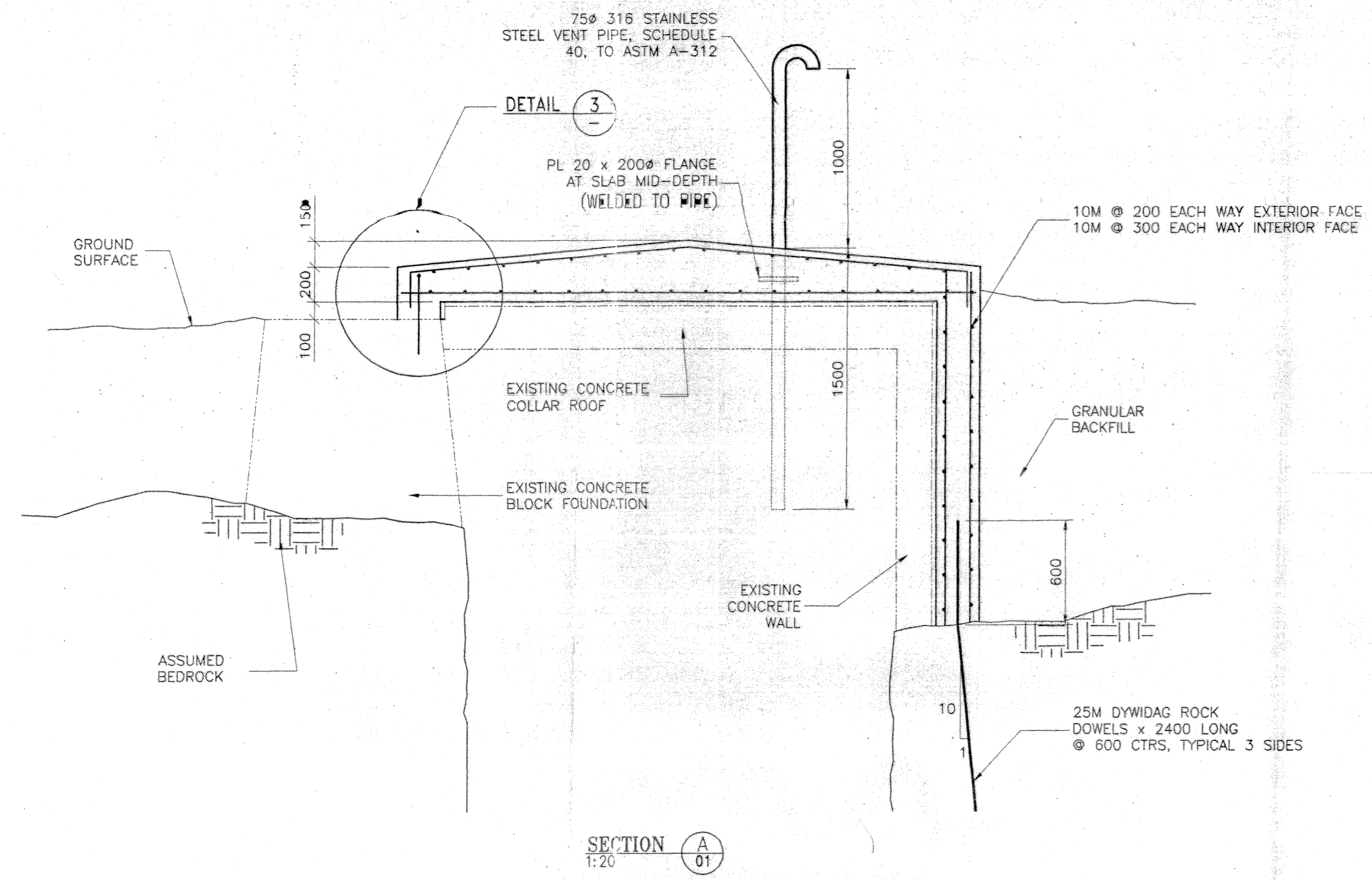
SOUTH ELEVATION (LOOKING NORTH)
SCALE 1:50

ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN
 CERTIFICATE OF AUTHORIZATION
 HEISLER ENGINEERING LTD.
 NUMBER C943
 PERMISSION TO CONSULT HELD BY:
 DISCIPLINE SASK. REG. NO. SIGNATURE
 Structural 4739



	LOCATION	EAGLE MINE SHAFT
	TITLE	SHAFT COVER REINFORCED CONCRETE PLANS, ELEVATIONS AND GENERAL NOTES
SCALE: AS SHOWN	DATE	
DESIGNED: LAD	01-JUN-06	
DRAWN: LAD	02-JUN-06	
CHECKED: TLH	22-JUN-06	
APPROVED:		
PROJECT No.	FIG. No.	
DRAWING No. MIS-2006-RC01	REV	▲

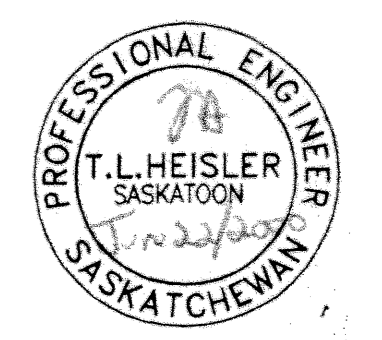
REVISIONS	No.	DATE	DESCRIPTION	BY	CHK	AP
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	0	22/06/00	ISSUED FOR CONSTRUCTION	LD	TH	
	B	15/06/00	ISSUED FOR APPROVAL	LD	TH	
	A	07/06/00	ISSUED FOR MATERIAL QUANTITIES	LD	TH	



TYPICAL CORNER BAR DETAIL
1:10

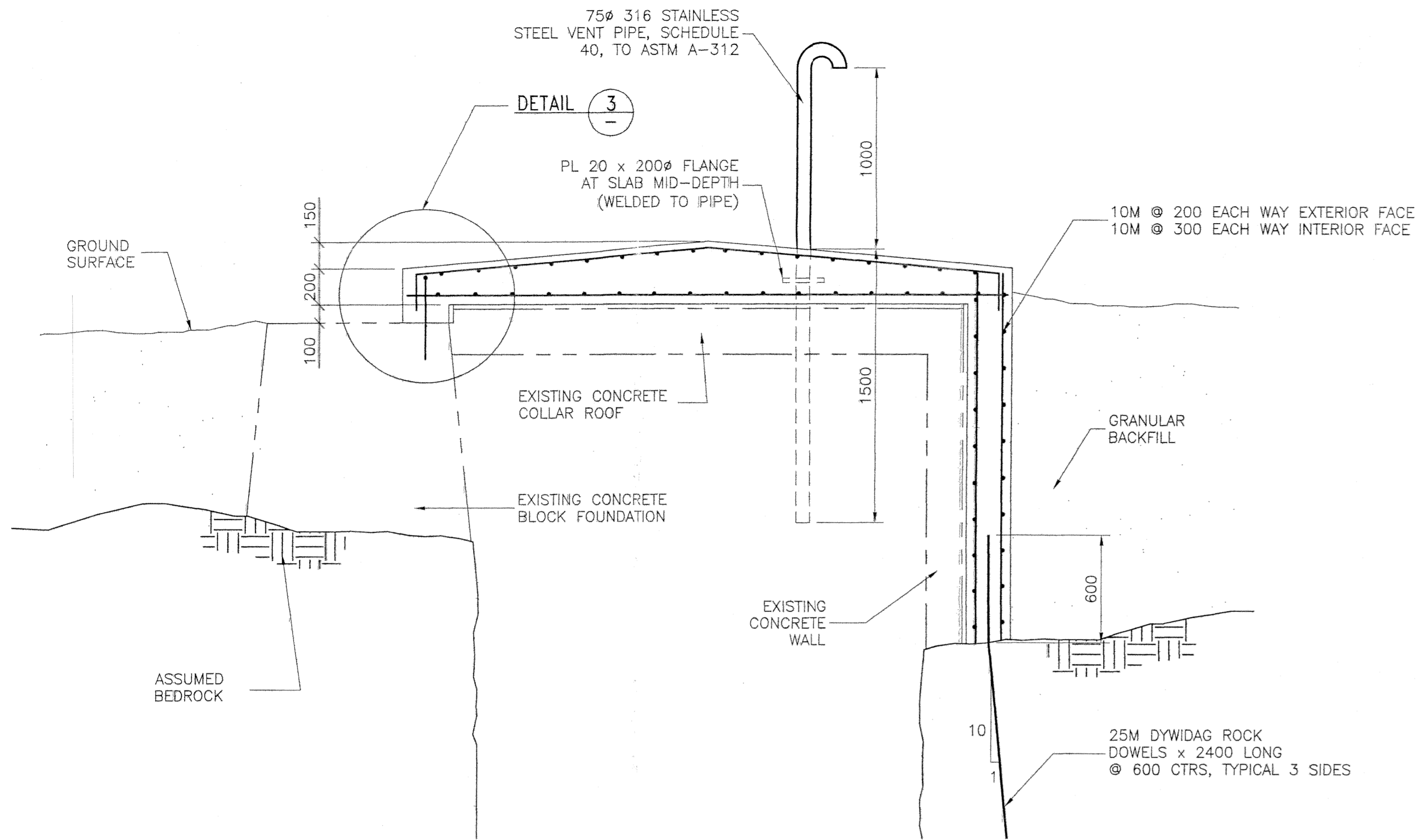
FOR GENERAL NOTES, SEE DRAWING MIS-2006-RC01

ASSOCIATION OF PROFESSIONAL ENGINEERS
& GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
HEISLER ENGINEERING LTD.
NUMBER C943
PERMISSION TO CONSULT HELD BY:
DISCIPLINE SASK. REG. No. SIGNATURE
Structural 4738

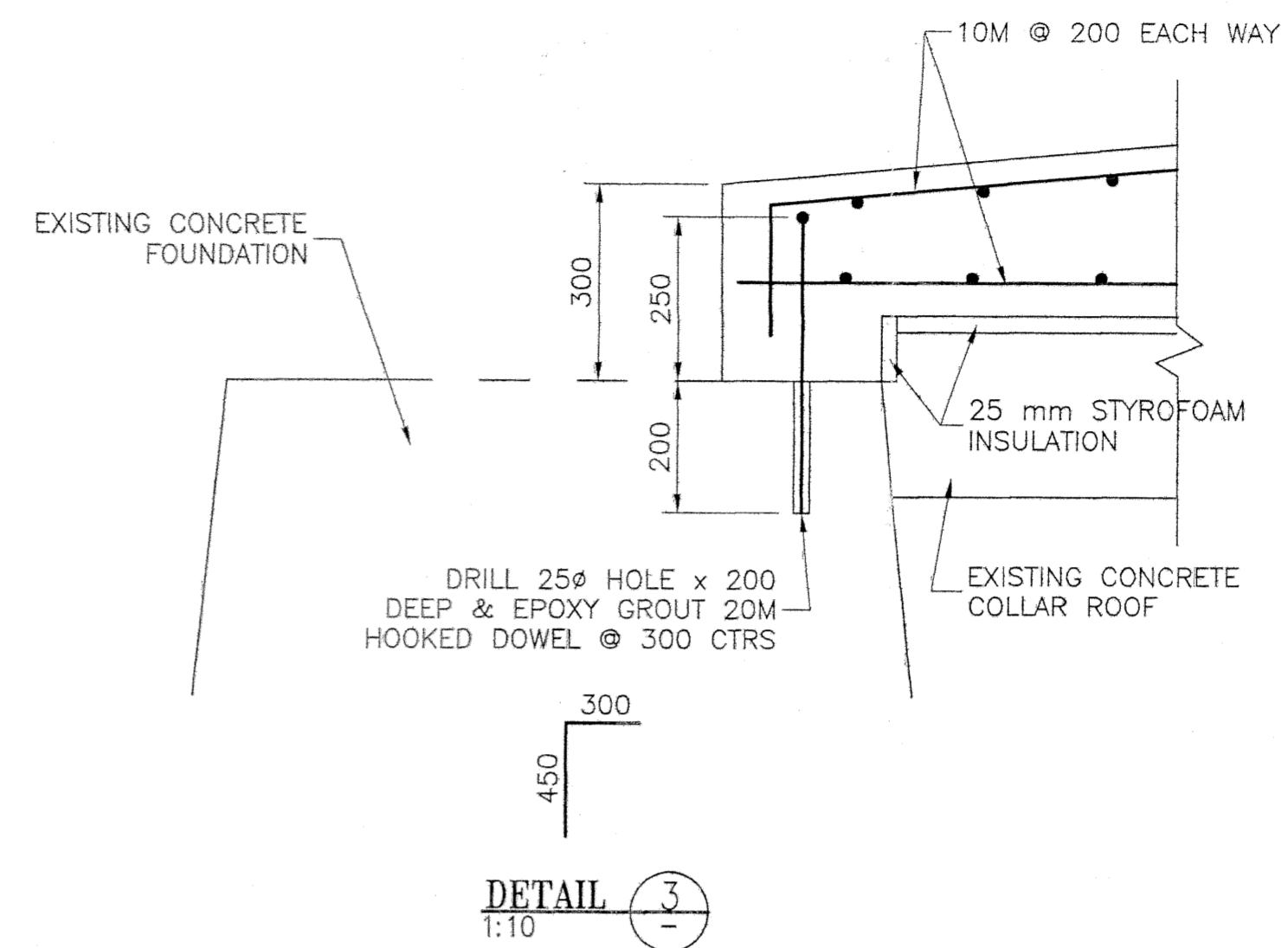


	LOCATION	EAGLE MINE SHAFT
	TITLE	SHAFT COVER REINFORCED CONCRETE SECTIONS AND DETAILS
SCALE: AS SHOWN	DATE	
DESIGNED: LAD	01-JUN-06	
DRAWN: LAD	08-JUN-06	
CHECKED: <i>[Signature]</i>		
APPROVED: <i>[Signature]</i>		
PROJECT No.	FIG. No.	
DRAWING No.	MIS-2006-RC02	REV

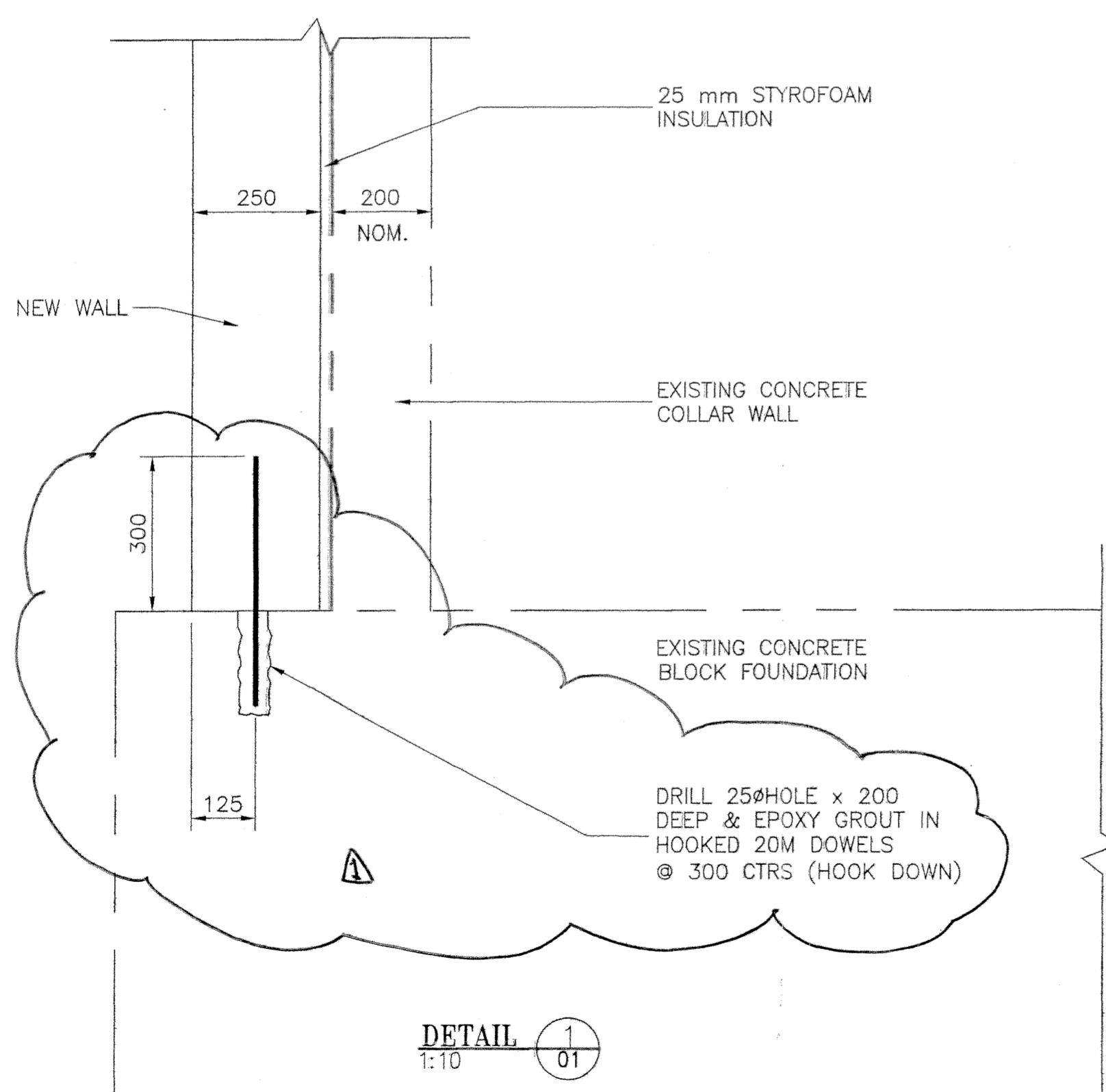
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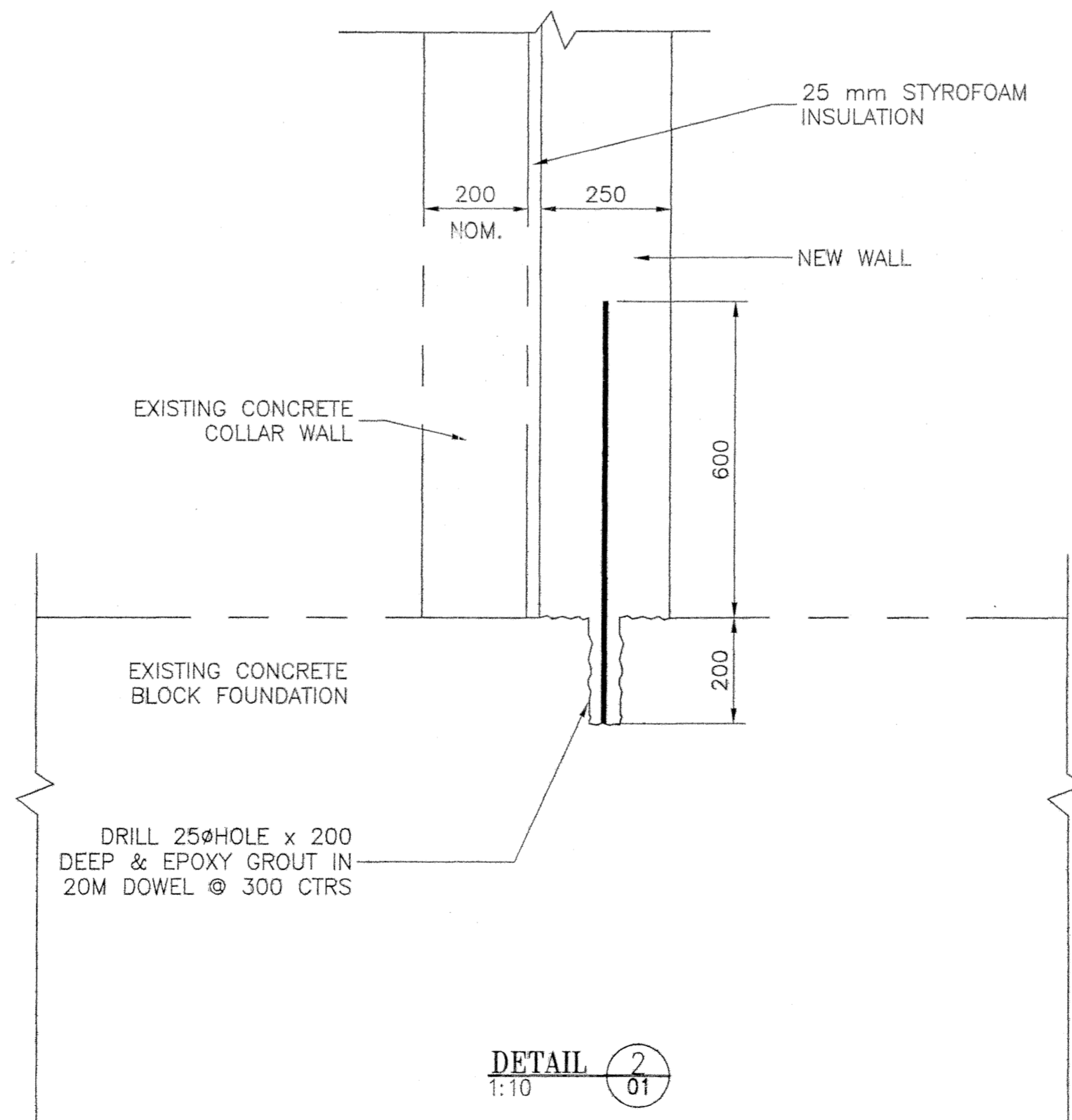
SECTION A
1:20



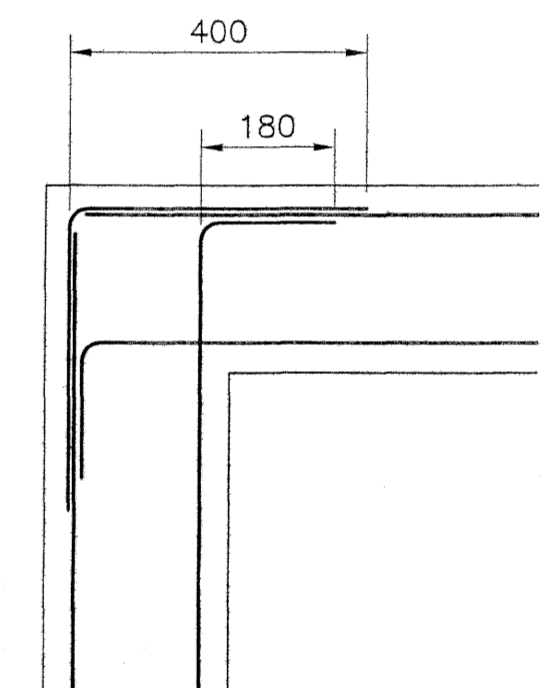
DETAIL 3
1:10



DETAIL 1
1:10



DETAIL 2
1:10



TYPICAL CORNER BAR DETAIL
1:10

FOR GENERAL NOTES, SEE DRAWING MIS-2006-RC01

ASSOCIATION OF PROFESSIONAL ENGINEERS
& GEOSCIENTISTS OF SASKATCHEWAN
CERTIFICATE OF AUTHORIZATION
HEISLER ENGINEERING LTD.
NUMBER C943
PERMISSION TO CONSULT HELD BY:
DISCIPLINE: SASK. REG. NO. SIGNATURE
Structural 4738 *[Signature]*



	LOCATION	EAGLE MINE SHAFT
	TITLE	SHAFT COVER REINFORCED CONCRETE SECTIONS AND DETAILS
SCALE: AS SHOWN	DATE	
DESIGNED: LAD	01-JUN-06	
DRAWN: LAD	08-JUN-06	
CHECKED: TLH	22-JUN-06	
APPROVED:		
PROJECT No.	FIG. No.	
DRAWING No. MIS-2006-RC02	REV	1

REF	No.	DATE	DESCRIPTION	BY	CHK	AP
	1	19/10/00	ISSUED FOR AS-BUILT INFORMATION	TH		
	0	22/06/00	ISSUED FOR CONSTRUCTION	LD	TH	
	B	15/06/00	ISSUED FOR APPROVAL	LD	TH	
	A	07/06/00	ISSUED FOR MATERIAL QUANTITIES	LD	TH	



Photograph 1: Excavation around existing Eagle Mine shaft cap.



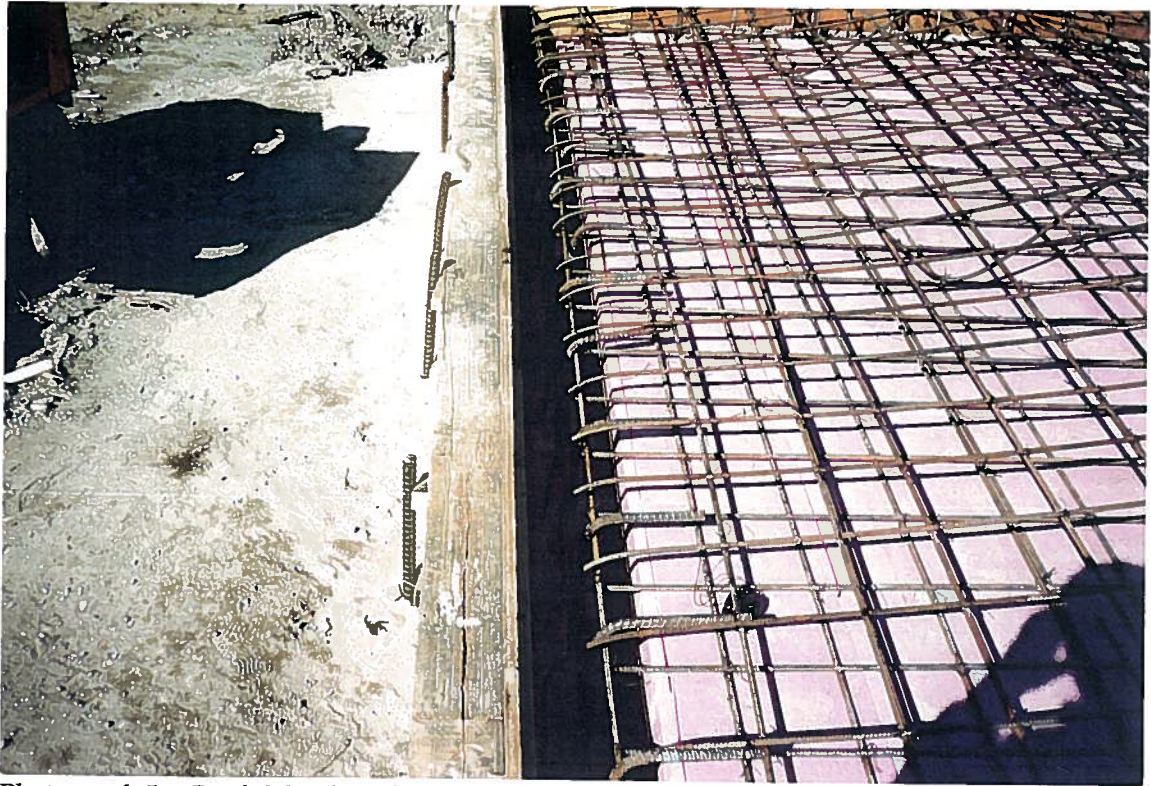
Photograph 2: Demolition of the existing ridge cap.



Photograph 3: Form break and rebar on the walls. Note: the rebar detail was revised to tie into existing wall.



Photograph 4: Form work and false work on the walls.



Photograph 5: Roof slab rebar placement. Note: the clearance of the rebar to the existing walls.



Photograph 6: Roof slab after the steel trowel finish.



Photograph 7: Completed structure after the forms were removed.



Photograph 8: Completed structure after placement of fill.



HEISLER ENGINEERING LTD.

527 Mendel Terrace
Saskatoon, Sask. S7J 5J6
Phone/Fax No. (306) 653-1688
E-Mail: heisler.eng@sk.sympatico.ca

October 19, 2000

Clifton Associates
101, 116 Research Drive
Saskatoon, Sask. S7N 3R3

Attention: Mr. Ron Barsi, P. Geo.

Reference: Cameco's Eagle Shaft
Concrete Cover As-Built Drawings

Dear Ron:

Attached are Drawings MIS-2006-RC01, Rev. 1 and MIS-2006-RC02, Rev. 1 representing as-built drawings for the construction of the concrete shaft cover near Uranium City, Saskatchewan.

The drawings accurately depict the actual field conditions that were encountered during the construction of the shaft cover. It is my understanding that the structure was constructed in strict accordance to the original construction drawings except for the changes as noted on the current drawings. These changes had been discussed with me previously during construction and had been approved by me.

Further, I have been provided with numerous concrete test reports of which I have reviewed the results. It is conclusive that the actual concrete used in the construction of the shaft cover meets and exceeds the original design criteria with regards to both strength and durability.

It has been a pleasure to be involved on this project with its long-term technical requirements. Please call at your convenience should you have any questions.

Yours truly

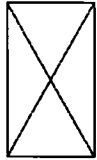
A handwritten signature in black ink, appearing to read 'Tim Heisler'. The signature is written in a cursive, flowing style.

T.L. (Tim) Heisler, M.Sc., P.Eng.
Senior Structural Engineer

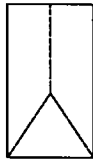
CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3179	Client Ref No.:	Test No.: 1			
Date Cast: AUG 31 2000	Date Received in Lab: SEP 6 2000	Design Strength: 30.0 MPa				
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1762		SEP 7 2000	7	33.2	D	YES
1763		SEP 28 2000	28	39.4	C	YES
1764		SEP 28 2000	28	39.5	C	YES
1765		OCT 26 2000	56	44.6	D	YES

Types of Fractures



A. Cone



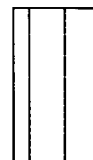
B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : 10	Temp. of Concrete (deg C) : 11
Measured Slump : 40 mm	Temp. of Atmosphere (deg C) : 9
Specified: mm ± mm	*Ticket Number : N/A
From: 75 mm to: 125 mm	*Truck Number : N/A
Measured Air : 5.8 %	Specified: % to: %
From: 5.0 % to: 7.0 %	*Time Load Left Plant : 09:30
*Admixtures : AEA	Time Load Arrived : 00:00
*Maximum Aggregate Size: 12.0 mm	Time Sampled : 09:35
Water Added on Job: litres	Time Cylinders Cast : 09:40
Authorized By:	Type of Molds Used : PVC
* From Concrete Producers Delivery Ticket	

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted

Cylinders cured in water as of this date unless otherwise specified :

Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **20**

Cylinders cast in Field : **4** Cylinders cast in Laboratory :

Location on Structure : **South wall. First lift.**

Density of Fresh Concrete : kg/m³

Density of Hardened Test Cylinder : kg/m³

Condition of Cylinders when received in Laboratory : **Good**

Cast by : **D. McDonald** of **Clifton Associates Ltd.**

Submitted by: of

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Camco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance with C.S.A. Standards for that portion of the testing performed by this Company



Per

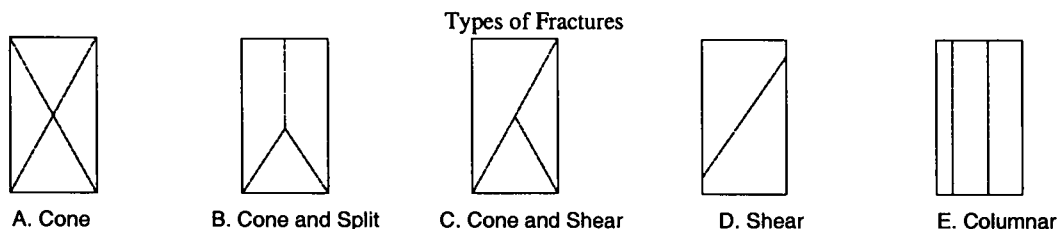


Clifton Associates Ltd.
 engineering science technology

Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3180	Client Ref No.:	Test No.: 2			
Date Cast: AUG 31 2000	Date Received in Lab: SEP 6 2000	Design Strength:	30.0 MPa			
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1766		SEP 7 2000	7	28.7	A	YES
1767		SEP 28 2000	28	36.7	C	YES
1768		SEP 28 2000	28	37.0	C	YES
1769		OCT 26 2000	56	38.0	D	YES



*Type of Cement : 10	Temp. of Concrete (deg C) : 13
Measured Slump : 20 mm	Temp. of Atmosphere (deg C) : 13
Specified: mm ± mm	*Ticket Number : N/A
From: 75 mm to: 125 mm	*Truck Number : N/A
Measured Air : 7.2 %	*Time Load Left Plant : 11:40
Specified: % to: %	Time Load Arrived : 00:00
From: 5.0 % to: 7.0 %	Time Sampled : 11:45
*Admixtures : AEA	Time Cylinders Cast : 11:50
*Maximum Aggregate Size: 12.0 mm	Type of Molds Used : PVC
Water Added on Job: litres	
Authorized By:	
* From Concrete Producers Delivery Ticket	

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted
 Cylinders cured in water as of this date unless otherwise specified :
 Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **20**
 Cylinders cast in Field : **4** Cylinders cast in Laboratory :
 Location on Structure : **South wall. Second lift.**

Density of Fresh Concrete : **kg/m³** Density of Hardened Test Cylinder : **kg/m³**
 Condition of Cylinders when received in Laboratory : **Good**
 Cast by : **D. McDonald of Clifton Associates Ltd.**
 Submitted by: **M. New of Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Cameco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance with C.S.A. Standards for that portion of the testing performed by this Company



Per _____



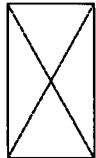
Clifton Associates Ltd.
 engineering science technology

Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

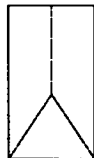
CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3181	Client Ref No.:	Test No.: 3			
Date Cast: AUG 31 2000	Date Received in Lab: SEP 6 2000	Design Strength: 30.0 MPa				
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1770		SEP 7 2000	7	30.8	C	YES
1771		SEP 28 2000	28	37.5	A	YES
1772		SEP 28 2000	28	37.2	D	YES
1773		OCT 26 2000	56	40.6	D	YES

Types of Fractures



A. Cone



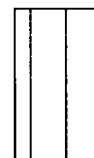
B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : 10	Temp. of Concrete (deg C) : 13
Measured Slump : 20 mm	Specified: mm ± mm
	From: 75 mm to: 125 mm
Measured Air : 6.8 %	Specified: % to: %
	From: 5.0 % to: 7.0 %
*Admixtures : AEA	Temp. of Atmosphere (deg C) : 13
*Maximum Aggregate Size: 12.0 mm	*Ticket Number : N/A
Water Added on Job: litres	*Truck Number : N/A
Authorized By:	*Time Load Left Plant : 12:30
* From Concrete Producers Delivery Ticket	Time Load Arrived : 00:00
	Time Sampled : 12:40
	Time Cylinders Cast : 12:35
	Type of Molds Used : PVC

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted
 Cylinders cured in water as of this date unless otherwise specified :
 Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **20**
 Cylinders cast in Field : **4** Cylinders cast in Laboratory :
 Location on Structure : **South wall. Third lift.**

Density of Fresh Concrete : **kg/m³** Density of Hardened Test Cylinder : **kg/m³**
 Condition of Cylinders when received in Laboratory : **Good**
 Cast by : **D. McDonald of Clifton Associates Ltd.**
 Submitted by: **M. New of Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Camco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance
 with C.S.A. Standards for that portion of
 the testing performed by this Company



Per



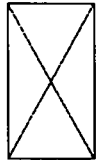
Clifton Associates Ltd.
 engineering science technology

Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

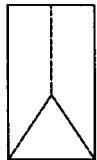
CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3182	Client Ref No.:	Test No.: 4			
Date Cast: AUG 31 2000	Date Received in Lab: SEP 6 2000	Design Strength: 30.0 MPa				
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1774		SEP 7 2000	7	30.2	C	YES
1775		SEP 28 2000	28	38.4	C	YES
1776		SEP 28 2000	28	39.1	A	YES
1777		OCT 26 2000	56	41.6	C	YES

Types of Fractures



A. Cone



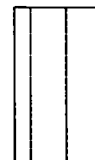
B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : 10	Temp. of Concrete (deg C) : 15
Measured Slump : 30 mm	Temp. of Atmosphere (deg C) : 15
Specified: mm ± mm	*Ticket Number : N/A
From: 75 mm to: 125 mm	*Truck Number : N/A
Measured Air : 7.4 %	*Time Load Left Plant : 14:40
Specified: % to: %	Time Load Arrived : 00:00
From: 5.0 % to: 7.0 %	Time Sampled : 14:45
*Admixtures : AEA	Time Cylinders Cast : 14:50
*Maximum Aggregate Size: 12.0 mm	Type of Molds Used : PVC
Water Added on Job: litres	
Authorized By:	
* From Concrete Producers Delivery Ticket	

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted
 Cylinders cured in water as of this date unless otherwise specified :
 Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **20**
 Cylinders cast in Field : **4** Cylinders cast in Laboratory :
 Location on Structure : **North wall. Final lift.**

Density of Fresh Concrete : **kg/m³** Density of Hardened Test Cylinder : **kg/m³**
 Condition of Cylinders when received in Laboratory : **Good**
 Cast by : **D. McDonald of Clifton Associates Ltd.**
 Submitted by: **M. New of Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Cameco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance
 with C.S.A. Standards for that portion of
 the testing performed by this Company



Per



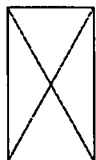
Clifton Associates Ltd.
 engineering science technology

Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3196	Client Ref No.:	Test No.: 5			
Date Cast: SEP 4 2000	Date Received in Lab: SEP 7 2000	Design Strength: 30.0 MPa				
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1782		SEP 11 2000	7	28.8	D	YES
1783		OCT 2 2000	28	35.7	D	YES
1784		OCT 2 2000	28	36.6	D	YES
1785		OCT 30 2000	56	36.6	D	YES

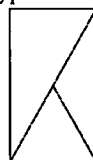
Types of Fractures



A. Cone



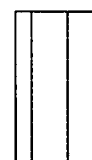
B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : 10	Specified: mm ± mm	Temp. of Concrete (deg C) : 12
Measured Slump : 120 mm	From: 75 mm to: 125 mm	Temp. of Atmosphere (deg C) : 12
Measured Air : 10.8 %	Specified: % to: %	*Ticket Number : N/A
	From: 5.0 % to: 7.0 %	*Truck Number : N/A
*Admixtures : AEA		*Time Load Left Plant : 10:30
*Maximum Aggregate Size: 12.0 mm		Time Load Arrived : 00:00
Water Added on Job: litres		Time Sampled : 10:35
Authorized By:		Time Cylinders Cast : 10:40
* From Concrete Producers Delivery Ticket		Type of Molds Used : PVC

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted
 Cylinders cured in water as of this date unless otherwise specified :
 Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **25**
 Cylinders cast in Field : **4** Cylinders cast in Laboratory :
 Location on Structure : **Roof slab - south side.**

Density of Fresh Concrete : kg/m³ Density of Hardened Test Cylinder : kg/m³
 Condition of Cylinders when received in Laboratory : **Good**
 Cast by : **D. McDonald of Clifton Associates Ltd.**
 Submitted by: **M. New of Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Cameco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance
 with C.S.A. Standards for that portion of
 the testing performed by this Company



Per



Clifton Associates Ltd.
 engineering science technology

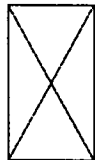
Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

CONCRETE TEST REPORT

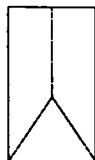
Project No.: **S1232** Ref No.: **3197** Client Ref No.: Test No.: **6**
 Date Cast: **SEP 4 2000** Date Received in Lab: **SEP 7 2000** Design Strength: **30.0 MPa**

Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1786		SEP 11 2000	7	27.7	D	YES
1787		OCT 2 2000	28	33.7	C	YES
1788		OCT 2 2000	28	34.8	C	YES
1789		OCT 30 2000	56	35.5	C	YES

Types of Fractures



A. Cone



B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : **10**Measured Slump : **90** mmMeasured Air : **12.0** %*Admixtures : **AEA***Maximum Aggregate Size: **12.0** mm

Water Added on Job:

Authorized By:

* From Concrete Producers Delivery Ticket

Specified: mm ± mm

From: **75** mm to: **125** mm

Specified: % to: %

From: **5.0** % to: **7.0** %Temp. of Concrete (deg C) : **15**Temp. of Atmosphere (deg C) : **15***Ticket Number : **N/A***Truck Number : **N/A***Time Load Left Plant : **12:20**Time Load Arrived : **00:00**Time Sampled : **12:25**Time Cylinders Cast : **12:30**Type of Molds Used : **PVC**

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted

Cylinders cured in water as of this date unless otherwise specified :

Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **25**Cylinders cast in Field : **4** Cylinders cast in Laboratory :Location on Structure : **Roof slab - centre**Density of Fresh Concrete : **kg/m³**Density of Hardened Test Cylinder : **kg/m³**Condition of Cylinders when received in Laboratory : **Good**Cast by : **D. McDonald** of **Clifton Associates Ltd.**Submitted by: **M. New** of **Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)**Procon - Jon Braaten (651-3500)****Cameco - Bob Phillips (956-6590)**

We Certify Testing Procedures in Accordance
with C.S.A. Standards for that portion of
the testing performed by this Company



Per _____



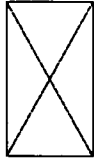
Clifton Associates Ltd.
engineering science technology

Client: **PANS**Project: **Eagle Mine Shaft**Location: **Uranium City, Saskatchewan**Contractor: **Procon**Concrete Producer: **Procon**

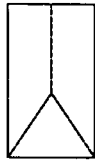
CONCRETE TEST REPORT

Project No.: S1232	Ref No.: 3198	Client Ref No.:	Test No.: 7			
Date Cast: SEP 4 2000	Date Received in Lab: SEP 7 2000	Design Strength:	30.0MPa			
Lab No.	Client No.	Date Tested	Age (Days)	Compressive Strength (MPa)	Type of Fracture	Fractured Aggregate
1790		SEP 11 2000	7	30.0	C	YES
1791		OCT 2 2000	28	38.1	C	YES
1792		OCT 2 2000	28	39.3	D	YES
1793		OCT 30 2000	56	41.7	C	YES

Types of Fractures



A. Cone



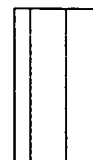
B. Cone and Split



C. Cone and Shear



D. Shear



E. Columnar

*Type of Cement : 10	Specified: mm ± mm	Temp. of Concrete (deg C) : 15
Measured Slump : 40 mm	From: 75 mm to: 125 mm	Temp. of Atmosphere (deg C) : 15
Measured Air : 12.0 %	Specified: % to: %	*Ticket Number : N/A
	From: 5.0 % to: 7.0 %	*Truck Number : N/A
*Admixtures : AEA		*Time Load Left Plant : 14:05
*Maximum Aggregate Size: 12.0 mm		Time Load Arrived : 00:00
Water Added on Job: litres		Time Sampled : 14:10
Authorized By:		Time Cylinders Cast : 14:15
* From Concrete Producers Delivery Ticket		Type of Molds Used : PVC

Cylinders are 100 mm (4") diameter X 200mm (8") Length unless otherwise noted
 Cylinders cured in water as of this date unless otherwise specified :
 Initial 24 hour curing temperatures: Minimum (deg C): **15** Maximum (deg C): **25**
 Cylinders cast in Field : **4** Cylinders cast in Laboratory :
 Location on Structure : **Roof slab - north side**

Density of Fresh Concrete : **kg/m³** Density of Hardened Test Cylinder : **kg/m³**
 Condition of Cylinders when received in Laboratory : **Good**
 Cast by : **D. McDonald** of **Clifton Associates Ltd.**
 Submitted by: **M. New** of **Clifton Associates Ltd.**

Remarks:

Report Distribution:

Tim Heisler (653-1688)
Procon - Jon Braaten (651-3500)
Cameco - Bob Phillips (956-6590)

We Certify Testing Procedures in Accordance
 with C.S.A. Standards for that portion of
 the testing performed by this Company



Per



Clifton Associates Ltd.
 engineering science technology

Client: **PANS**
 Project: **Eagle Mine Shaft**
 Location: **Uranium City, Saskatchewan**
 Contractor: **Procon**
 Concrete Producer: **Procon**

2010 Cover Installation

MRTN 1 - Adit (BVL)

MRTN 1 - Adit (BVL)

Ms. Sarah Eaton and Mr. Dale Kristoff

September 27, 2010

Page 4

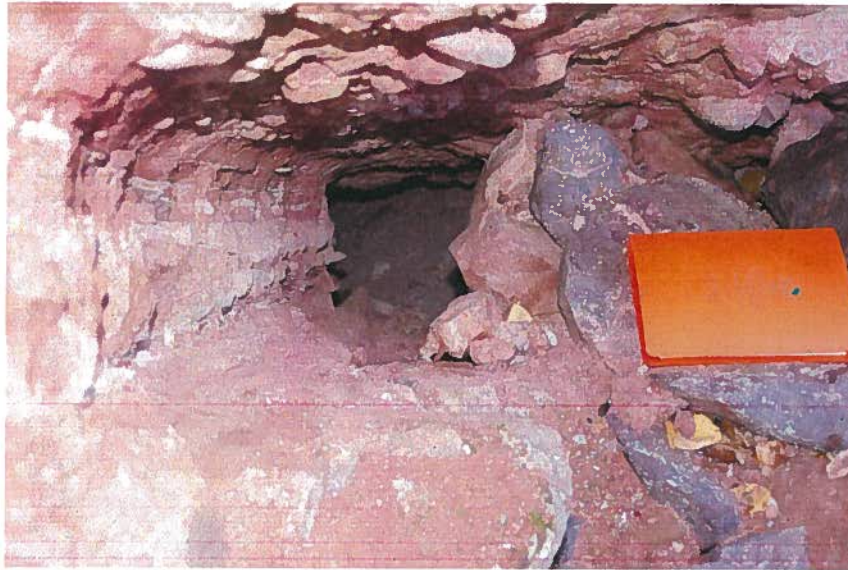


Figure 1 – Approximately 12” diameter opening in Martin Lake adit (Beaverlodge Lake Side)

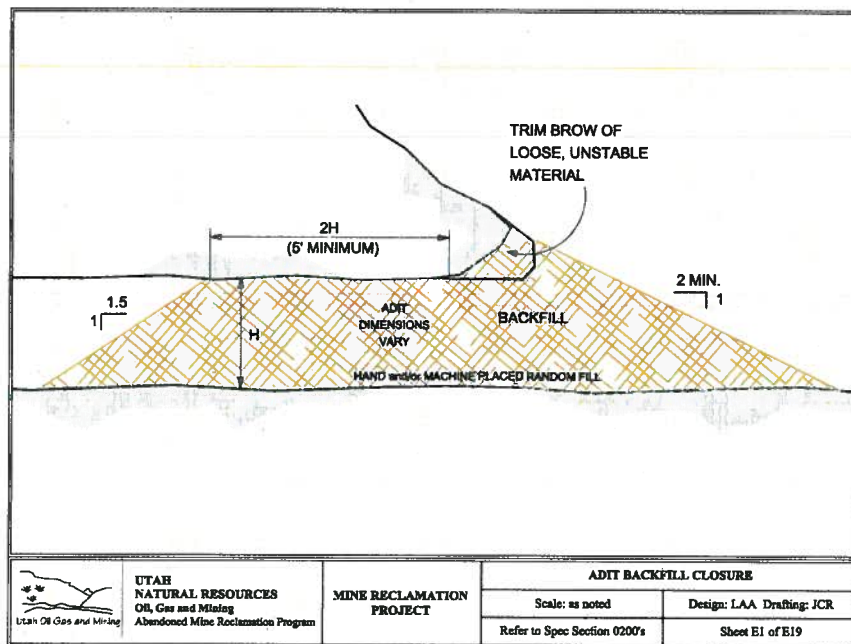


Figure 2 – Adit Backfill Closure Plan

Ms. Sarah Eaton and Mr. Dale Kristoff

September 27, 2010

Page 5



Figure 3 – Exposed Adit



Figure 4 – Adit Closure

Ms. Sarah Eaton and Mr. Dale Kristoff

September 27, 2010

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Figure 5 –Adit Following Closure Activities

2016 Cover Installations

ACE 1 – Ace Shaft



ACE 1 – Ace Shaft

GENERAL NOTES:

1. ALL STRUCTURAL PLATE MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS IF REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN AROUND SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 9785 LB
5. DO NOT BACK FILL WALLS OF COVER.

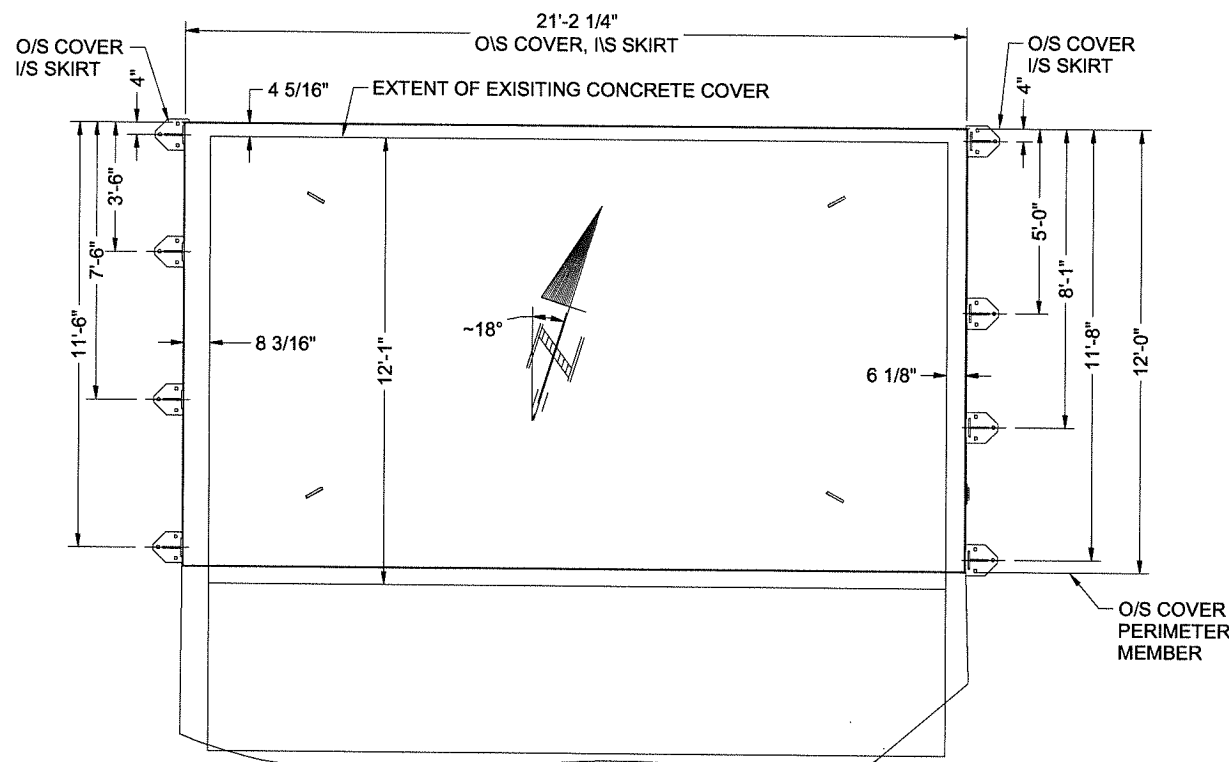
BILL OF MATERIALS				
ITEM	QTY	DESCRIPTION	PART #	SHT #
1		(E) ROCK BED		
2	1	(N) OPENING COVER	MK#S17550-A-201	2

ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 6245 LB
AS INSTALLED: 9785 LB

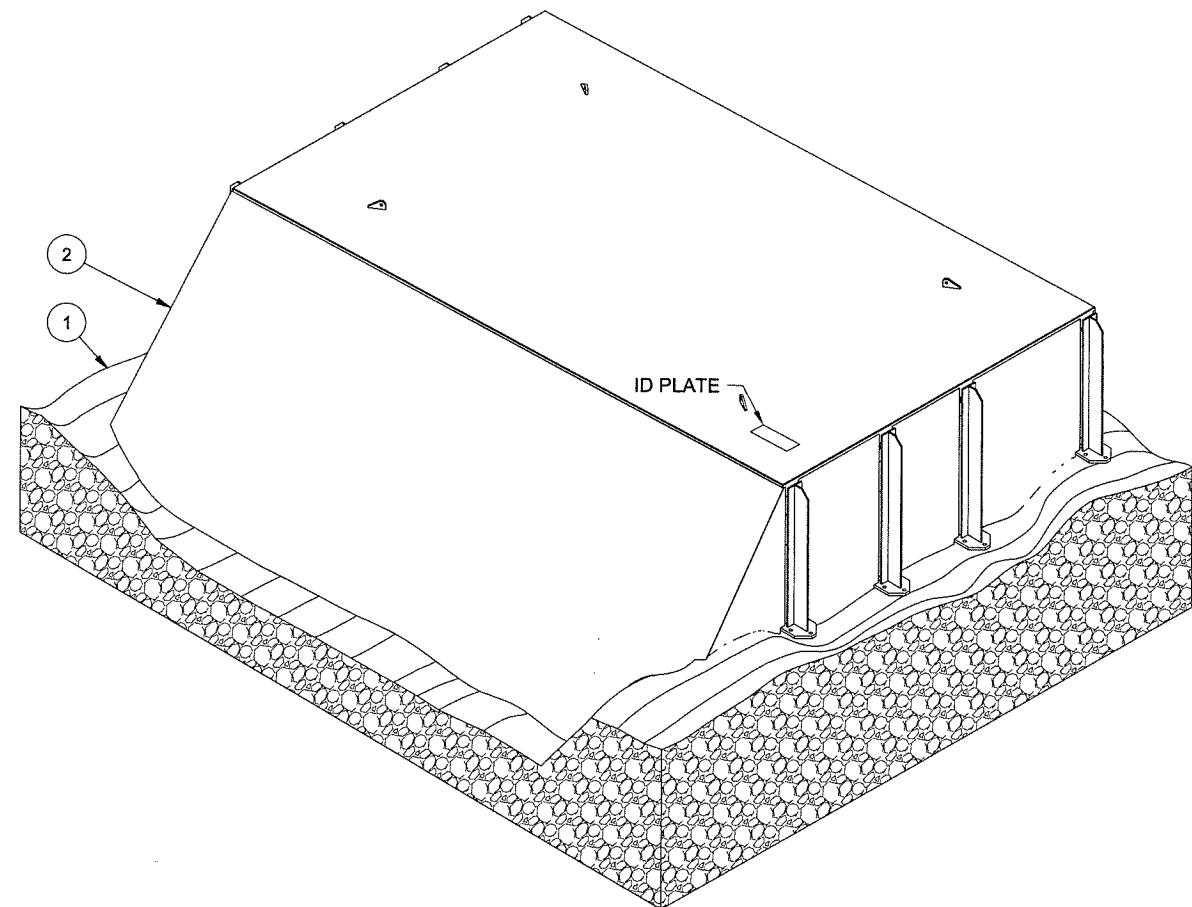
BEAVERLODGE ACE 1 SHAFT OPENING COVER
GPS LOCATION: 59° 33'43.52N, 108° 27'23.86W
SEALED: 2016
CONTACT THE SK MINISTRY OF ENVIRONMENT IF DAMAGED

ID PLATE (SUPPLIED BY FABRICATOR)
TO BE SUPPLIED AND INSTALLED BY FABRICATOR

LETTERS TO BE MILLED INTO 12ga 316 SS SHEETING
AND MIN LETTER HEIGHT IS 10mm



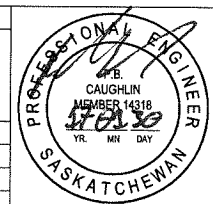
PLAN VIEW - ACE 1 SHAFT OPENING COVER



ISO VIEW - LOOKING NORTHEAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RCB ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	30/Jan/17	KD	
		△	ISSUED FOR CONSTRUCTION	30/Nov/15	JG	DRWN BY: JG DATE: 13/Nov/15
		△	ISSUED FOR REVIEW	26/Nov/15	JG	CHK'D BY: AC ENG BY: PC



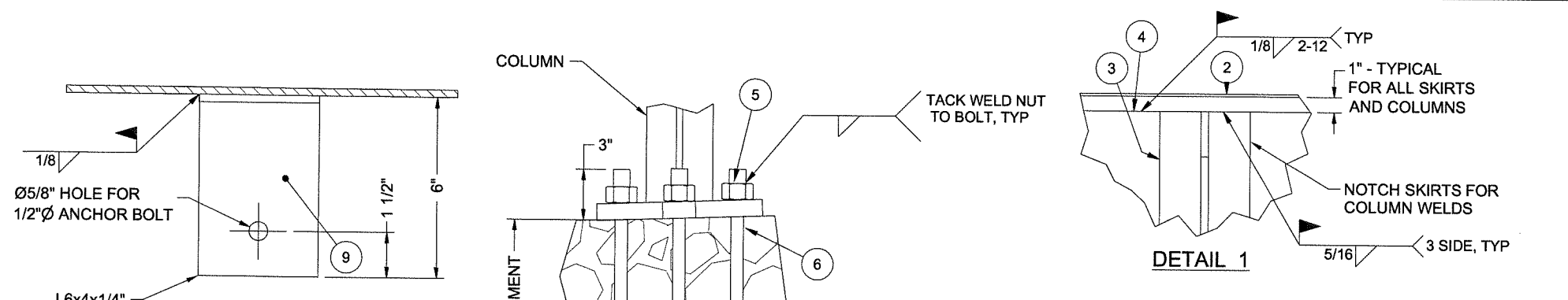
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline: Sk. Reg. No. Signature
STRUCTURAL 14318

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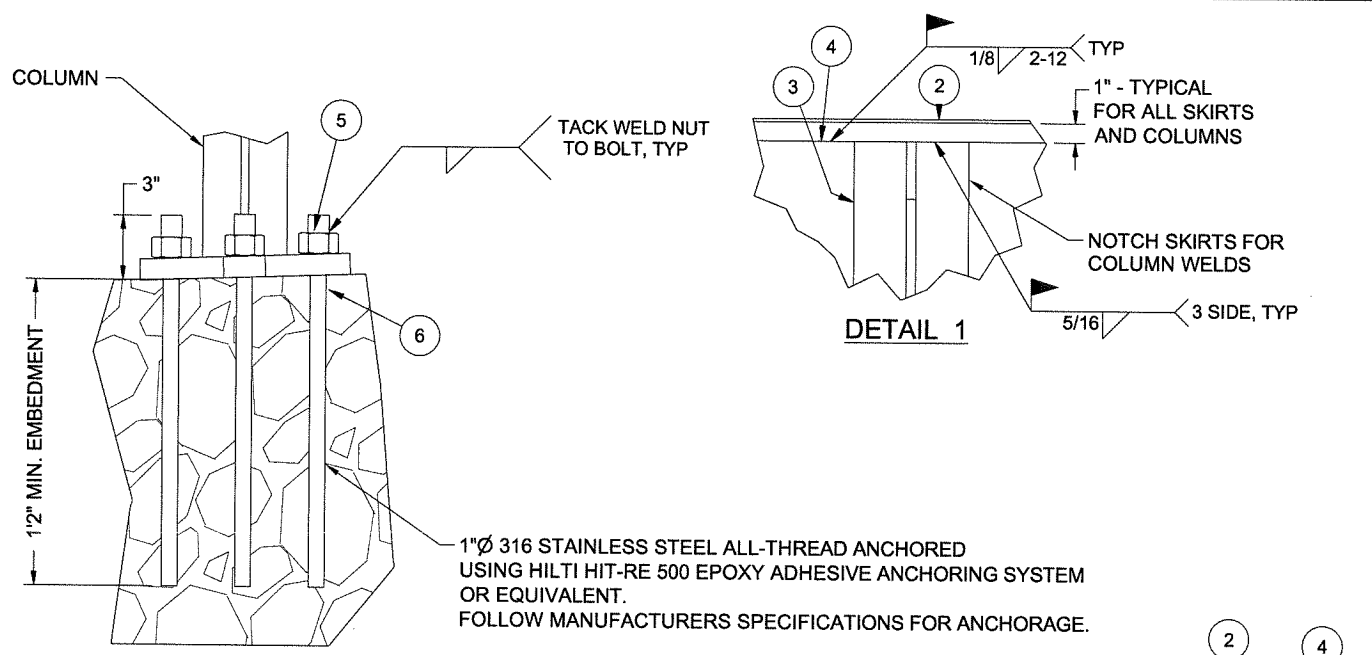
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 1 SHAFT OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°33'43.52N 108°27'23.86W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

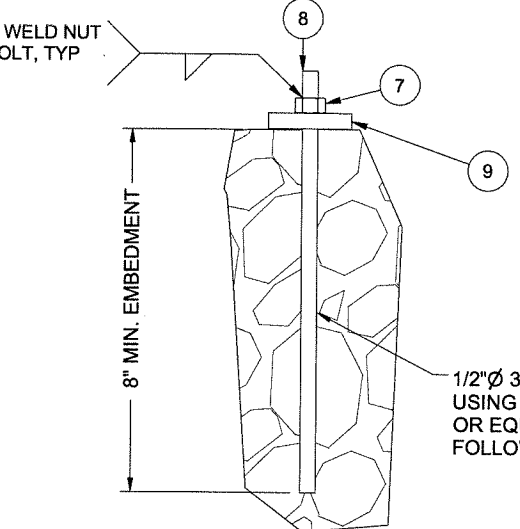
DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 5
DWG. NO.: S17550-02-1



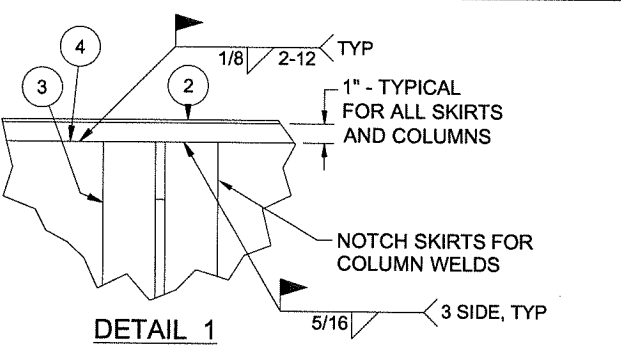
SECTION A-A



TYPICAL COLUMN ANCHOR BOLT DETAIL



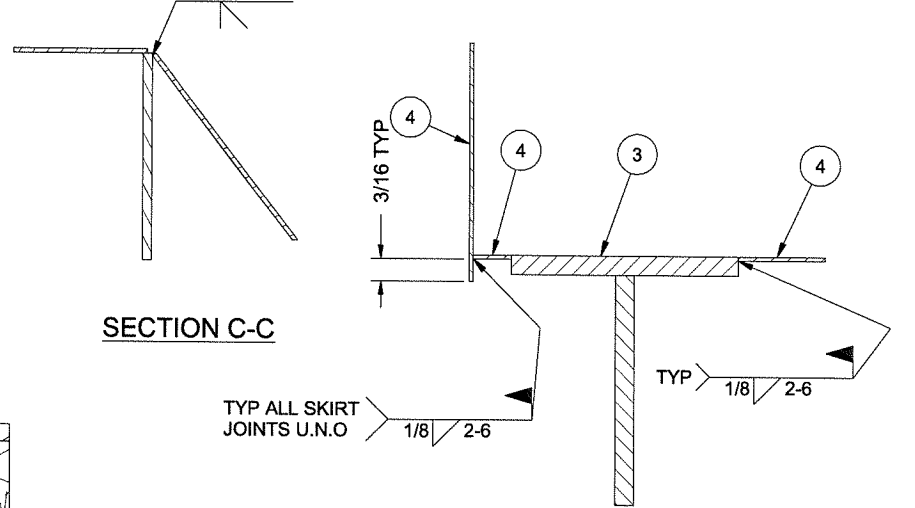
TYPICAL SKIRT ANCHOR DETAIL



DETAIL 1

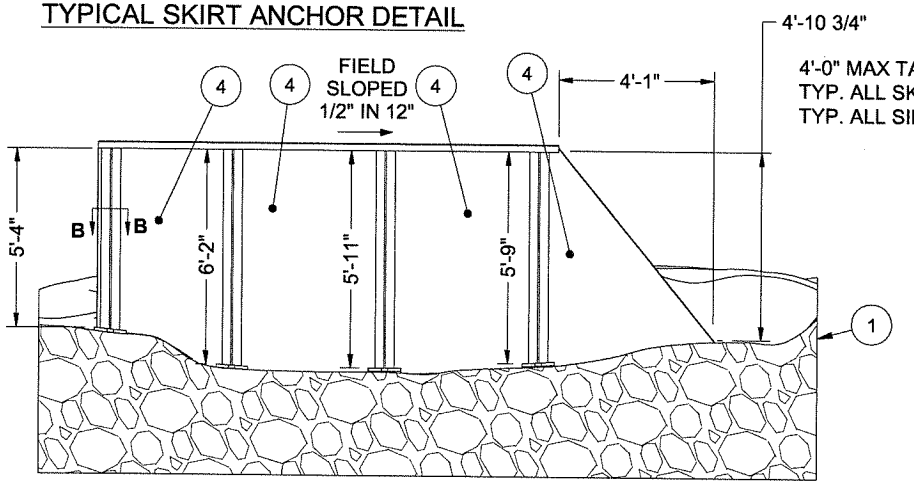
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1		(E) ROCK BED			
2		(N) OPENING COVER	MK#S17550-A-202		3
3	8	(N) COLUMN ASSEMBLY	MK#S17550-A-203		4
4		(N) 12ga SKIRT SHEETING		ASTM A240-316L	
5	24	(N) 1 inch HEAVY HEX NUT		ASTM A194 GRADE B8M	
6	24	(N) 1 inch ALL THREAD		ASTM A193 GRADE B8M	
7	20	(N) 1/2 inch HEAVY HEX NUT		ASTM A194 GRADE B8M	
8	20	(N) 1/2 inch ALL THREAD		ASTM A193 GRADE B8M	
9	20	(N) 1/4 inch SKIRT TAB		ASTM A240-316L	
10		(N) 3/16 inch SKIRT SHEETING		ASTM A240-316L	

ESTIMATED TOTAL COLUMN LENGTH 40'-1" WITHOUT SCRAP OR EXTRA. KOVA RECOMMENDS COLUMN LENGTH BE SUPPLIED PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.

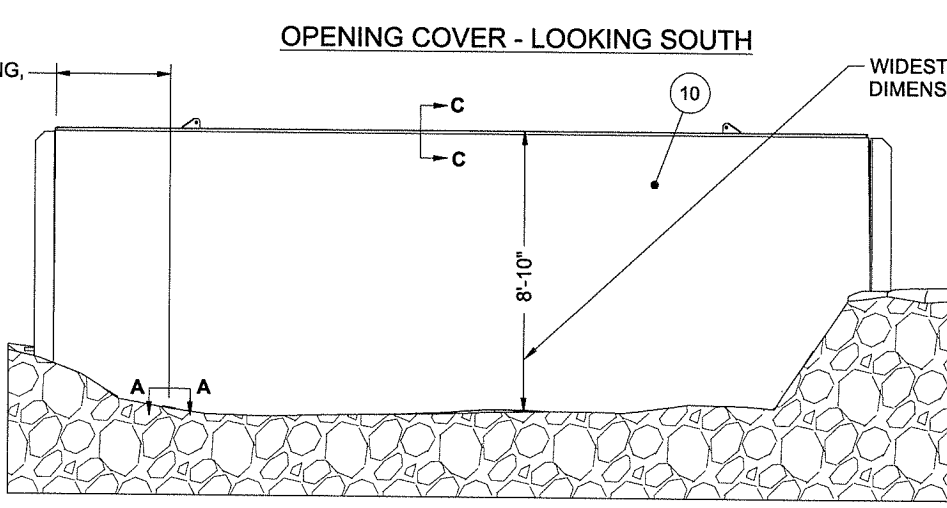


SECTION C-C

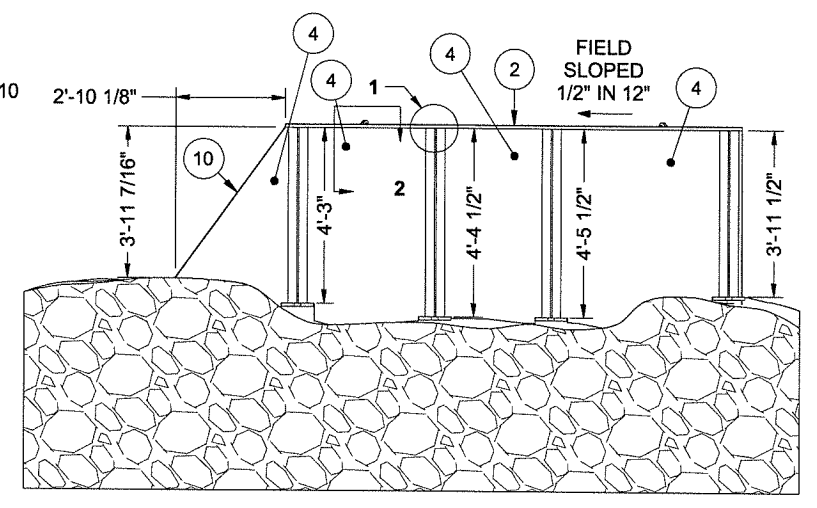
SECTION B-B



OPENING COVER - MK#S17550-A-201 - LOOKING EAST



OPENING COVER - LOOKING NORTH



OPENING COVER - LOOKING WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RCB ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	30/Jan/17	KD	
		△	ISSUED FOR CONSTRUCTION	30/Nov/15	JG	DRWN BY: JG DATE: 13/Nov/15
		△	ISSUED FOR REVIEW	26/Nov/15	JG	CHK'D BY: [Signature] ENG BY: PC

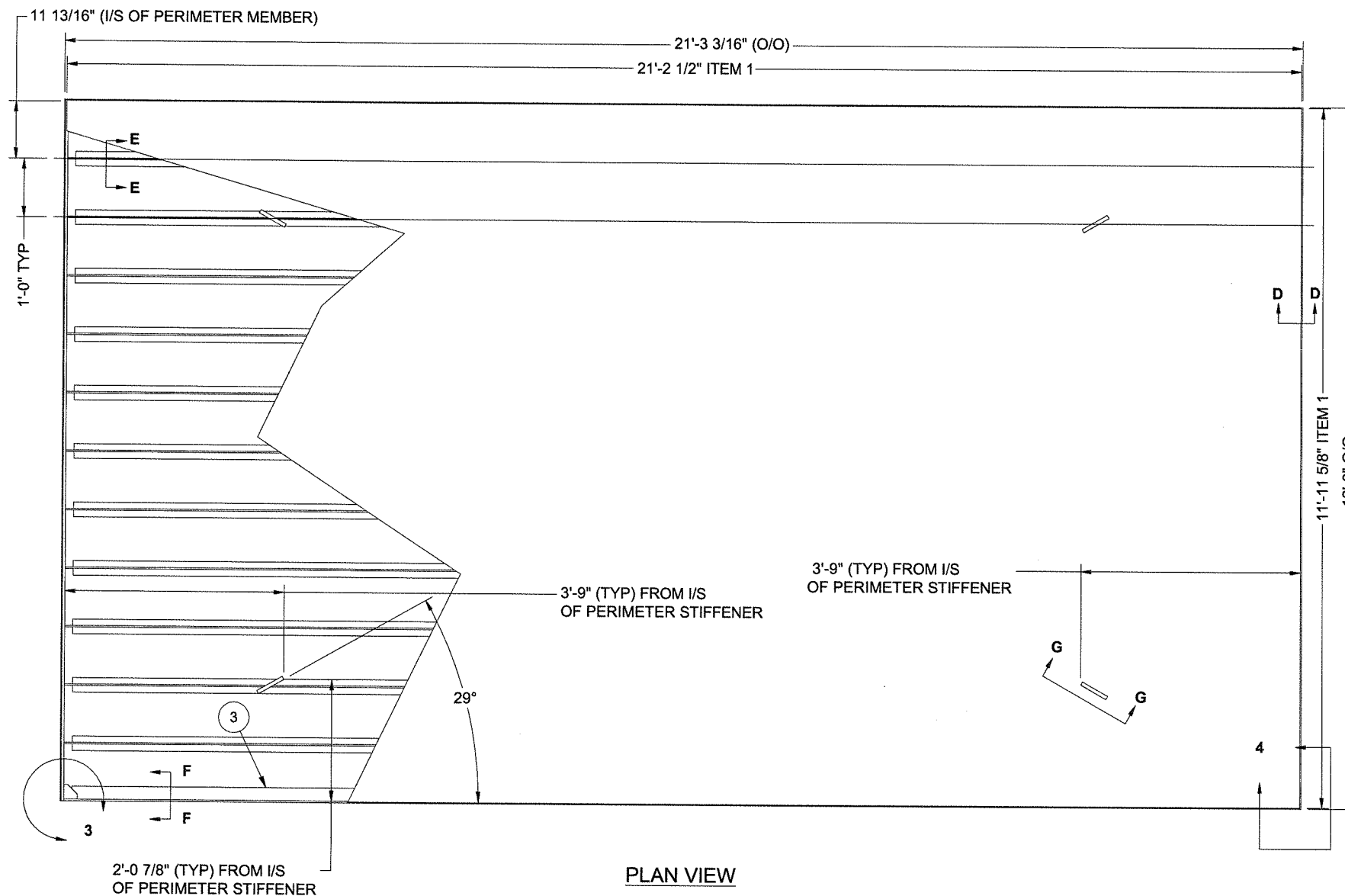


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 Number C672
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 Discipline: STRUCTURAL, Sk. Reg. No.: 14318, Signature: [Signature]

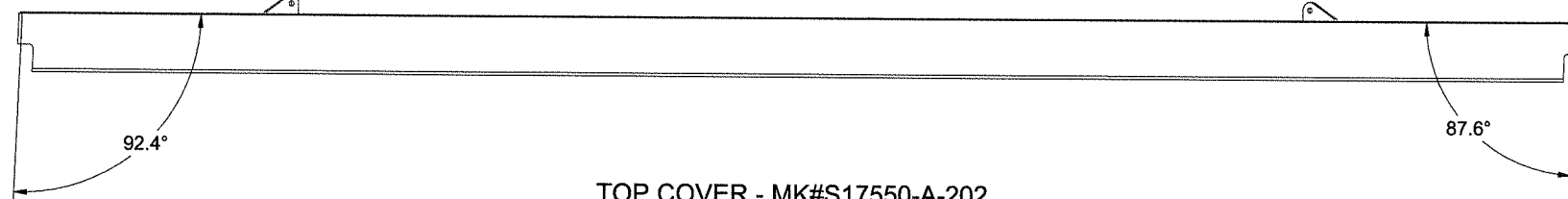
Kova Engineering Saskatchewan Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 1 SHAFT OPENING
 INSTALLATION DETAILS
 LOCATION: 59°33'43.52N 108°27'23.86W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 5
 DWG. NO.: S17550-02-2
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.248.1059

BILL OF MATERIALS

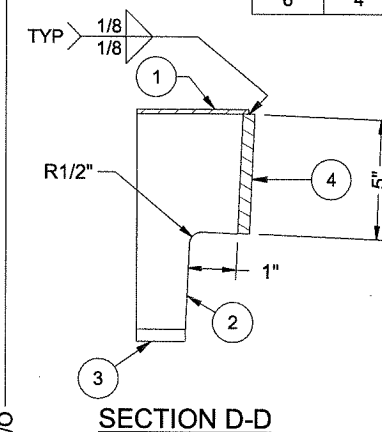
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1	1	(N) 3/16" PLATE		ASTM A240-316L	
2	13	(N) 9"x5/16" FLAT BAR		ASTM A240-316L	
3	13	(N) 3"x1/2" FLAT BAR		ASTM A240-316L	
4	2	(N) 5"x1/2" FLAT BAR		ASTM A240-316L	
5	4	(N) 5/8" PLATE		ASTM A240-316L	
6	4	(N) 3/8" PLATE		ASTM A240-316L	



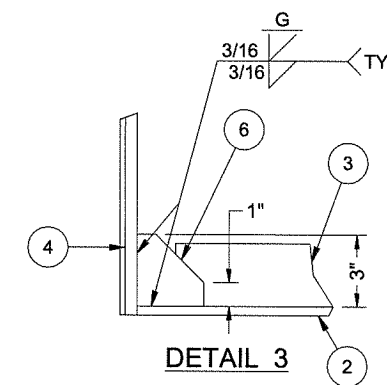
PLAN VIEW



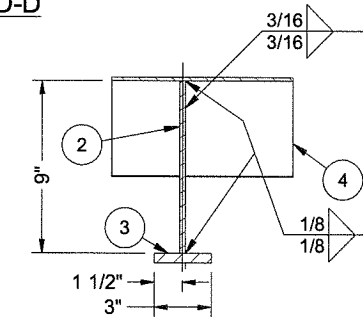
TOP COVER - MK#S17550-A-202



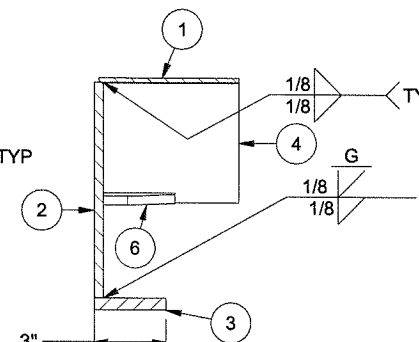
SECTION D-D



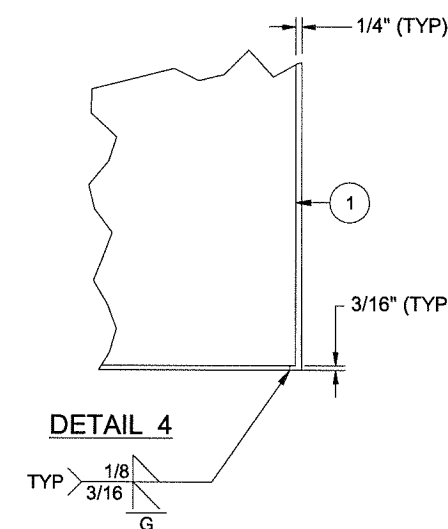
DETAIL 3



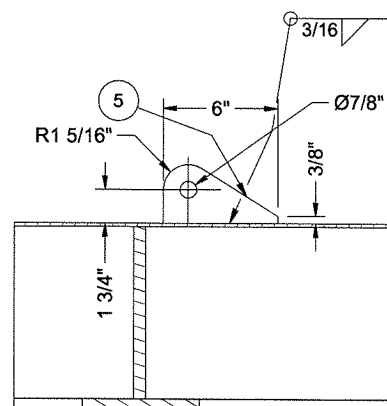
SECTION E-E



SECTION F-F



DETAIL 4

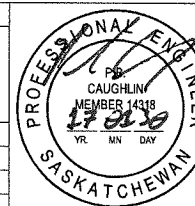


SECTION G-G

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 2/32" MACHINED SURFACES: 1/32" ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		▲	AS-BUILT DRAWING	30/Jan/17	KD	
		⊕	ISSUED FOR CONSTRUCTION	30/Nov/15	JG	DRWN BY: JG DATE: 13/Nov/15
		⊕	ISSUED FOR REVIEW	26/Nov/15	JG	CHK'D BY: PC ENG BY: PC



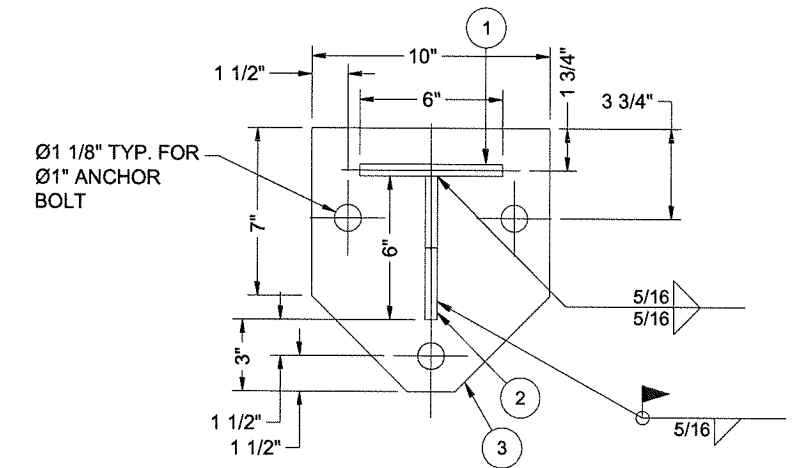
Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: STRUCTURAL, Sk. Reg. No. 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

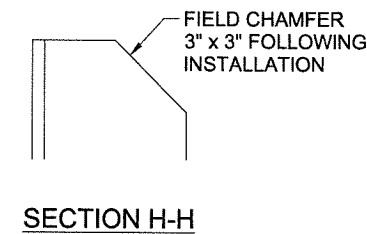
PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 1 SHAFT OPENING
 TOP COVER FABRICATION DETAILS
 LOCATION: 59°33'43.52N 108°27'23.86W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 5
 DWG. NO.: S17550-02-3
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(N) 6"x1/2" FLAT BAR		ASTM A240-316L	
2	1	(N) 6"x1/2" FLAT BAR		ASTM A240-316L	
3	1	(N) 1" PLATE		ASTM A240-316L	

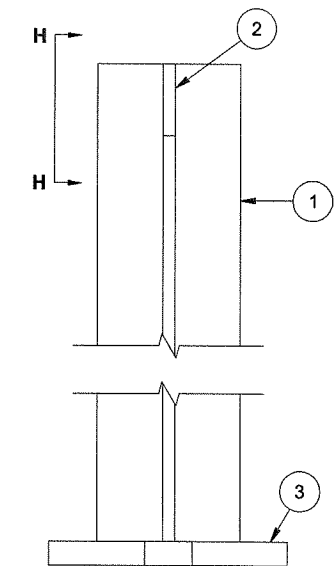
NOTE: QUANTITIES IN BILL OF MATERIALS ARE FOR ONE OF EACH ASSEMBLY ONLY. EIGHT (8) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



TYPICAL COLUMN PLAN



SECTION H-H

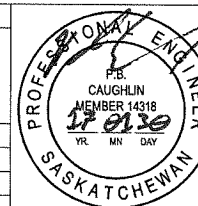


TYPICAL COLUMN ELEVATION
MK#S17550-A-203

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		▲	AS-BUILT DRAWING	30/Jan/17	KD	DRWN BY: JG
		⊕	ISSUED FOR CONSTRUCTION	30/Nov/15	JG	DATE: 13/Nov/15
		▲	ISSUED FOR REVIEW	26/Nov/15	JG	CHK'D BY: <i>PC</i> ENG BY: PC

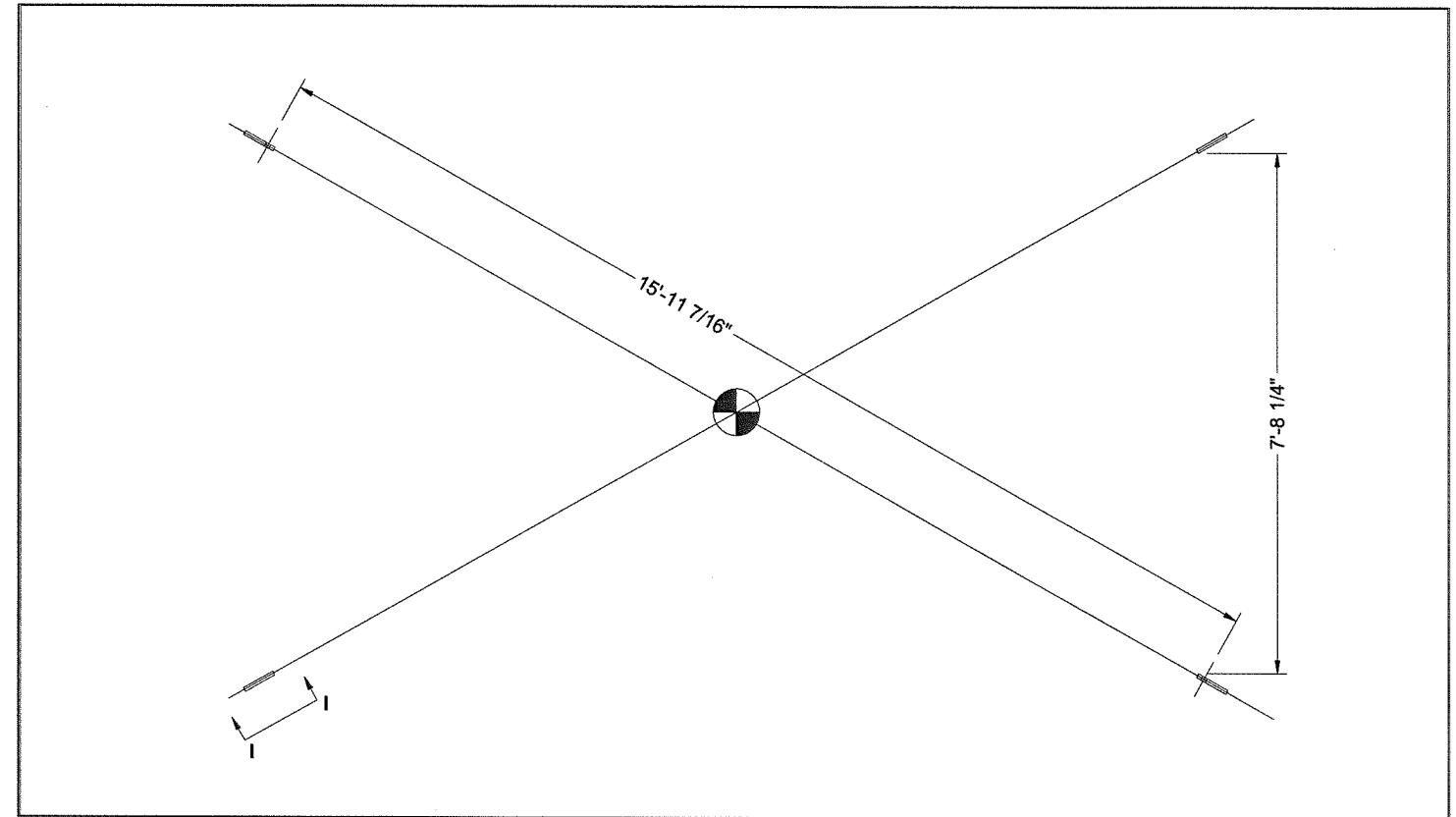


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 Number C672
 Permission to Consult held by:
 Discipline: STRUCTURAL Sk. Reg. No. 14318
 Signature: *[Signature]*

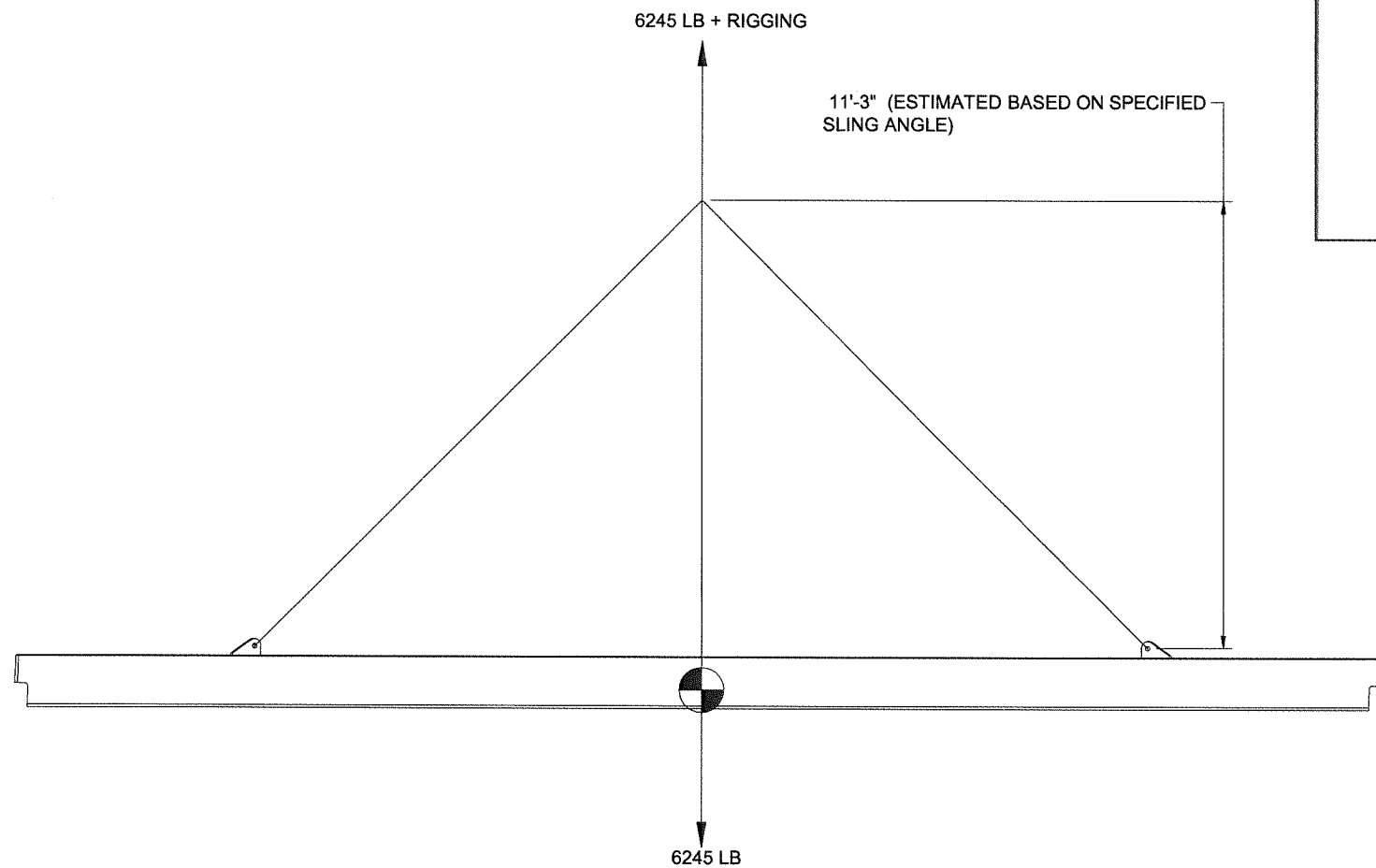
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 1 SHAFT OPENING
 INSPECTION HATCH AND COLUMN ASSEMBLY FABRICATION DETAILS
 LOCATION: 59°33'43.52N 108°27'23.86W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

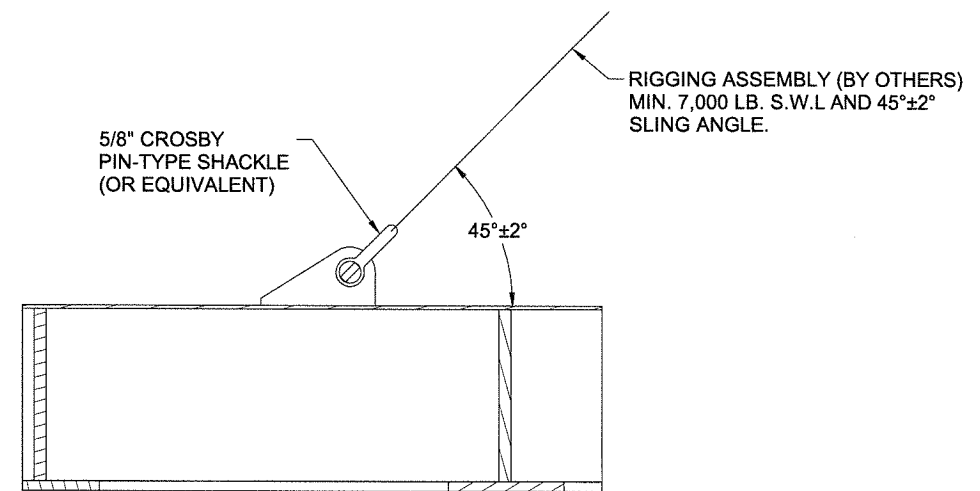
DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 5 DWG. NO.: S17550-02-4



TOP COVER LIFTING DIAGRAM - PLAN VIEW



TOP COVER LIFTING DIAGRAM - SIDE VIEW

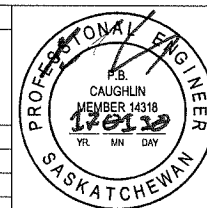


SECTION I-I

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	30/Jan/17	KD	DRWN BY: JG
		△	ISSUED FOR CONSTRUCTION	30/Nov/15	JG	DATE: 13/Nov/15
		△	ISSUED FOR REVIEW	26/Nov/15	JG	CHK'D BY: PC ENG BY: PC



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 Number C672
 Permission to Consult held by:
 Discipline: STRUCTURAL Sk. Reg. No. 14318 Signature: *[Signature]*

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 1 SHAFT OPENING
 COVER LIFTING DETAILS
 LOCATION: 59°33'43.52N 108°27'23.86W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 5

DWG. NO.: **S17550-02-5**

FAY 12 - Waste Haul Adit

FAY 12 - Waste Haul Adit

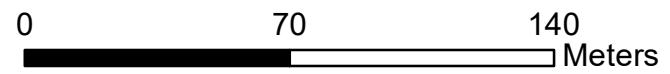


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Google

Imagery ©2016 DigitalGlobe

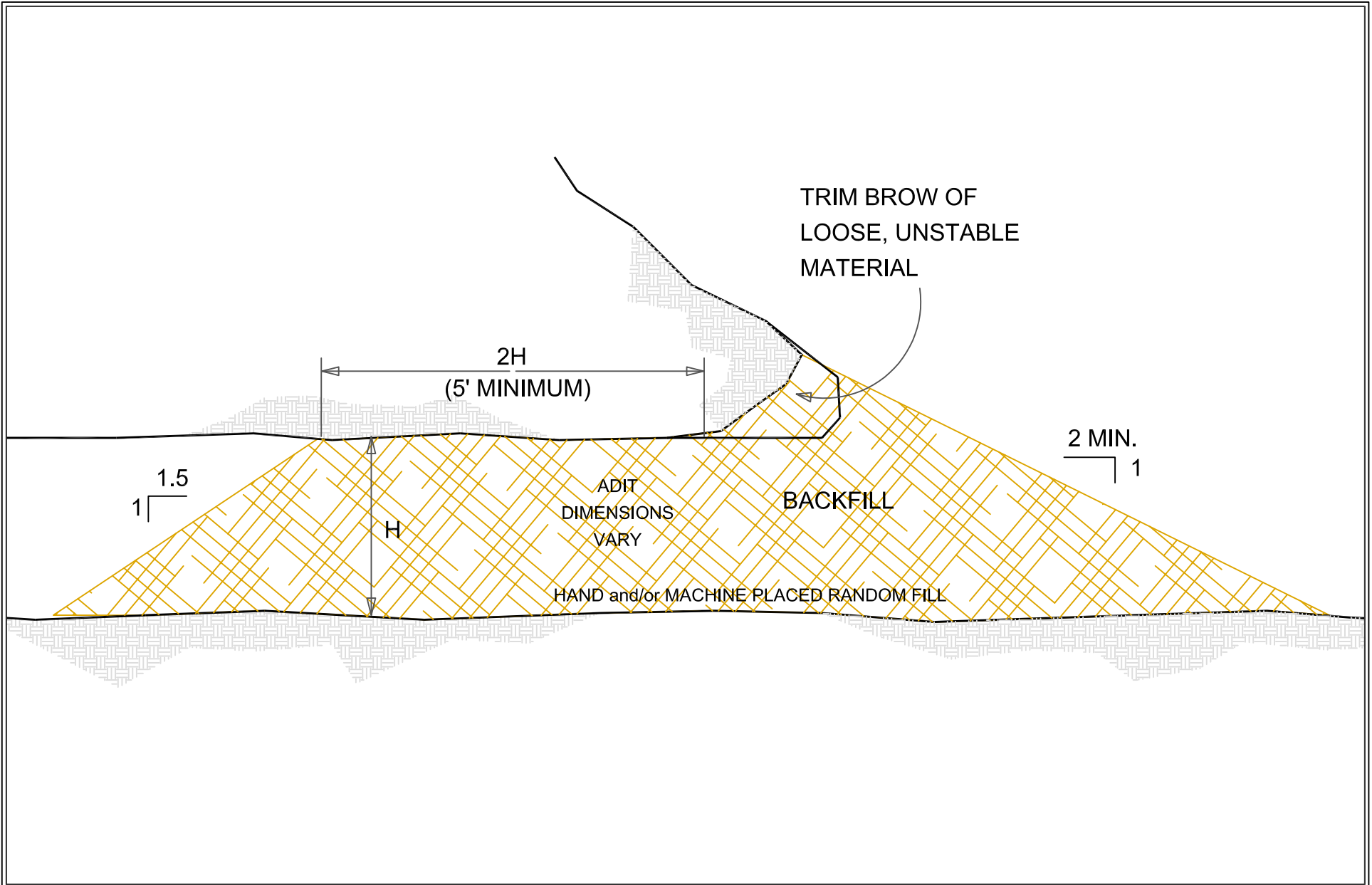
NOTE:
 Coordinate System: UTM WGS 1984 Zone 12
 Image source: Saskatchewan Geospatial Imagery Collaborative 2012-2016



Job No: 1CC007.054
 Filename: 1CC007_054_fig_01_fay_mill_area

CAMECO CORPORATION

Mine Opening Investigation		
FAY AREA		
Date: Aug 2016	Approved:	Figure: 1



 <p>UTAH NATURAL RESOURCES Oil, Gas and Mining Abandoned Mine Reclamation Program</p>	<p>MINE RECLAMATION PROJECT</p>	<p>ADIT BACKFILL CLOSURE</p>	
		<p>Scale: as noted</p>	<p>Design: LAA Drafting: JCR</p>
		<p>Refer to Spec Section 0200's</p>	<p>Sheet E1 of E19</p>

Figure 1: Subsidence Observed Above the Waste Haulage Adit



Figure 2: Partially Excavated Adit with Steel Encountered in Backfill



Figure 3: Excavated Adit



Figure 4: Backfilling Adit with Loader Attachment



Figure 5: Sorted Waste Rock Used for Backfill Material



Figure 6: Backfilled Adit



Figure 7: Placing Sorted Waste Rock in Adit Entrance



Figure 8: Backfilled Adit Entrance with Material Placed to Original Slope



Figure 9: Completed project



2017 Cover Installations

2017 Stainless Steel Cover Details

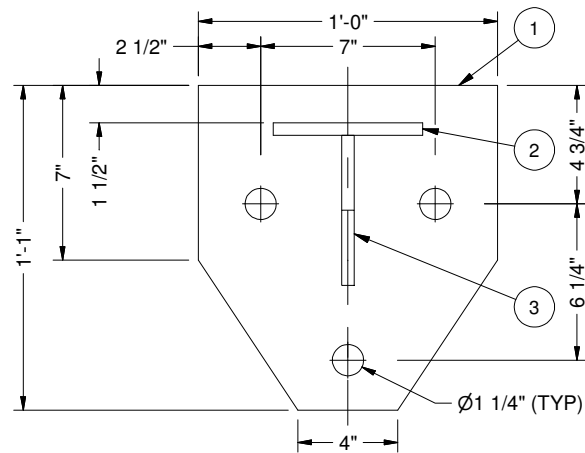
- **Columns Details and Notes**
- **Bedrock Anchor Details**
- **Welding Details**
- **Lift Lug Design**

2017 Stainless Steel Cover Details

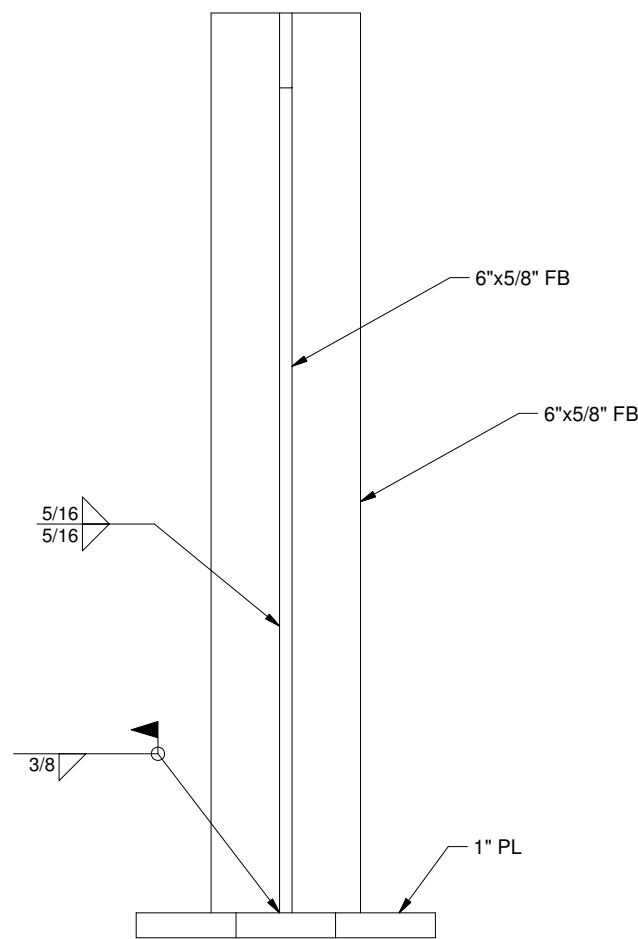
GENERAL NOTES:

1. ALL STRUCTURAL PLATE MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
5. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
6. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
7. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
8. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

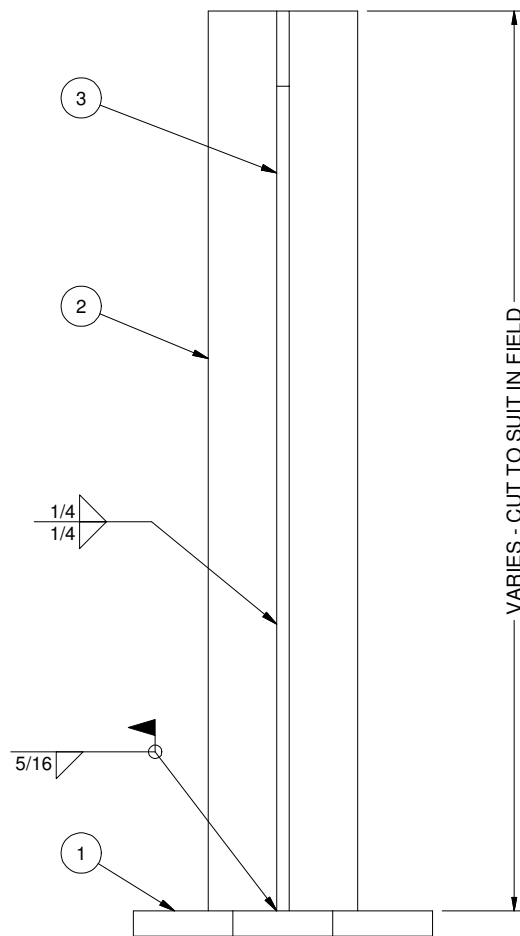
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	1" PL		ASTM A240-316L	
2	1	6" x 1/2" FB		ASTM A240-316L	
3	1	6" x 1/2" FB		ASTM A240-316L	



TOP VIEW

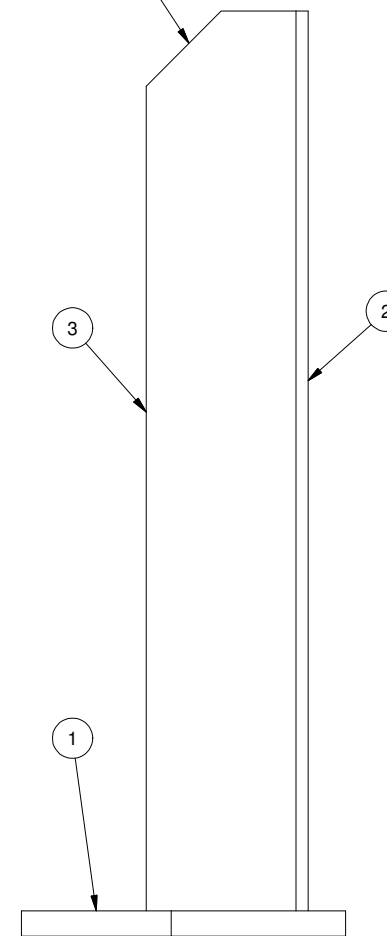


**ALTERNATIVE COLUMN DETAIL
5/8" PLATE COLUMNS**

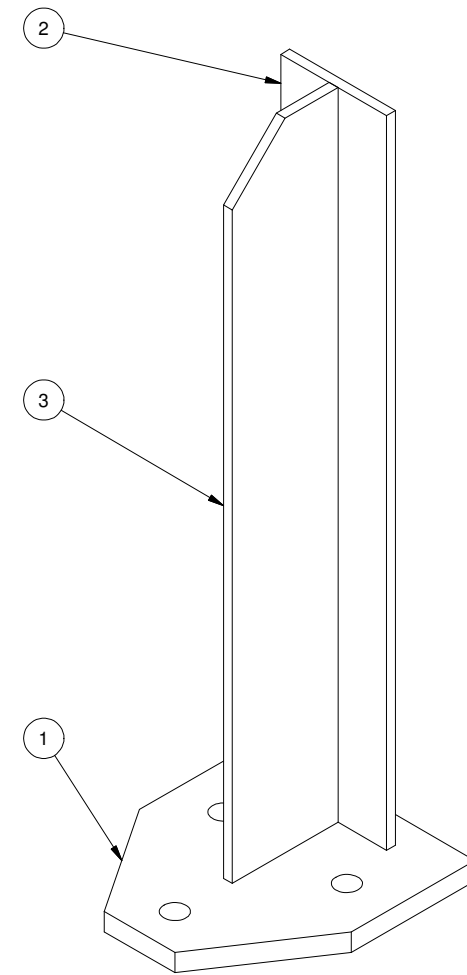


COLUMN DETAIL

FIELD CHAMFER 3" x 3" FOLLOWING INSTALLATION



SIDE VIEW



ISO VIEW

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT REVISIONS	11/3/2017	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/26/2016	A.R.	DRWN BY: A.R. DATE: 8/30/2016
S18678-01-11	KOVA DWGS - COVERS FOR SHAFT OPENINGS	△	ISSUED FOR REVIEW	10/6/2016	A.R.	CHK'D BY: ENG BY: P.C.

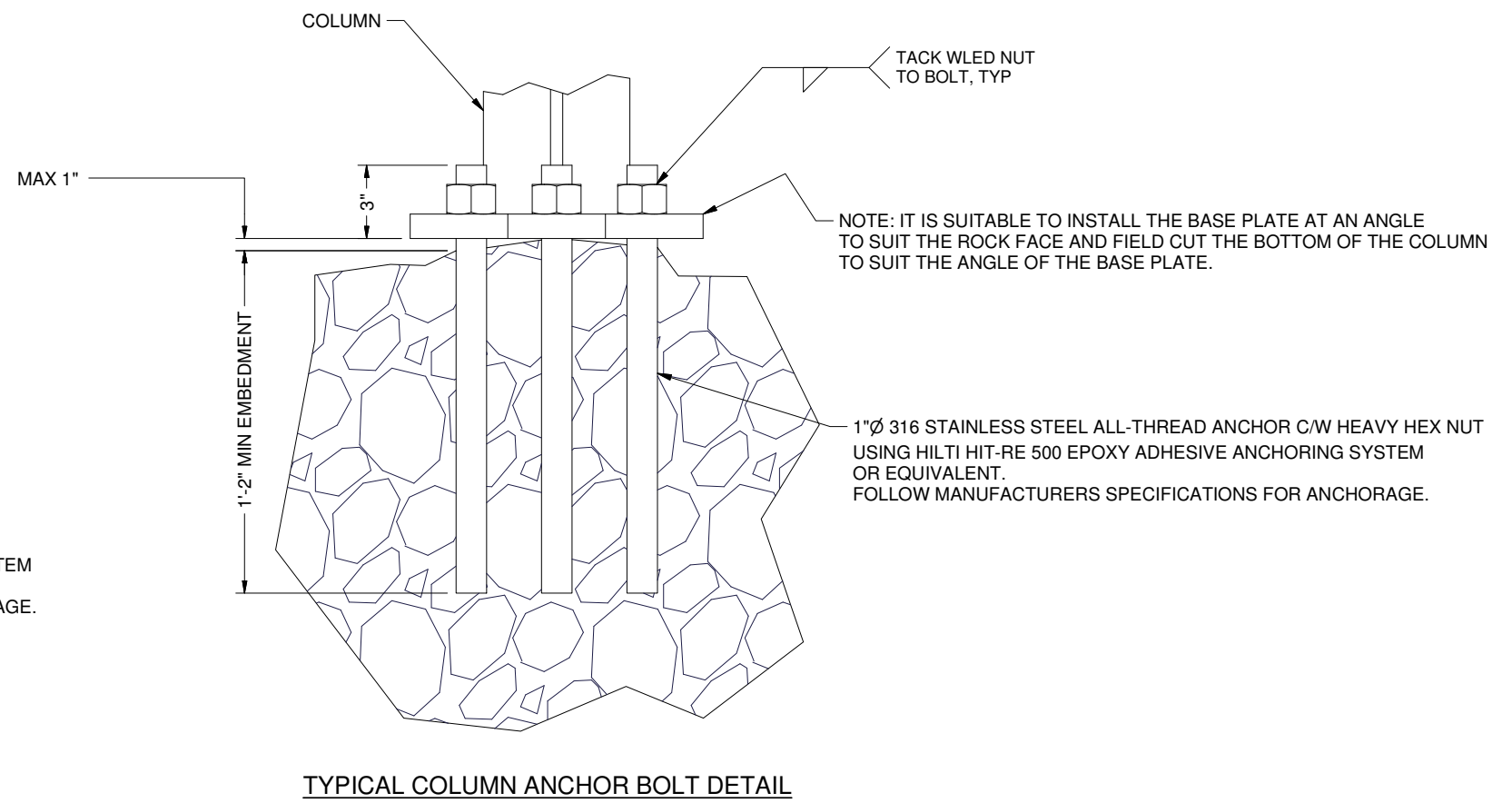
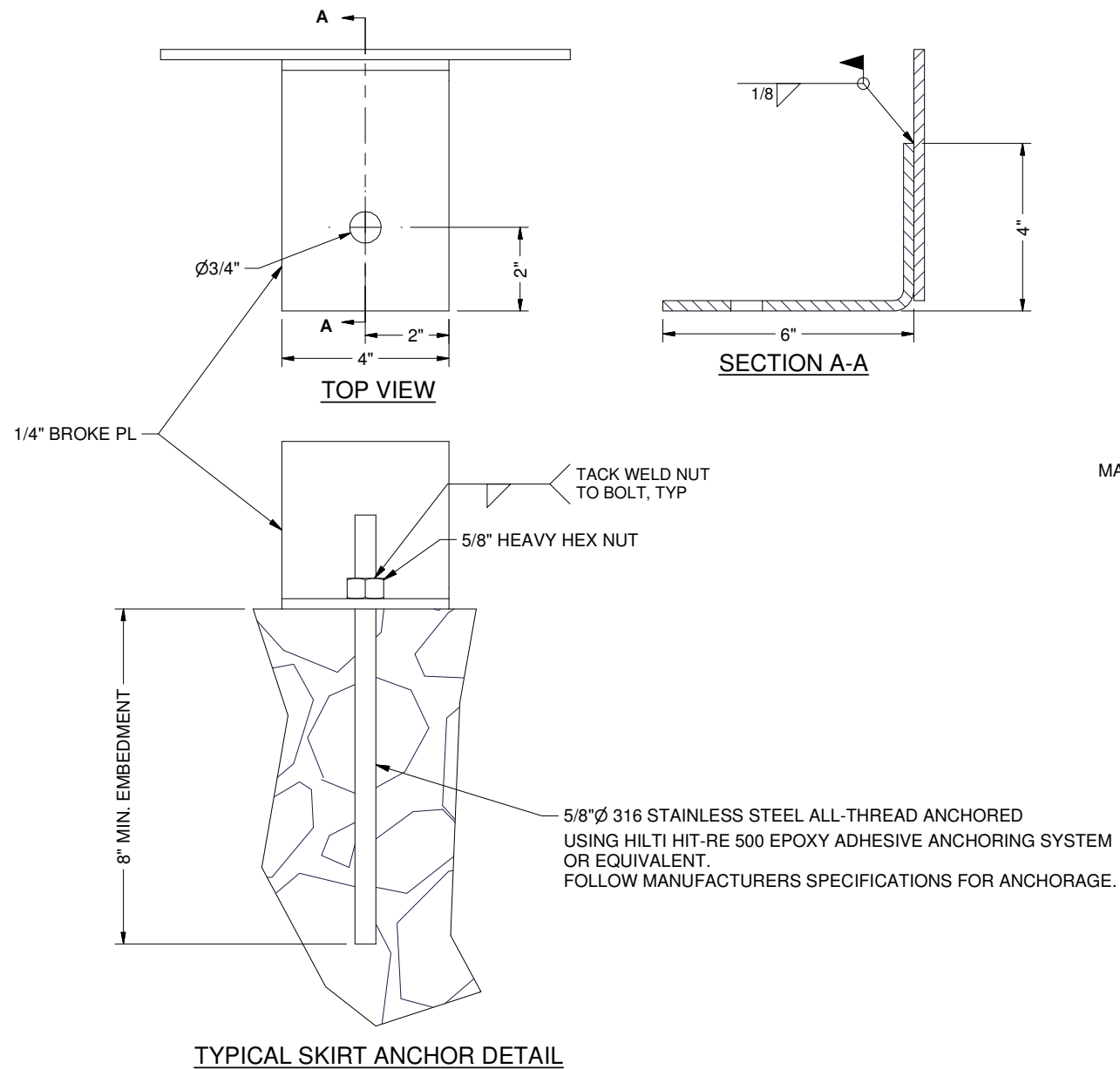


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CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: *[Signature]*

Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR SHAFT OPENINGS - STANDARD DETAILS
 COLUMN DETAILS & NOTES
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 4 DWG. NO.: S18678-12-1



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT REVISIONS	11/3/2017	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/26/2016	A.R.	DRWN BY: A.R. DATE: 8/30/2016
S18678-01-11	KOVA DWGS - COVERS FOR SHAFT OPENINGS	△	ISSUED FOR REVIEW	10/6/2016	A.R.	CHK'D BY: ENG BY: P.C.

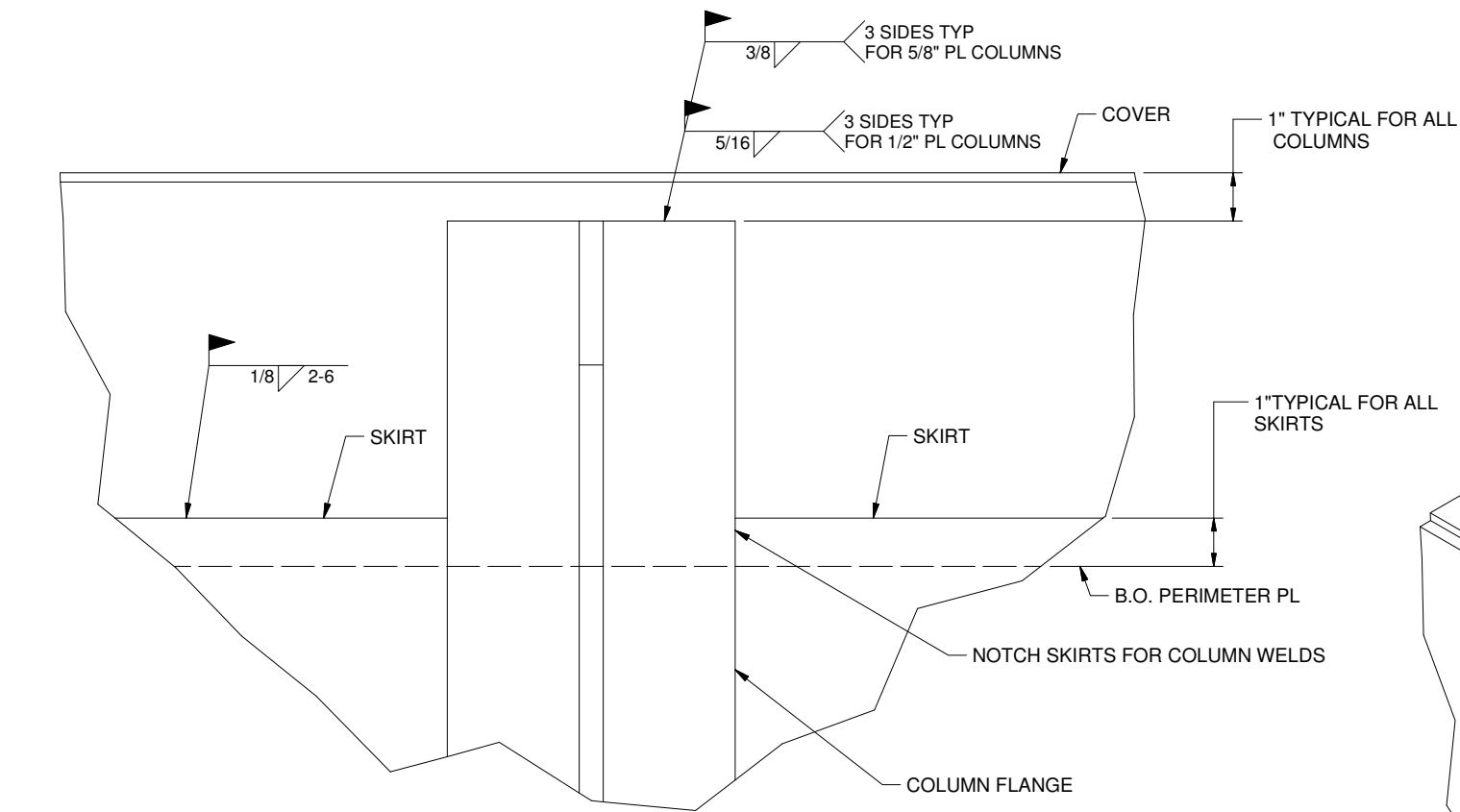


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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

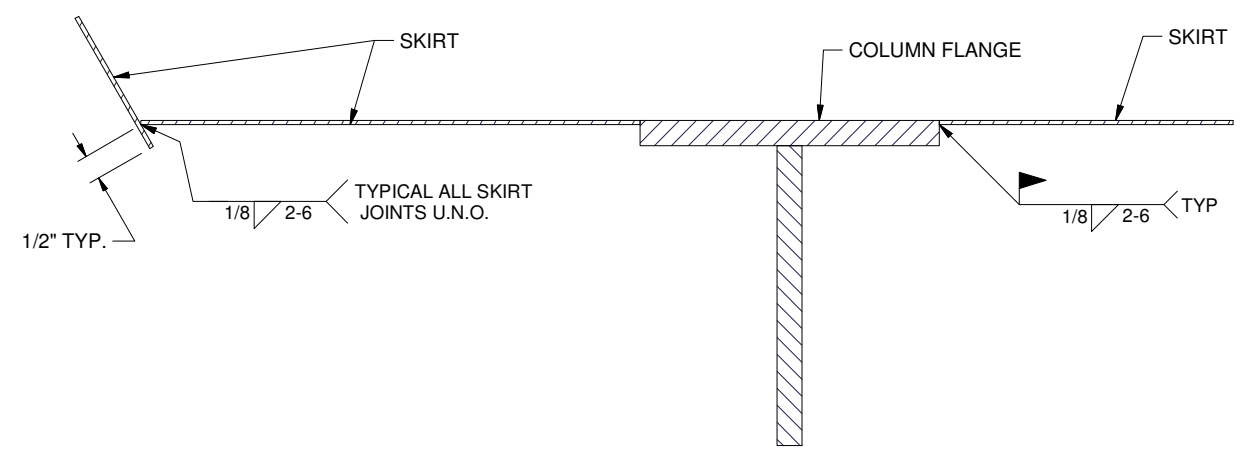
Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR SHAFT OPENINGS - STANDARD DETAILS
 ANCHOR DETAILS
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

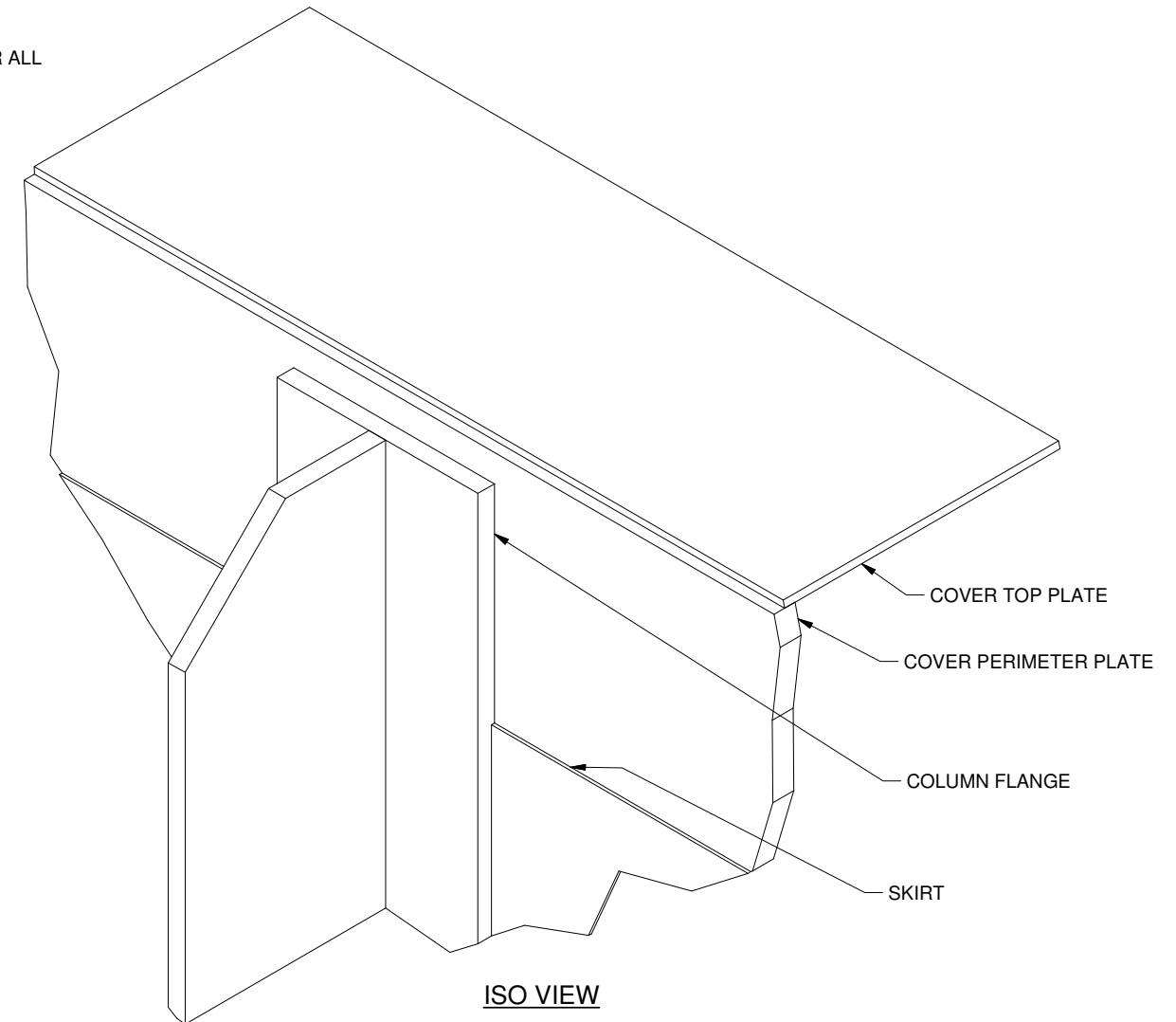
DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 4 DWG. NO.: **S18678-12-2**



WELDING COLUMN AND SKIRT TO COVER



SKIRT WELDING



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT REVISIONS	11/3/2017	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/26/2016	A.R.	DRWN BY: A.R. DATE: 8/30/2016
S18678-01-11	KOVA DWGS - COVERS FOR SHAFT OPENINGS	△	ISSUED FOR REVIEW	10/6/2016	A.R.	CHK'D BY: ENG BY: P.C.



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

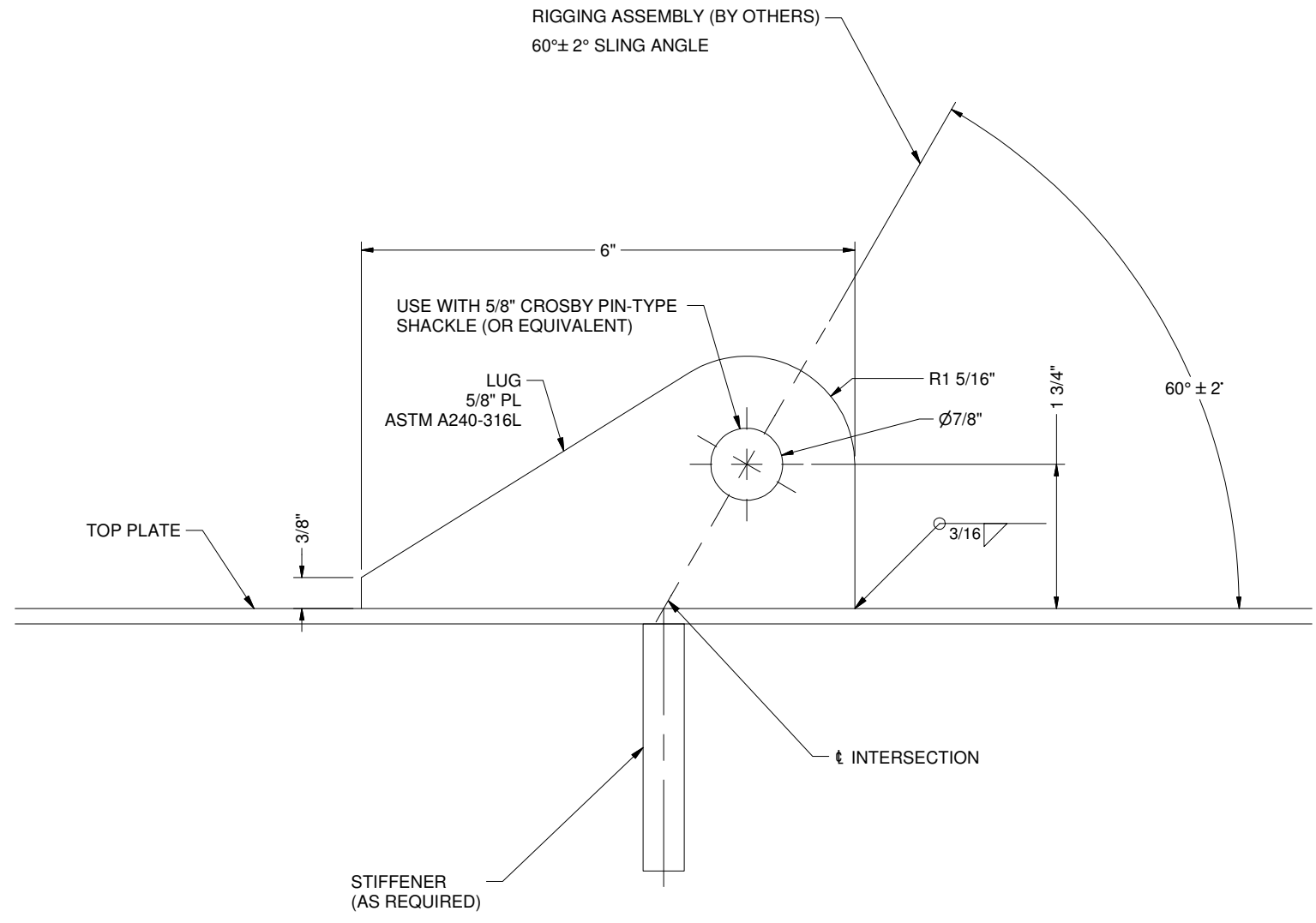
Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR SHAFT OPENINGS - STANDARD DETAILS
 WELDING DETAILS
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 4

DWG. NO.: **S18678-12-3**

1



LUG DETAIL

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT REVISIONS	11/3/2017	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/26/2016	A.R.	DRWN BY: A.R. DATE: 8/30/2016
S18678-01-11	KOVA DWGS - COVERS FOR SHAFT OPENINGS	△	ISSUED FOR REVIEW	10/6/2016	A.R.	CHK'D BY: ENG BY: P.C.

Kova Engineering Saskatchewan Ltd. 

PROJECT: BEAVERLODGE PERMANENT COVERS FOR SHAFT OPENINGS - STANDARD DETAILS
LIFT LUG DESIGN
LOCATION: NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 4 OF 4

DWG. NO.: **S18678-12-4**



ACE 2 – 2157 Raise



ACE 2 – 2157 Raise

GENERAL NOTES:

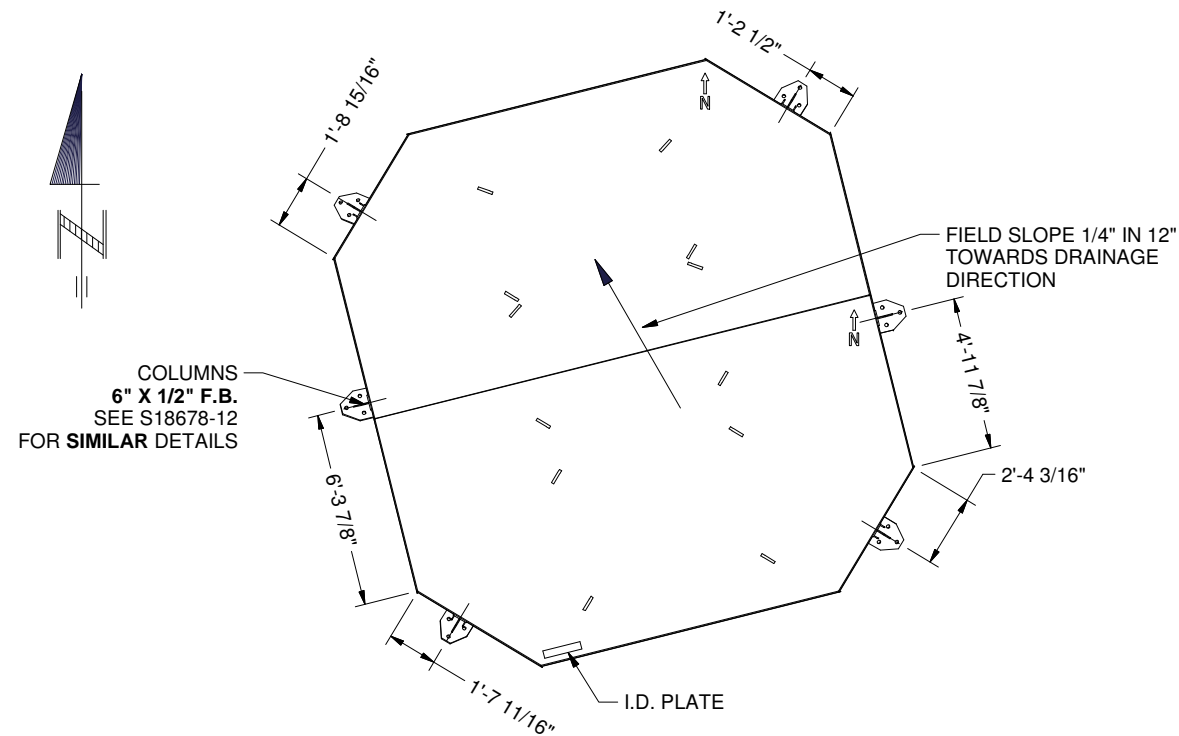
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

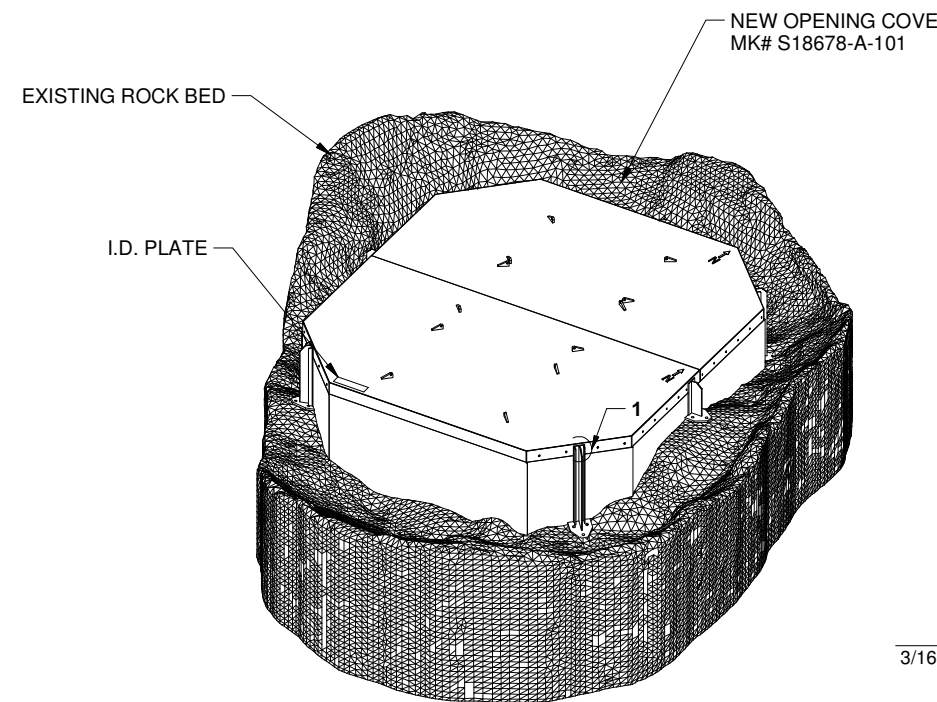
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 7515 LB
5. DO NOT BACK FILL WALLS OF COVER.



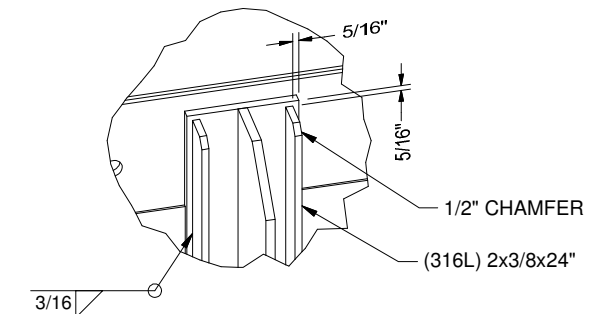
ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 5609 LB
AS INSTALLED: 7515 LB



PLAN VIEW - ACE 2 OPENING COVER



ISO VIEW
LOOKING NORTH-WEST

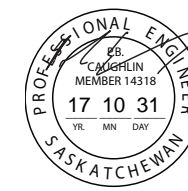


DETAIL 1
CORNER COLUMNS (4X)

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline: Sk. Reg. No. Signature
Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 6

DWG. NO.: **S18678-01-1**

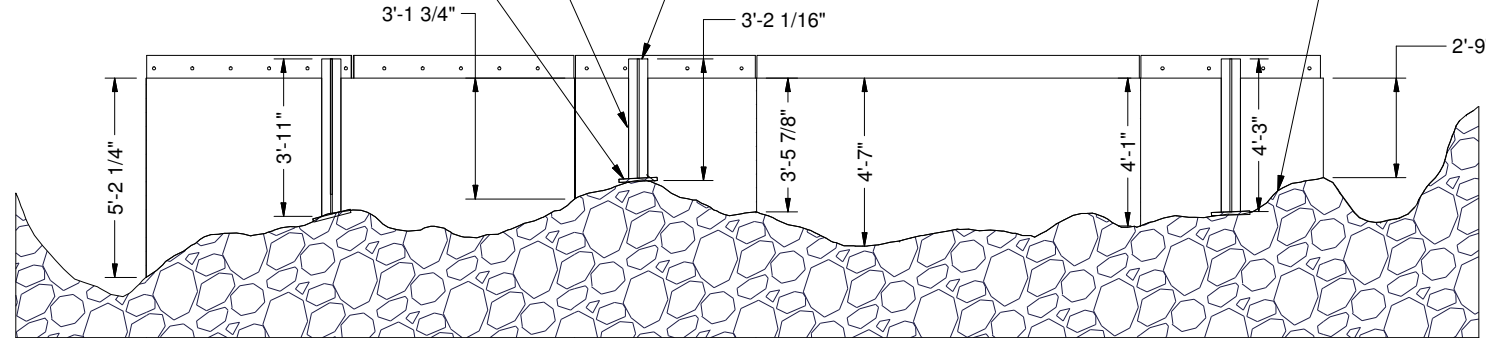
ESTIMATED TOTAL COLUMN LENGTH 270" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.

ESTIMATED COLUMN HEIGHTS
 CUT LENGTH TO SUIT

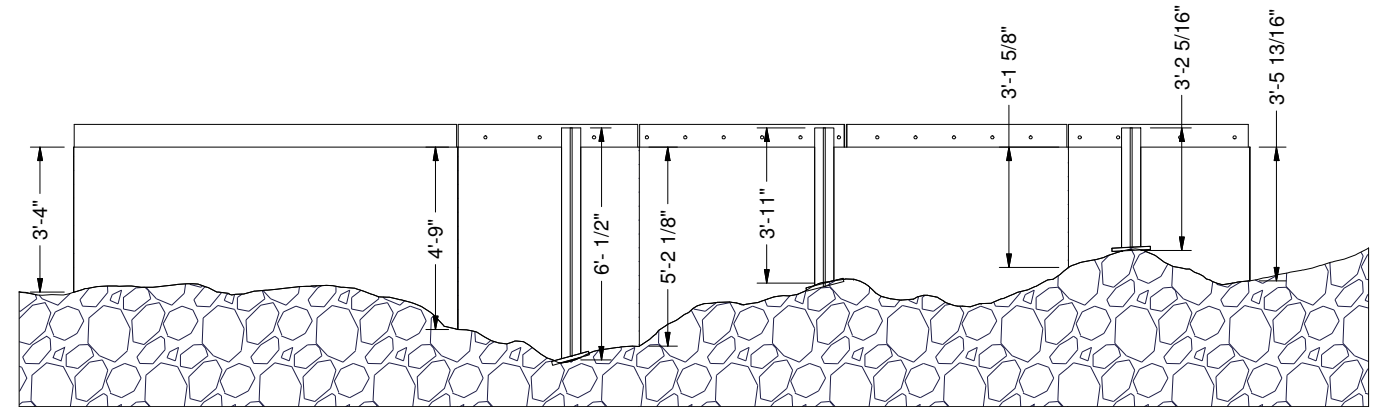
SEE S18678-12 FOR
 ANCHOR DETAILS

SEE S18678-12
 FOR WELDING DETAILS

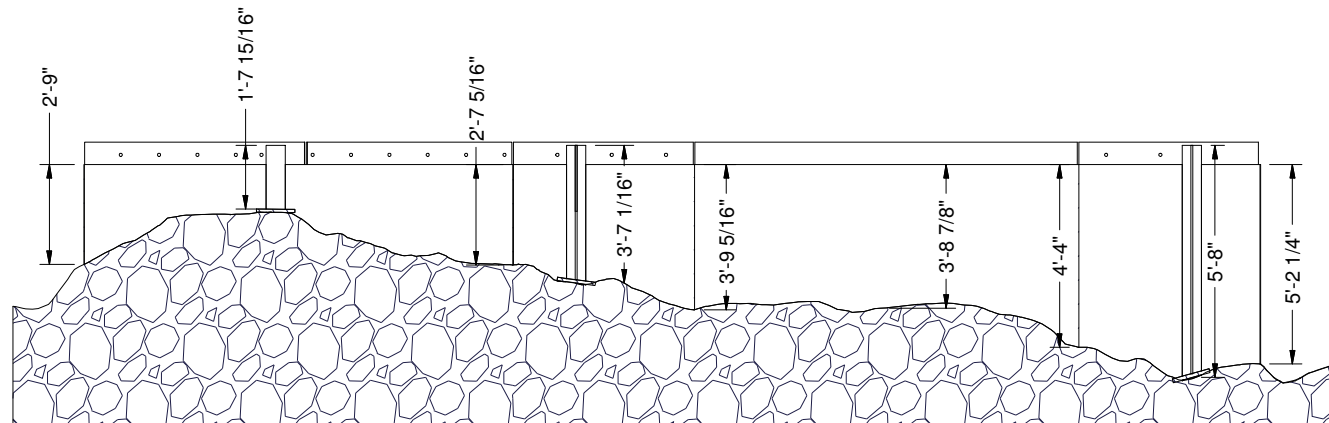
TRIM SKIRT PLATE TO
 SUIT ROCK BED, TYP.



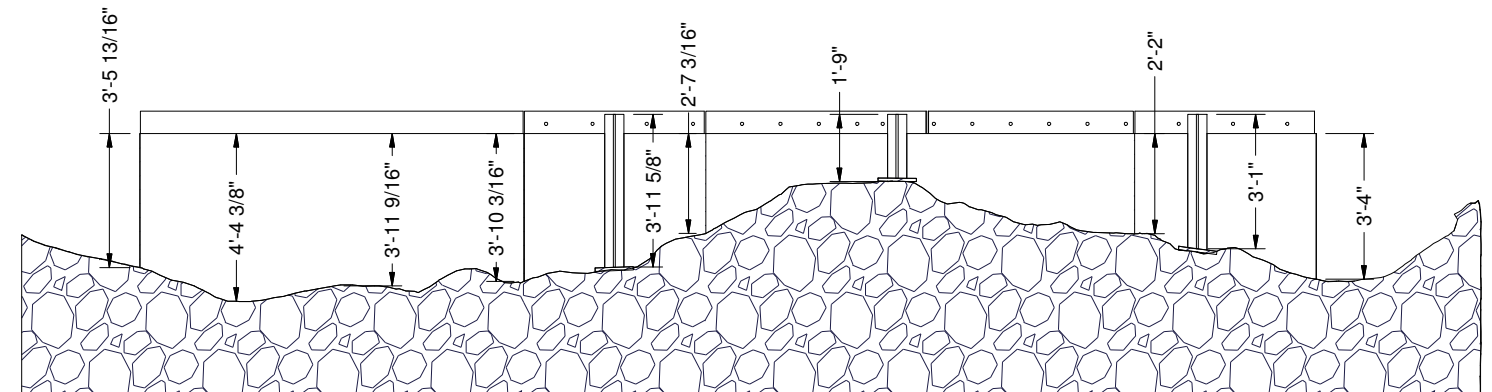
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING EAST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY
		△	AS-BUILT REVISIONS	10/31/2017	A.R.
		△	ID PLATE UPDATED	10/26/2016	A.R.
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.

TOLERANCES-U.N.O.
 LINEAR DIMS: ± 1/16"
 ANGULAR DIMS: ± 1 deg.
 CUT SURFACES: 250
 MACHINED SURFACES: 125
 ALL PIN TOL. TO BE ANSI RC8
 ALL DIMENSIONS IN INCHES

DRWN BY: A.R.
 DATE: 8/29/2016
 CHK'D BY:
 ENG BY: P.C.



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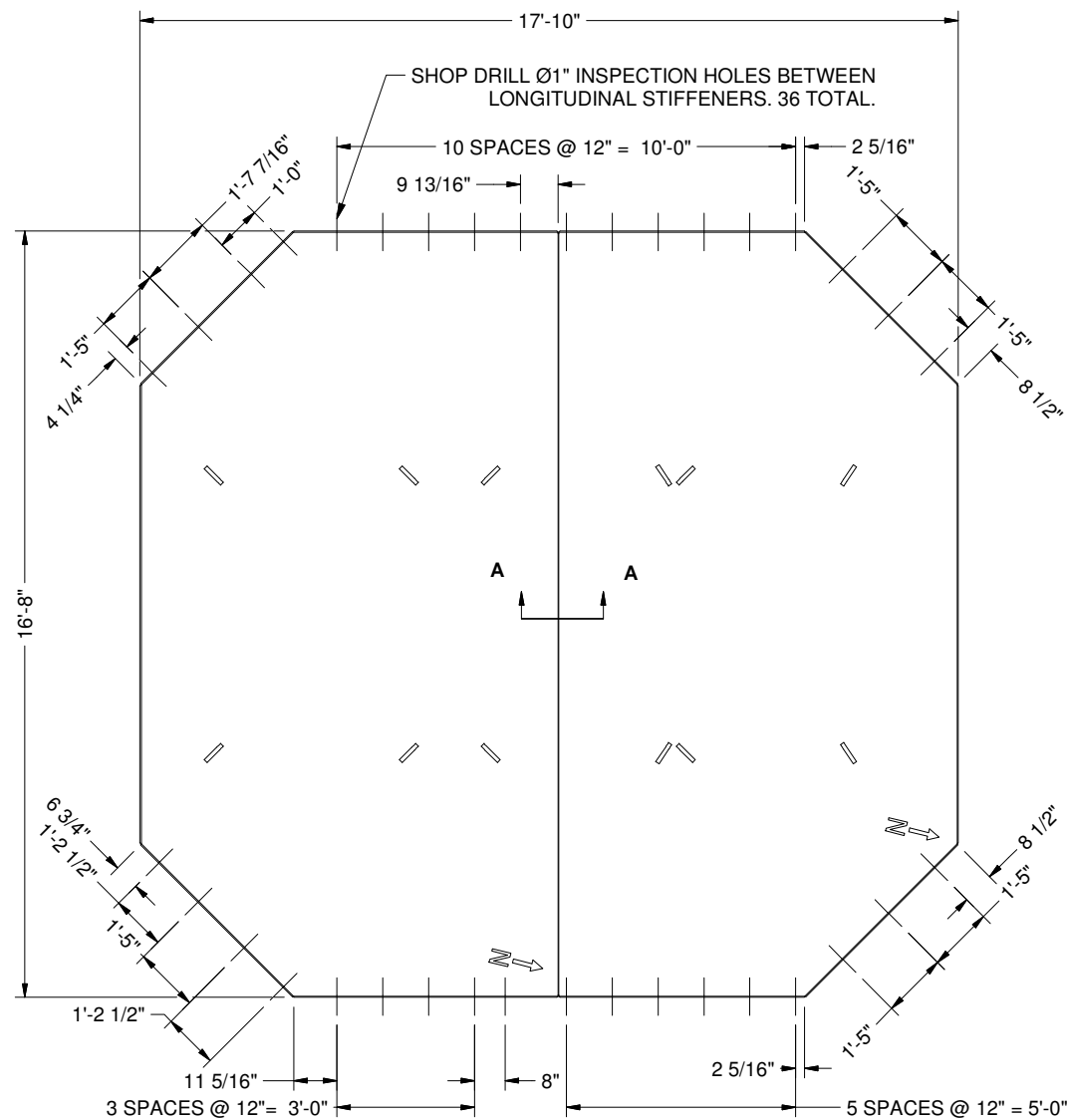
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

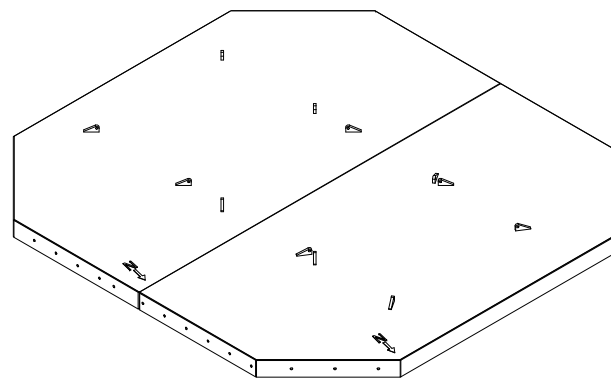
DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 6

DWG. NO.: **S18678-01-2**

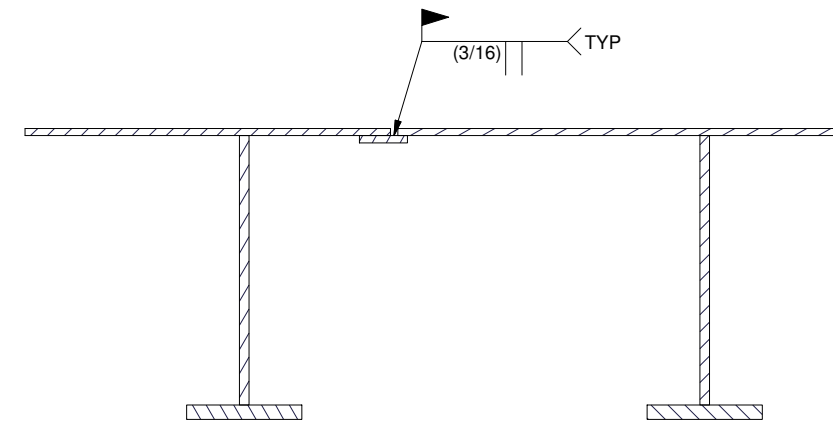
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
4	1	TOP COVER SECTION 1	S18678-A-103		4
5	1	TOP COVER SECTION 2	S18678-A-102		4



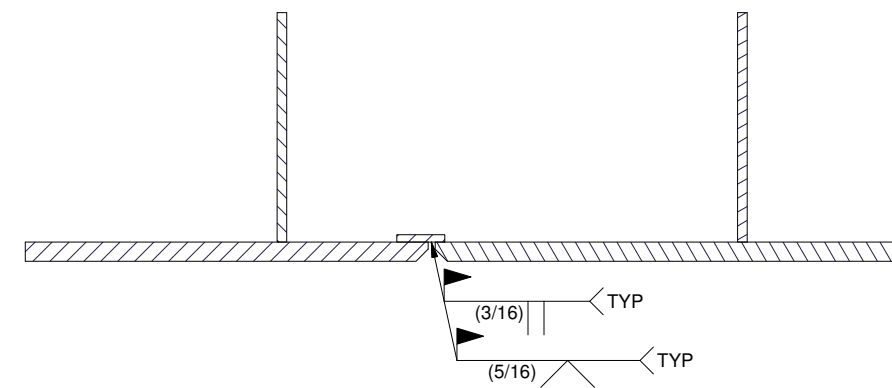
S18678-A-101 - TOP VIEW
TOP PLATE DIMENSIONS



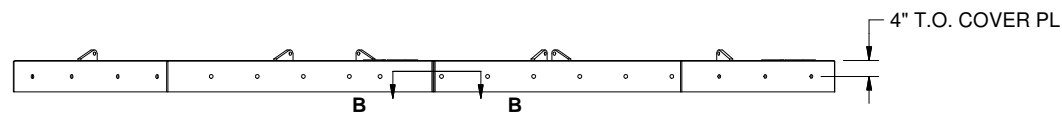
S18678-A-101 - ISO VIEW



SECTION A-A



SECTION B-B



SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
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S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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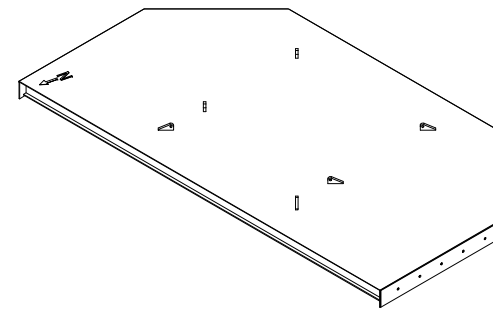
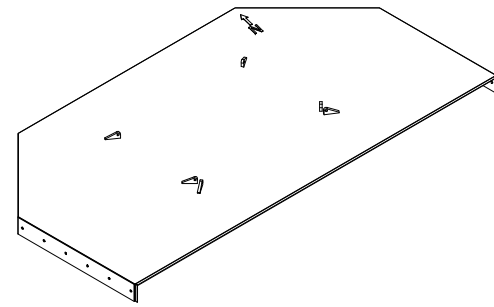
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING
 TOP COVER DETAILS
 LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 3 OF 6 DWG. NO.: **S18678-01-3**

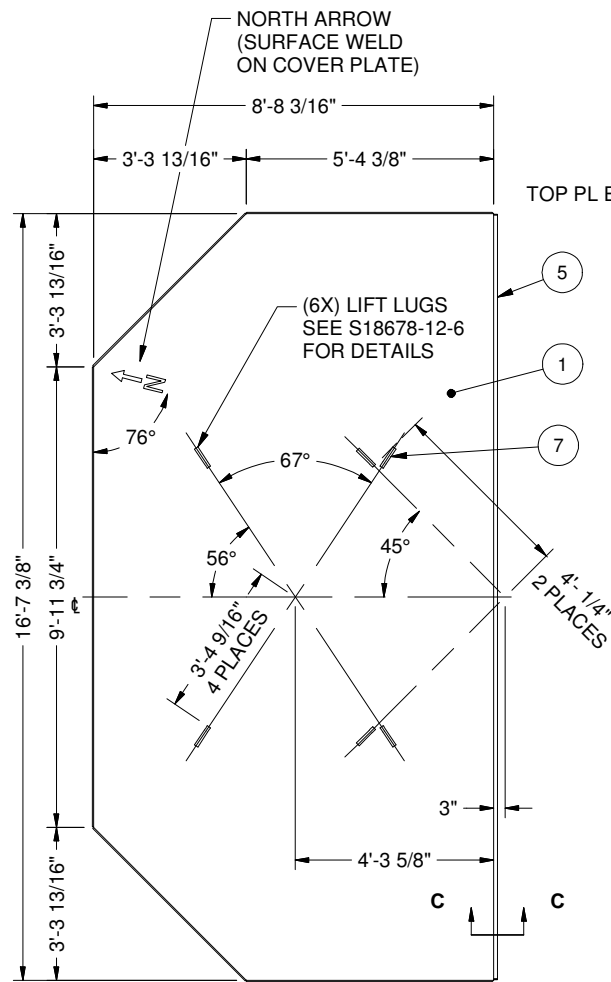
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	3/16" PL	ASTM 1240-316L
2		8"x1/2" FB	ASTM 1240-316L
3		7"x1/4" FB	ASTM 1240-316L
4		3"x3/8" FB	ASTM 1240-316L
5		1 1/4"x1/4" FB	ASTM 1240-316L
6	6	3"x3/8" FB	ASTM 1240-316L
7	6	5/8" PL	ASTM 1240-316L

BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
8	1	3/16" PL	ASTM 1240-316L
9		8"x1/2" FB	ASTM 1240-316L
10		7"x1/4" FB	ASTM 1240-316L
11		3"x3/8" FB	ASTM 1240-316L
12	6	3"x3/8" FB	ASTM 1240-316L
13	6	5/8" PL	ASTM 1240-316L

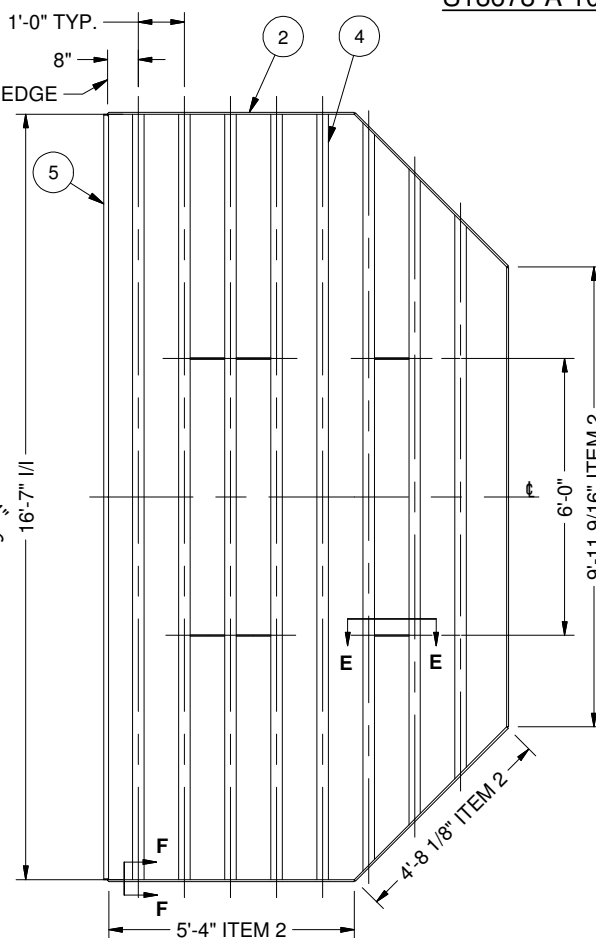


S18678-A-102 - ISO VIEW

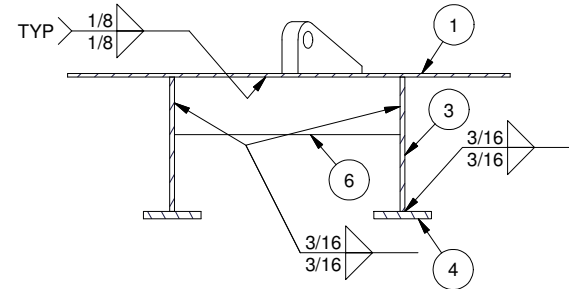
S18678-A-103 - ISO VIEW



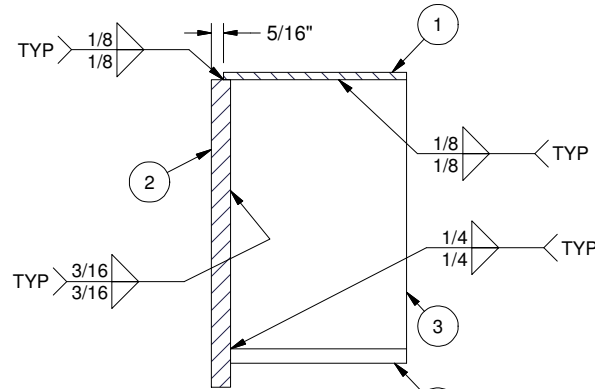
S18678-A-102 - TOP VIEW
TOP PLATE DIMENSIONS



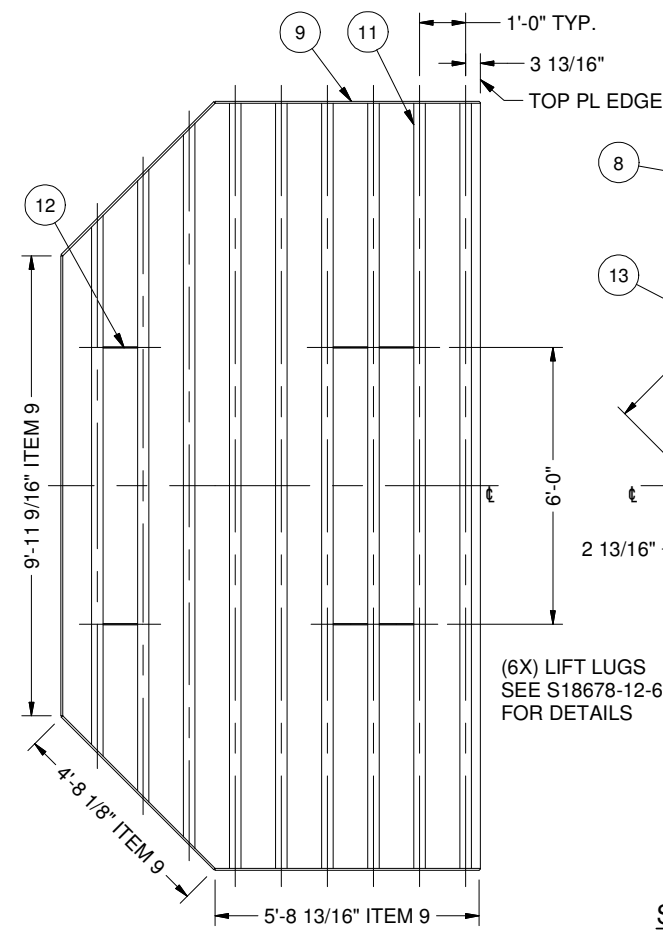
S18678-A-102 - BOTTOM VIEW
STIFFENER LAYOUT



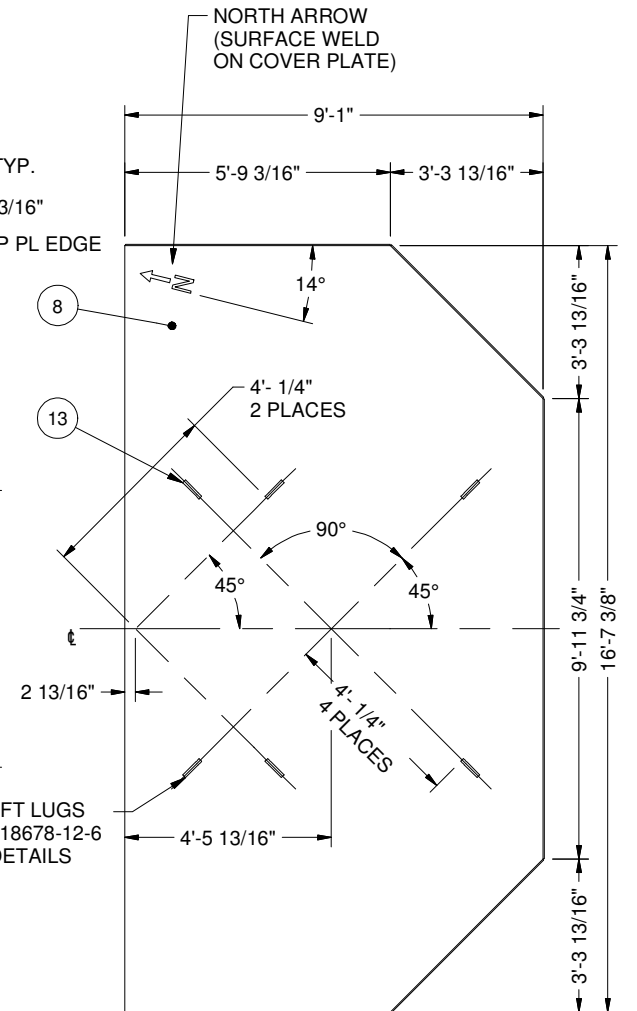
SECTION E-E
SIMILAR FOR S18678-A-103



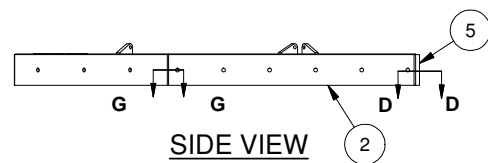
SECTION F-F
SIMILAR FOR S18678-A-103



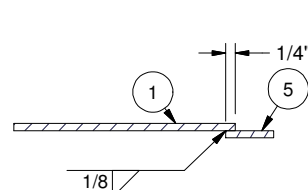
S18678-A-103 - BOTTOM VIEW
STIFFENER LAYOUT



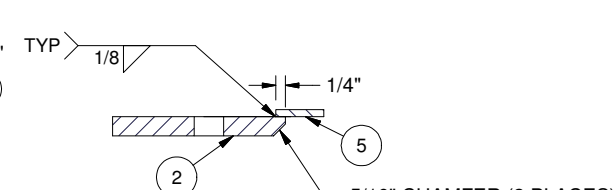
S18678-A-103 - TOP VIEW
TOP PLATE DIMENSIONS



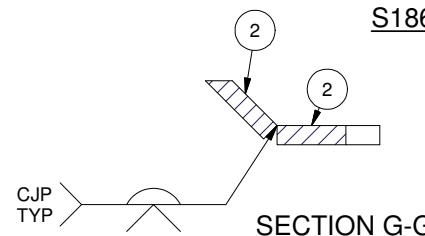
SIDE VIEW



SECTION C-C



SECTION D-D



SECTION G-G

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



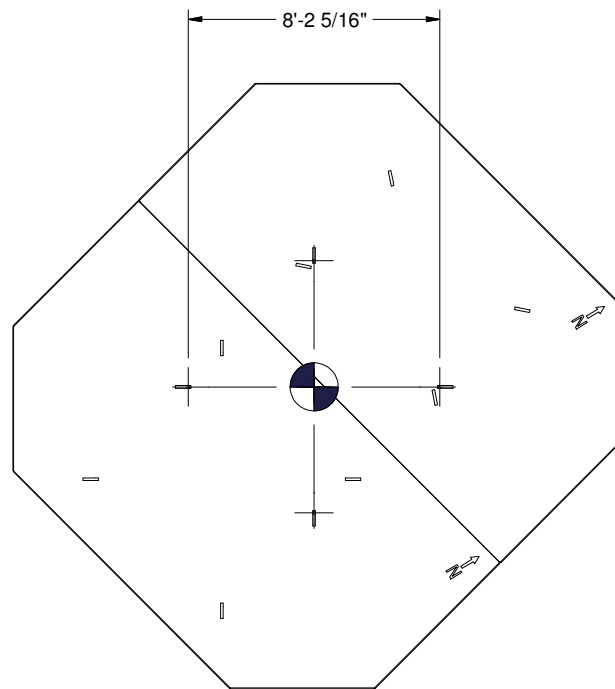
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline: Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

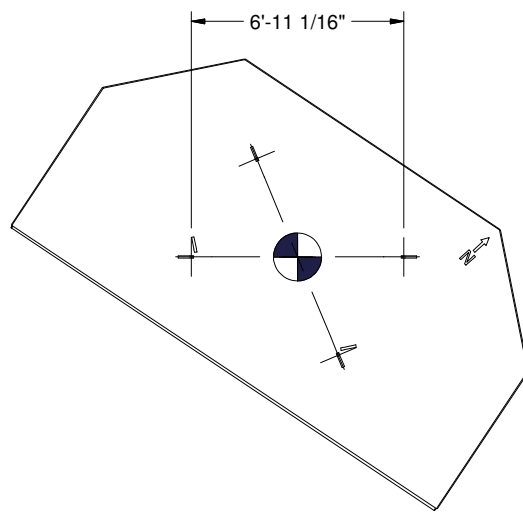
PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING
 TOP COVER SECTIONS
 LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 6

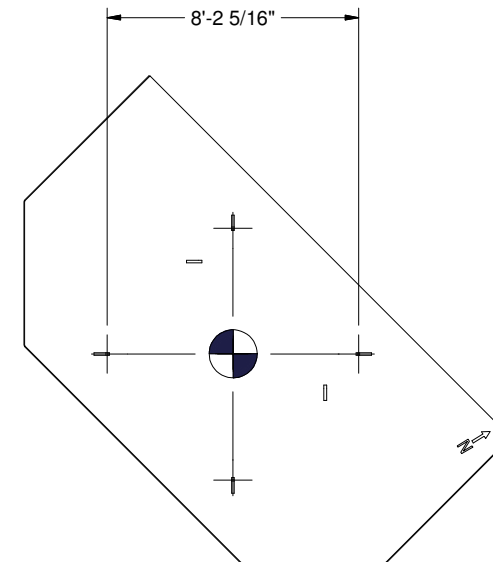
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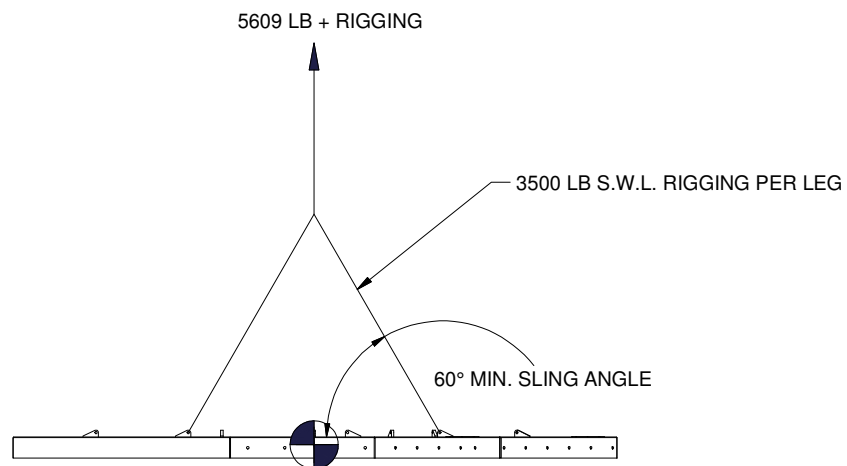
TOP COVER LIFTING DIAGRAM
S18678-A-101



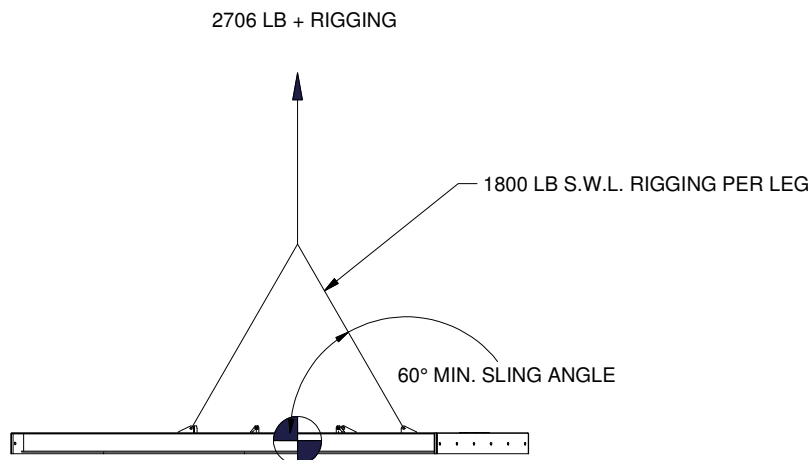
TOP COVER LIFTING DIAGRAM
S18678-A-102



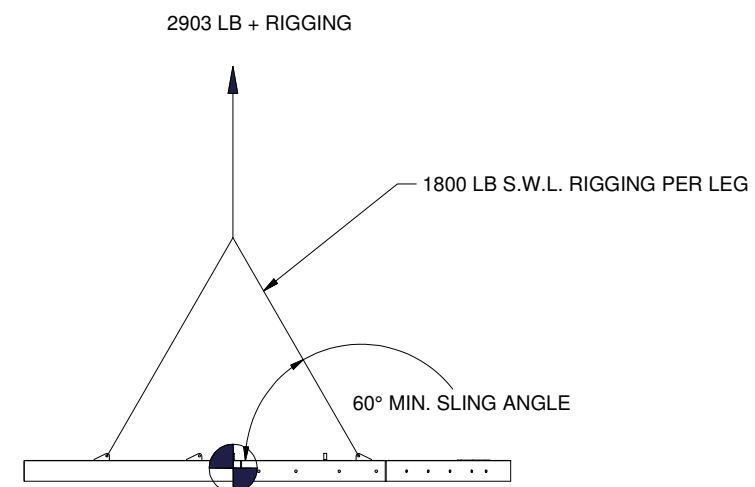
TOP COVER LIFTING DIAGRAM
S18678-A-103



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-101



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-102



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-103

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ± 0.005 MACHINED SURFACES: ± 0.0025 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	

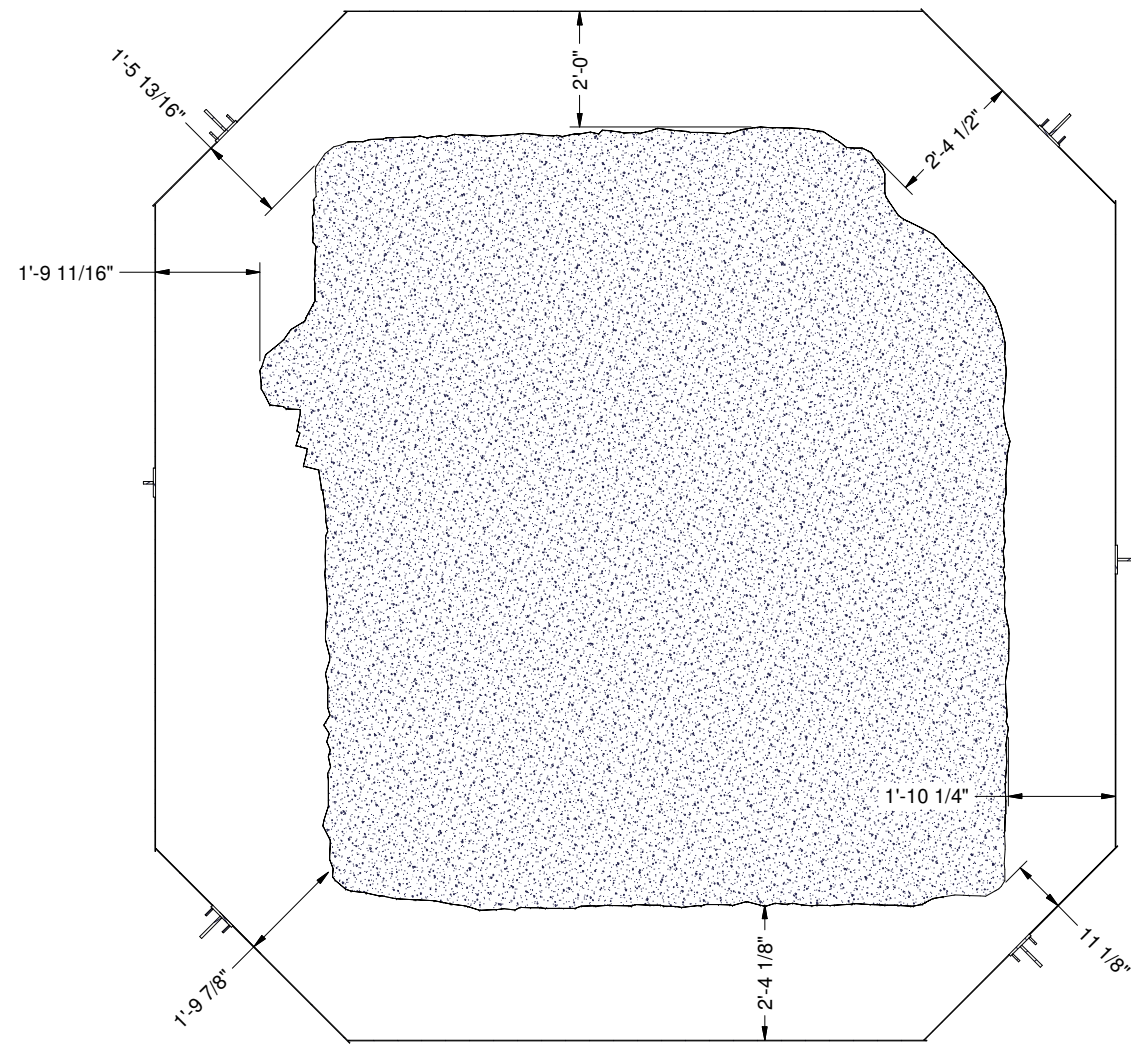


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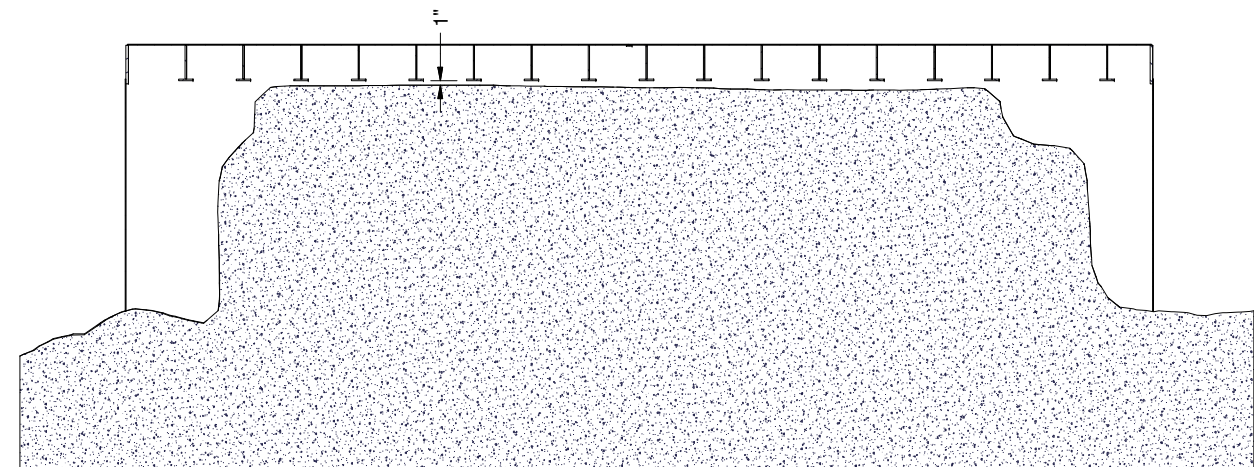
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING
 LIFTING DETAILS
 LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 6 DWG. NO.: S18678-01-5



OPENING TO SKIRT CLEARANCE

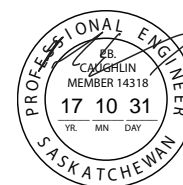


OPENING TO TOP COVER CLEARANCE


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
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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 Structural 14318

Kova Engineering Saskatchewan Ltd. 

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 2 OPENING CLEARANCES
 LOCATION: 59°33'35.0"N 108°27'47.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 6 DWG. NO.: **S18678-01-6** 

ACE 3 – 2158 Raise



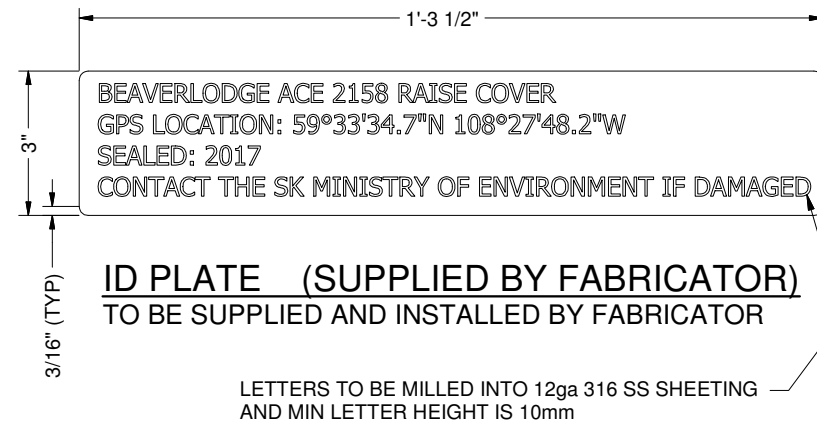
ACE 3 – 2158 Raise

GENERAL NOTES:

1. ALL STRUCTURAL PLATE MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

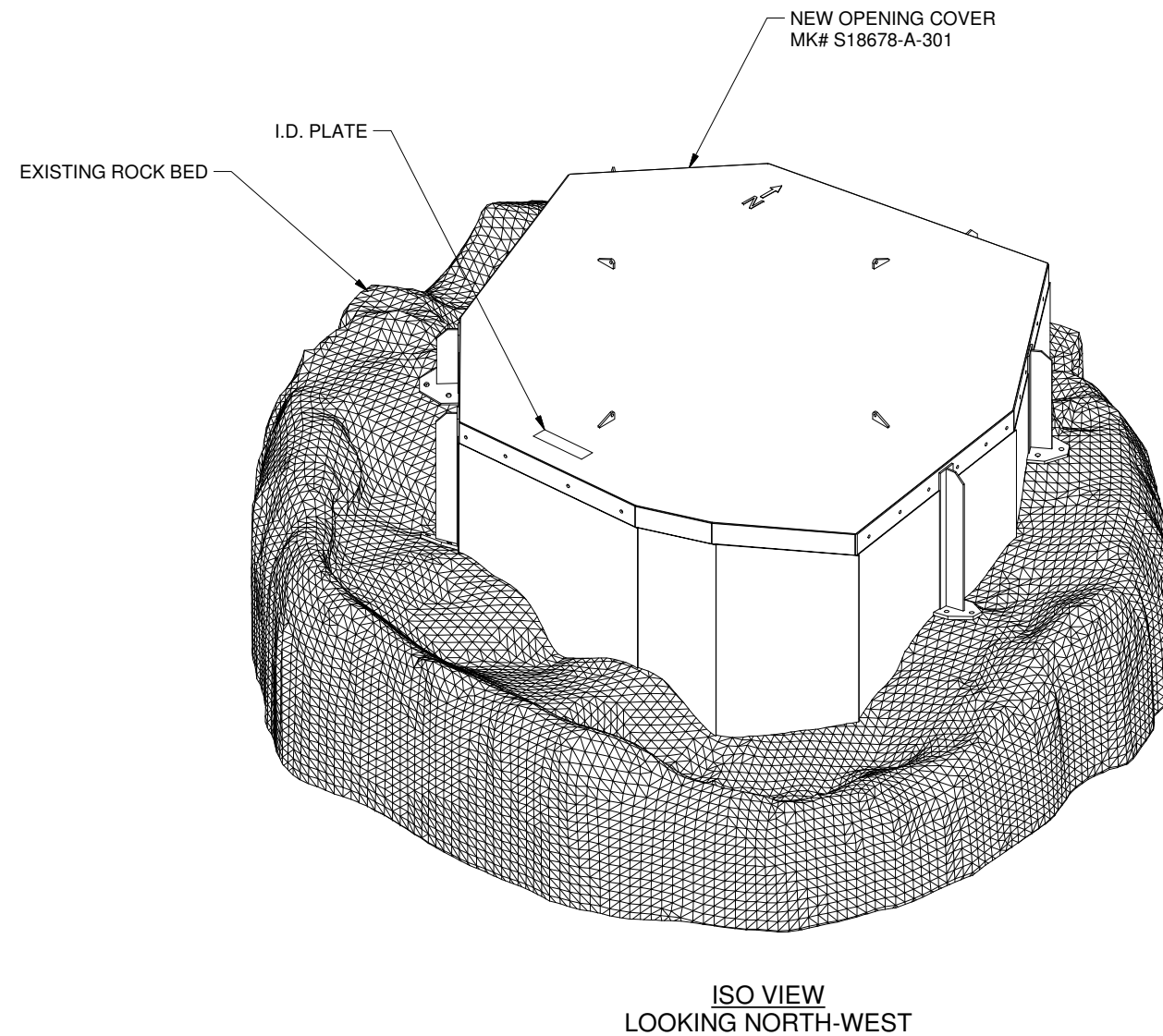
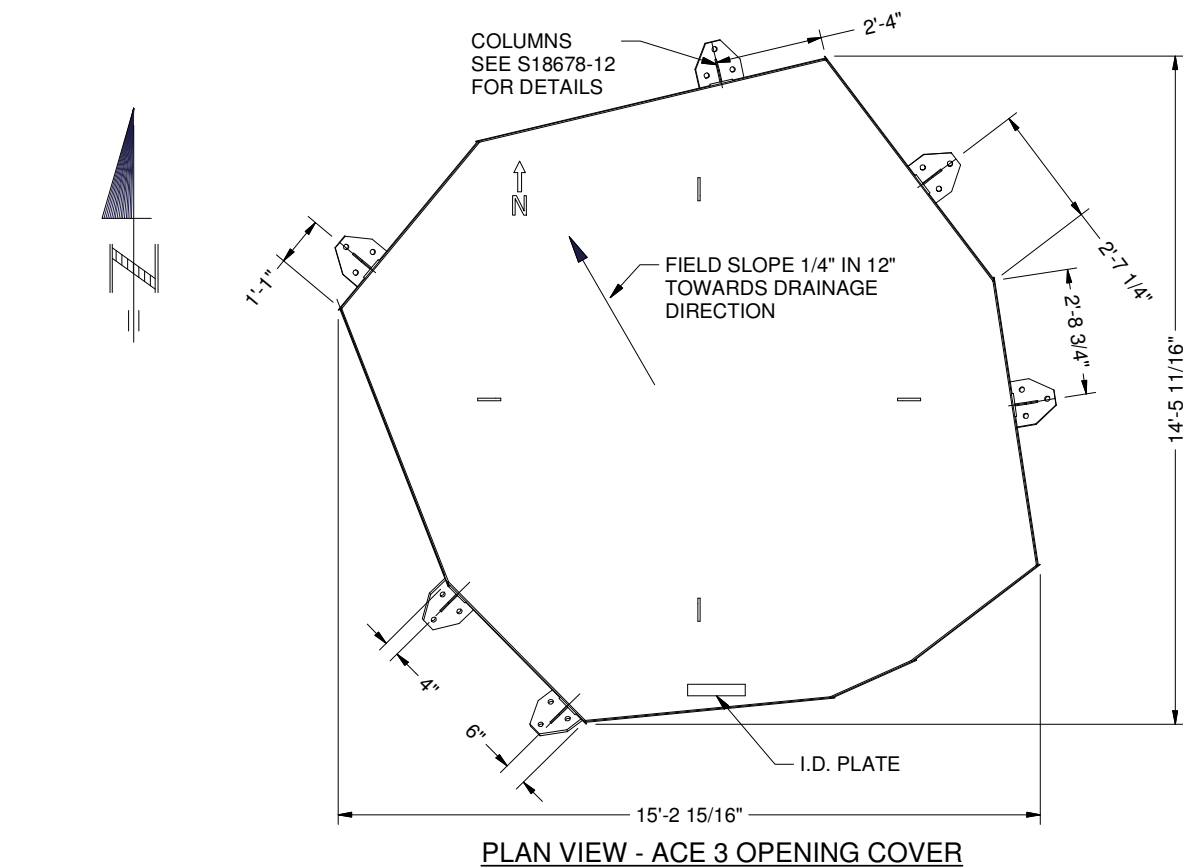
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 5796 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 4285 LB
AS INSTALLED: 5796 LB

ID PLATE (SUPPLIED BY FABRICATOR)
TO BE SUPPLIED AND INSTALLED BY FABRICATOR

LETTERS TO BE MILLED INTO 12ga 316 SS SHEETING
AND MIN LETTER HEIGHT IS 10mm



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BULT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

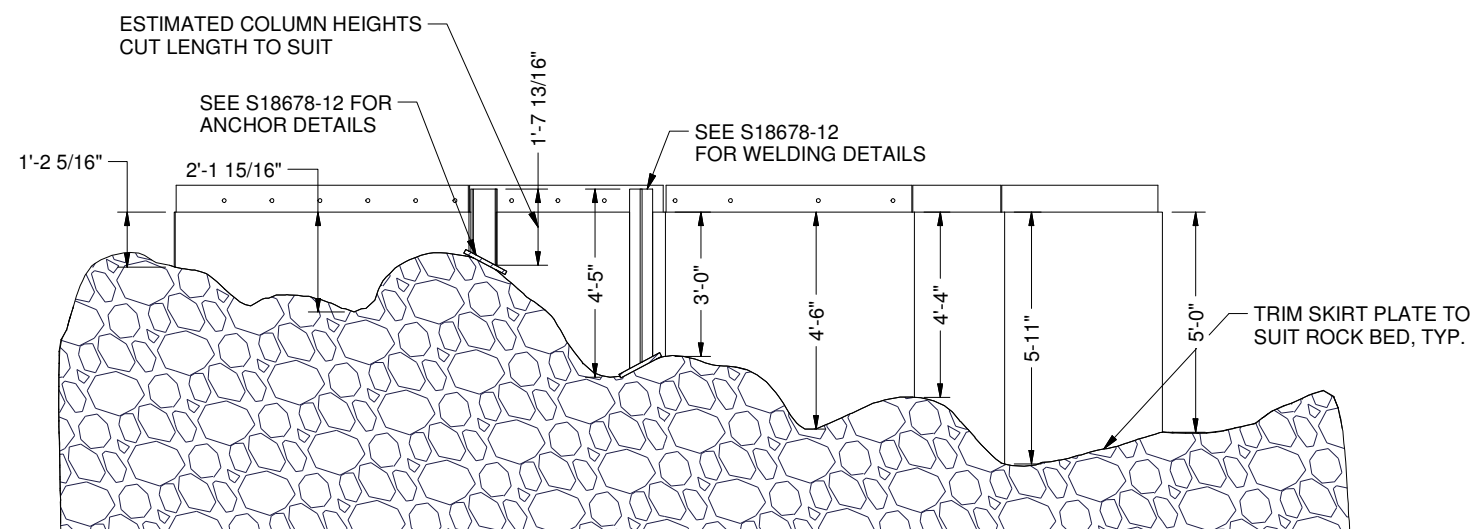
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

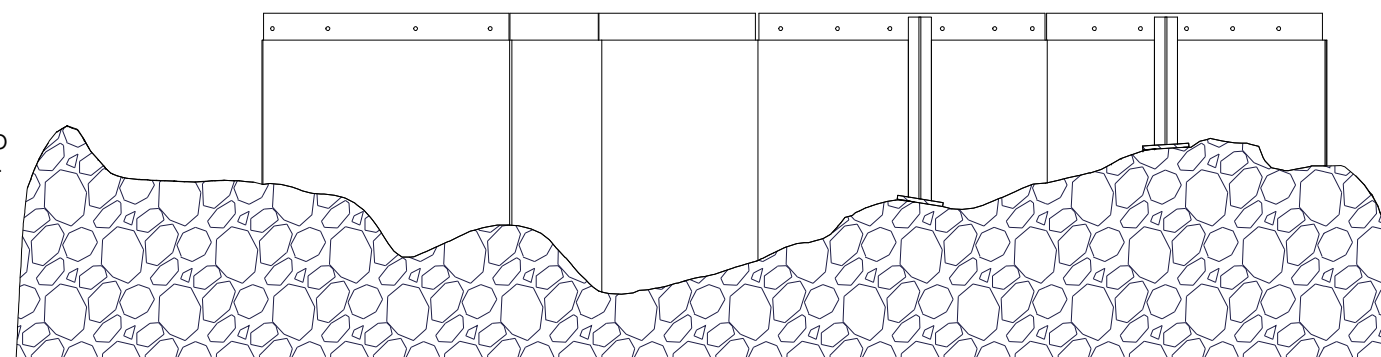
DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 6

DWG. NO.: S18678-03-1

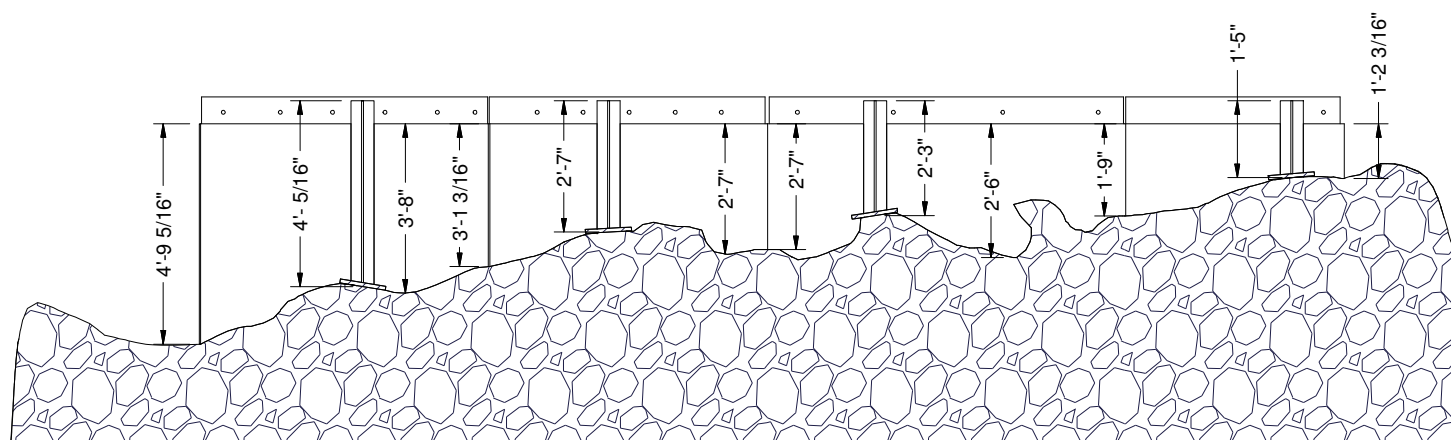
ESTIMATED TOTAL COLUMN LENGTH 196" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



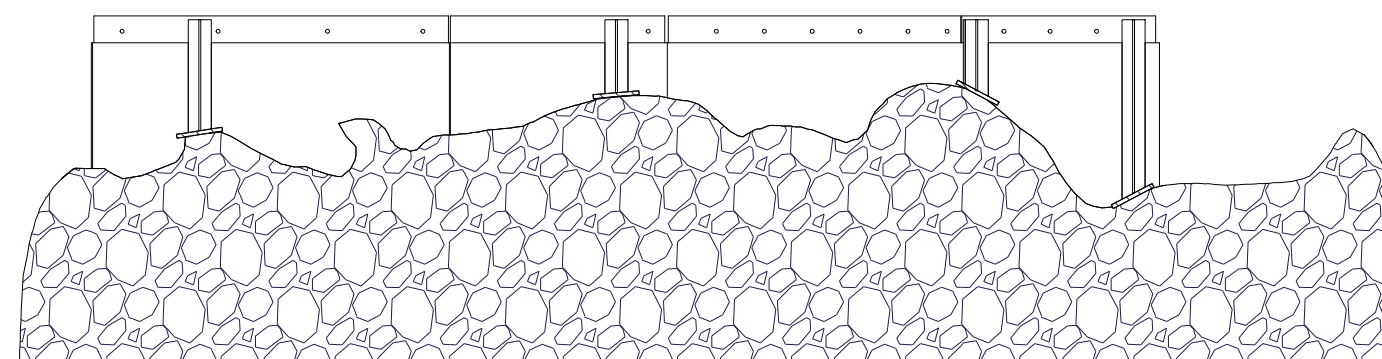
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BULT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ± 0.005 MACHINED SURFACES: ± 0.005 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	

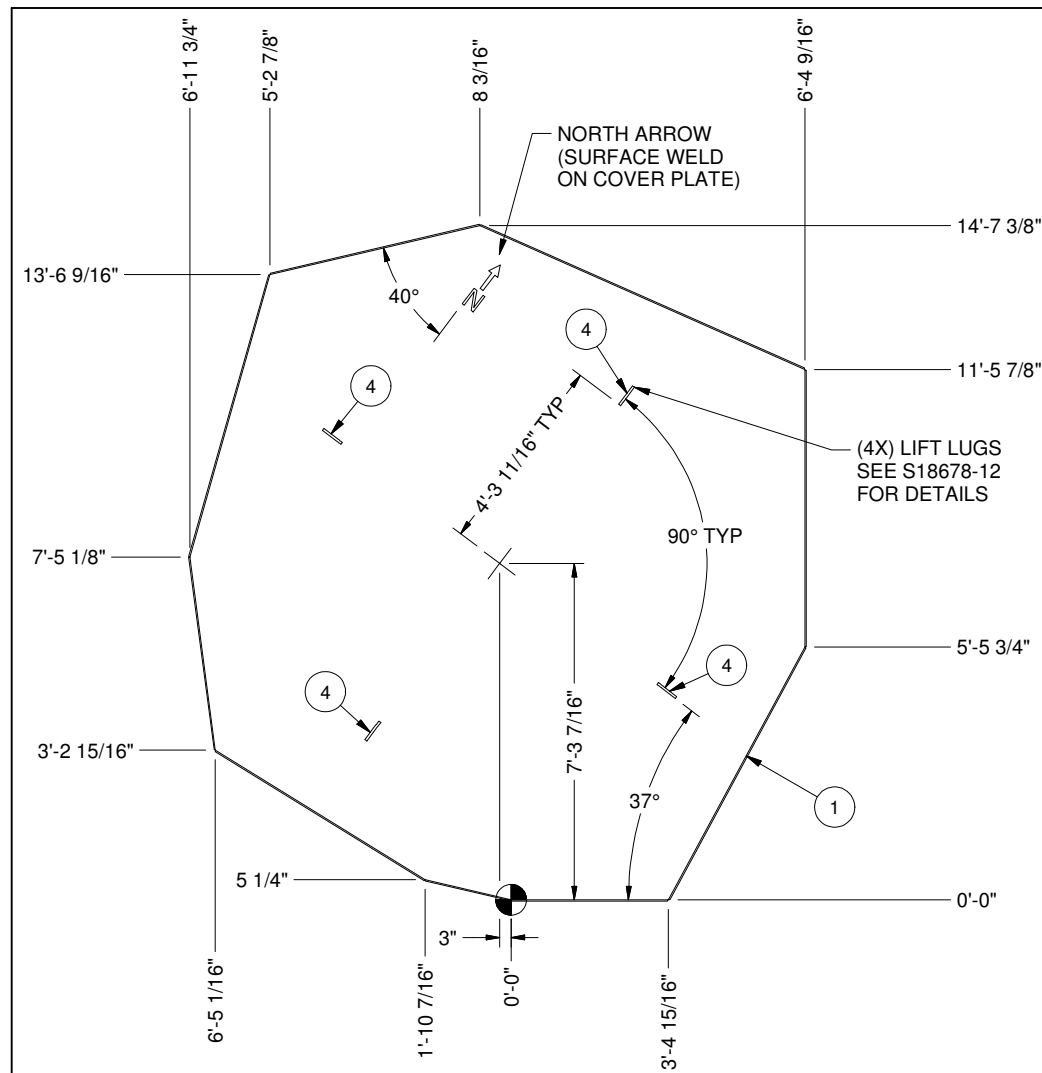


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CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

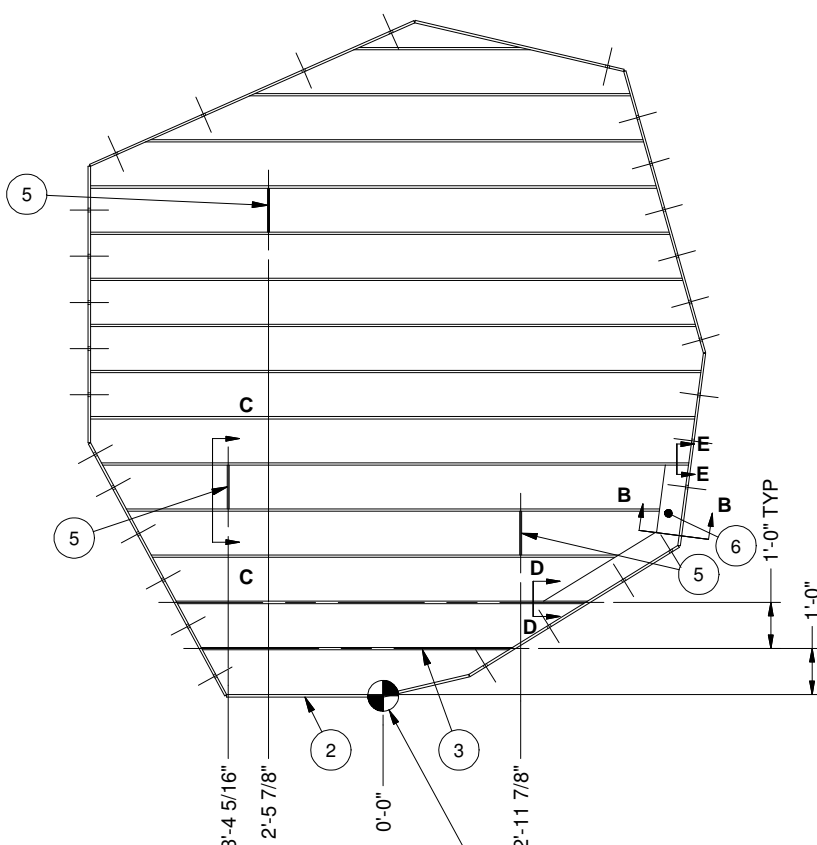
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 6 DWG. NO.: S18678-03-2

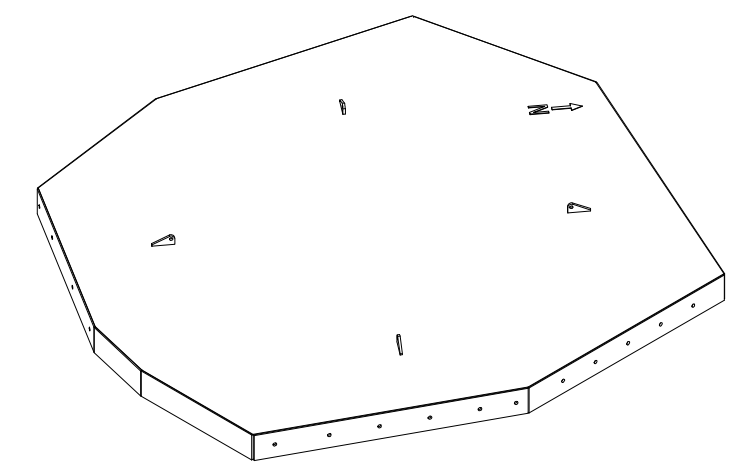


S18678-A-301 - TOP VIEW
TOP PLATE DIMENSIONS

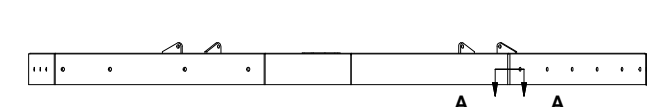


BOTTOM VIEW
STIFFENER LAYOUT

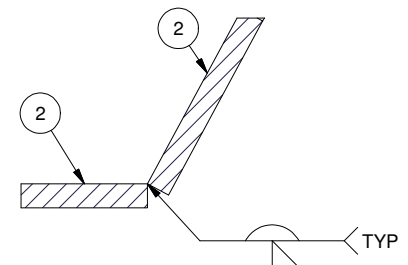
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	3/16" PL	ASTM A240-316L
2		8" x 5/8" FB	ASTM A240-316L
3		7" x 5/8" FB	ASTM A240-316L
4	4	5/8" PL	ASTM A240-316L
5	3	3" x 1/2" FB	ASTM A240-316L
6	1	1/2" PL	ASTM A240-316L



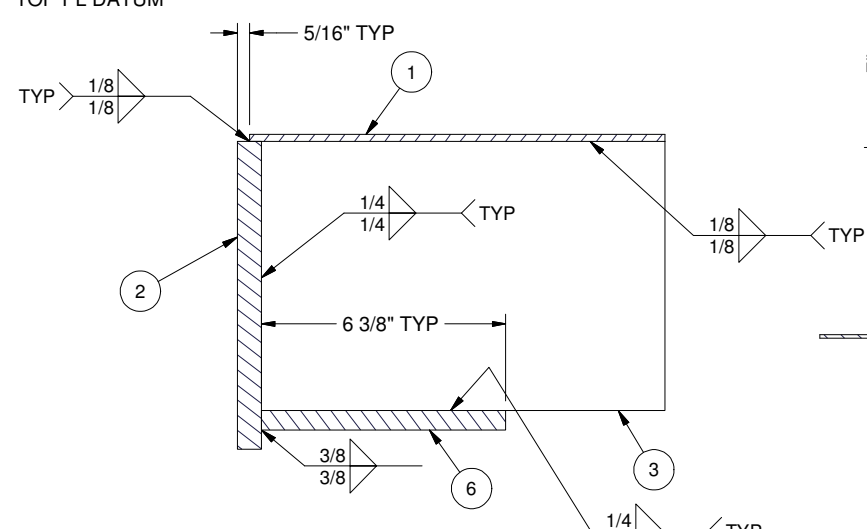
ISO VIEW



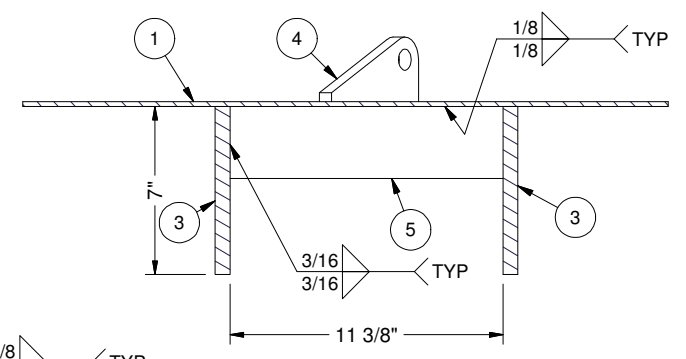
SIDE VIEW



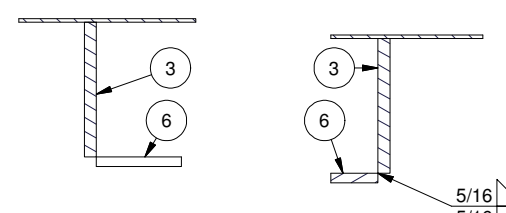
SECTION A-A
TYP CORNER WELDING



SECTION B-B



SECTION C-C



SECTION D-D

SECTION E-E

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



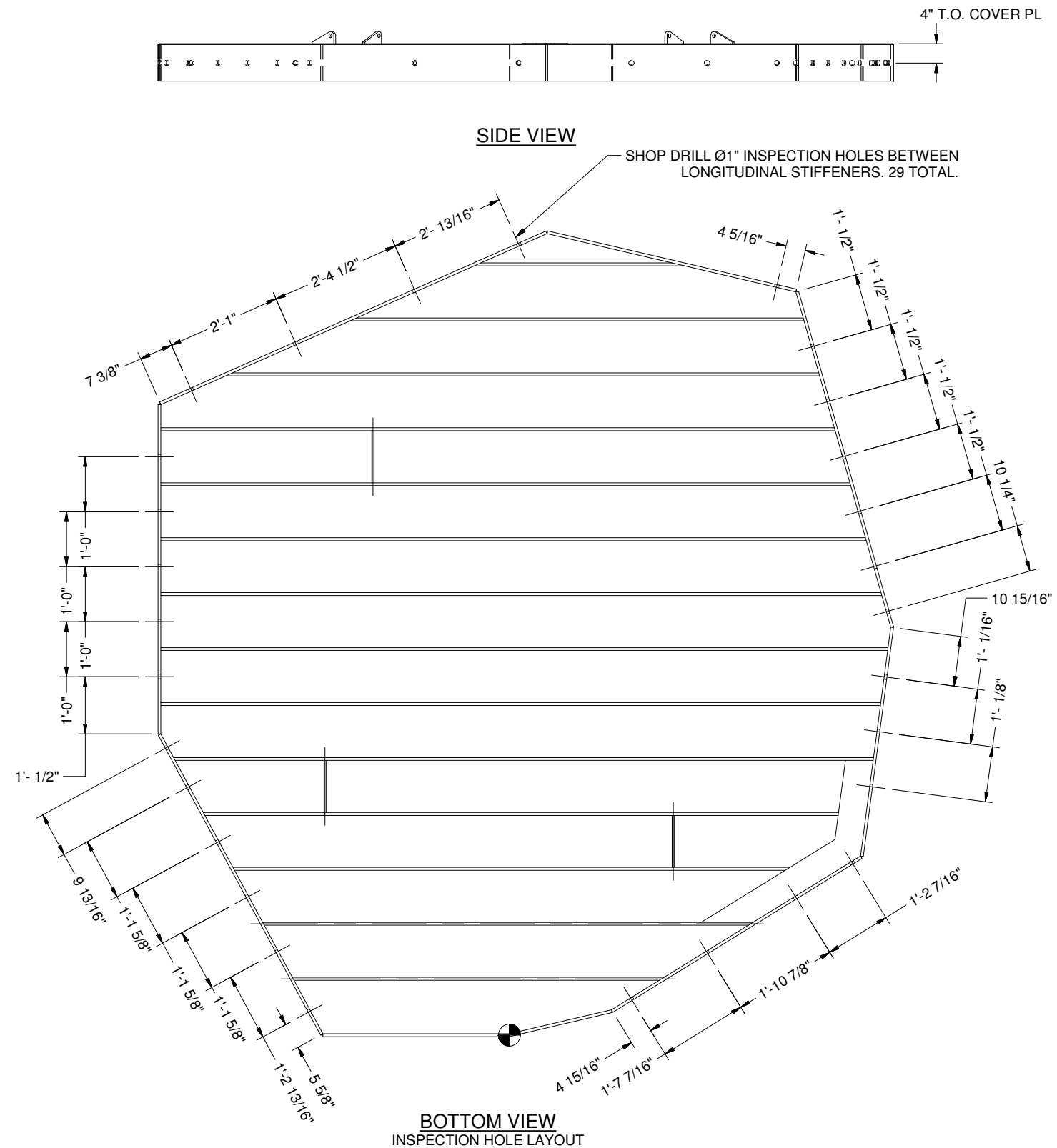
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING
 TOP COVER DETAILS
 LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 6

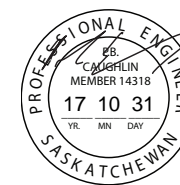
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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BULT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	

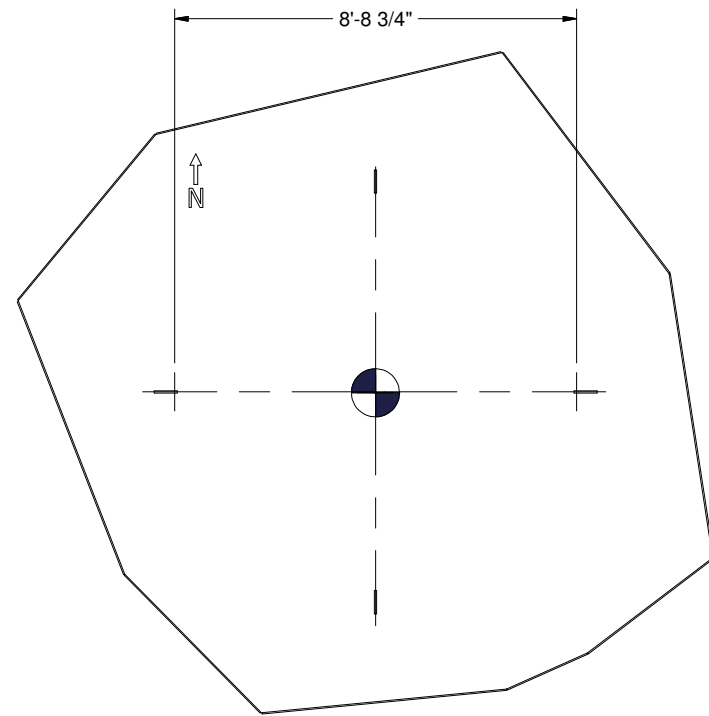


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by: _____
 Discipline: Structural Sk. Reg. No. 14318 Signature: _____

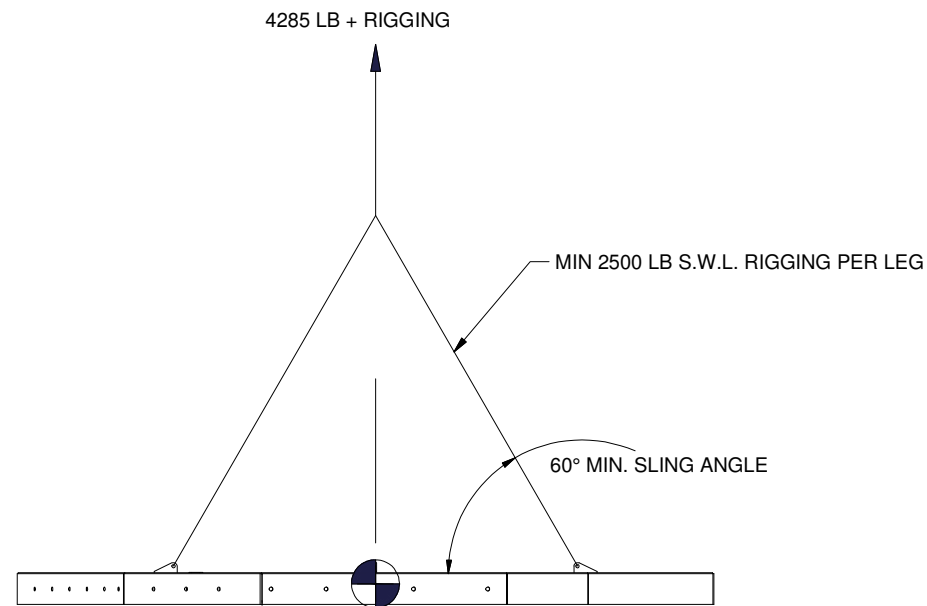
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING
 INSPECTION HOLE LOCATIONS
 LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 6 DWG. NO.: **S18678-03-4**



TOP COVER LIFTING DIAGRAM - TOP VIEW



TOP COVER LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	

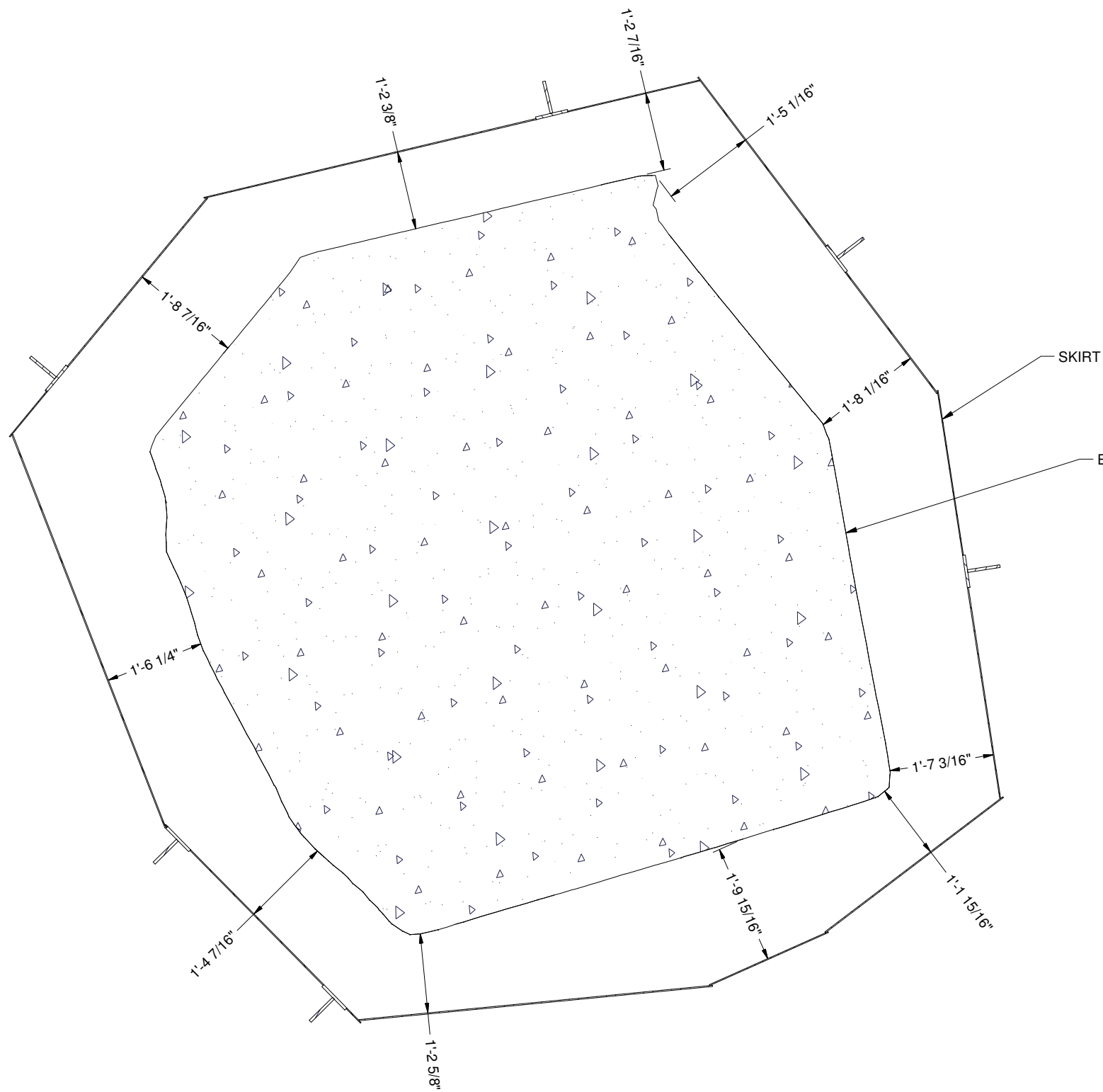


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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

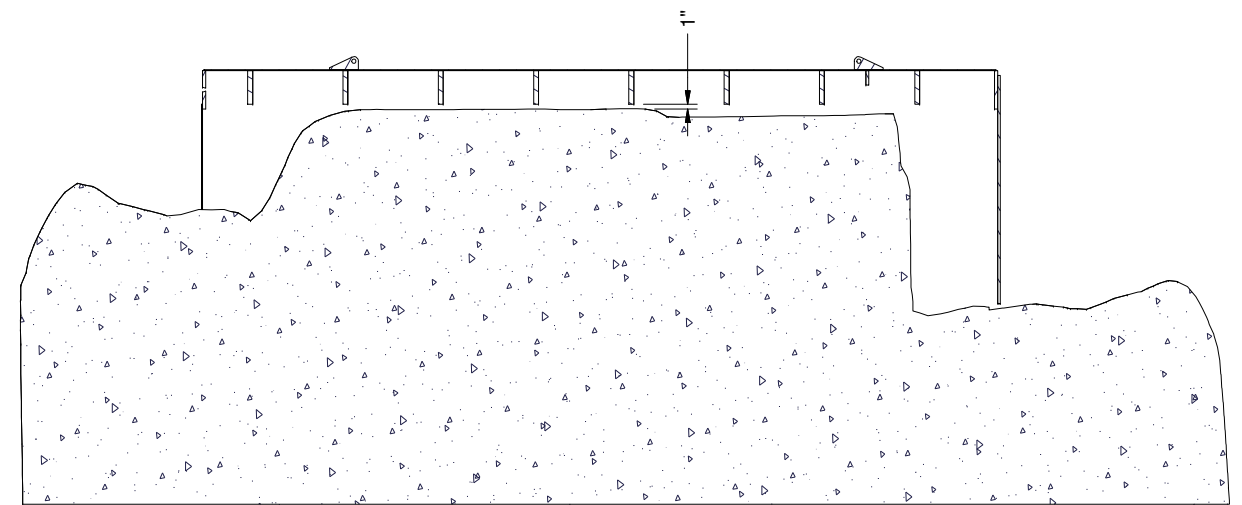
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING
 LIFTING DETAILS
 LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 6 DWG. NO.: **S18678-03-5**



OPENING TO SKIRT CLEARANCE

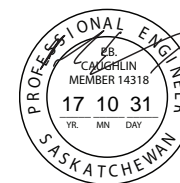


OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BULT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by: _____
 Discipline: Structural Sk. Reg. No. 14318 Signature: _____

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 3 OPENING CLEARANCES
 LOCATION: 59°33'34.7"N 108°27'48.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 6 DWG. NO.: **S18678-03-6**

ACE 4 – 130 Raise



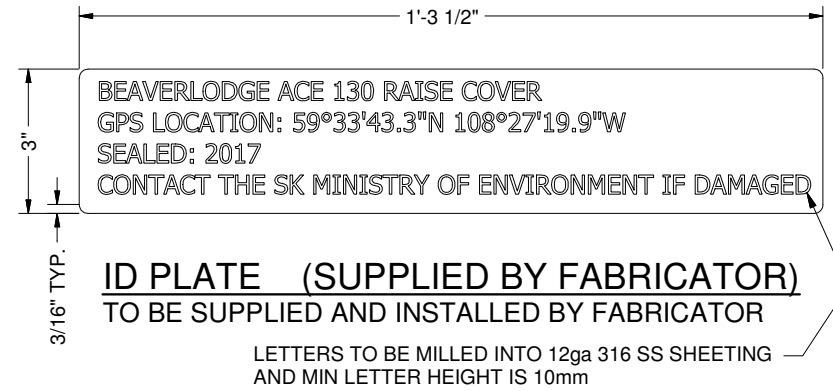
ACE 4 – 130 Raise

GENERAL NOTES:

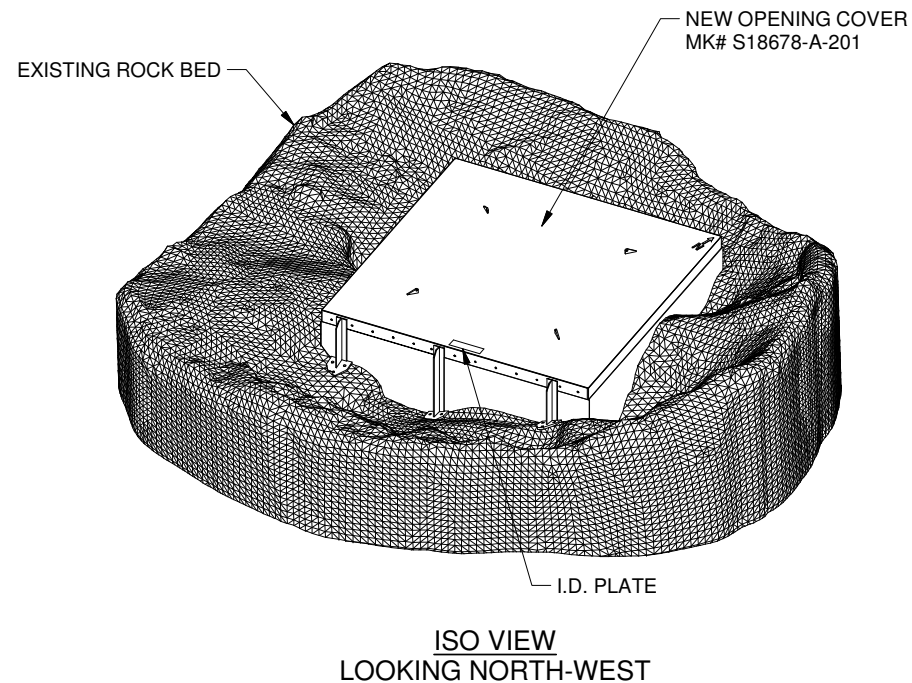
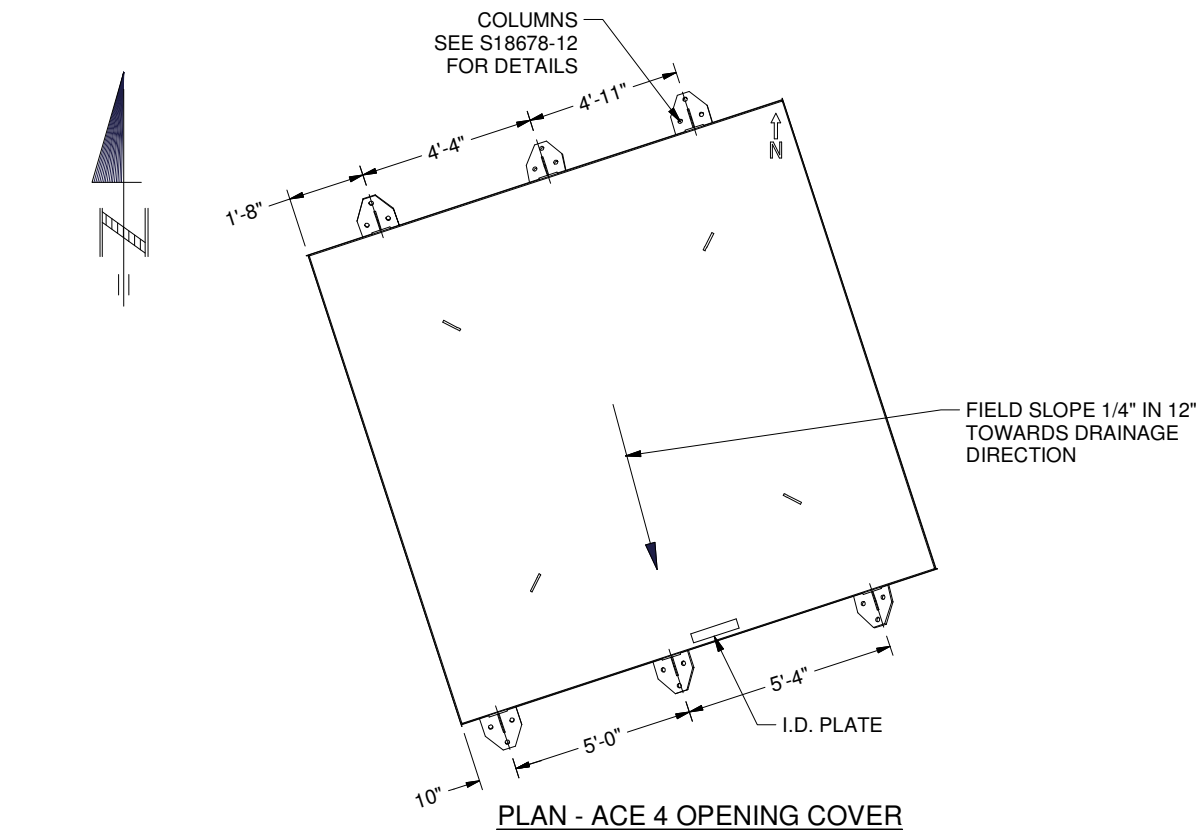
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 4,810 LB
5. DO NOT BACK FILL WALLS OF COVER.



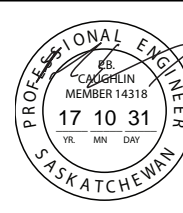
ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 3,805 LB
AS INSTALLED: 4,810 LB



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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	DRWN BY: A.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



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Structural 14318

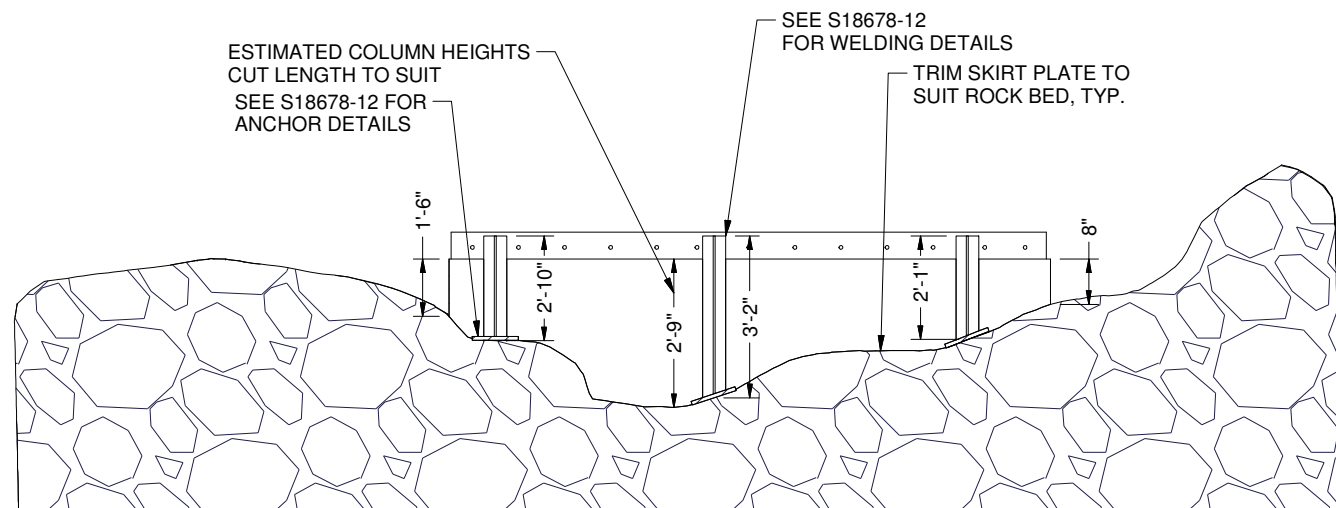
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 4 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°33'43.3"N 108°27'19.9"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

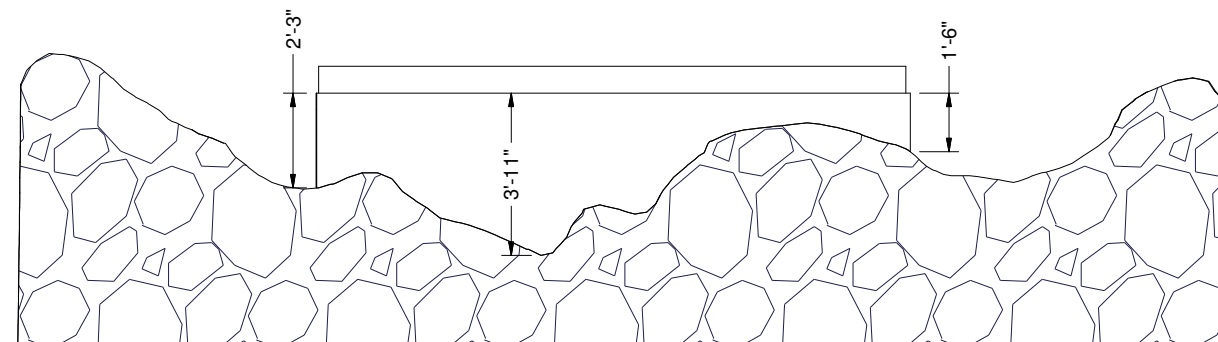
DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 5

DWG. NO.: **S18678-02-1**

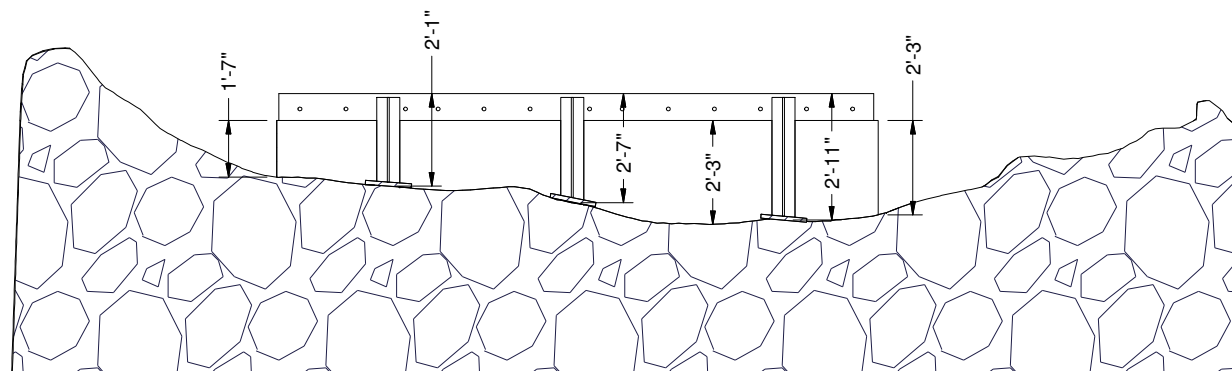
ESTIMATED TOTAL COLUMN LENGTH 182" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



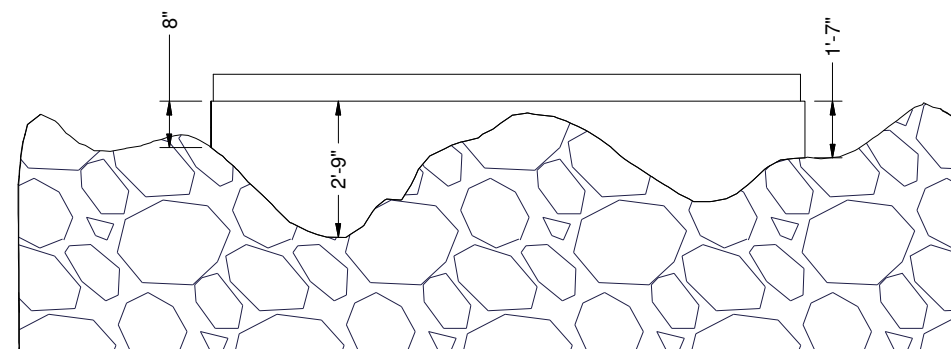
ELEVATION - LOOKING NORTH-WEST



ELEVATION - LOOKING NORTH-EAST



ELEVATION - LOOKING SOUTH-EAST



ELEVATION - LOOKING SOUTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



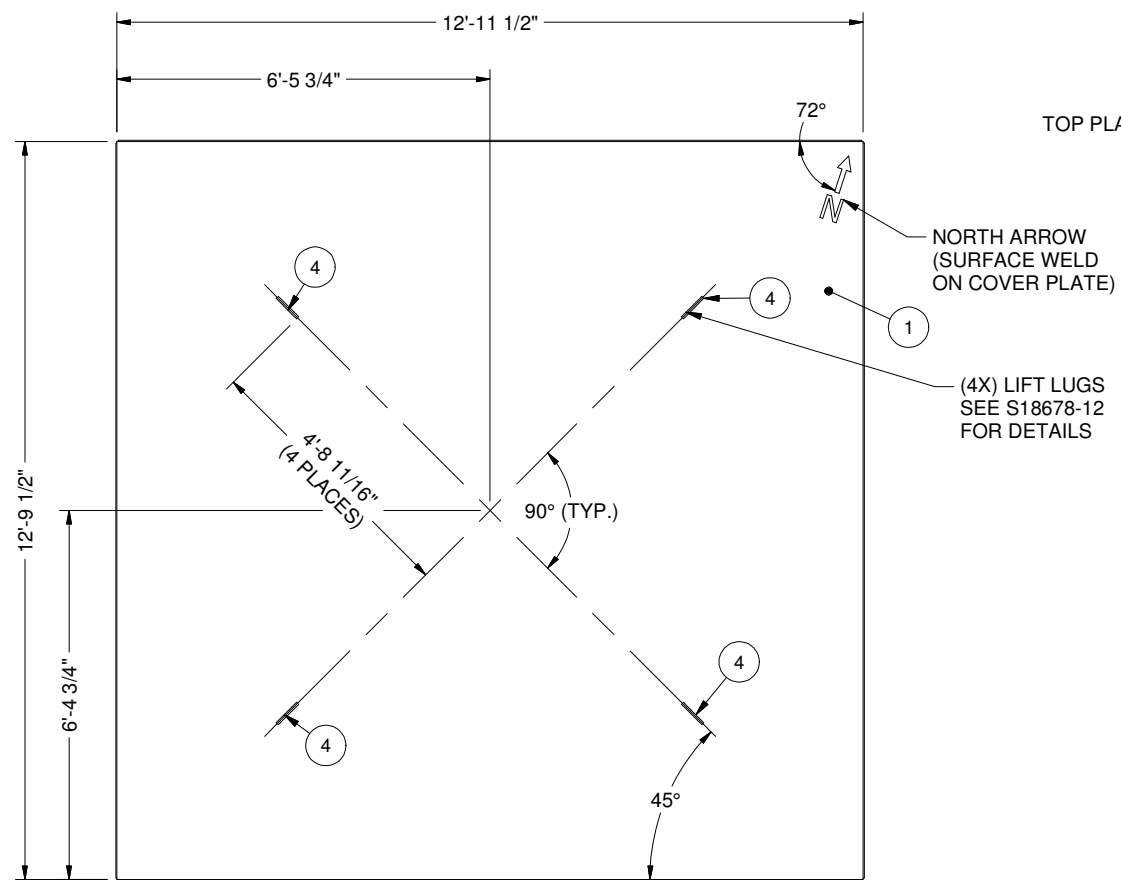
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

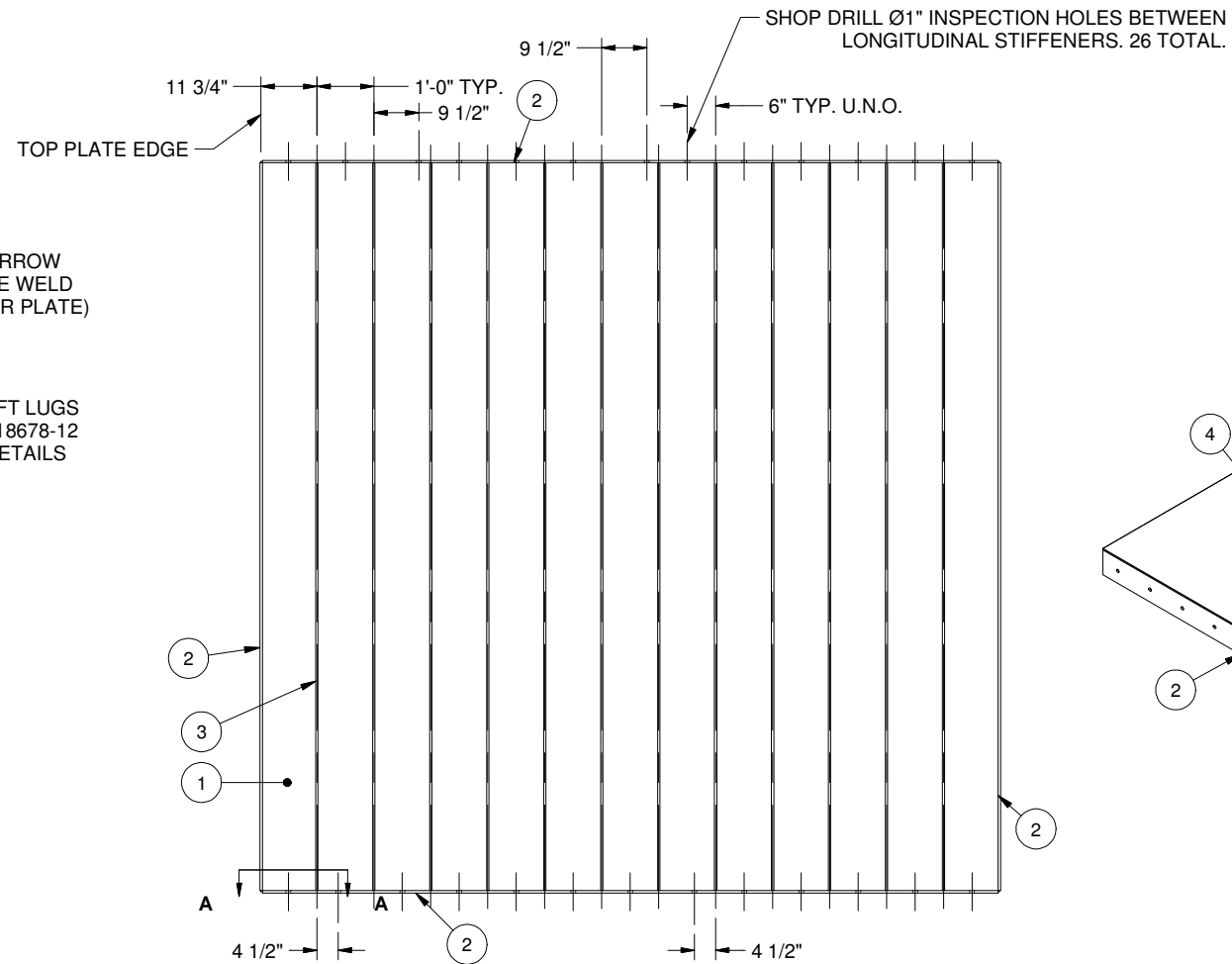
PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 4 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°33'43.3"N 108°27'19.9"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 5 DWG. NO.: S18678-02-2

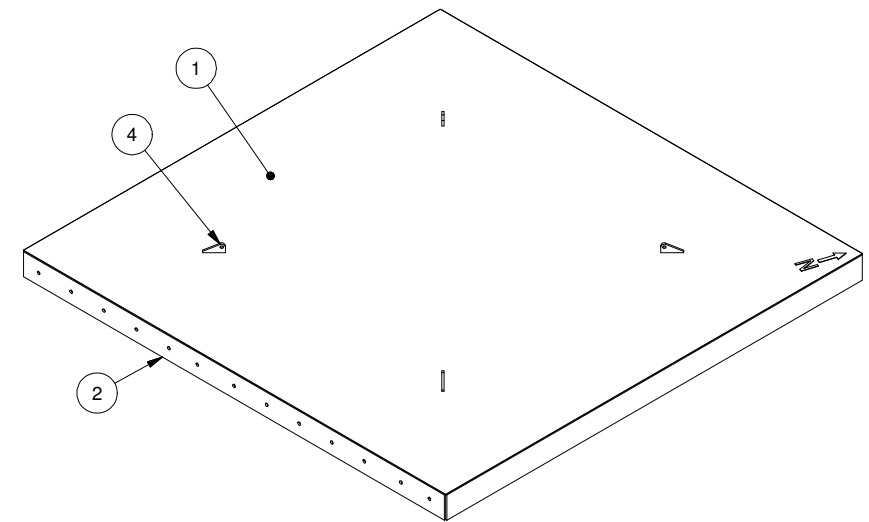
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2		8" x 1/2" FB	ASTM A240-316L	
3		7" x 1/2" FB	ASTM A240-316L	
4	4	5/8" PL	ASTM A240-316L	



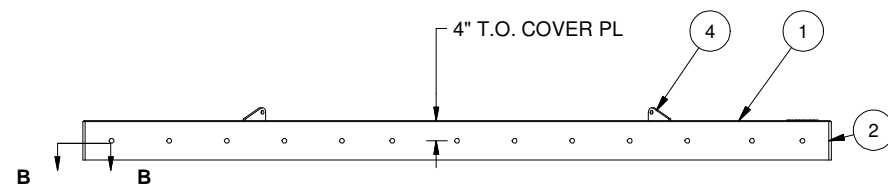
S18678-A-201 - TOP VIEW
TOP PLATE DIMENSIONS



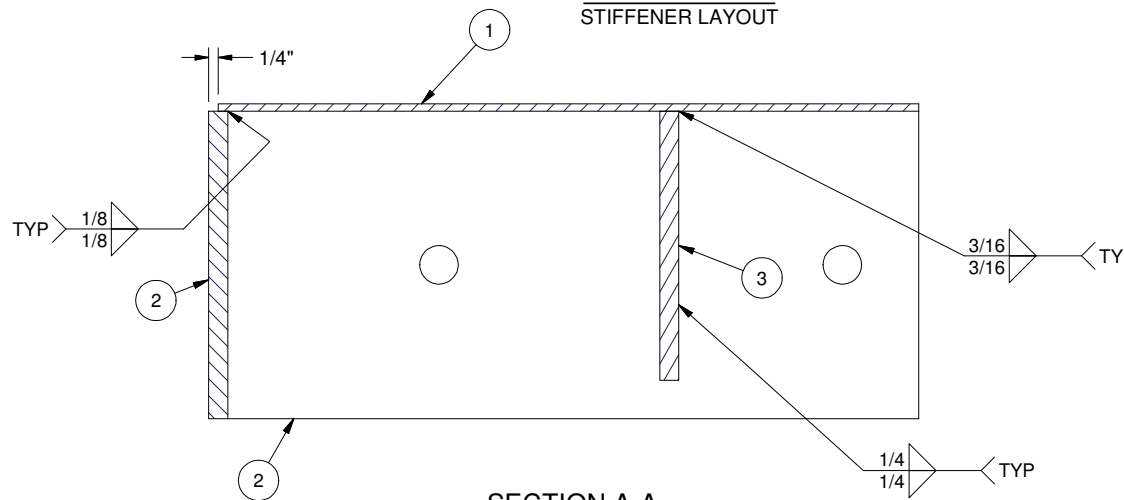
BOTTOM VIEW
STIFFENER LAYOUT



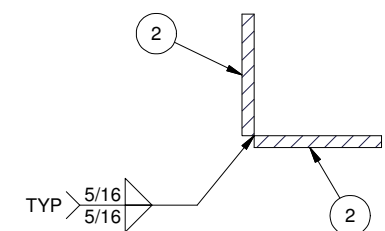
ISO VIEW



SIDE VIEW



SECTION A-A



SECTION B-B

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	DRWN BY: A.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



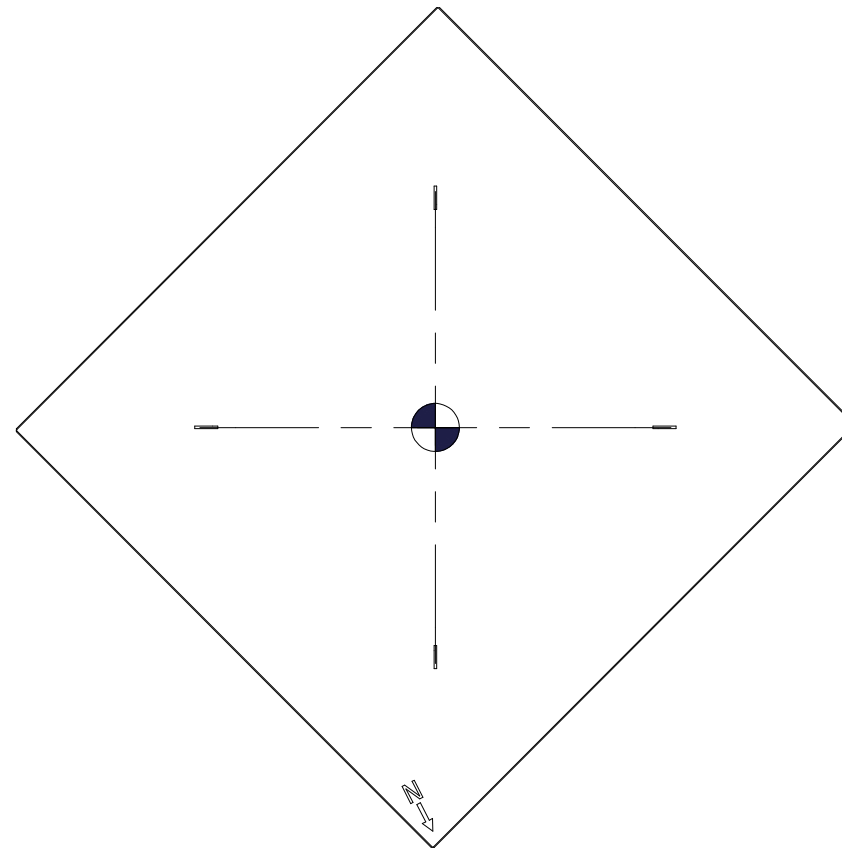
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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by: Signature
Discipline Sk. Reg. No. 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 4 OPENING
TOP COVER DETAILS
LOCATION: 59°33'43.3"N 108°27'19.9"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

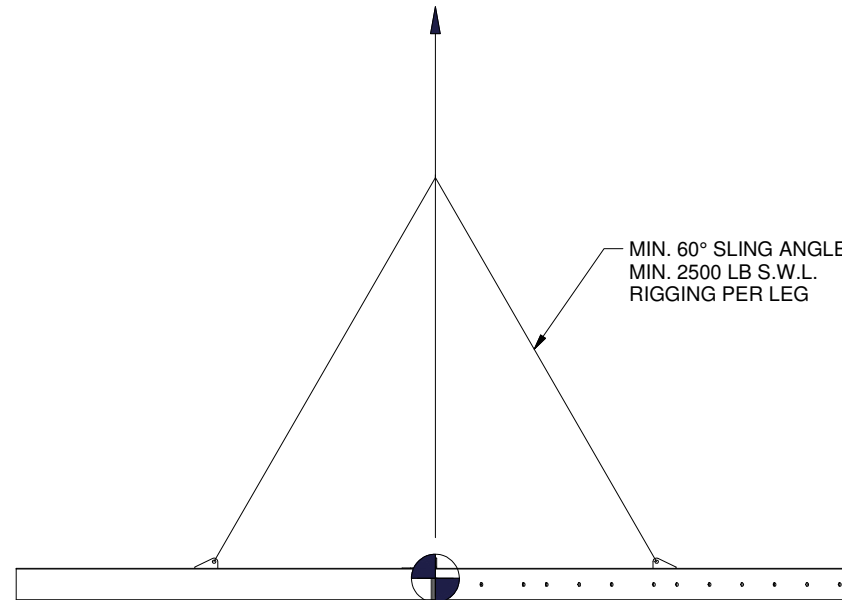
DO NOT SCALE DRAWINGS
SHEET NO.: 3 OF 5

DWG. NO.: S18678-02-3



TOP COVER LIFTING DIAGRAM - TOP VIEW

3805 LB + RIGGING



TOP COVER LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/24/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	

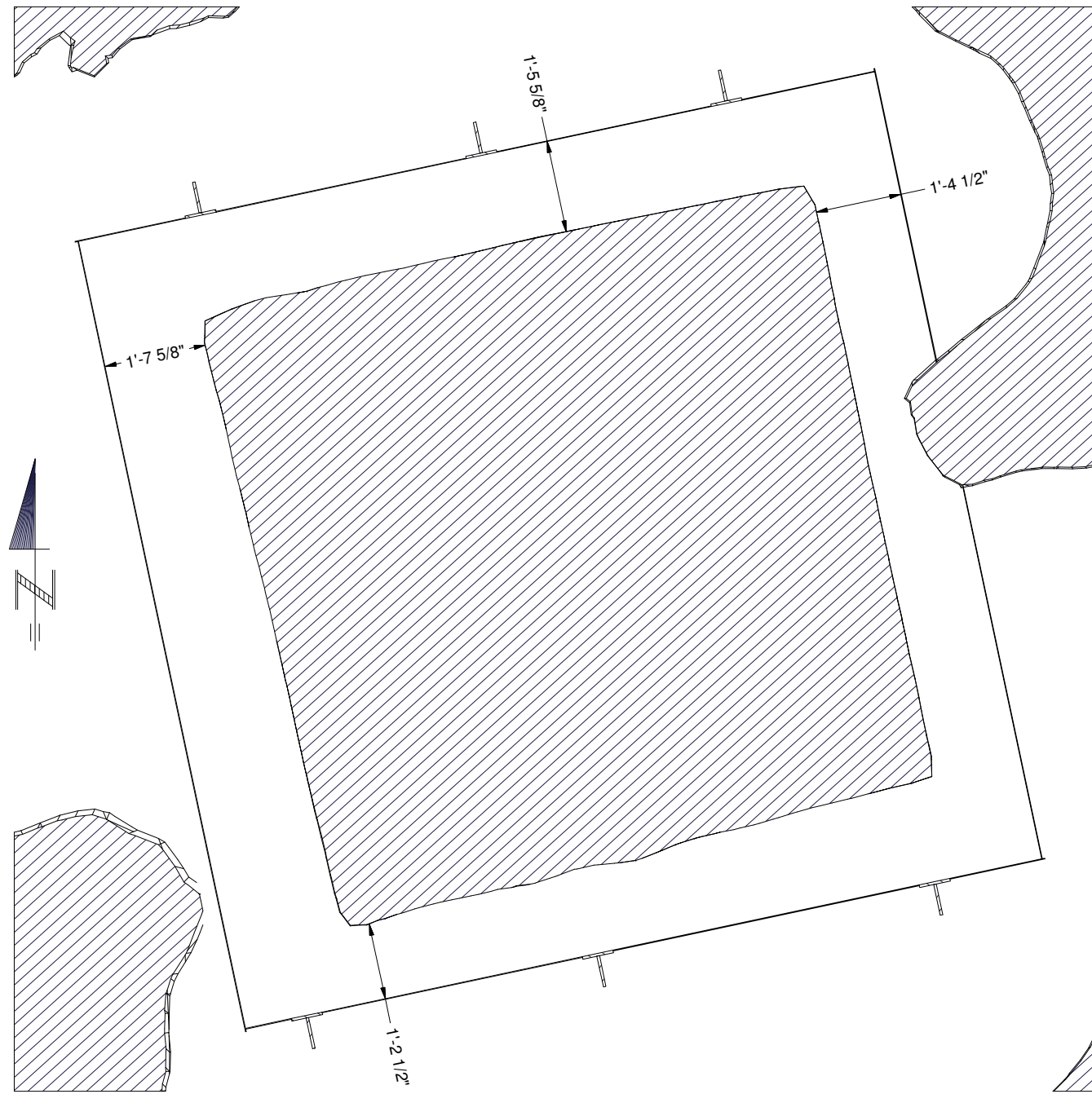


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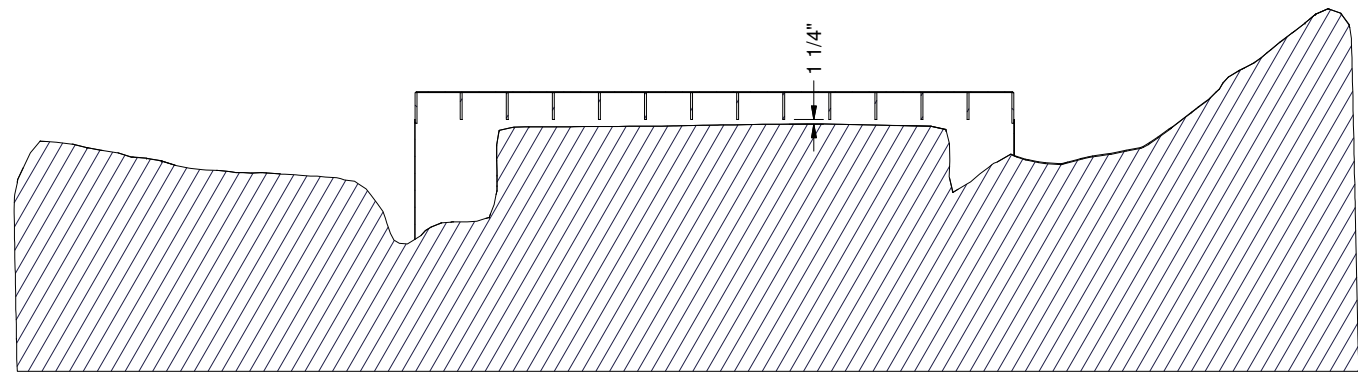
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 4 OPENING
 LIFTING DETAILS
 LOCATION: 59°33'43.3"N 108°27'19.9"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS	DWG. NO.:	S18678-02-4	2
SHEET NO.:	4 OF 5		



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ± 0.005 MACHINED SURFACES: ± 0.005 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
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S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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 Discipline: Structural Sk. Reg. No.: 14318 Signature: *[Signature]*

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE ACE 4 OPENING CLEARANCES
 LOCATION: 59°33'43.3"N 108°27'19.9"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 5 DWG. NO.: **S18678-02-5**

DUBYNA 1 - 810394 Raise



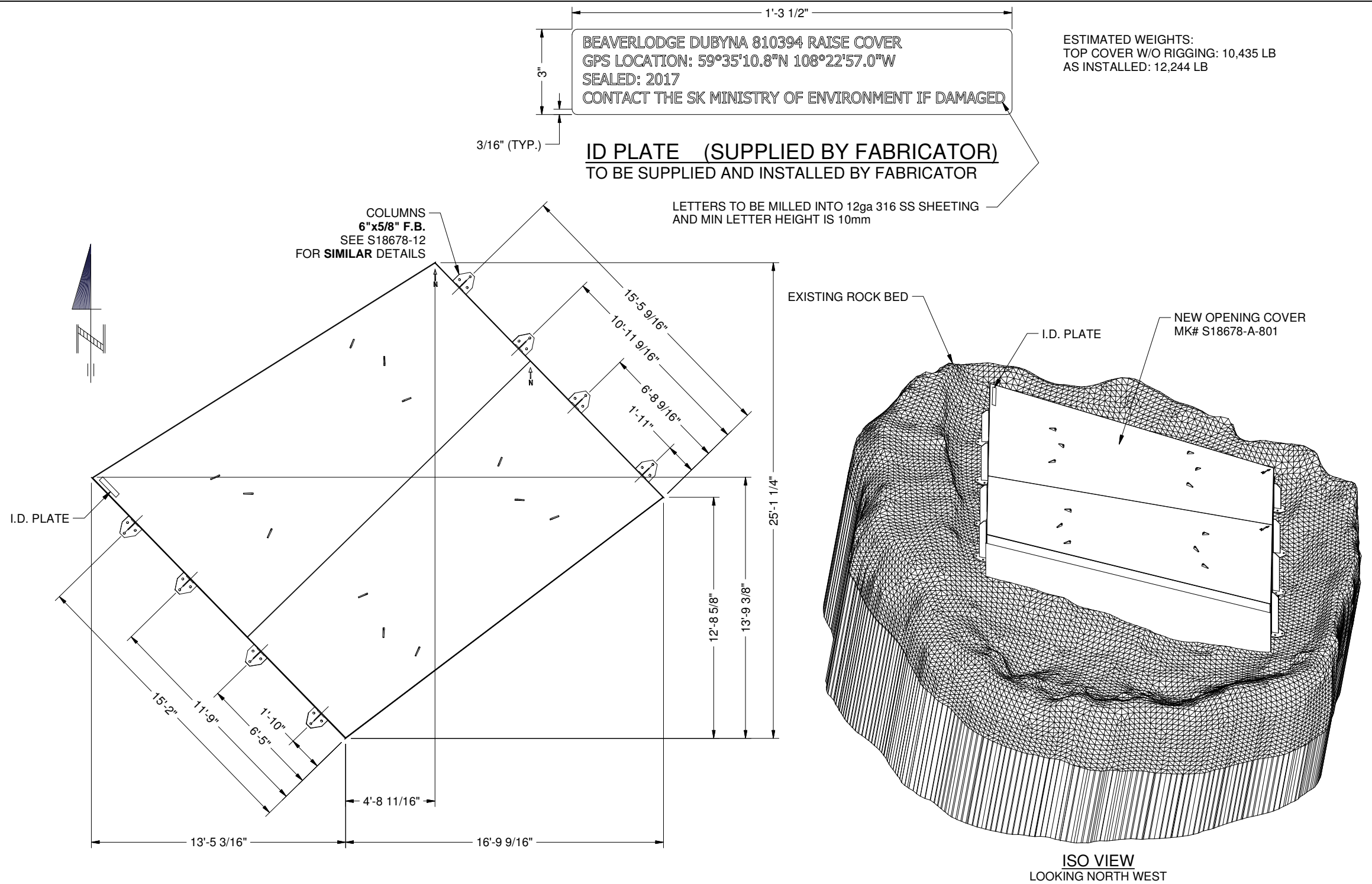
DUBYNA 1 - 810394 Raise

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 12,244 LB
5. DO NOT BACK FILL WALLS OF COVER.



PLAN VIEW - DUBYNA 1 OPENING COVER
(HORIZONTAL PROJECTED DIMENSIONS SHOWN)

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		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: N.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



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Structural 14318

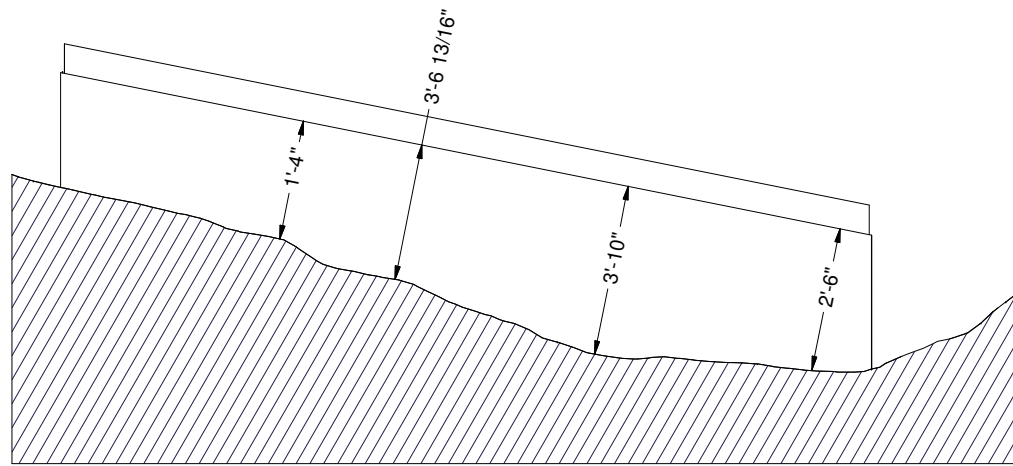
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

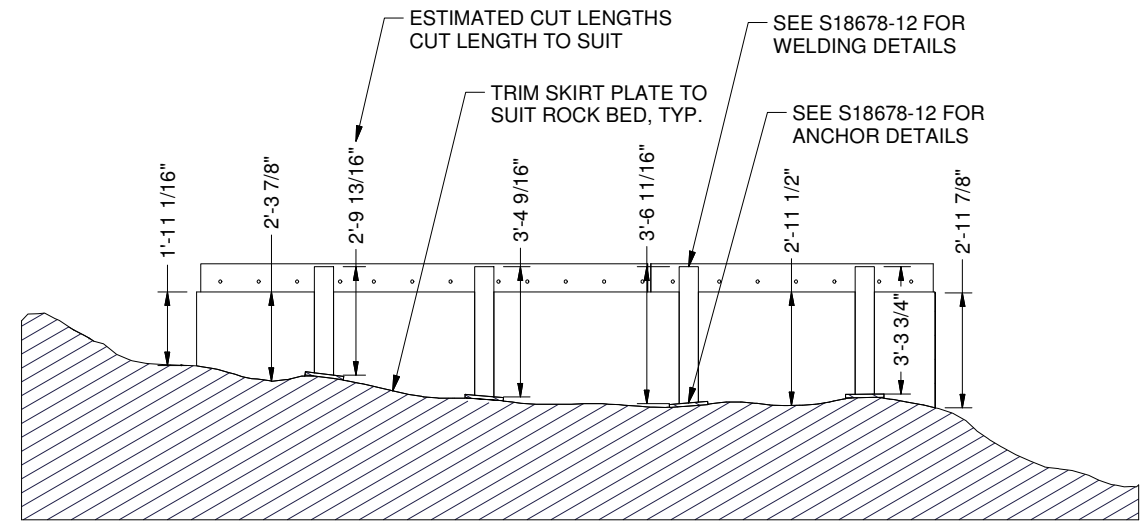
DO NOT SCALE DRAWINGS DWG. NO.: **S18678-08-1** 2

SHEET NO.: 1 OF 7

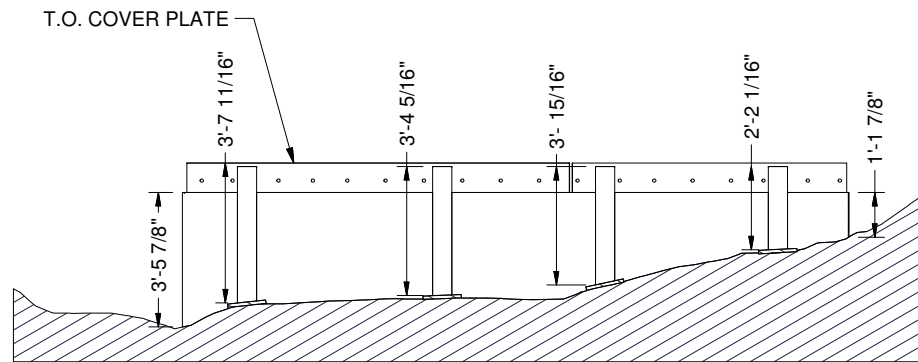
ESTIMATED TOTAL COLUMN LENGTH 303" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 EIGHT (8) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



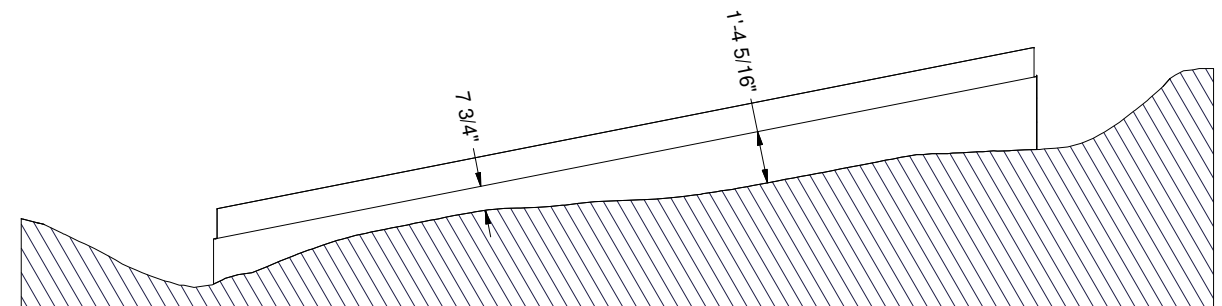
ELEVATION - LOOKING NORTH WEST



ELEVATION - LOOKING NORTH EAST



ELEVATION - LOOKING SOUTH WEST



ELEVATION - LOOKING SOUTH EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
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		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	

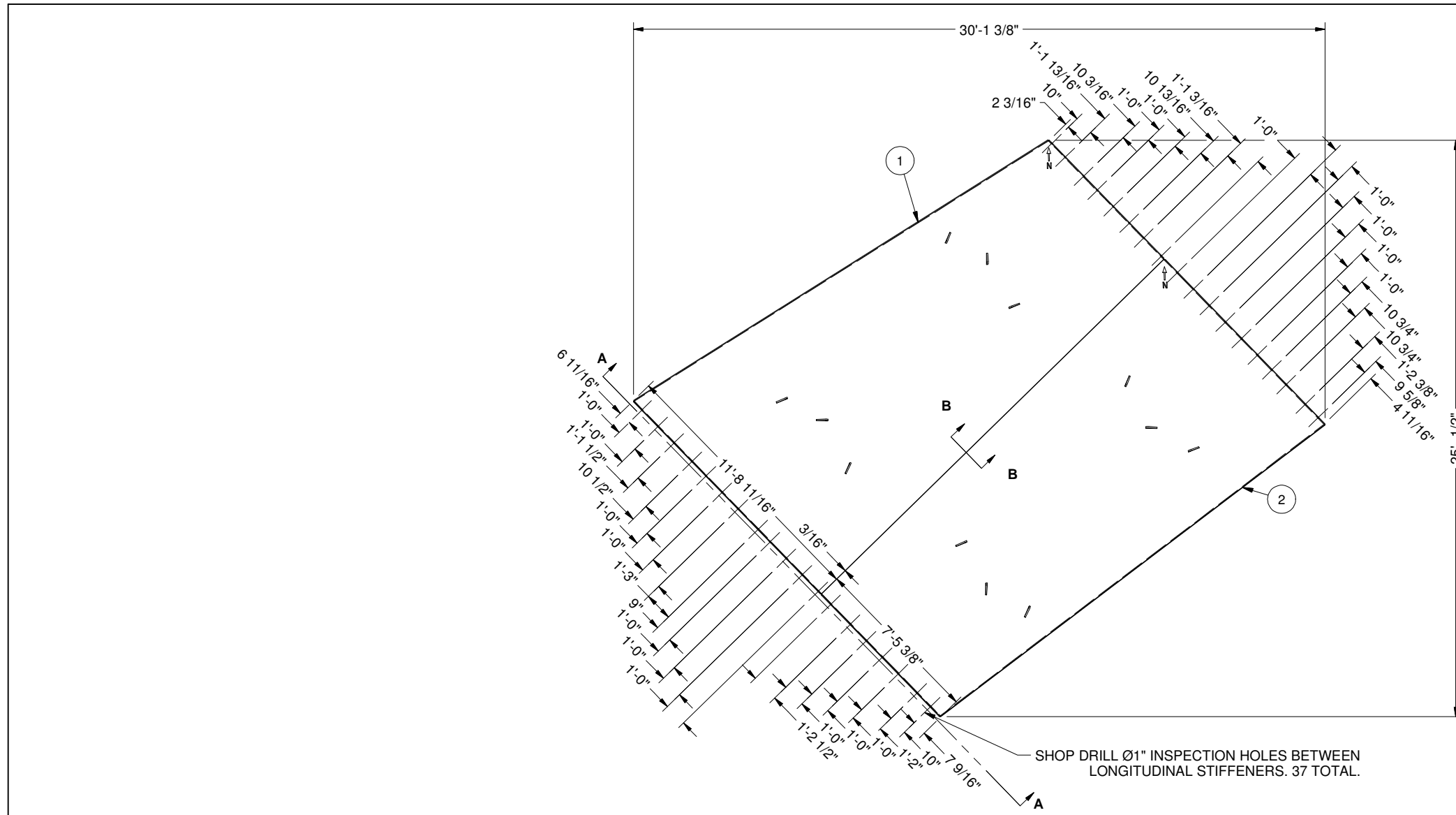


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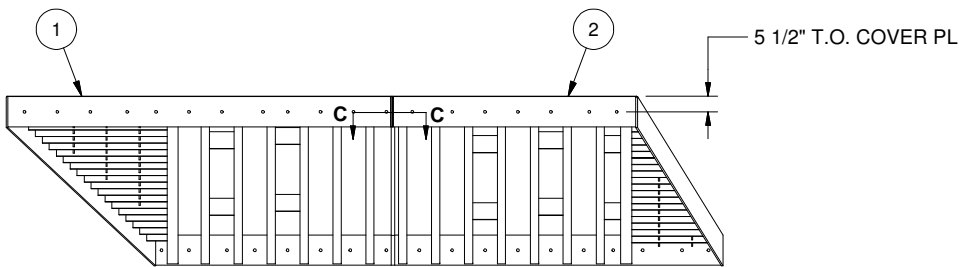
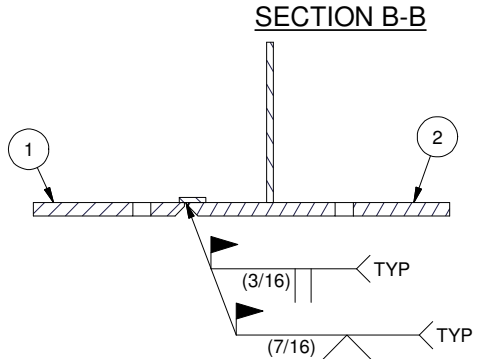
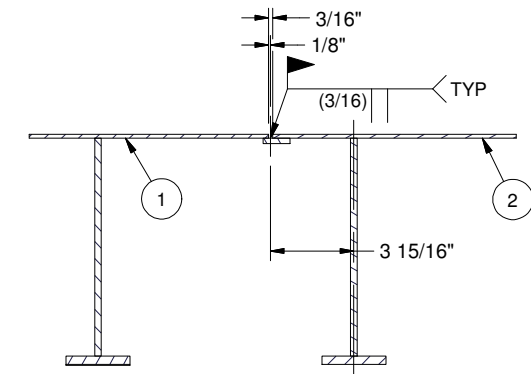
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 7 DWG. NO.: S18678-08-2

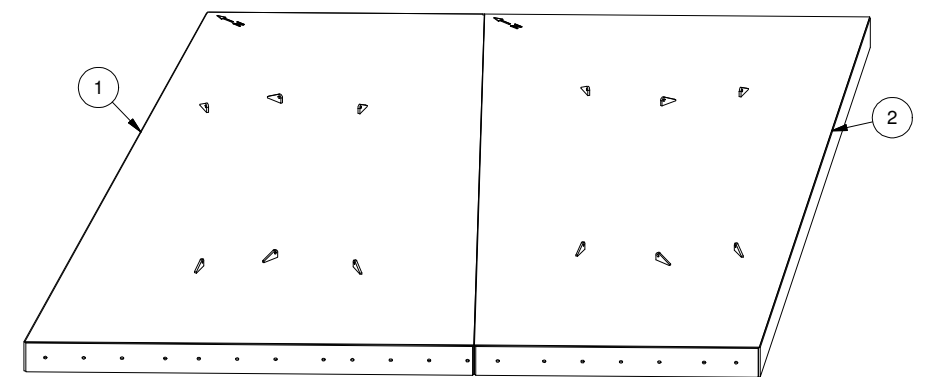


S18678-A-801 - TOP VIEW
TOP PLATE DIMENSIONS
(HORIZONTAL PROJECTED DIMENSIONS SHOWN)

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	TOP COVER SECTION 1	S18678-A-802		4
2	1	TOP COVER SECTION 2	S18678-A-803		5



SECTION A-A



ISO VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: N.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



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Number C672
Permission to Consult held by:
Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
TOP COVER DETAILS

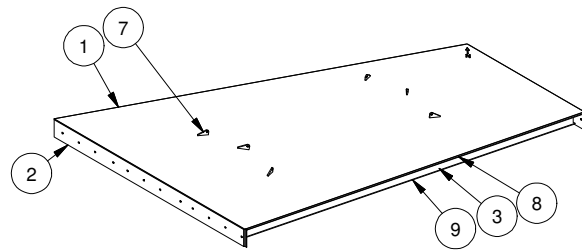
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CLIENT: CAMECO SHEQ

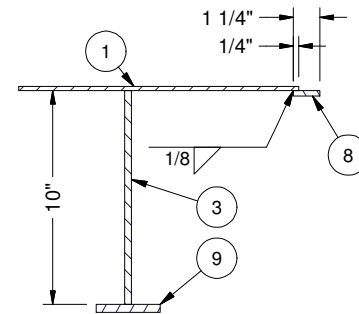
DO NOT SCALE DRAWINGS

SHEET NO.: 3 OF 7 DWG. NO.: S18678-08-3

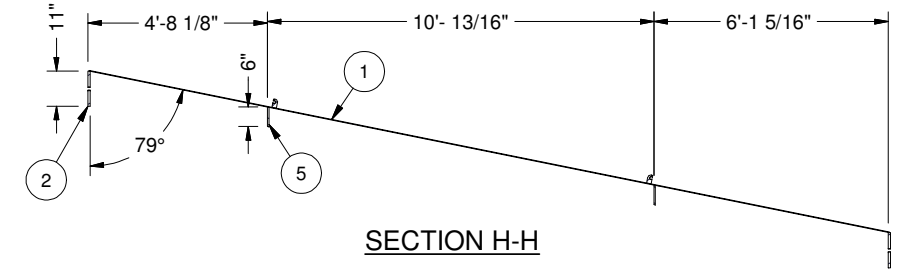
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3	7	10"x5/16" FB	ASTM A240-316L		
4	1	4"x3/8" FB	ASTM A240-316L		
5	4	6"x1/2" FB	ASTM A240-316L		
6		5"x3/8" FB	ASTM A240-316L		
7	6	5/8" PL	ASTM A240-316L		
8		1 1/4"x1/4" FB	ASTM A240-316L		
9	6	3"x3/8" FB	ASTM A240-316L		
10	35	4"x3/8" FB	ASTM A240-316L		



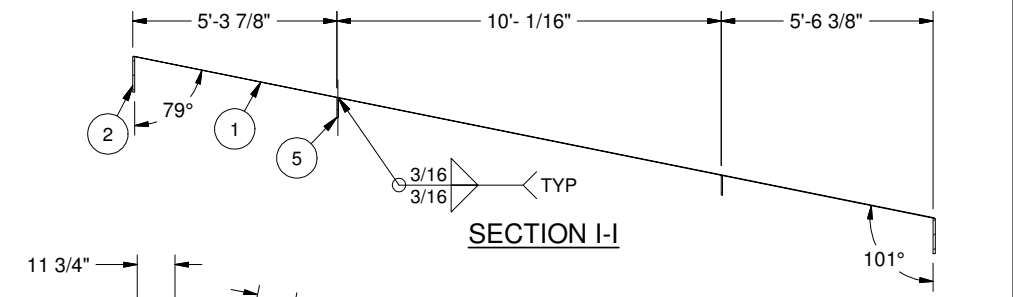
S18678-A-802 - ISO VIEW



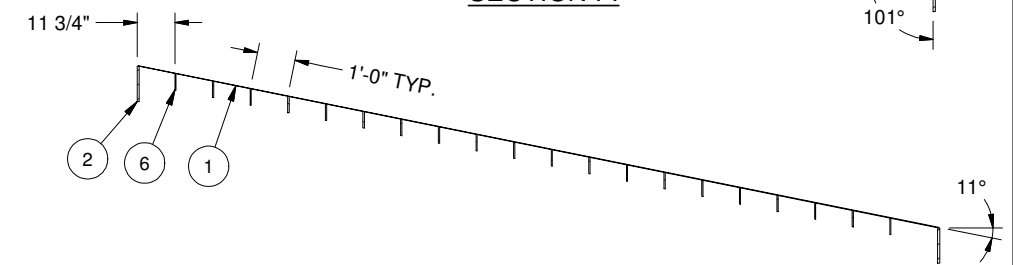
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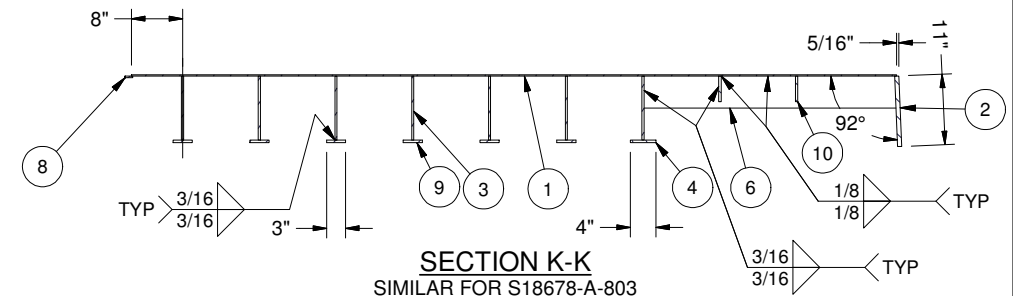
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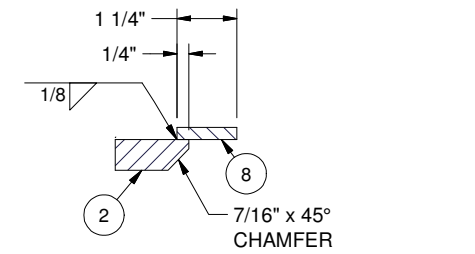
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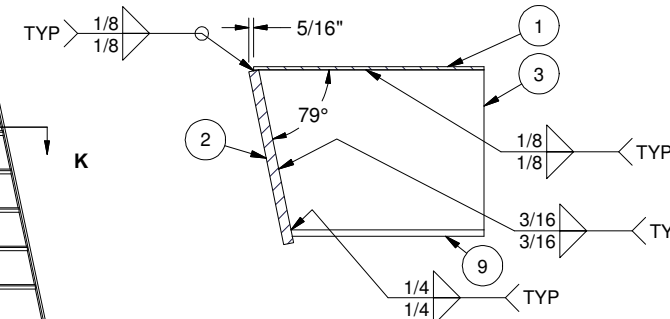
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SIMILAR FOR S18678-A-803



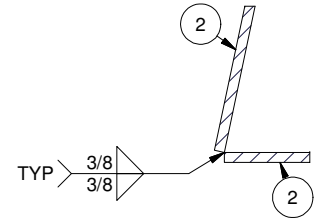
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SIMILAR FOR S18678-A-803



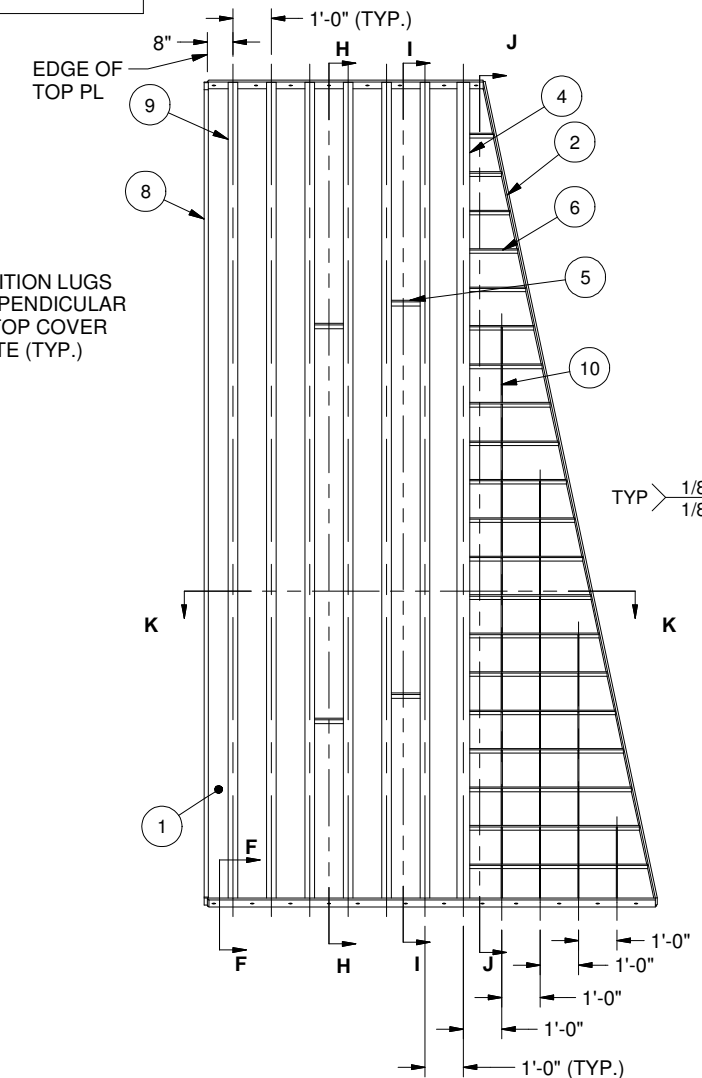
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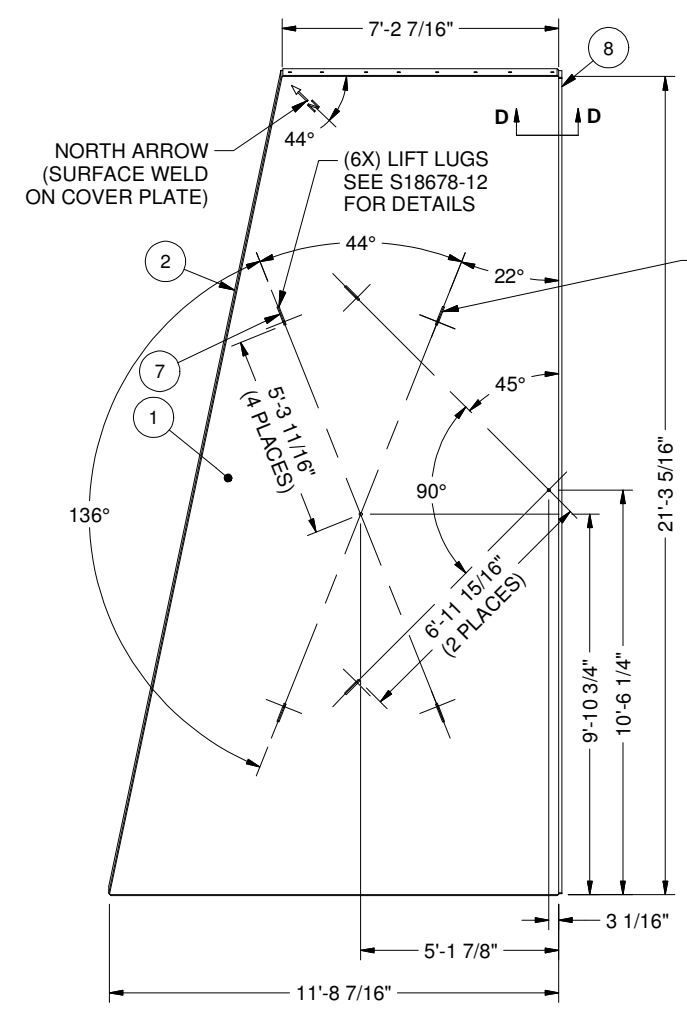
SECTION F-F
SIMILAR FOR S18678-A-803



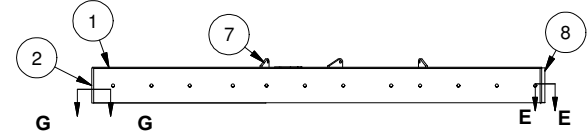
SECTION G-G
SIMILAR FOR S18678-A-803



S18678-A-802 - BOTTOM VIEW
STIFFENER LAYOUT



S18678-A-802 - TOP VIEW
TOP PLATE DIMENSIONS



S18678-A-802 - SIDE VIEW

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: N.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



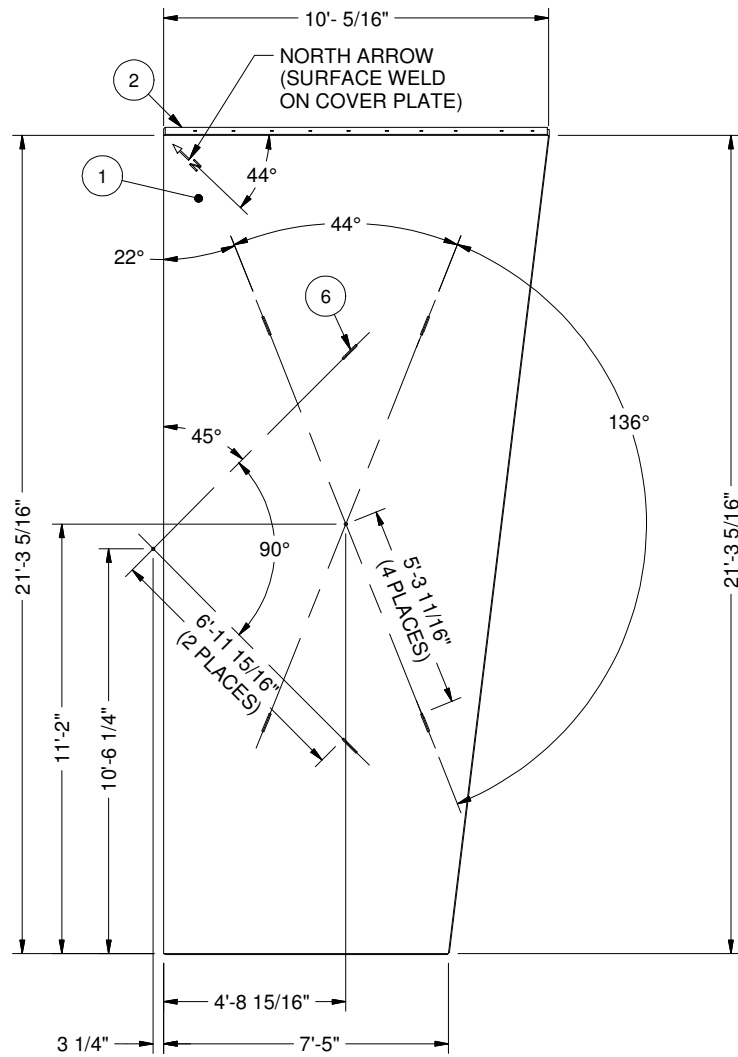
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

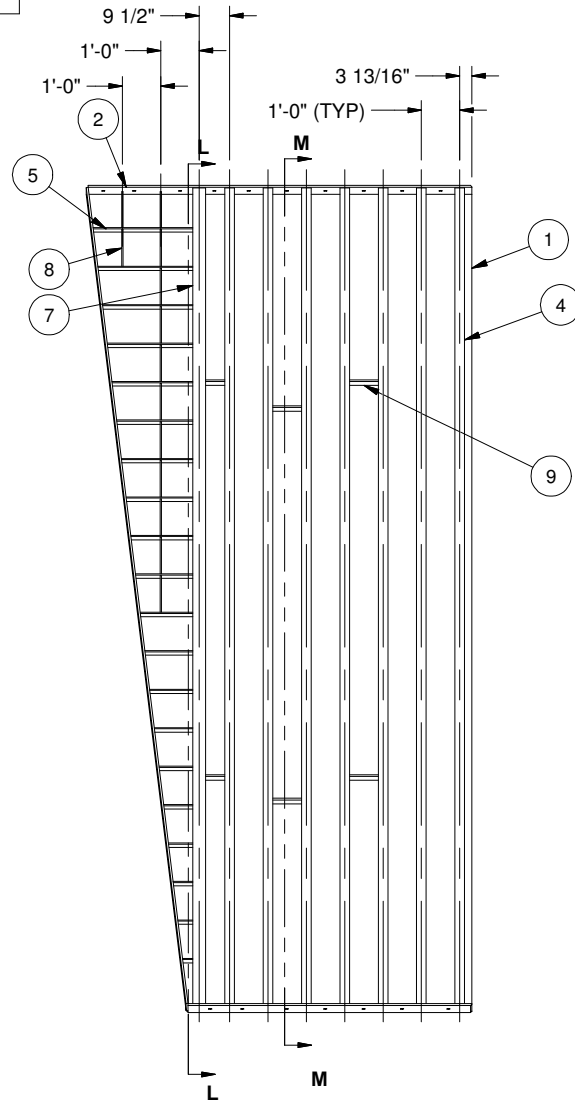
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
 TOP COVER SECTION 802
 LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-08-4** SHEET NO.: 4 OF 7

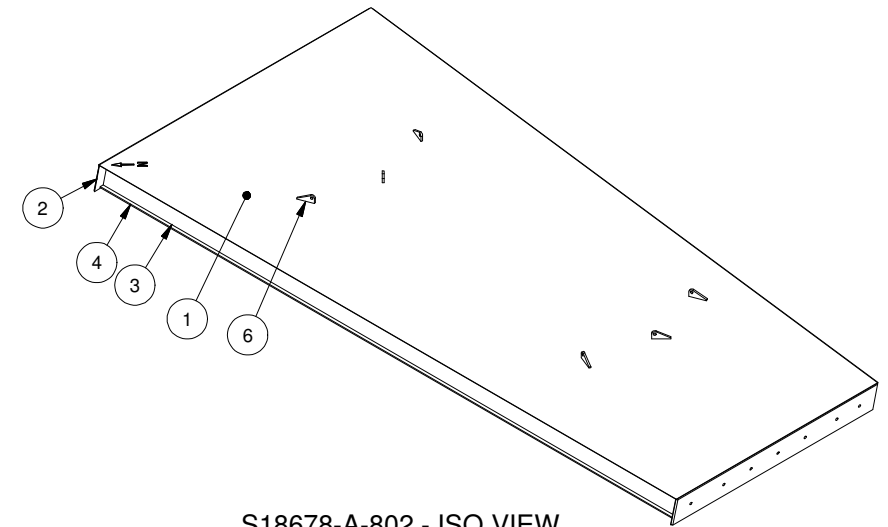
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3	8	10"x5/16" FB	ASTM A240-316L		
4	7	3"x3/8" FB	ASTM A240-316L		
5		5"x3/8" FB	ASTM A240-316L		
6	6	5/8" PL	ASTM A240-316L		
7	1	4"x3/8" FB	ASTM A240-316L		
8	13	4"x3/8" FB	ASTM A240-316L		
9	6	6"x1/2" FB	ASTM A240-316L		



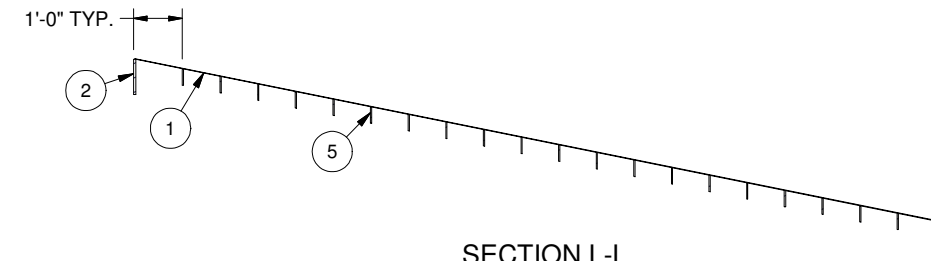
S18678-A-803 - TOP VIEW
TOP PLATE DIMENSIONS



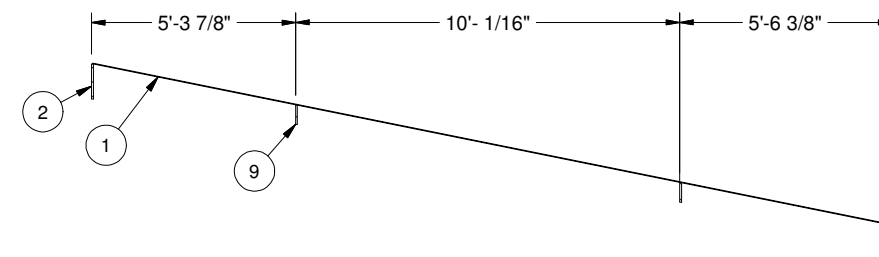
S18678-A-803 - BOTTOM VIEW
STIFFENER LAYOUT



S18678-A-802 - ISO VIEW



SECTION L-L

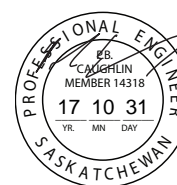


SECTION M-M

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: N.R. DATE: 10/5/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



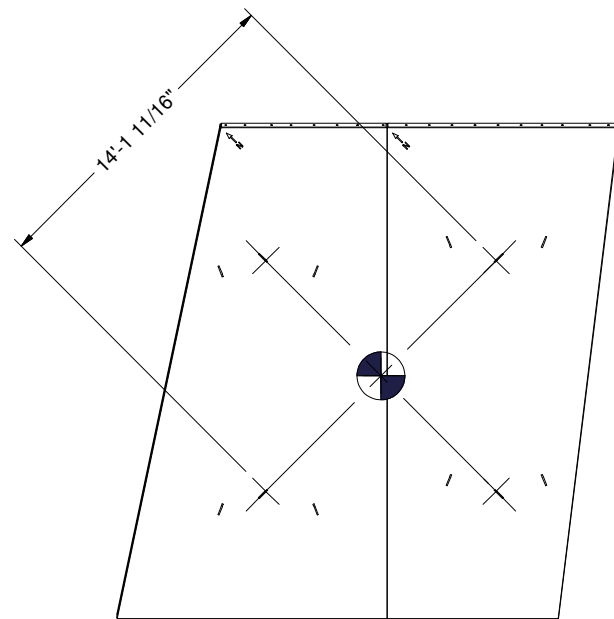
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

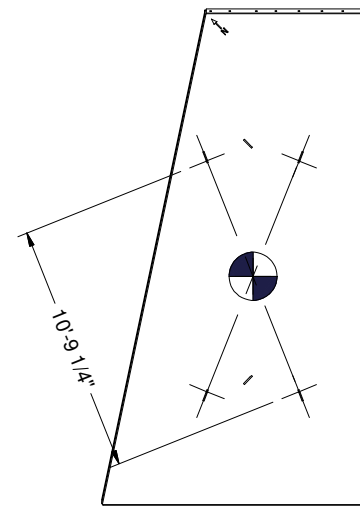
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
 TOP COVER SECTION 803
 LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-08-5**

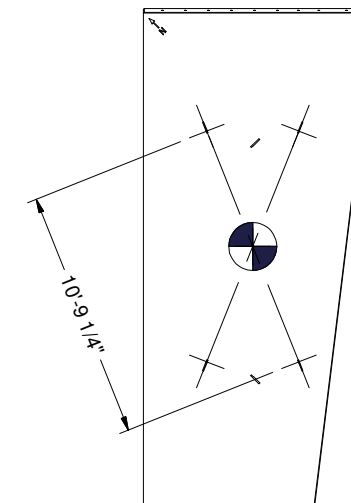
SHEET NO.: 5 OF 7



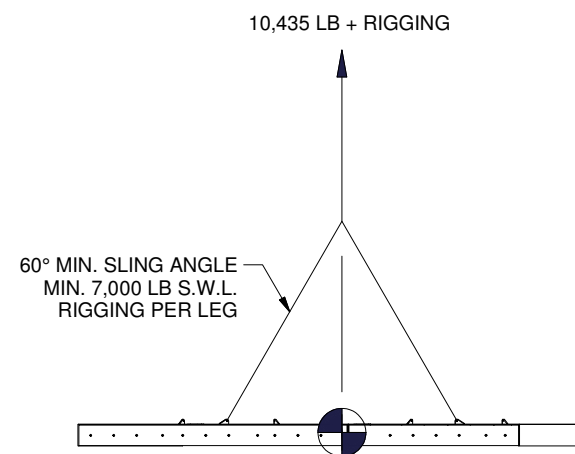
TOP COVER LIFTING DIAGRAM - TOP VIEW



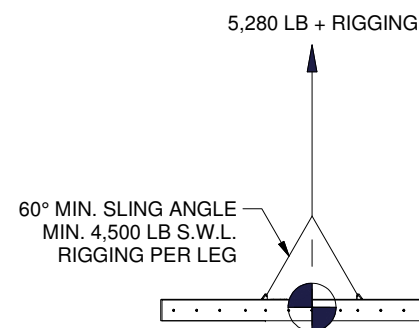
S18678-A-802 LIFTING DIAGRAM - TOP VIEW



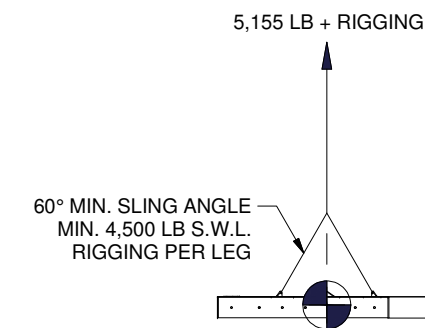
S18678-A-803 LIFTING DIAGRAM - TOP VIEW



TOP COVER LIFTING DIAGRAM - SIDE VIEW



S18678-A-802 LIFTING DIAGRAM - SIDE VIEW



S18678-A-803 LIFTING DIAGRAM - SIDE VIEW

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	

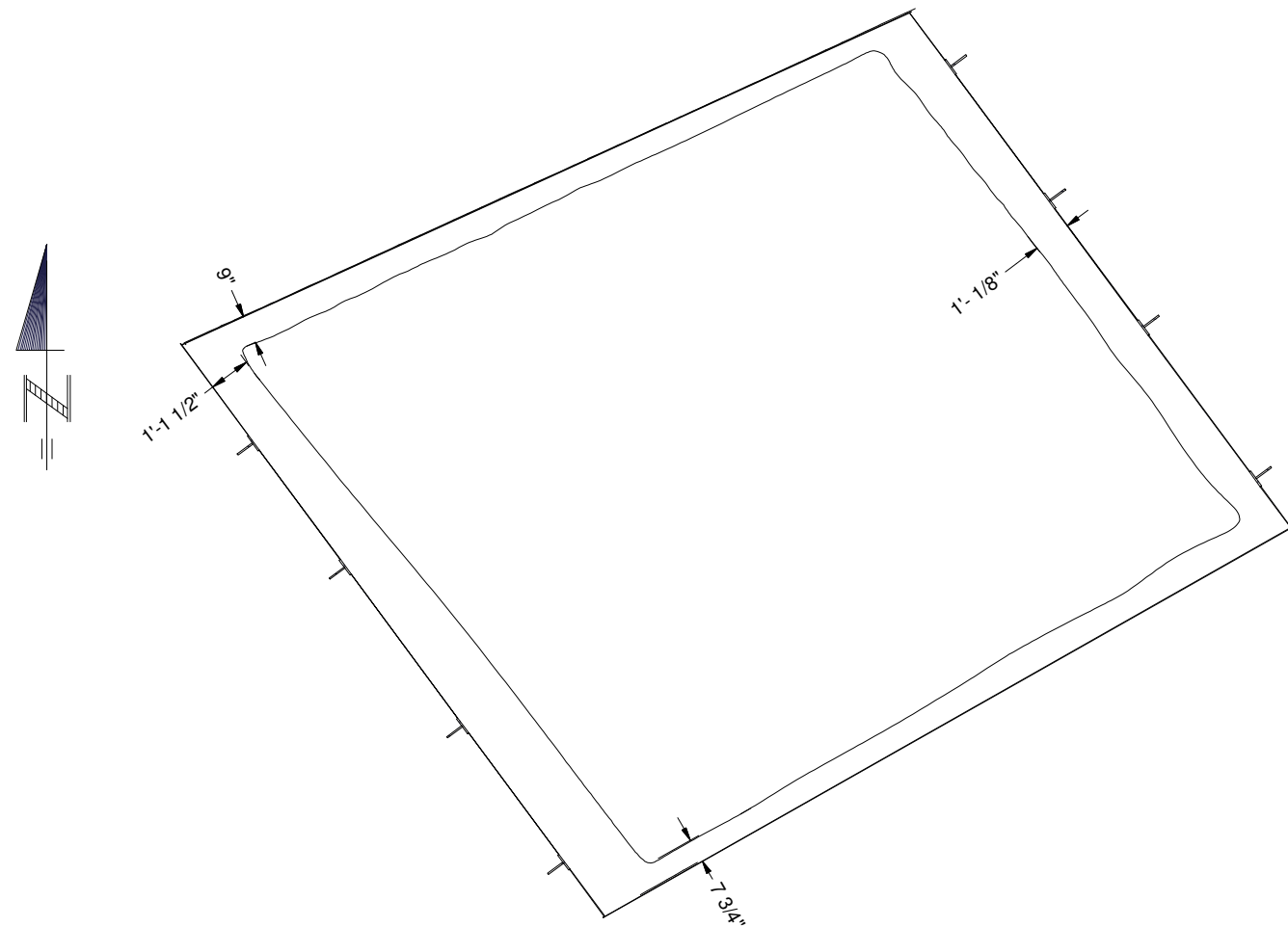


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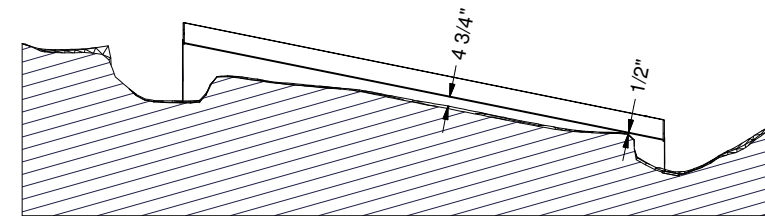
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING
 LIFTING DETAILS
 LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-08-6** SHEET NO.: 6 OF 7



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
		△	ISSUED FOR REVIEW	10/17/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 1 OPENING CLEARANCES
 LOCATION: 59°35'10.8"N 108°22'57.0"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-08-7** SHEET NO.: 7 OF 7

DUBYNA 2 - 820694 Raise



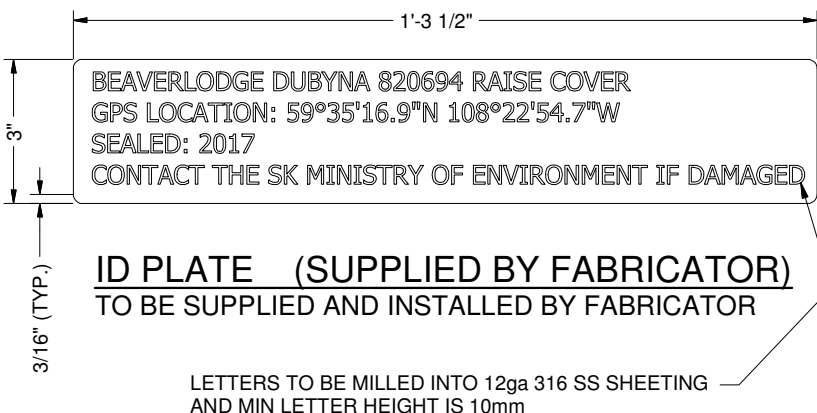
DUBYNA 2 - 820694 Raise

GENERAL NOTES:

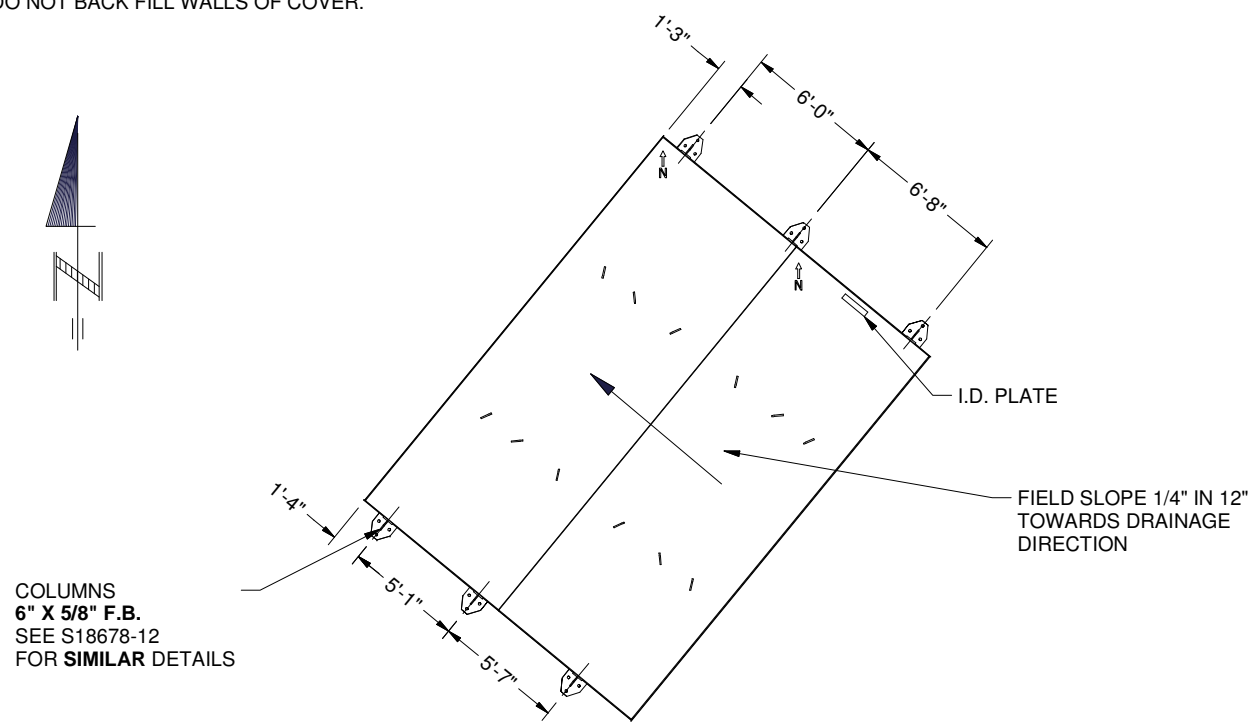
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

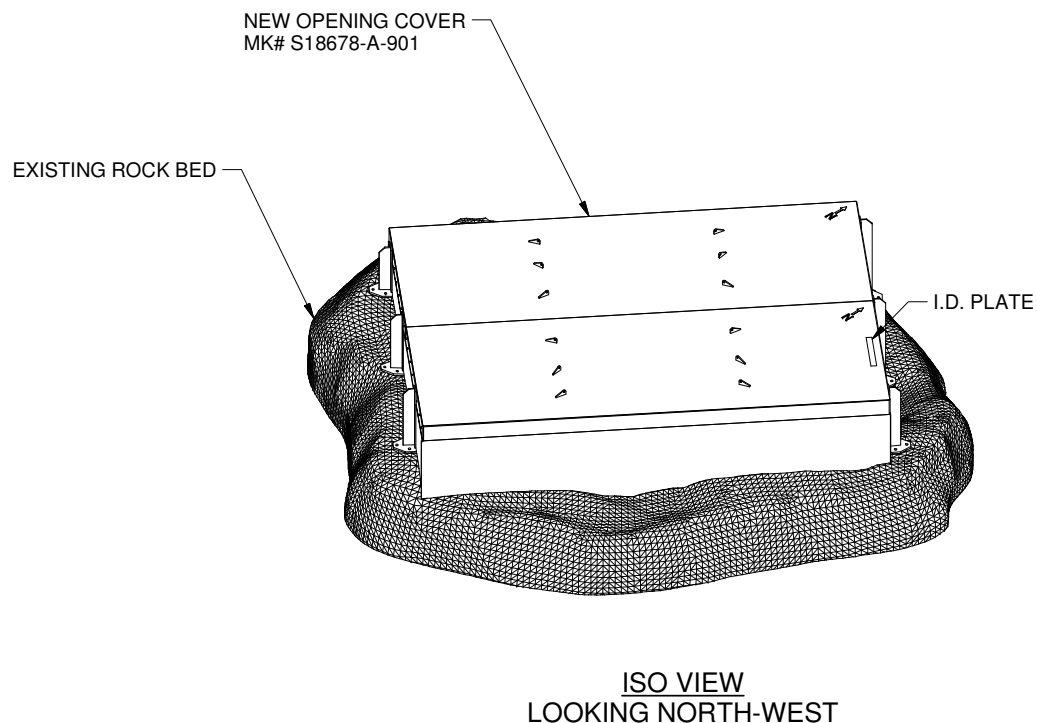
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 9,490LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 7,750 LB
AS INSTALLED: 9,490 LB



PLAN VIEW - DUBYNA 2 OPENING COVER



ISO VIEW
LOOKING NORTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	CHK'D BY: ENG BY: P.C.



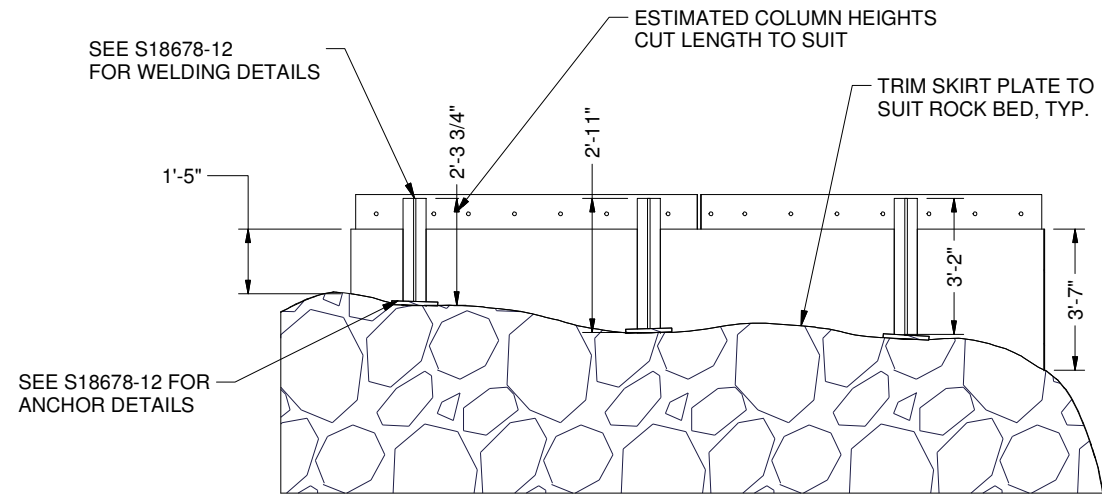
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Structural 14318

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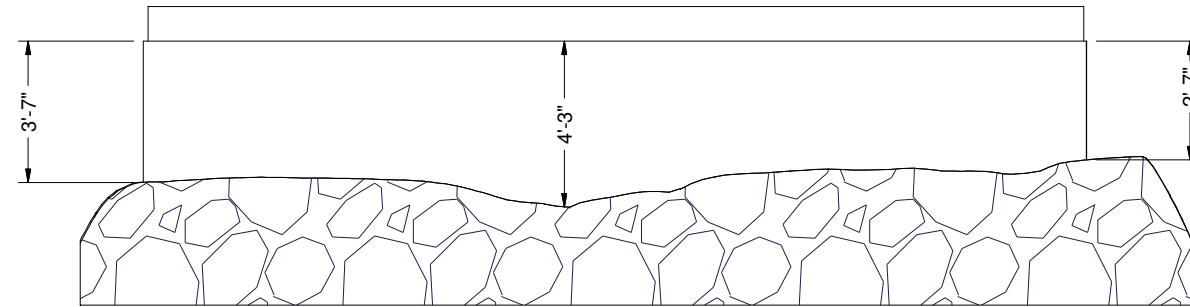
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-09-1** SHEET NO.: 1 OF 6

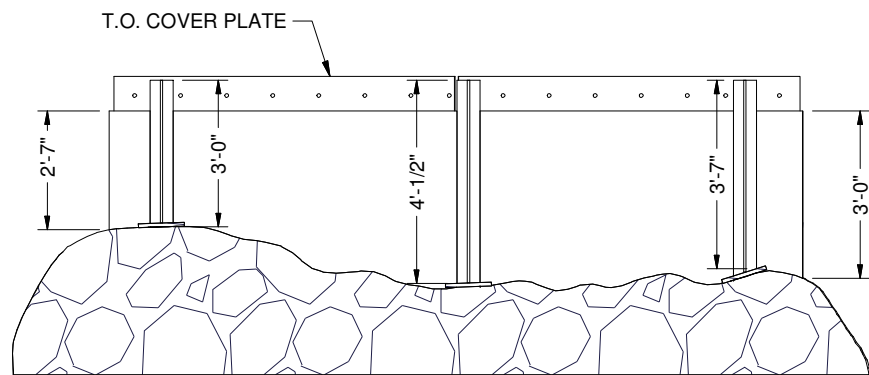
ESTIMATED TOTAL COLUMN LENGTH 244" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



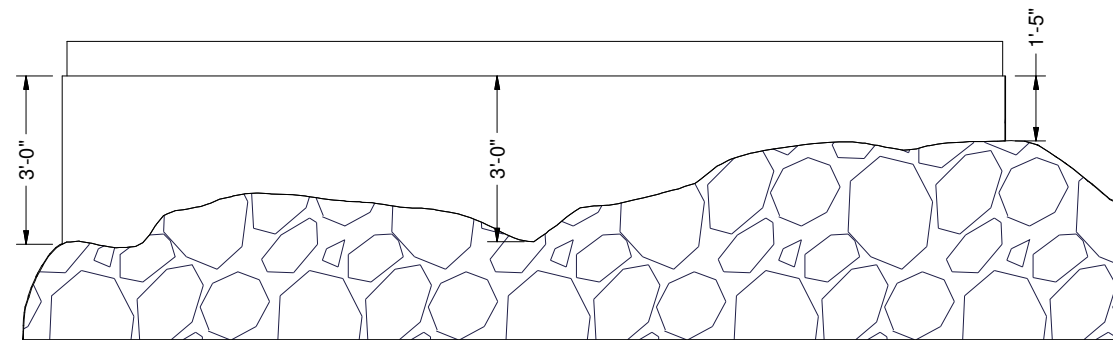
ELEVATION - LOOKING NORTH-EAST



ELEVATION - LOOKING NORTH-WEST



ELEVATION - LOOKING SOUTH-WEST



ELEVATION - LOOKING SOUTH-EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



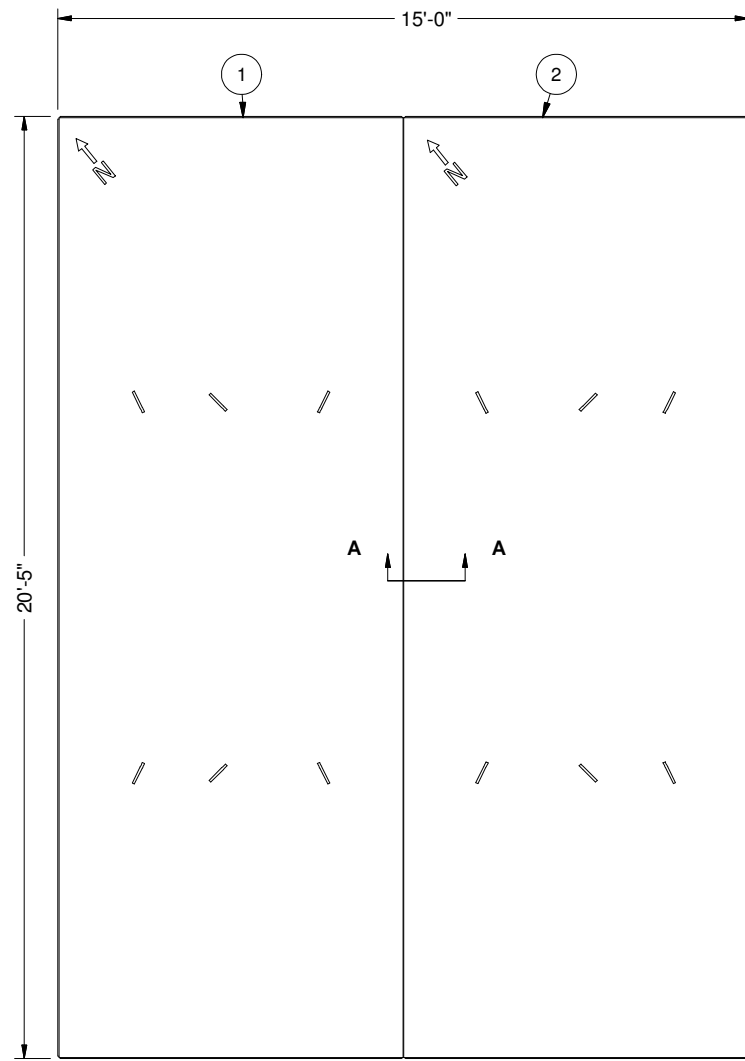
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

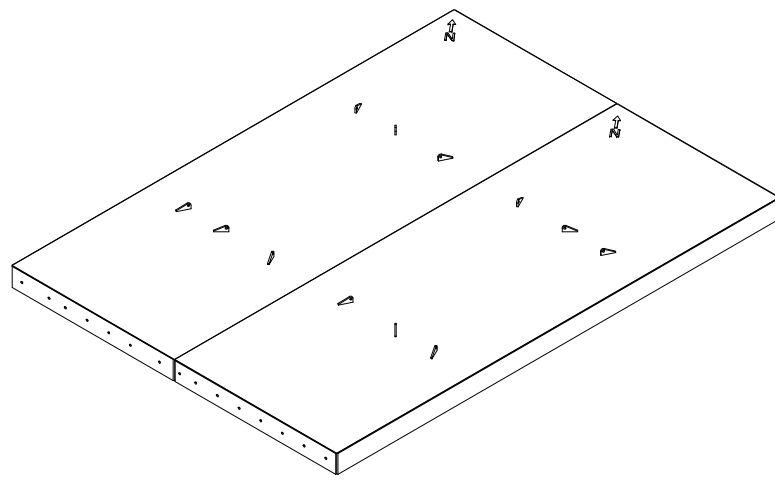
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 6 DWG. NO.: **S18678-09-2**

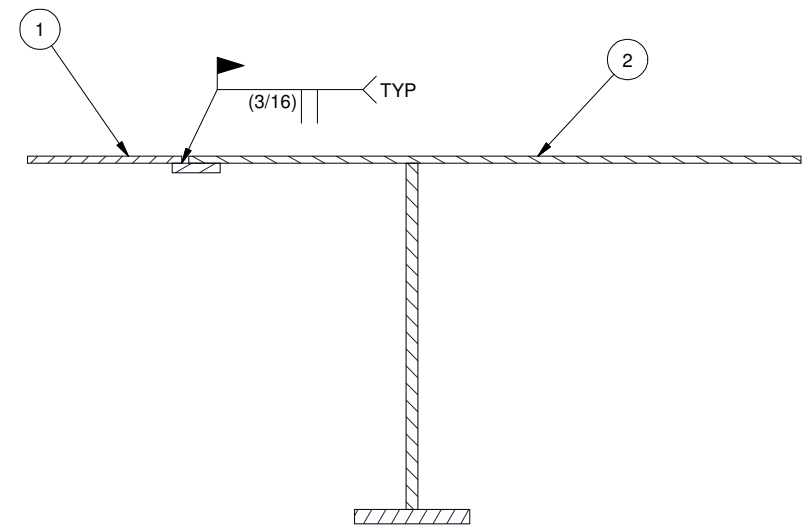
BILL OF MATERIALS					
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2	1	COVER SECTION 2	S18678-A-903		



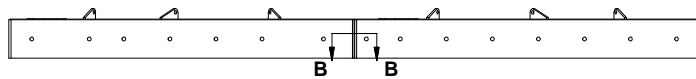
S18678-A-901 - TOP VIEW
TOP PLATE DIMENSIONS



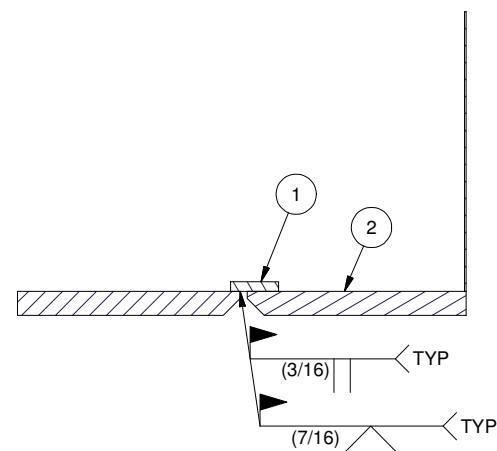
S18678-A-901 - ISO VIEW



SECTION A-A



S18678-A-901 - SIDE VIEW



SECTION B-B

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

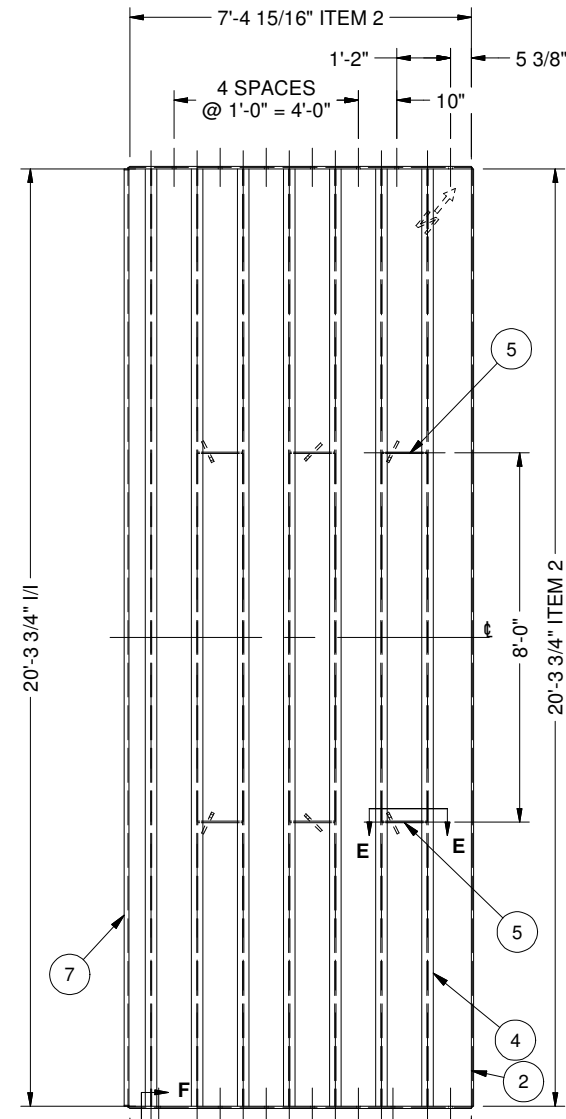
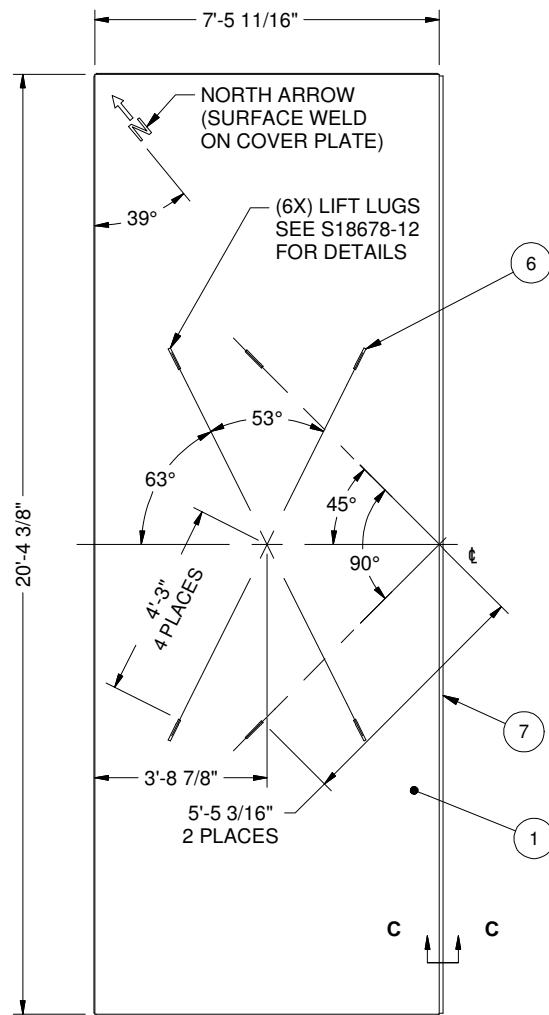
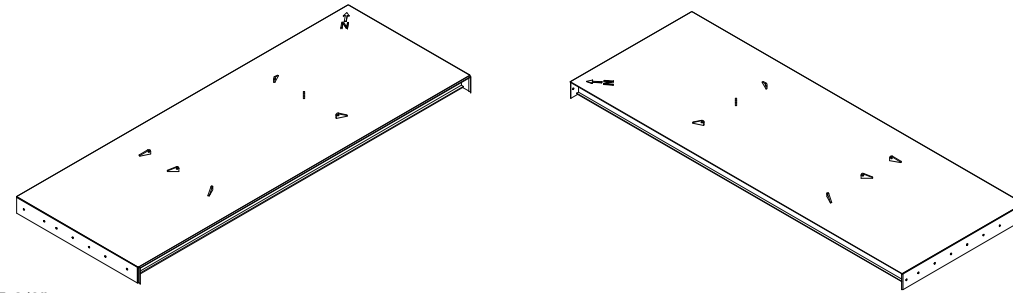
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING
 TOP COVER DETAILS
 LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-09-3**

SHEET NO.: 3 OF 6

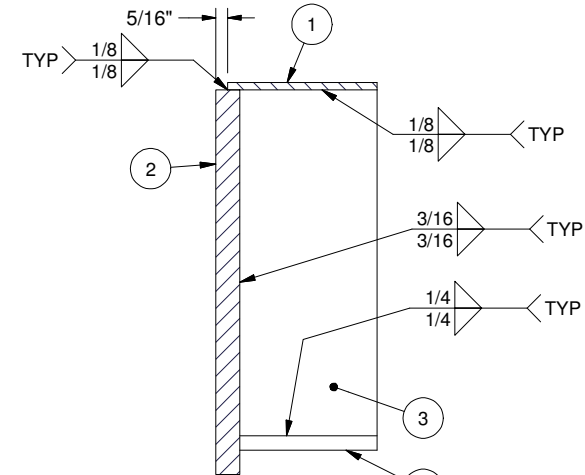
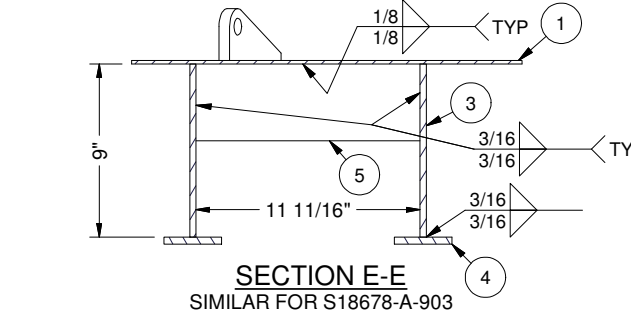
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	3/16" PL	ASTM A240-316L
2		10"x5/8" FB	ASTM A240-316L
3		9"x5/16" FB	ASTM A240-316L
4		3"x3/8" FB	ASTM A240-316L
5	6	4"x3/8" FB	ASTM A240-316L
6	6	5/8" PL	ASTM A240-316L
7		1 1/4"x1/4" FB	ASTM A240-316L

BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	3/16" PL	ASTM A240-316L
2		10"x5/8" FB	ASTM A240-316L
3		9"x5/16" FB	ASTM A240-316L
4		3"x3/8" FB	ASTM A240-316L
5	6	5/8" PL	ASTM A240-316L
6	6	4"x3/8" FB	ASTM A240-316L

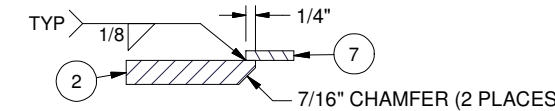


S18678-A-902 - ISO VIEW

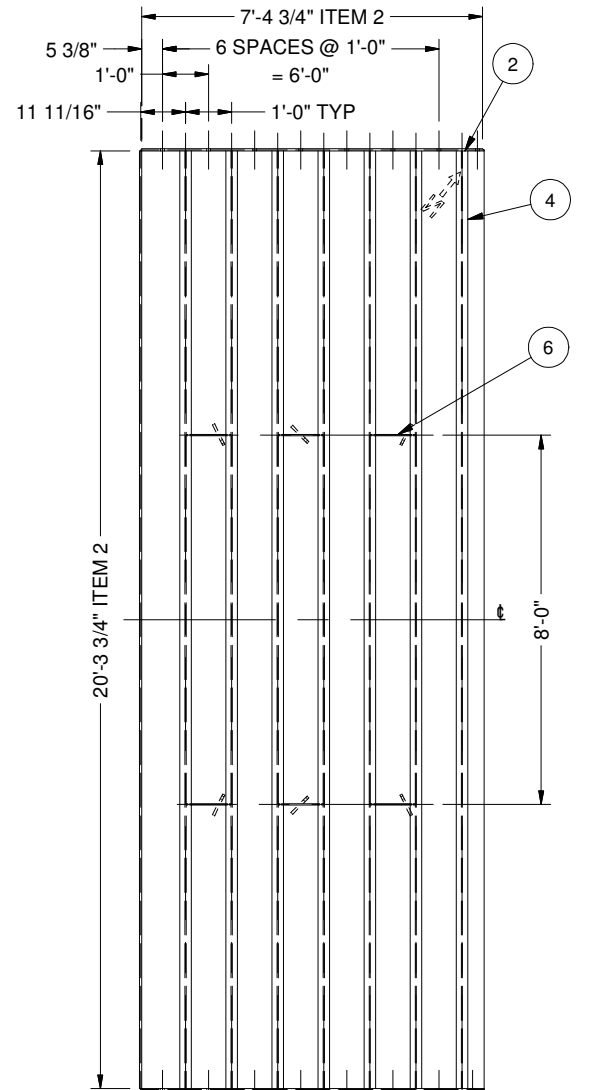
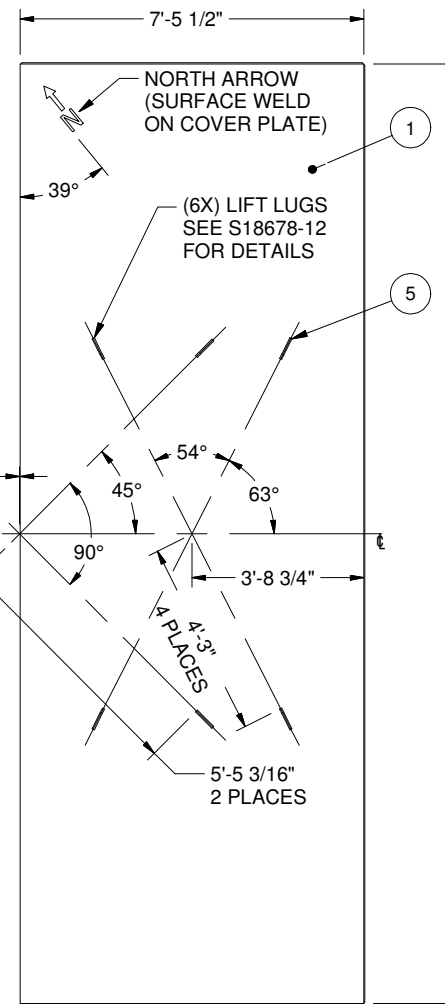
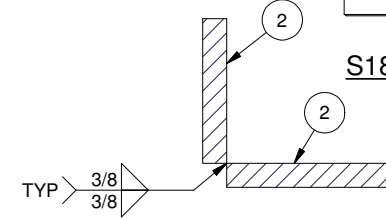
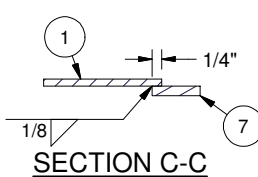
S18678-A-903 - ISO VIEW



SECTION D-D

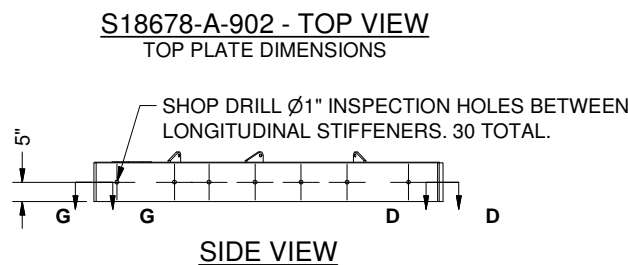


SECTION C-C



S18678-A-903 - TOP VIEW TOP PLATE DIMENSIONS

S18678-A-903 - BOTTOM VIEW TOP PLATE DIMENSIONS



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	CHK'D BY: ENG BY: P.C.



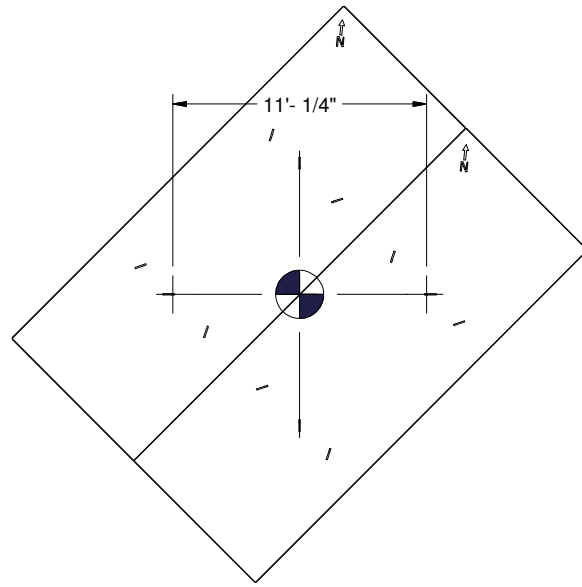
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

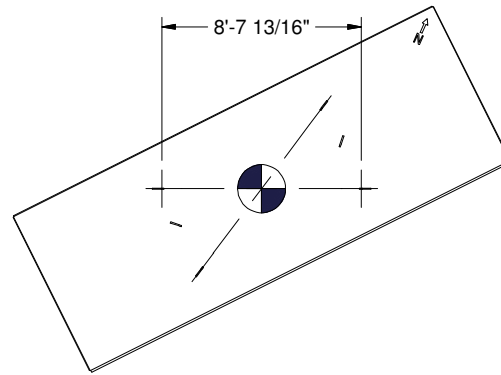
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING
 TOP COVER SECTIONS
 LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 6

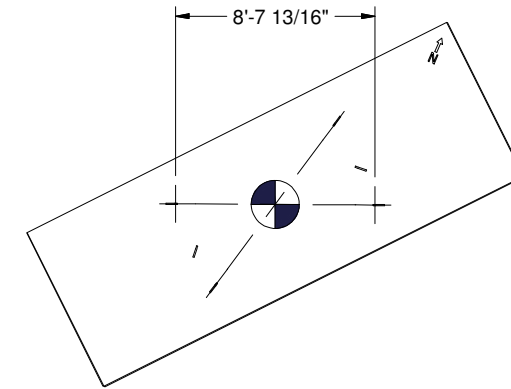
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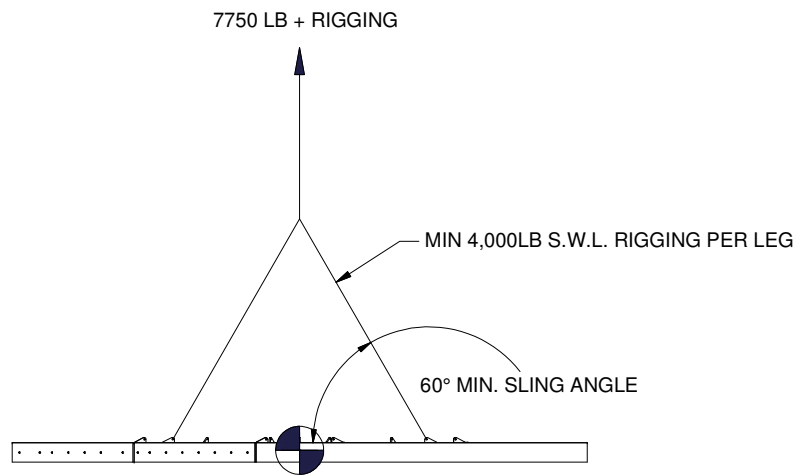
TOP COVER LIFTING DIAGRAM
S18678-A-901



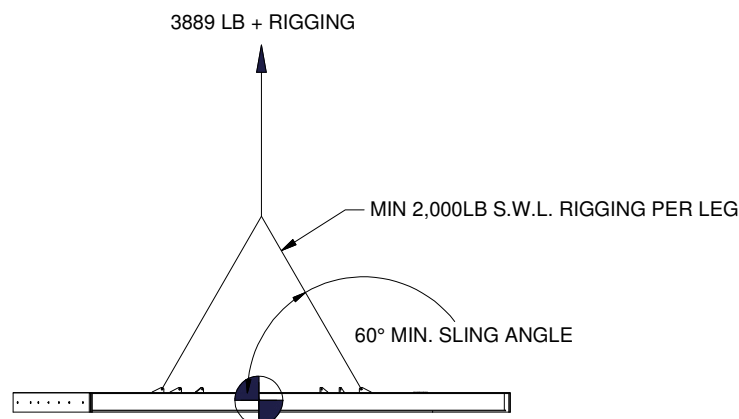
COVER SECTION 1 LIFTING DIAGRAM
S18678-A-902



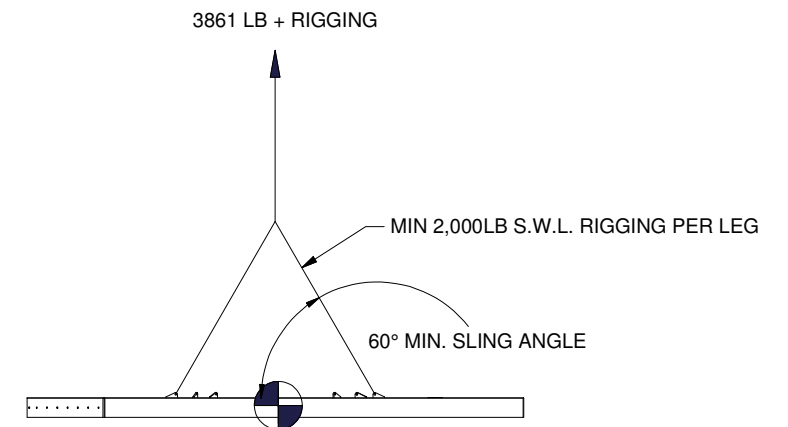
COVER SECTION 2 LIFTING DIAGRAM
S18678-A-903



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-901



COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
S18678-A-902



COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
S18678-A-903

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



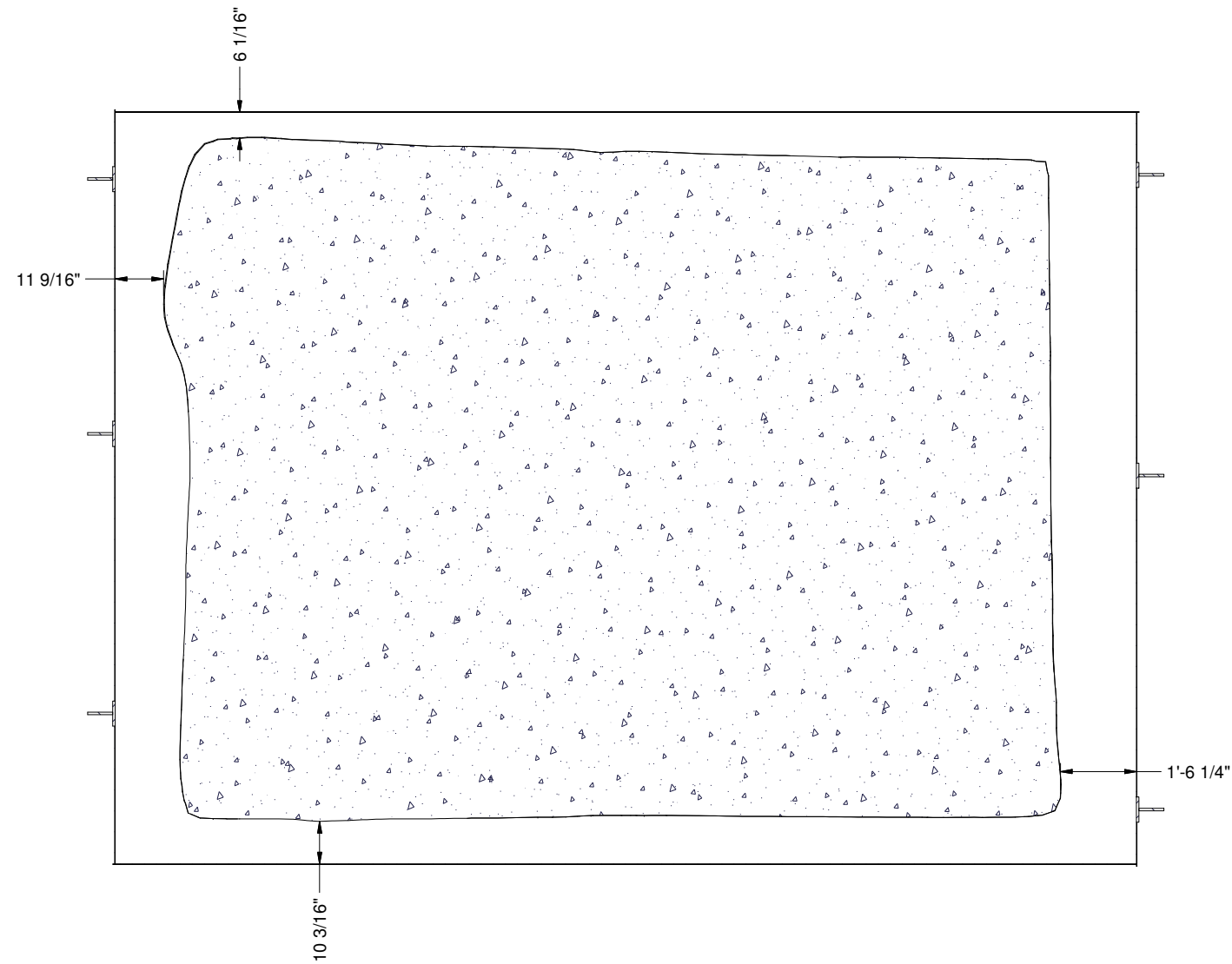
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

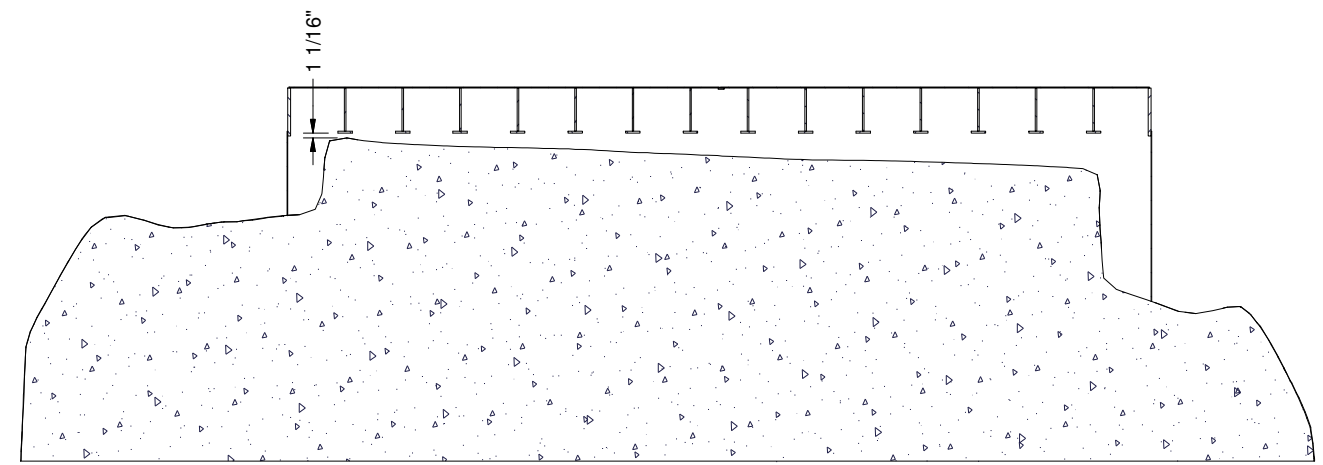
PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING
 LIFTING DETAILS
 LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 6

DWG. NO.: **S18678-09-5**



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE DUBYNA 2 OPENING CLEARANCES
 LOCATION: 59°35'16.9"N 108°22'54.7"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 6 DWG. NO.: **S18678-09-6**

FAY 10 Raise



FAY 10 Raise

GENERAL NOTES:

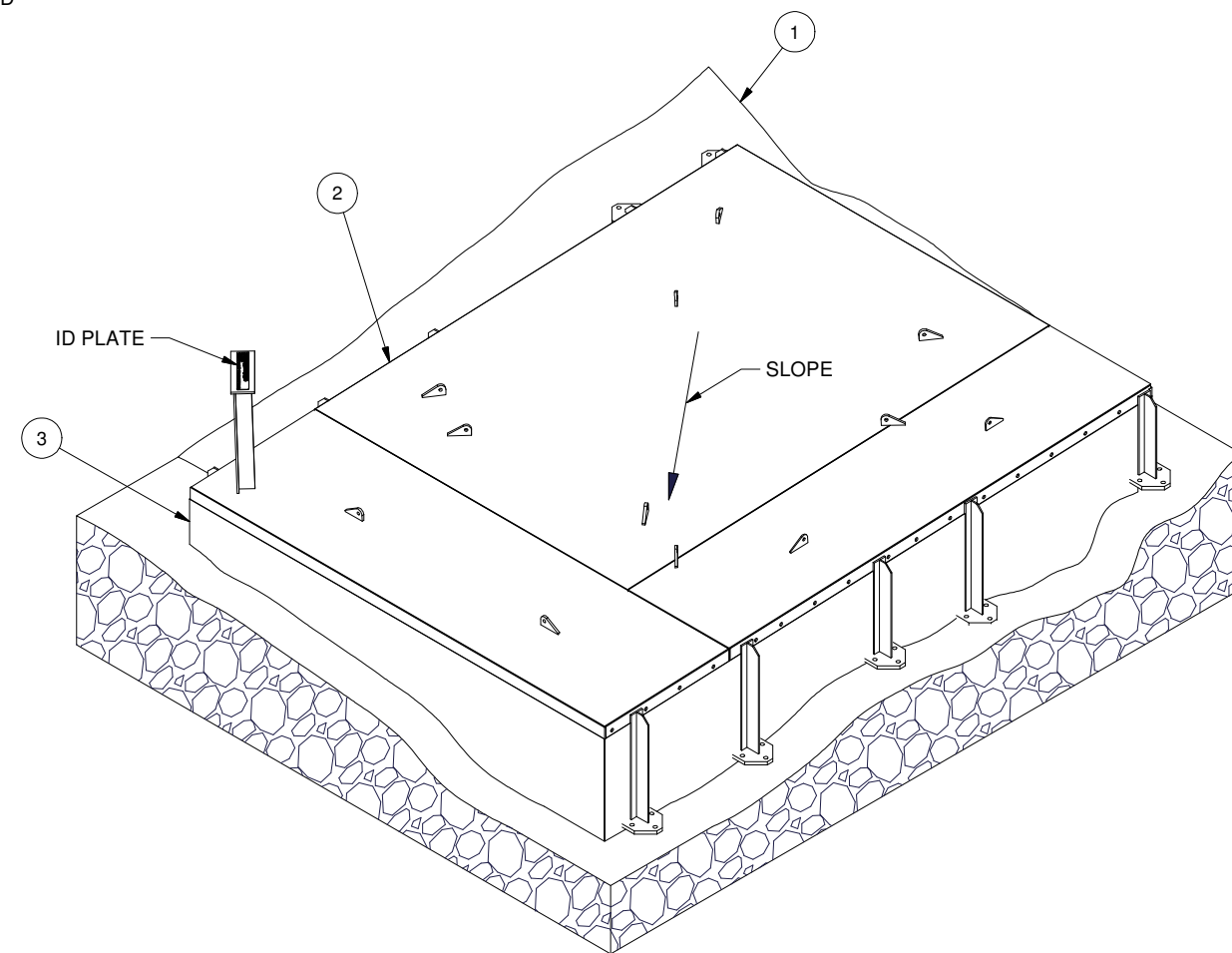
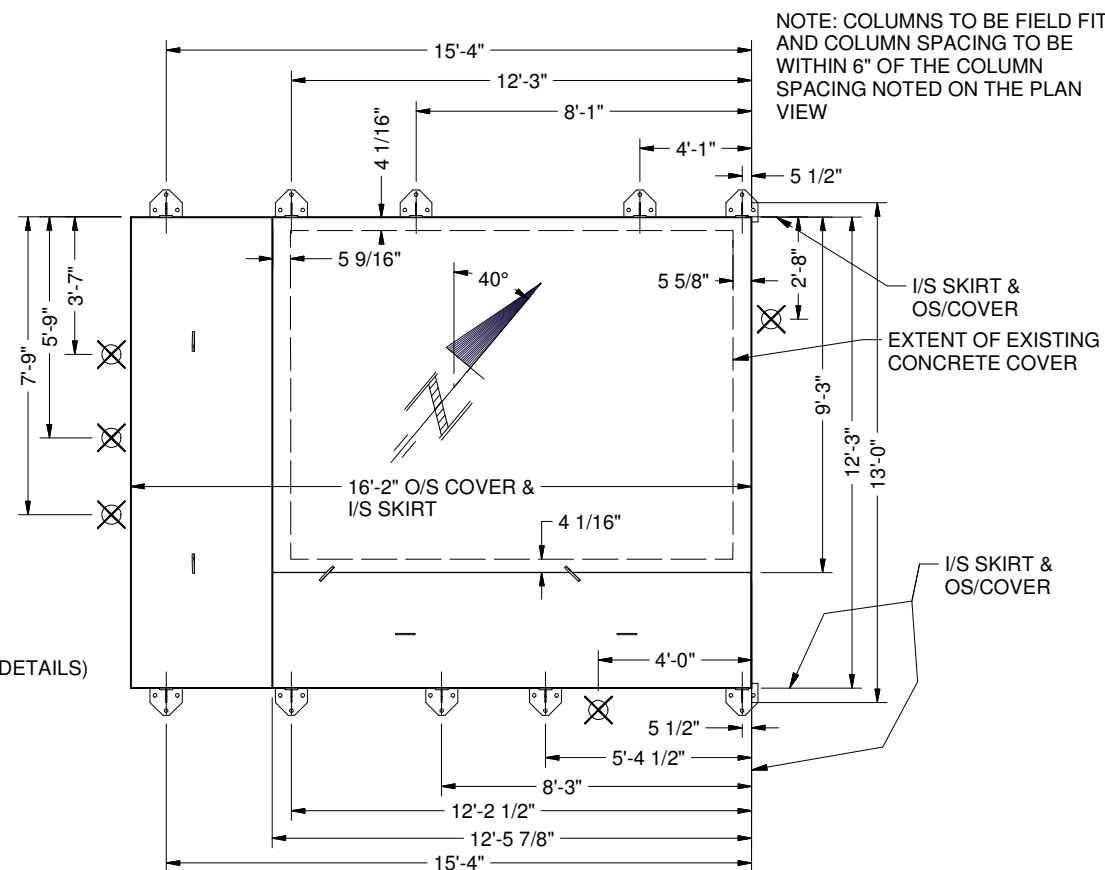
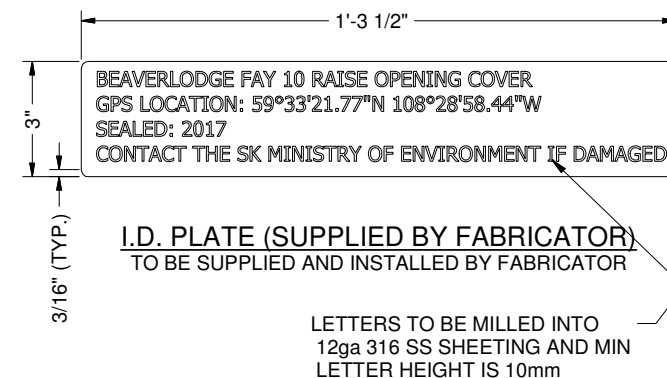
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. ALL ITEMS ARE EXISTING UNLESS NOTED OTHERWISE, (M) DENOTES MODIFIED ITEM, (N) DENOTES NEW ITEM.
15. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGS. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
16. (N) DENOTES ITEMS THAT ARE TO BE SUPPLIED BETWEEN DECEMBER 2016 AND SPRING OF 2017. (E) DENOTES ITEMS THAT WERE SUPPLIED DURING THE SPRING OF 2016.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD. COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL, WITHOUT DELIBERATE SABOTAGE. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 5,066 LBS
5. DO NOT BACK FILL WALLS OR TOP OF COVER.

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1		(E) ROCK BED			
2	1	(M) EXTENDED TOP COVER	MK#S17550-A-101		3
3		(E) 12 ga. SKIRT SHEETING		ASTM A240-316L	

ESTIMATED WEIGHTS:
 TOP COVER W/O RIGGING: 4,072 LBS
 AS INSTALLED: 5,066 LBS



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		A	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		A	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		A	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	A	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC



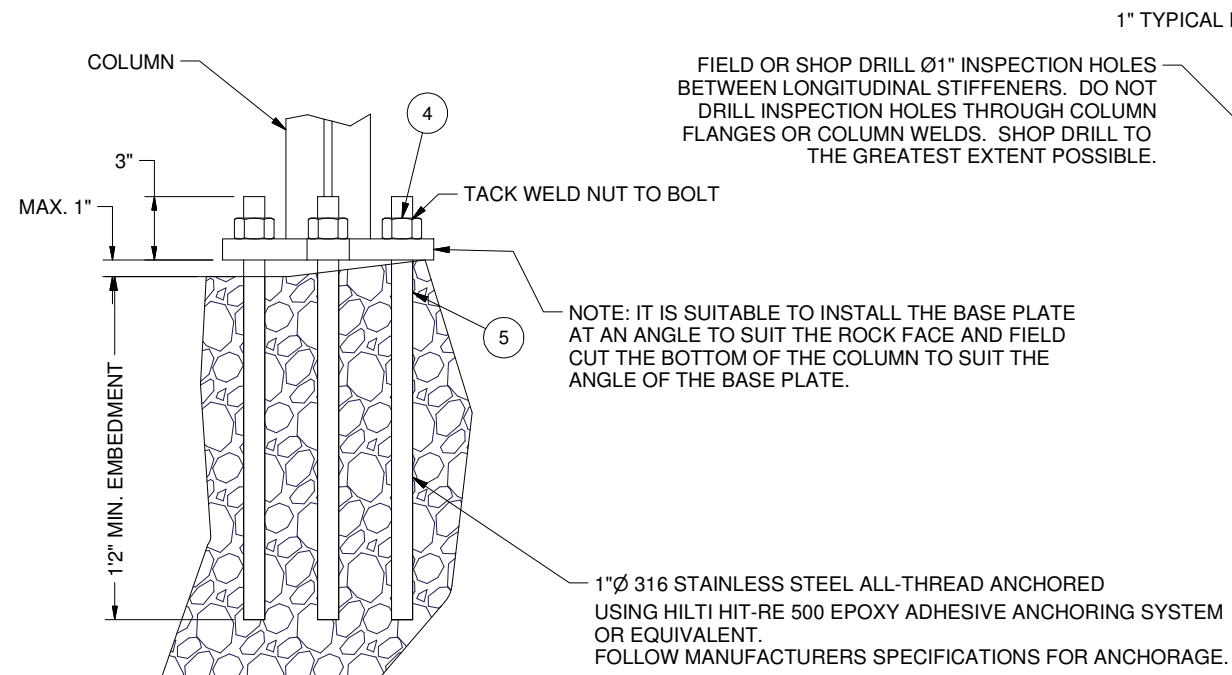
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
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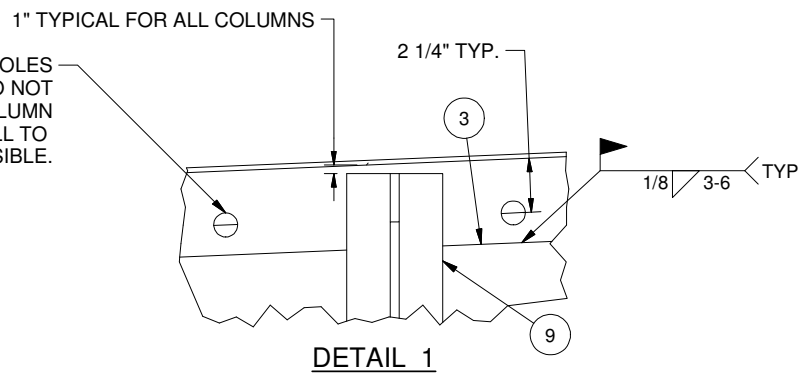
PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 10

DWG. NO.: S17550-01-1

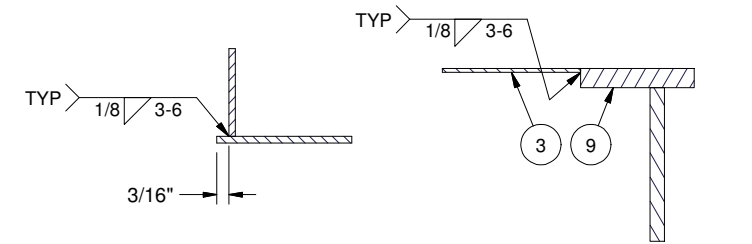


TYPICAL COLUMN ANCHOR BOLT DETAIL



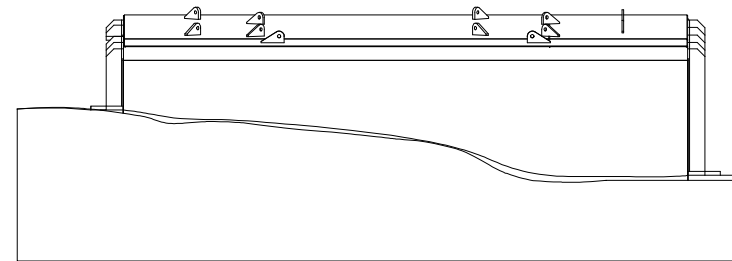
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1		(E) ROCK BED			
2	1	(M) EXTENDED TOP COVER	MK#S17550-A-101		3
3		(E) 12 ga. SKIRT SHEETING		ASTM A240-316L	
4	48	(E) Ø1" HEAVY HEX NUT		ASTM A194 GR. B8M	
5	24	(E) Ø1" ALL THREAD		ASTM A193 GR. B8M	
6	~24	(E) 3/8" SKIRT TAB		ASTM A240-316L	
7	~24	(E) Ø5/8" NUT		ASTM A194 GR. B8M	
8	~24	(E) Ø5/8" ALL THREAD		ASTM A193 GR. B8M	
9	8	(E) COLUMN ASSEMBLY	MK#S17550-A-104		6

ESTIMATED TOTAL COLUMN LENGTH 13'-9 3/4" WITHOUT SCRAP OR EXTRA. KOVA RECOMMENDS COLUMN LENGTH BE SUPPLIED PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.

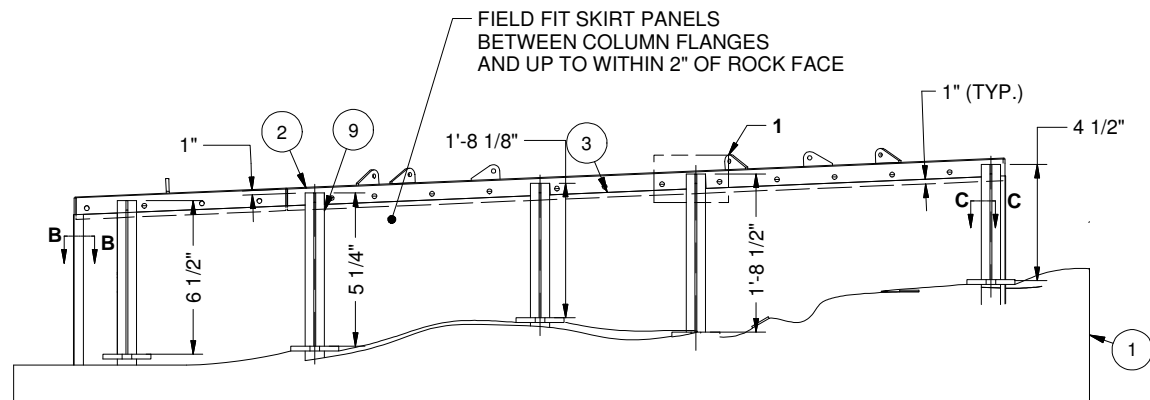


SECTION B-B

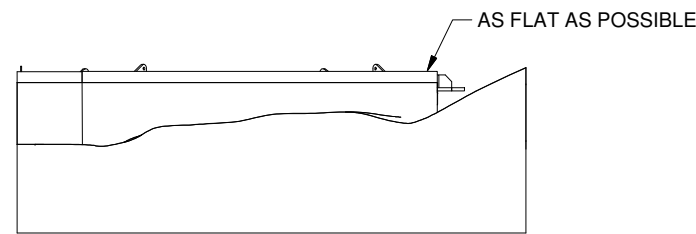
SECTION C-C



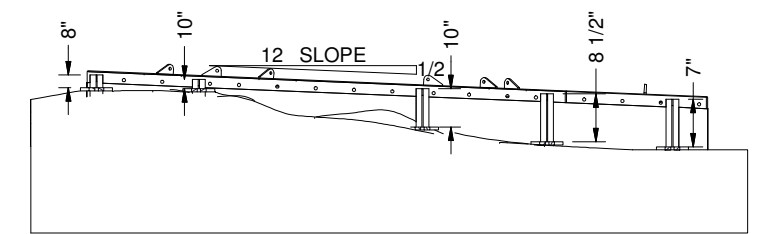
OPENING COVER - LOOKING NORTHEAST



OPENING COVER - MK#S17550-A-101 - LOOKING NORTHWEST



OPENING COVER - LOOKING SOUTHWEST



OPENING COVER - LOOKING SOUTHEAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC



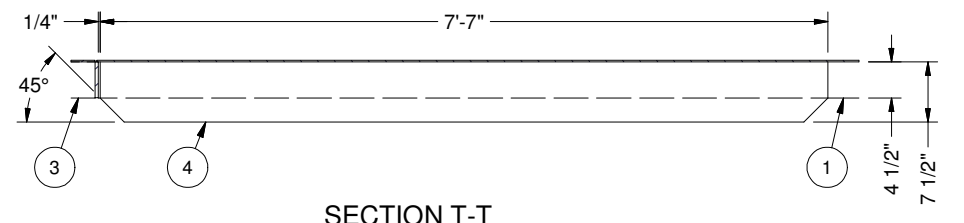
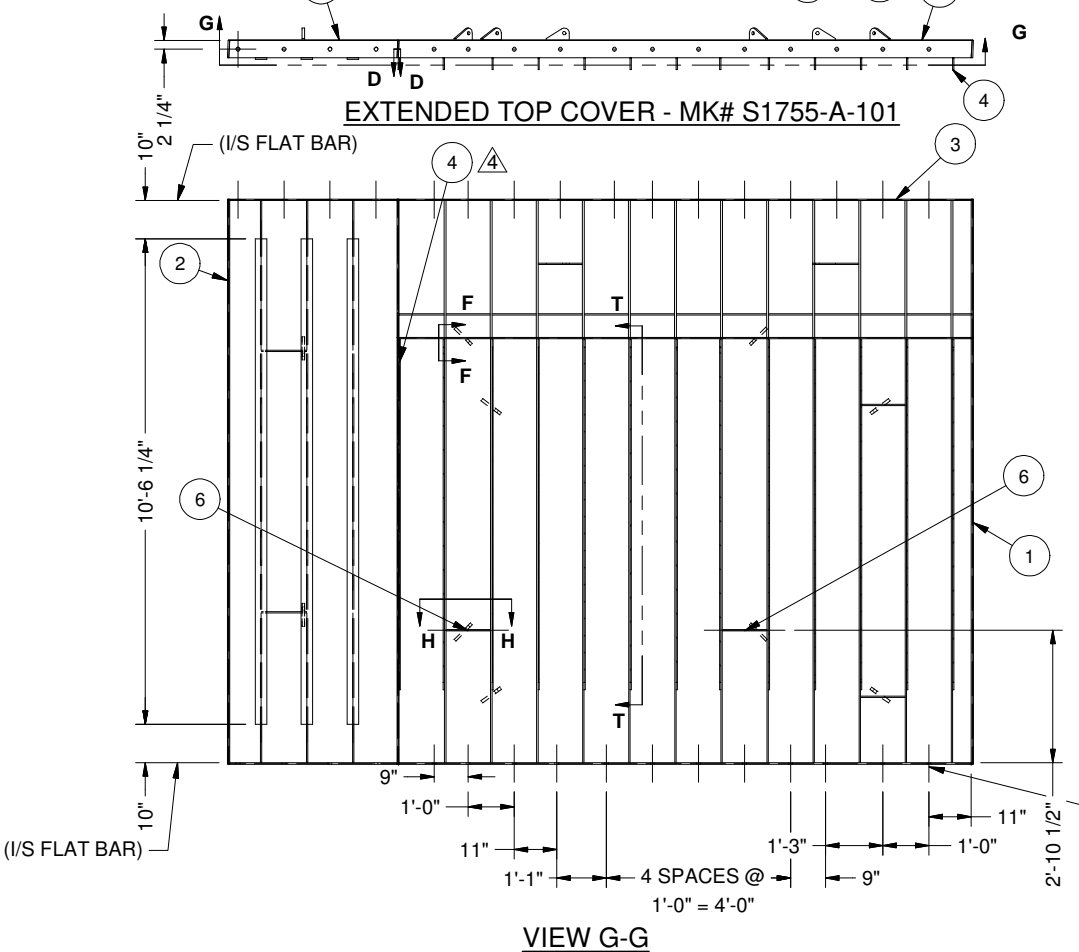
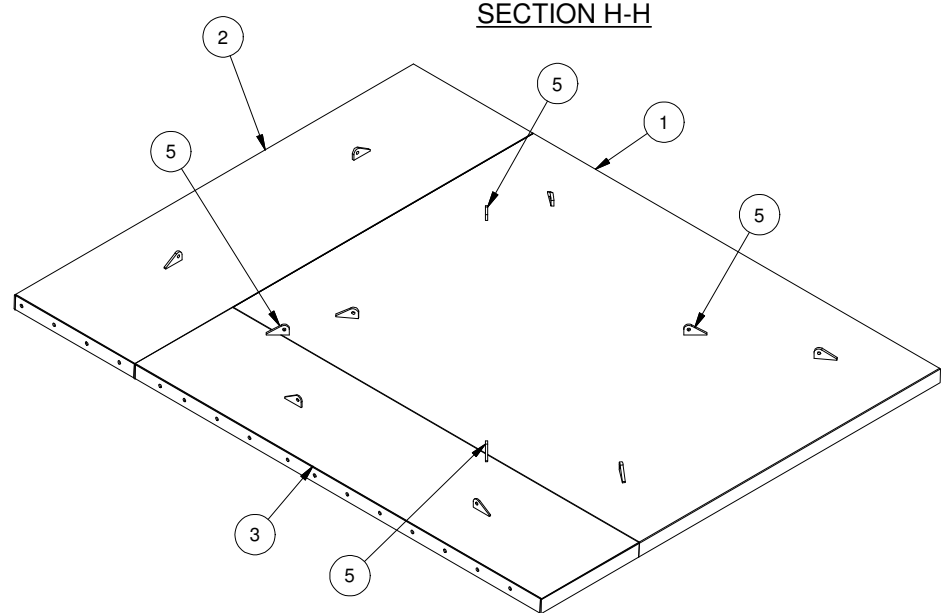
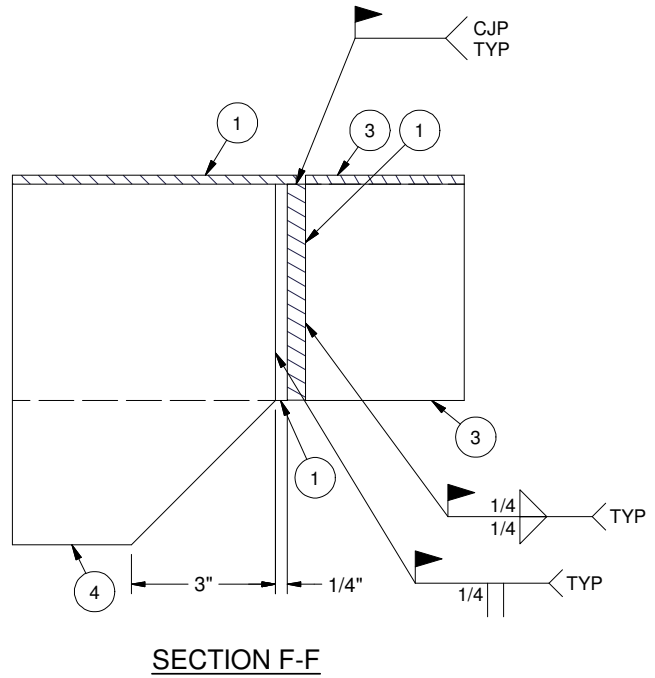
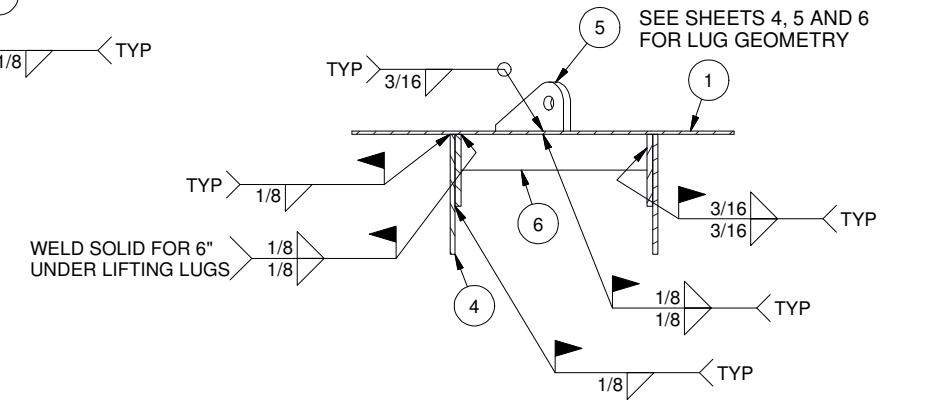
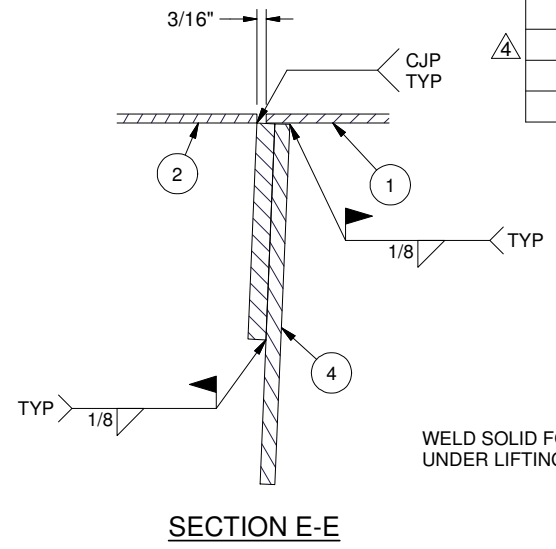
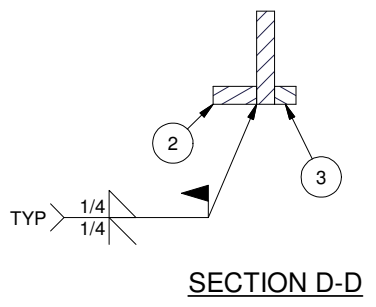
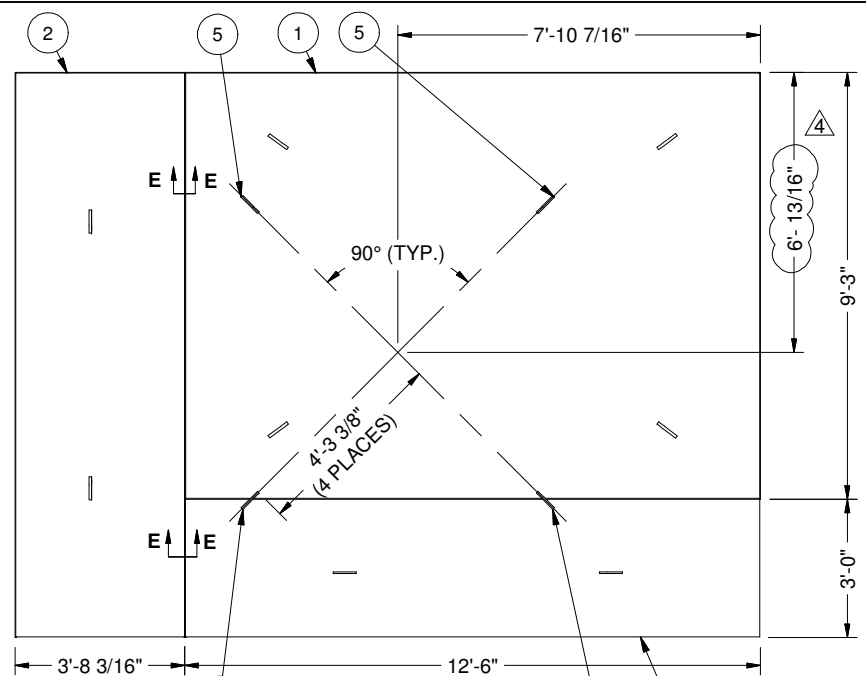
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 INSTALLATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 10

DWG. NO.: **S17550-01-2**



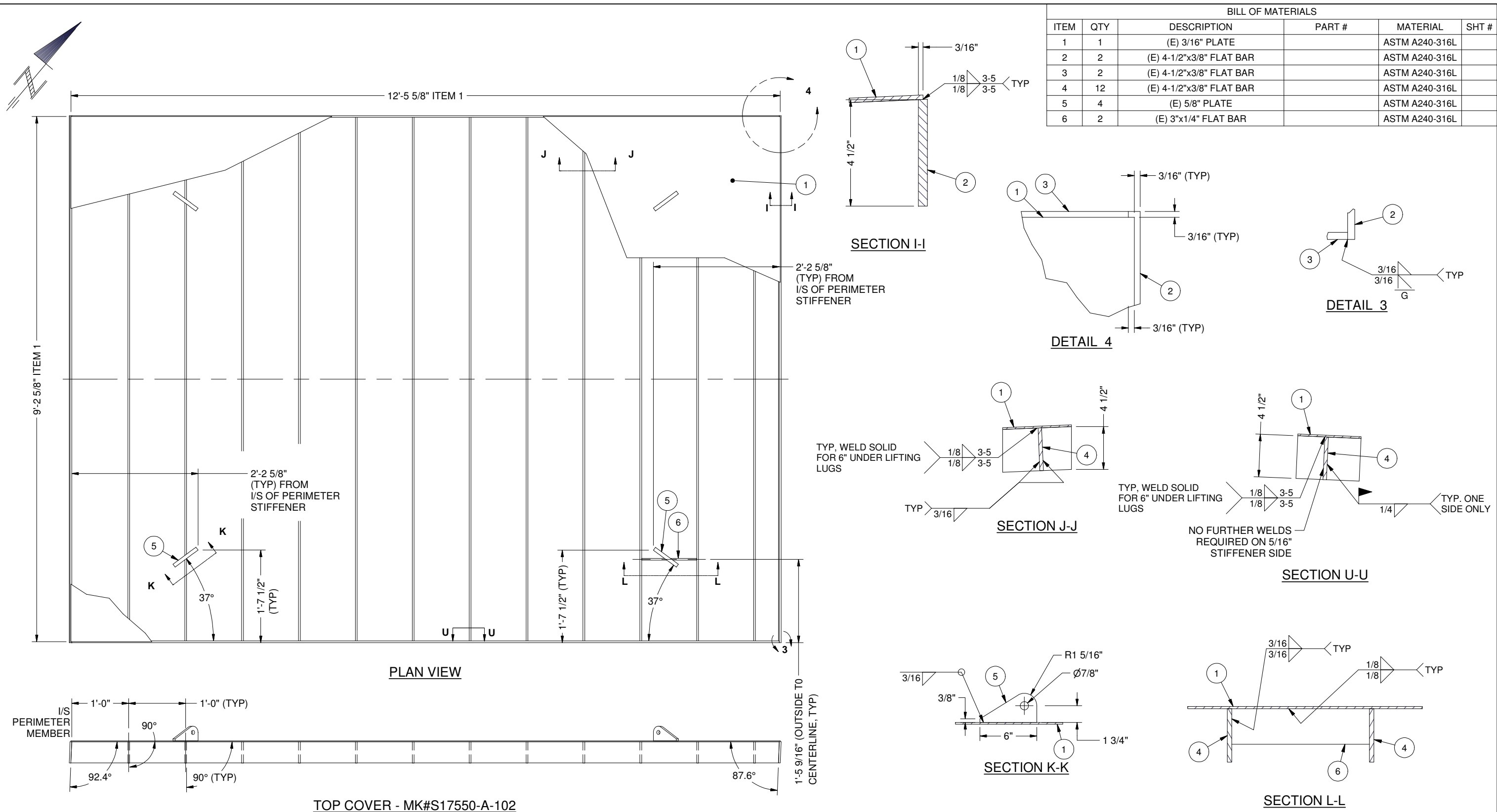
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(E) OPENING COVER	MK# S1755-A-102		4
2	1	(N) OPENING COVER EXTENSION 1	MK# S1755-A-103		5
3	1	(N) OPENING COVER EXTENSION 2	MK# S1755-A-104		6
4	13	(N) 5/16\"		ASTM A240-316L	
5	4	(N) 5/8\"		ASTM A240-316L	
6	2	(N) 2-1/4\"x3/8\" FLAT BAR		ASTM A240-316L	

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16\"
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	ANGULAR DIMS: ± 1 deg.
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	CUT SURFACES: 250
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	MACHINED SURFACES: 125

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318
 Signature: *[Signature]*
 17 10 31
 PROFESSIONAL ENGINEER MEMBER 14318
 SASKATCHEWAN

Kova Engineering Saskatchewan Ltd.
 PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 EXTENDED TOP COVER FABRICATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 10
 DWG. NO.: S17550-01-3
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059



BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(E) 3/16" PLATE		ASTM A240-316L	
2	2	(E) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
3	2	(E) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
4	12	(E) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
5	4	(E) 5/8" PLATE		ASTM A240-316L	
6	2	(E) 3"x1/4" FLAT BAR		ASTM A240-316L	

TOP COVER - MK#S17550-A-102

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC

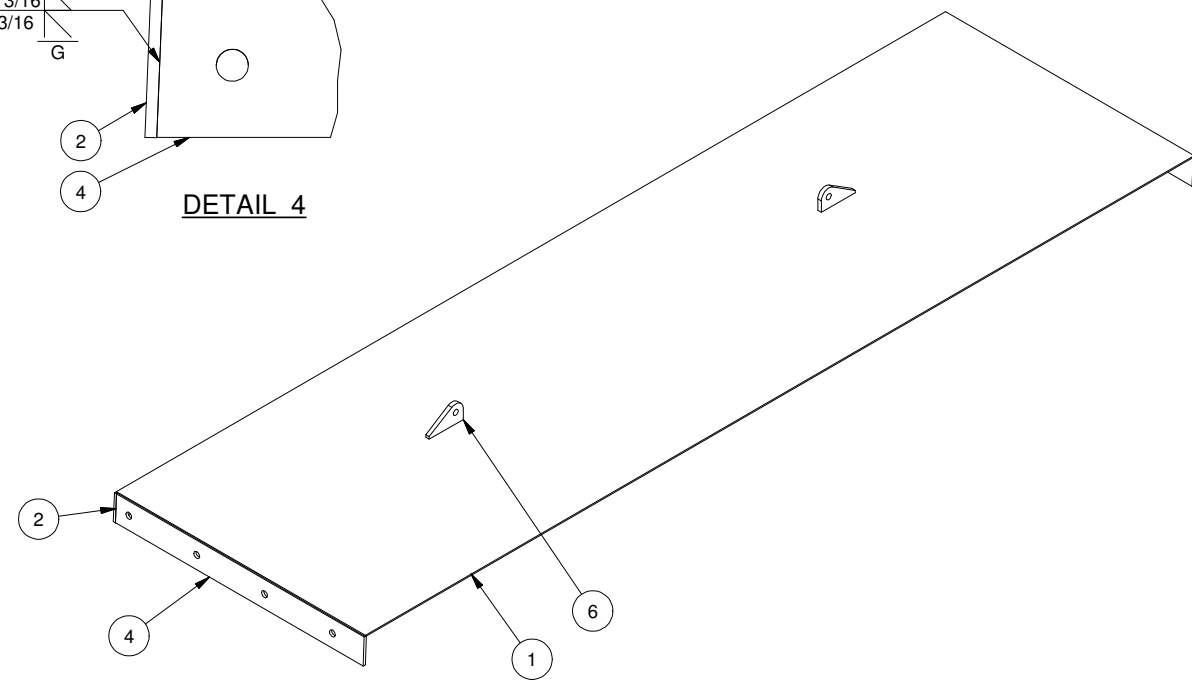
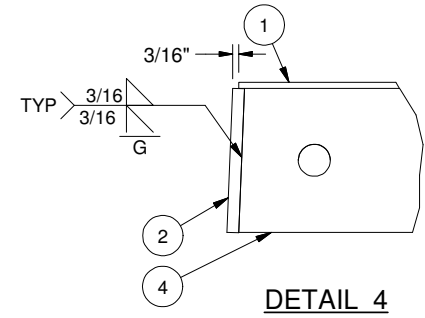
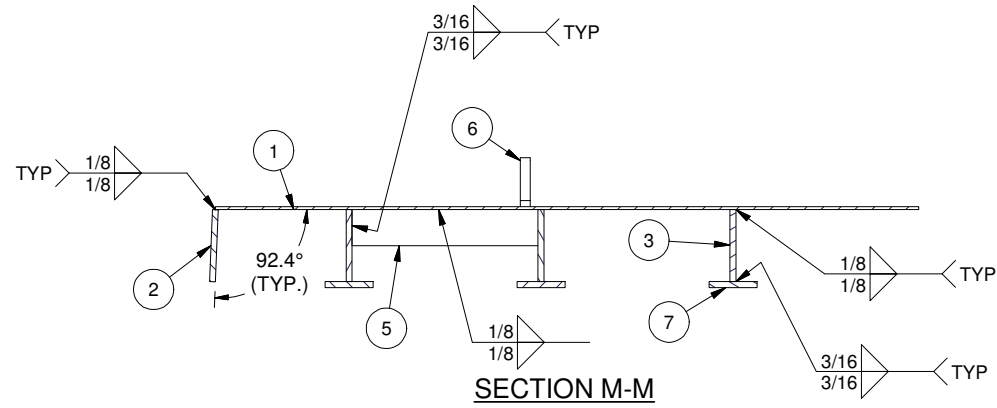
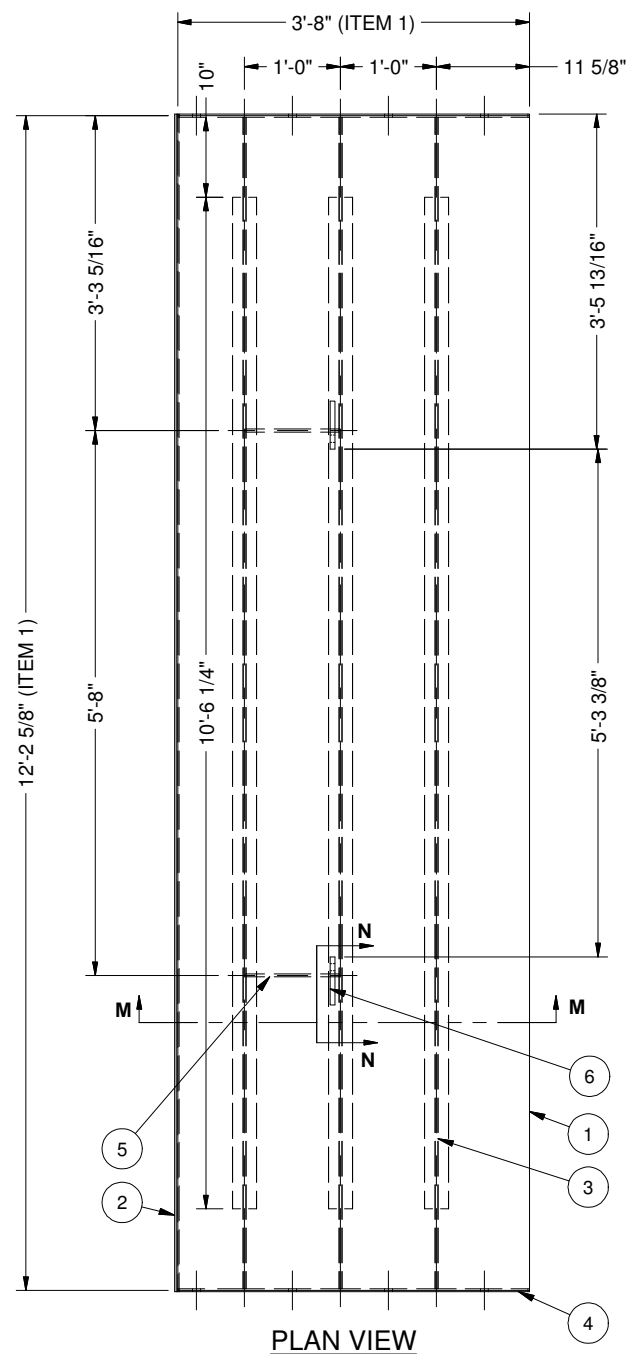


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

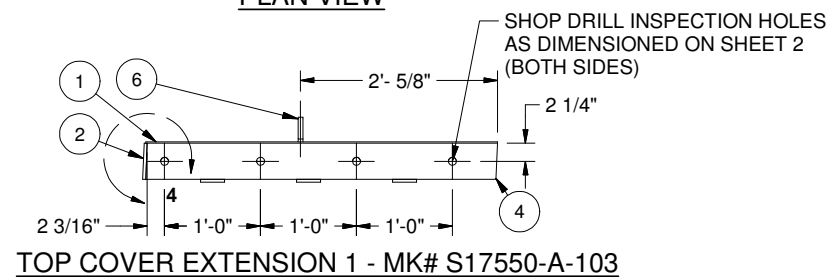
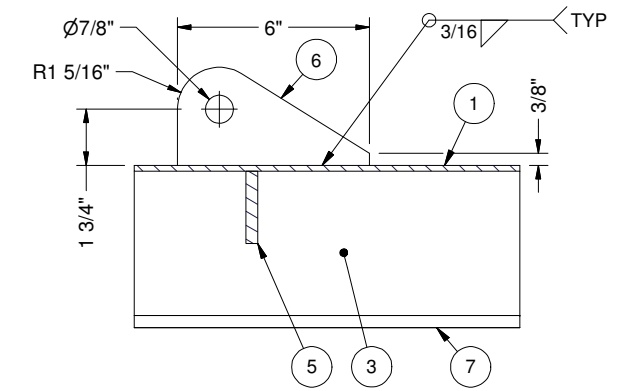
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 TOP COVER FABRICATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 10
 DWG. NO.: S17550-01-4



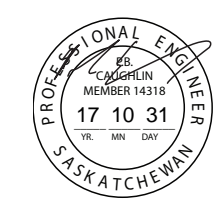
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(N) 3/16" PLATE		ASTM A240-316L	
2	1	(N) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
3	3	(N) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
4	2	(N) 4-1/2"x3/8" FLAT BAR		ASTM A240-316L	
5	2	(N) 2-1/4"x3/8" PLATE		ASTM A240-316L	
6	2	(N) 5/8" PLATE		ASTM A240-316L	
7	3	(N) 3/8" x 3" PLATE		ASTM A240-316L	



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC



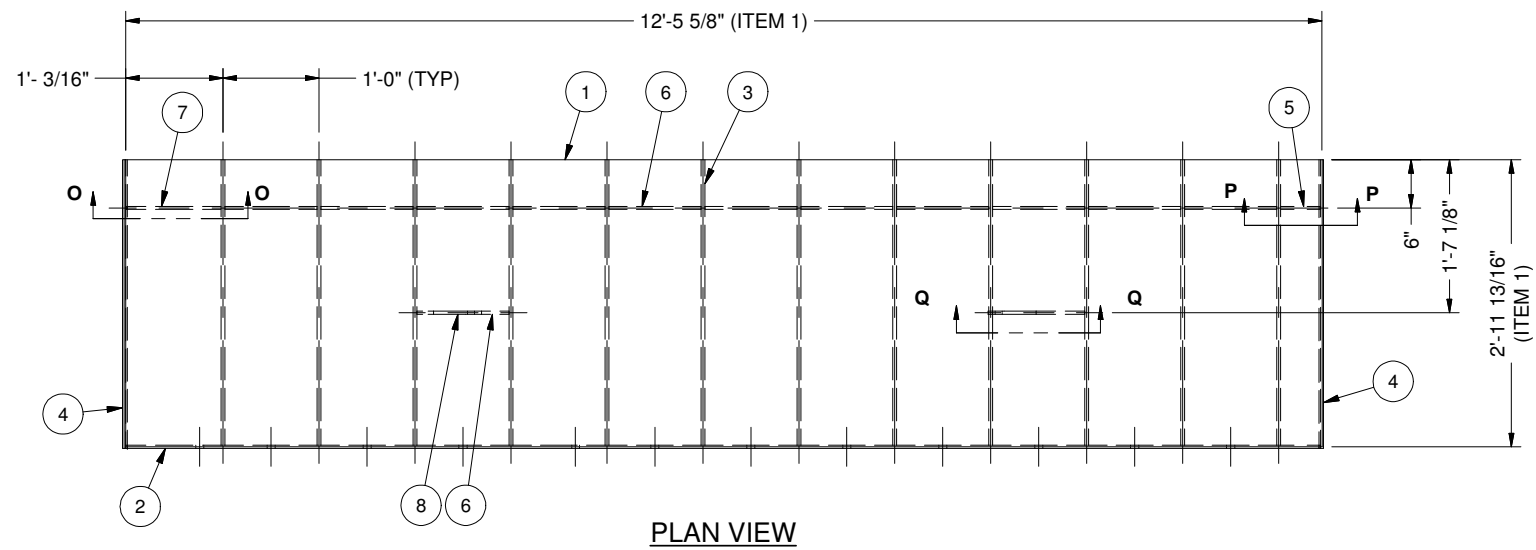
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

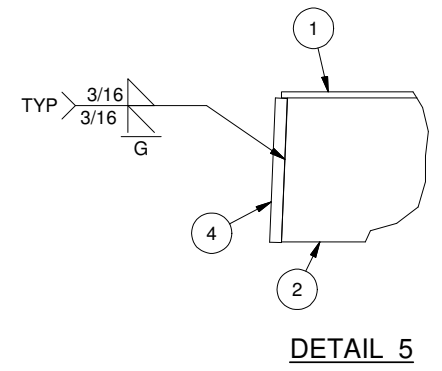
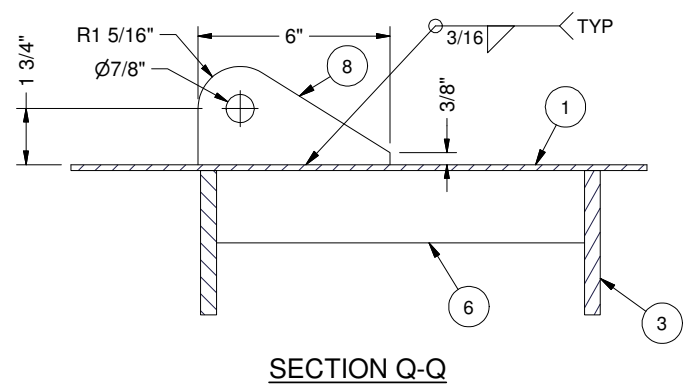
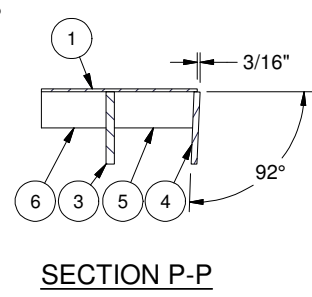
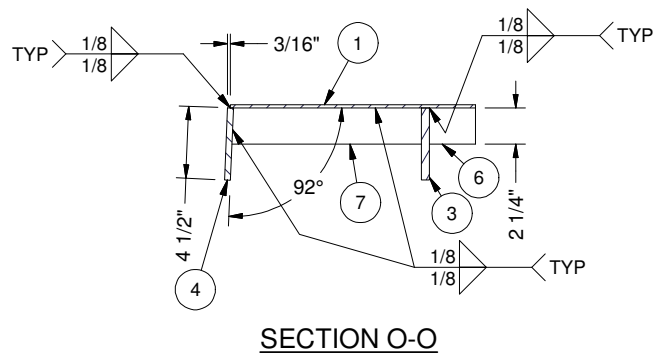
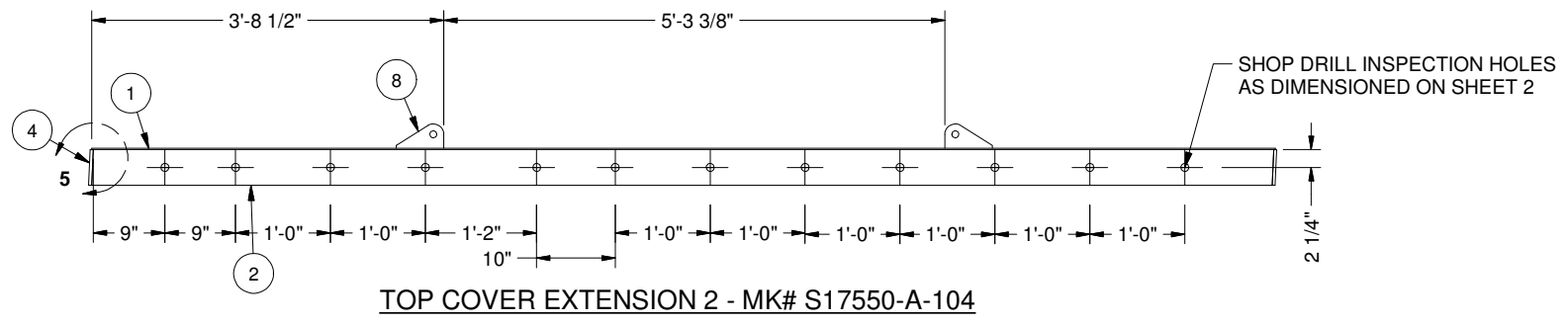
PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 TOP COVER EXTENSION 1 FABRICATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 10

DWG. NO.: **S17550-01-5**



BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(N) 3/16\"		ASTM A240-316L	
2	1	(N) 4-1/2\"x3/8\" FLAT BAR		ASTM A240-316L	
3	12	(N) 4-1/2\"x1/2\" FLAT BAR		ASTM A240-316L	
4	2	(N) 4-1/2\"x3/8\" FLAT BAR		ASTM A240-316L	
5	1	(N) 2-1/4\"x3/8\" FLAT BAR		ASTM A240-316L	
6	13	(N) 2-1/4\"x3/8\" FLAT BAR		ASTM A240-316L	
7	1	(N) 2-1/4\"x3/8\" FLAT BAR		ASTM A240-316L	
8	2	(N) 5/8\"		ASTM A240-316L	



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC

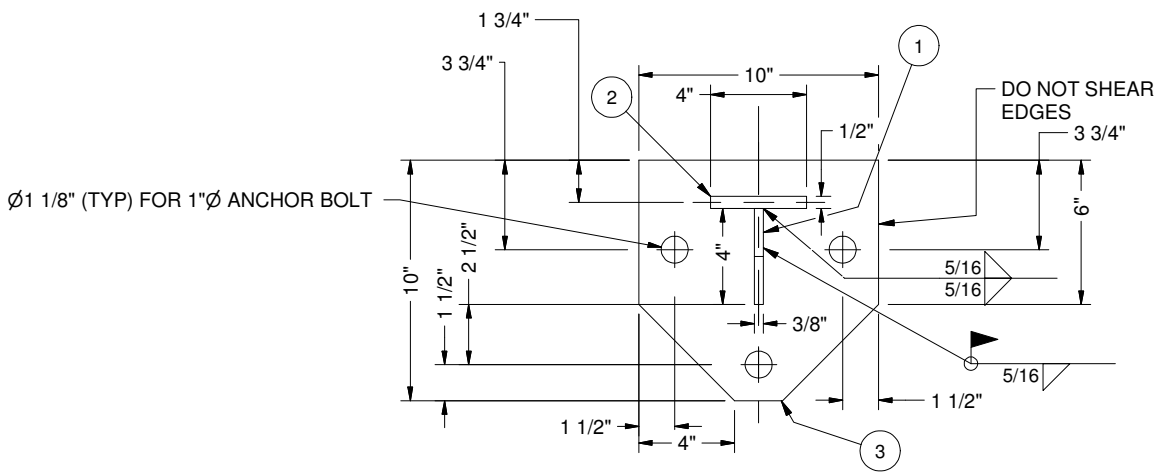


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

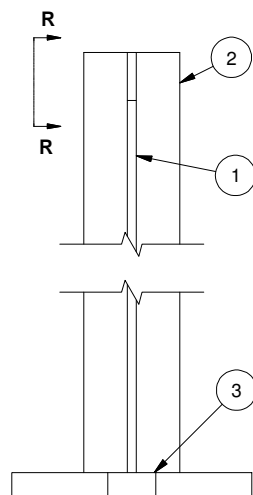
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 TOP COVER EXTENSION 2 FABRICATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

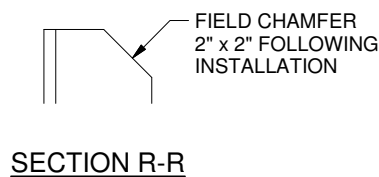
DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 10 DWG. NO.: **S17550-01-6**



TYPICAL COLUMN PLAN



TYPICAL COLUMN ELEVATION
MK#S17550-A-105



SECTION R-R

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT #
1	1	(E) 4x3/8" FLAT BAR		ASTM A240-316L	
2	1	(E) 4x1/2" FLAT BAR		ASTM A240-316L	
3	1	(E) 1" PLATE		ASTM A240-316L	

NOTE: QUANTITIES IN BOM ARE FOR ONE OF EACH ASSEMBLY ONLY. EIGHT (8) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC

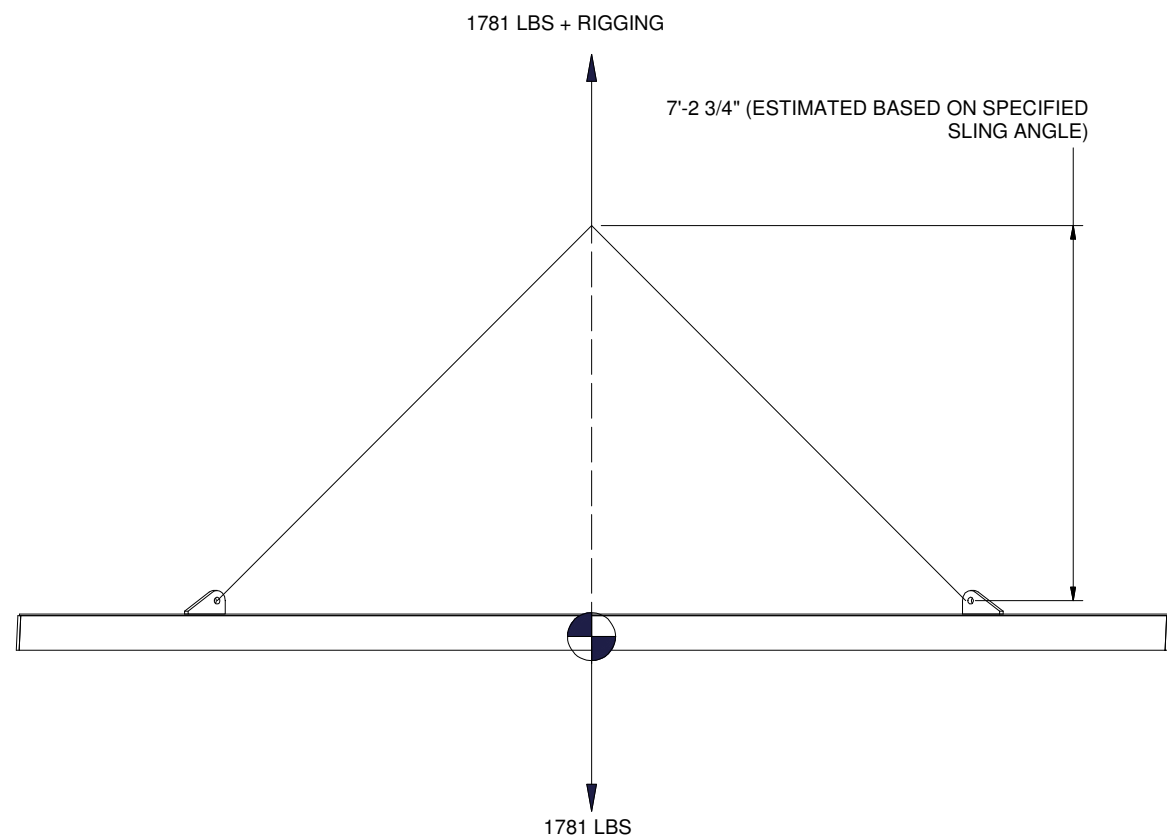


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 Structural 14318

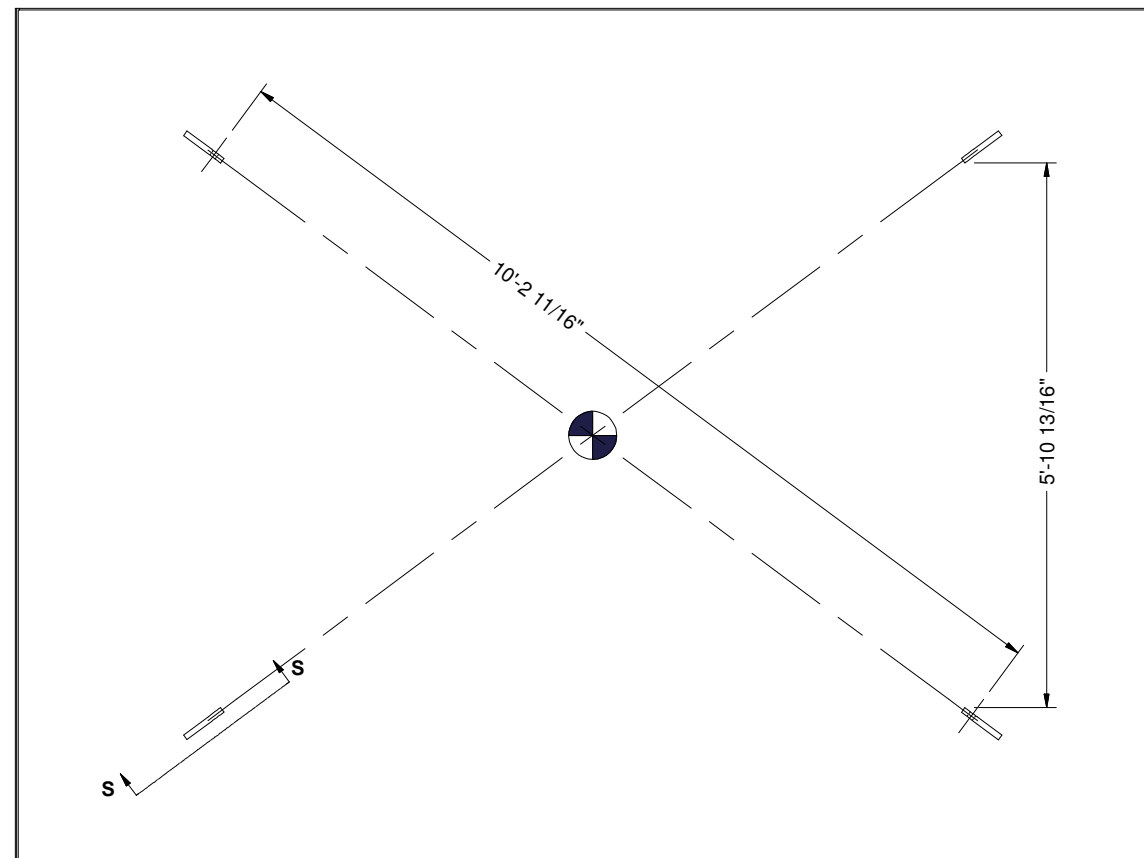
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 COLUMN ASSEMBLY FABRICATION DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

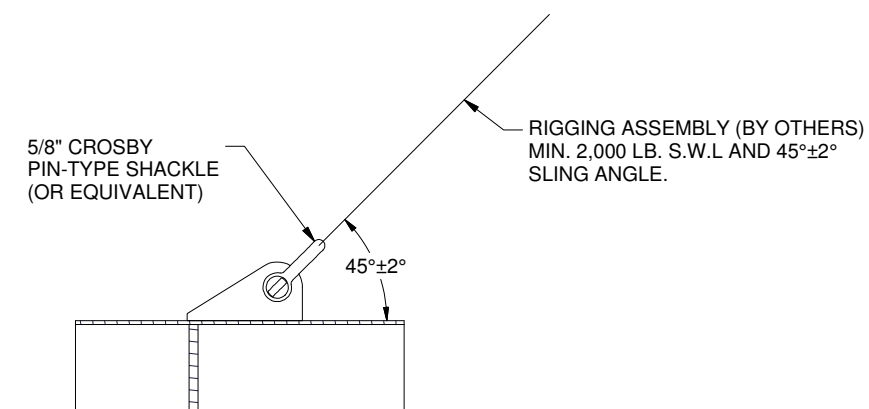
DO NOT SCALE DRAWINGS SHEET NO.: 7 OF 10 DWG. NO.: S17550-01-7



TOP COVER LIFTING DIAGRAM - SIDE VIEW



TOP COVER LIFTING DIAGRAM - PLAN VIEW



SECTION S-S

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	DRWN BY: JG DATE: 11/13/2015
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	CHK'D BY: ENG BY: PC

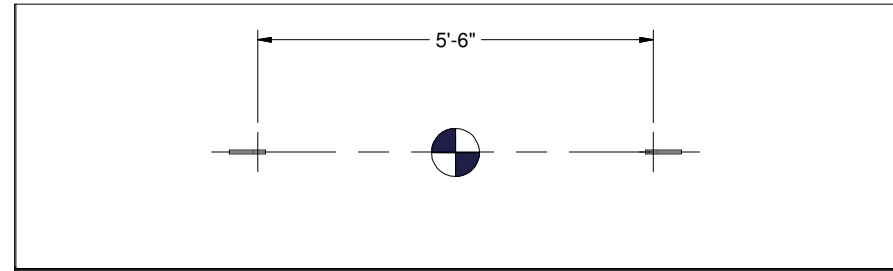


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 Structural 14318

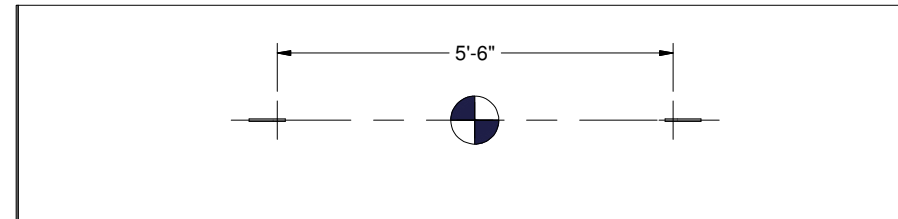
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 COVER LIFTING DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

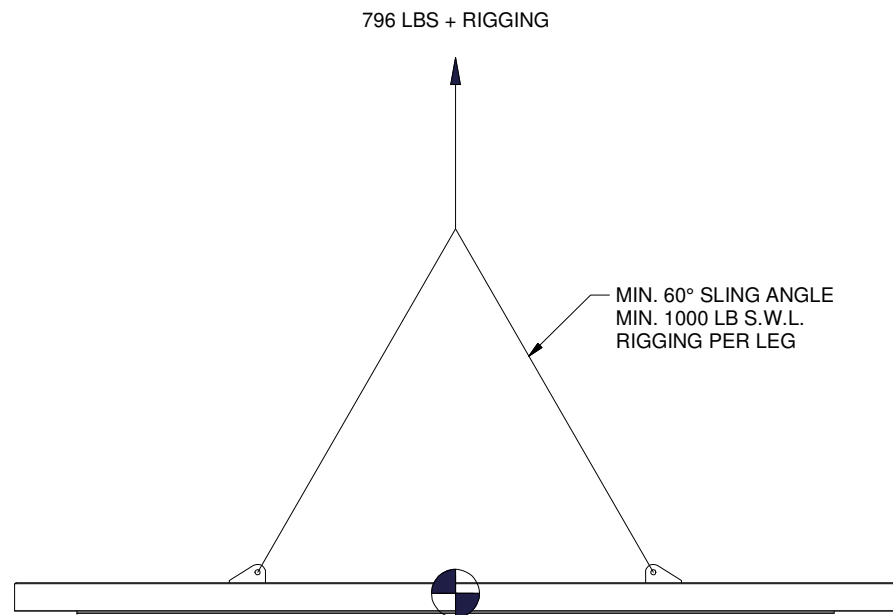
DO NOT SCALE DRAWINGS SHEET NO.: 8 OF 10 DWG. NO.: **S17550-01-8**



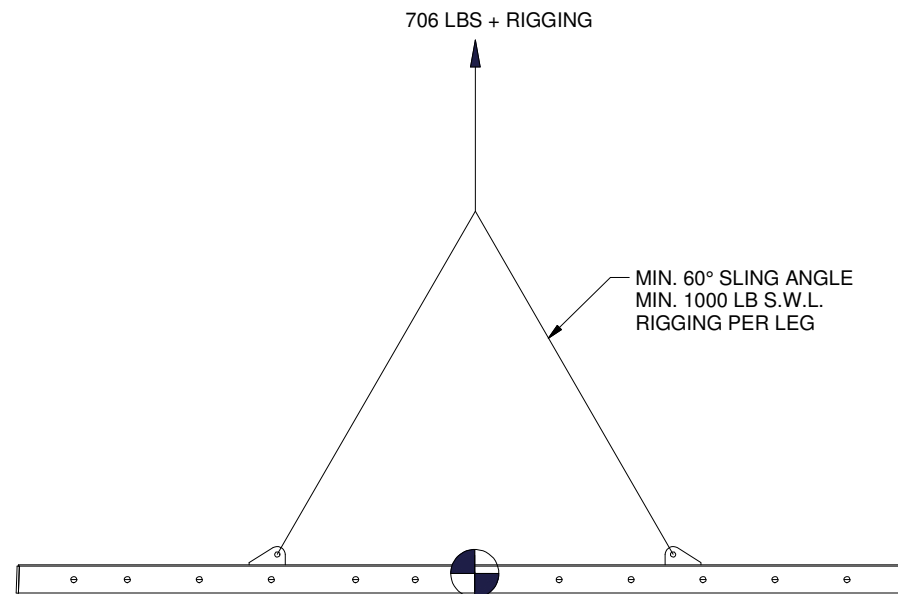
TOP COVER EXTENSION 1 LIFTING DIAGRAM - PLAN VIEW



TOP COVER EXTENSION 2 LIFTING DIAGRAM - PLAN VIEW



TOP COVER EXTENSION 1 LIFTING DIAGRAM - SIDE VIEW



TOP COVER EXTENSION 2 LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	

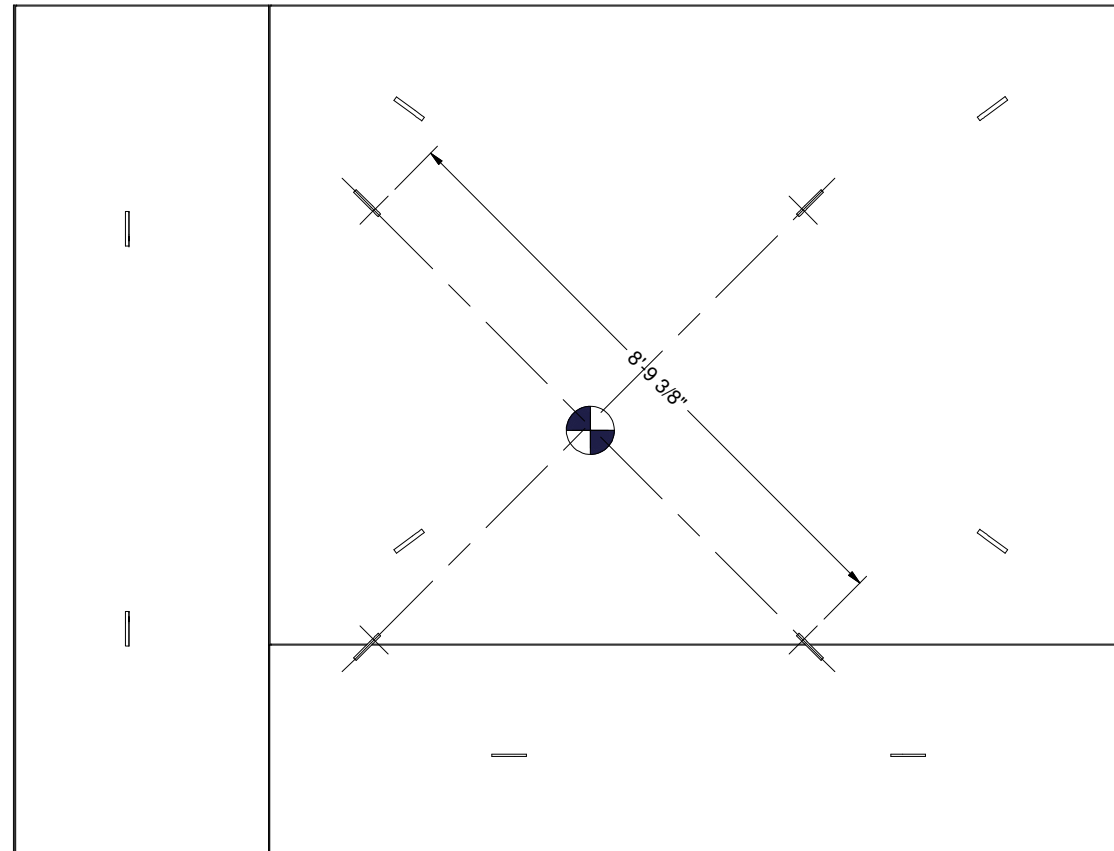


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 Structural 14318

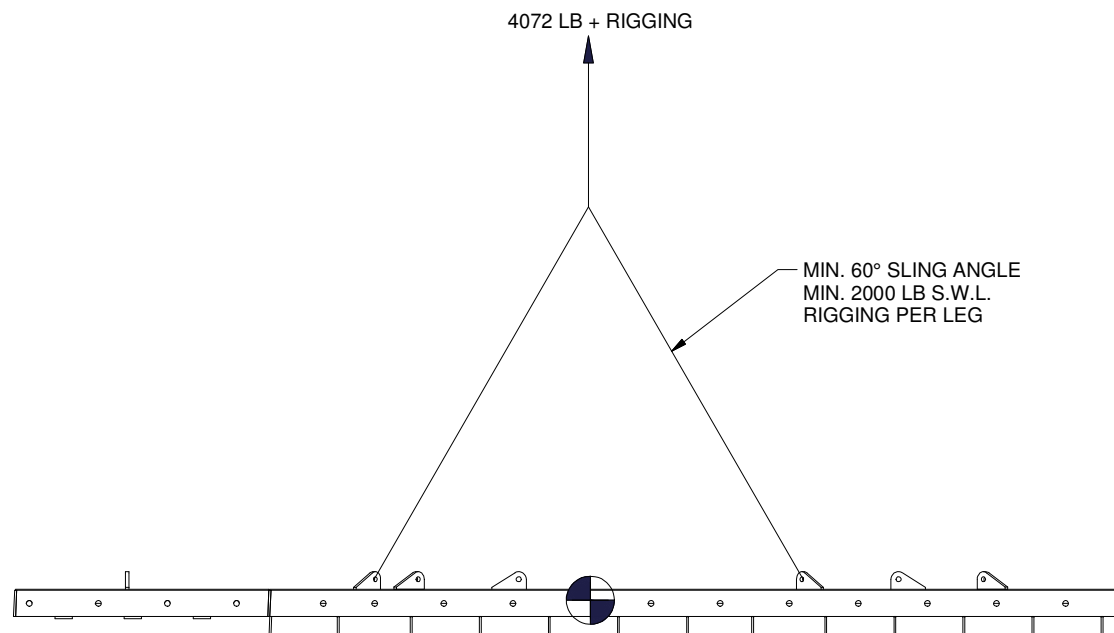
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 COVER EXTENSION ASSEMBLY LIFTING DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 9 OF 10 DWG. NO.: S17550-01-9



EXTENDED TOP COVER LIFTING DETAIL - PLAN VIEW

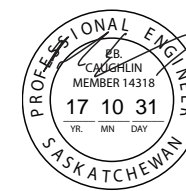


EXTENDED TOP COVER LIFTING DETAIL - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	REVISED FOLLOWING FABRICATOR INPUT	11/18/2016	N.R.	
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ADDED EXTENSIONS, AND REVISED INSPECTION HOLES AND SKIRT	10/25/2016	N.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C872
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT STAINLESS STEEL COVER FOR BEAVERLODGE FAY 10 OPENING
 EXTENDED TOP COVER ASSEMBLY LIFTING DETAILS
 LOCATION: 59°33'21.77N, 108°28'58.44W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 10 OF 10 DWG. NO.: **S17550-01-10**

HAB 2 - 013904 Raise



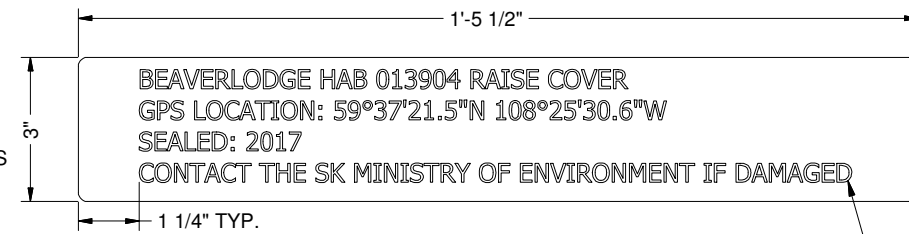
HAB 2 - 013904 Raise

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

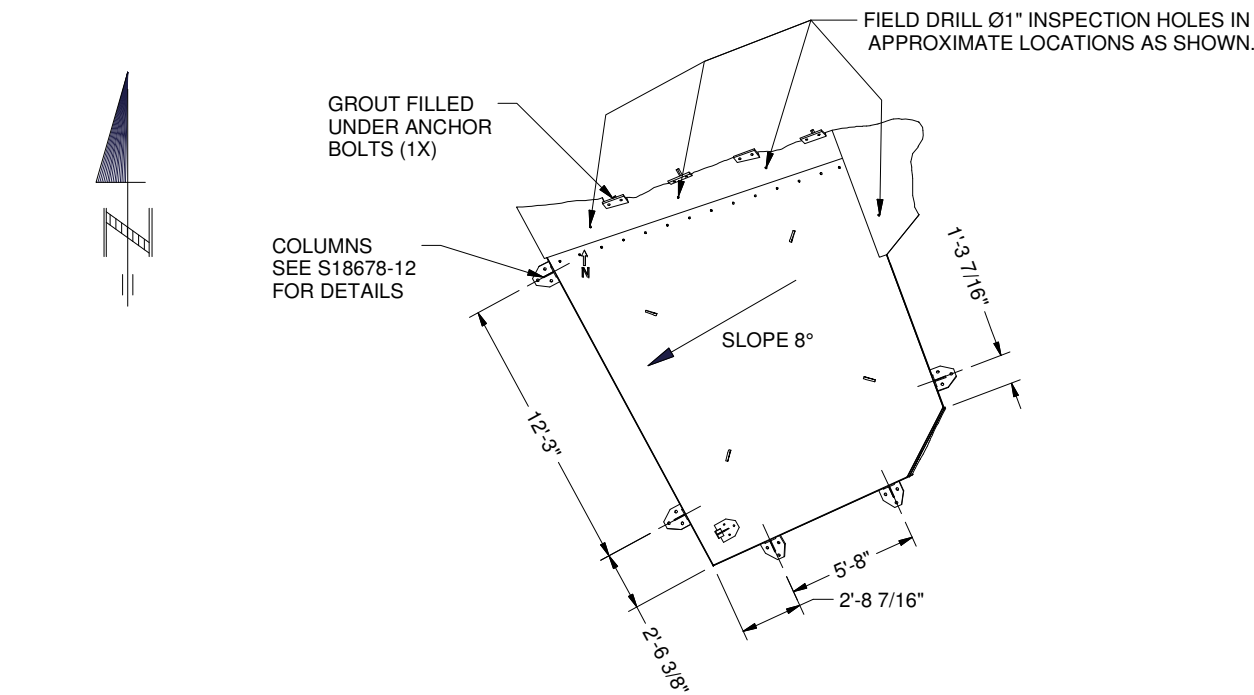
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 5732 LB
5. DO NOT BACK FILL WALLS OF COVER.



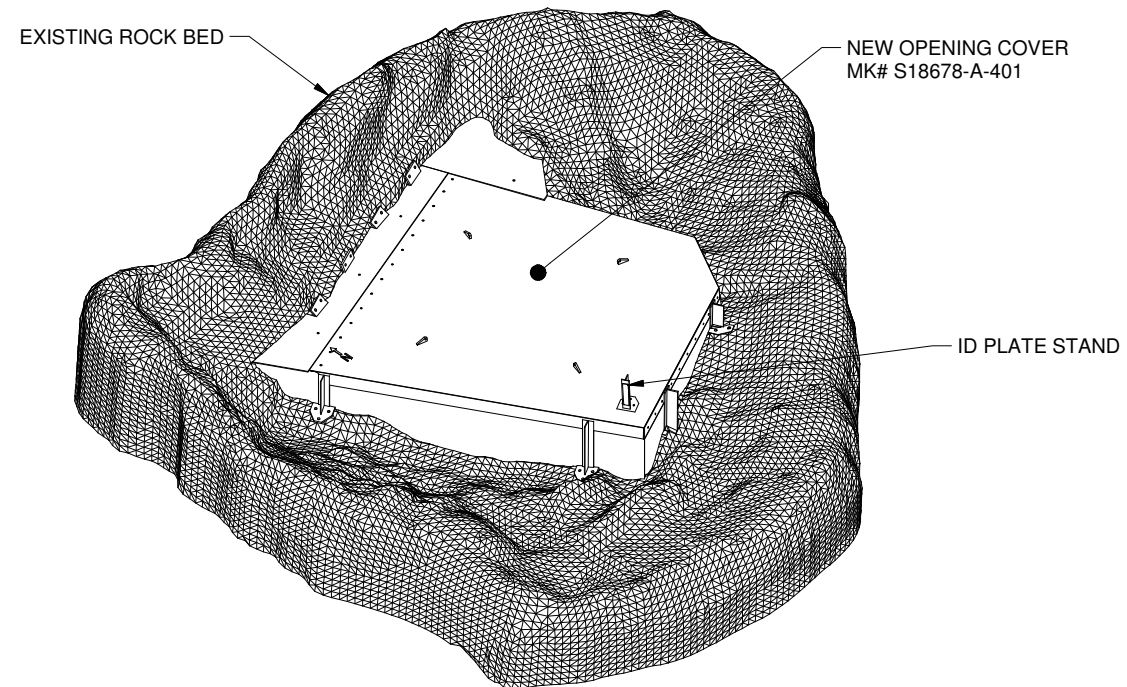
ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 4242 LB
AS INSTALLED: 5732 LB

**ID PLATE (SUPPLIED BY FABRICATOR)
TO BE SUPPLIED AND INSTALLED BY FABRICATOR**

LETTERS TO BE MILLED INTO 12ga 316 SS SHEETING
AND MIN LETTER HEIGHT IS 10mm



PLAN VIEW - HAB 2 OPENING COVER



**ISO VIEW
LOOKING NORTH-WEST**

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

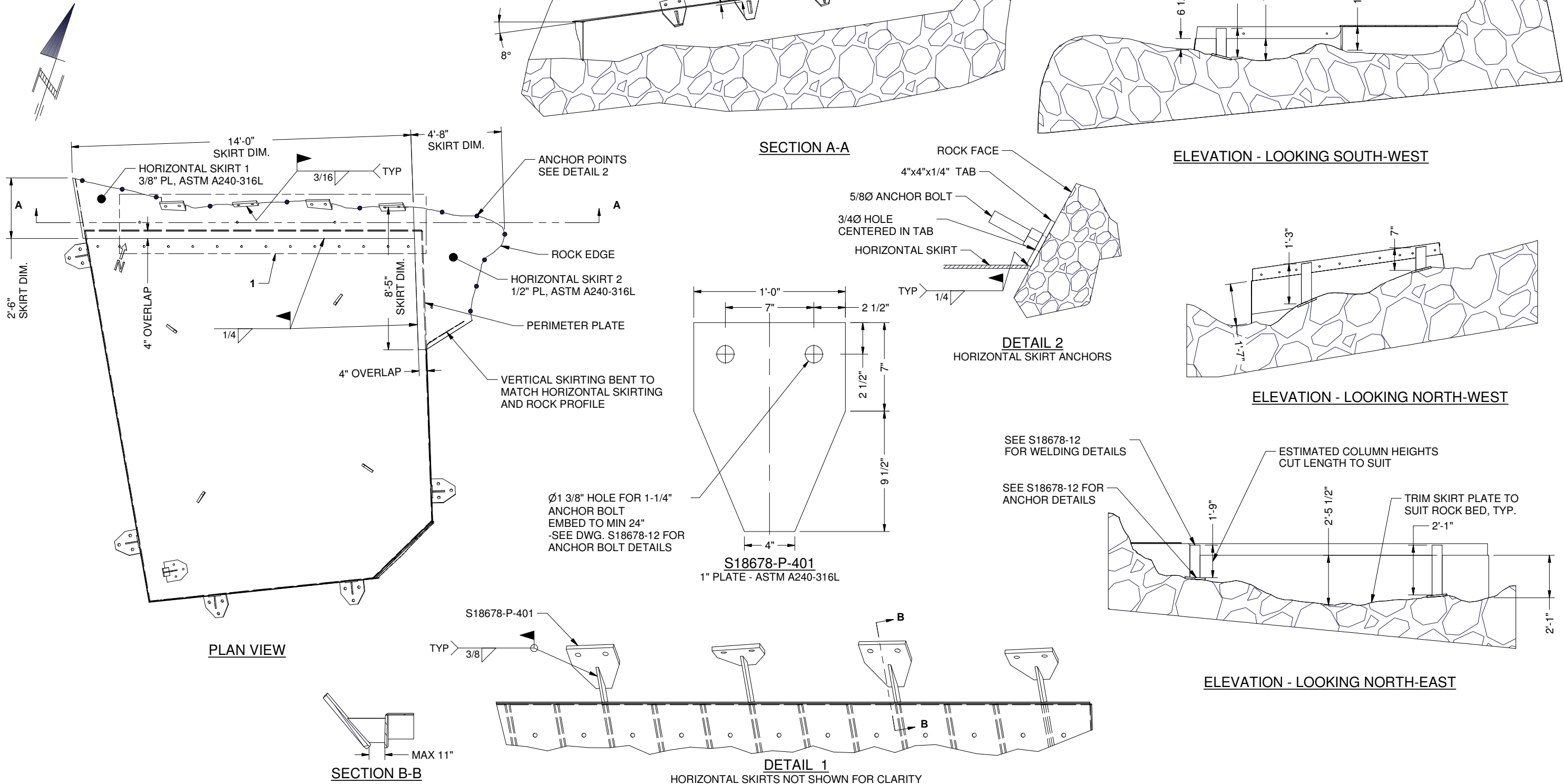
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 6

DWG. NO.: **S18678-04-1**

ESTIMATED TOTAL COLUMN LENGTH 102" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (4) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	CHK'D BY: ENG BY: P.C.



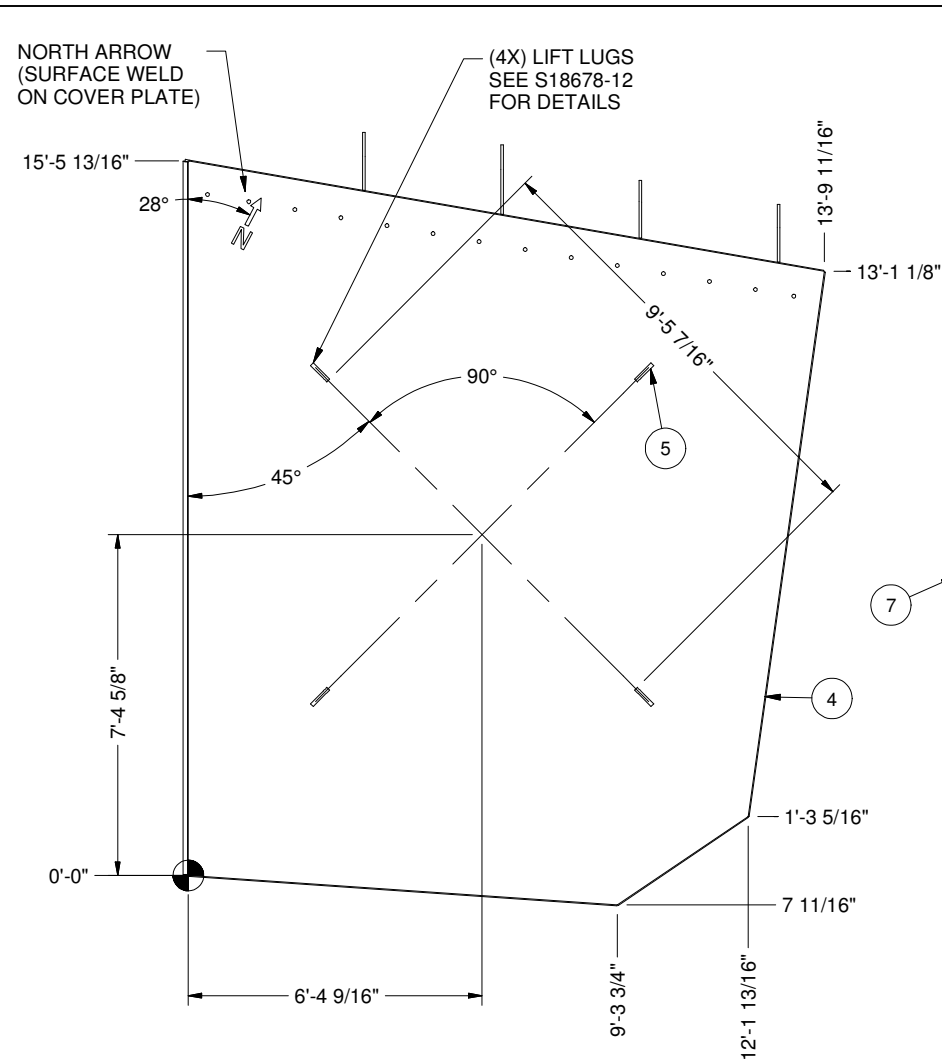
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
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 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

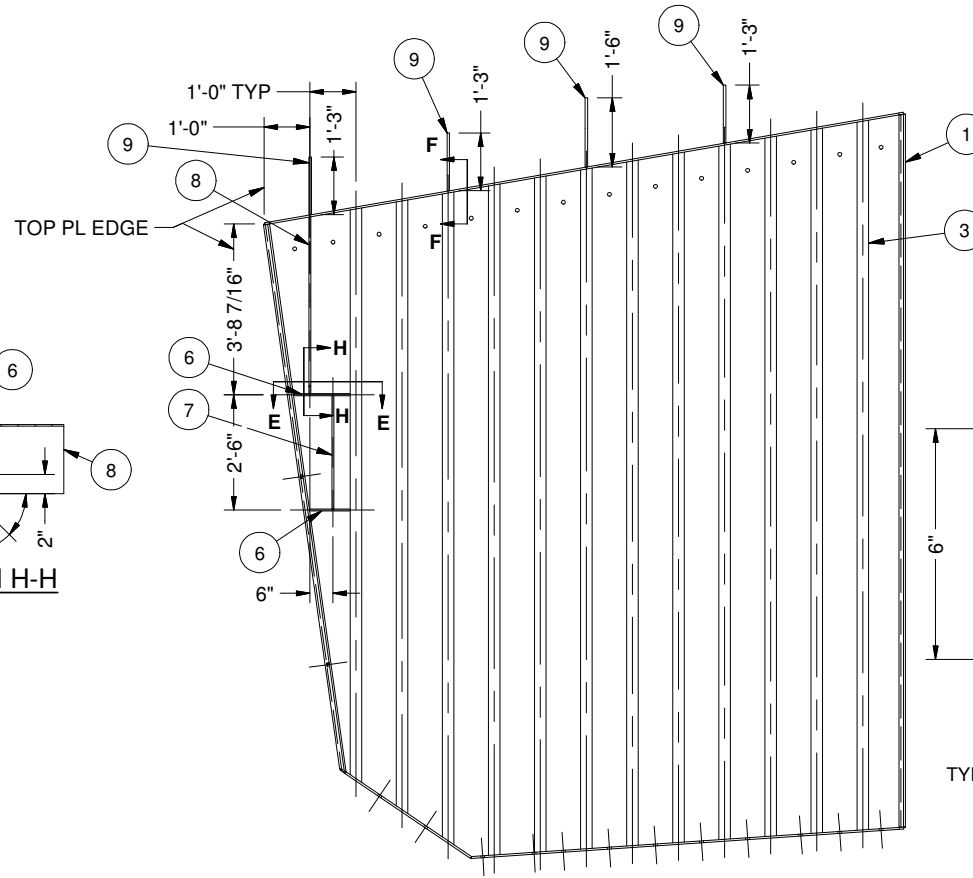
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING
 INSTALLATION DETAILS
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 6

DWG. NO.: **S18678-04-2**

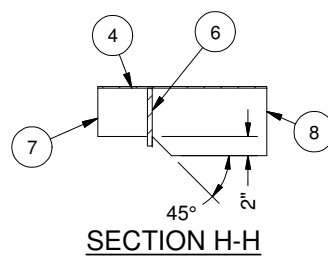


S18678-A-401 - TOP VIEW
TOP PLATE DIMENSIONS

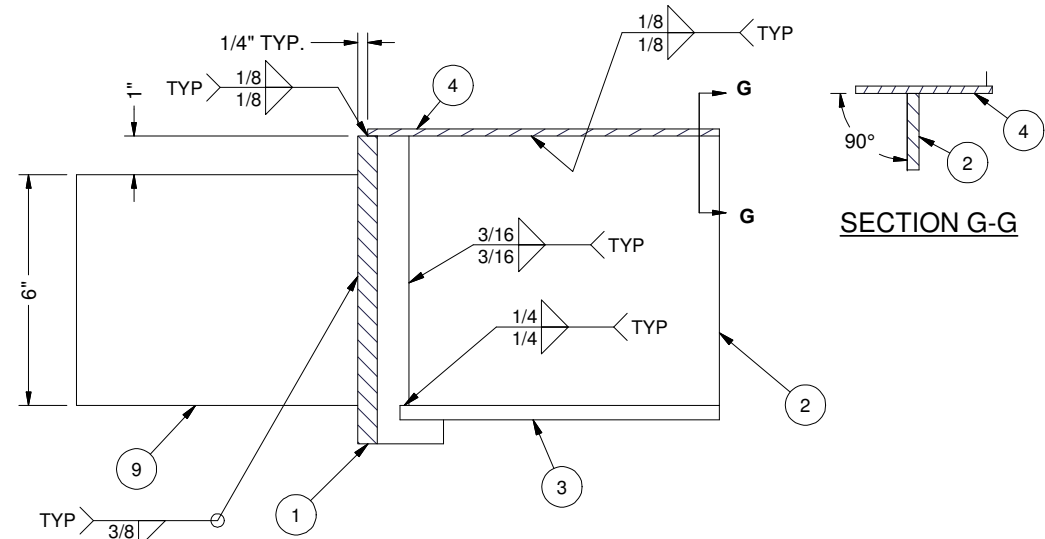


S18678-A-401 - BOTTOM VIEW
STIFFENER LAYOUT

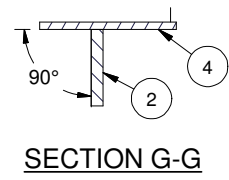
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1		8"x1/2" FB	ASTM A240-316L
2		7" x 5/16" FB	ASTM A240-316L
3		3"x3/8" FB	ASTM A240-316L
4	1	3/16" PL	ASTM A240-316L
5	4	5/8" PL	ASTM A240-316L
6	2	6" X 1/2" FB	ASTM A240-316L
7	1	5" x 1/2" FB	ASTM A240-316L
8	1	7" x 1/2" FB	ASTM A240-316L
9	4	6" x 5/8" F.B.	ASTM A240-316L



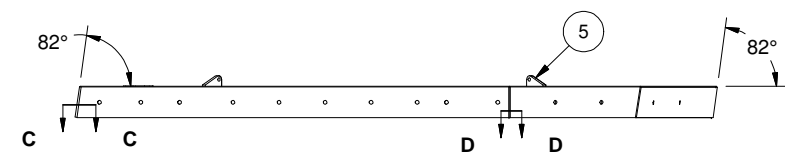
SECTION H-H



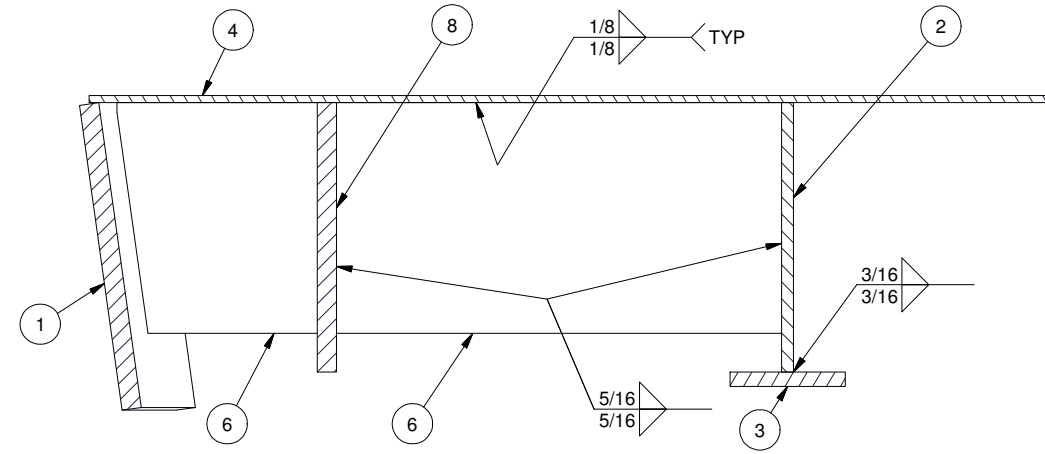
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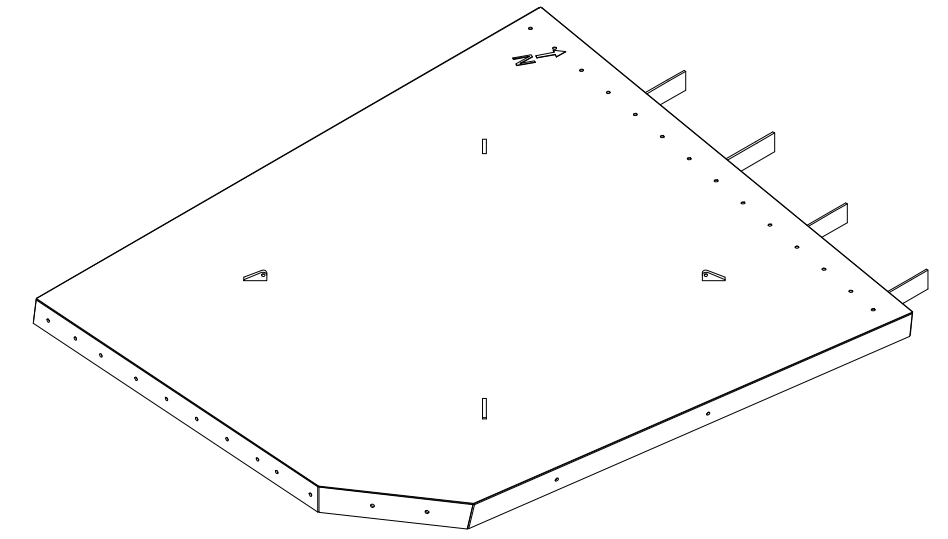
SECTION G-G



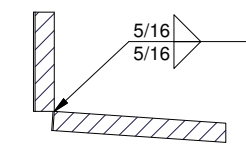
SIDE VIEW



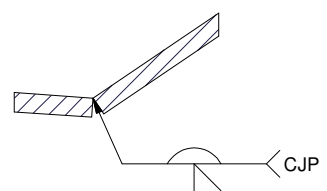
SECTION E-E



S18678-A-401 - ISO VIEW



SECTION C-C



SECTION D-D

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	CHK'D BY: ENG BY: P.C.



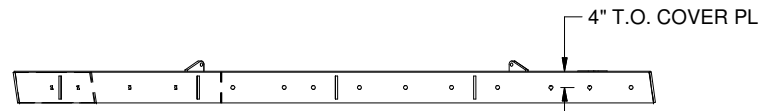
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

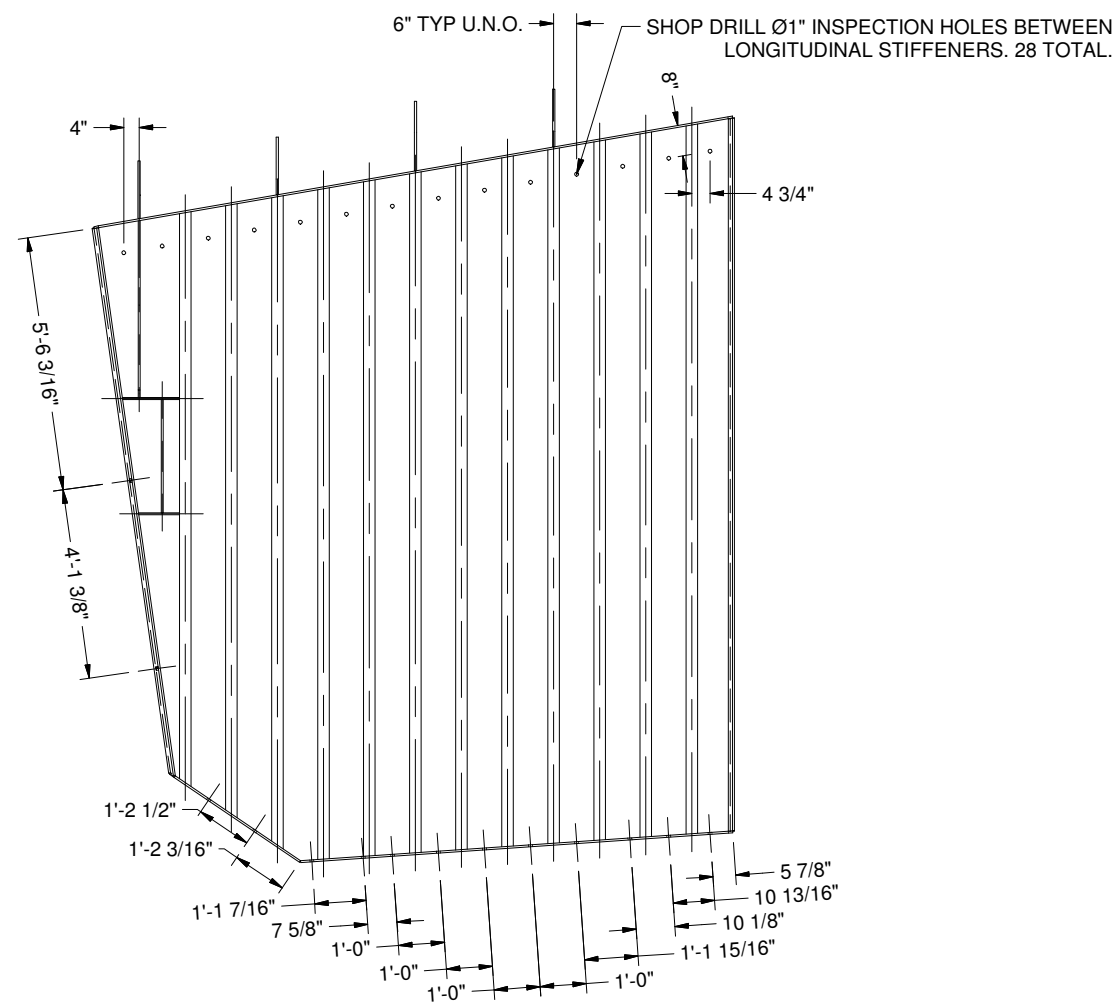
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING
 TOP COVER SECTIONS
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-04-3**

SHEET NO.: 3 OF 6



SIDE VIEW



S18678-A-401 - BOTTOM VIEW
INSPECTION HOLE LAYOUT

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	

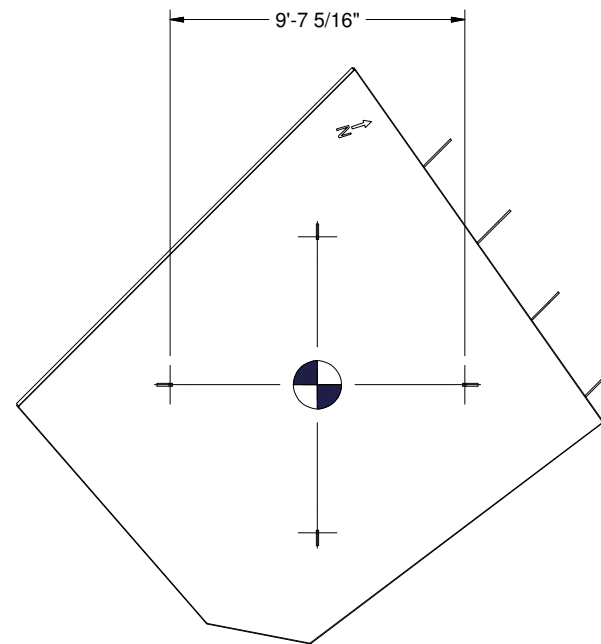


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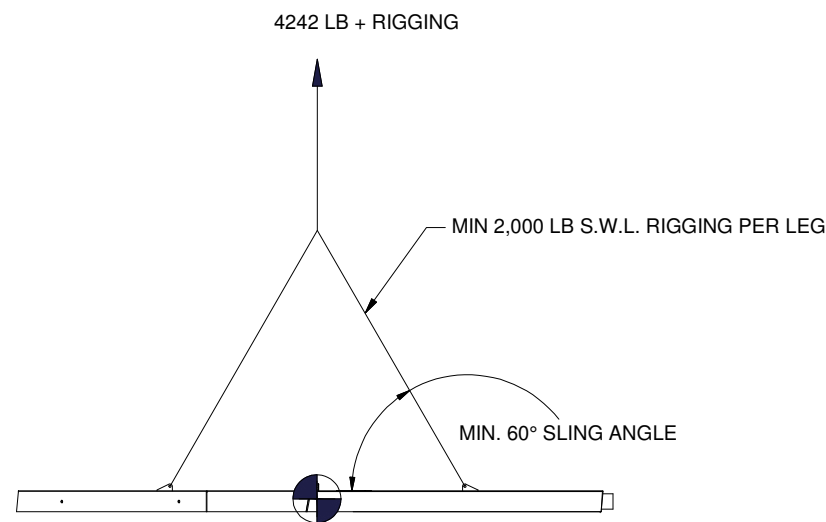
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING
 INSPECTION HOLE LOCATIONS
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 6 DWG. NO.: **S18678-04-4**



TOP COVER LIFTING DIAGRAM
S18678-A-401

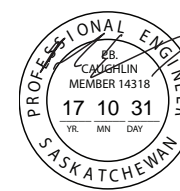


TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-401

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ± 0.005 MACHINED SURFACES: ± 0.005 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	

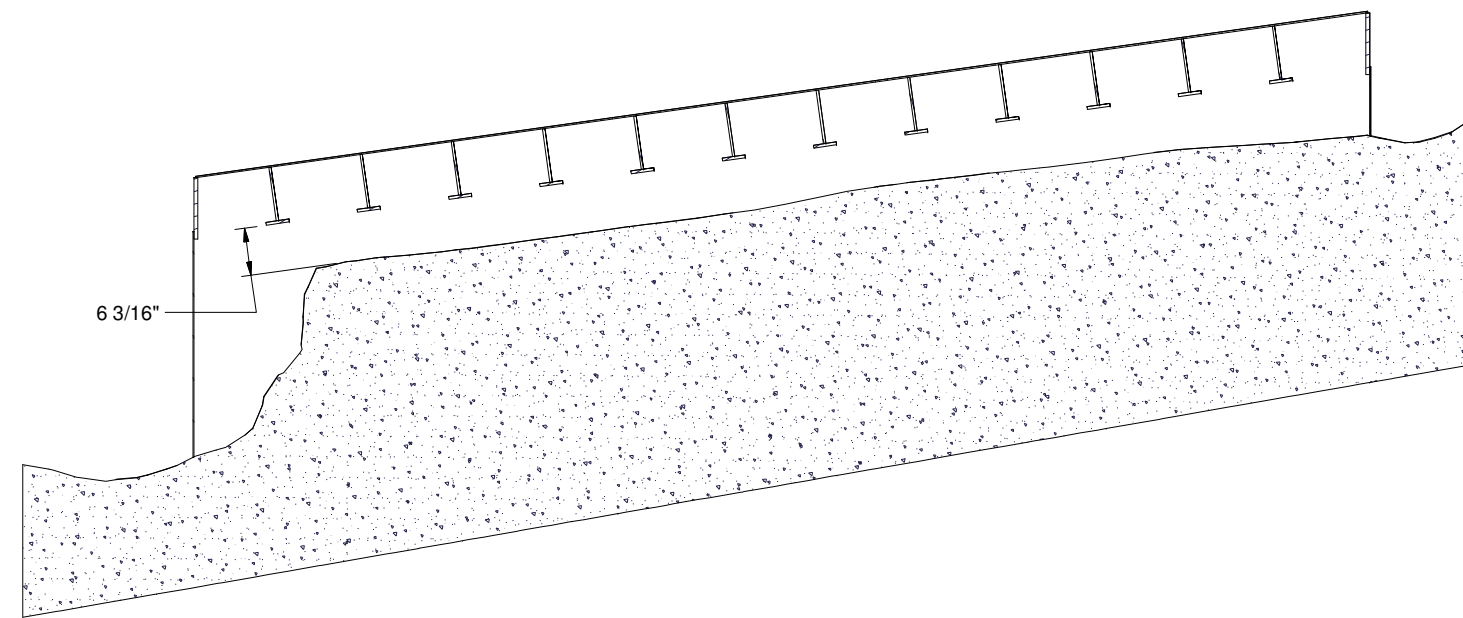


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: *[Signature]*

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING
 LIFTING DETAILS
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 6 DWG. NO.: **S18678-04-5**



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATED	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
		△	ISSUED FOR REVIEW	10/18/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	A.R.	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 2 OPENING CLEARANCES
 LOCATION: 59°37'21.5"N 108°25'30.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 6 DWG. NO.: **S18678-04-6**

HAB 3 - 013905 Raise



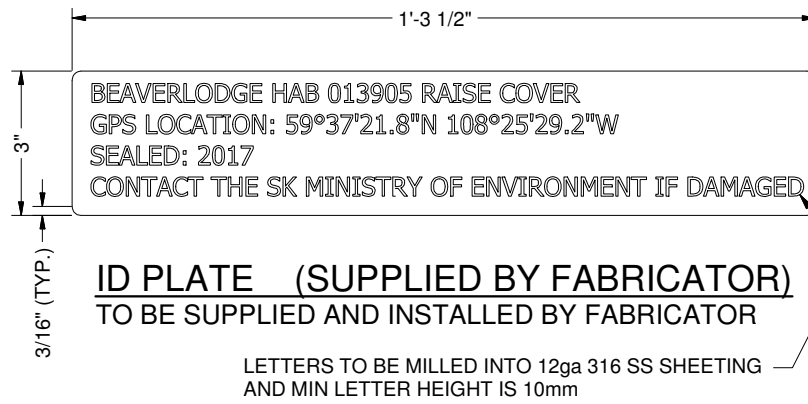
HAB 3 - 013905 Raise

GENERAL NOTES:

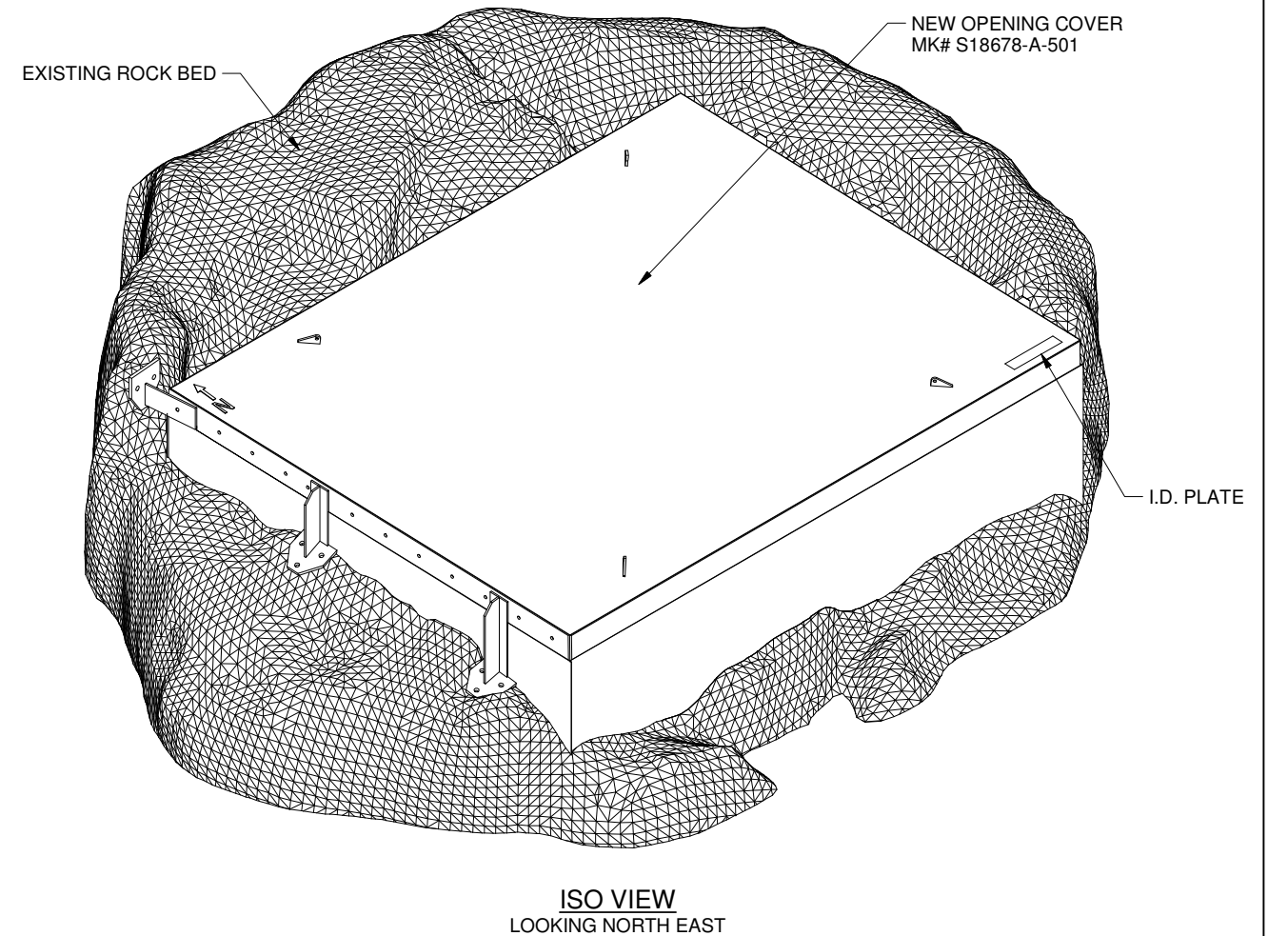
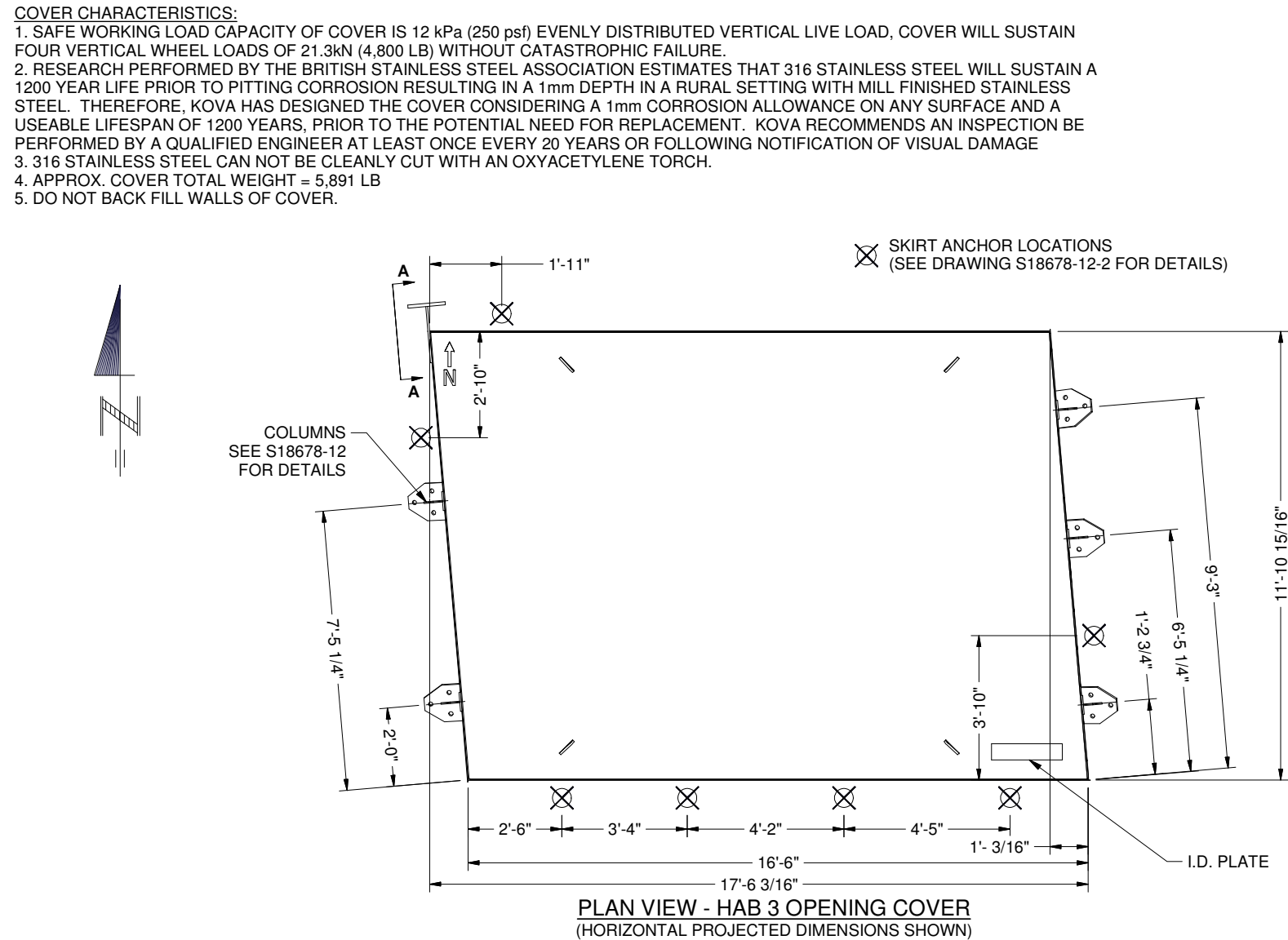
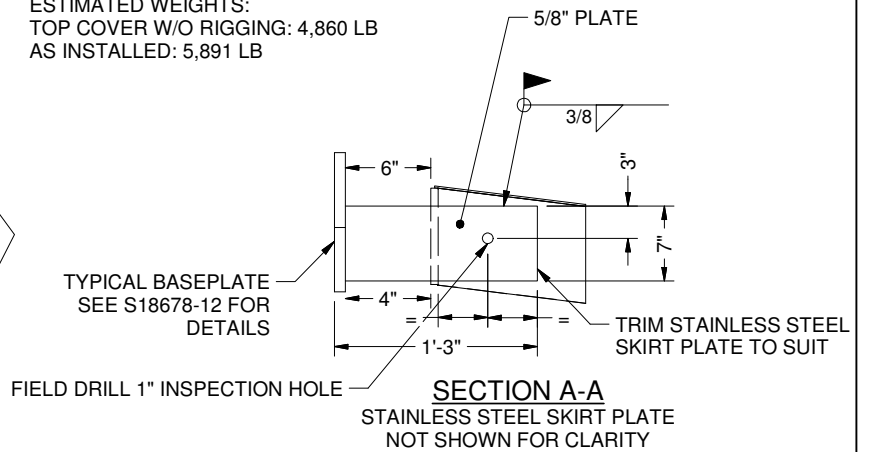
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 5,891 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 4,860 LB
AS INSTALLED: 5,891 LB



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		A	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		A	ID PLATE UPDATE	10/26/2016	A.R.	
		A	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: N.R. DATE: 10/6/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	A	ISSUED FOR REVIEW	10/14/2016	N.R.	CHK'D BY: ENG BY: P.C.



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of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline Sk. Reg. No. Signature
Structural 14318

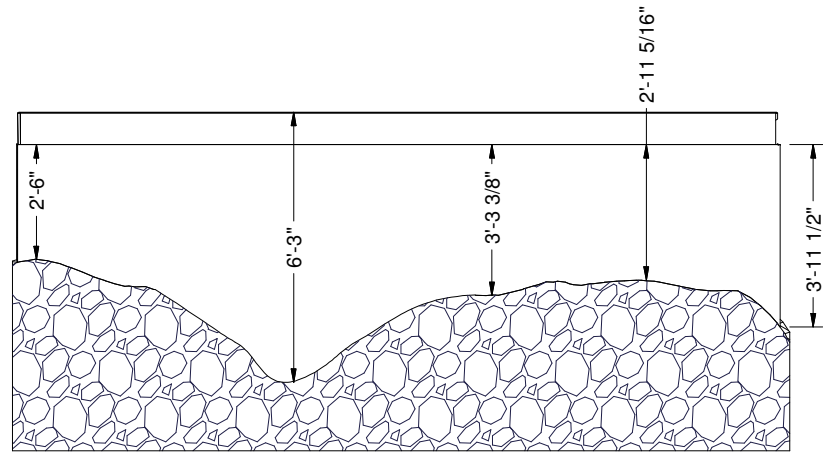
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 3 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°37'21.8"N 108°25'29.2"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

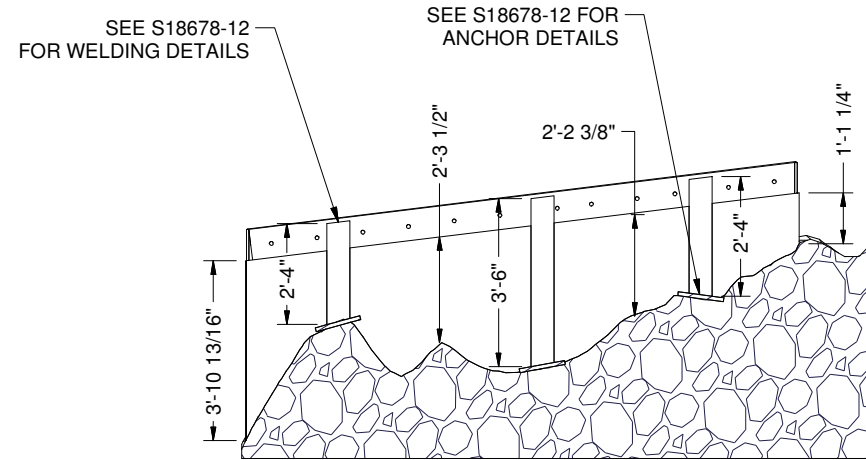
DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 5

DWG. NO.: **S18678-05-1**

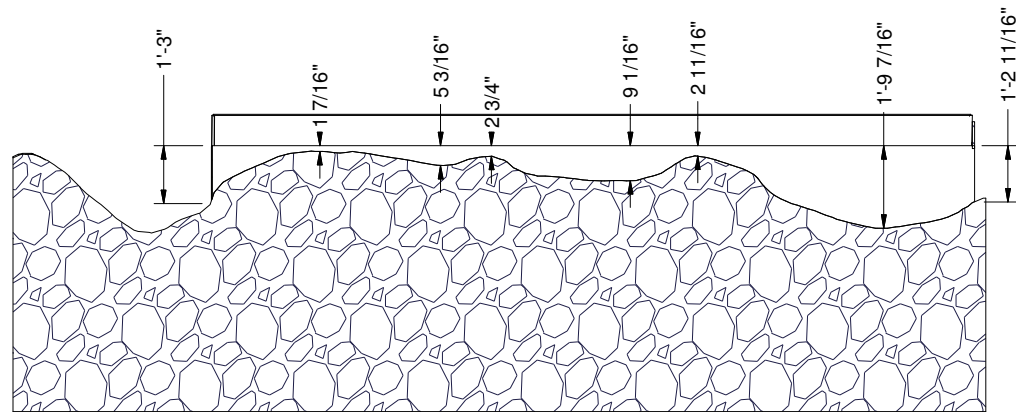
ESTIMATED TOTAL COLUMN LENGTH 145" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 FIVE (5) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



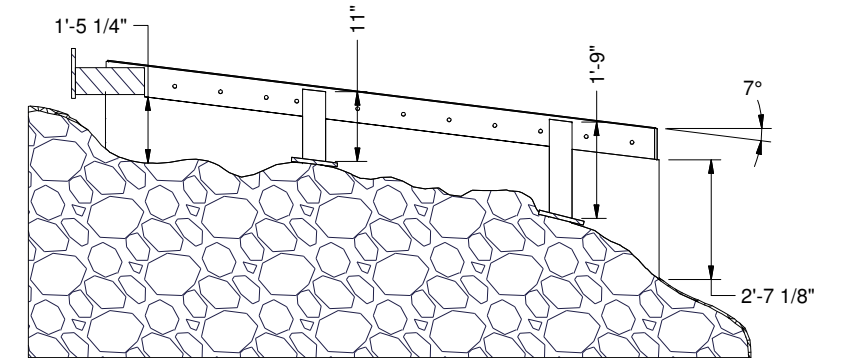
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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		△	ID PLATE UPDATE	10/26/2016	A.R.	
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		△	ISSUED FOR REVIEW	10/14/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/14/2016	N.R.	



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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

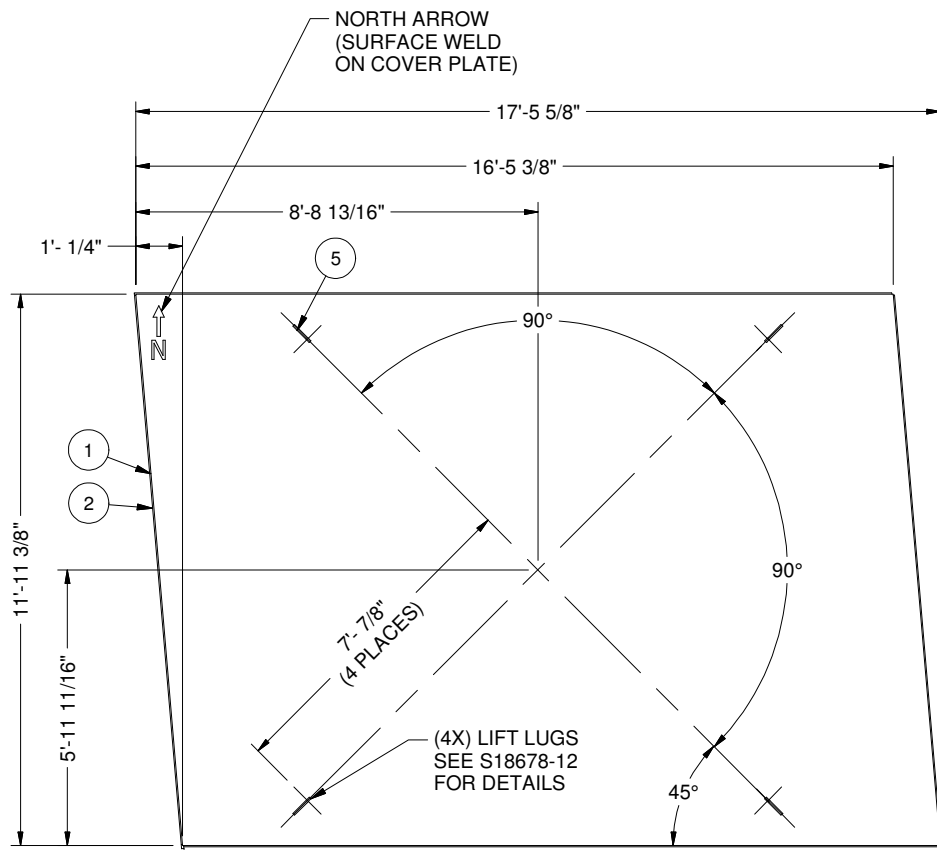
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 3 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°37'21.8"N 108°25'29.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

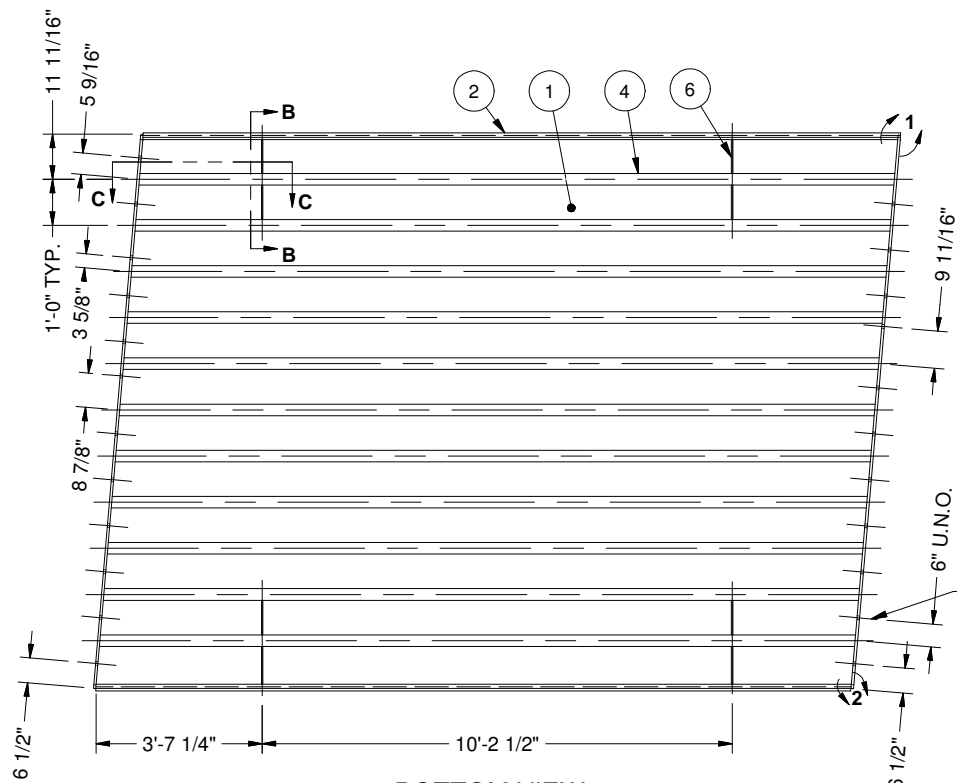
DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 5

DWG. NO.: S18678-05-2

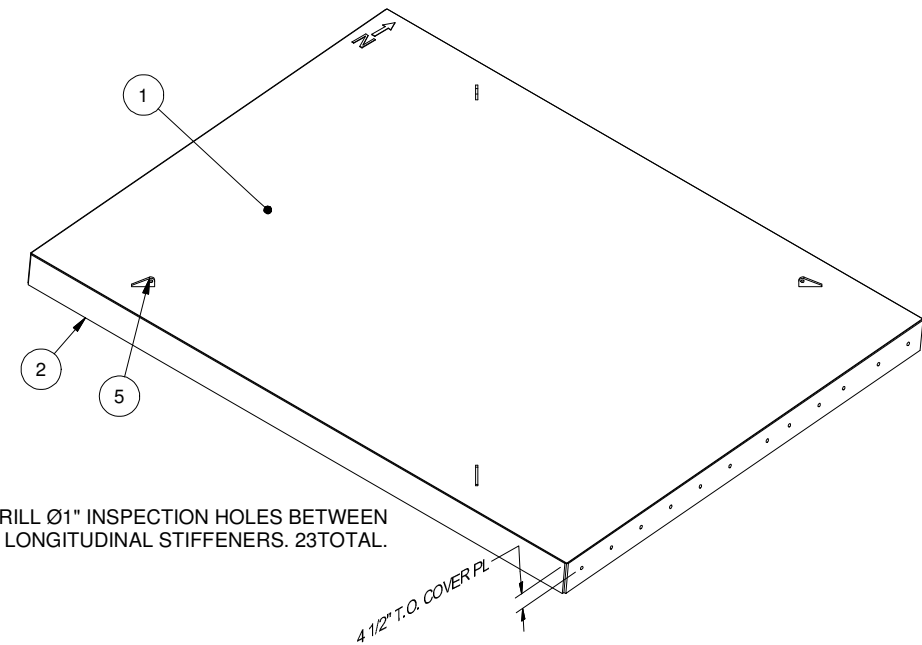
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
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3	11	8"x5/16" FB		ASTM A240-316L	
4	11	3"x3/8" FB		ASTM A240-316L	
5	4	5/8" PL		ASTM A240-316L	
6	8	3"x3/8" FB		ASTM A240-316L	



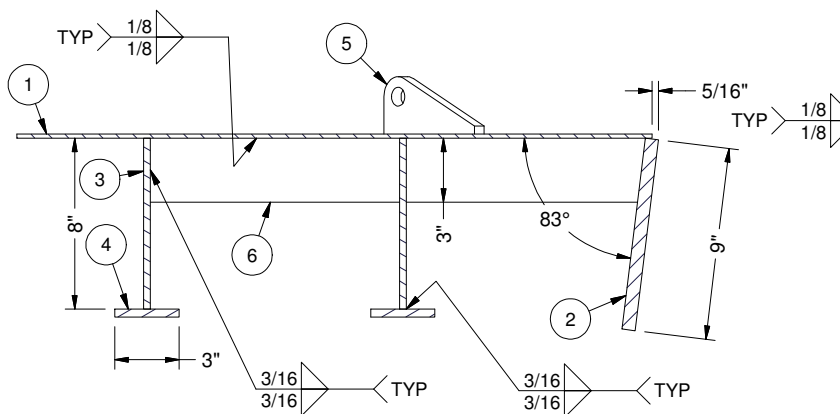
S18678-A-501
TOP PLATE DIMENSIONS



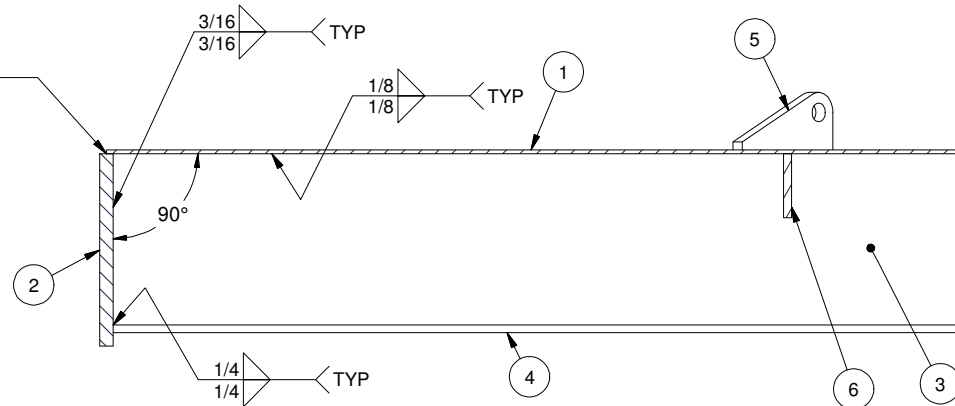
BOTTOM VIEW
STIFFENER LAYOUT



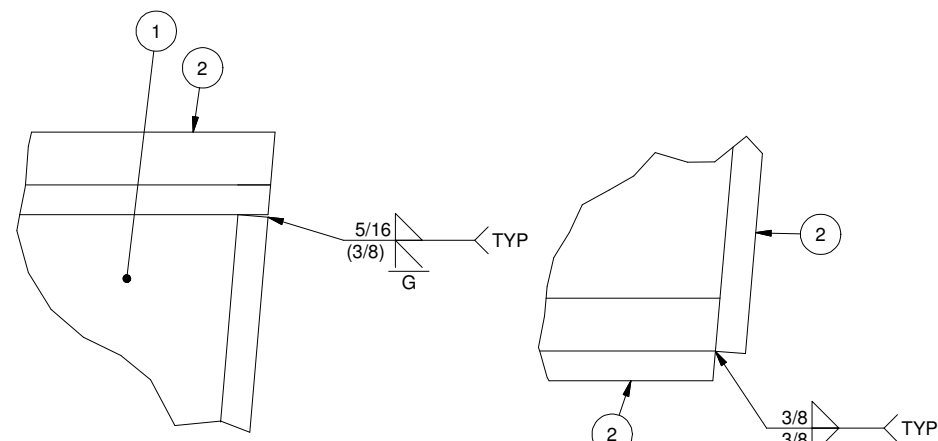
ISO VIEW



SECTION B-B



SECTION C-C



DETAIL 1
NORTH WEST CORNER ONLY

DETAIL 2

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		△	ID PLATE UPDATE	10/26/2016	A.R.	
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		△	ISSUED FOR REVIEW	10/14/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW			

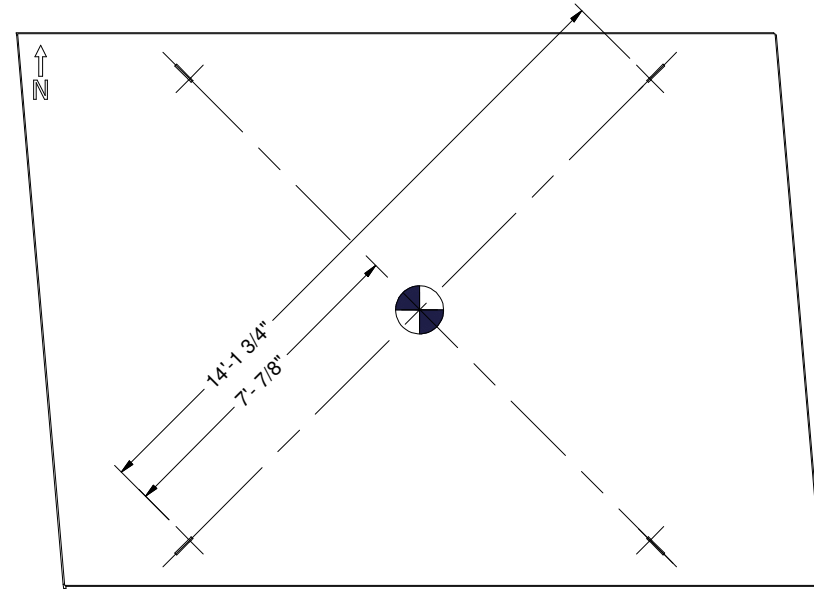


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 Structural 14318

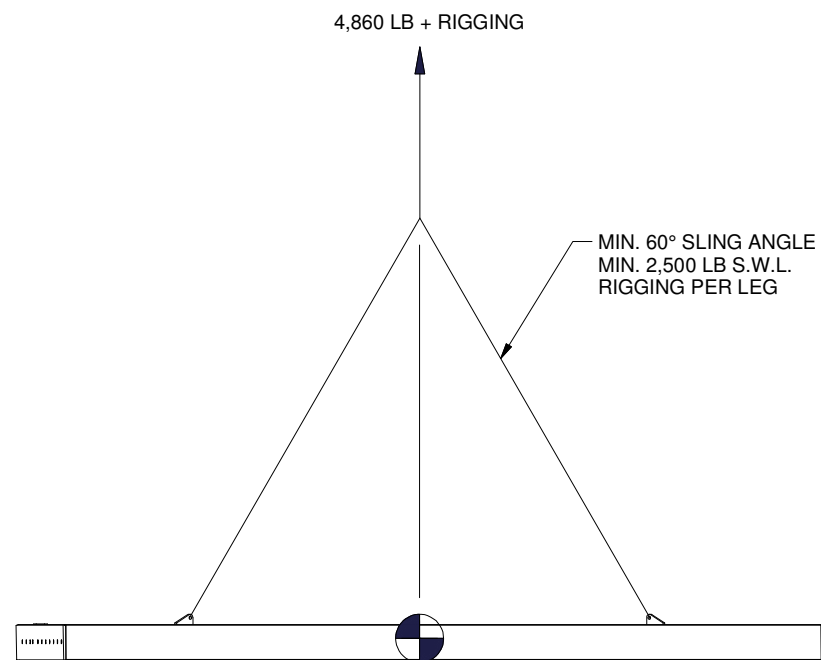
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 3 OPENING
 TOP COVER DETAILS
 LOCATION: 59°37'21.8"N 108°25'29.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 5
 DWG. NO.: S18678-05-3



TOP COVER LIFTING DIAGRAM - TOP VIEW

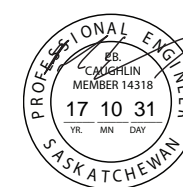


TOP COVER LIFTING DIAGRAM - SIDE VIEW

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		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₃₂ " MACHINED SURFACES: ¹²⁵ / ₃₂ " ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
		△	ISSUED FOR REVIEW	10/14/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/14/2016	N.R.	

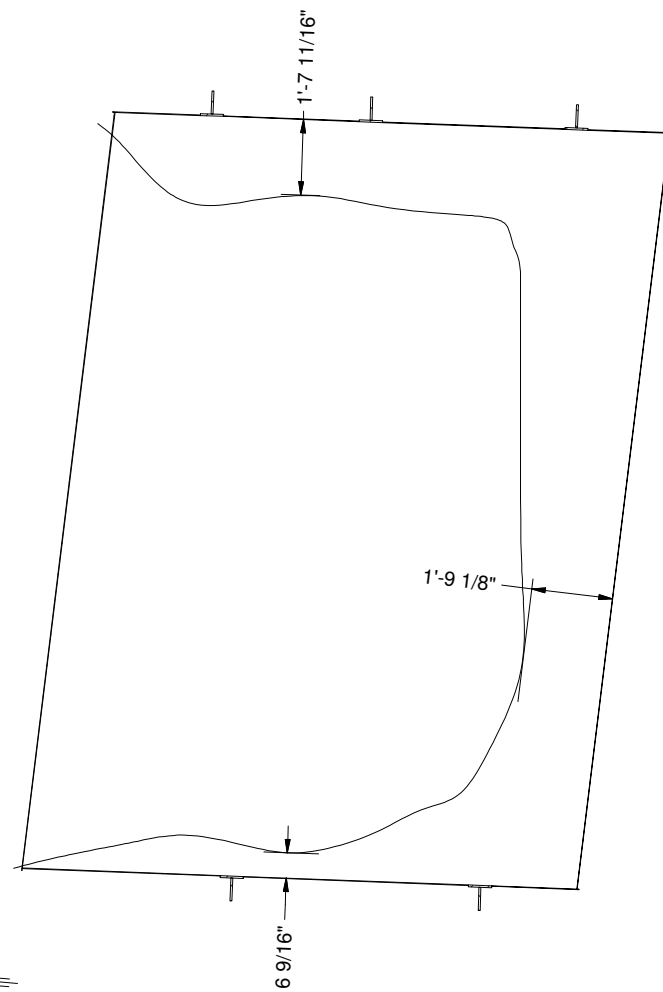


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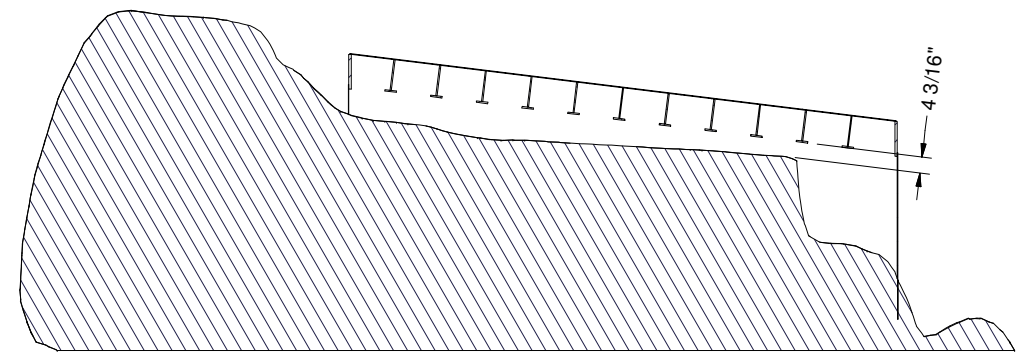
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 3 OPENING
 LIFTING DETAILS
 LOCATION: 59°37'21.8"N 108°25'29.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 5 DWG. NO.: S18678-05-4



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
		△	ISSUED FOR REVIEW	10/14/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/14/2016	N.R.	



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 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 3 OPENING CLEARANCES
 LOCATION: 59°37'21.8"N 108°25'29.2"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 5 DWG. NO.: S18678-05-5

HAB 5 - 013927 Raise



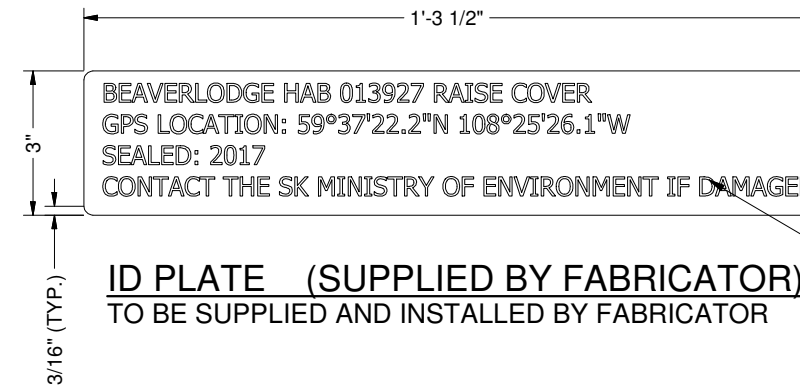
HAB 5 - 013927 Raise

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

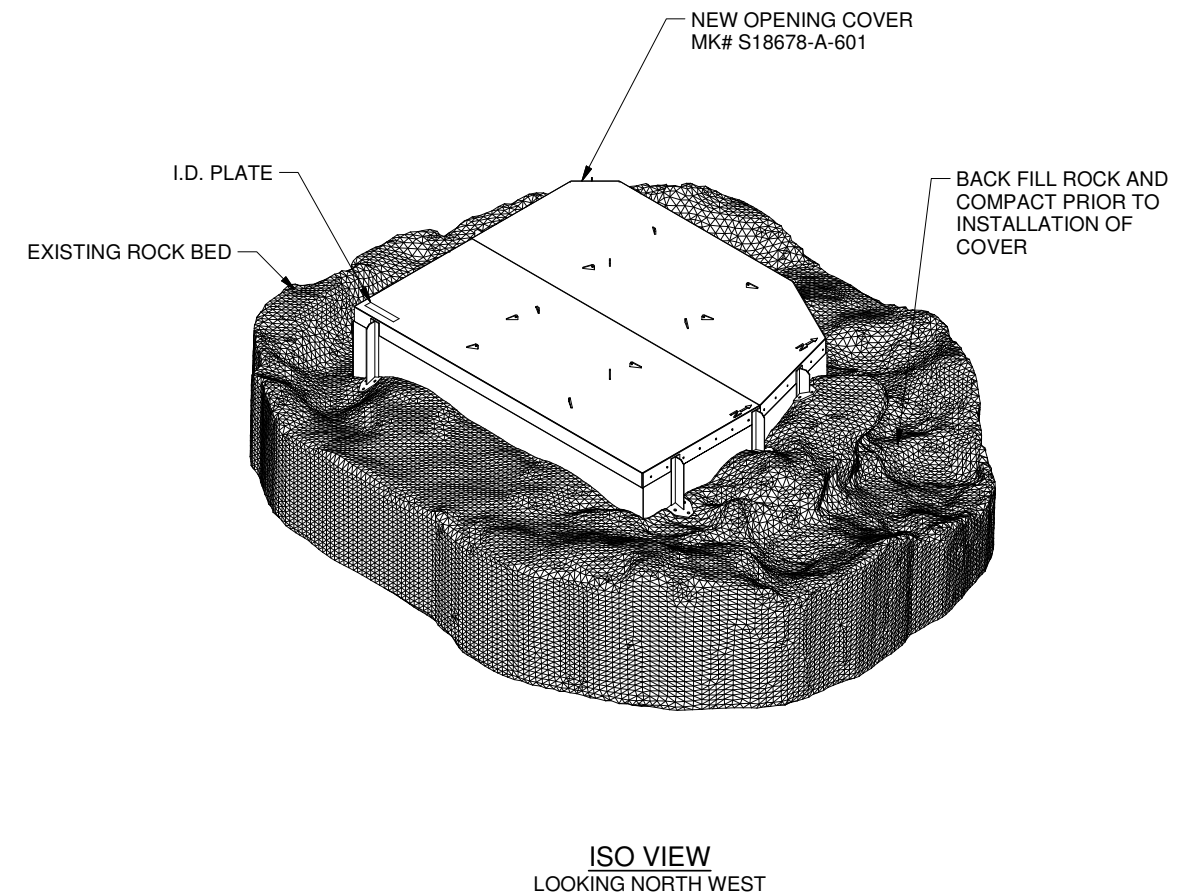
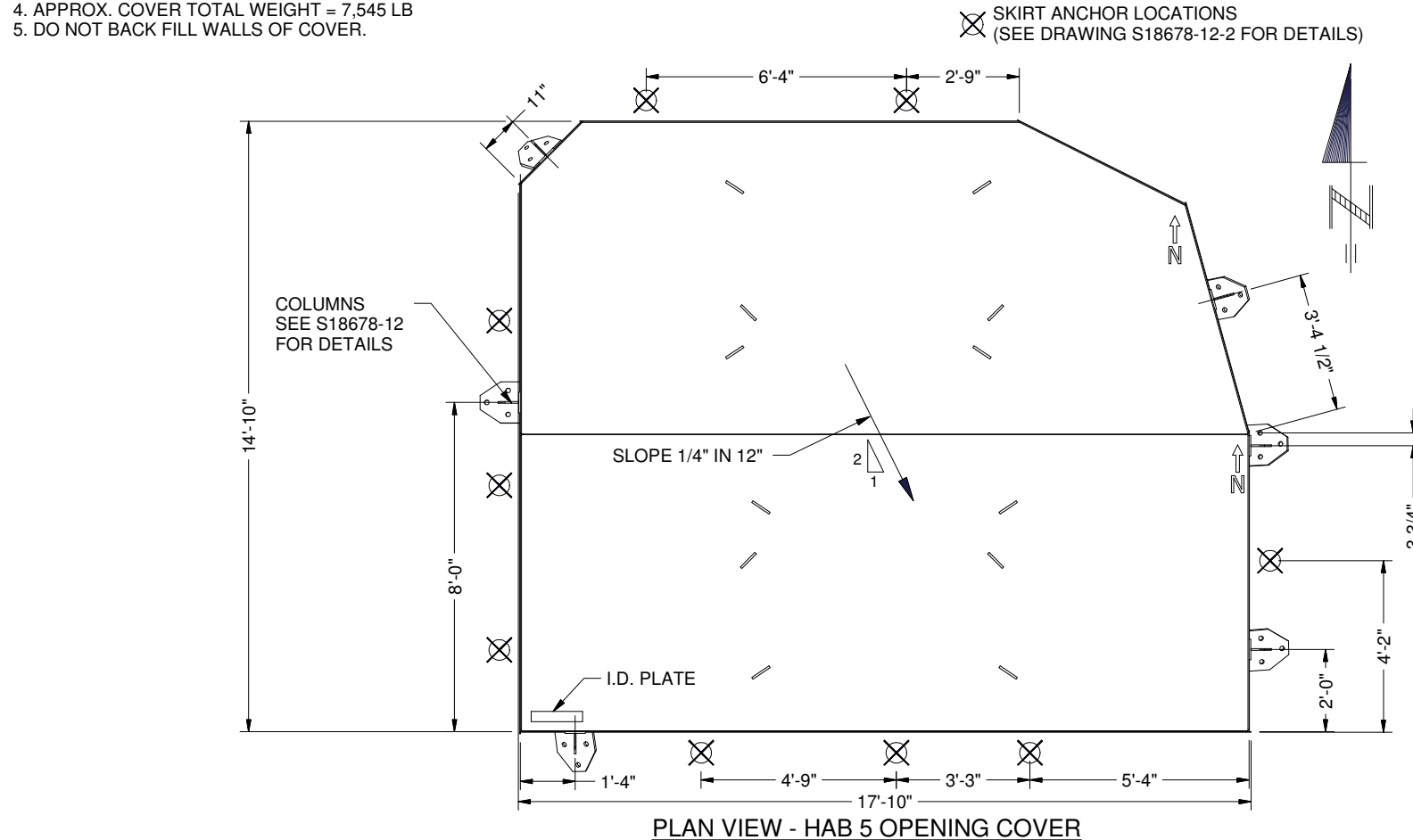
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 7,545 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 6,505 LB
AS INSTALLED: 7,545 LB

ID PLATE (SUPPLIED BY FABRICATOR)
TO BE SUPPLIED AND INSTALLED BY FABRICATOR

LETTERS TO BE MILLED INTO 12ga 316 SS SHEETING
AND MIN LETTER HEIGHT IS 10mm



ISO VIEW
LOOKING NORTH WEST

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		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: A.R. DATE: 10/6/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



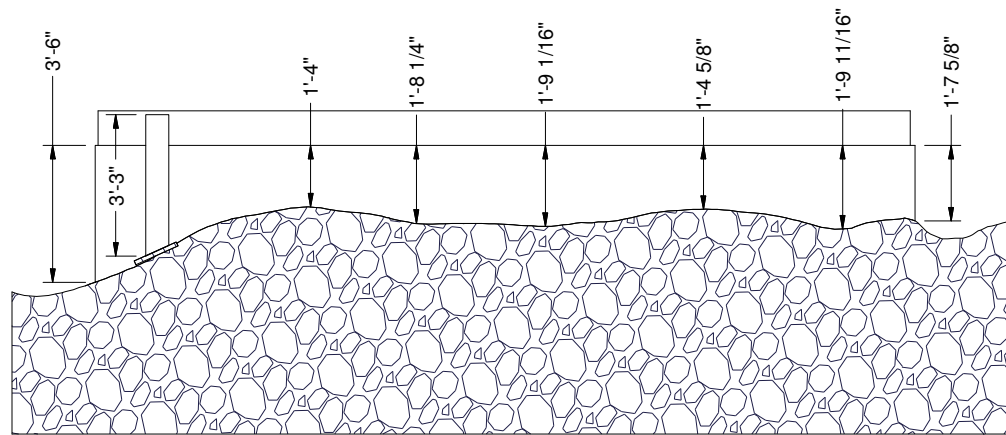
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Discipline: Sk. Reg. No. Signature
Structural 14318

Kova Engineering Saskatchewan Ltd.

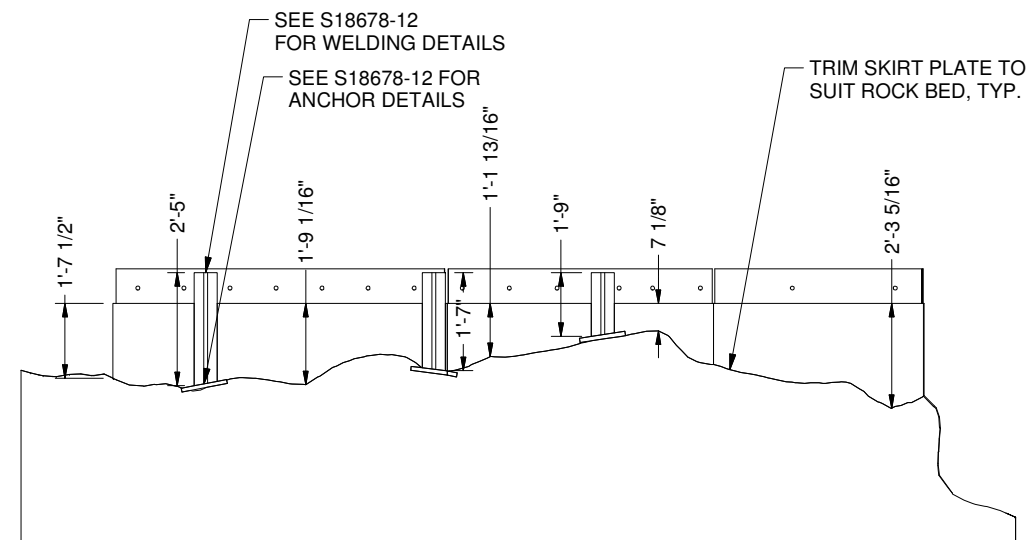
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 7 DWG. NO.: S18678-06-1

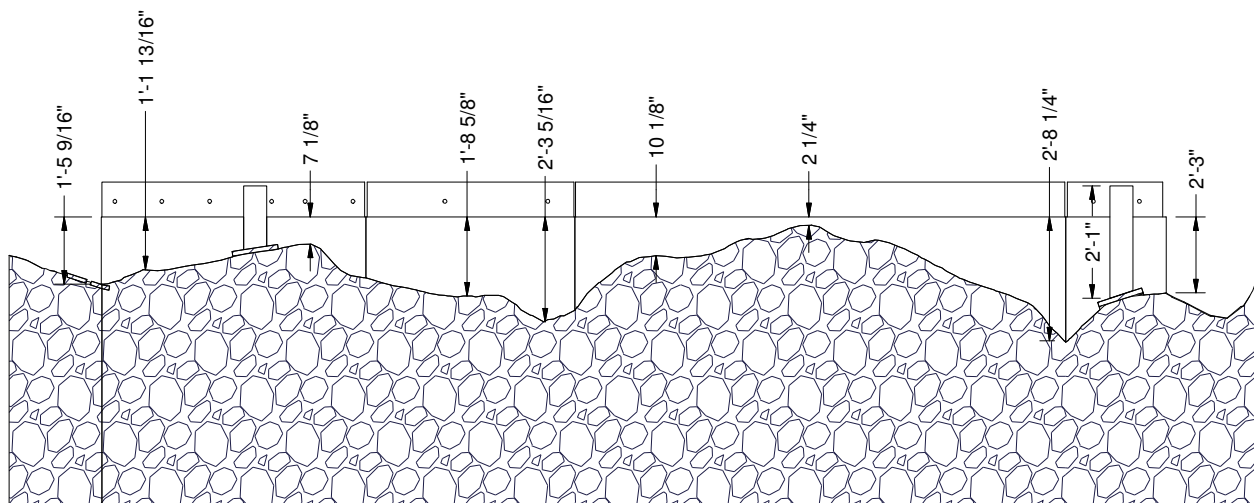
ESTIMATED TOTAL COLUMN LENGTH 171" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



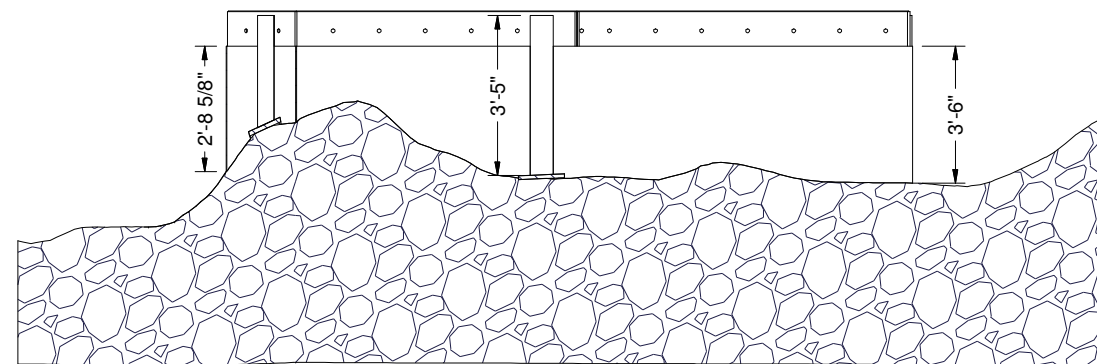
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	
						DRWN BY: A.R. DATE: 10/6/2016 CHK'D BY: ENG BY: P.C.



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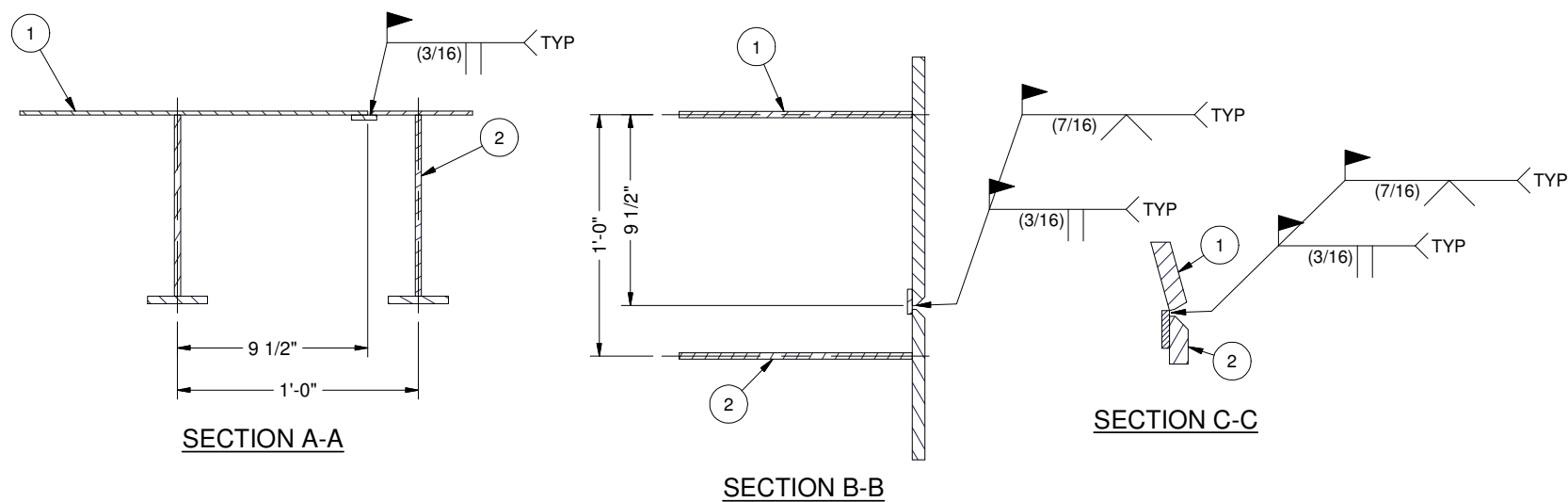
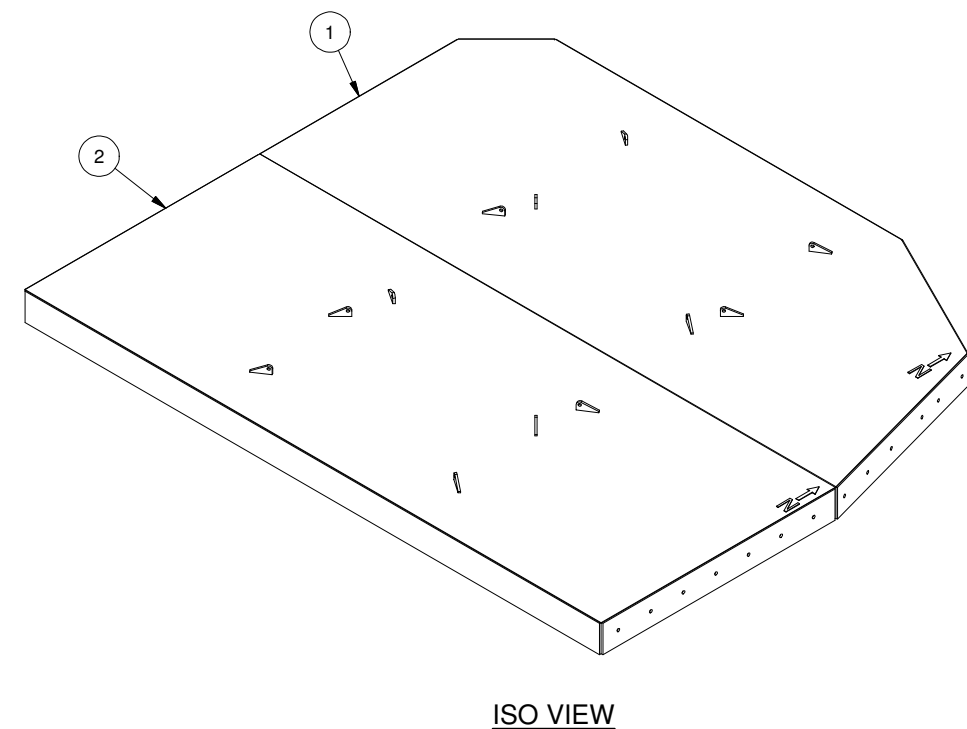
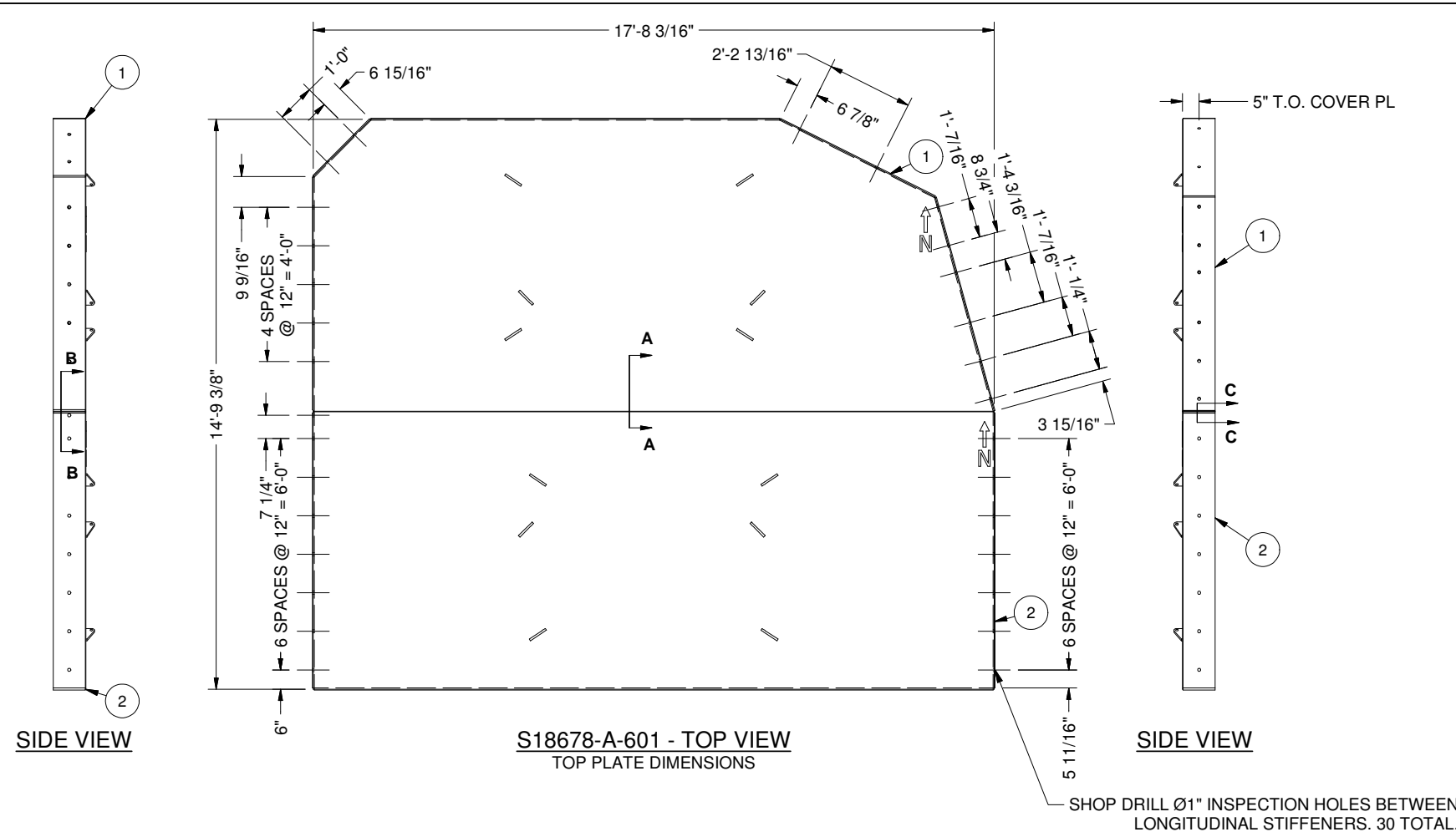
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 7

DWG. NO.: **S18678-06-2**

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	TOP COVER SECTION 1	S18678-A-602		4
2	1	TOP COVER SECTION 2	S18678-A-603		5



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	DRWN BY: A.R. DATE: 10/6/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	CHK'D BY: ENG BY: P.C.



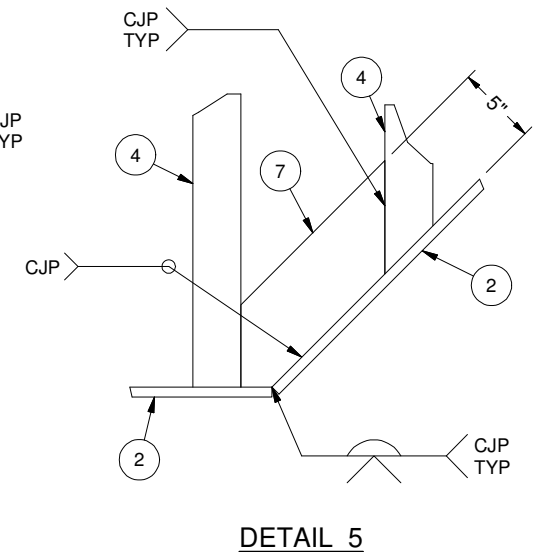
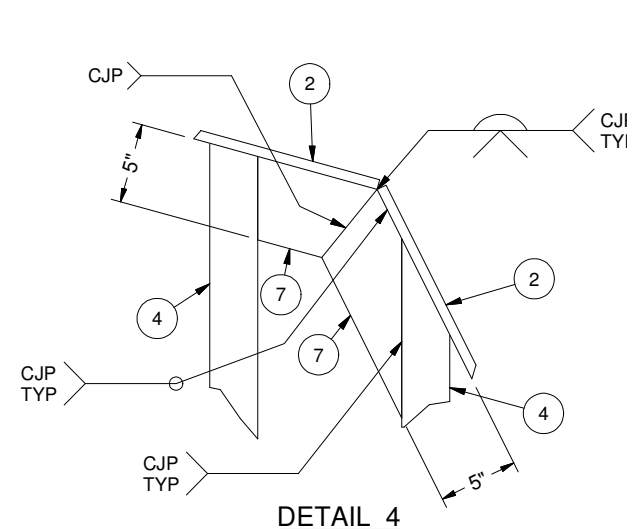
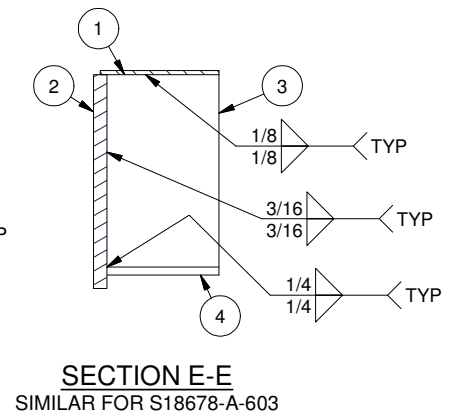
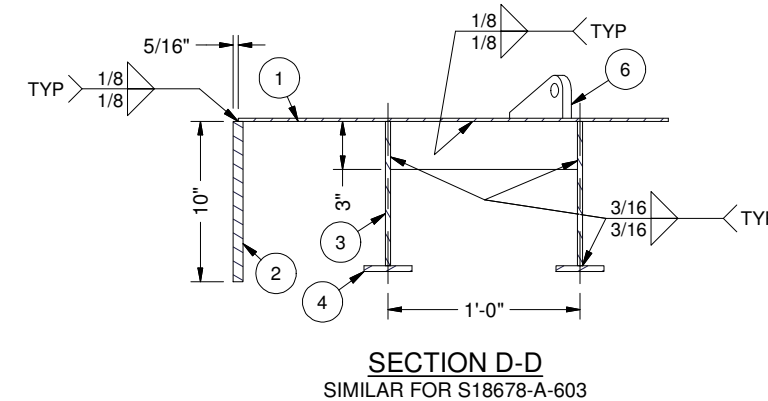
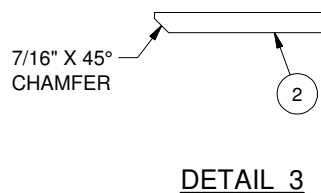
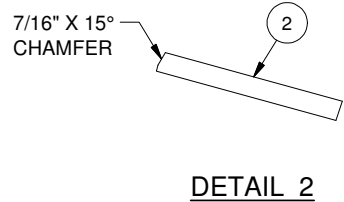
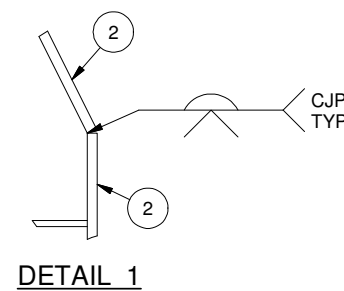
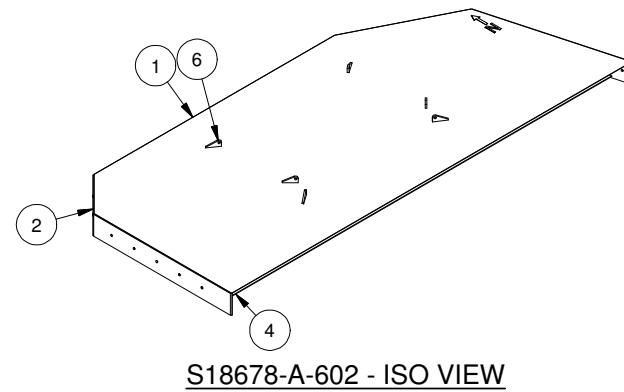
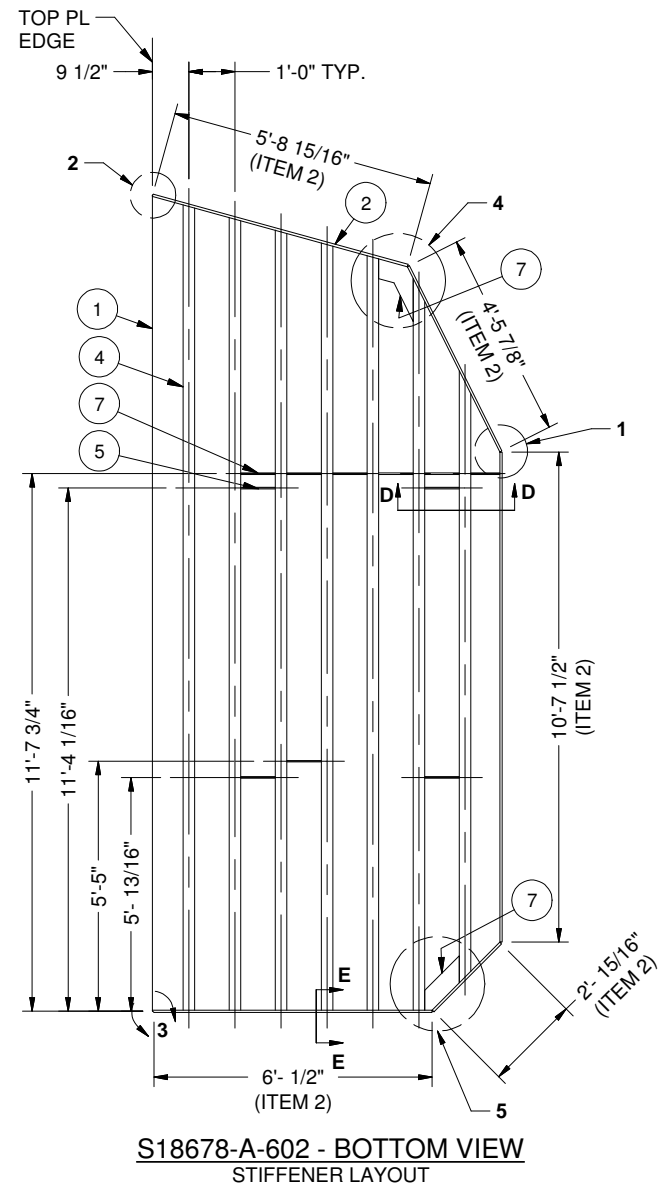
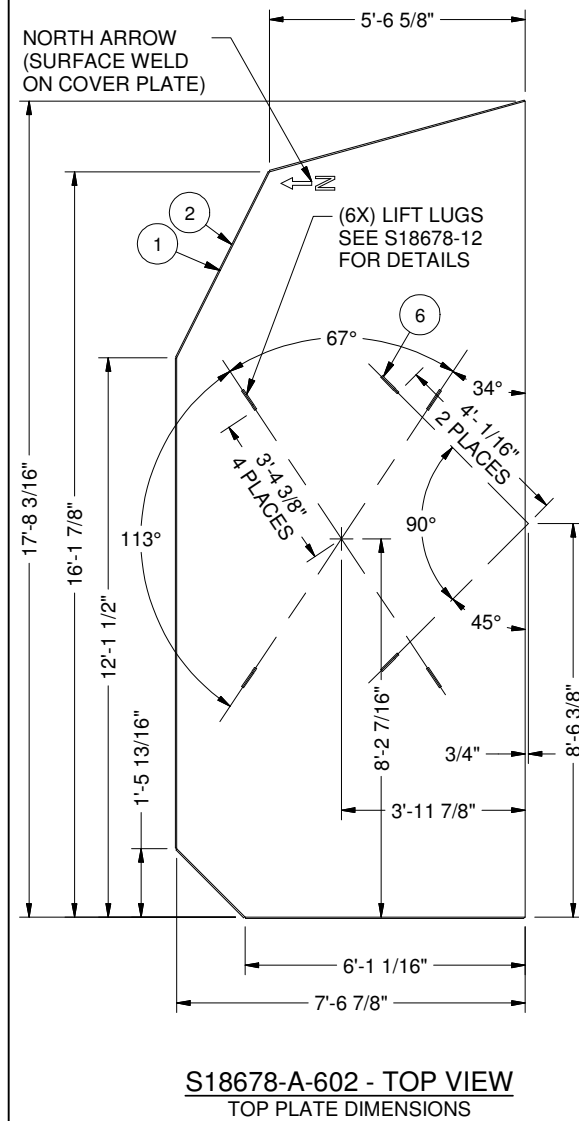
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
 TOP COVER DETAILS
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 3 OF 7 DWG. NO.: S18678-06-3

BILL OF MATERIALS				
ITEM	QTY	DESCRIPTION	MATERIAL	SHT#
1	1	3/16" PL	ASTM A240-316L	
2		10"x5/8" FB	ASTM A240-316L	
3		9"x5/16" FB	ASTM A240-316L	
4		3"x3/8" FB	ASTM A240-316L	
5	5	3"x3/8" FB	ASTM A240-316L	
6	6	5/8" PL	ASTM A240-316L	
7		5"x3/8" FB	ASTM A240-316L	



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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 Number C672
 Permission to Consult held by:
 Discipline: Structural, SK Reg. No. 14318, Signature: [Signature]

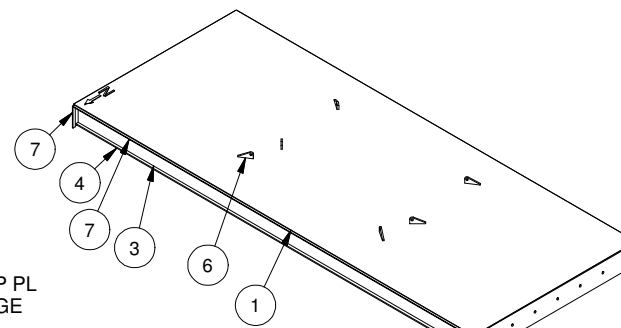
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
 TOP COVER SECTIONS
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

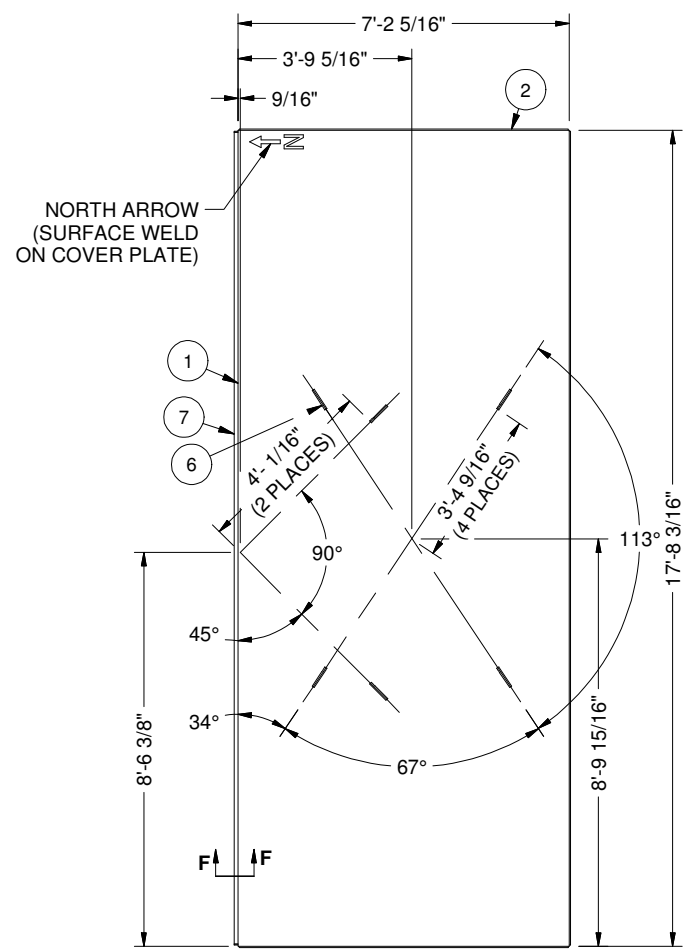
DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7

DWG. NO.: **S18678-06-4**

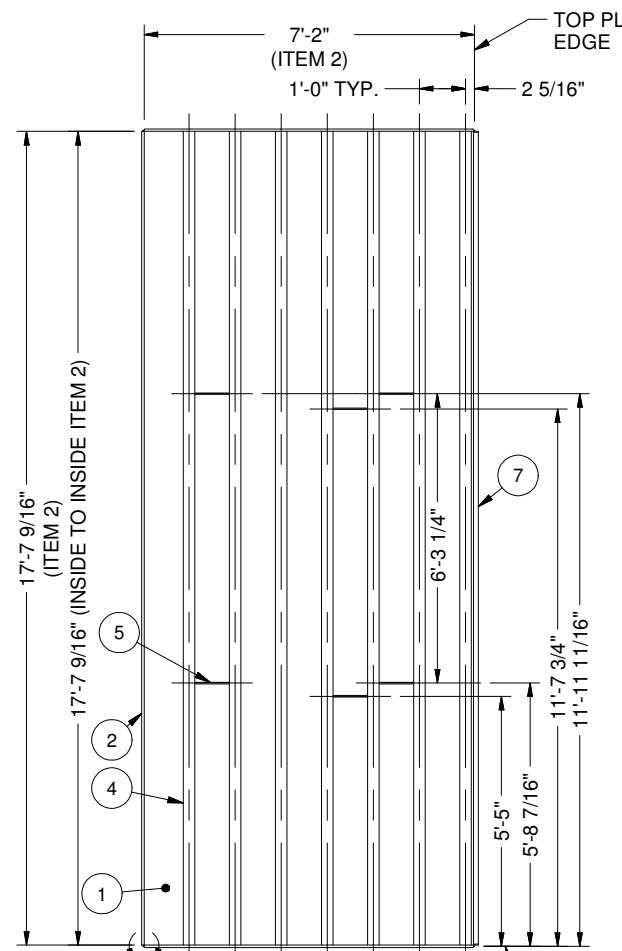
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2		10"x5/8" FB	ASTM A240-316L	
3		9"x5/16" FB	ASTM A240-316L	
4		3"x3/8" FB	ASTM A240-316L	
5	6	3"x3/8" FB	ASTM A240-316L	
6	6	5/8" PL	ASTM A240-316L	
7		1 1/4"x1/4" FB	ASTM A240-316L	



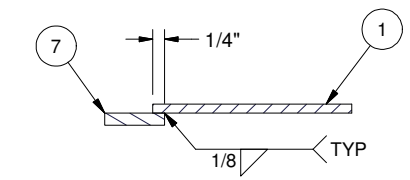
S18678-A-603 - ISO VIEW



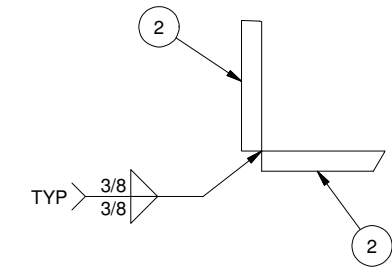
S18678-A-603 - TOP VIEW
TOP PLATE DIMENSIONS



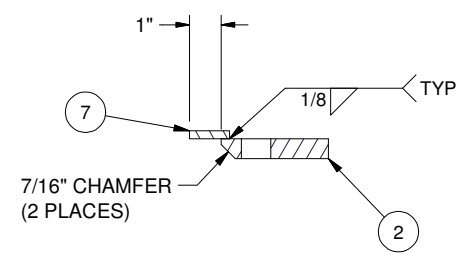
S18678-A-603 - BOTTOM VIEW
STIFFENER LAYOUT



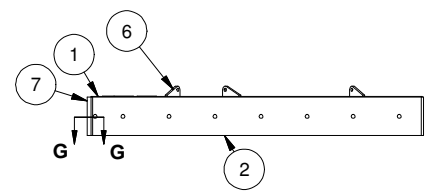
SECTION F-F



DETAIL 6



SECTION G-G

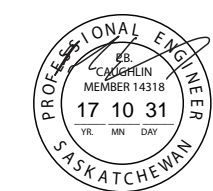


S18678-A-603 - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 25° MACHINED SURFACES: 125° ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	

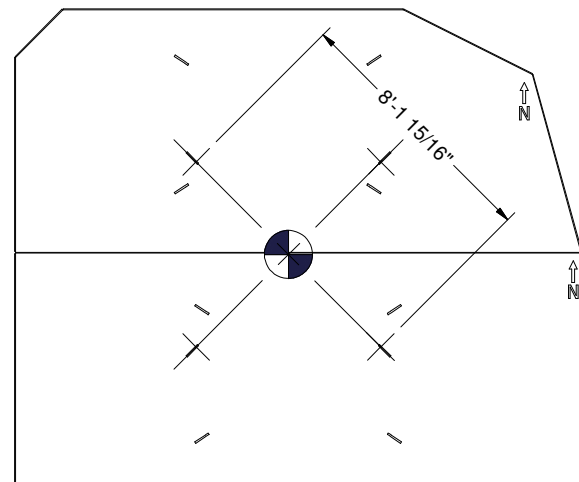


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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by: _____
 Discipline: Structural Sk. Reg. No. 14318 Signature: _____

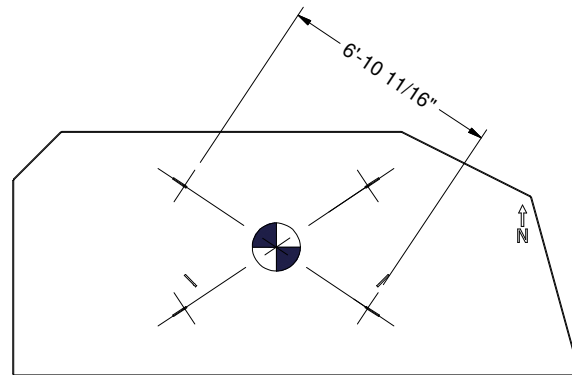
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
 TOP COVER SECTION 2
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

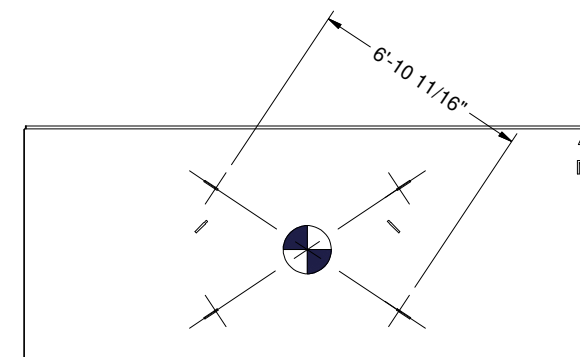
DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 7 DWG. NO.: S18678-06-5



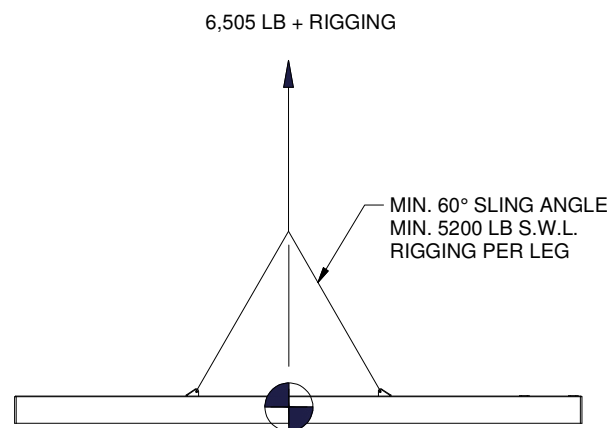
TOP COVER LIFTING DIAGRAM - TOP VIEW



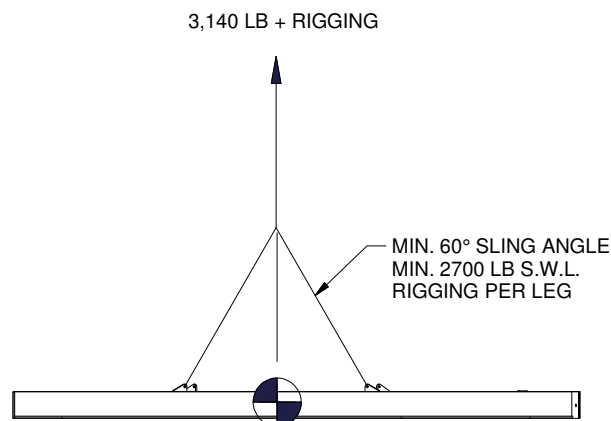
S18678-A-602 LIFTING DIAGRAM - TOP VIEW



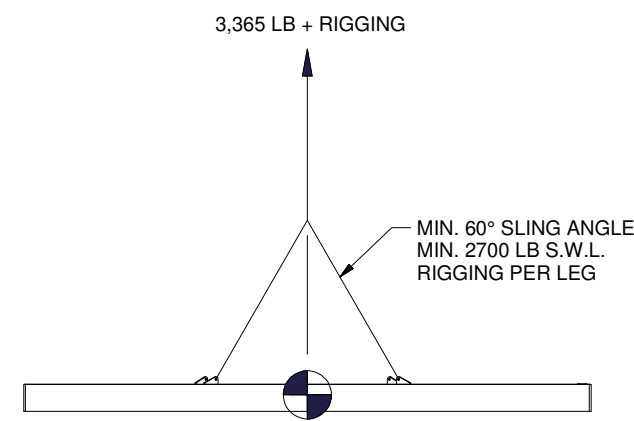
S18678-A-603 LIFTING DIAGRAM - TOP VIEW



TOP COVER LIFTING DIAGRAM - SIDE VIEW



S18678-A-602 LIFTING DIAGRAM - SIDE VIEW

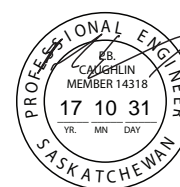


S18678-A-603 LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	
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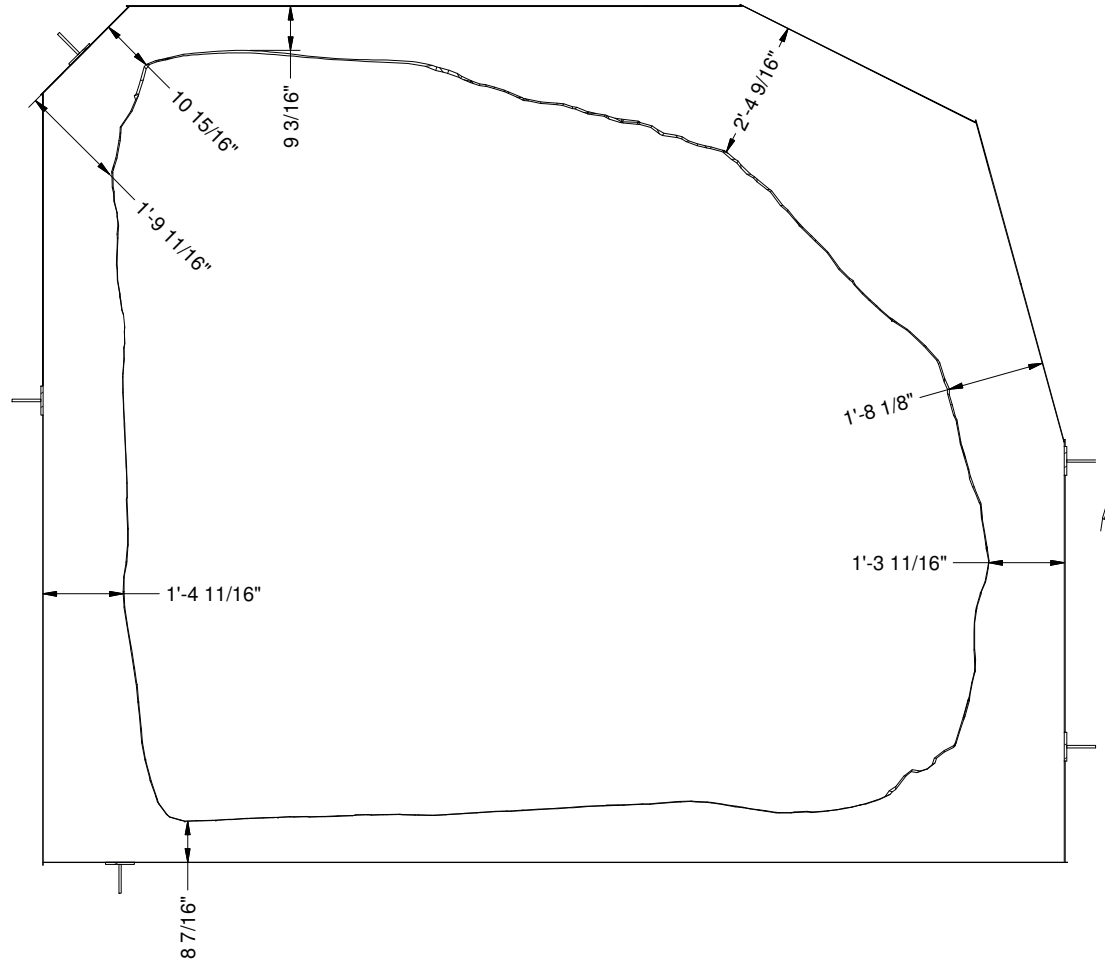


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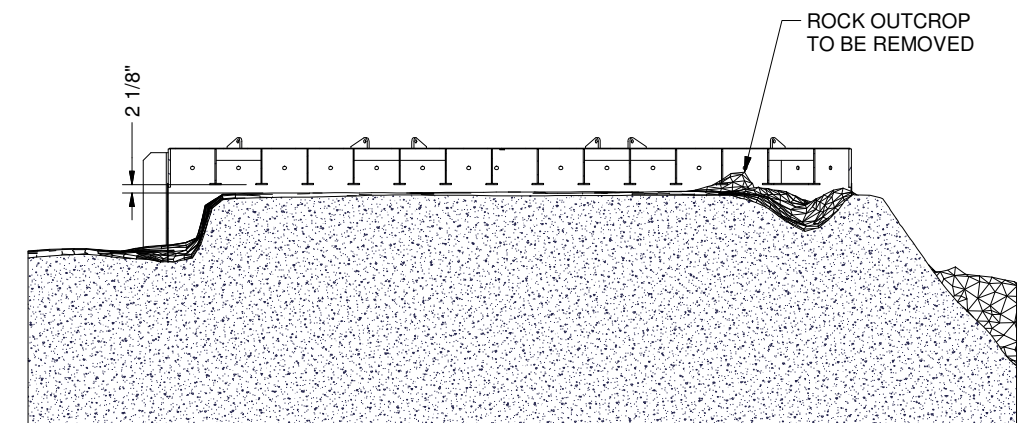
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING
 LIFTING DETAILS
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 7 DWG. NO.: S18678-06-6



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ID PLATE UPDATE	10/26/2016	A.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	A.R.	
		△	ISSUED FOR REVIEW	10/17/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/17/2016	N.R.	



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 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 5 OPENING CLEARANCES
 LOCATION: 59°37'22.2"N 108°25'26.1"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 7 OF 7 DWG. NO.: S18678-06-7

HAB 8 - 013810 Raise



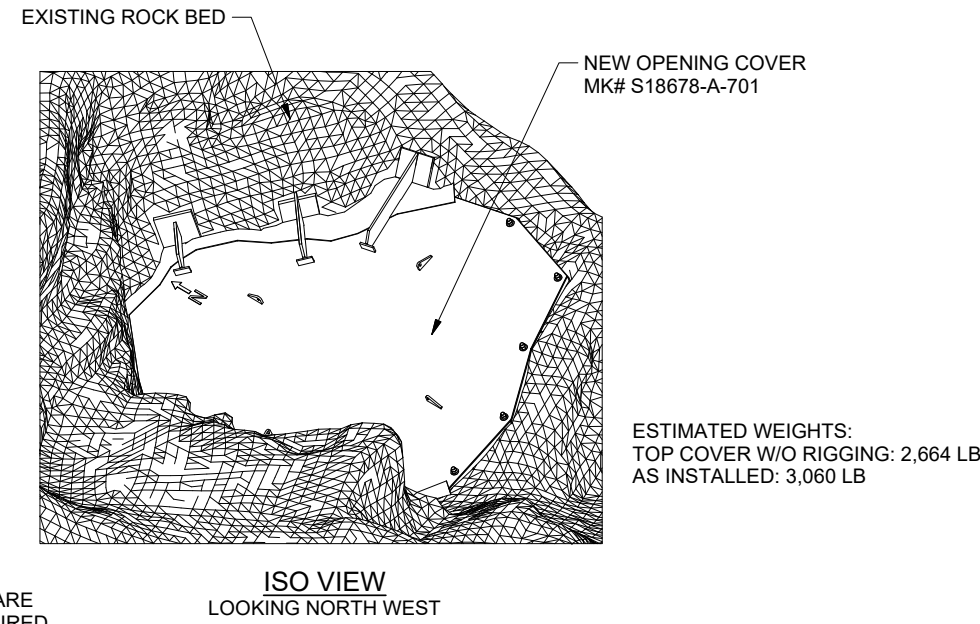
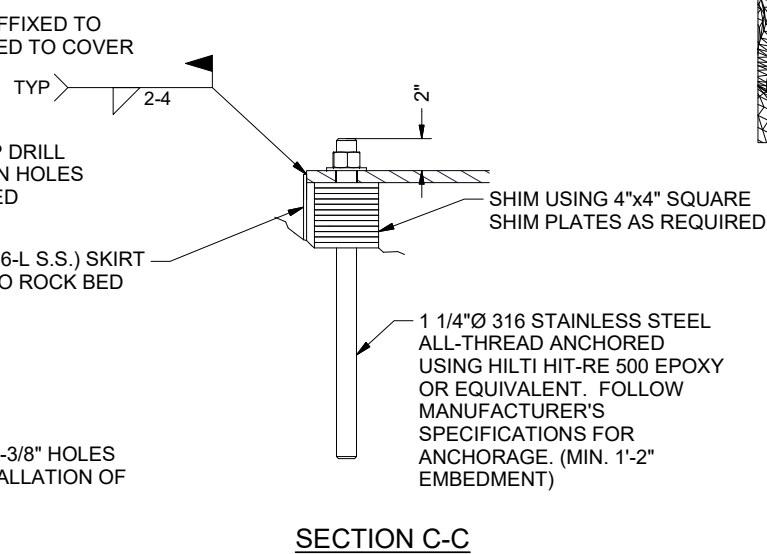
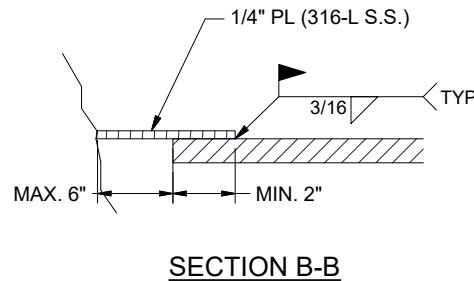
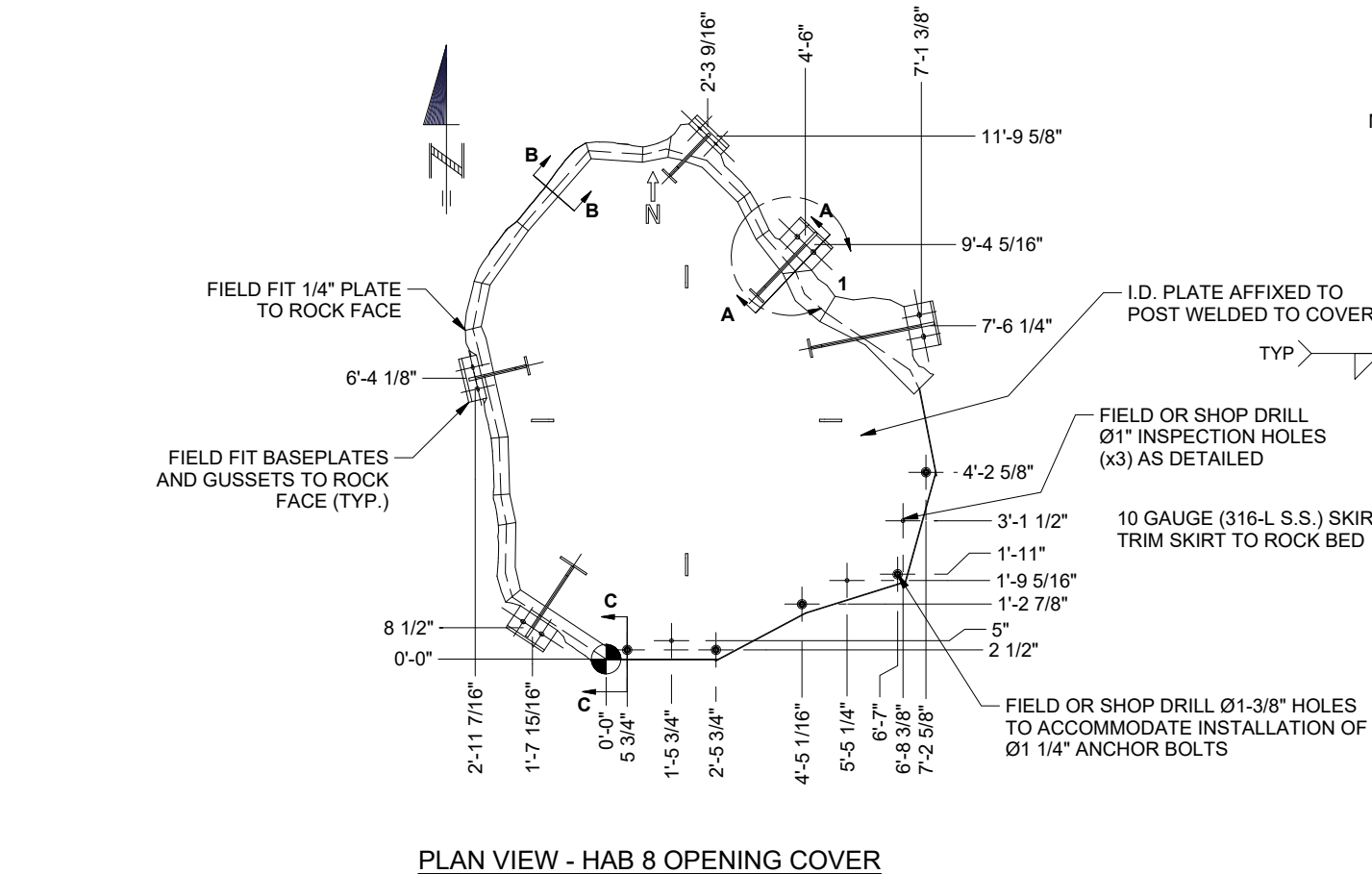
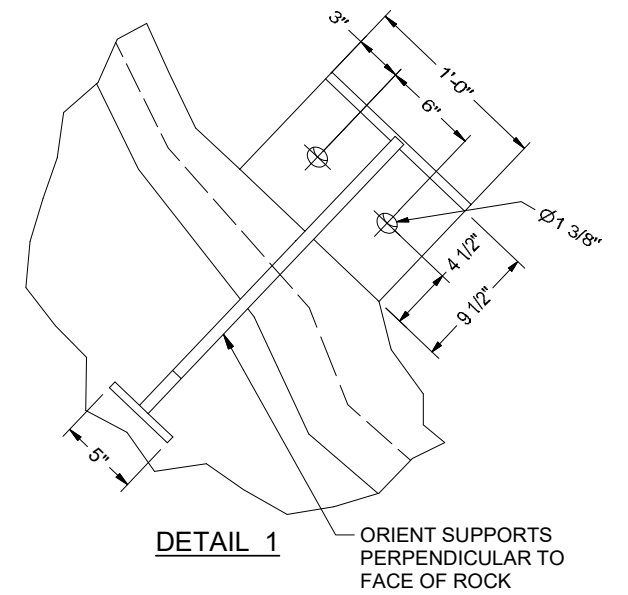
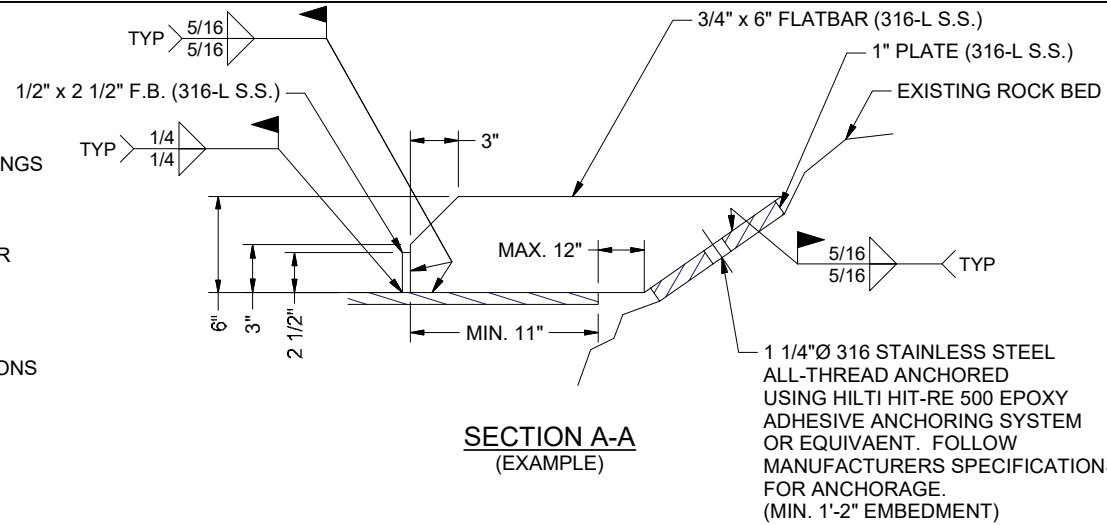
HAB 8 - 013810 Raise

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN ONE VERTICAL WHEEL LOAD OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 3,060 LB
5. DO NOT BACK FILL WALLS OF COVER.



BEAVERLODGE HAB 013810 RAISE COVER
 GPS LOCATION: 59°37'10.8"N 108°25'10.6"W
 SEALED: 2017
 CONTACT THE SK MINISTRY OF ENVIRONMENT IF DAMAGED

ID PLATE (SUPPLIED BY FABRICATOR)
 TO BE SUPPLIED AND INSTALLED BY FABRICATOR
 LETTERS TO BE MILLED INTO 12ga 316 SS SHEETING
 AND MIN LETTER HEIGHT IS 10mm

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT REVISIONS	31/Oct/17	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	26/Oct/16	N.R.	
		△	ISSUED FOR CONSTRUCTION	25/Oct/15	N.R.	DRWN BY: A.R. DATE: 06/Oct/16
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	18/Oct/16	N.R.	CHK'D BY: ENG BY: P.C.



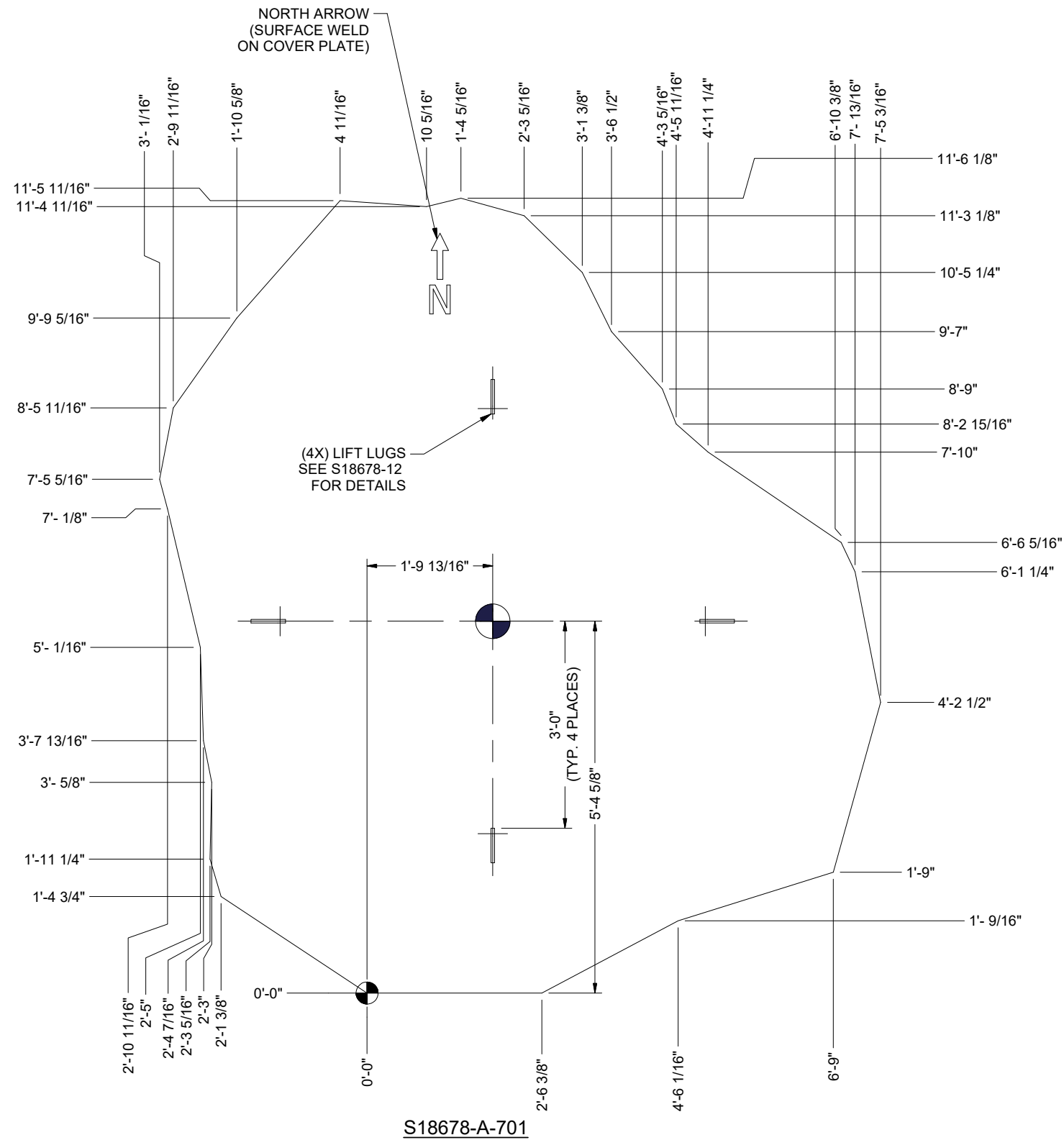
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
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 Permission to Consult held by:
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 Structural 14318

Kova Engineering Saskatchewan Ltd.

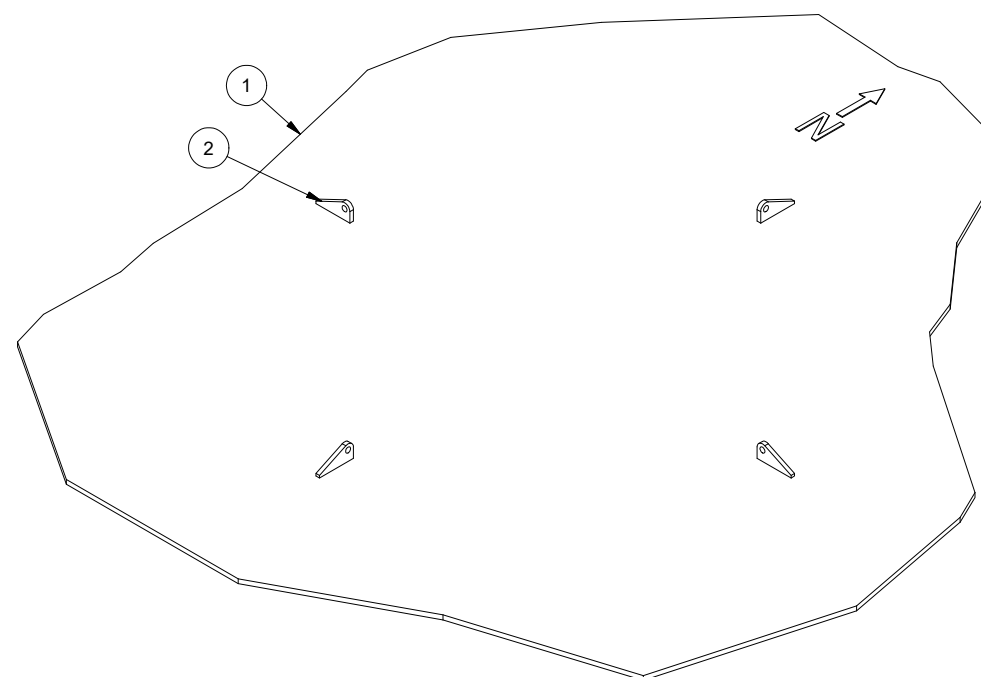
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 8 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59°37'10.8"N 108°25'10.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 4 DWG. NO.: S18678-07-1

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	3/4" PL		ASTM A240-316L	
2	4	5/8" PL		ASTM A240-316L	



S18678-A-701



ISO VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT REVISIONS	31/Oct/17	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	26/Oct/16	N.R.	
		△	ISSUED FOR CONSTRUCTION	25/Oct/15	N.R.	DRWN BY: A.R. DATE: 06/Oct/16
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	18/Oct/16	N.R.	CHK'D BY: ENG BY: P.C.

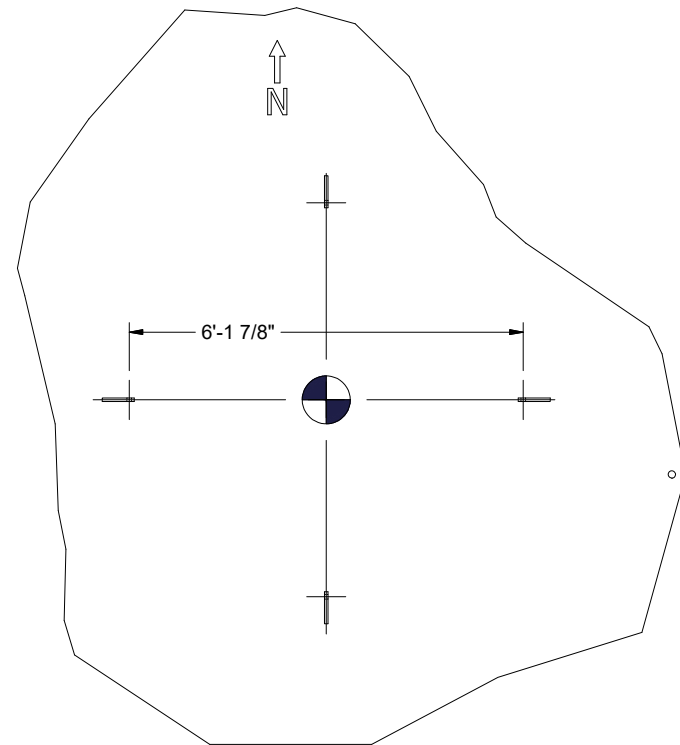


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Kova Engineering (Saskatchewan) Ltd.
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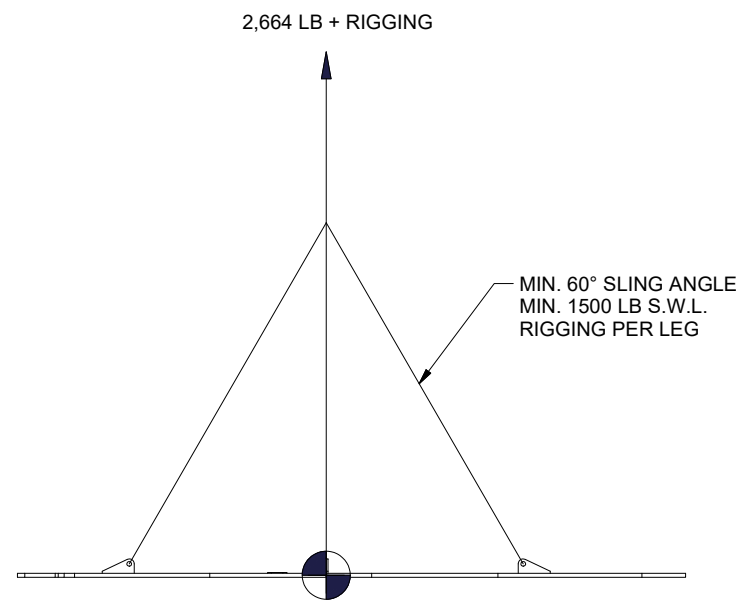
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 8 OPENING
 TOP COVER DETAILS
 LOCATION: 59°37'10.8"N 108°25'10.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 4 DWG. NO.: S18678-07-2



TOP COVER LIFTING DIAGRAM - TOP VIEW



TOP COVER LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT REVISIONS	31/Oct/17	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	26/Oct/16	N.R.	
		△	ISSUED FOR CONSTRUCTION	25/Oct/15	N.R.	DRWN BY: A.R. DATE: 06/Oct/16
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	18/Oct/16	N.R.	CHK'D BY: ENG BY: P.C.

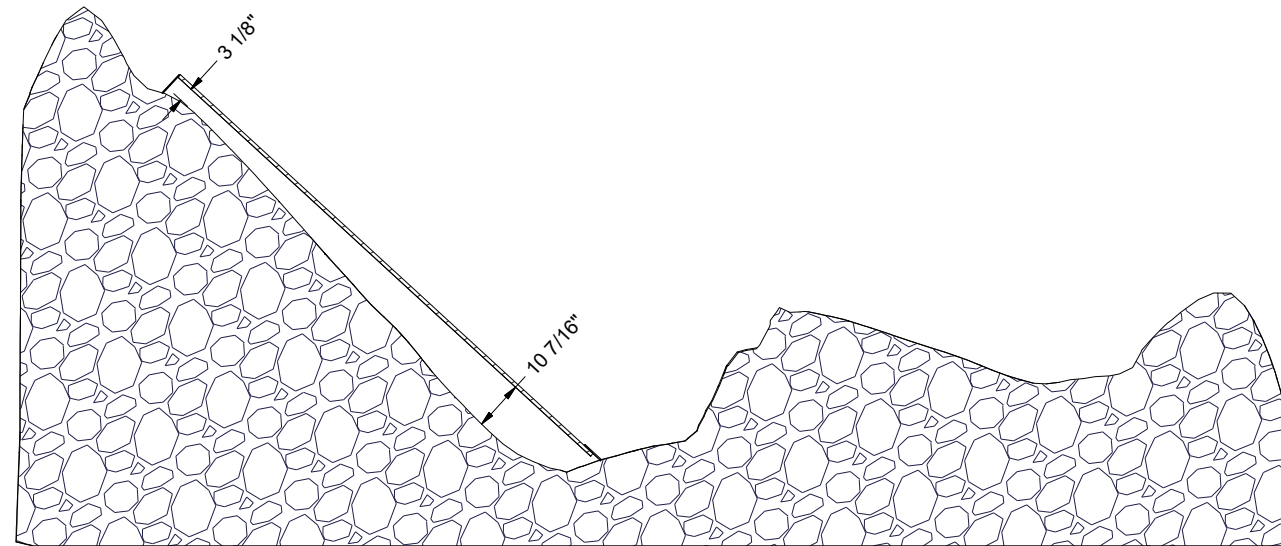


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 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 8 OPENING
 LIFTING DETAILS
 LOCATION: 59°37'10.8"N 108°25'10.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 3 OF 4 DWG. NO.: S18678-07-3



OPENING TO TOP COVER CLEARANCE


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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT REVISIONS	31/Oct/17	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / _R MACHINED SURFACES: ¹²⁵ / _R ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	26/Oct/16	N.R.	
		△	ISSUED FOR CONSTRUCTION	25/Oct/15	N.R.	DRWN BY: A.R. DATE: 06/Oct/16
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	18/Oct/16	N.R.	CHK'D BY: ENG BY: P.C.




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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*

Kova Engineering Saskatchewan Ltd. 

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 8 OPENING CLEARANCES
 LOCATION: 59°37'10.8"N 108°25'10.6"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 4 OF 4

DWG. NO.: **S18678-07-4** 

VERNA 4 - Bored Raise



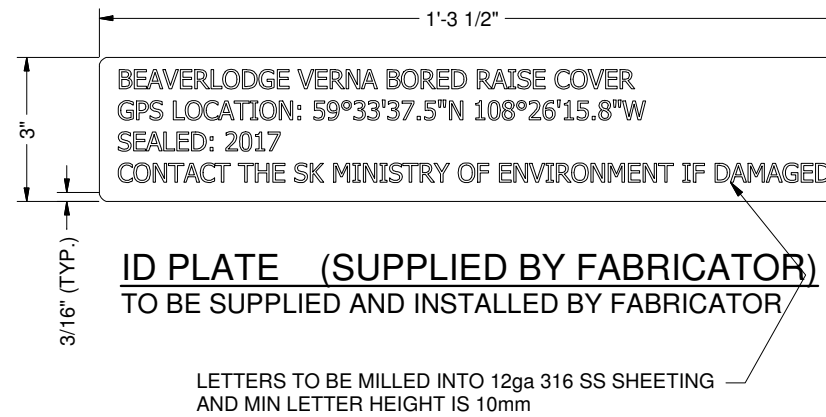
VERNA 4 - Bored Raise

GENERAL NOTES:

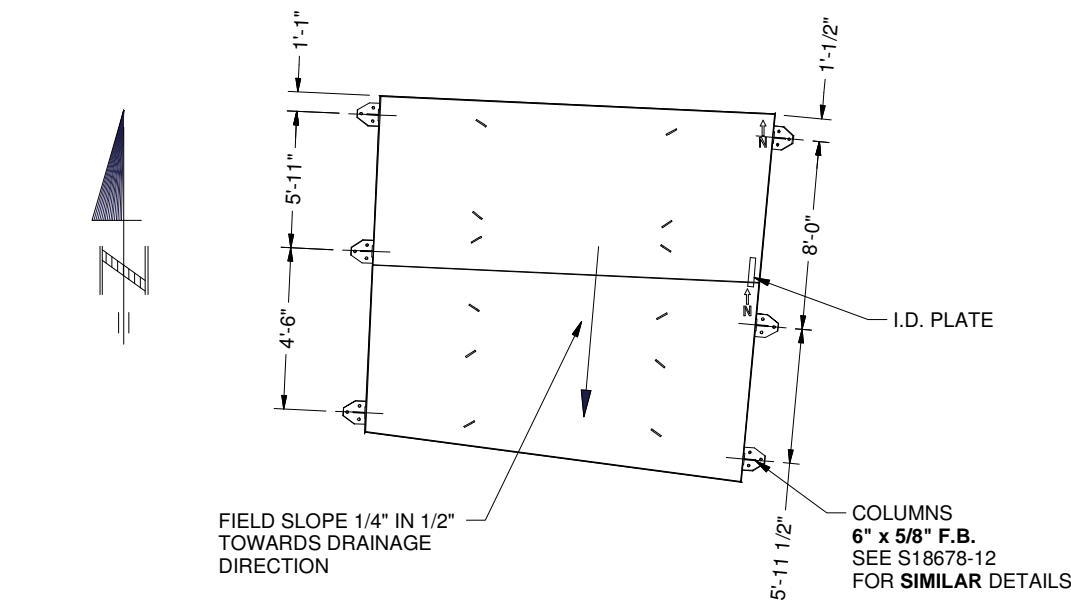
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

COVER CHARACTERISTICS:

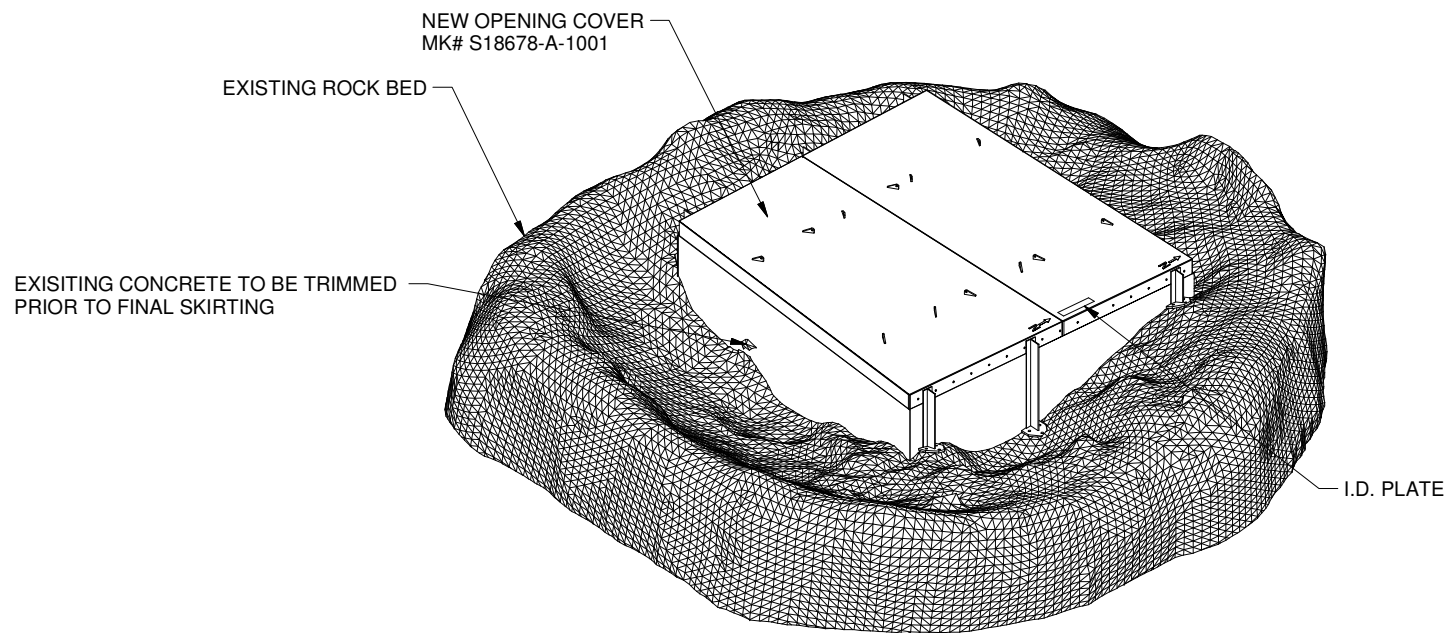
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 8,436LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 6,660 LB
AS INSTALLED: 8,436 LB



PLAN VIEW - VERNA 4 OPENING COVER



ISO VIEW
LOOKING NORTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



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Discipline Sk. Reg. No. Signature
Structural 14318

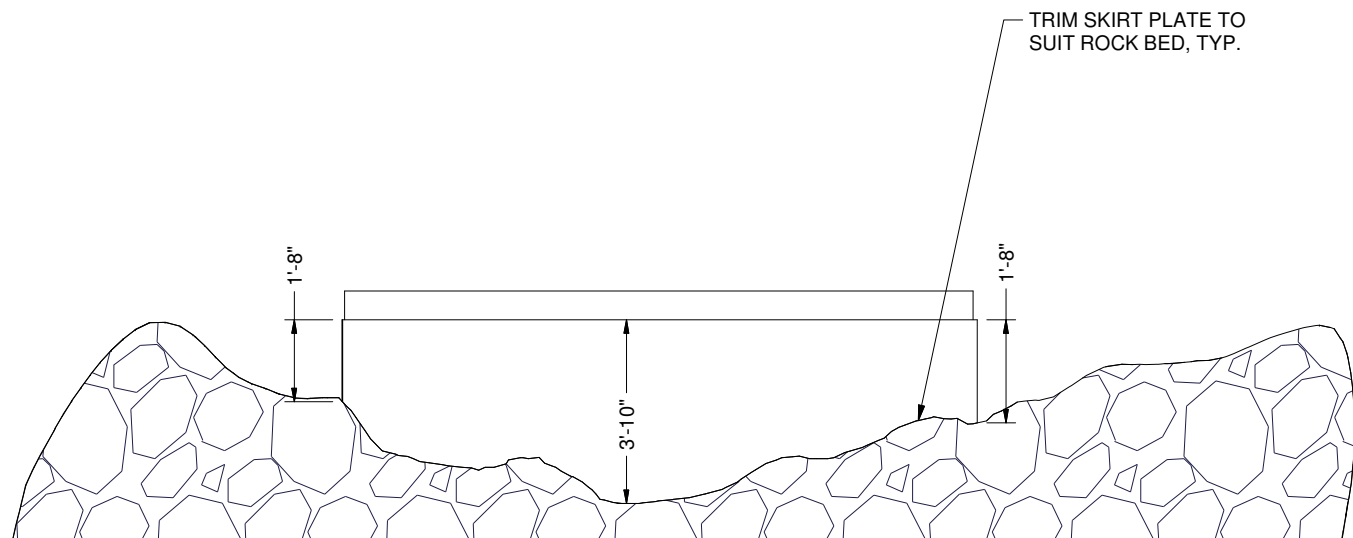
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 4 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

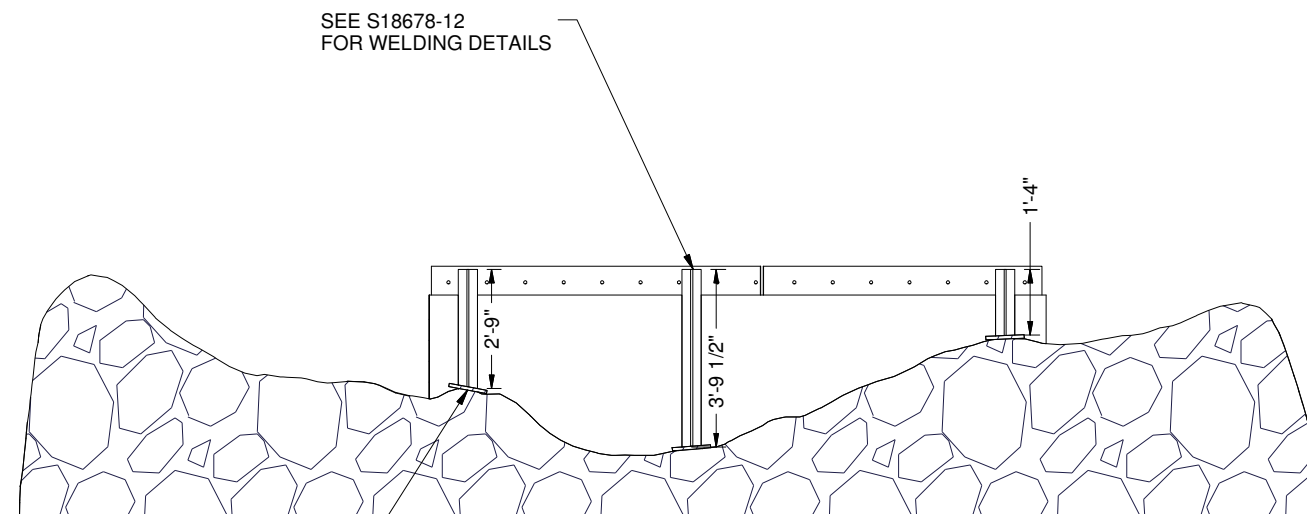
DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 6

DWG. NO.: **S18678-10-1**

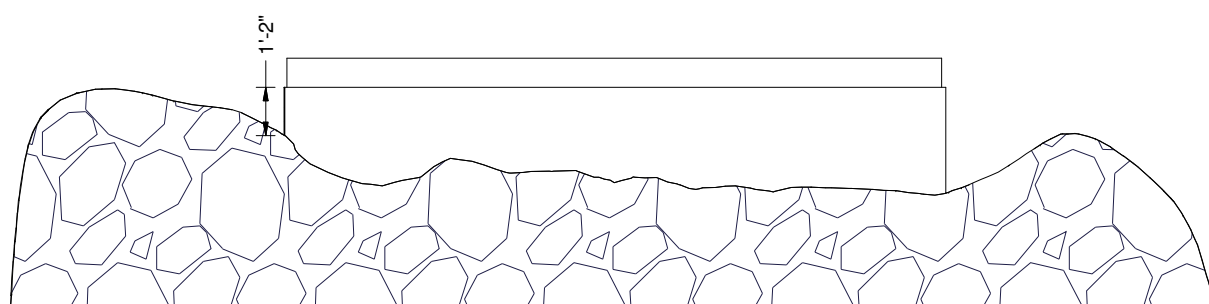
ESTIMATED TOTAL COLUMN LENGTH 220" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



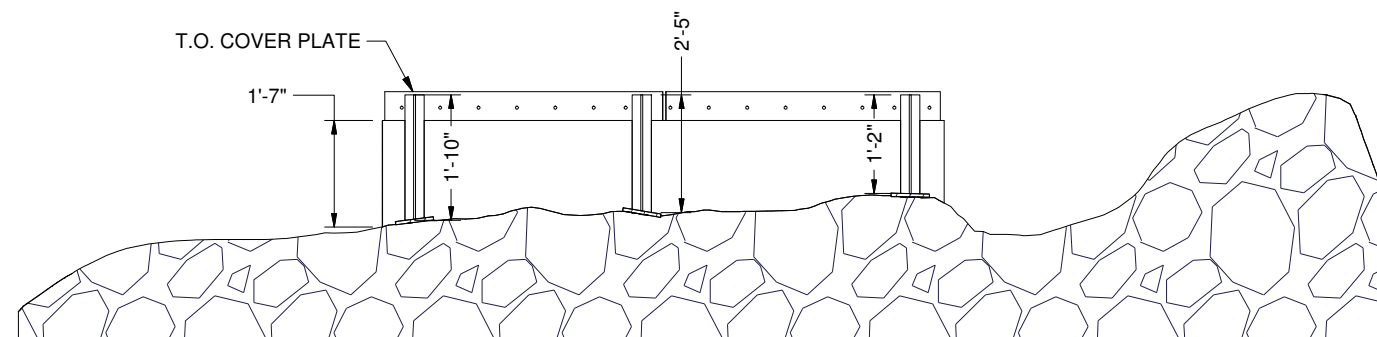
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



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 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

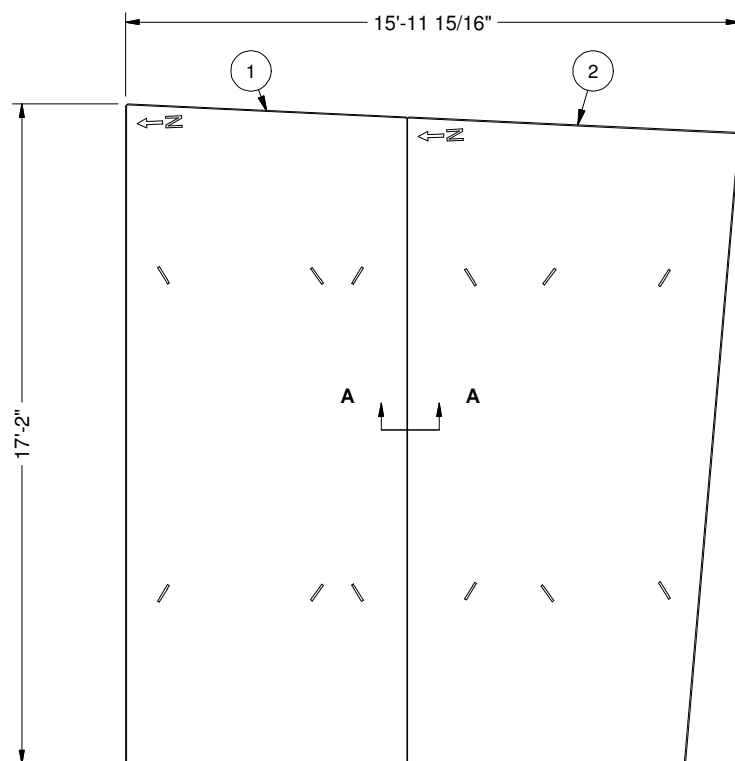
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERN 4 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

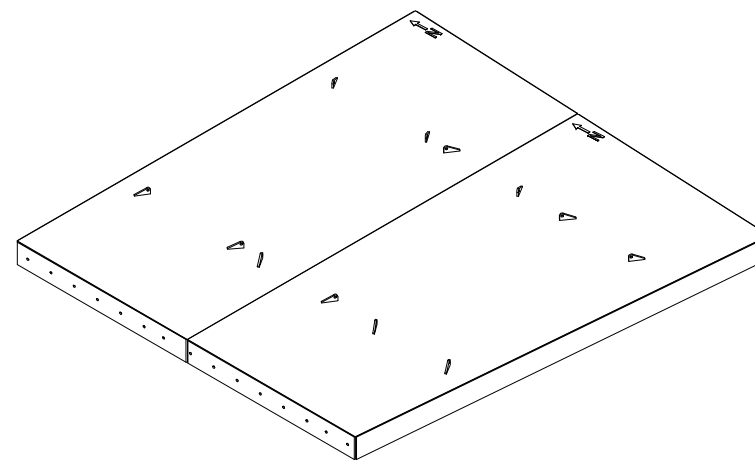
DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 6

DWG. NO.: **S18678-10-2**

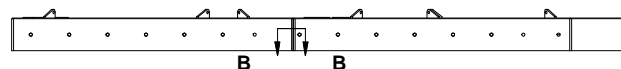
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	COVER SECTION 1	S18678-A-1002		4
2	1	COVER SECTION 2	S18678-A-1003		4



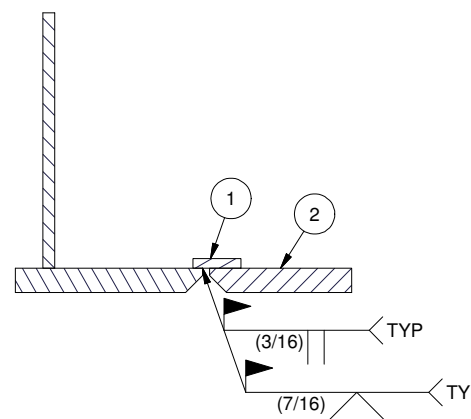
S18678-A-1001 - TOP VIEW
WELDED ASSEMBLY



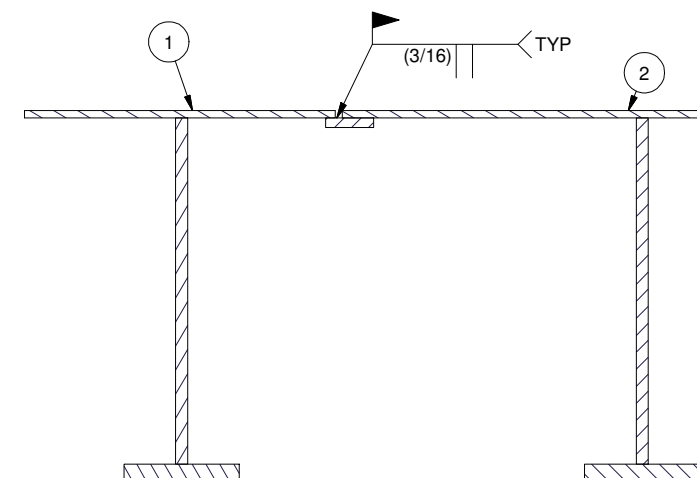
S18678-A-1001 - ISO VIEW



S18678-A-1001 - SIDE VIEW



SECTION B-B



SECTION A-A

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
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		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



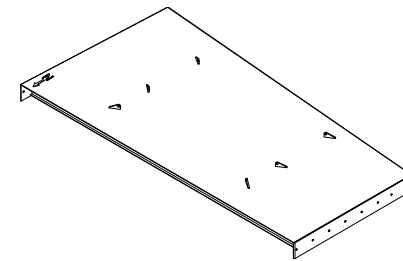
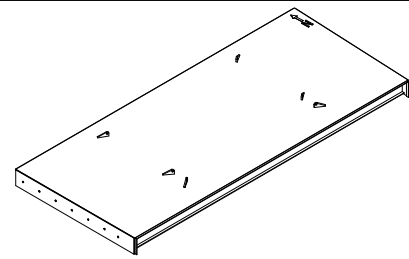
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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 4 OPENING
 TOP COVER DETAILS
 LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS SHEET NO.: 3 OF 6
 DWG. NO.: **S18678-10-3**

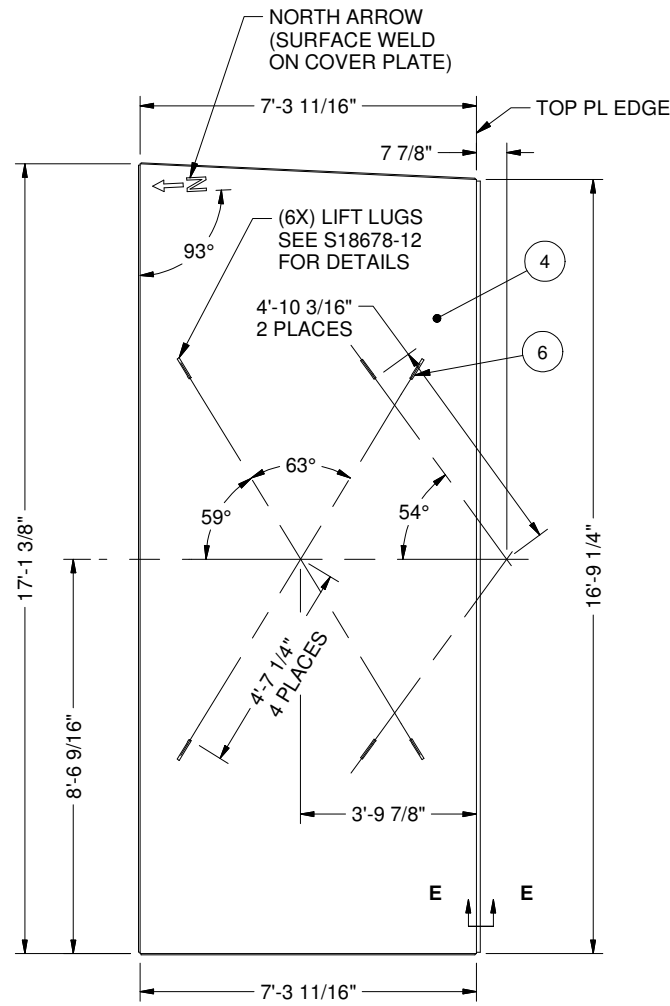
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
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2		3"x3/8" FB	ASTM A240-316L
3		10x5/8" FB	ASTM A240-316L
4	1	3/16" PL	ASTM A240-316L
5		1 1/4"x1/4" FB	ASTM A240-316L
6	6	5/8" PL	ASTM A240-316L

BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1		9"x5/16" FB	ASTM A240-316L
2		3"x3/8" FB	ASTM A240-316L
3		5"x3/8" FB	ASTM A240-316L
4		4"x3/8" FB	ASTM A240-316L
5		10"x5/8" FB	ASTM A240-316L
6	1	3/16" FB	ASTM A240-316L
7	6	5/8" PL	ASTM A240-316L

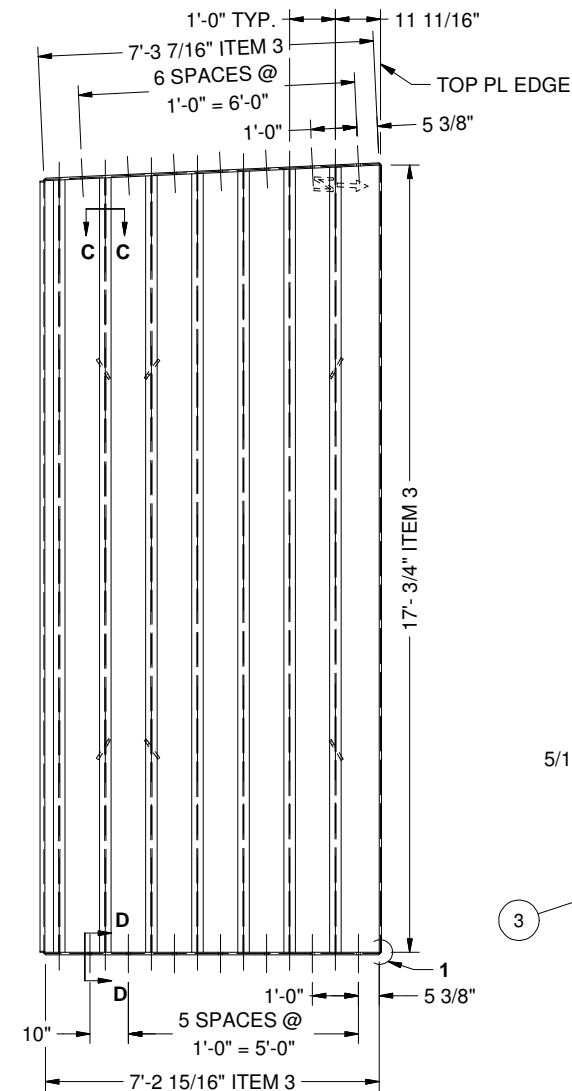


S18678-A-1002 - ISO VIEW

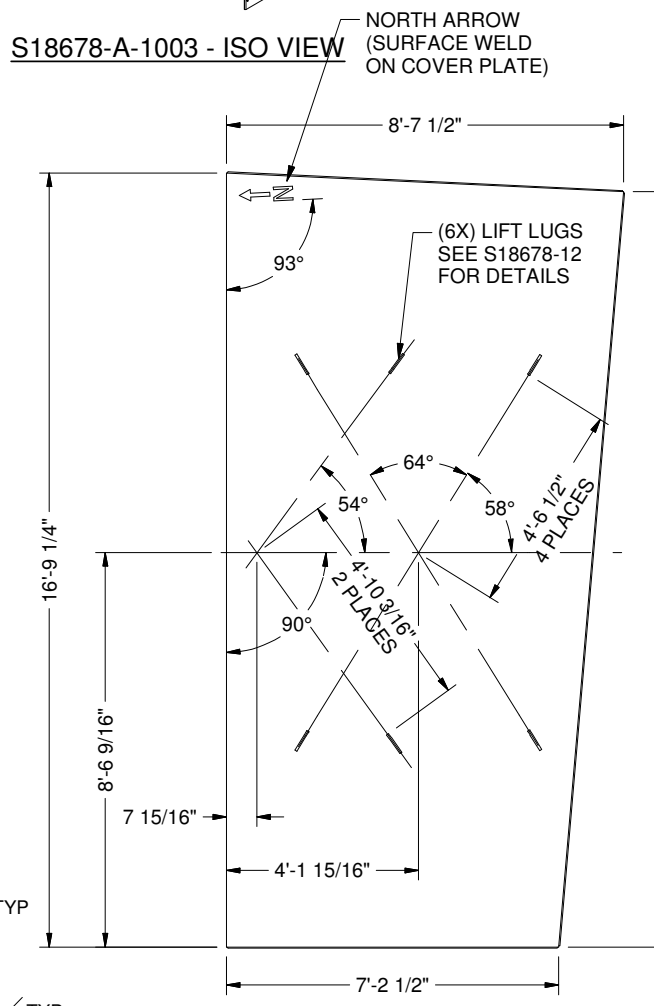
S18678-A-1003 - ISO VIEW



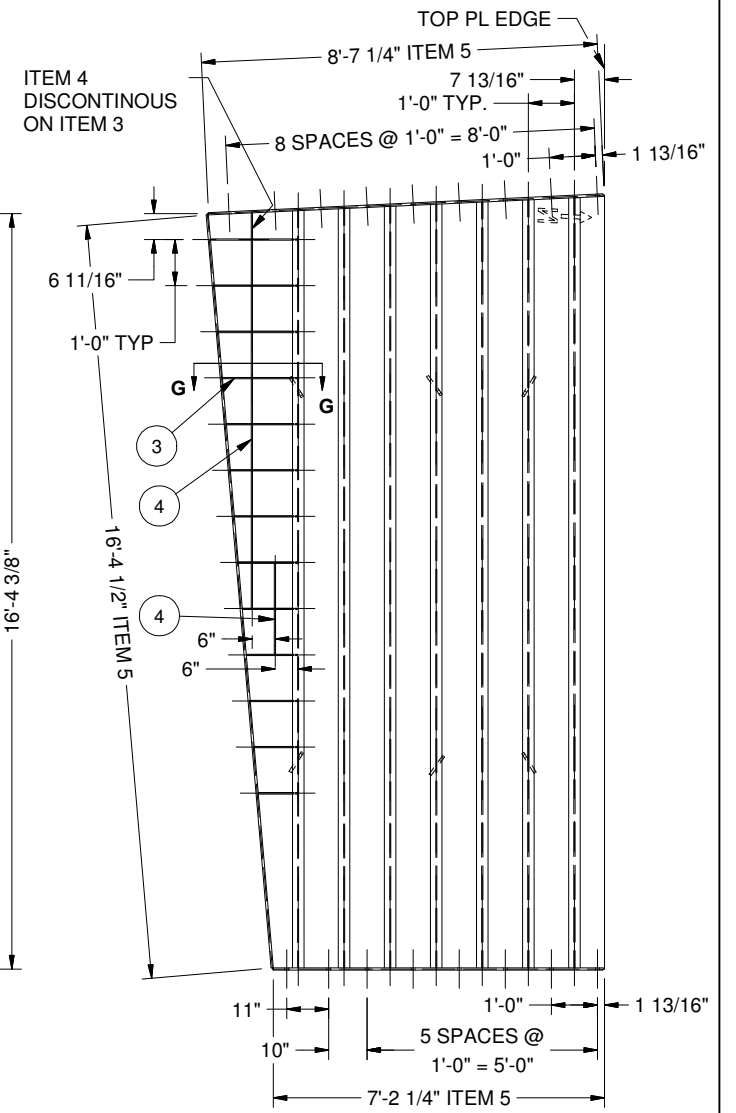
S18678-A-1002 - TOP VIEW
TOP PLATE DIMENSIONS



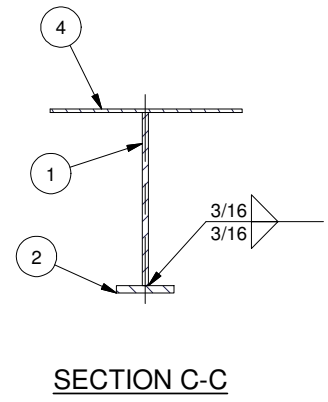
S18678-A-1002 - BOTTOM VIEW
STIFFENER LAYOUT



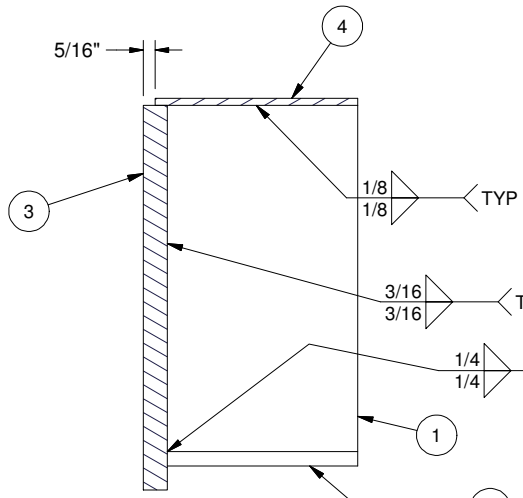
S18678-A-1003 - TOP VIEW
TOP PLATE DIMENSIONS



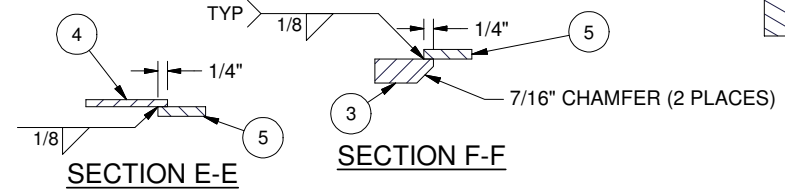
S18678-A-1003 - BOTTOM VIEW
STIFFENER LAYOUT



SECTION C-C

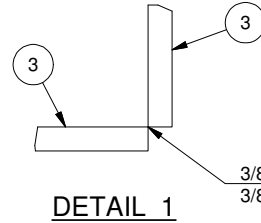


SECTION D-D

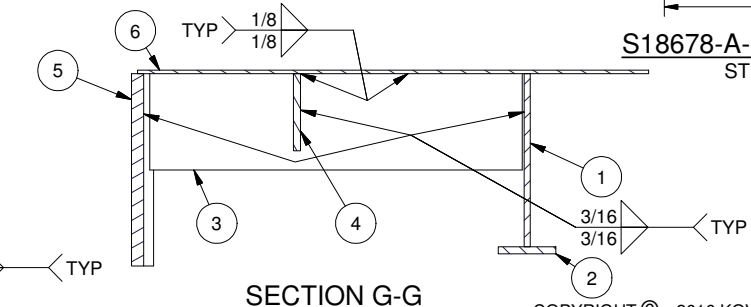


SECTION E-E

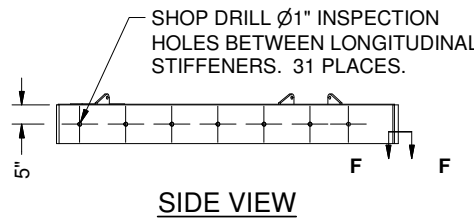
SECTION F-F



DETAIL 1



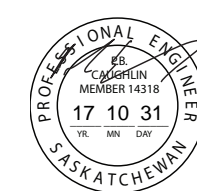
SECTION G-G



SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	DRWN BY: A.R. DATE: 8/29/2016
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	CHK'D BY: ENG BY: P.C.

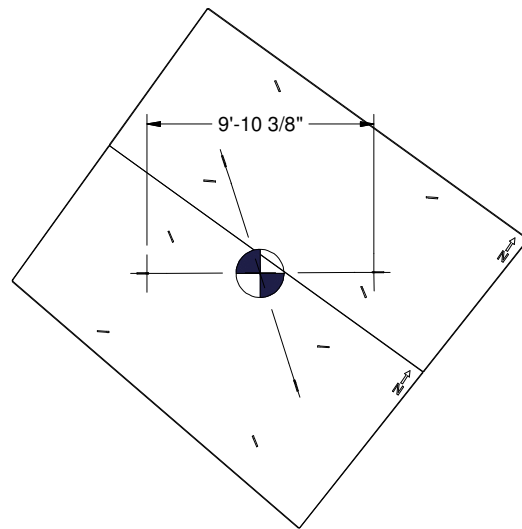


Association of Professional Engineers & Geoscientists of Saskatchewan
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 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

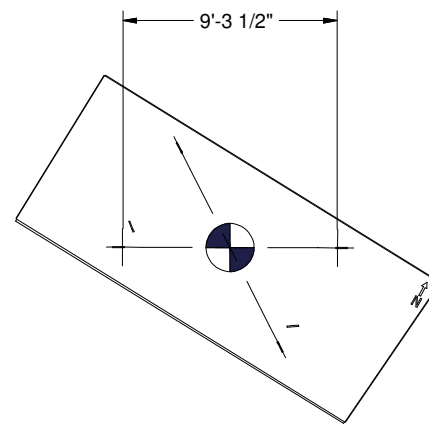
Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 4 OPENING
 TOP COVER SECTIONS
 LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

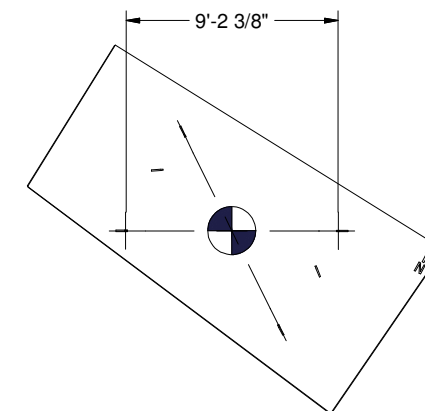
DO NOT SCALE DRAWINGS DWG. NO.: **S18678-10-4** SHEET NO.: 4 OF 6



TOP COVER LIFTING DIAGRAM
S18678-A-1001

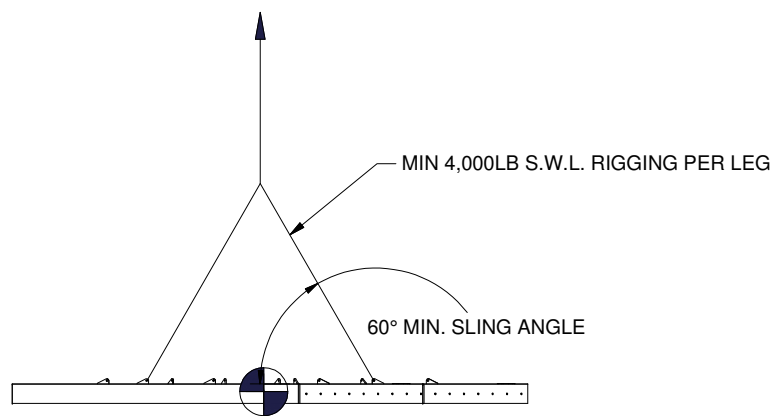


TOP COVER LIFTING DIAGRAM
S18678-A-1002



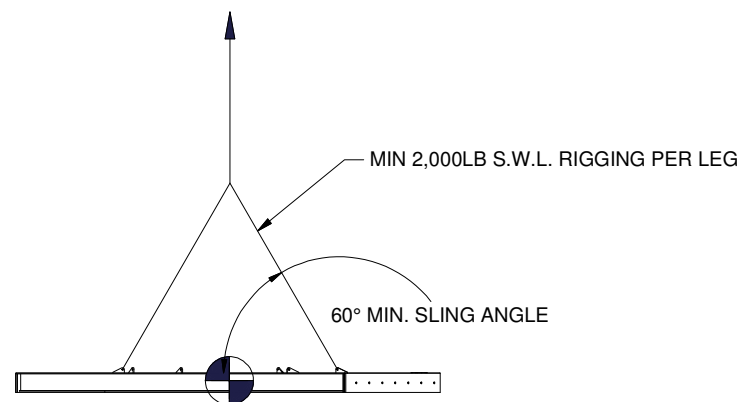
TOP COVER LIFTING DIAGRAM
S18678-A-1003

6660LBS + RIGGING WEIGHT



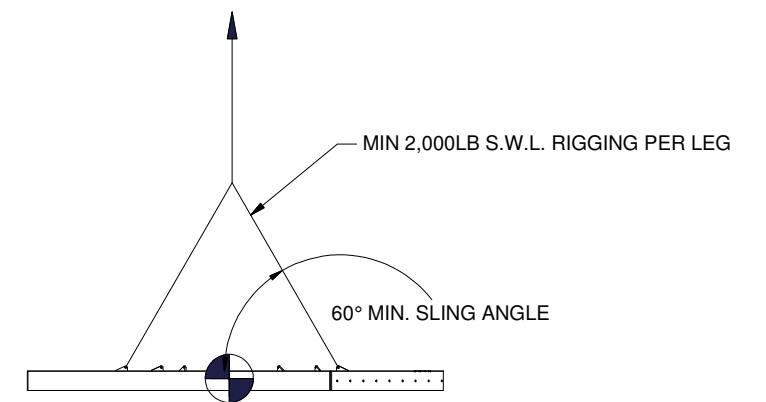
TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-1001

3238LBS + RIGGING WEIGHT



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-1002

3422LBS + RIGGING WEIGHT



TOP COVER LIFTING DIAGRAM - SIDE VIEW
S18678-A-1003

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



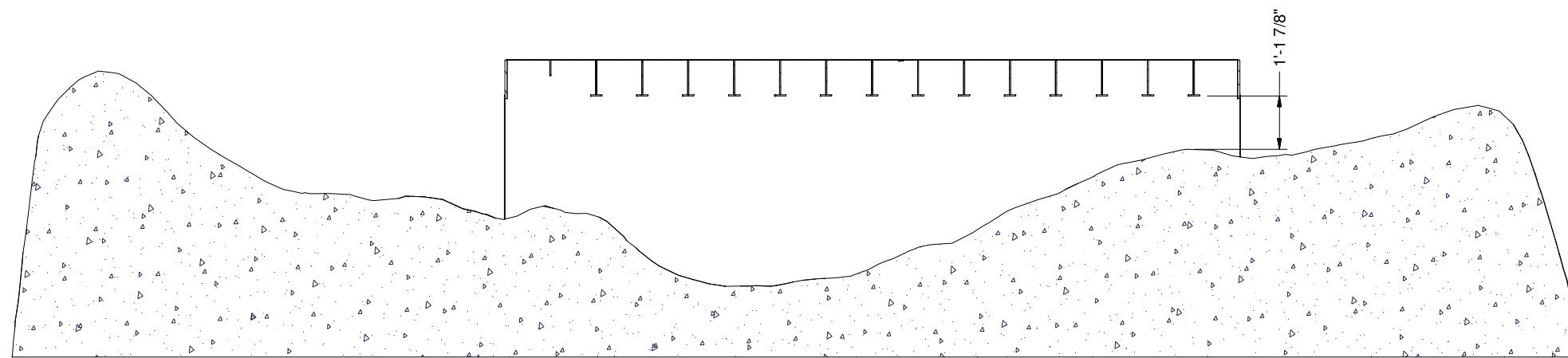
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 4 OPENING
 LIFTING DETAILS
 LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS DWG. NO.: **S18678-10-5**

SHEET NO.: 5 OF 6

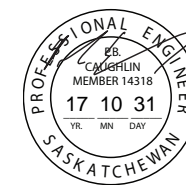


OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS-BUILT REVISIONS	10/31/2017	A.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ± 0.005 MACHINED SURFACES: ± 0.0025 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	I.D. PLATE UPDATED	10/26/2016	N.R.	
		△	ISSUED FOR CONSTRUCTION	10/25/2016	N.R.	
		△	ISSUED FOR REVIEW	10/18/2016	N.R.	
S18678-12	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	10/18/2016	N.R.	



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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*

Kova Engineering Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 4 OPENING CLEARANCES
 LOCATION: 59°33'37.5"N 108°26'15.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 6 DWG. NO.: **S18678-10-6**

2018 Cover Installations

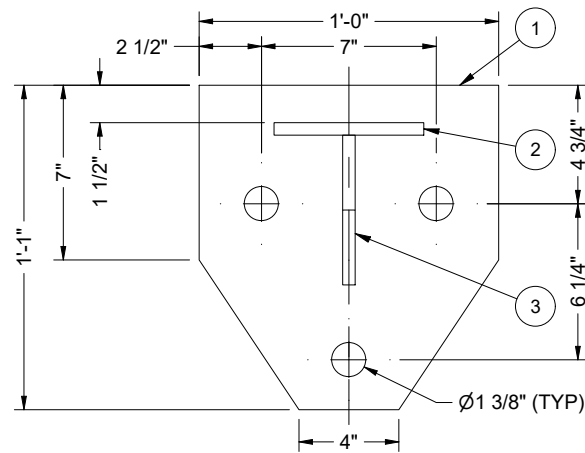
2018 Stainless Steel Cover Details

- **Columns Details and Notes**
- **Bedrock Anchor Details**
- **Welding Details**
- **Lift Lug Design**

2018 Stainless Steel Cover Details

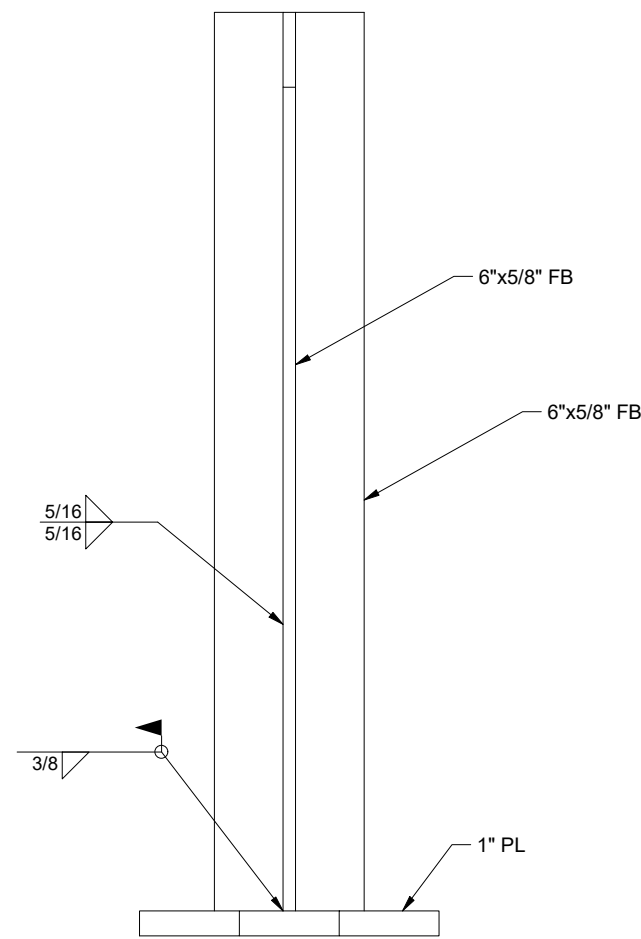
GENERAL NOTES:

1. ALL STRUCTURAL PLATE MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
5. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
6. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
7. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
8. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

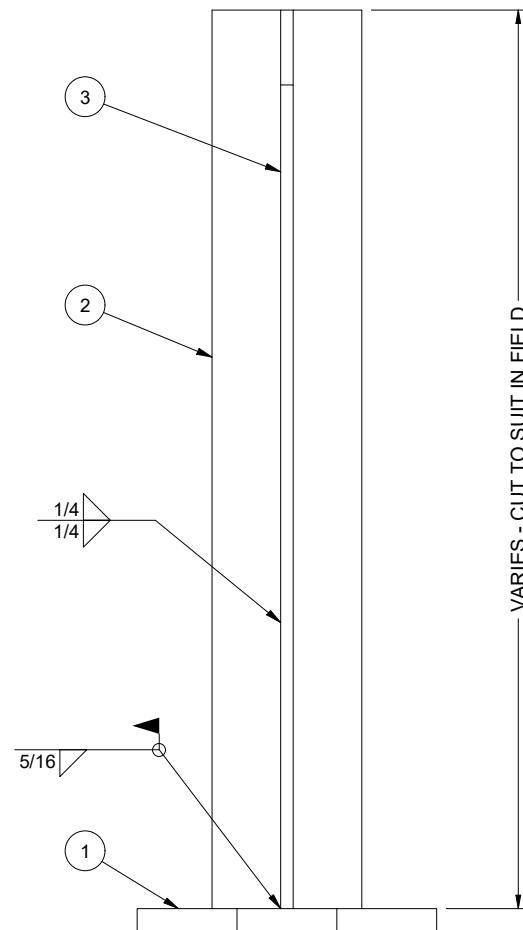


TOP VIEW

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	1" PL		ASTM A240-316L	
2	1	6" x 1/2" FB		ASTM A240-316L	
3	1	6" x 1/2" FB		ASTM A240-316L	

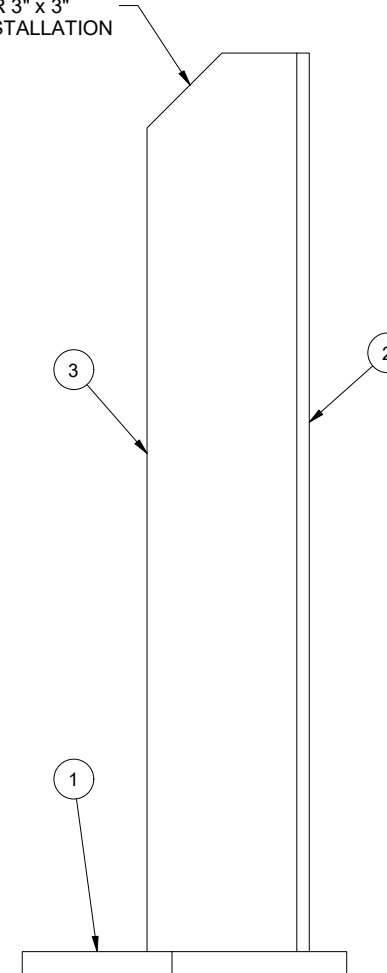


**ALTERNATIVE COLUMN DETAIL
5/8" PLATE COLUMNS**

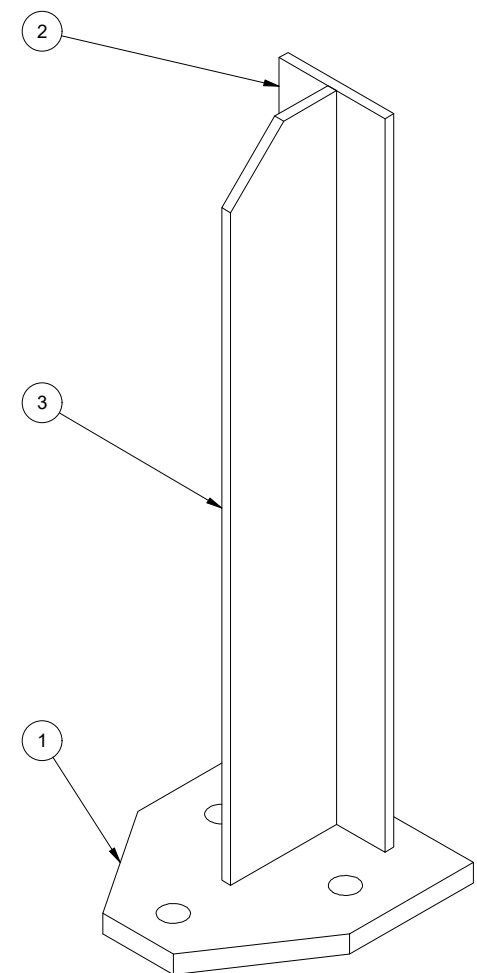


COLUMN DETAIL

FIELD CHAMFER 3" x 3"
FOLLOWING INSTALLATION



SIDE VIEW



ISO VIEW

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: A.R. DATE: 13/Nov/17
P60236-01-6	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



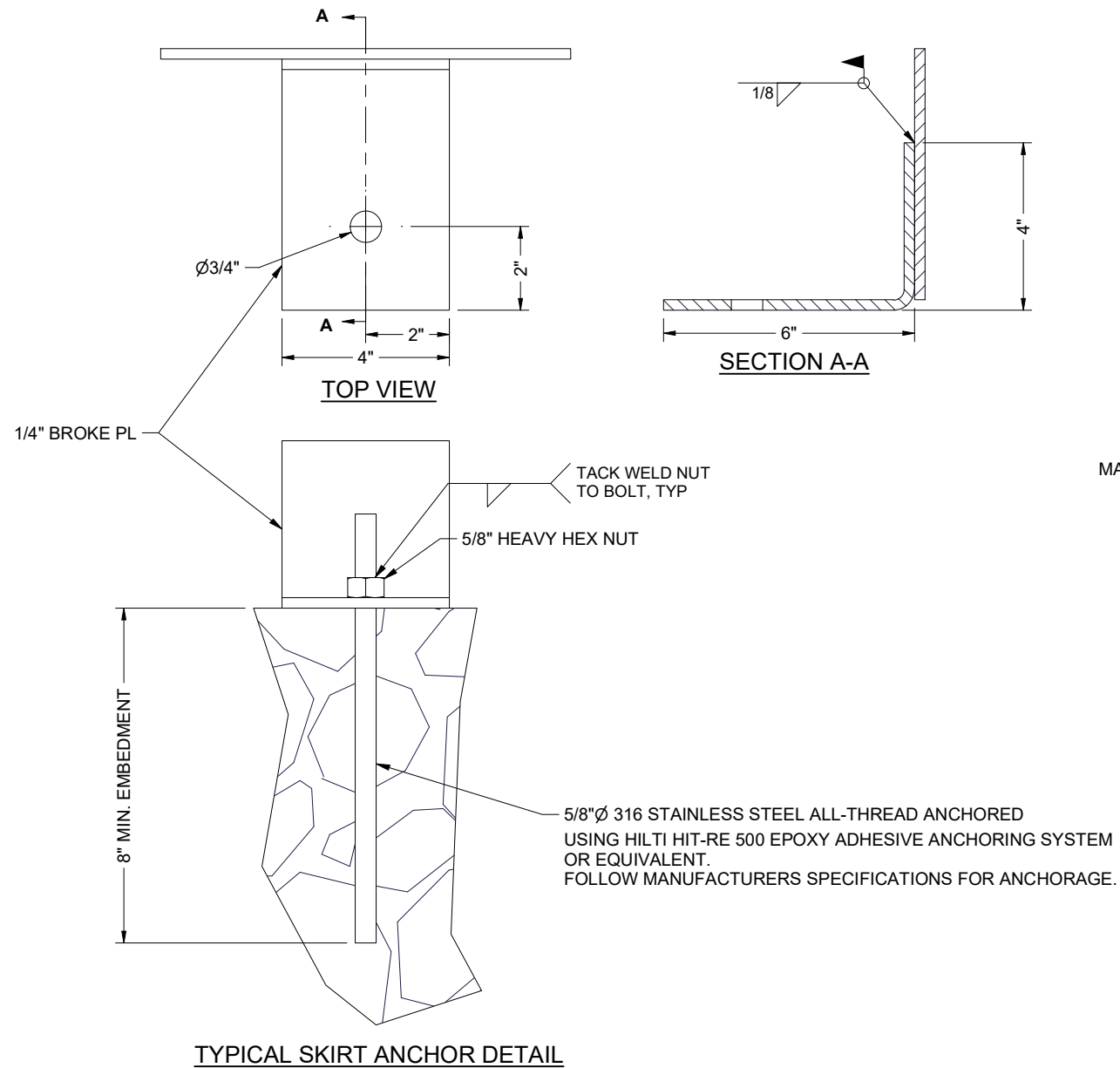
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Sk. Reg. No. Signature
 Structural 14318

Kova Engineering Saskatchewan Ltd.

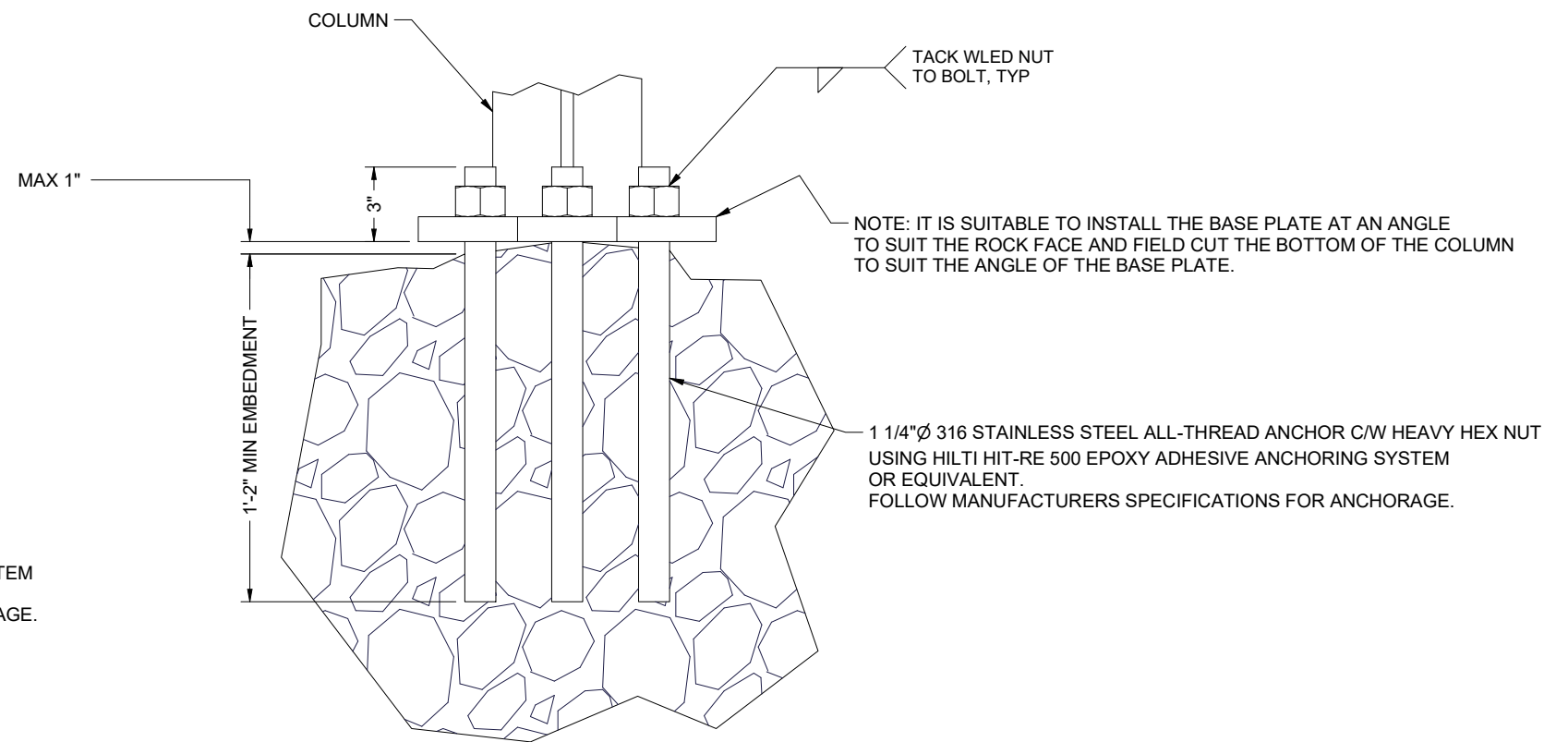
PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 COLUMN DETAILS & NOTES
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 4

DWG. NO.: **P60236-07-1**



TYPICAL SKIRT ANCHOR DETAIL



TYPICAL COLUMN ANCHOR BOLT DETAIL

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: A.R. DATE: 13/Nov/17
P60236-01~6	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.

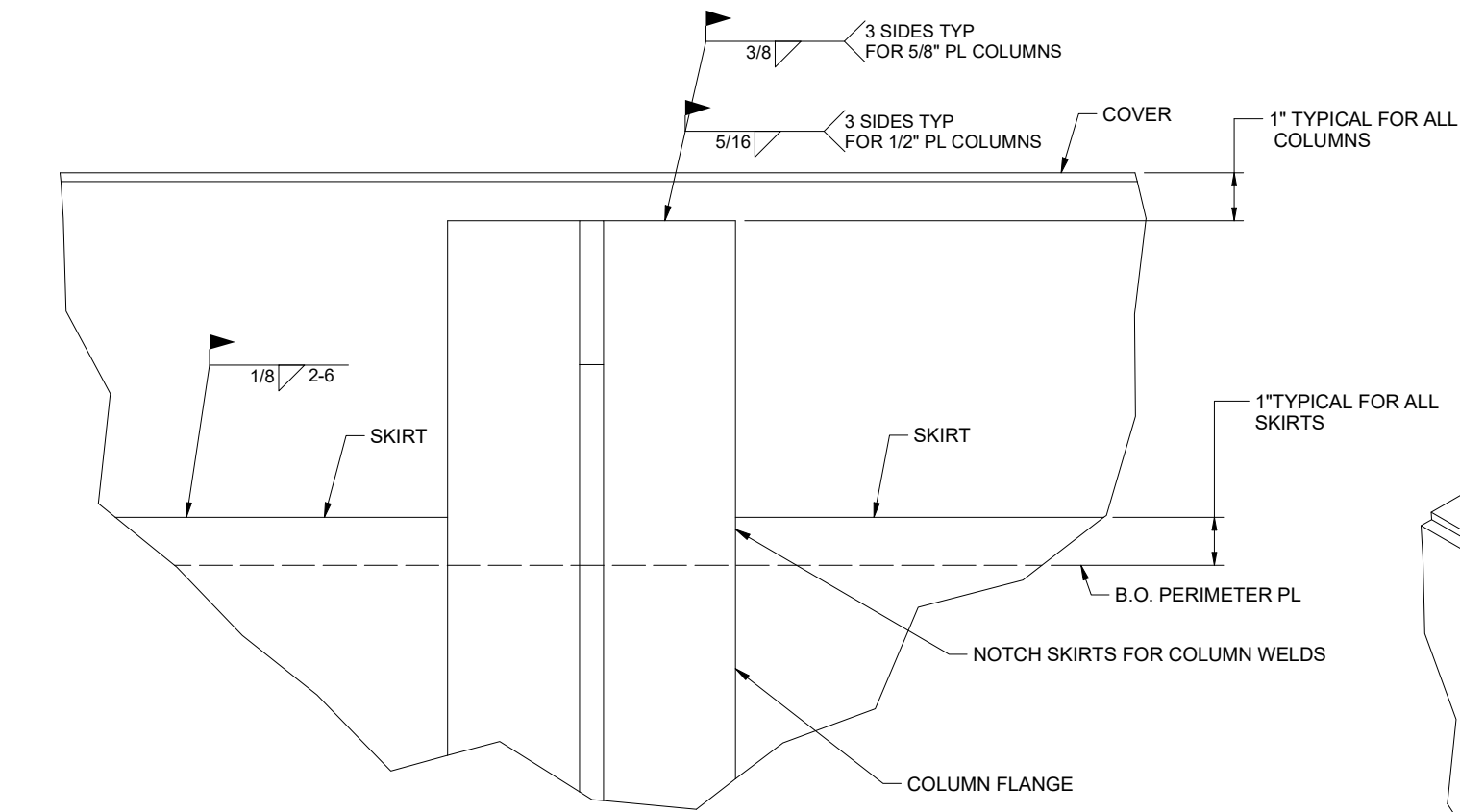


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 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

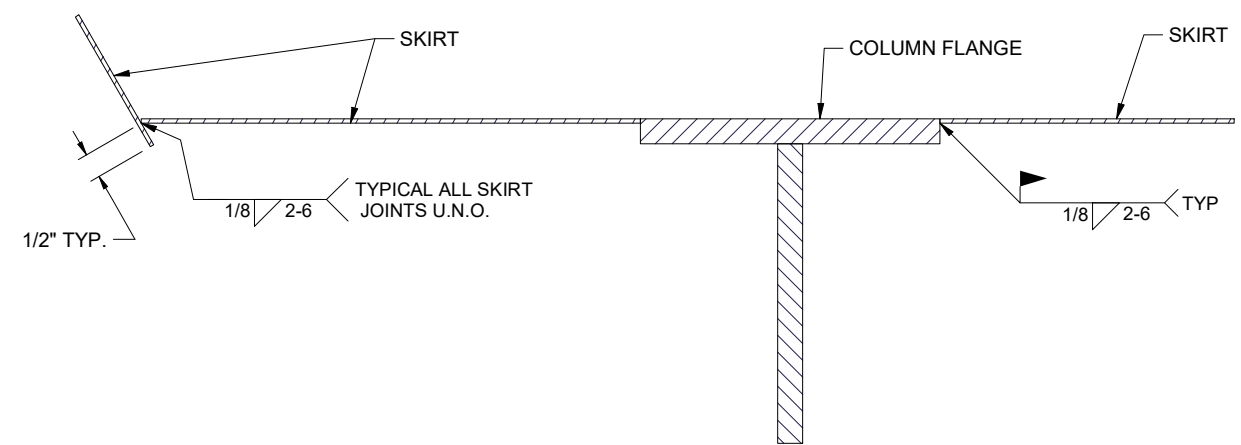
Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 ANCHOR DETAILS
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

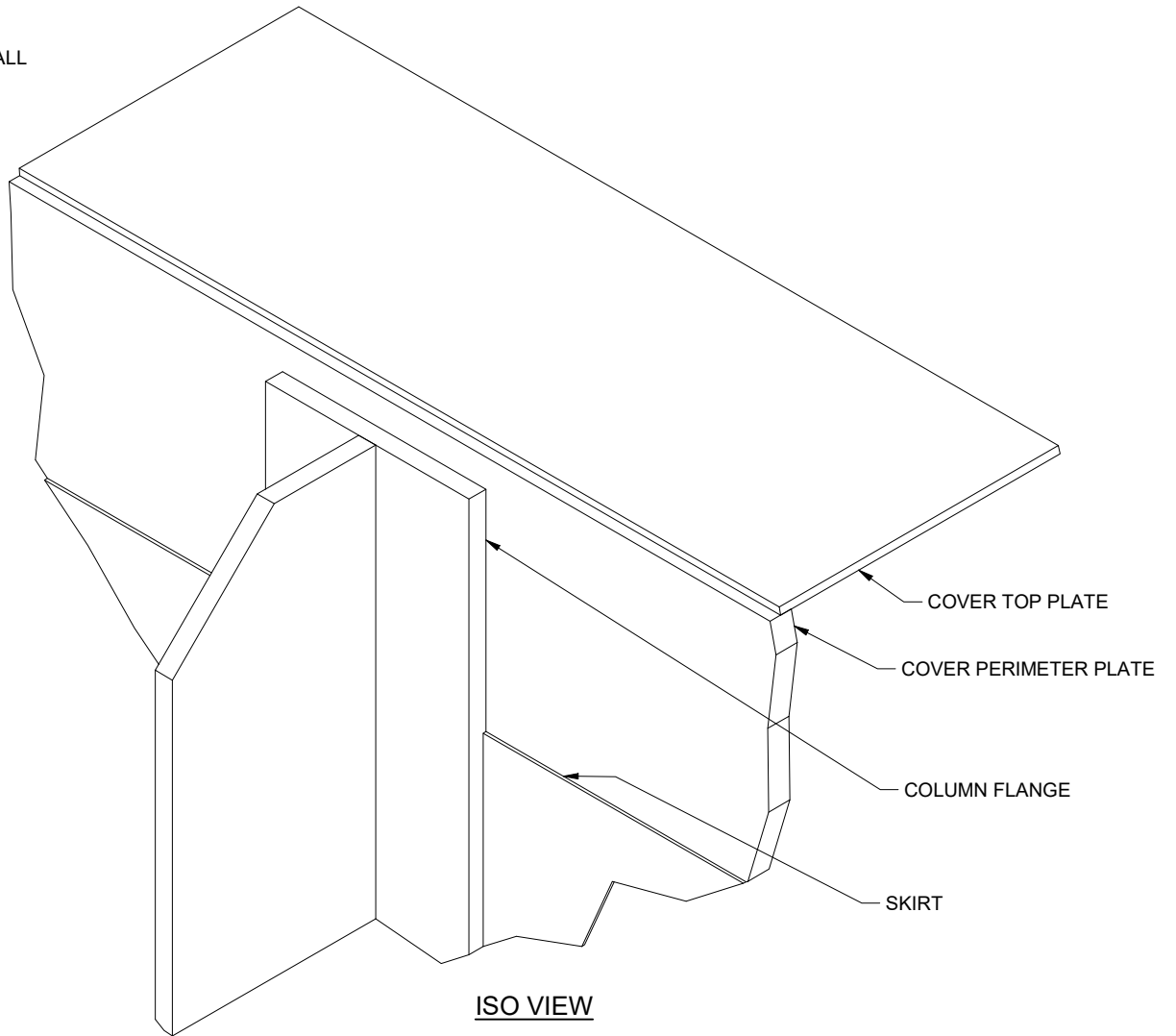
DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 4
 DWG. NO.: P60236-07-2



WELDING COLUMN AND SKIRT TO COVER



SKIRT WELDING



ISO VIEW

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: A.R. DATE: 13/Nov/17
P60236-01~6	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.

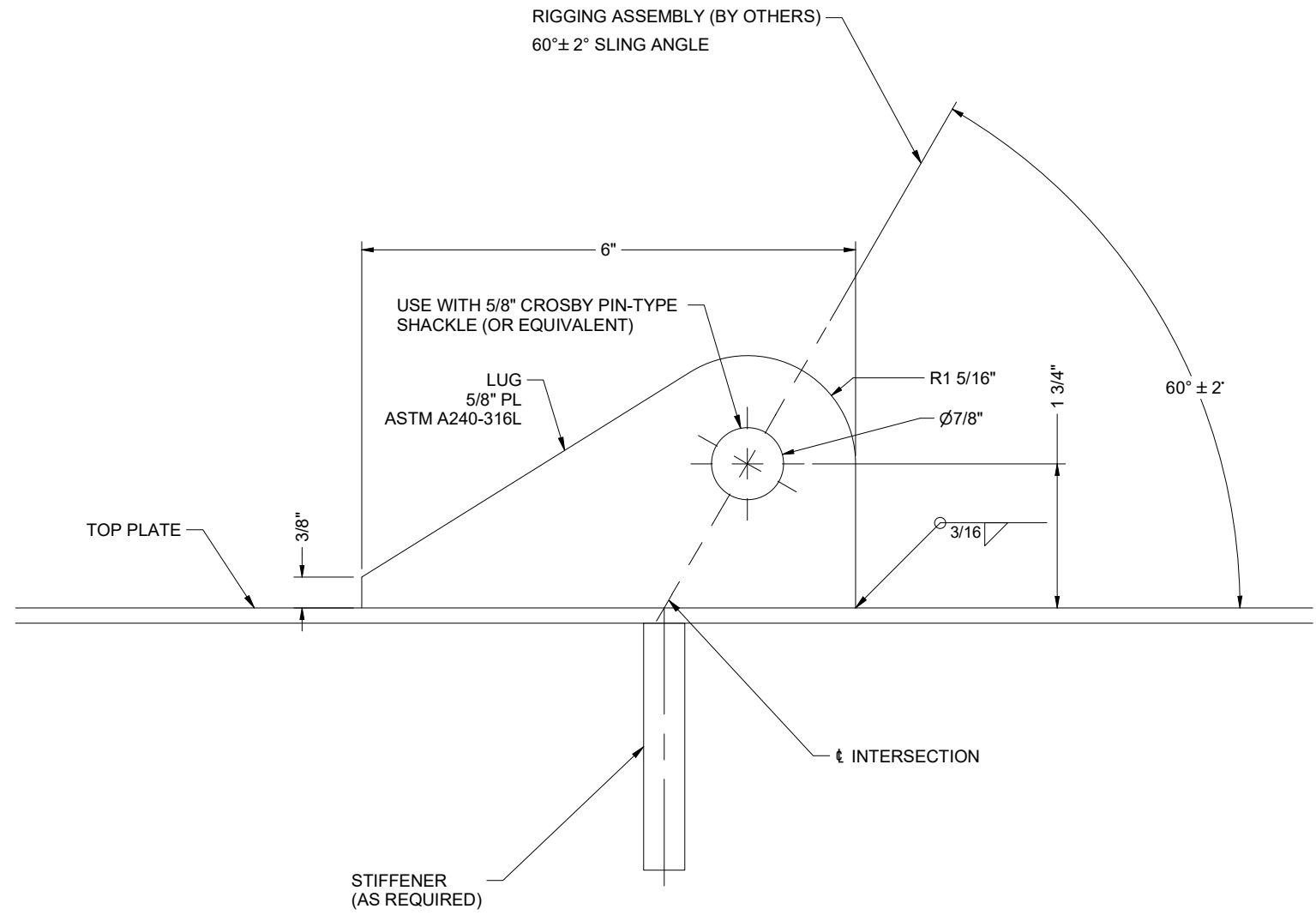


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 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 WELDING DETAILS
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 3 OF 4 DWG. NO.: **P60236-07-3**



LUG DETAIL

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: A.R. DATE: 13/Nov/17
P60236-01~6	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No.: 14318 Signature: [Signature]

Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 LIFT LUG DESIGN
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 4 DWG. NO.: **P60236-07-4**

FAY 5 – Surface Dump Raise



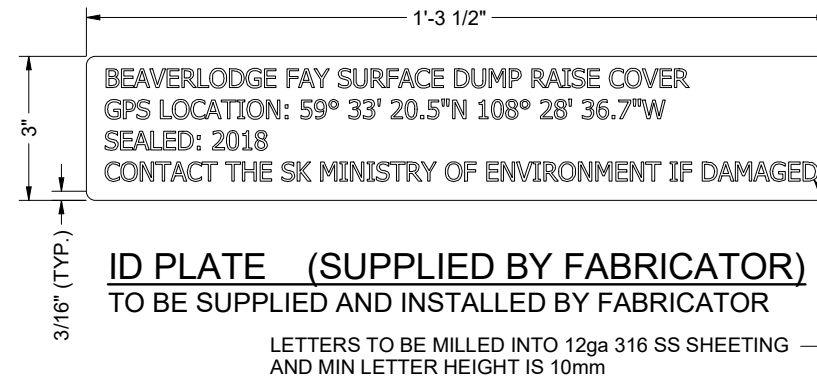
FAY 5 – Surface Dump Raise

GENERAL NOTES:

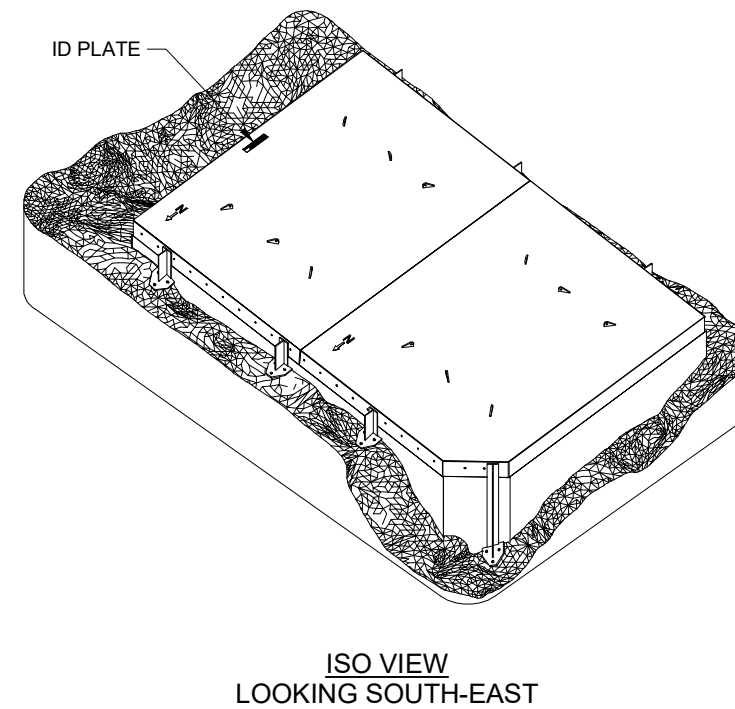
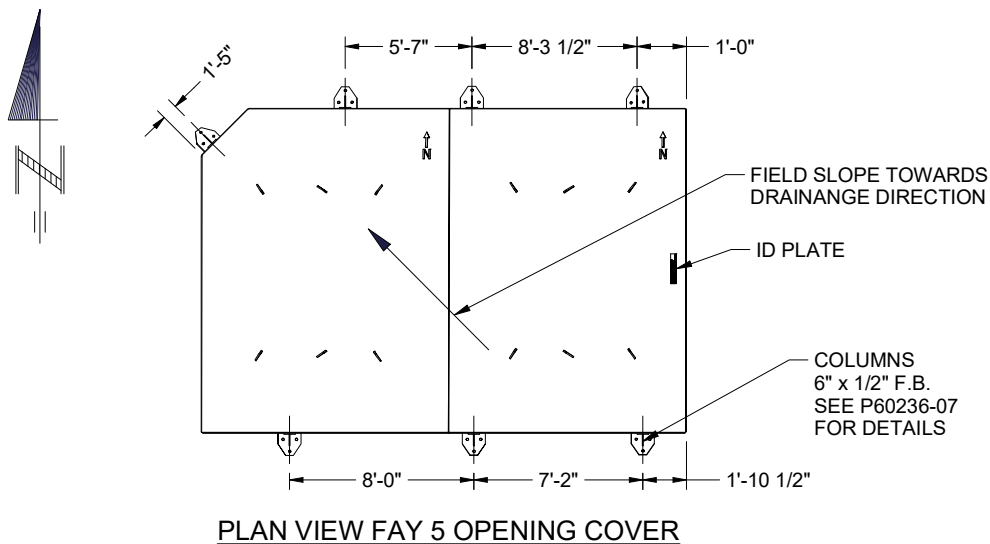
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
15. SEE DRAWING P60236-07 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 10,200 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
 TOP COVER ASSEMBLY W/O RIGGING: 8,530 LB
 AS INSTALLED: 10,200 LB



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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



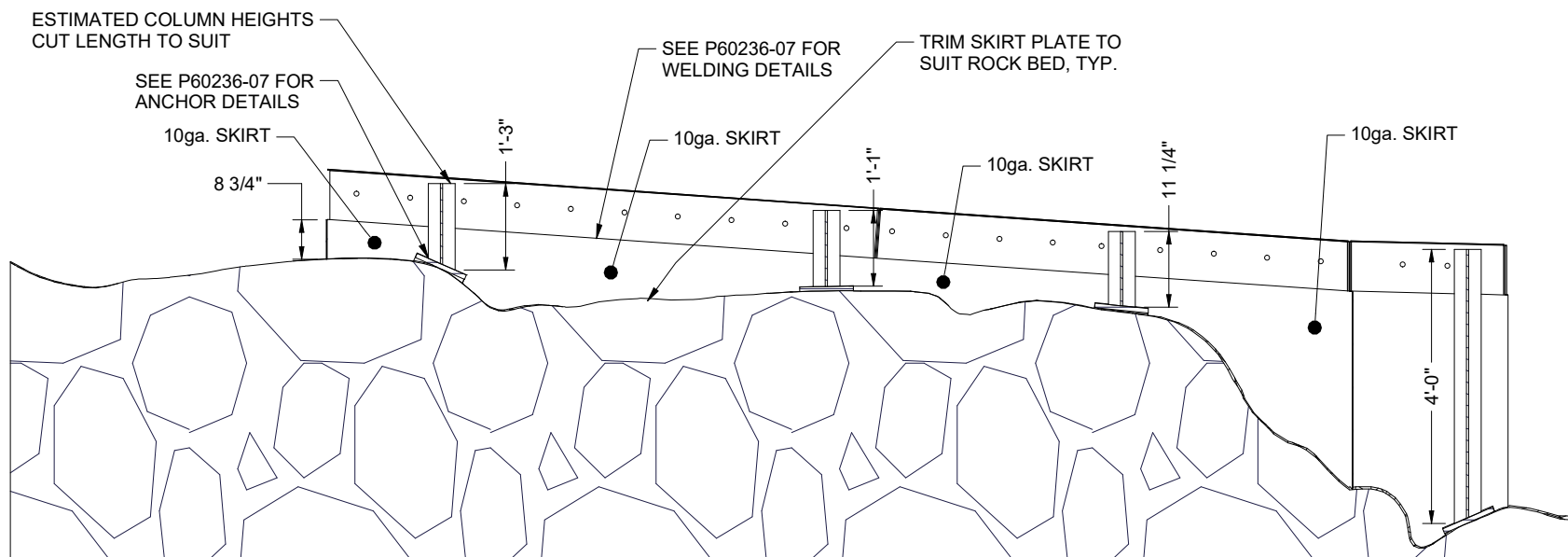
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Kova Engineering
 Saskatchewan Ltd.

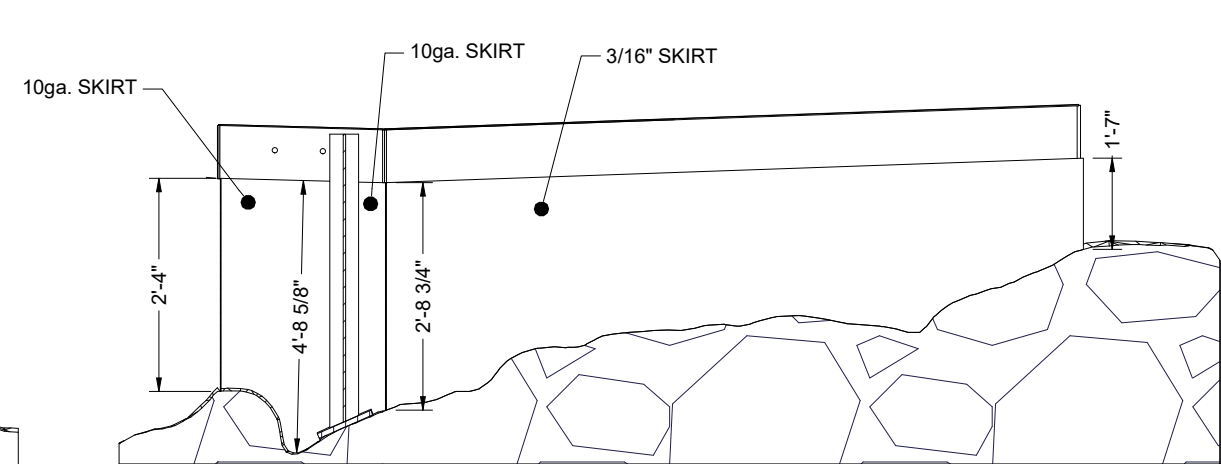
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 5 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 33' 20.5"N 108° 28' 36.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 5 DWG. NO.: P60236-03-1

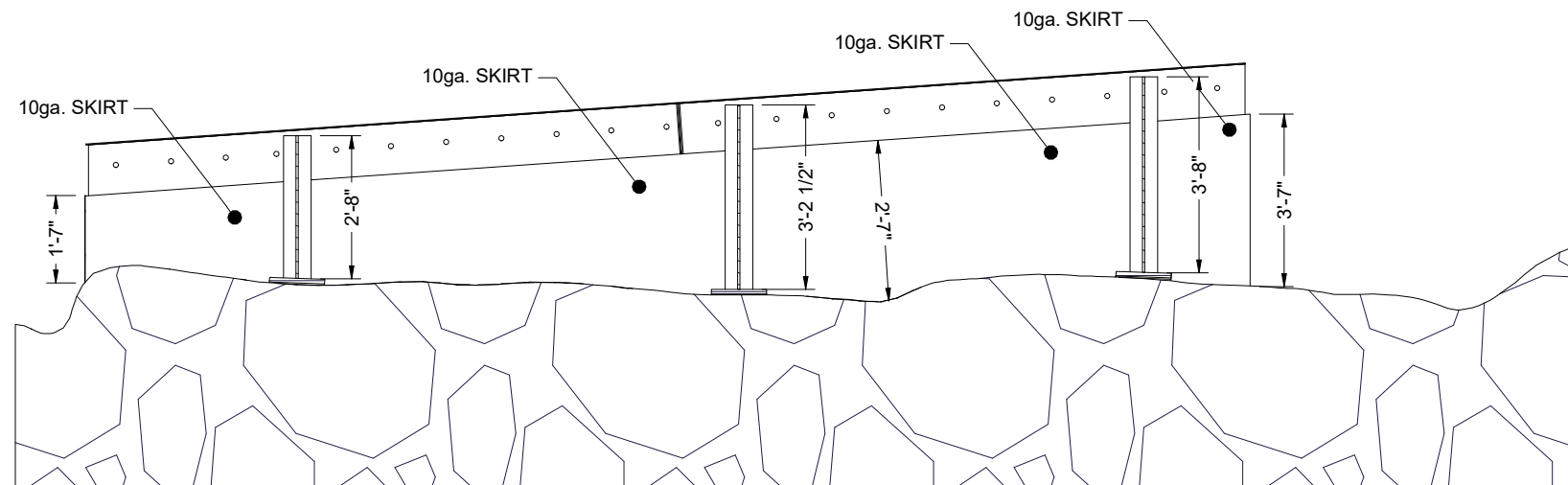
ESTIMATED TOTAL COLUMN LENGTH 220" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SEVEN (7) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



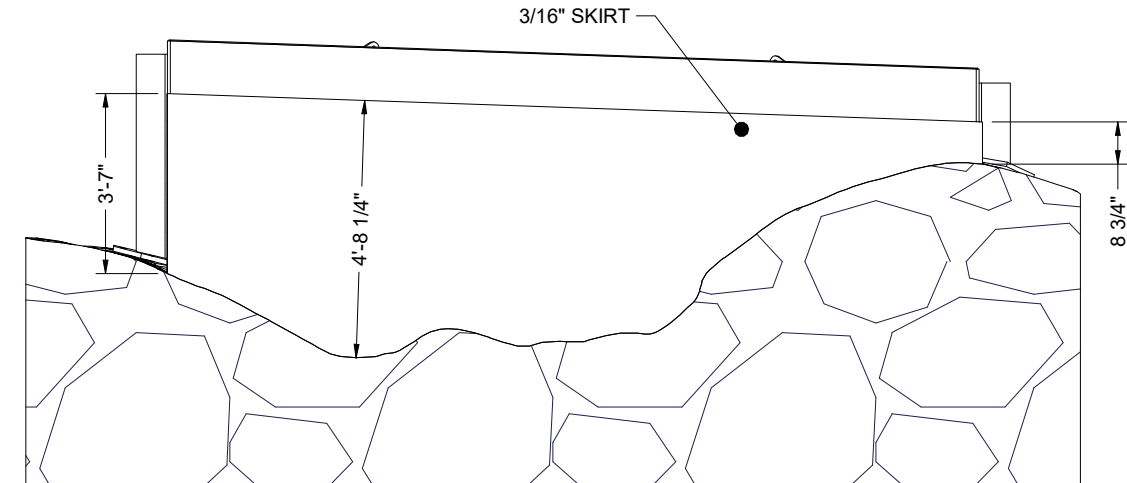
ELEVATION LOOKING SOUTH



ELEVATION LOOKING EAST



ELEVATION LOOKING NORTH



ELEVATION LOOKING WEST

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		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.

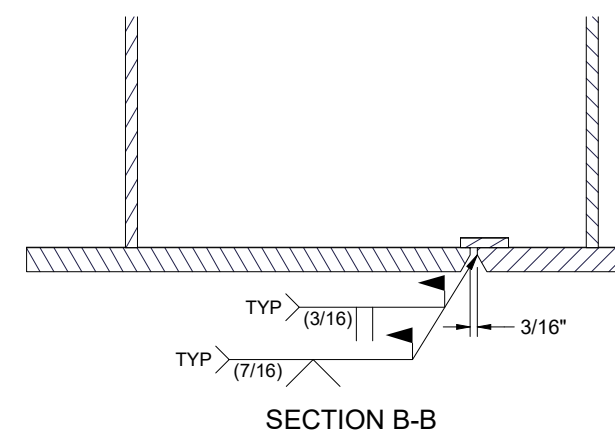
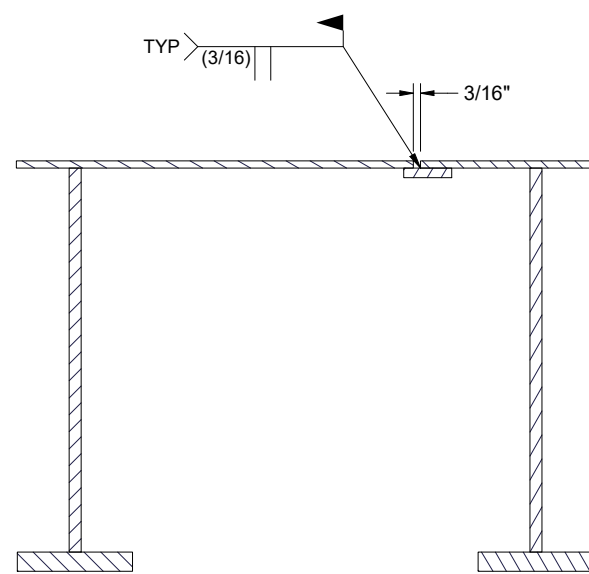
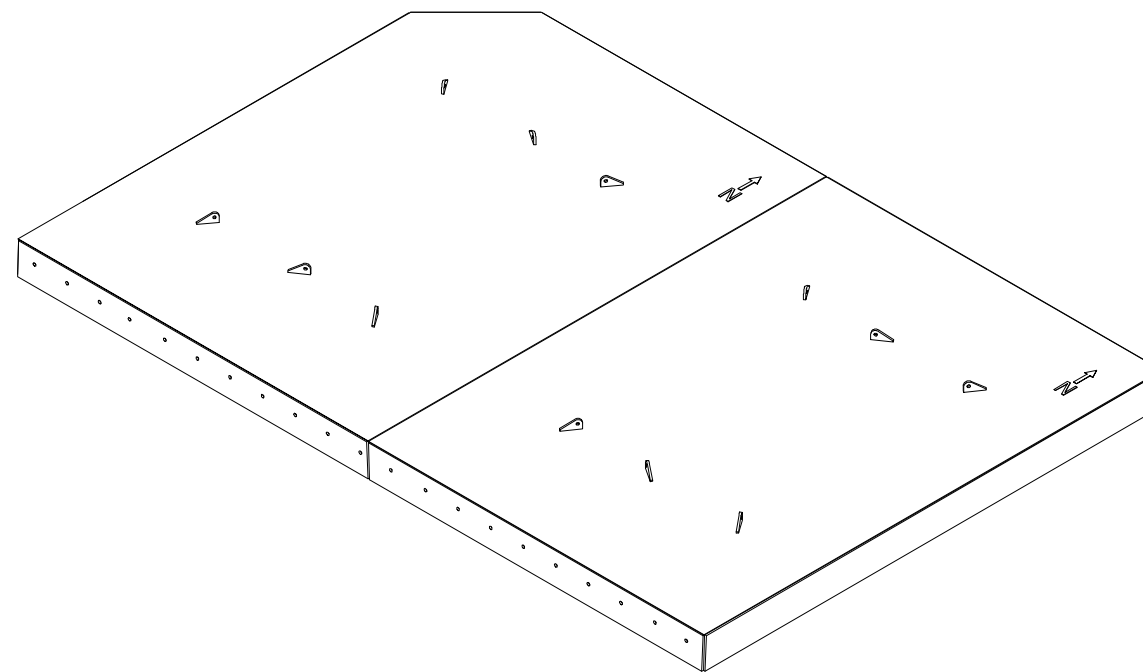
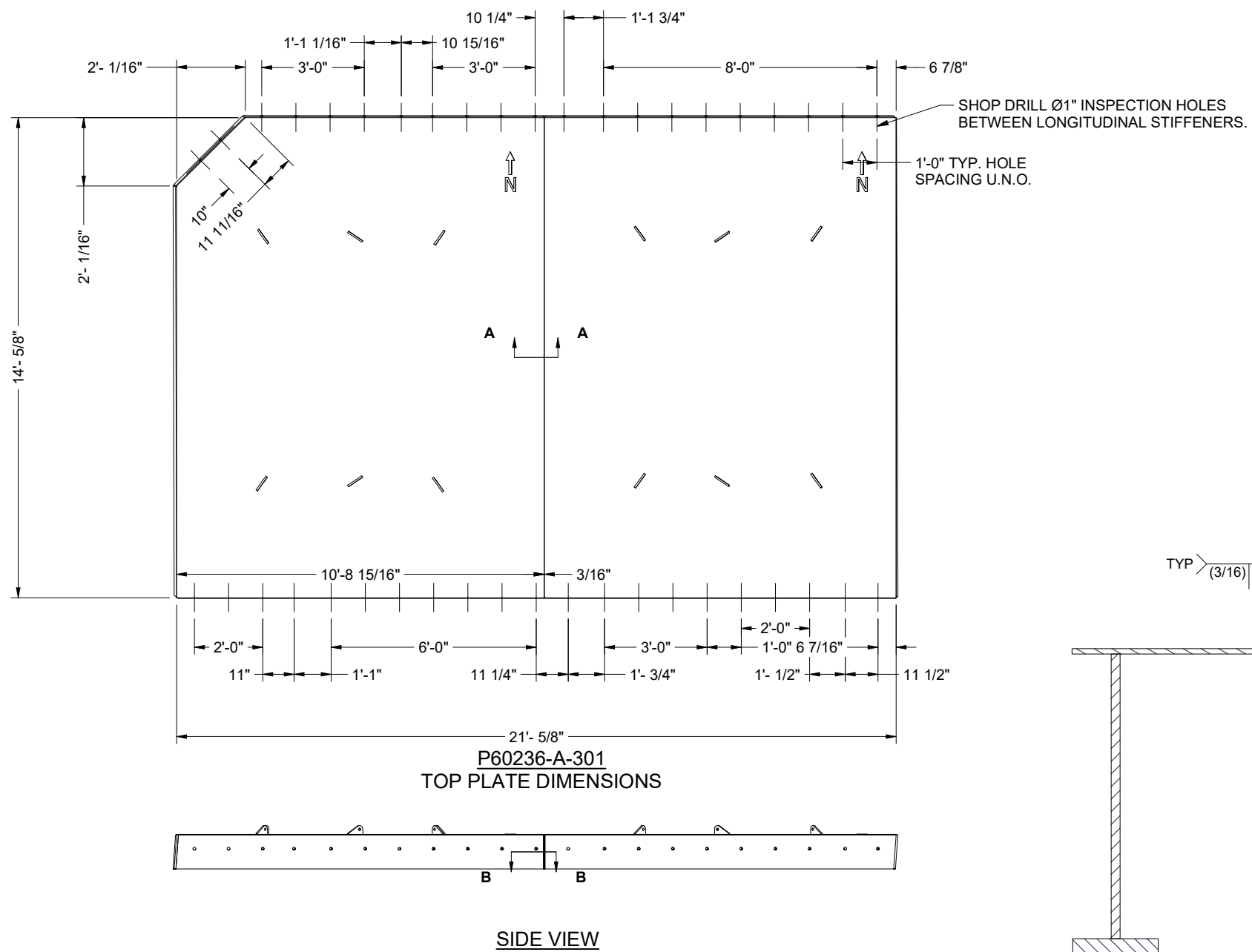


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]



PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 5 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 33' 20.5"N 108° 28' 36.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 5
 DWG. NO.: P60236-03-2
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
19	1	TOP COVER SECTION 2	P60236-A-303		
27	1	TOP COVER SECTION 1	P60236-A-302		



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



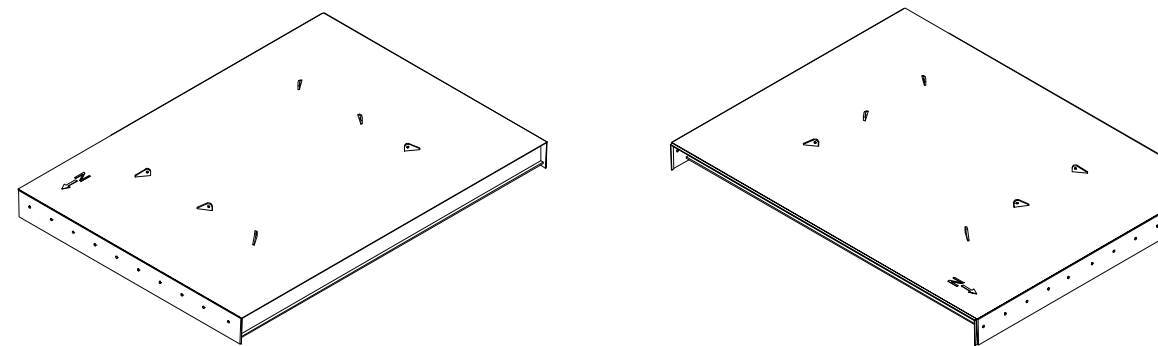
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
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 Discipline: Sk. Reg. No. Signature
 Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 5 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 33' 20.5"N 108° 28' 36.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 5
 DWG. NO.: P60236-03-3

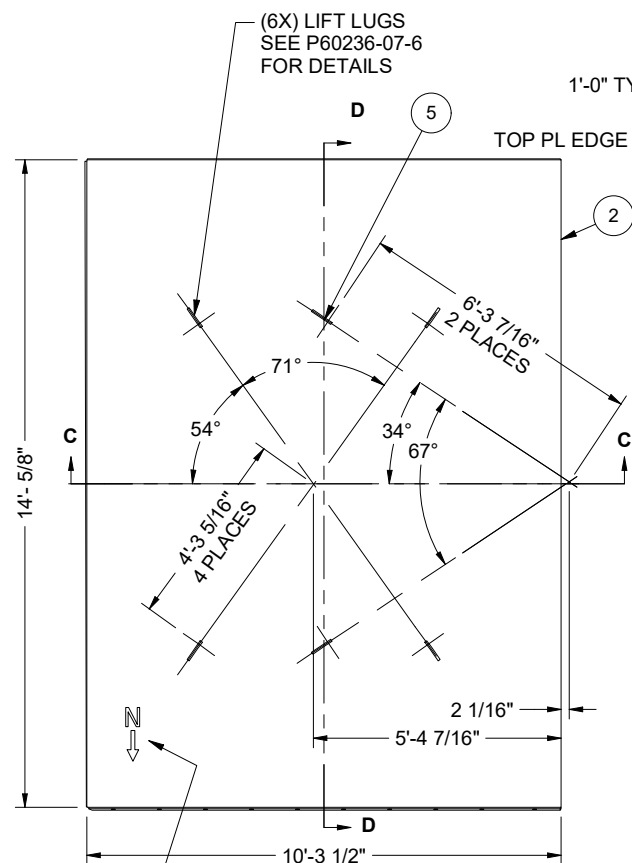
BILL OF MATERIALS		
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2	3/16" PL	ASTM A-240 316
3	10"x5/16" FB	ASTM A-240 316
4	3"x1/2" FB	ASTM A-240 316
5	5/8" PL	ASTM A-240 316
6	4"x3/8" FB	ASTM A-240 316

BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
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8	3/16" PL	ASTM A-240 316
9	10"x5/16" FB	ASTM A-240 316
10	3"x1/2" FB	ASTM A-240 316
11	1 1/4"x1/4" FB	ASTM A-240 316
12	5/8" PL	ASTM A-240 316
13	4"x3/8" FB	ASTM A-240 316

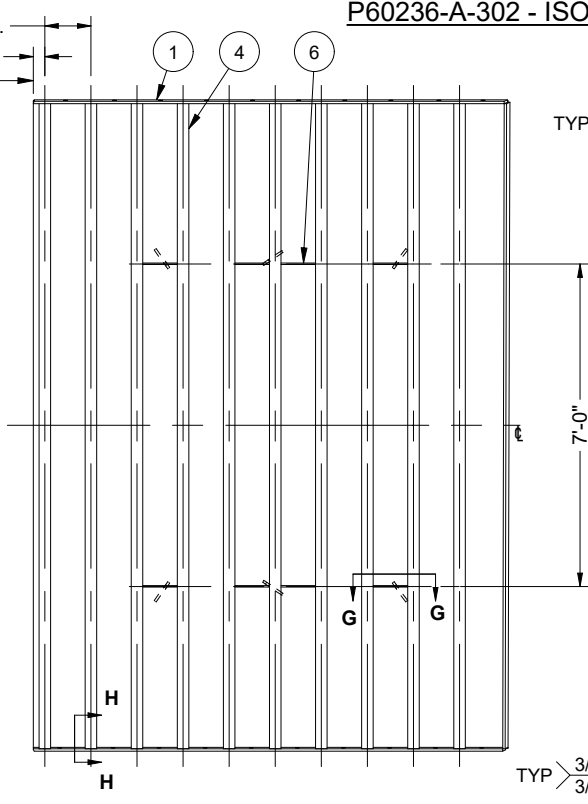


P60236-A-302 - ISO VIEW

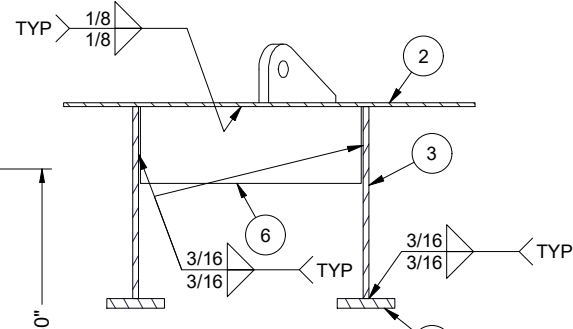
P60236-A-303 - ISO VIEW



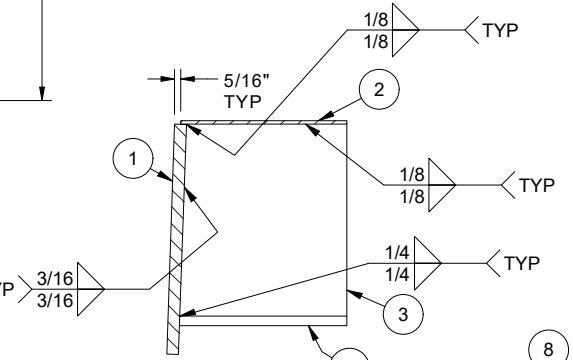
P60236-A-302 - TOP VIEW
TOP PLATE DIMENSIONS



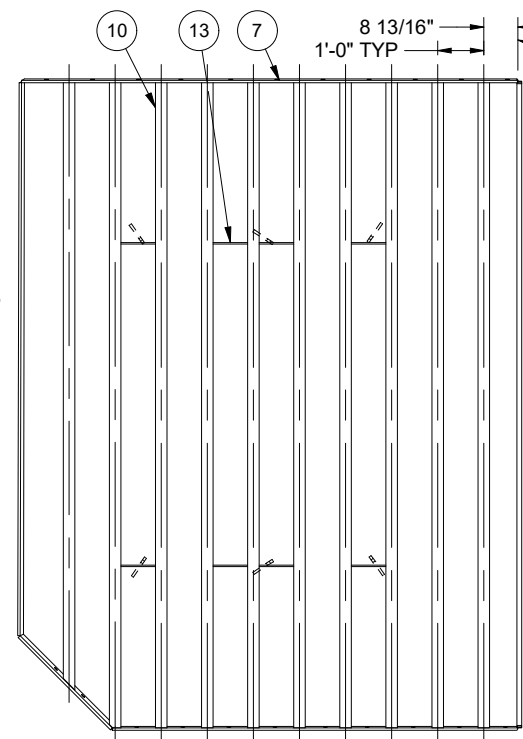
P60236-A-302 - BOTTOM VIEW
STIFFENER LAYOUT



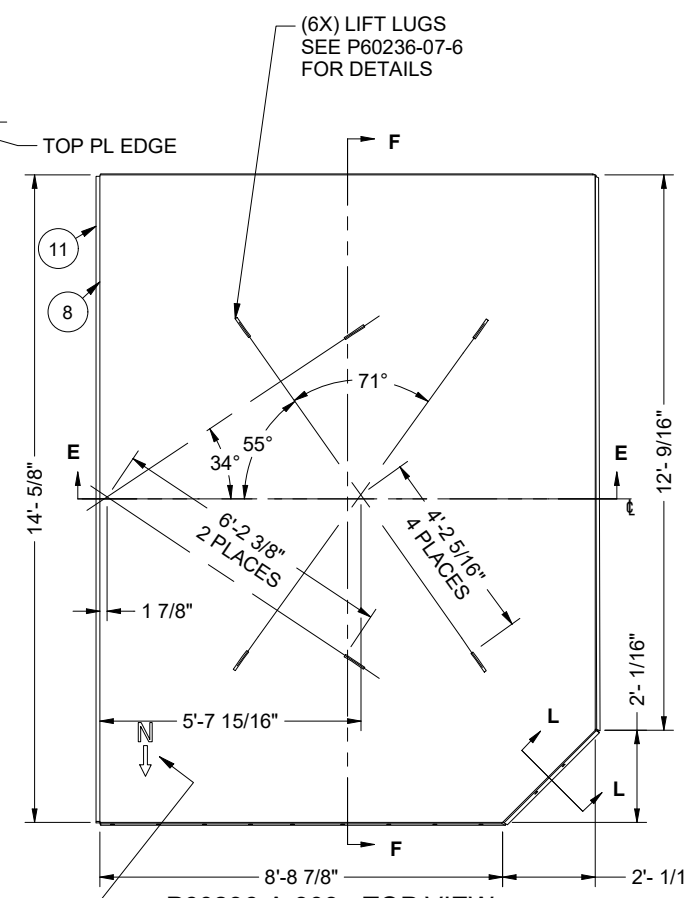
SECTION G
SIMILAR FOR P60236-A-303



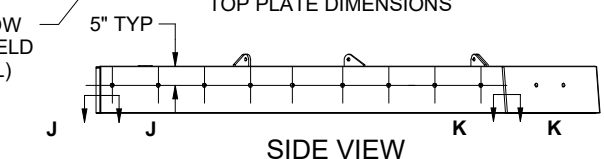
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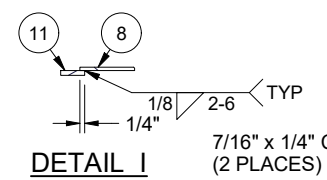
P60236-A-303 - BOTTOM VIEW
STIFFENER LAYOUT



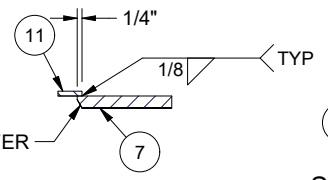
P60236-A-303 - TOP VIEW
TOP PLATE DIMENSIONS



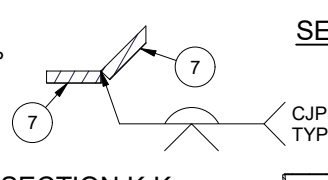
SIDE VIEW



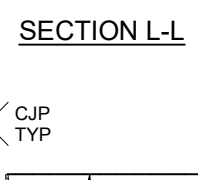
DETAIL I



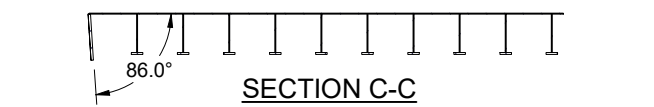
SECTION J-J



SECTION K-K



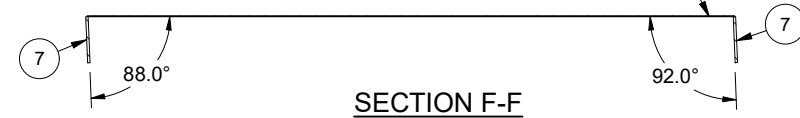
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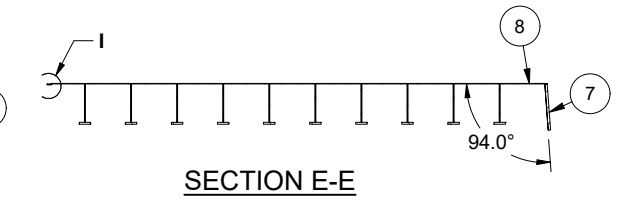
SECTION C-C



SECTION D-D



SECTION F-F



SECTION E-E

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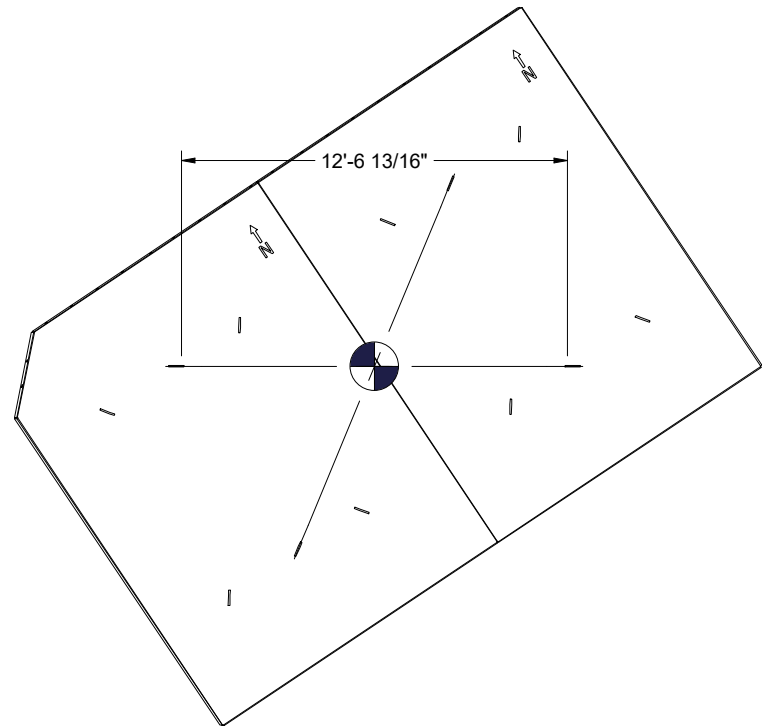
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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI Y14.75 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



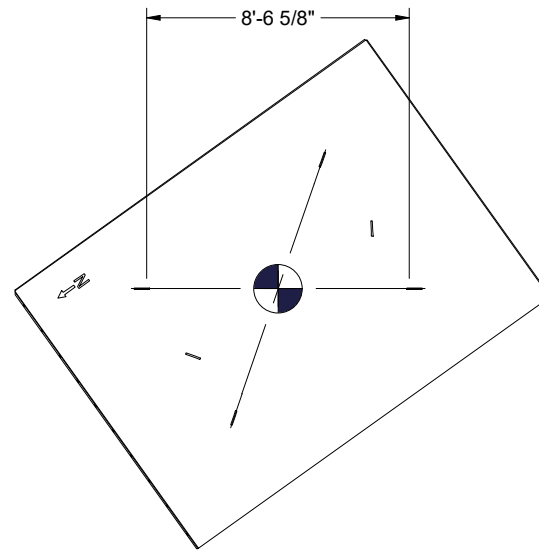
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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]



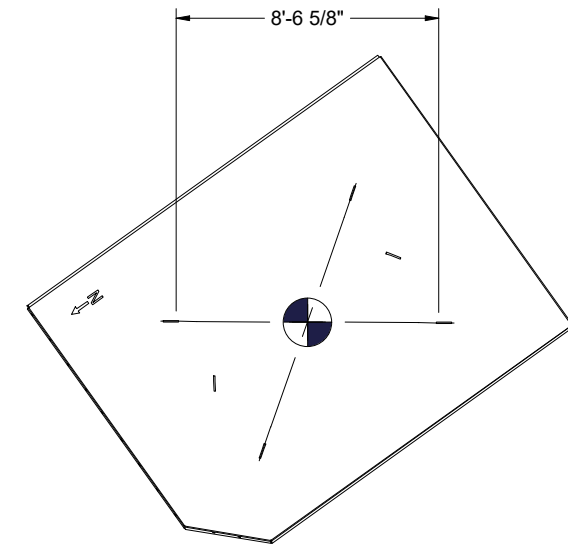
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 5 OPENING
 TOP COVER SECTIONS
 LOCATION: 59° 33' 20.5"N 108° 28' 36.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 5
 DWG. NO.: P60236-03-4



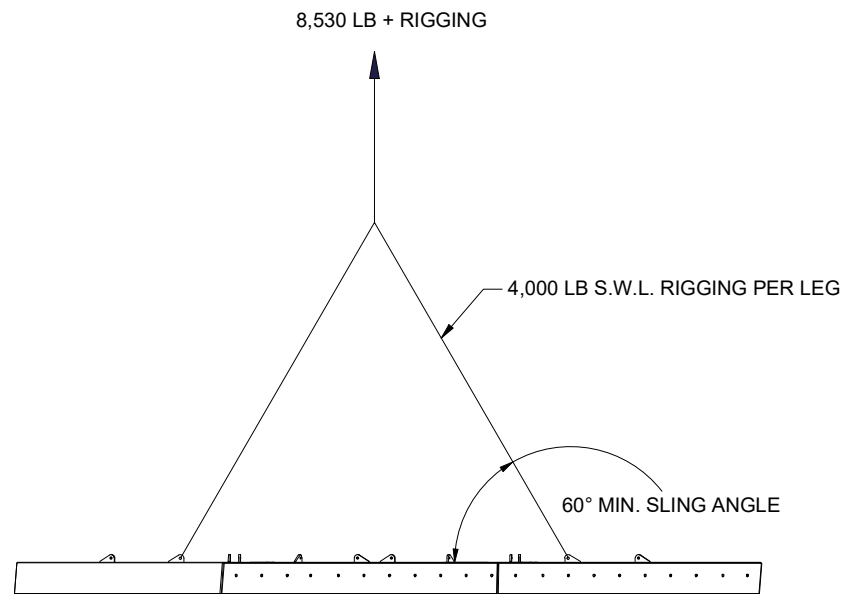
TOP COVER LIFTING DIAGRAM
P60236-A-301



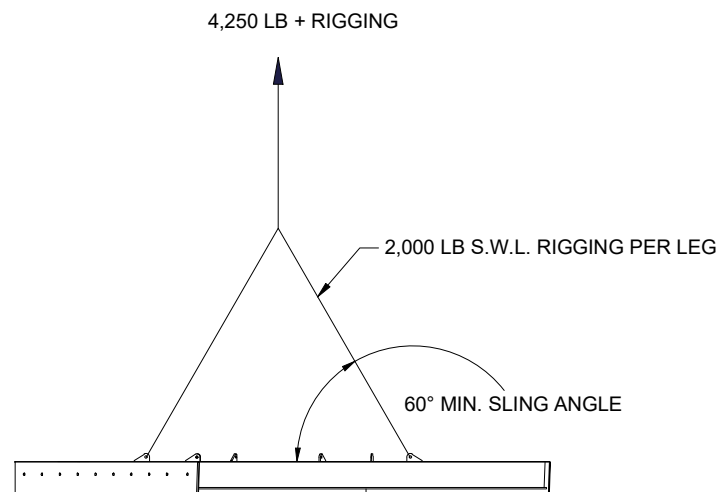
TOP COVER LIFTING DIAGRAM
P60236-A-302



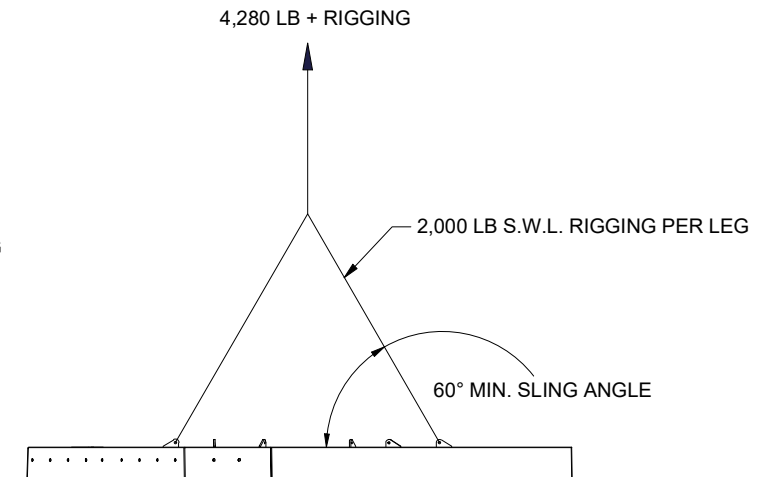
TOP COVER LIFTING DIAGRAM
P60236-A-303



TOP COVER LIFTING DIAGRAM - SIDE VIEW
P60236-A-301



TOP COVER LIFTING DIAGRAM - SIDE VIEW
P60236-A-302



TOP COVER LIFTING DIAGRAM - SIDE VIEW
P60236-A-303

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



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 Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 5 OPENING
 LIFTING DETAILS
 LOCATION: 59° 33' 20.5"N 108° 28' 36.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 5 DWG. NO.: P60236-03-5

**FAY 11 – 24094 Ventilation Raise
(Main Beaverlodge Ventilation Shaft)**



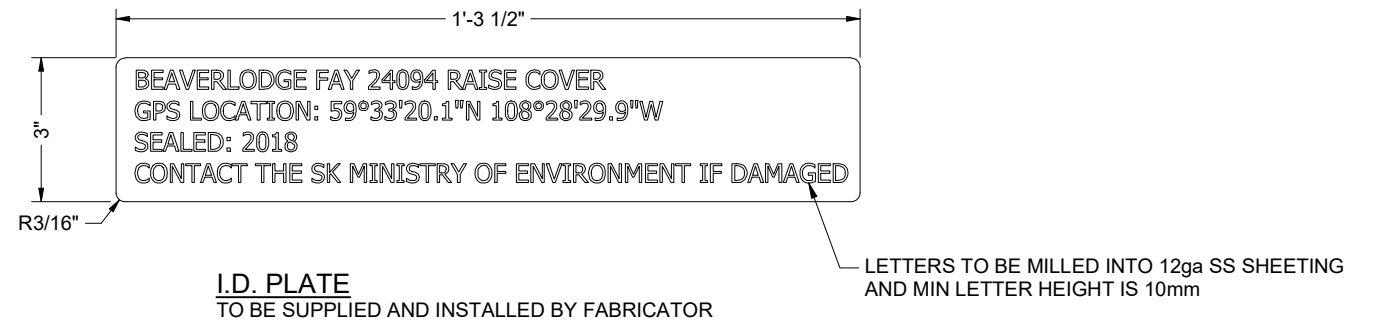
FAY 11 – 24094 Raise

GENERAL NOTES:

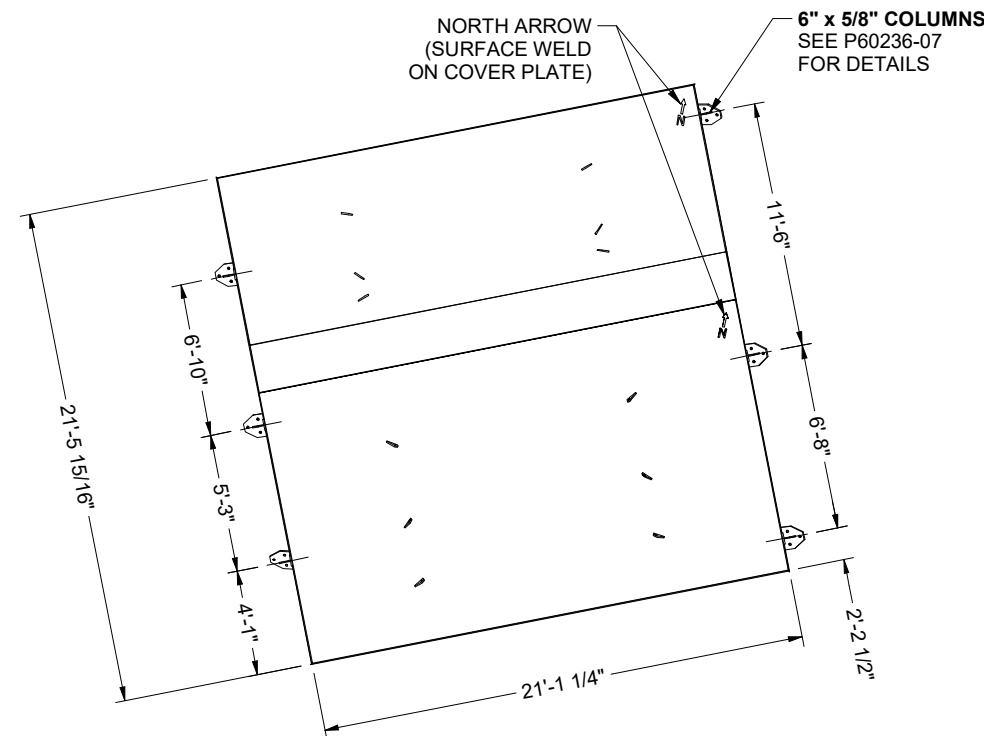
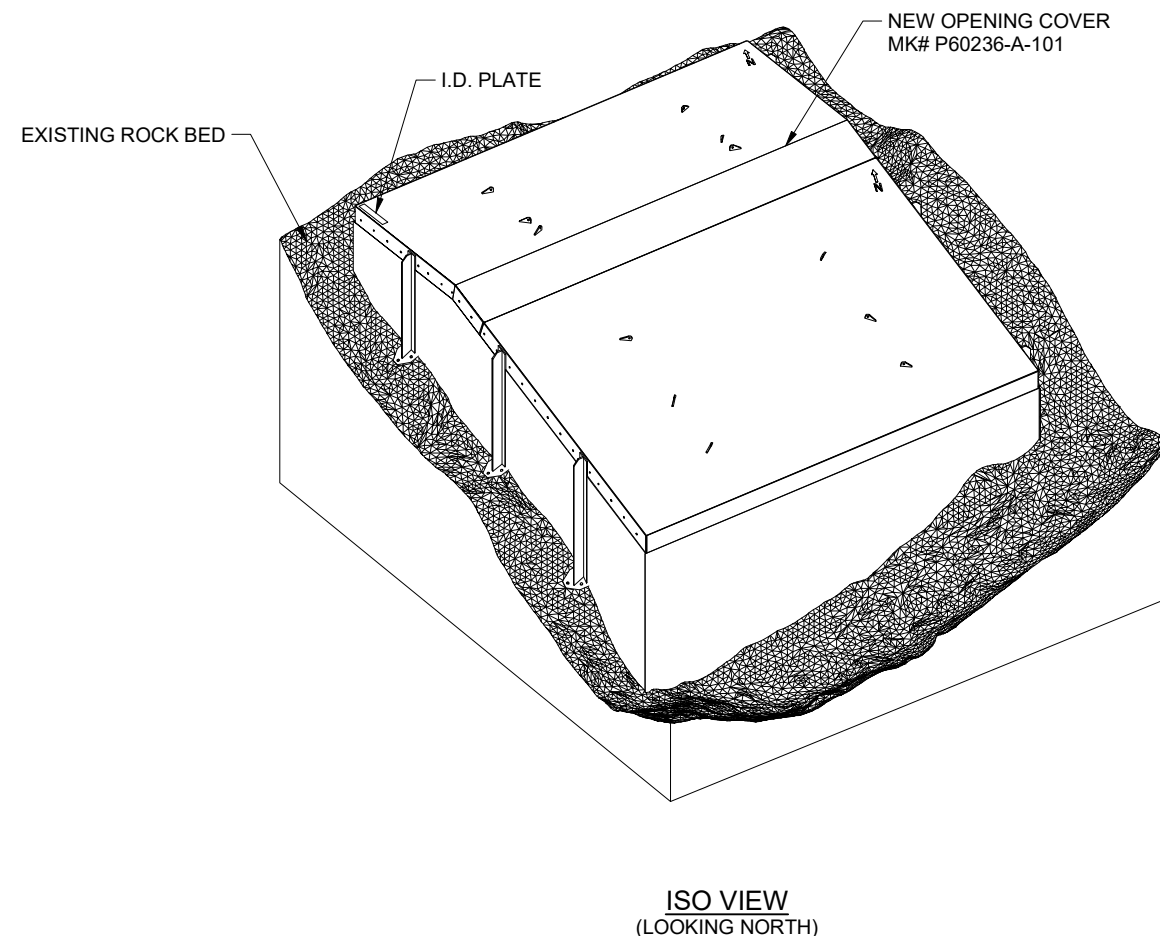
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
15. SEE DRAWING P60236-07 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 19,010 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS
 TOP COVER W/O RIGGING: 15,510 Lbs
 AS INSTALLED: 19,010 Lbs



PLAN VIEW - FAY 11 OPENING COVER

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC

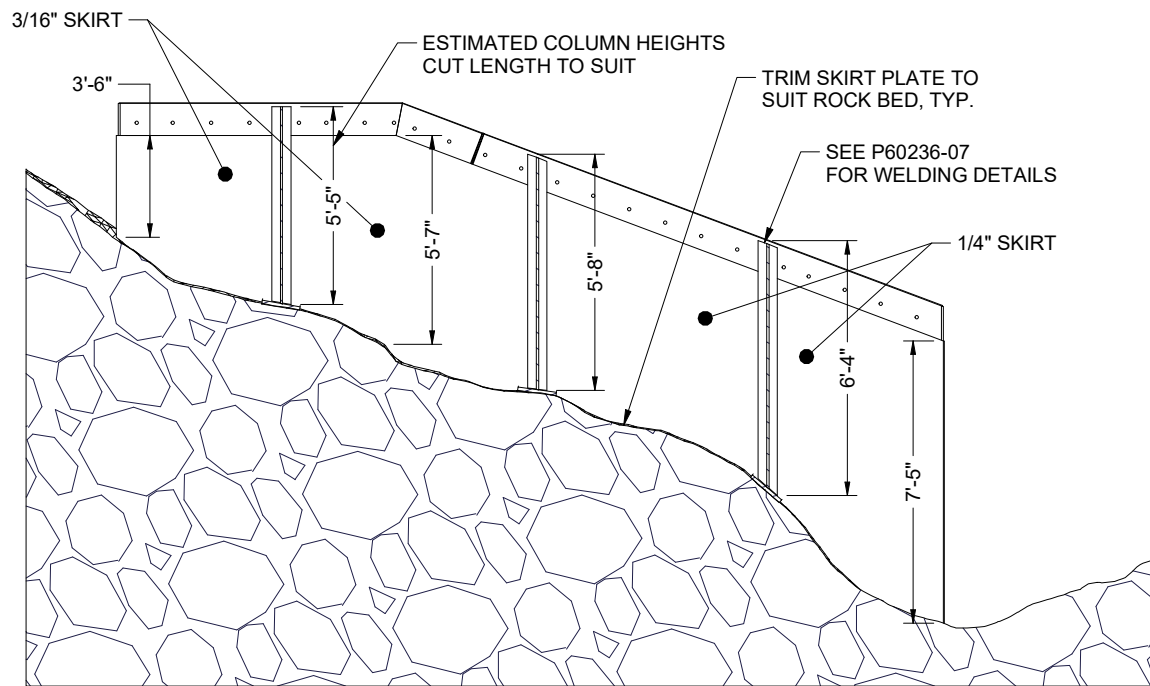


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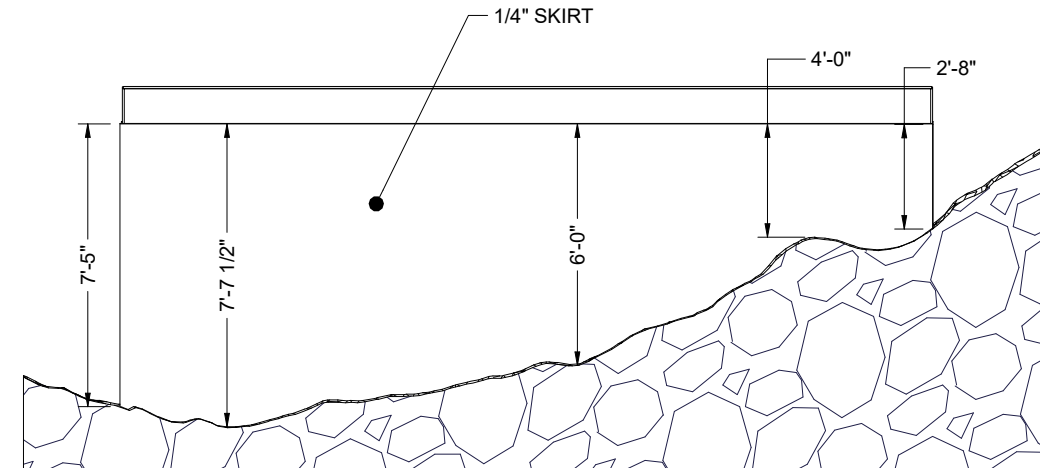


PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 7
 DWG. NO.: P60236-01-1

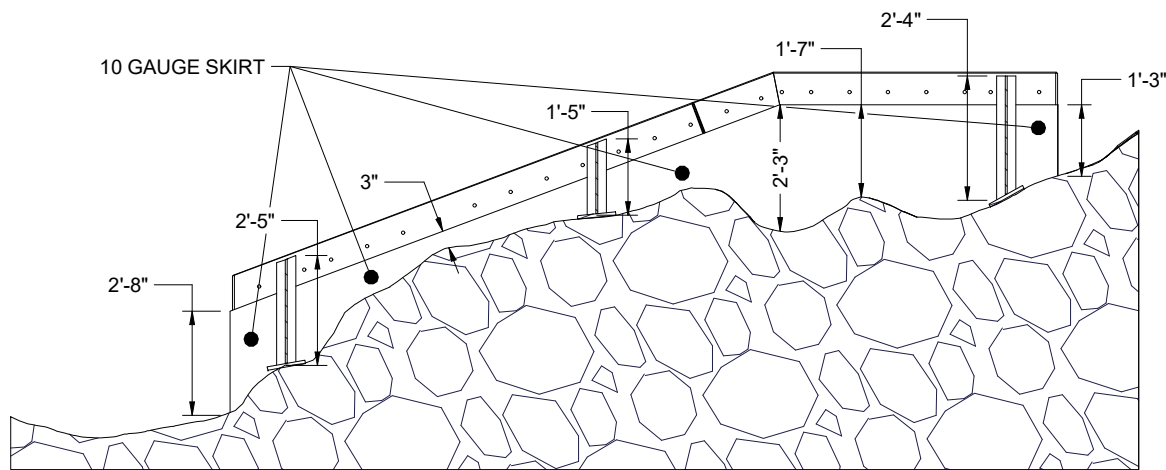
ESTIMATED TOTAL COLUMN LENGTH 313" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



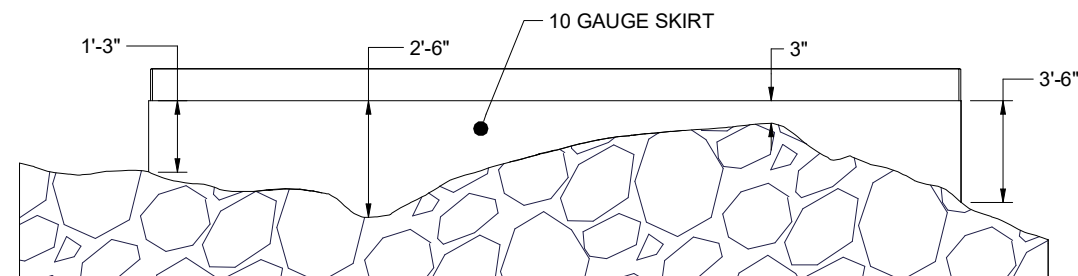
ELEVATION VIEW - LOOKING NORTH-EAST



ELEVATION VIEW - LOOKING NORTH-WEST



ELEVATION VIEW - LOOKING SOUTH-WEST



ELEVATION VIEW - LOOKING SOUTH-EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC

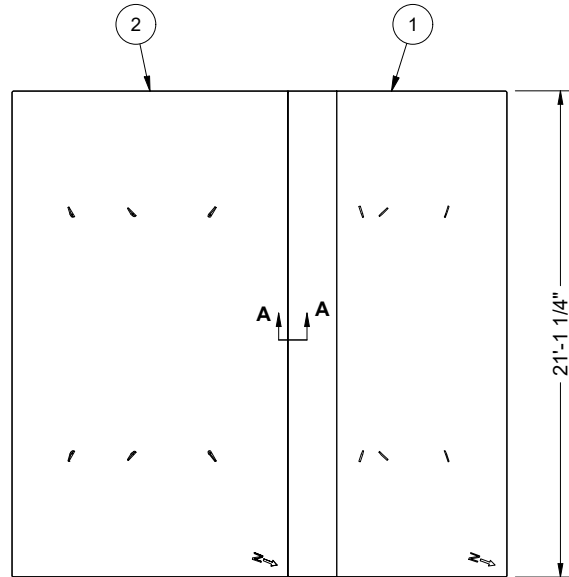


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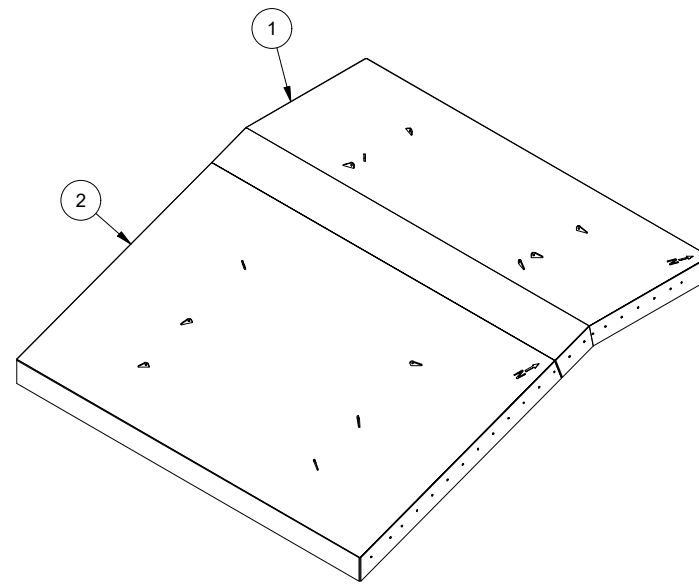


PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 7
 DWG. NO.: P60236-01-2
 1

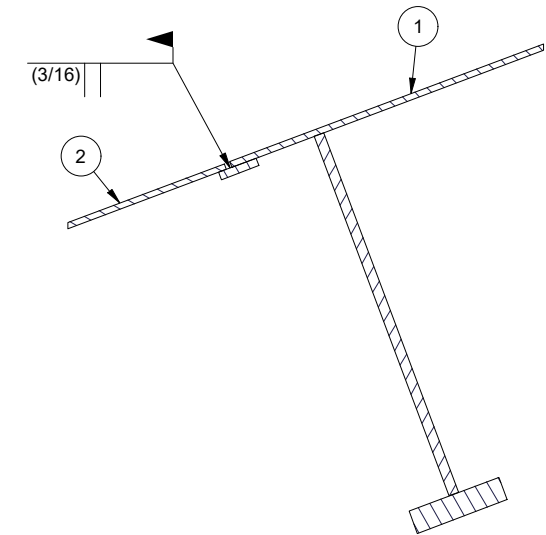
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
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2	COVER SECTION 2	MK# P60236-A-103		



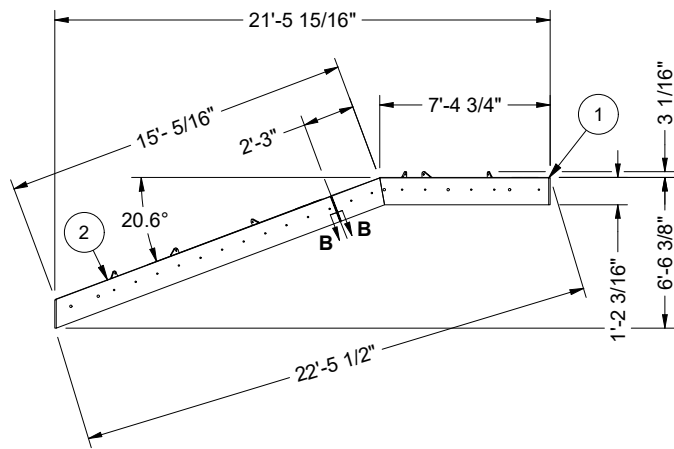
MK# P60236-A-101 - PLAN VIEW



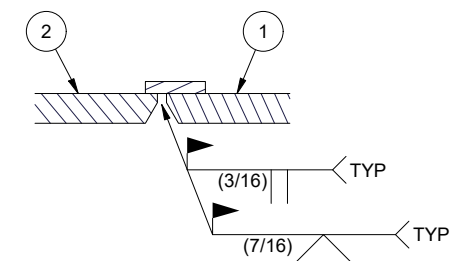
MK# P60236-A-101 - ISO VIEW



SECTION A-A



MK# P60236-A-101 - ELEVATION VIEW

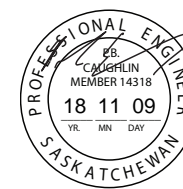


SECTION B-B

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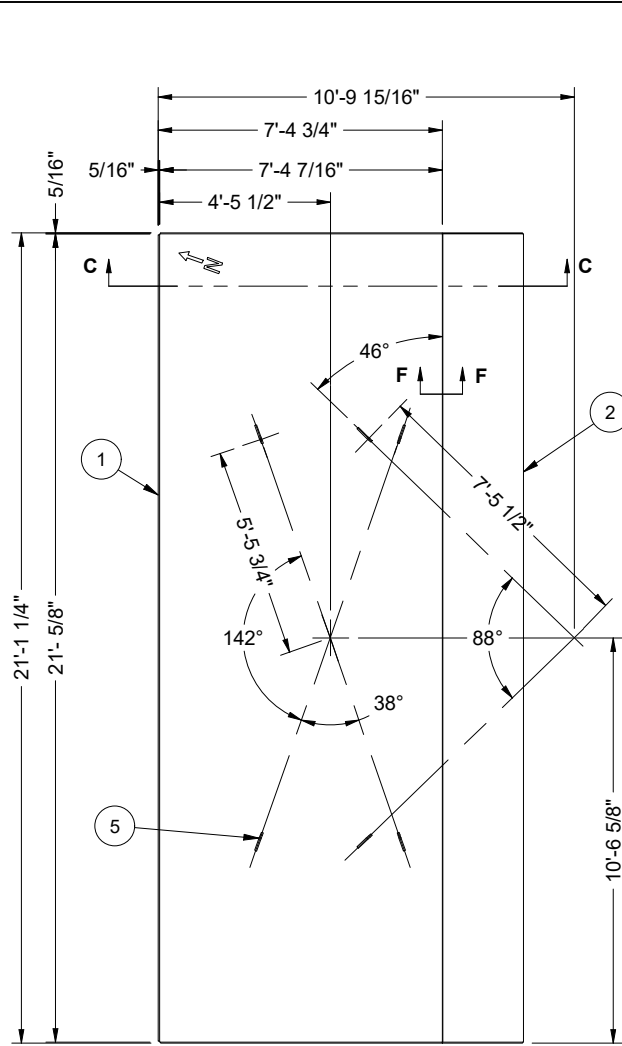
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



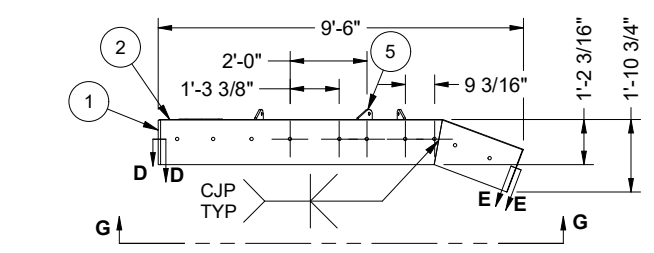
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by: _____
 Discipline: Structural Sk. Reg. No. 14318 Signature: _____



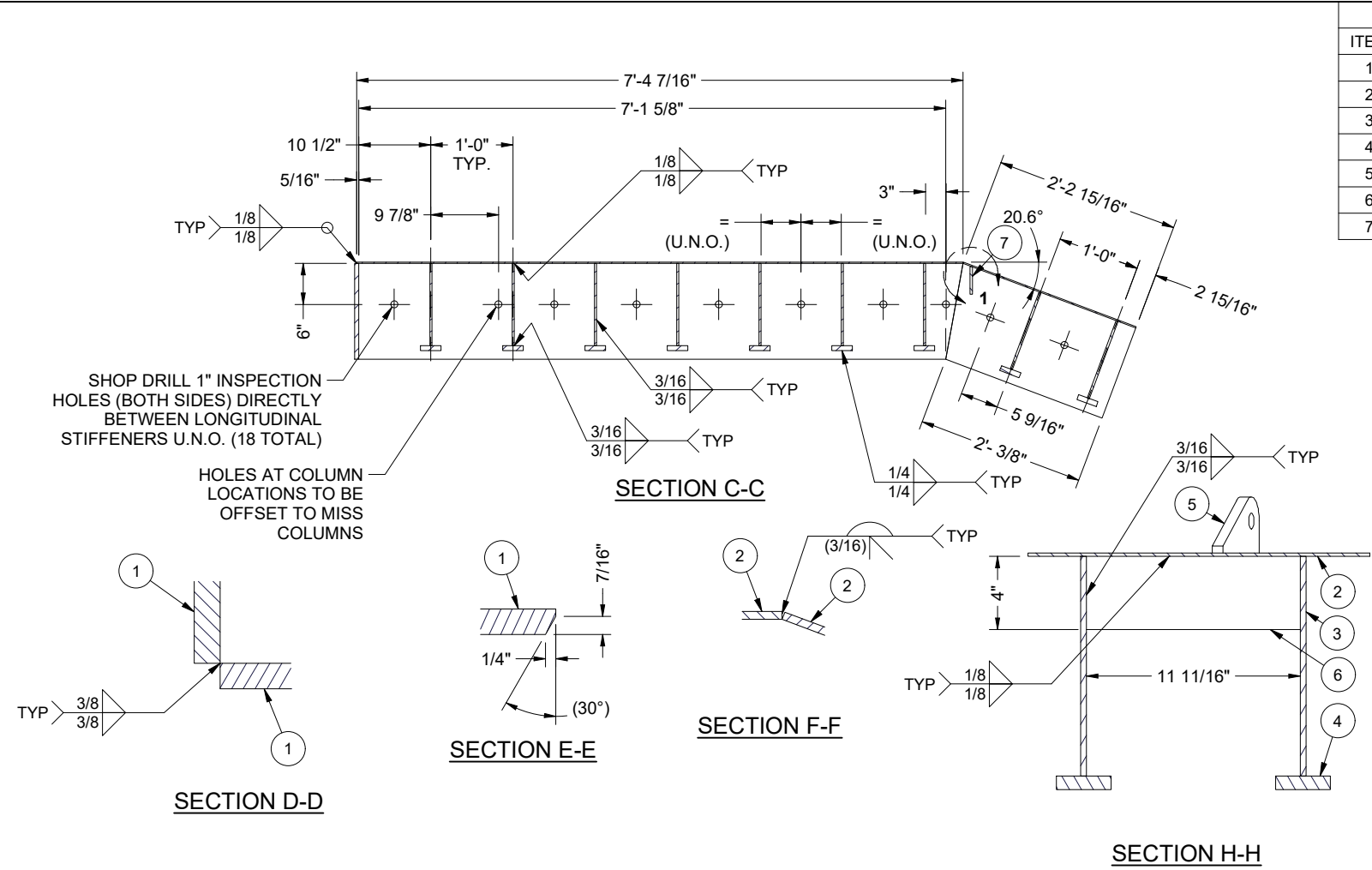
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 7
 DWG. NO.: P60236-01-3
 1



MK# P60236-A-102 - PLAN VIEW



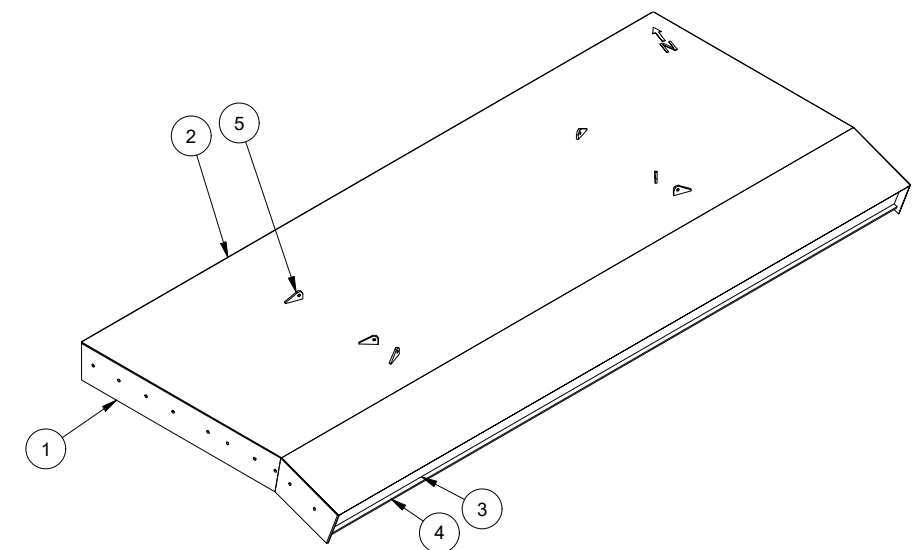
MK# P60236-A-102 - ELEVATION VIEW



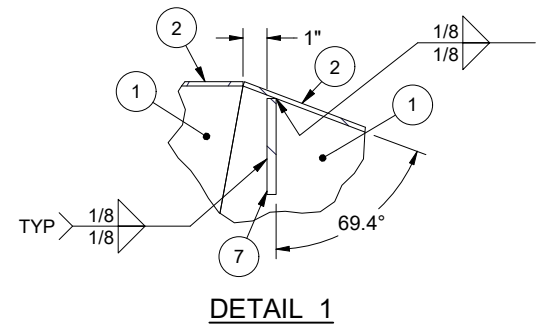
SHOP DRILL 1" INSPECTION HOLES (BOTH SIDES) DIRECTLY BETWEEN LONGITUDINAL STIFFENERS U.N.O. (18 TOTAL)

HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS

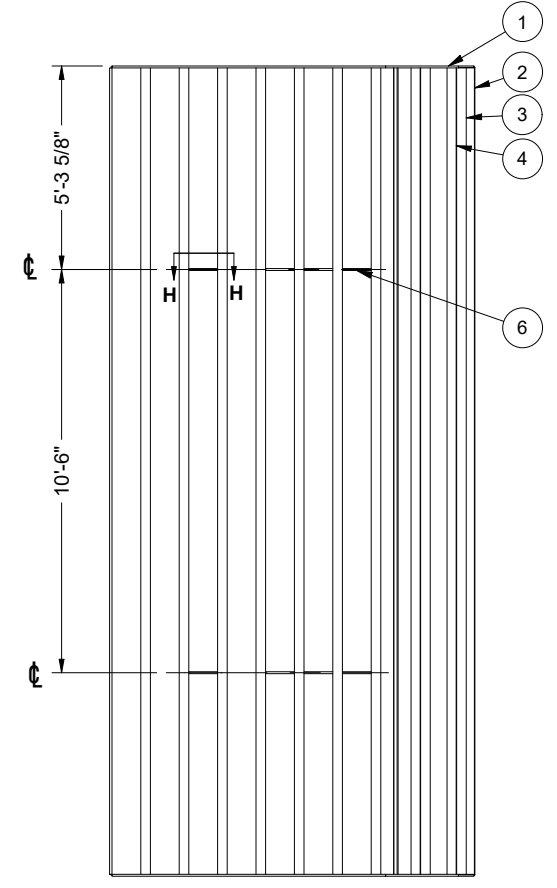
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	14" x 5/8" PL		ASTM A240-316L	
2	3/16" PL		ASTM A240-316L	
3	12" x 5/16" PL		ASTM A240-316L	
4	3" x 3/4" PL		ASTM A240-316L	
5	5/8" PL		ASTM A240-316L	
6	4" x 1/2" PL		ASTM A240-316L	
7	4" x 3/8" PL		ASTM A240-316L	



ISO VIEW



DETAIL 1



VIEW G-G

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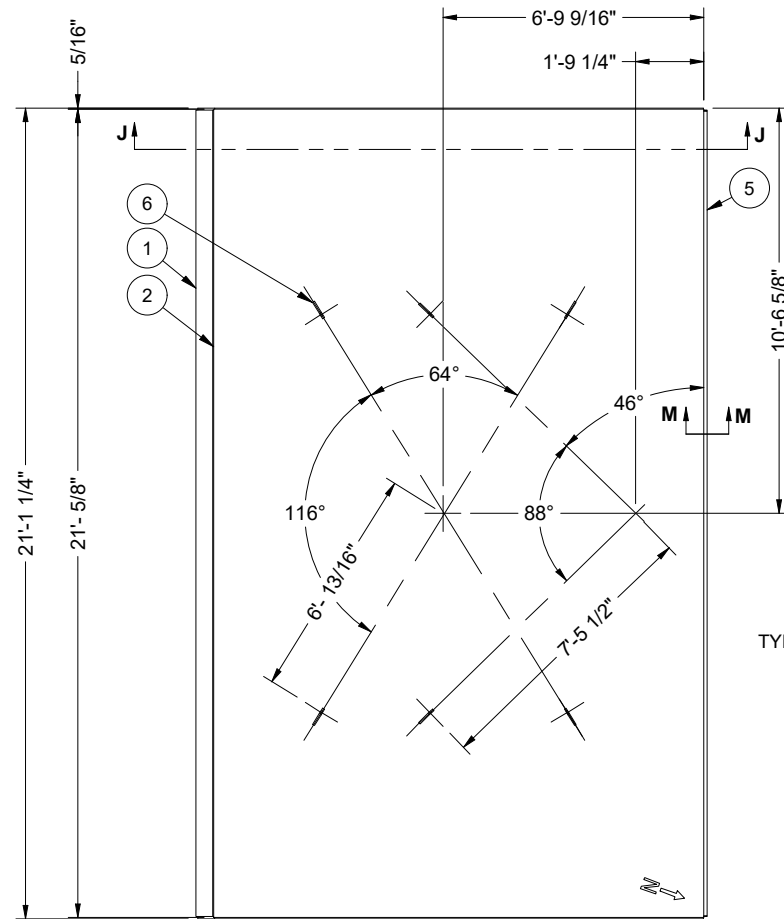
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



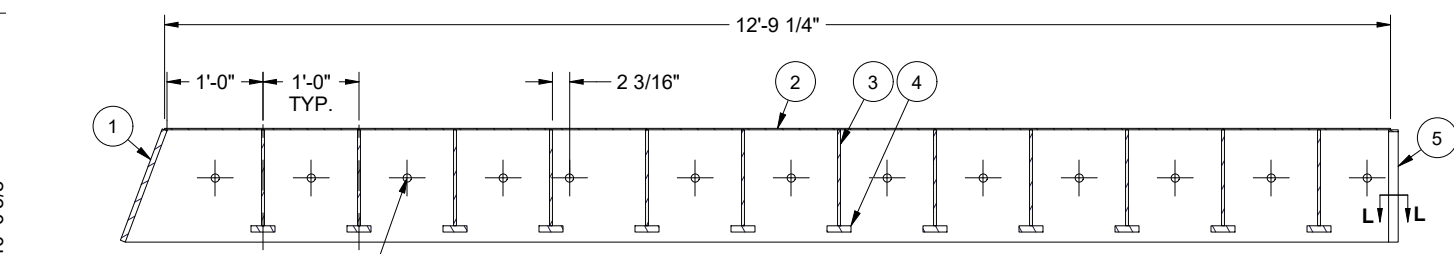
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]



PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
 TOP COVER SECTION DETAILS
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7
 DWG. NO.: P60236-01-4

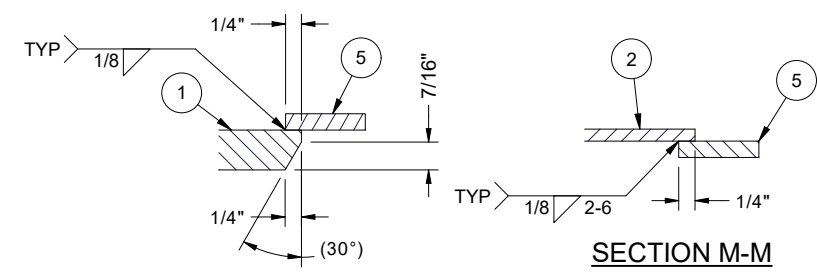


MK# P60236-A-103 - PLAN VIEW



SECTION J-J

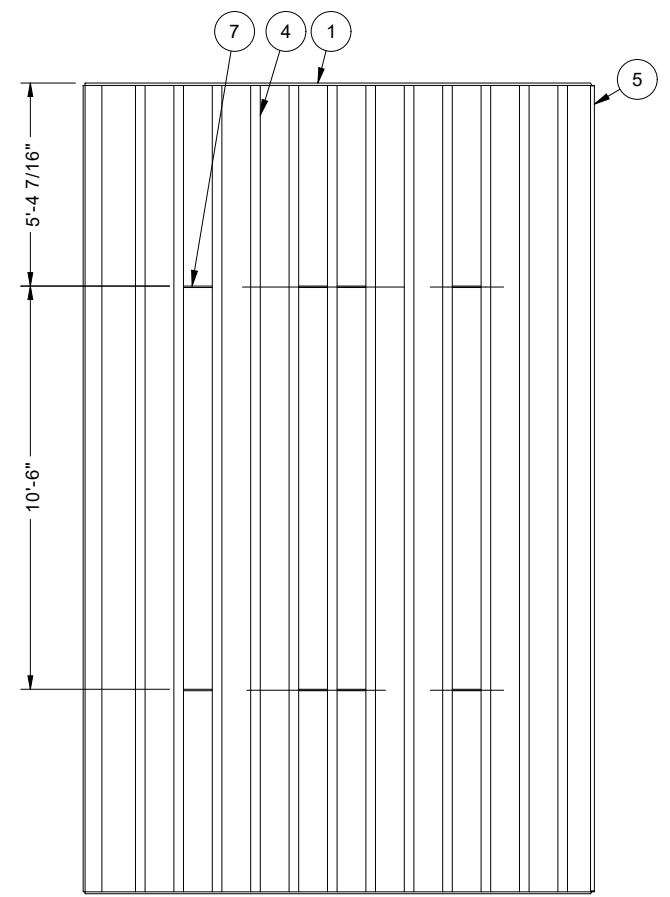
SHOP DRILL 1\"/>



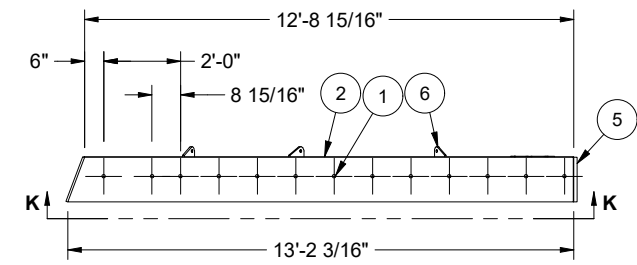
SECTION M-M

SECTION L-L

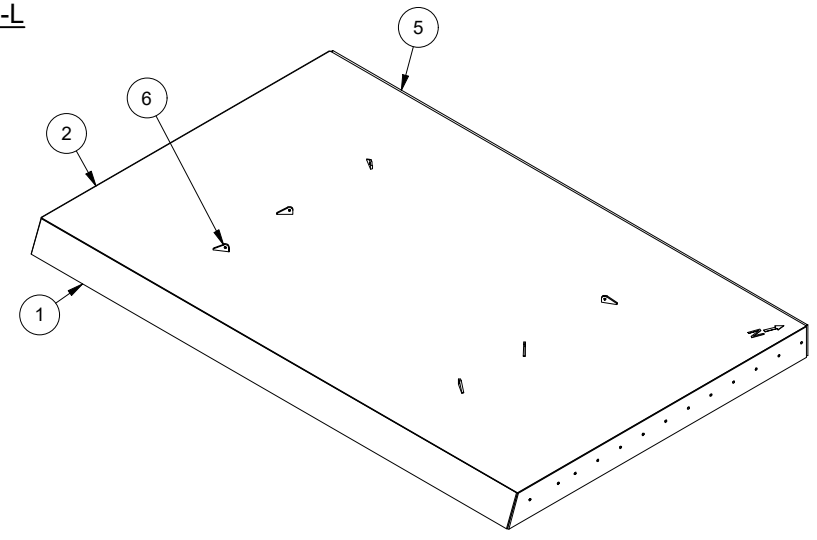
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	14" x 5/8" PL		ASTM A240-316L	
2	3/16" PL		ASTM A240-316L	
3	12" x 5/16" PL		ASTM A240-316L	
4	3" x 3/4" PL		ASTM A240-316L	
5	1 1/4" x 1/4" PL		ASTM A240-316L	
6	5/8" PL		ASTM A240-316L	
7	4" x 1/2" PL		ASTM A240-316L	



VIEW K-K



MK# P60236-A-103 - ELEVATION VIEW



ISO VIEW

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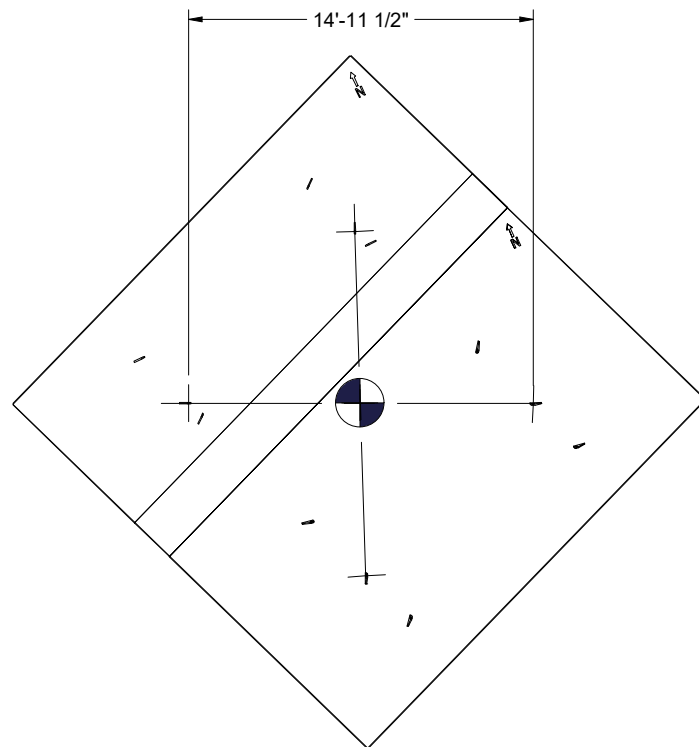
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



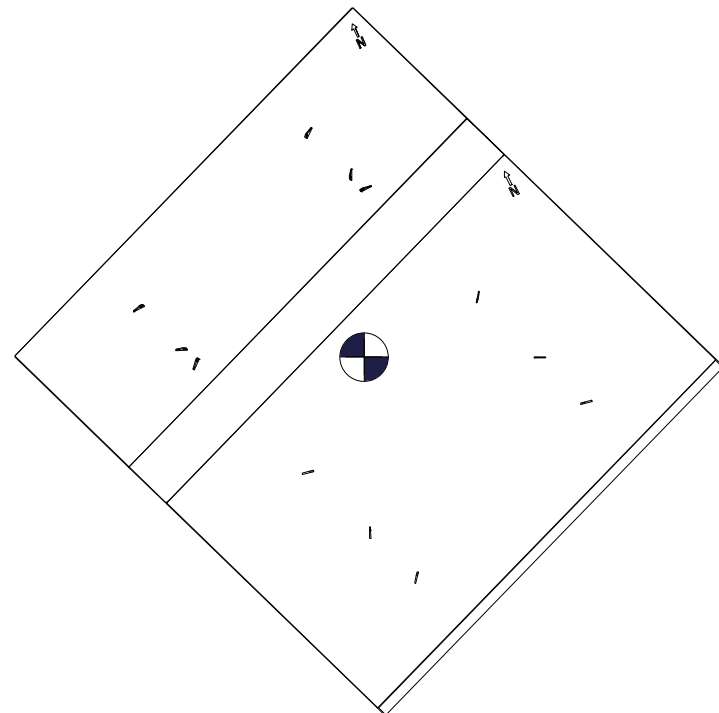
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]



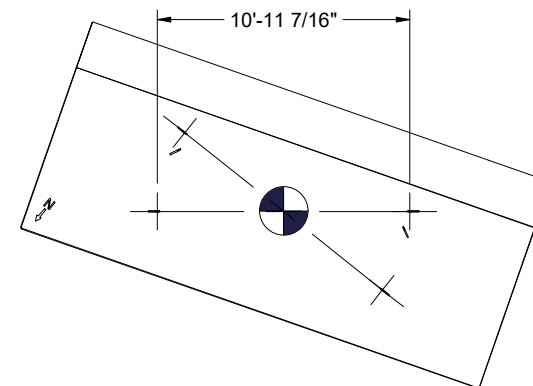
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
 TOP COVER SECTION DETAILS
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 7
 DWG. NO.: P60236-01-5



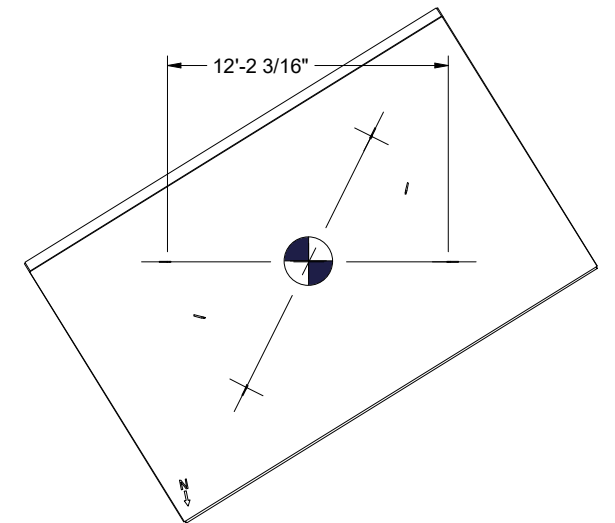
TOP COVER LIFTING DIAGRAM
(MK# P60236-A-102 HORIZONTAL)
(MK# P60236-A-101)



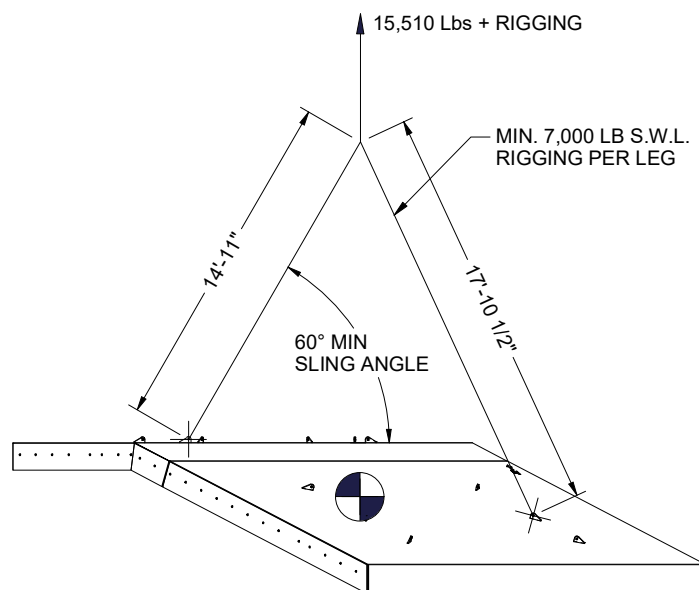
TOP COVER LIFTING DIAGRAM
(MK# P60236-A-103 HORIZONTAL)
(MK# P60236-A-101)



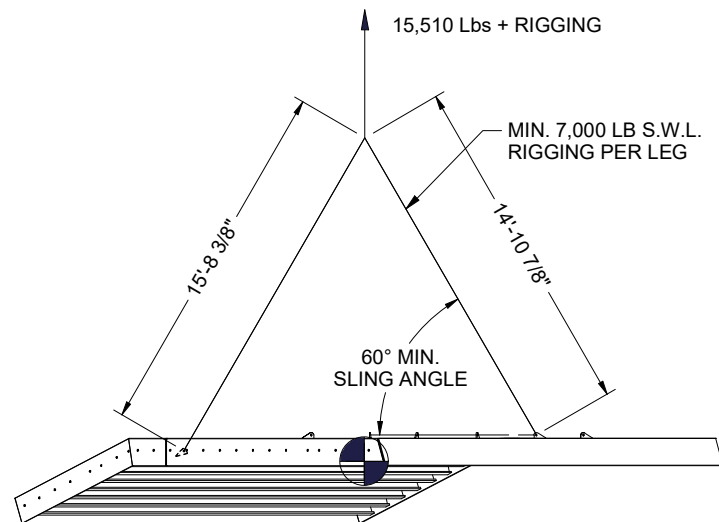
COVER SECTION 1 LIFTING DRAWING
(MK# P60236-A-102)



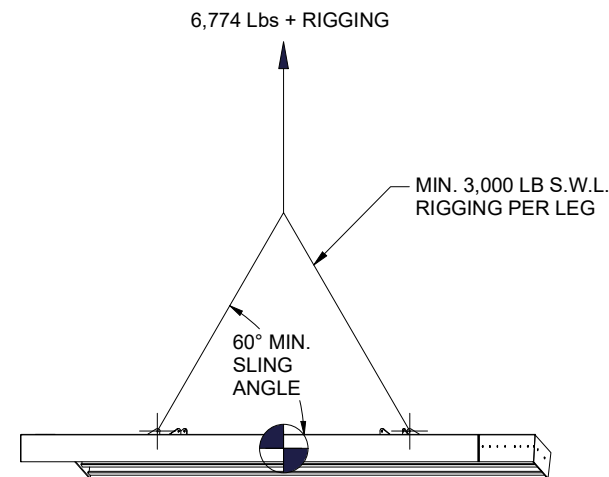
COVER SECTION 2 LIFTING DRAWING
(MK# P60236-A-103)



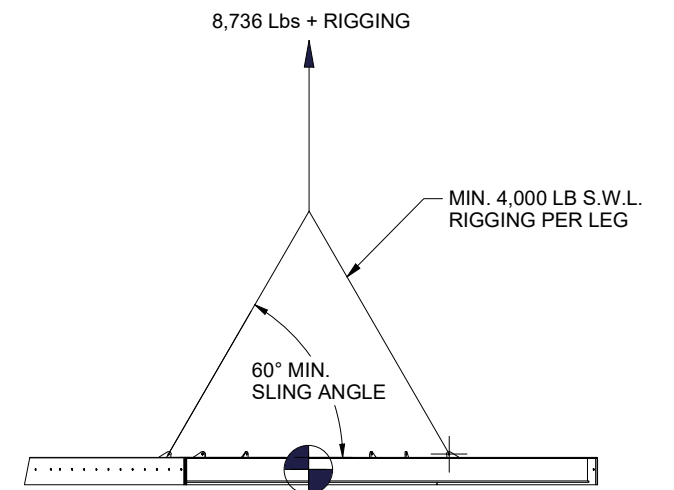
TOP COVER LIFTING DRAWING - SIDE VIEW
(MK# P60236-A-101)



TOP COVER LIFTING DRAWING - SIDE VIEW
(MK# P60236-A-101)



COVER SECTION 1 LIFTING DRAWING - SIDE VIEW
(MK# P60236-A-102)



COVER SECTION 2 LIFTING DRAWING - SIDE VIEW
(MK# P60236-A-103)

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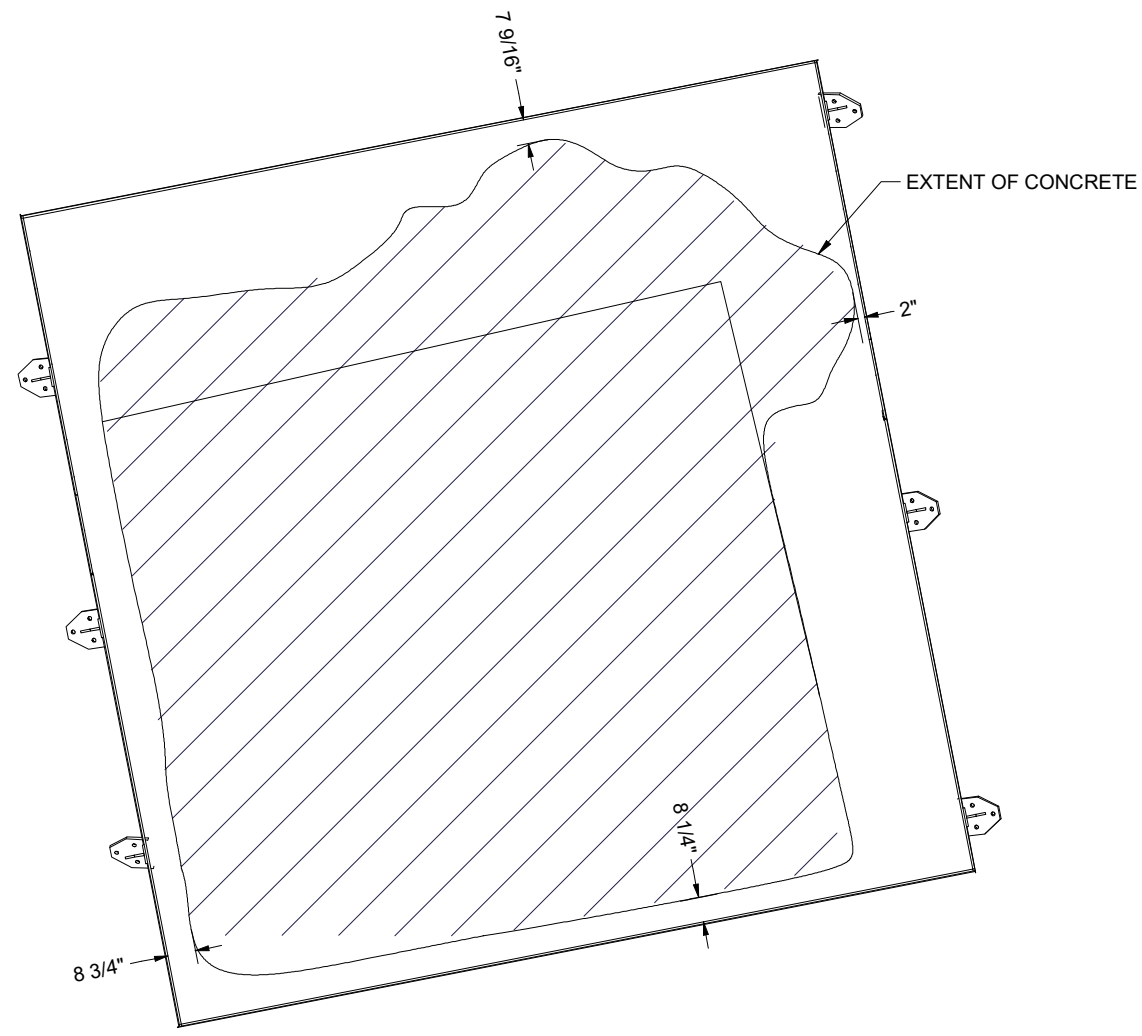
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



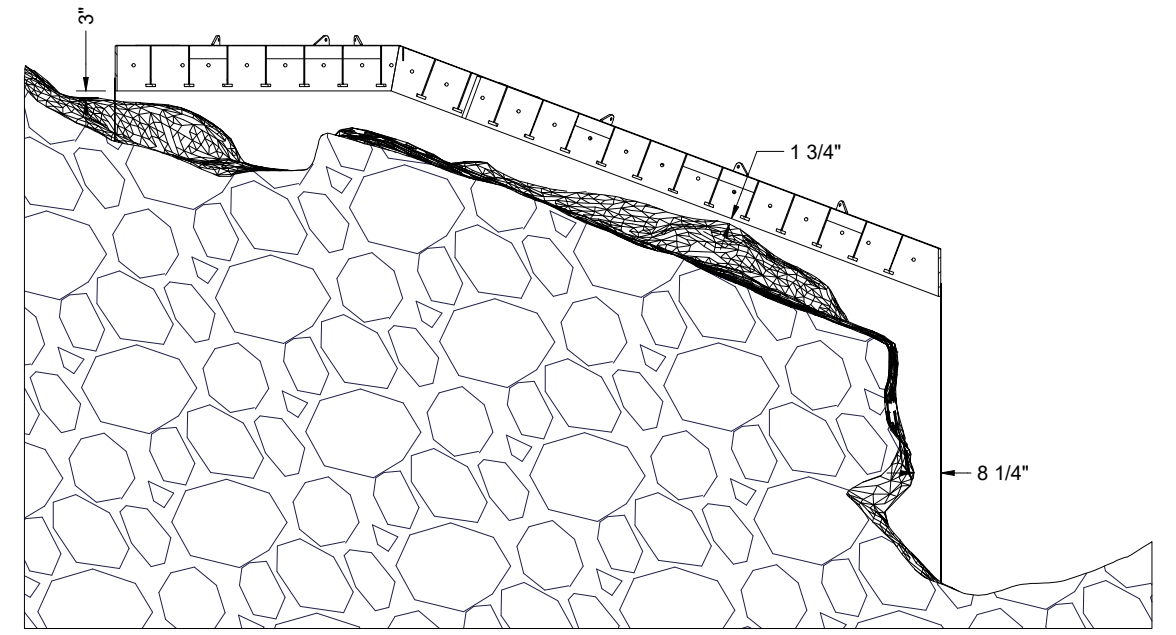
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline Sk. Reg. No. Signature
Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING
LIFTING DETAILS
LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ
DO NOT SCALE DRAWINGS
SHEET NO.: 6 OF 7
DWG. NO.: P60236-01-6



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / _R MACHINED SURFACES: ¹²⁵ / _R ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



Association of Professional Engineers & Geoscientists of Saskatchewan
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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering
Saskatchewan Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY 11 OPENING CLEARANCES
 LOCATION: 59° 33' 20.1" N, 108° 28' 29.9" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 7 OF 7 DWG. NO.: P60236-01-7

HAB 9 – Hab Shaft



HAB 9 – Hab Shaft

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD. COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 22,060 LB
5. DO NOT BACK FILL WALLS OF COVER.

1'-3 1/2"

3"

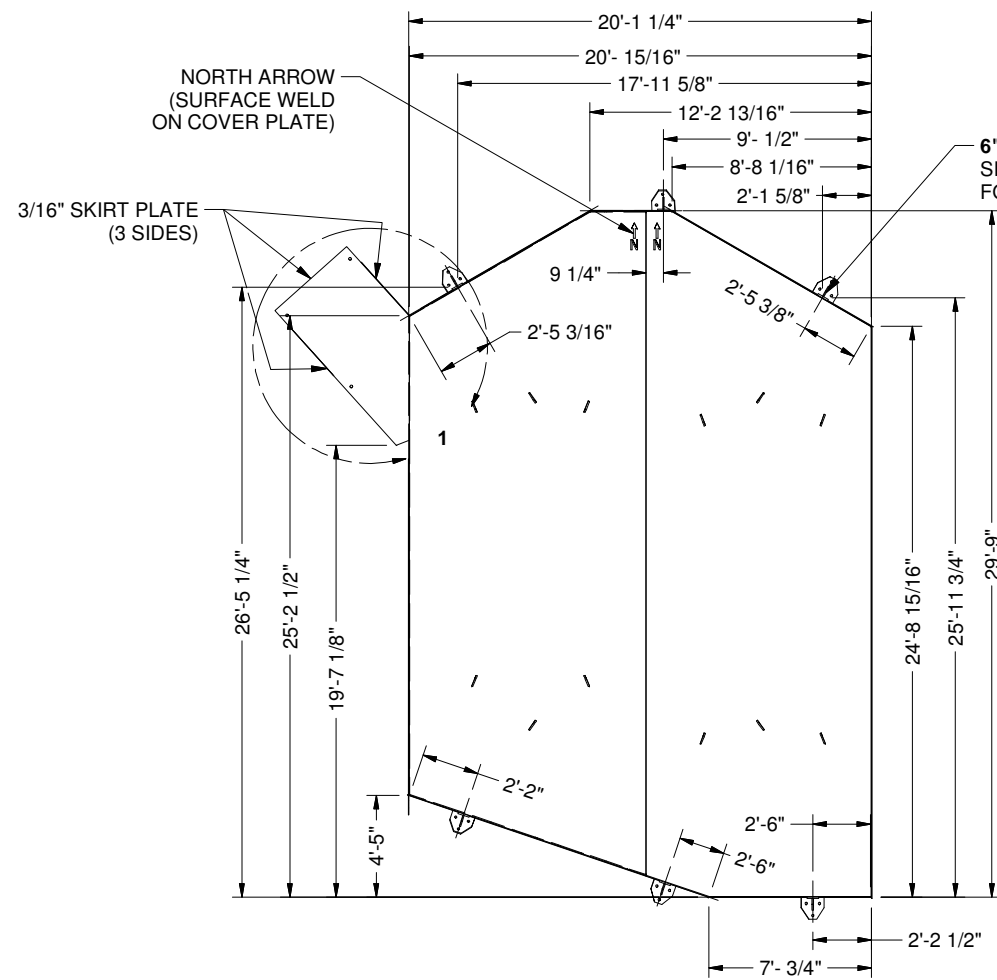
R3/16"

BEAVERLODGE HAB 9 SHAFT COVER
 GPS LOCATION: 59°37'18.8"N 108°25'9.0"W
 SEALED: 2018
 CONTACT THE SK MINISTRY OF ENVIRONMENT IF DAMAGED

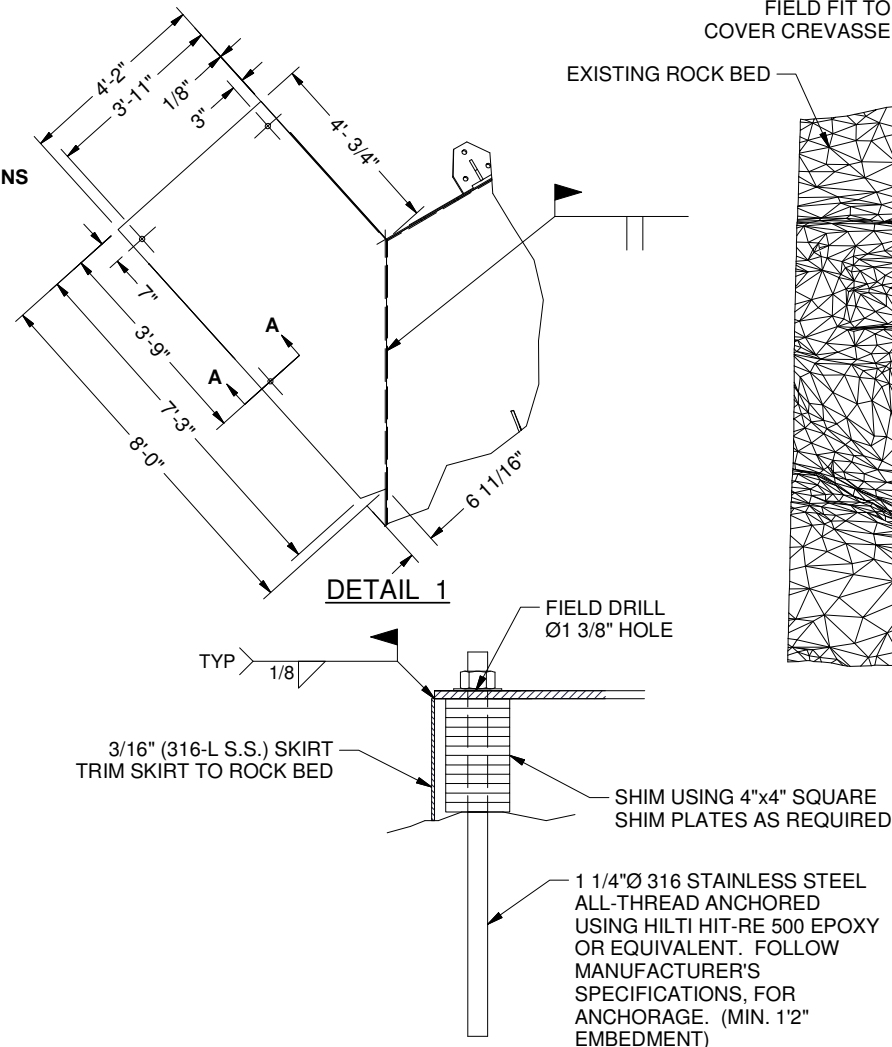
I.D. PLATE
 TO BE SUPPLIED AND INSTALLED BY FABRICATOR

ESTIMATED WEIGHTS
 TOP COVER W/O RIGGING: 18,470 Lbs
 AS INSTALLED: 22,060 Lbs

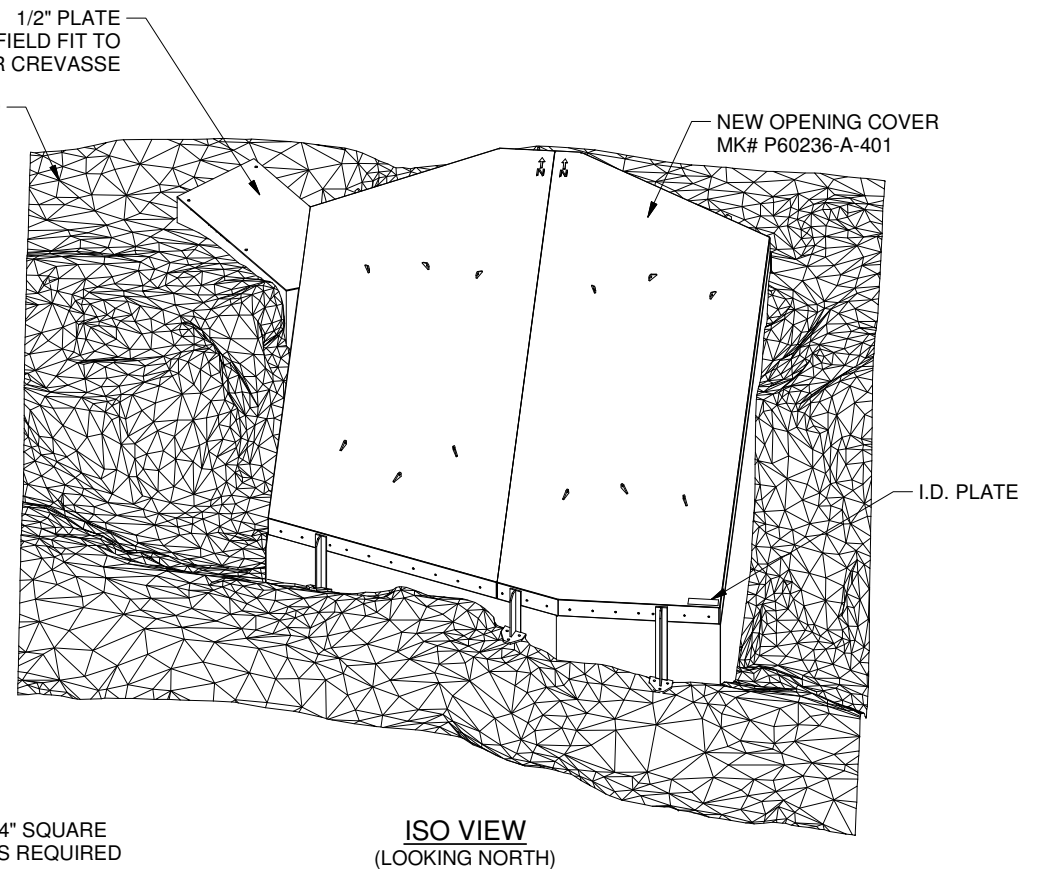
LETTERS TO BE MILLED INTO
 12ga SS SHEETING AND MIN.
 LETTER HEIGHT IS 10mm



PLAN VIEW - HAB 9 OPENING COVER



SECTION A-A



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



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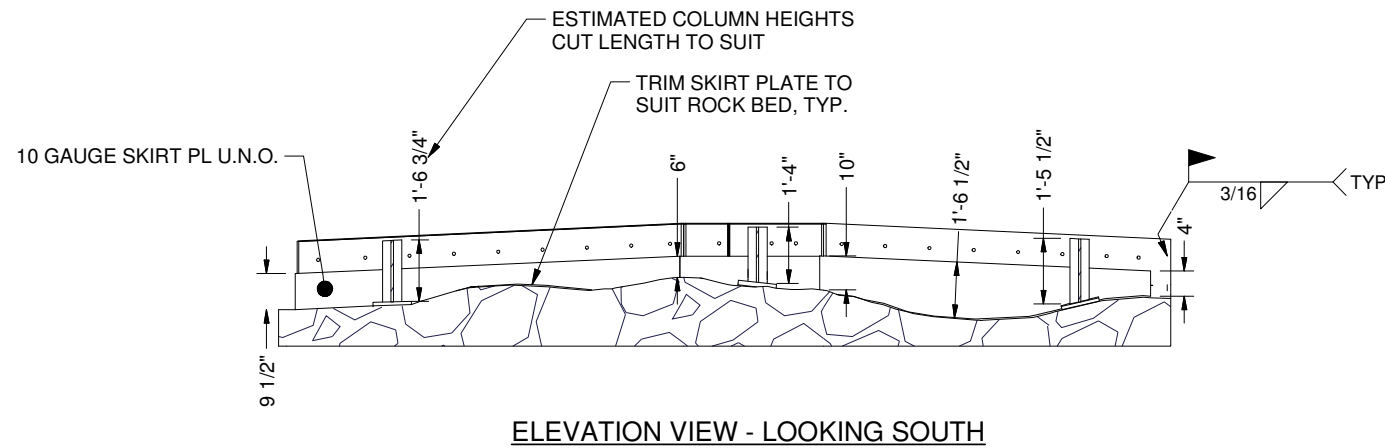


PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

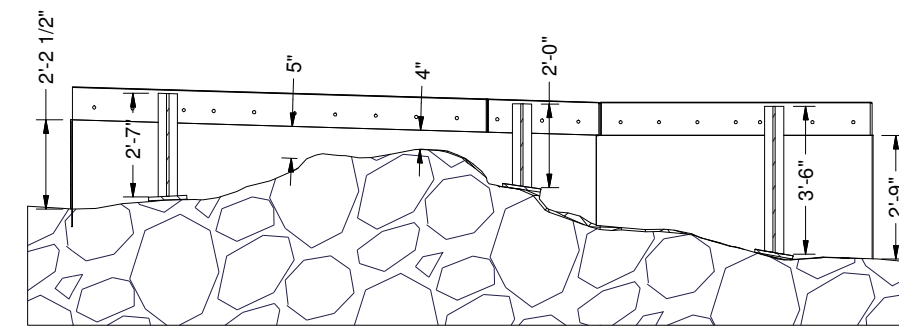
DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 7

DWG. NO.: **P60236-04-1**

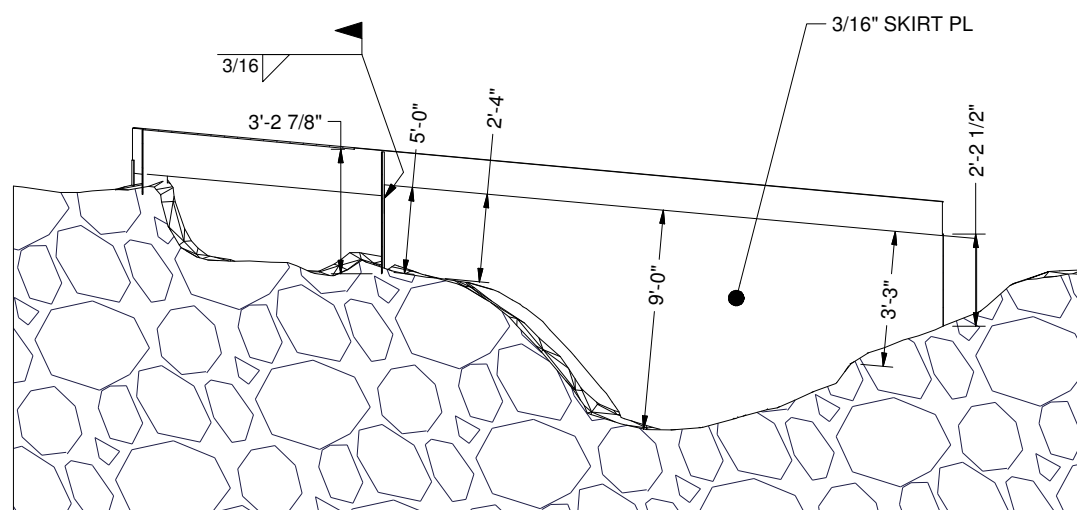
ESTIMATED TOTAL COLUMN LENGTH 154" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE
 OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



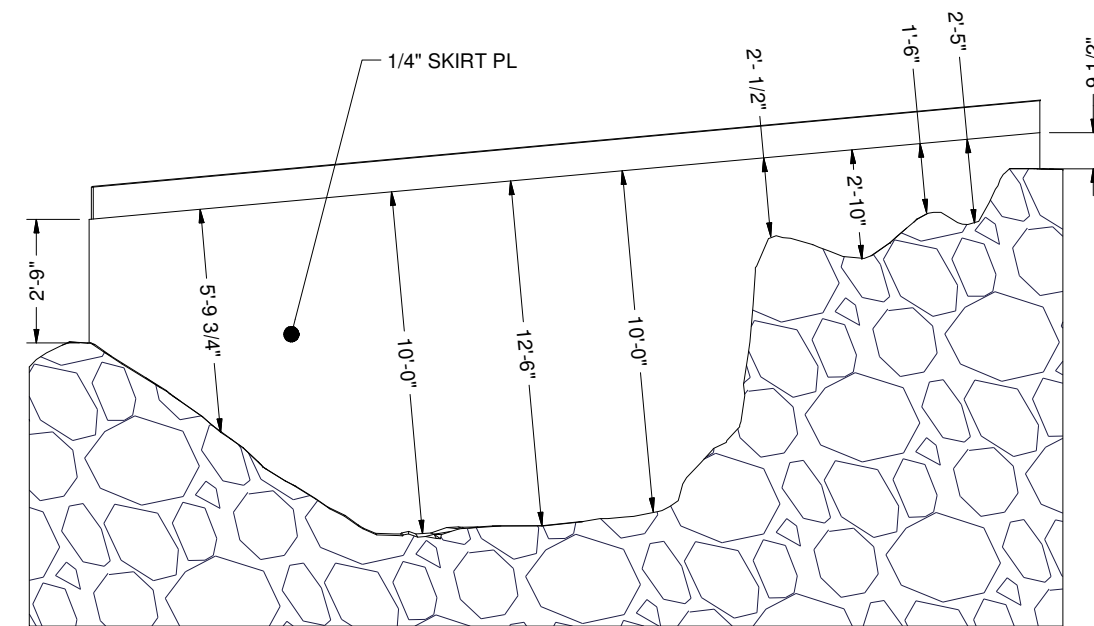
ELEVATION VIEW - LOOKING SOUTH



ELEVATION VIEW - LOOKING NORTH



ELEVATION VIEW - LOOKING EAST

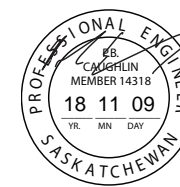


ELEVATION VIEW - LOOKING WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



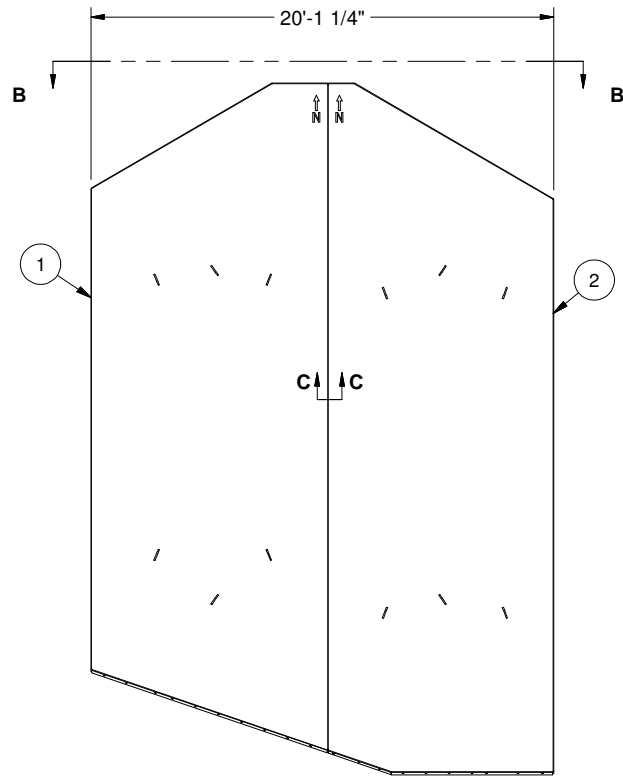
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 Structural 14318



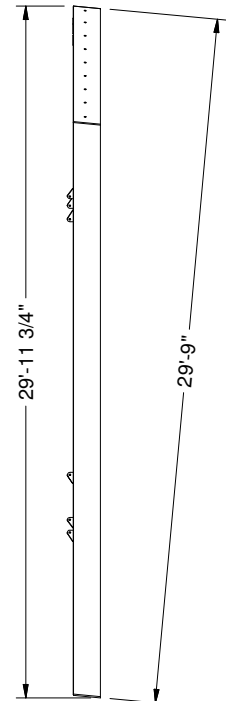
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 7 DWG. NO.: P60236-04-2

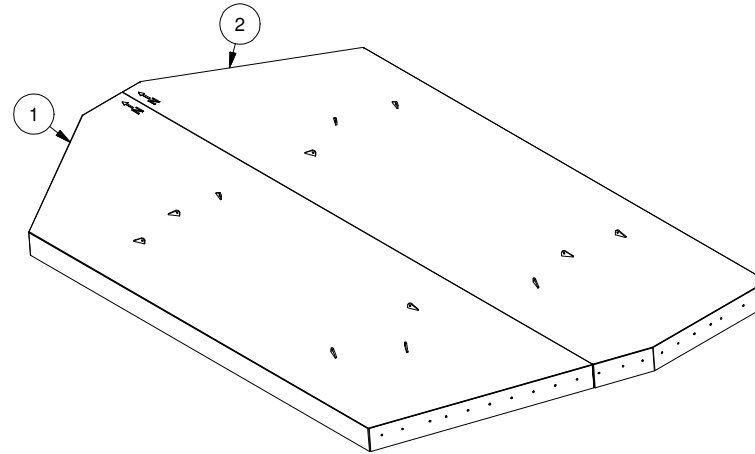
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	COVER SECTION 1	MK# P60236-A-402		
2	COVER SECTION 2	MK# P60236-A-403		



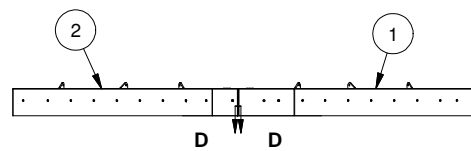
MK# P60236-A-401 - PLAN VIEW



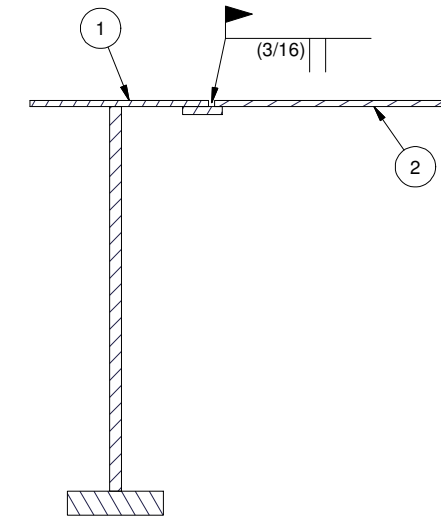
MK# P60236-A-401 - SIDE VIEW



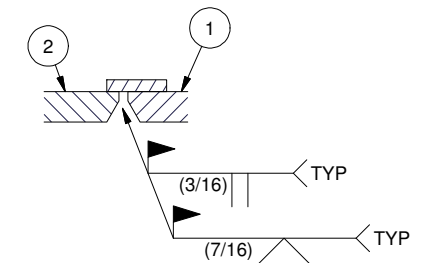
ISO VIEW



VIEW B-B



SECTION C-C

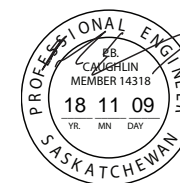


SECTION D-D

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC

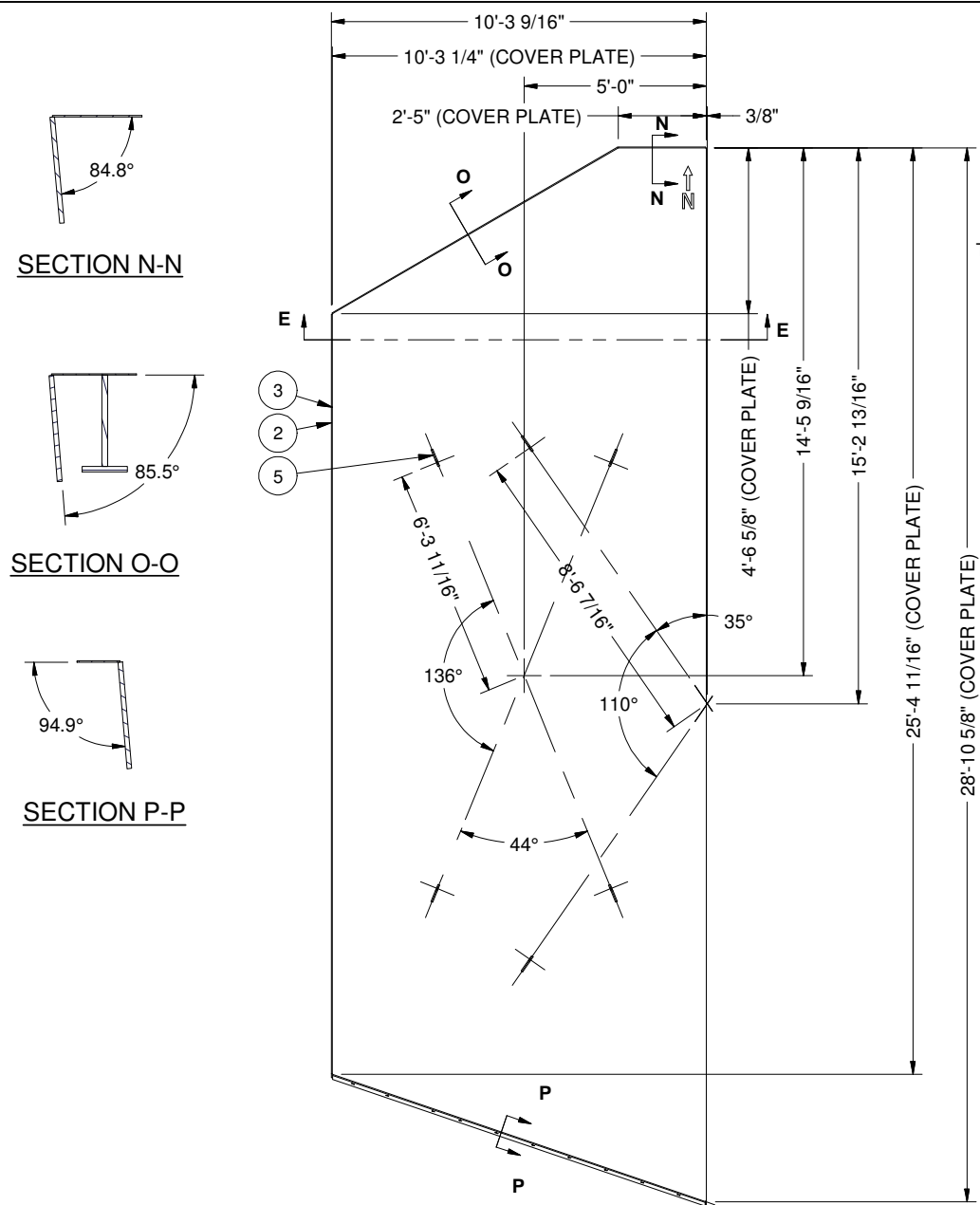


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PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
 TOP COVER DETAIL
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

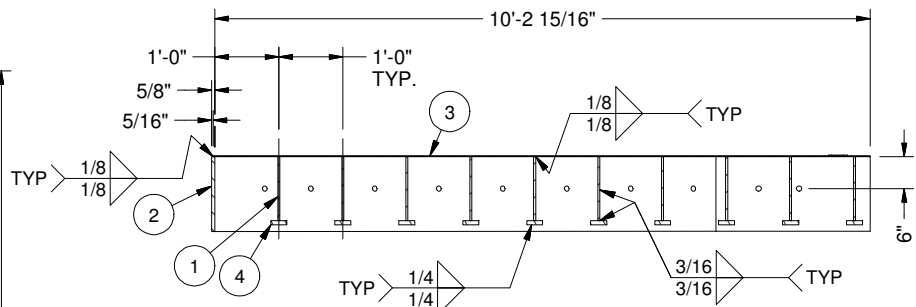
DO NOT SCALE DRAWINGS	DWG. NO.:	P60236-04-3	2
SHEET NO.:	3 OF 7		



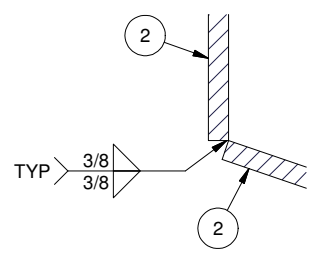
SECTION N-N

SECTION O-O

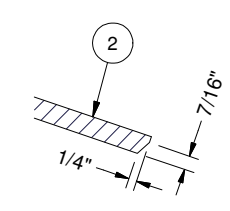
SECTION P-P



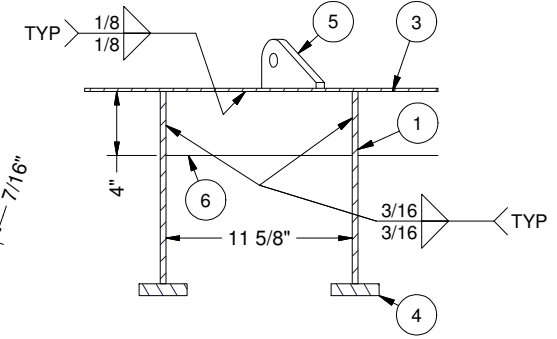
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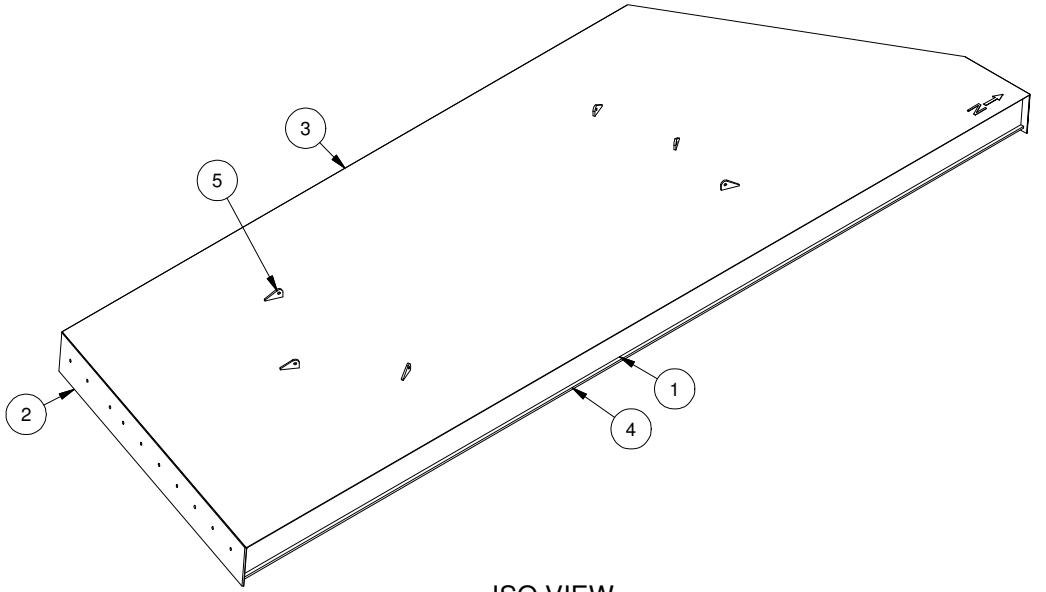
SECTION G-G



SECTION H-H

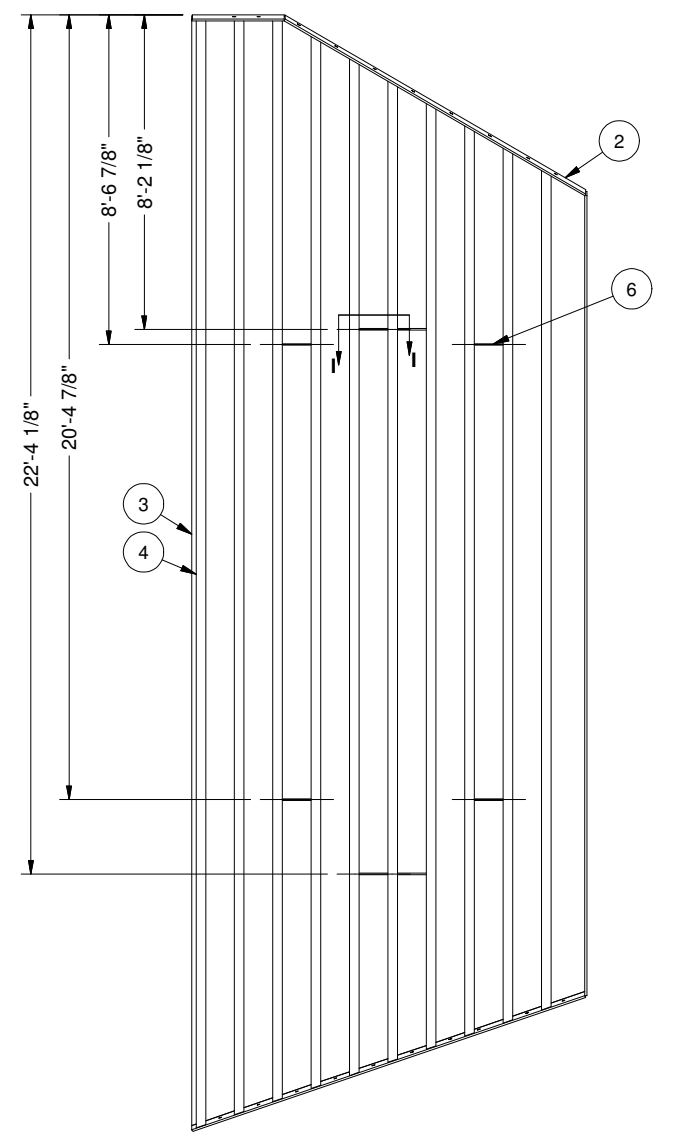


SECTION I-I



ISO VIEW

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	12" x 3/8" PL		ASTM A240-316L	
2	14" x 5/8" PL		ASTM A240-316L	
3	3/16" PL		ASTM A240-316L	
4	3" x 3/4" PL		ASTM A240-316L	
5	5/8" PL		ASTM A240-316L	
6	4" x 1/2" PL		ASTM A240-316L	



VIEW F-F

MK# P60236-A-402 - PLAN VIEW

SHOP DRILL 1" INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (20 TOTAL)

HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS

MK# P60236-A-402 - ELEVATION VIEW

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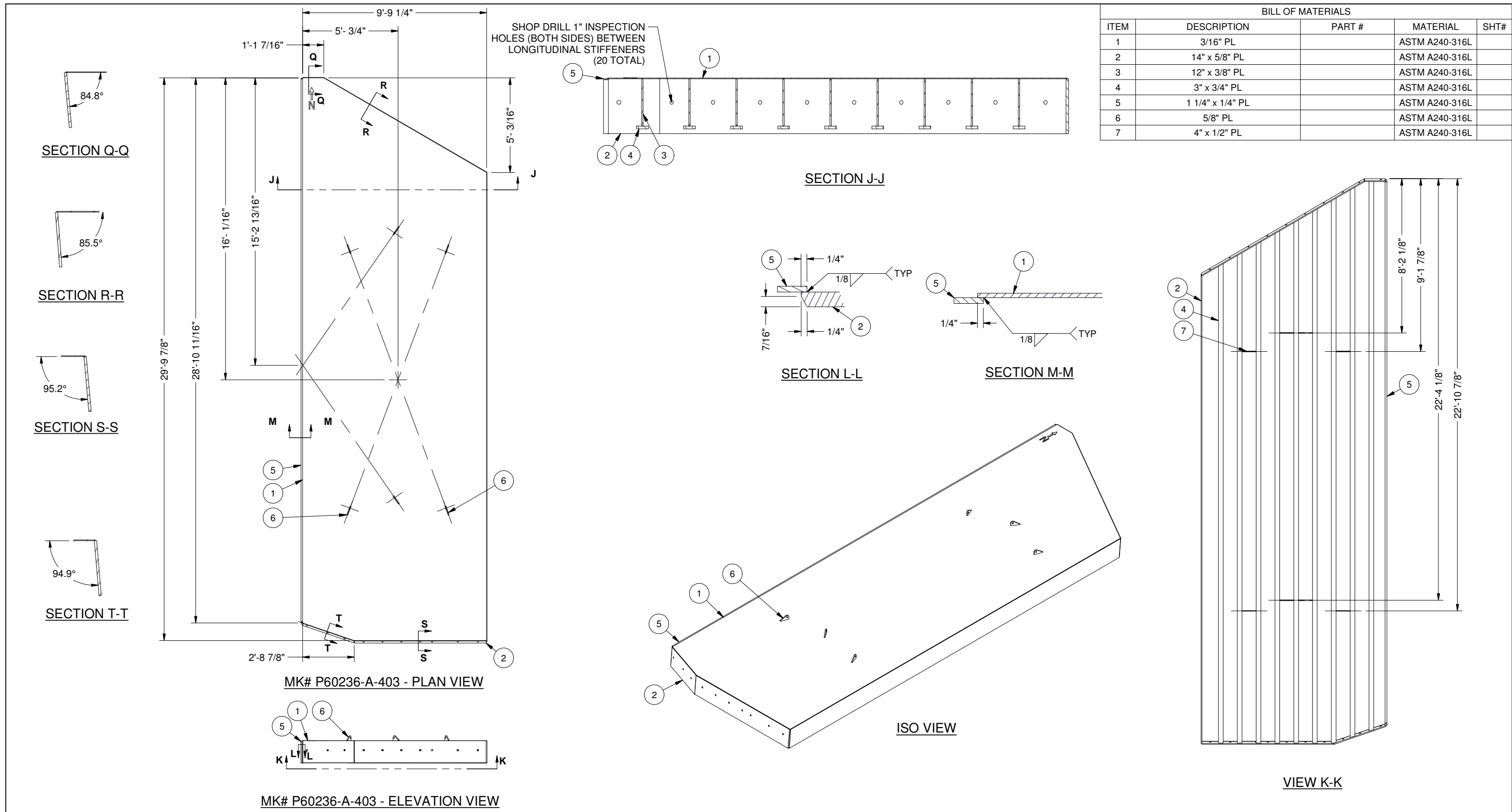
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		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]



PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
 TOP COVER SECTION DETAILS
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7
 DWG. NO.: P60236-04-4
 2

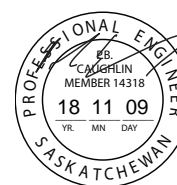


BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	3/16" PL		ASTM A240-316L	
2	14" x 5/8" PL		ASTM A240-316L	
3	12" x 3/8" PL		ASTM A240-316L	
4	3" x 3/4" PL		ASTM A240-316L	
5	1 1/4" x 1/4" PL		ASTM A240-316L	
6	5/8" PL		ASTM A240-316L	
7	4" x 1/2" PL		ASTM A240-316L	

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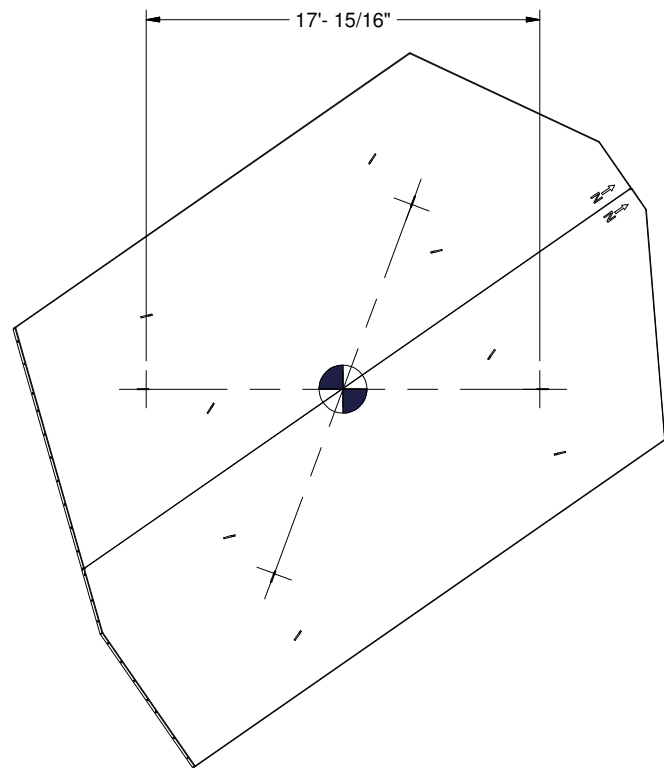
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		A	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		B	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		C	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	D	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



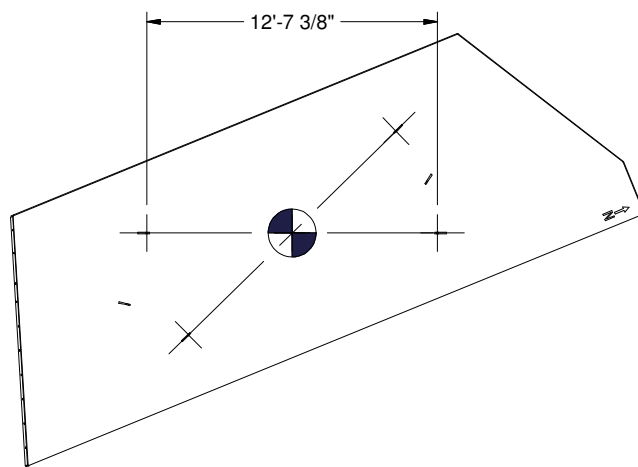
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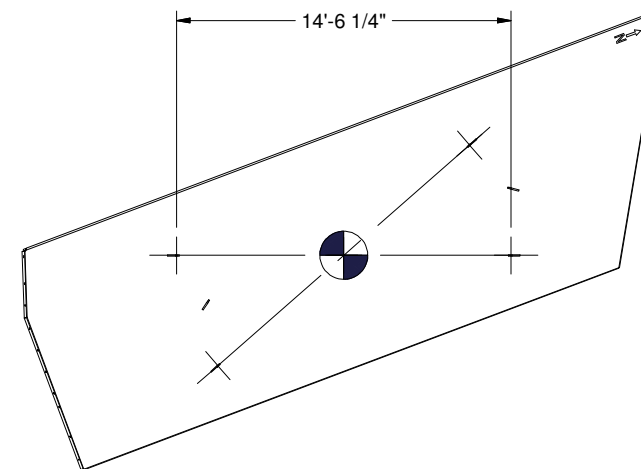
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
 TOP COVER SECTION DETAILS
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 7
 DWG. NO.: P60236-04-5
 2



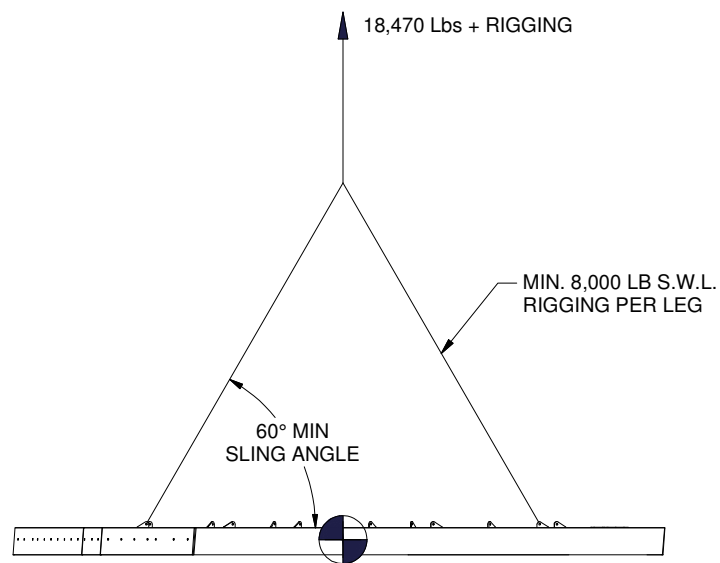
TOP COVER LIFTING DIAGRAM
(MK# P60236-A-401)



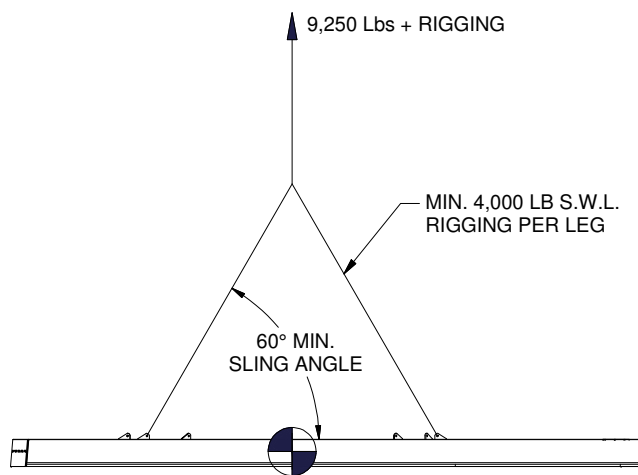
COVER SECTION 1 LIFTING DIAGRAM
(MK# P60236-A-402)



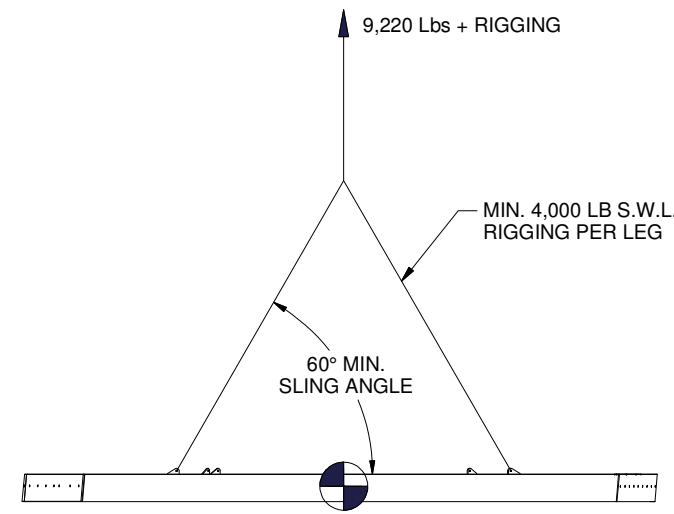
COVER SECTION 2 LIFTING DIAGRAM
(MK# P60236-A-403)



TOP COVER LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-401



COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
(MK# P60236-A-402)



COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
(MK# P60236-A-403)

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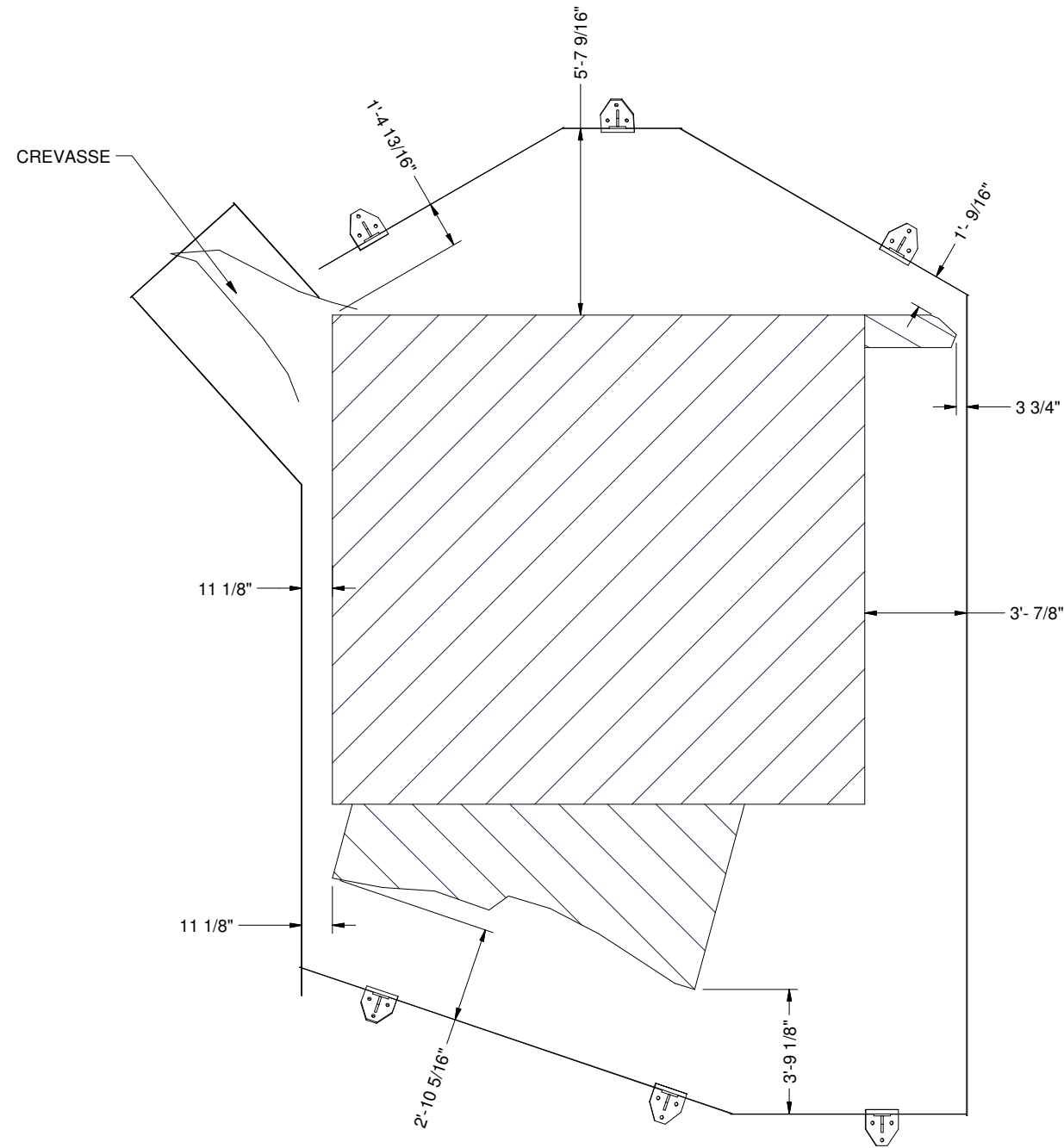
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



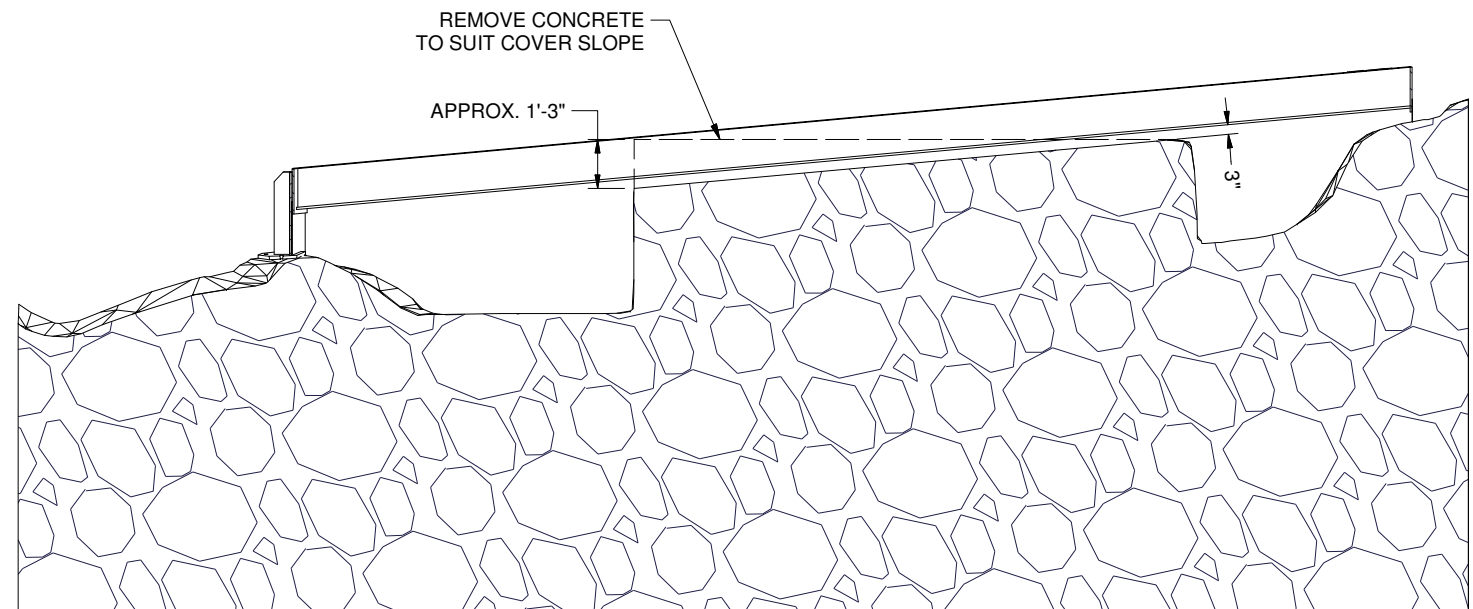
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PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING
 LIFTING DETAILS
 LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 6 OF 7
 DWG. NO.: **P60236-04-6**
 2



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△	AS BUILT DETAILS	09/Nov/18	N.R.	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₃₂ MACHINED SURFACES: ¹²⁵ / ₃₂ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	ADDED SECTION VIEWS ON SHEETS 4 AND 5	11/Jan/18	N.R.	
		△	ISSUED FOR CONSTRUCTION	05/Jan/18	N.R.	DRWN BY: N.R. DATE: 14/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	N.R.	CHK'D BY: ENG BY: PC



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 Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 9 OPENING CLEARANCES

LOCATION: 59° 37' 18.8" N, 108° 25' 9.0" W NEAR URANIUM CITY, SK

CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

DWG. NO.: P60236-04-7

SHEET NO.: 7 OF 7

2

311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

VERNA 1
(Verna Shaft)



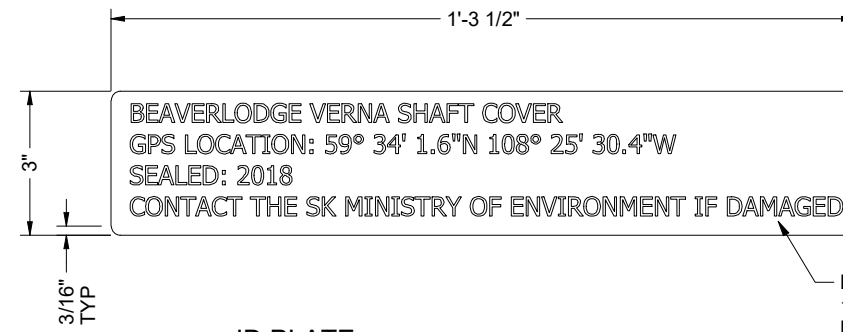
VERNA 1 – Verna Shaft

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KONDA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
15. SEE DRAWING P60236-07 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

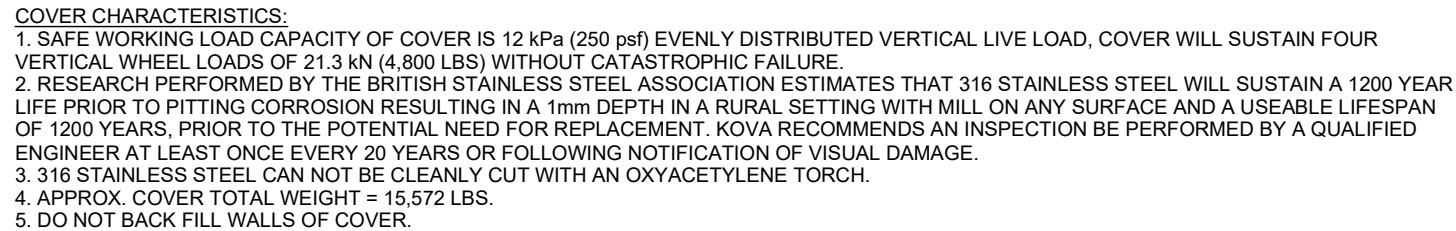
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 15,572 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



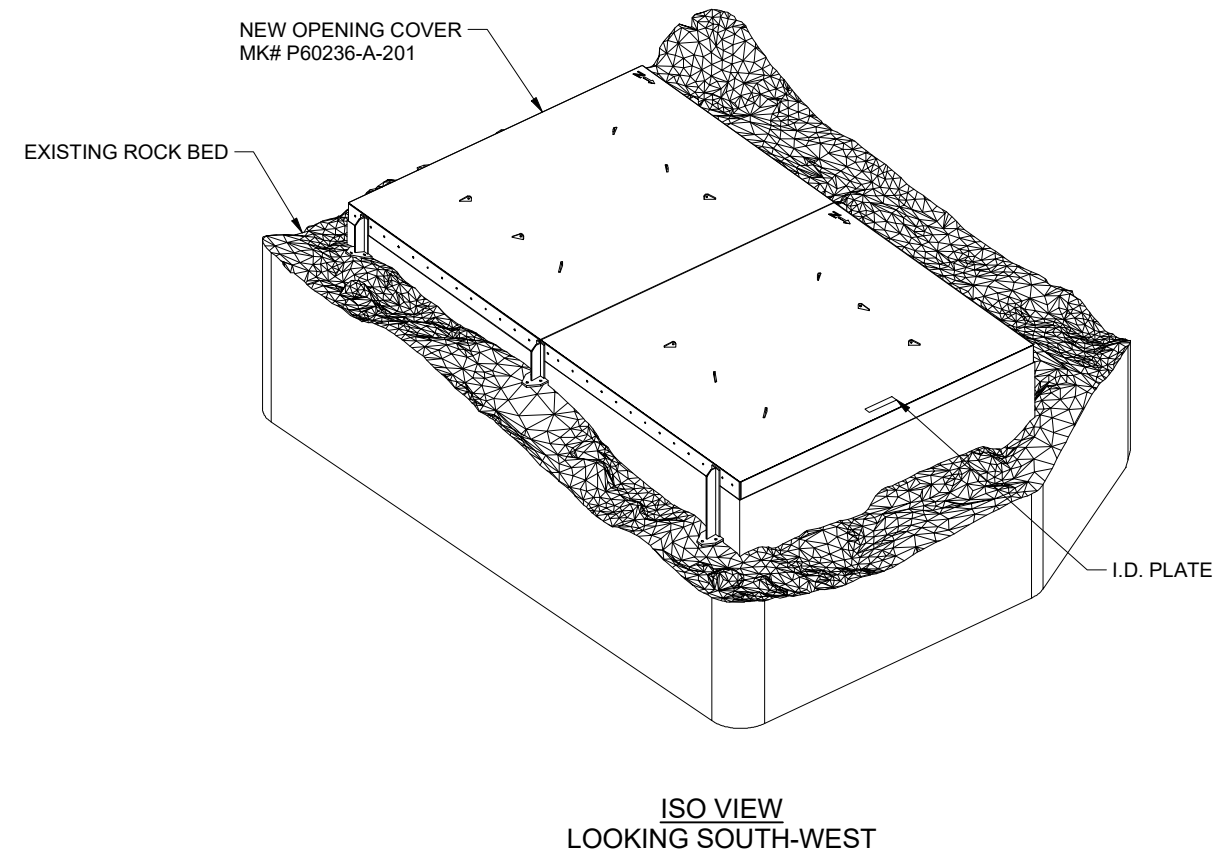
ESTIMATED WEIGHTS:
 TOP COVER W/O RIGGING: 13,967 LBS
 AS INSTALLED: 15,572 LBS

ID PLATE
 TO BE SUPPLIED AND INSTALLED BY FABRICATOR

LETTERS TO BE MILLED INTO
 12ga 316 SS SHEETING.
 MIN. 10mm LETTER HEIGHT



PLAN VIEW - VERNA 1 OPENING COVER



ISO VIEW
 LOOKING SOUTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC

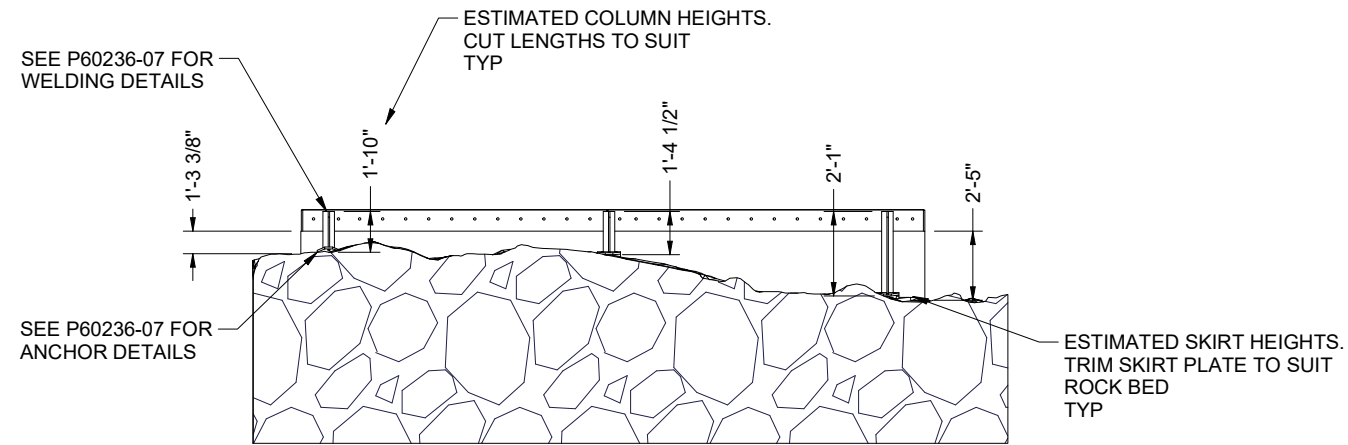


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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by: _____
 Discipline: Structural Sk. Reg. No. 14318 Signature: _____

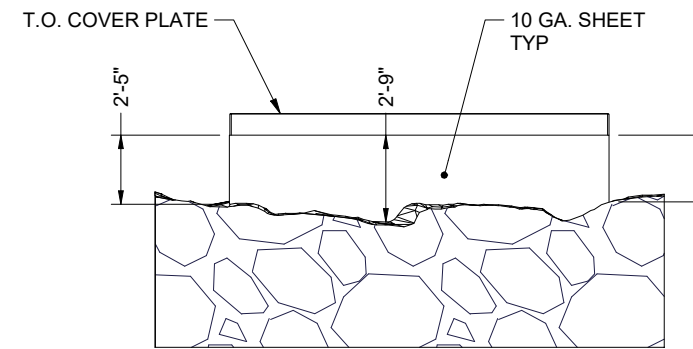


PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 7
 DWG. NO.: P60236-02-1

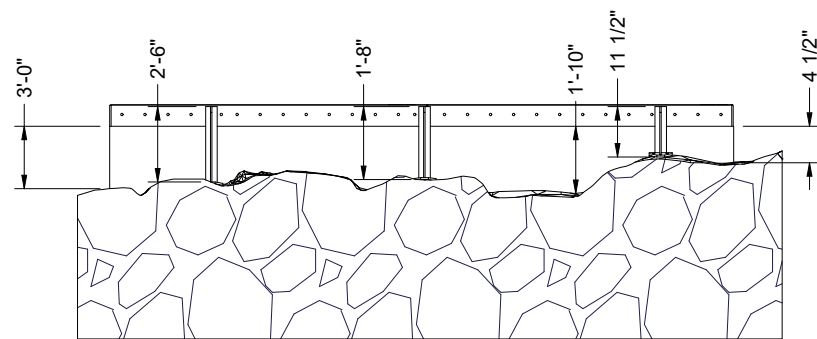
ESTIMATED TOTAL COLUMN LENGTH 195" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER
 GUIDANCE OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



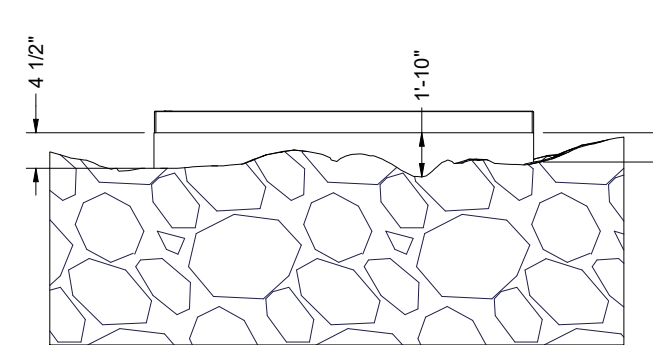
ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST



ELEVATION - LOOKING NORTH

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC

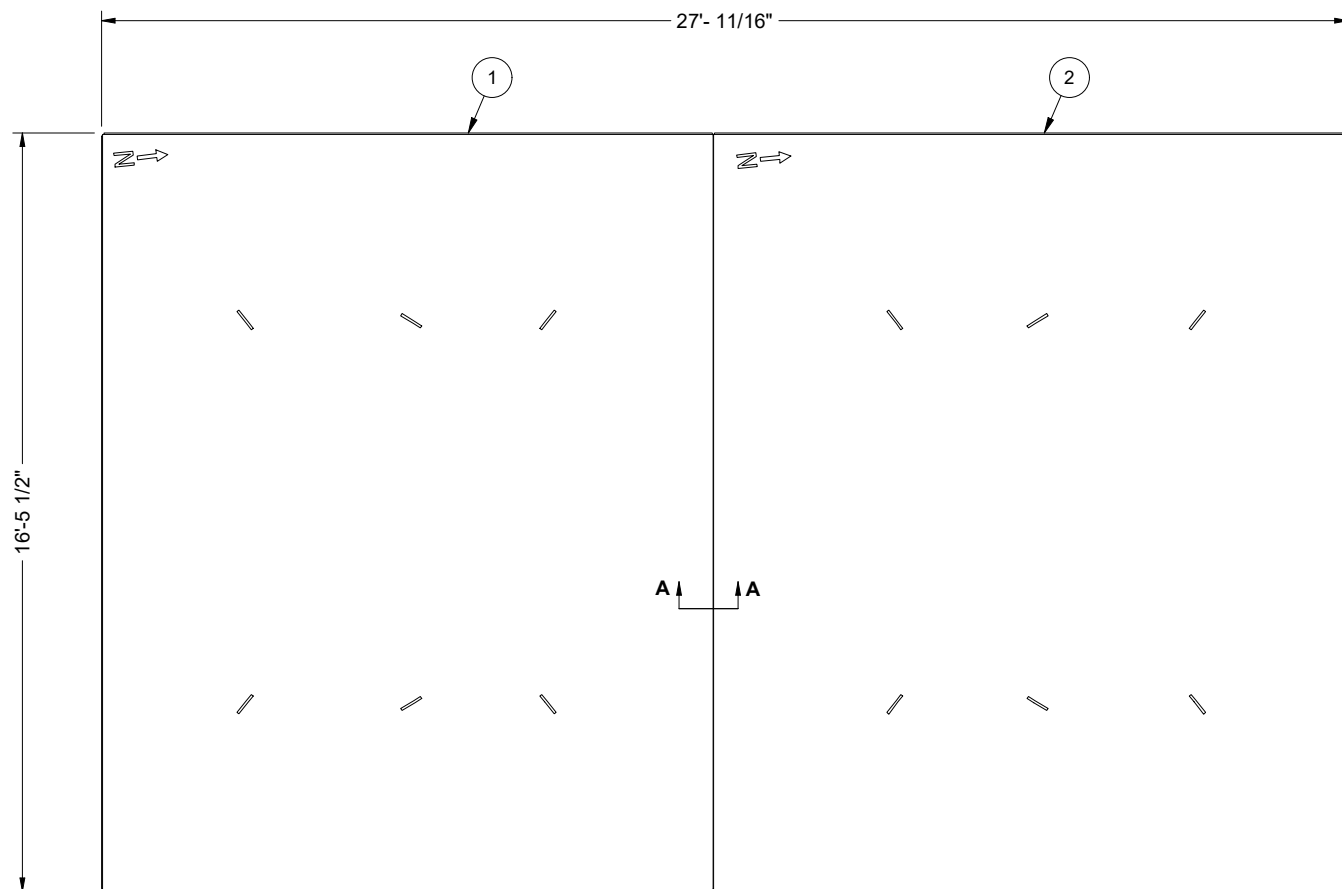


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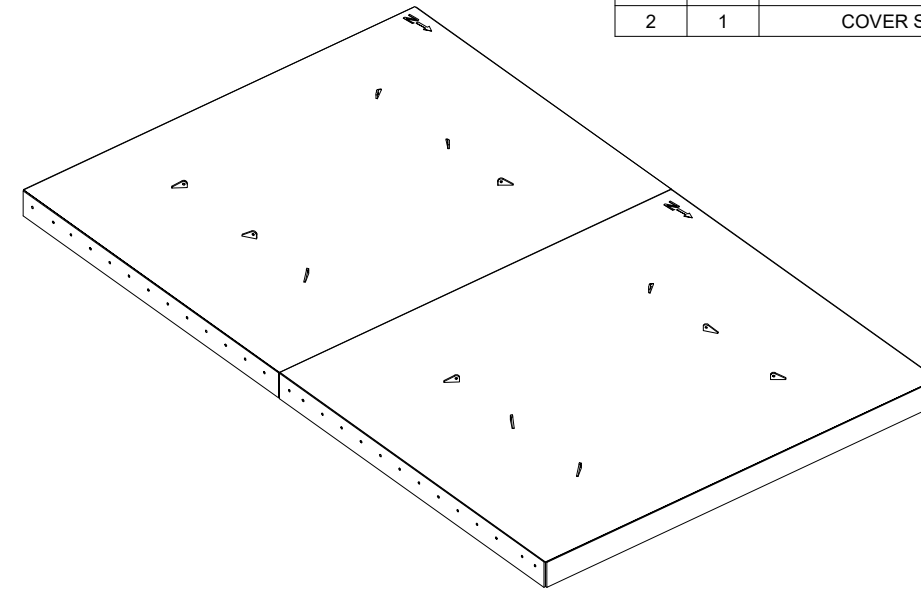


PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 7
 DWG. NO.: P60236-02-2

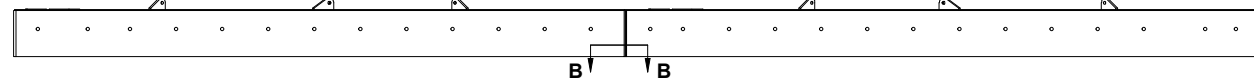
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	COVER SECTION 1	P60236-A-202		4
2	1	COVER SECTION 2	P60236-A-203		4



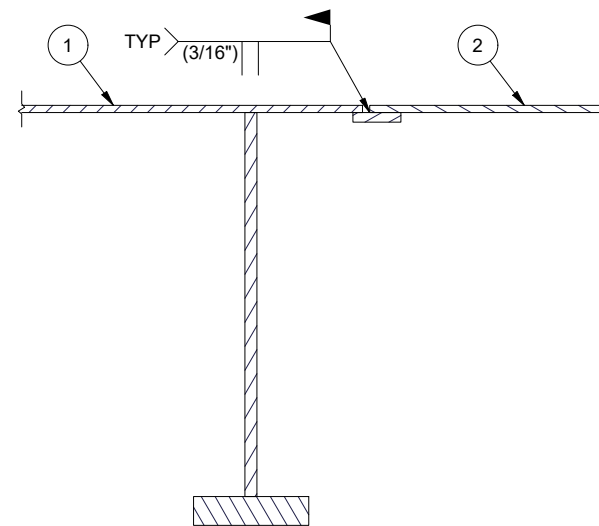
P60236-A-201 - TOP VIEW
TOP PLATE DIMENSIONS



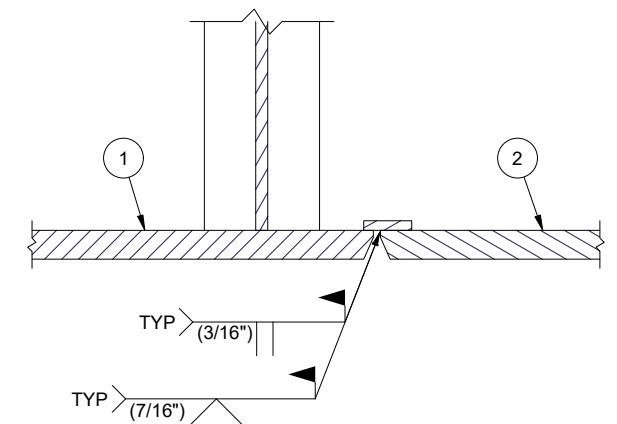
P60236-A-201 - ISO VIEW



P60236-A-201 - SIDE VIEW



SECTION A-A



SECTION B-B

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC

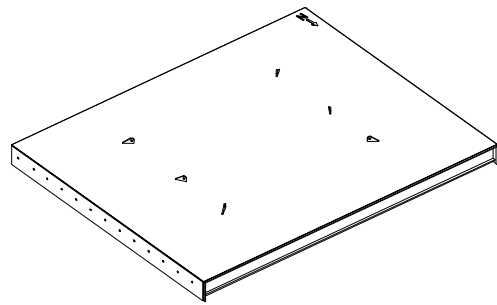


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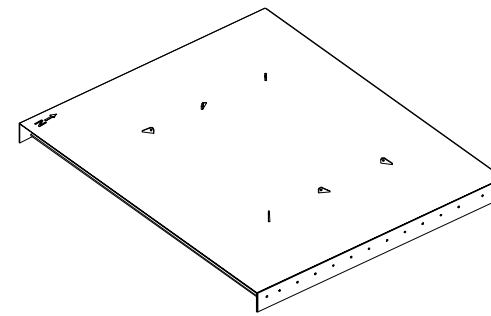
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 7
 DWG. NO.: P60236-02-3

MK# P60236-A-202 BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
1	3/16" PLATE	ASTM A240-316-L
2	12"x3/4" FB	ASTM A240-316-L
3	10"x5/16" FB	ASTM A240-316-L
4	3"x3/4" FB	ASTM A240-316-L
5	5/8" PL	ASTM A240-316-L
6	4"x1/2" FB	ASTM A240-316-L
7	1 1/4"x1/4" FB	ASTM A240-316-L

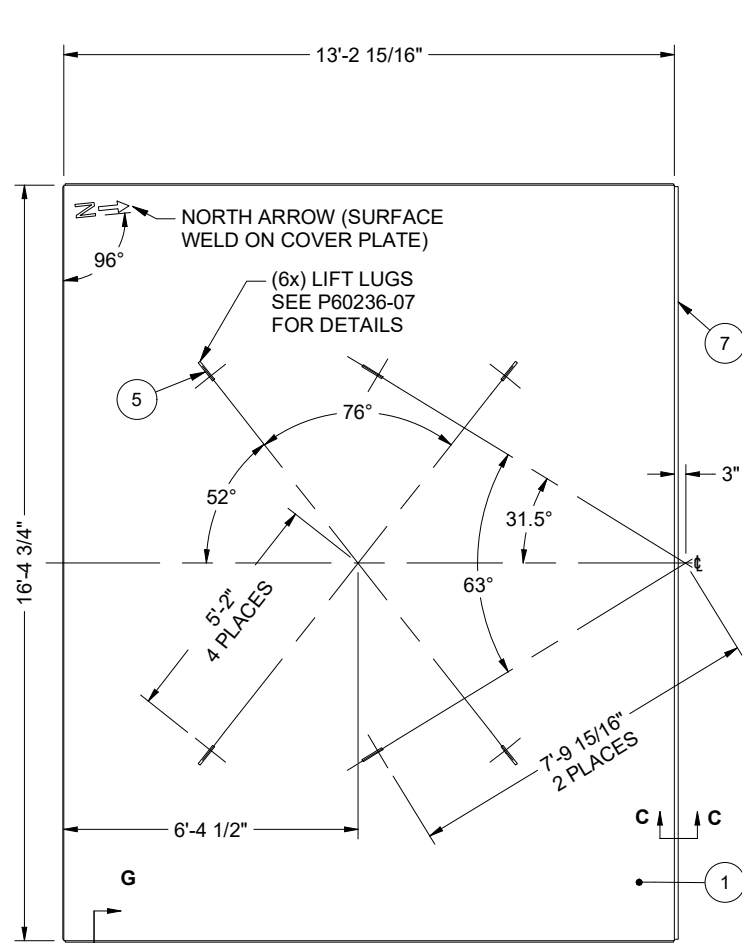


P60236-A-202 - ISO VIEW

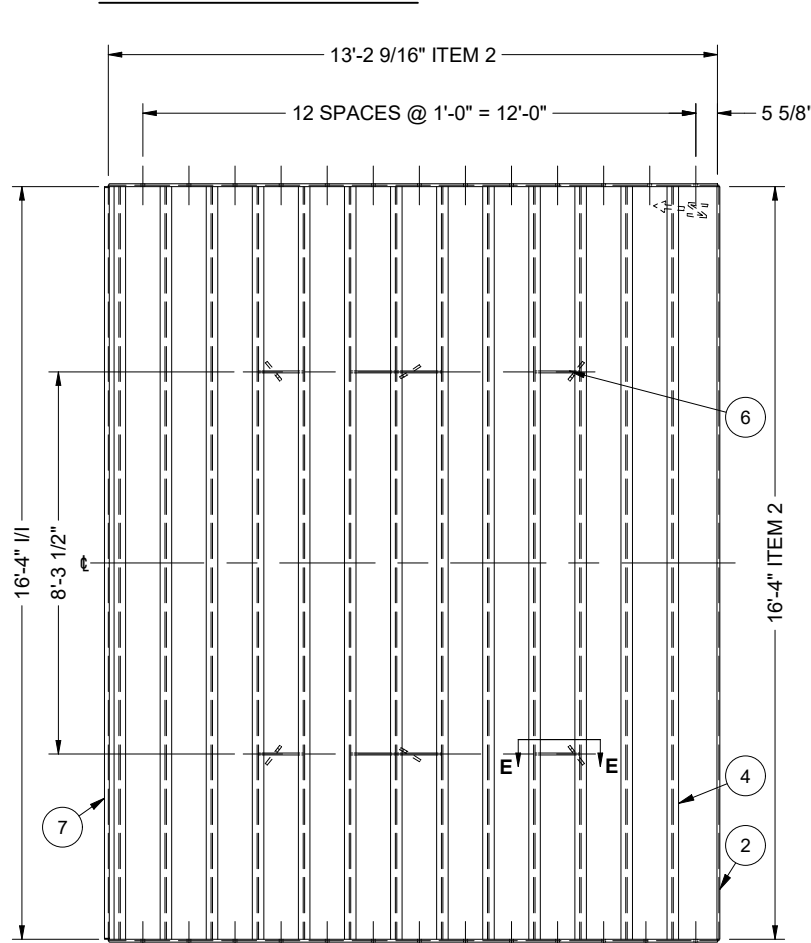
MK# P60236-A-203 BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
1	3/16" PLATE	ASTM A240-316-L
2	12"x3/4" FB	ASTM A240-316-L
3	10"x5/16" FB	ASTM A240-316-L
4	3"x3/4" FB	ASTM A240-316-L
5	5/8" PL	ASTM A240-316-L
6	4"x1/2" FB	ASTM A240-316-L



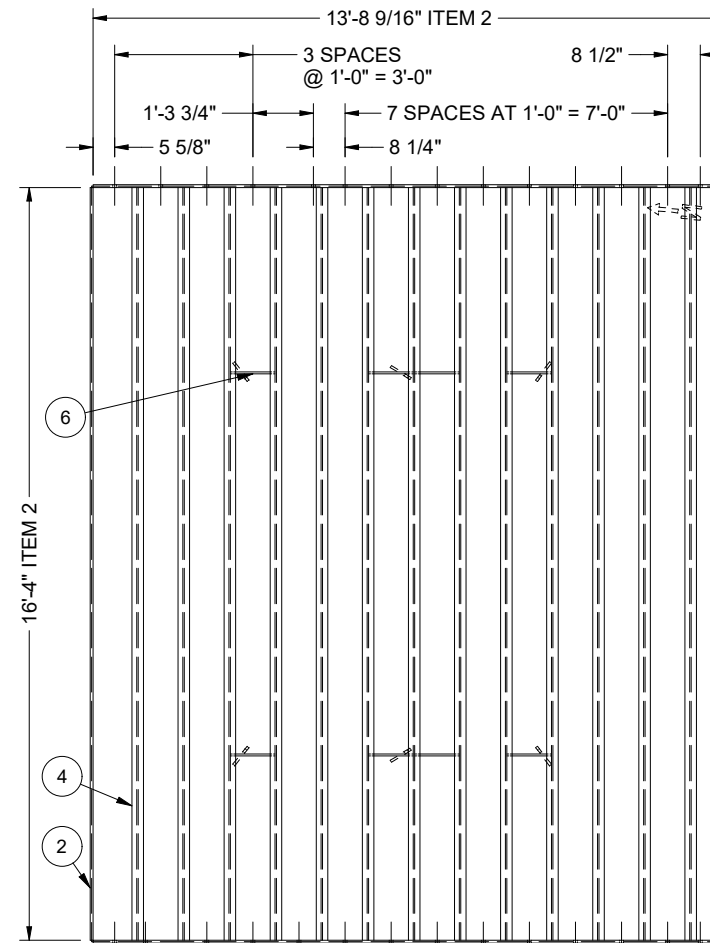
P60236-A-203 - ISO VIEW



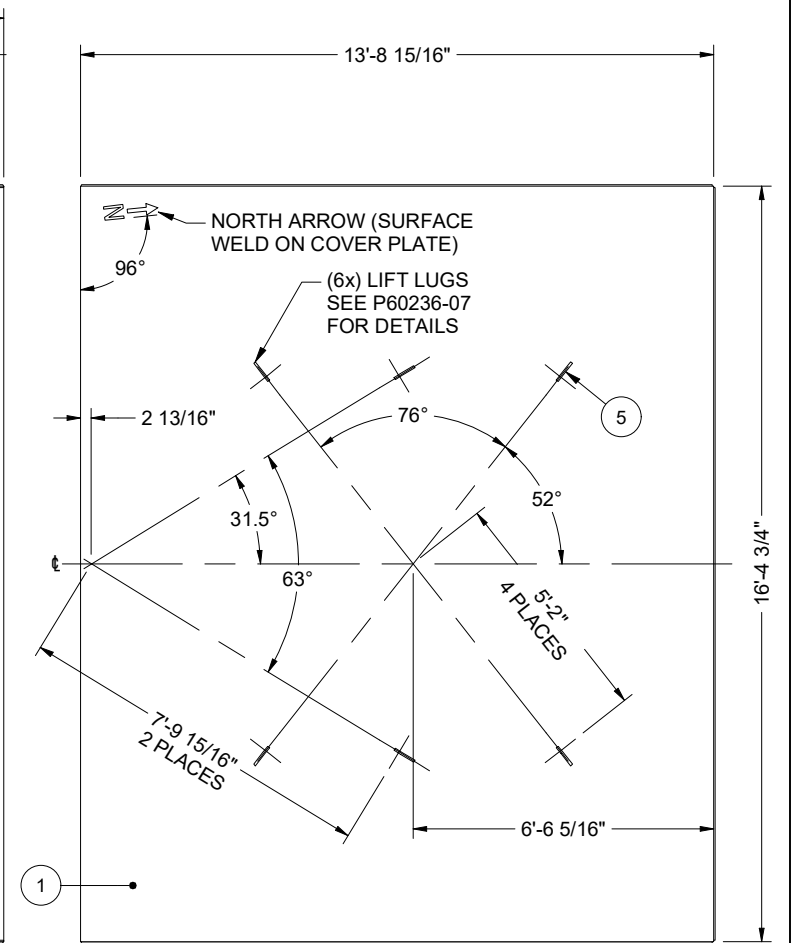
P60236-A-202 - TOP VIEW
TOP PLATE DIMENSIONS



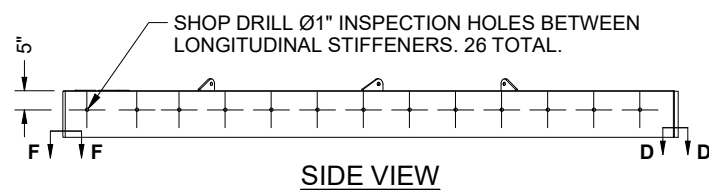
P60236-A-202 - BOTTOM VIEW
TOP PLATE DIMENSIONS



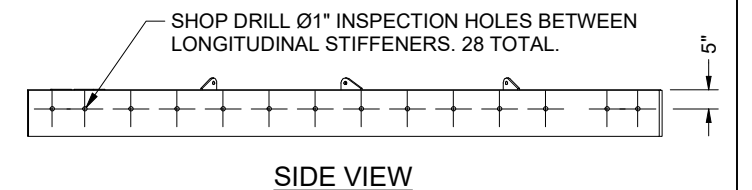
P60236-A-203 - BOTTOM VIEW
TOP PLATE DIMENSIONS



P60236-A-203 - TOP VIEW
TOP PLATE DIMENSIONS



SIDE VIEW



SIDE VIEW

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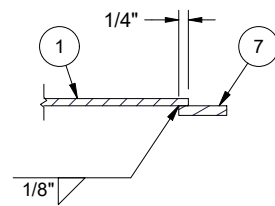
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



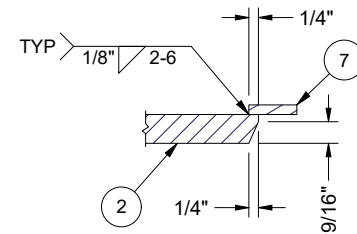
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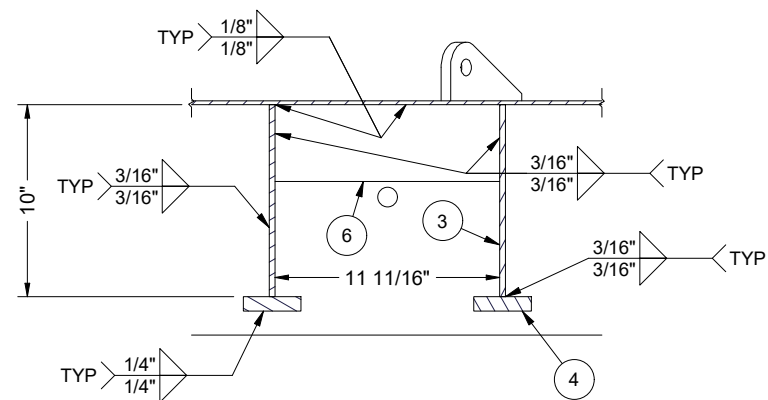
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 TOP COVER SECTIONS
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7
 DWG. NO.: P60236-02-4



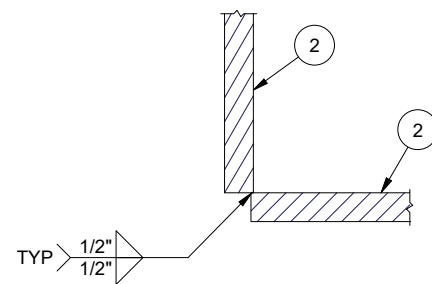
SECTION C-C
FROM SHEET 4



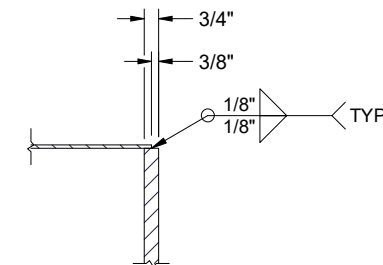
SECTION D-D
FROM SHEET 4



SECTION E-E
FROM SHEET 4



SECTION F-F
FROM SHEET 4



SECTION G-G
FROM SHEET 4

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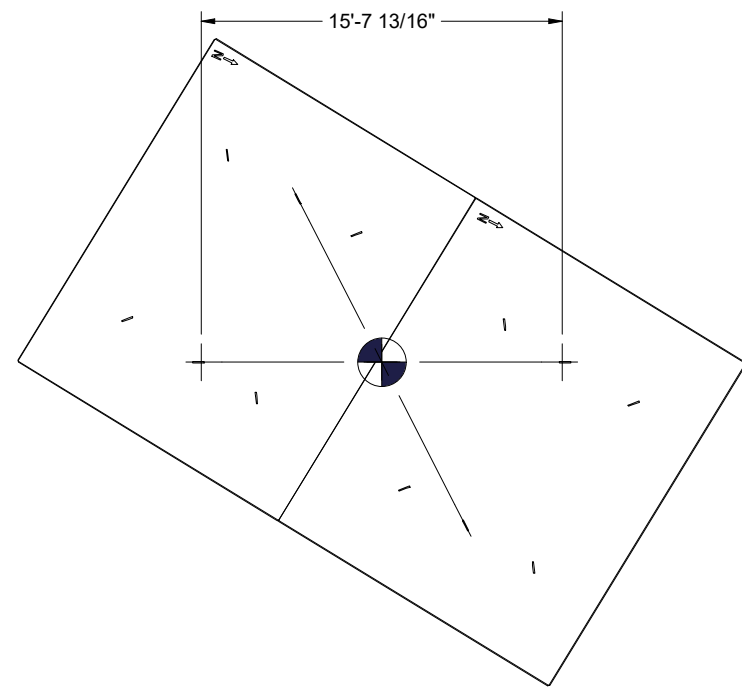
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



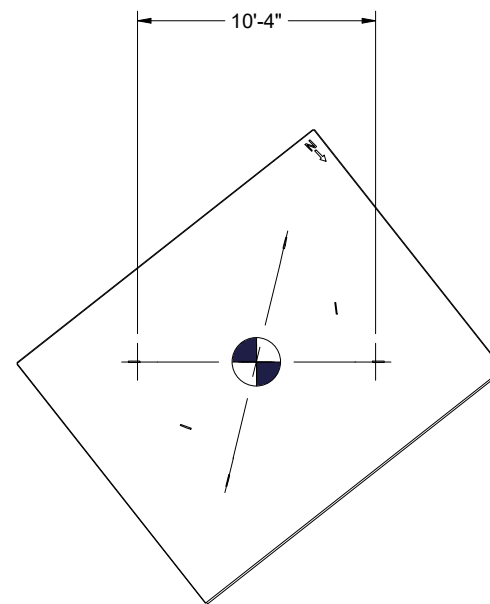
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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]



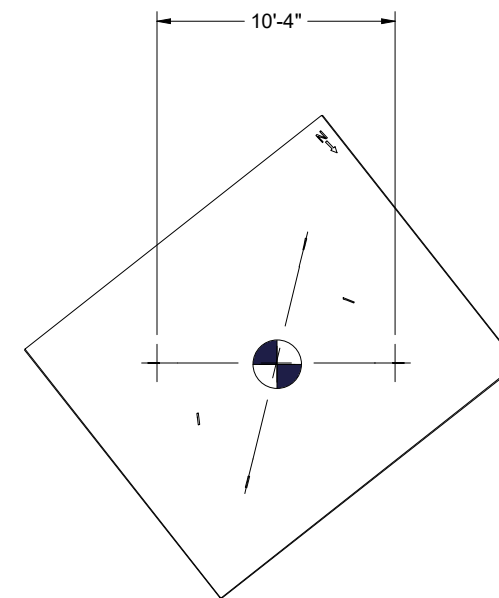
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 SECTIONS
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 7
 DWG. NO.: P60236-02-5



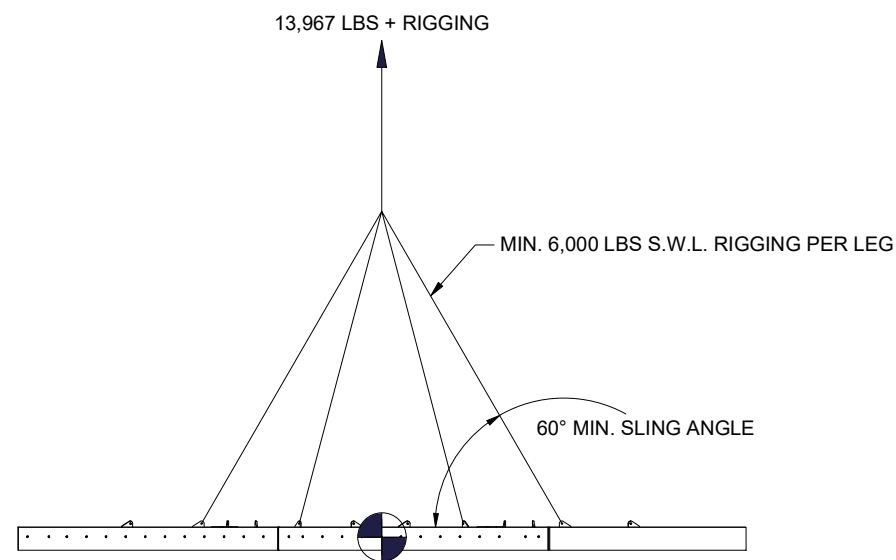
TOP COVER LIFTING DIAGRAM
P60236-A-201



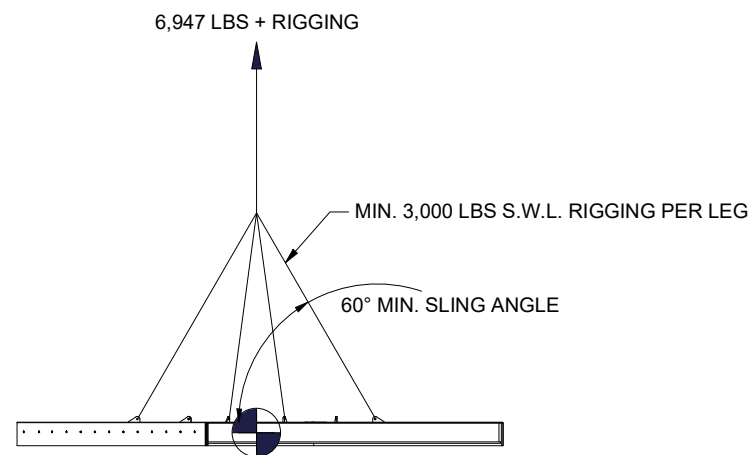
COVER SECTION 1 LIFTING DIAGRAM
P60236-A-202



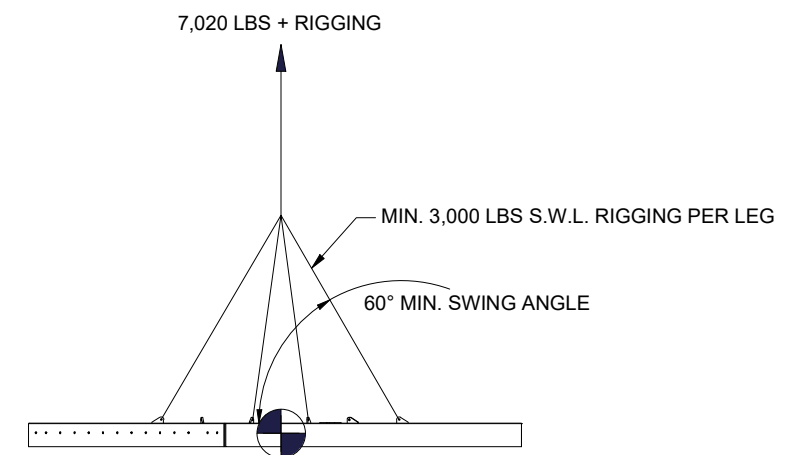
COVER SECTION 2 LIFTING DIAGRAM
P60236-A-203



TOP COVER LIFTING DIAGRAM - SIDE VIEW
P60236-A-201



COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
P60236-A-202



COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
P60236-A-203

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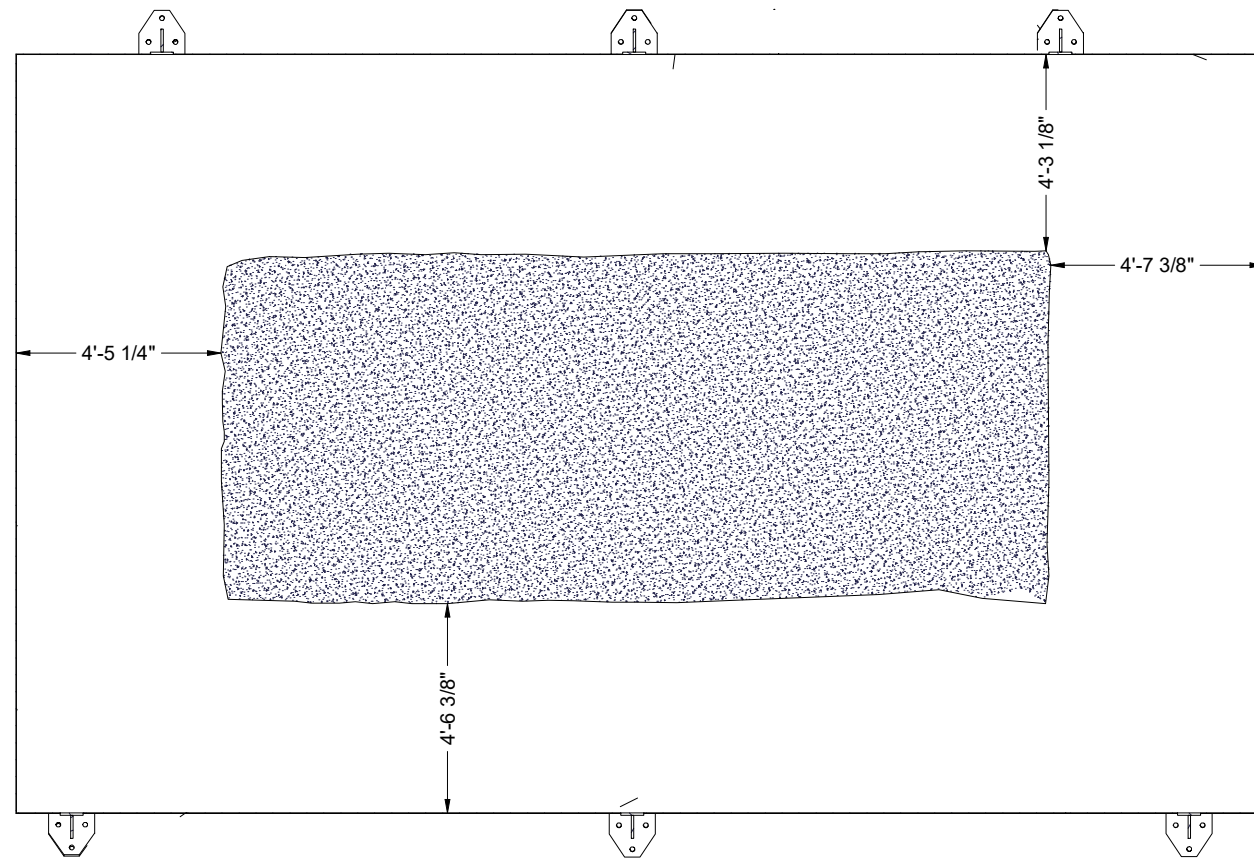
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₁₂₅ MACHINED SURFACES: ¹²⁵ / ₁₂₅ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



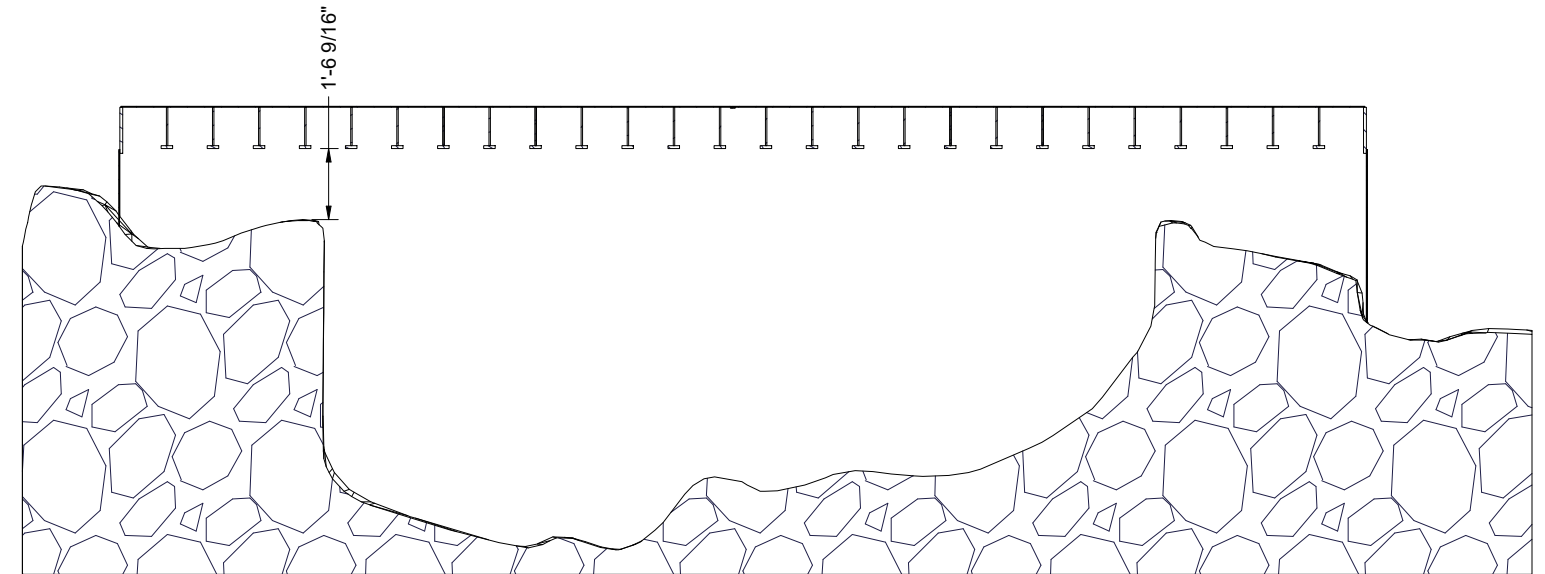
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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]



PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING
 LIFTING DETAILS
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 6 OF 7
 DWG. NO.: P60236-02-6
 1



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 07/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



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 Number C672
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 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*



PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 1 OPENING CLEARANCES
 LOCATION: 59° 34' 1.6"N 108° 25' 30.4"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 7 OF 7
 DWG. NO.: P60236-02-7

VERNA 3 – 026594 Raise
(Verna Finger Raise)



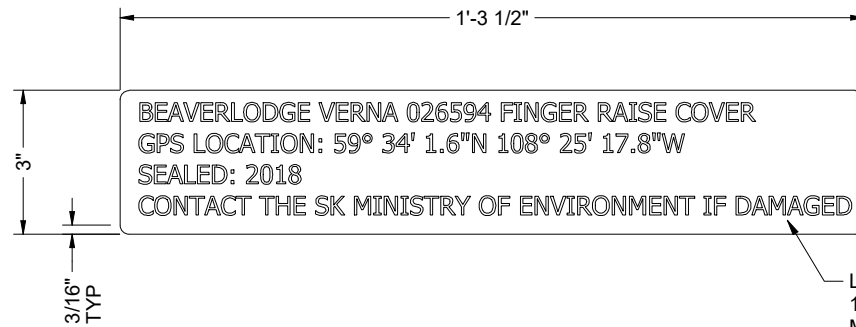
VERNA 3 – 026594 Raise

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KONDA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
15. SEE DRAWING P60236-07 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

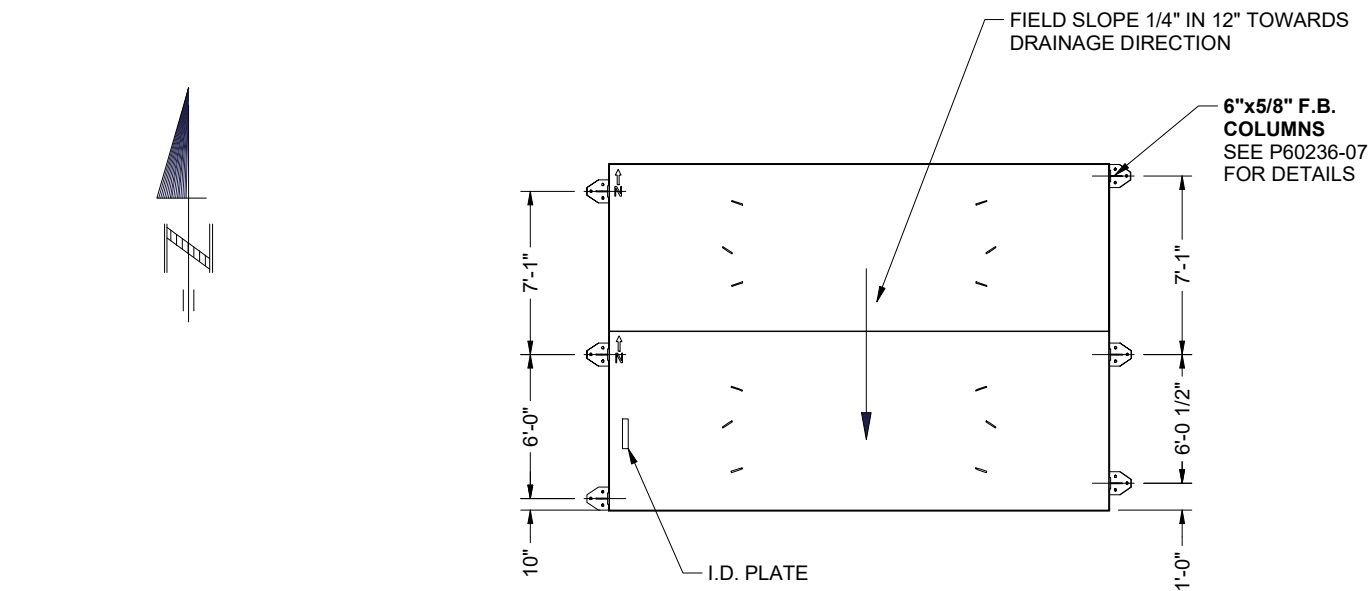
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 11,915 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



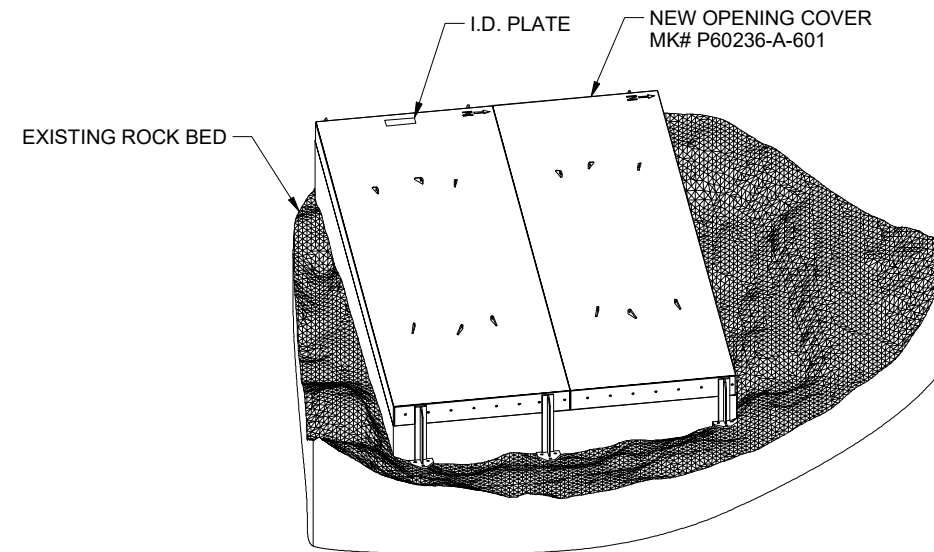
ESTIMATED WEIGHTS:
 TOP COVER W/O RIGGING: 10,485 LBS
 AS INSTALLED: 11,915 LBS

LETTERS TO BE MILLED INTO
 12ga 316 SS SHEETING.
 MIN. 10mm LETTER HEIGHT

ID PLATE
 TO BE SUPPLIED AND INSTALLED BY FABRICATOR



PLAN VIEW - VERNA 3 OPENING COVER



**ISO VIEW
 LOOKING WEST**

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 08/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC

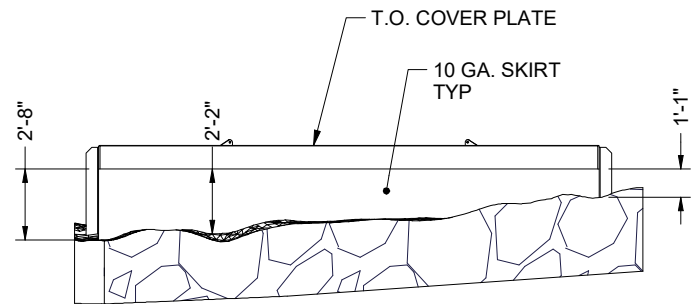


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 Structural 14318

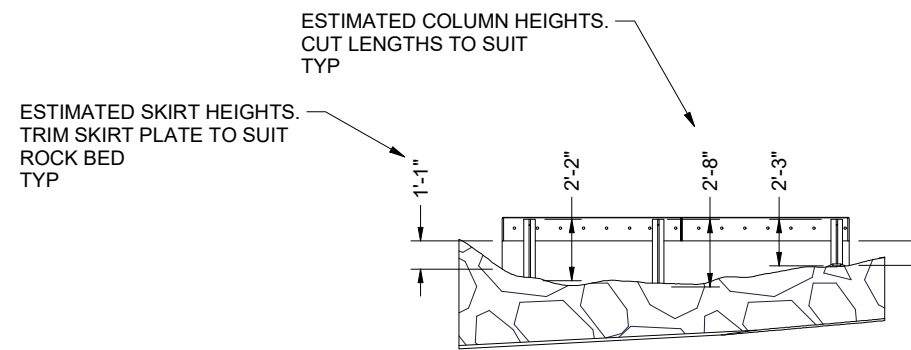


PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 3 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 6
 DWG. NO.: P60236-06-1

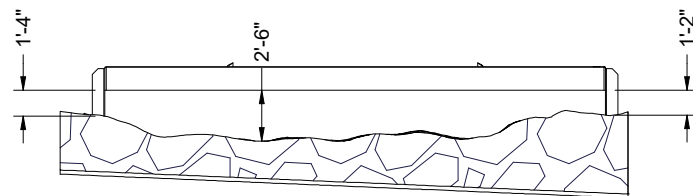
ESTIMATED TOTAL COLUMN LENGTH 202" WITHOUT SCRAP OR EXTRA.
 KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER
 GUIDANCE OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



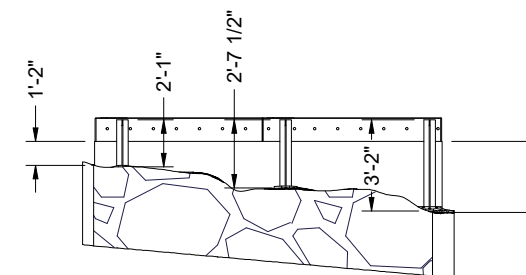
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₁₆ MACHINED SURFACES: ¹²⁵ / ₁₆ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 08/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC

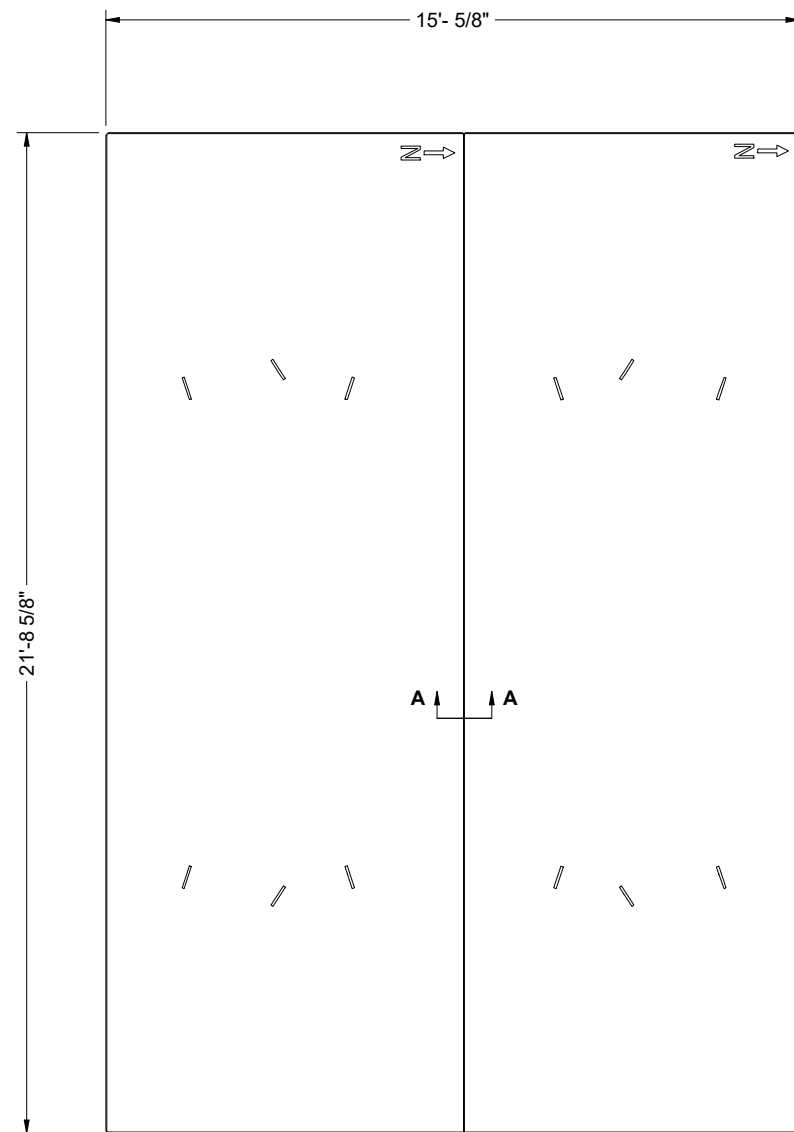


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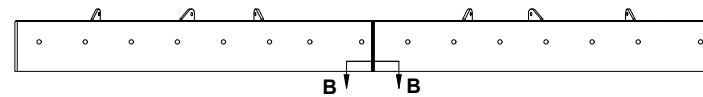


PROJECT: PERMANENT COVER FOR BEAVERLODGE VERA 3 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 6
 DWG. NO.: P60236-06-2

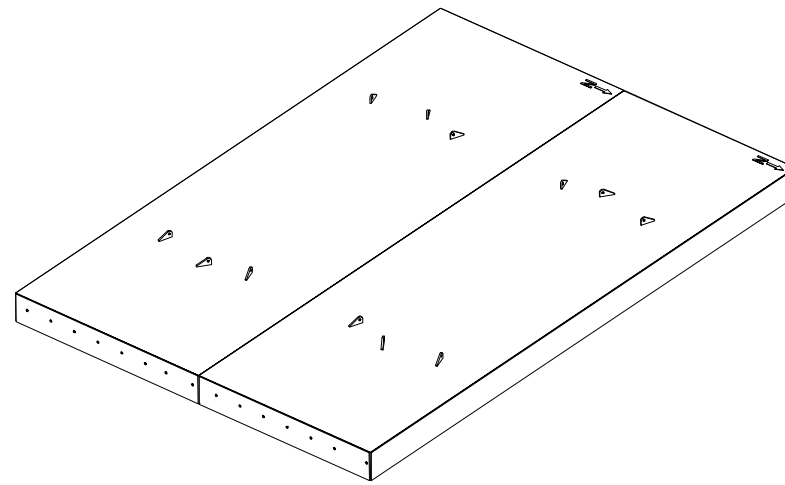
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	COVER SECTION 1	MK# P60236-A-602		4
2	1	COVER SECTION 2	MK# P60236-A-603		4



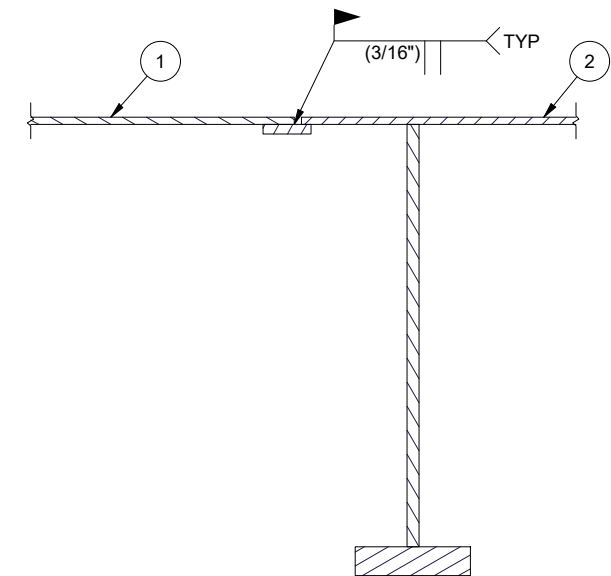
MK# P60236-A-601 - TOP VIEW
TOP PLATE DIMENSIONS



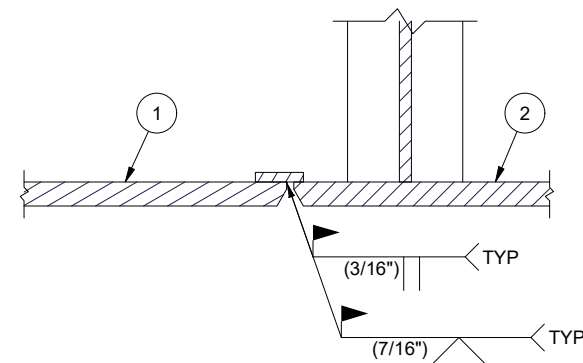
MK# P60236-A-601 - SIDE VIEW



MK# P60236-A-601 - ISO VIEW



SECTION A-A



SECTION B-B

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P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



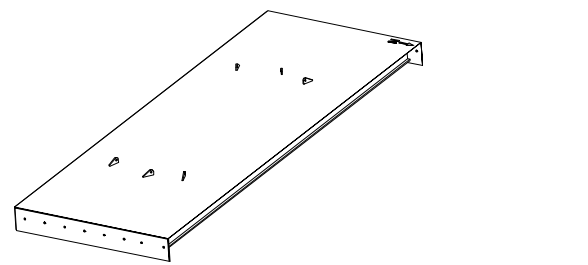
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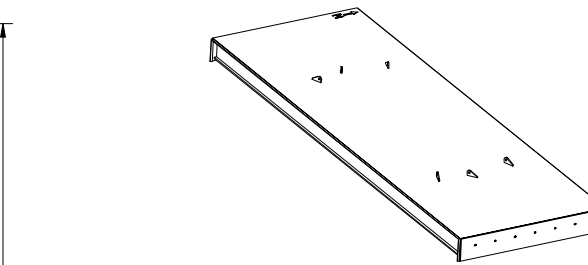
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 3 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 6
 DWG. NO.: P60236-06-3

MK# P60236-A-602 BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
1	3/16" PLATE	ASTM A240-316-L
2	13"x5/8" FB	ASTM A240-316-L
3	11"x5/16" FB	ASTM A240-316-L
4	3"x3/4" FB	ASTM A240-316-L
5	5/8" PL	ASTM A240-316-L
6	4"x3/8" FB	ASTM A240-316-L

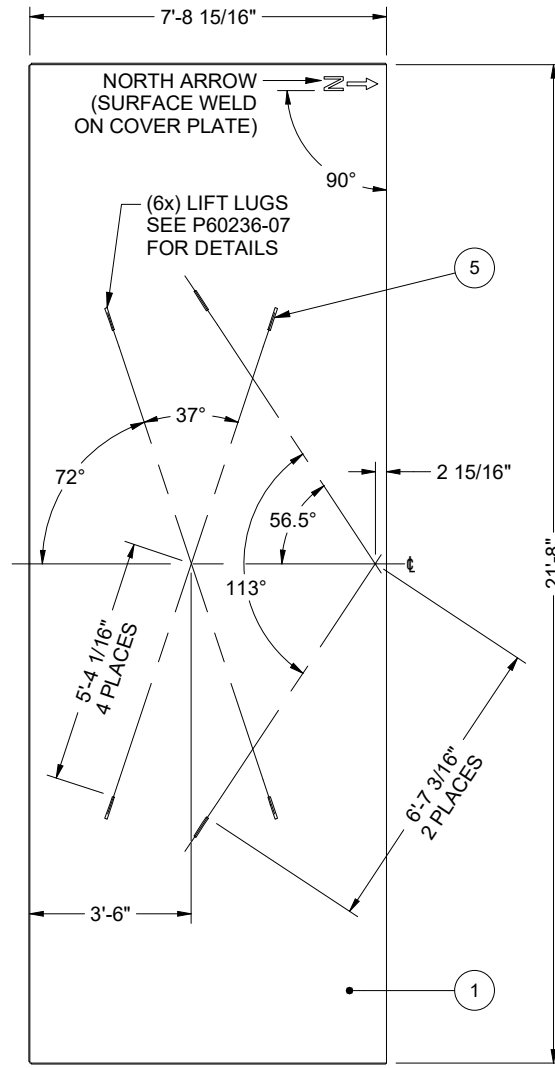
MK# P60236-A-603 BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
1	3/16" PLATE	ASTM A240-316-L
2	13"x5/8" FB	ASTM A240-316-L
3	11"x5/16" FB	ASTM A240-316-L
4	3"x3/4" FB	ASTM A240-316-L
5	5/8" PL	ASTM A240-316-L
6	4"x3/8" FB	ASTM A240-316-L
7	1 1/4"x1/4" FB	ASTM A240-316-L



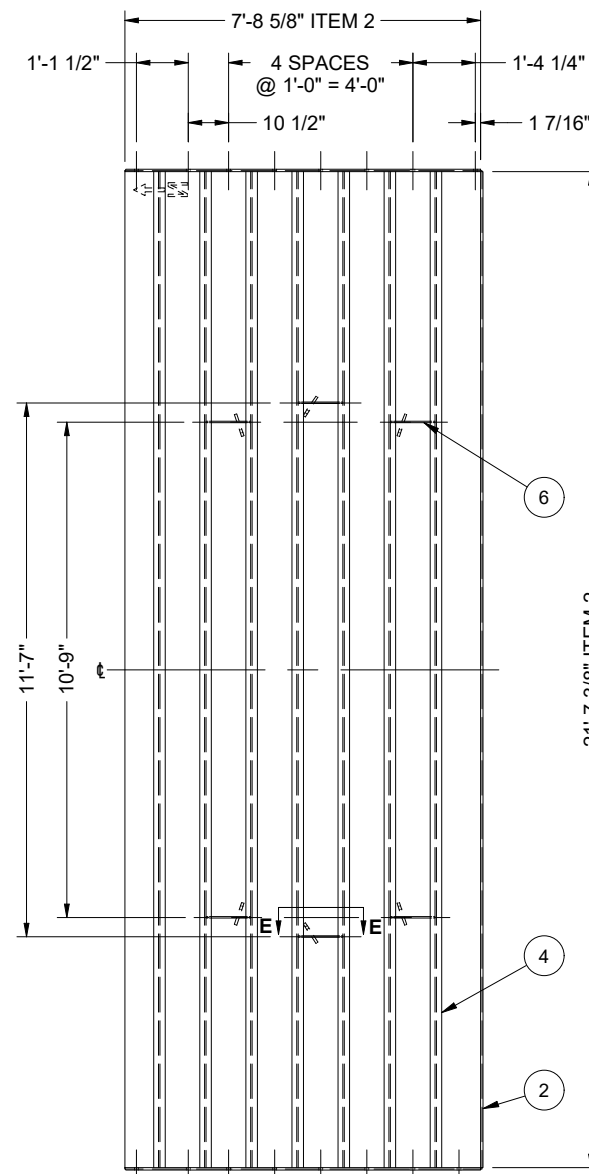
MK# P60236-A-602 - ISO VIEW



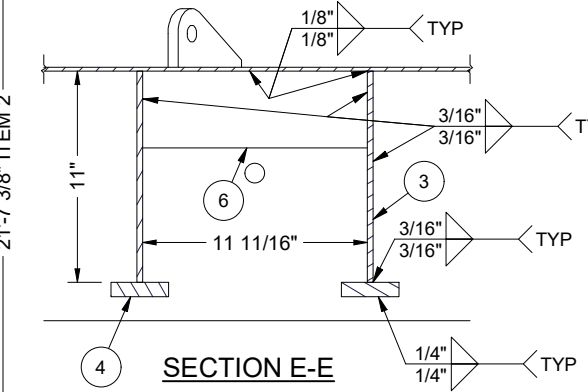
MK# P60236-A-603 - ISO VIEW



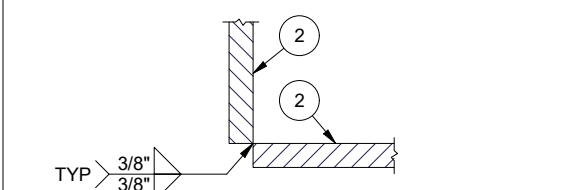
MK# P60236-A-602 - TOP VIEW
TOP PLATE DIMENSIONS



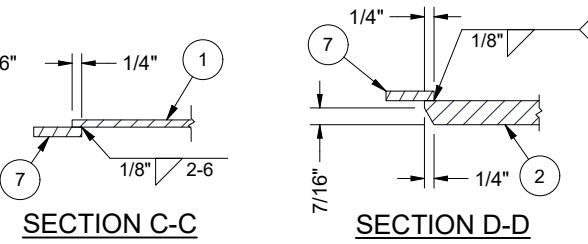
MK# P60236-A-602 - BOTTOM VIEW
TOP PLATE DIMENSIONS



SECTION E-E

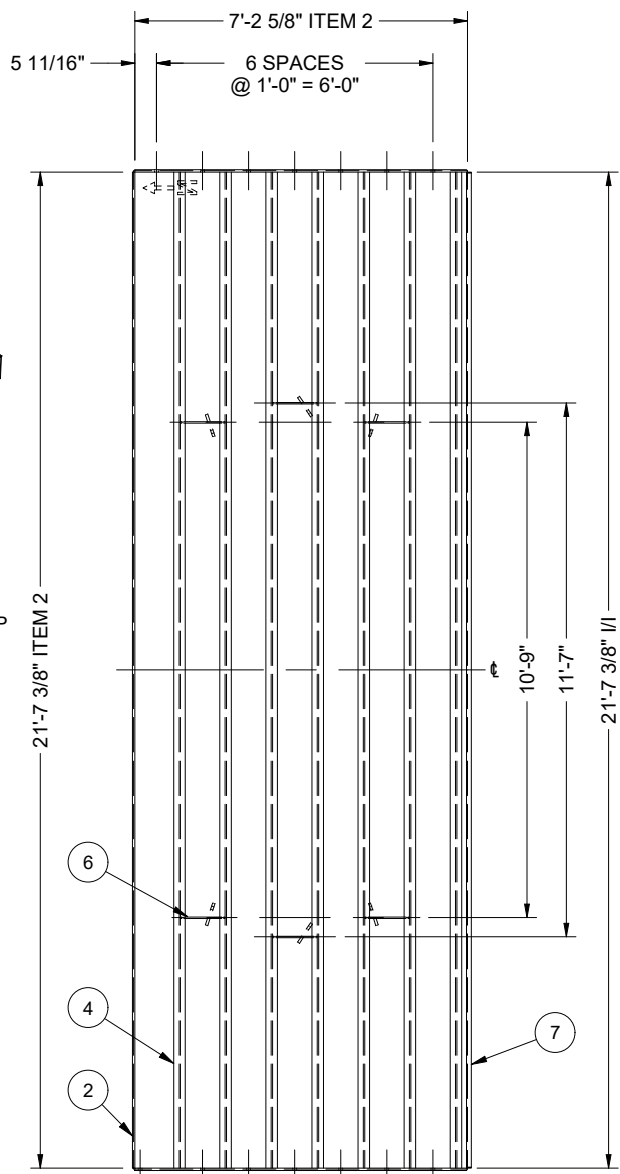


SECTION F-F

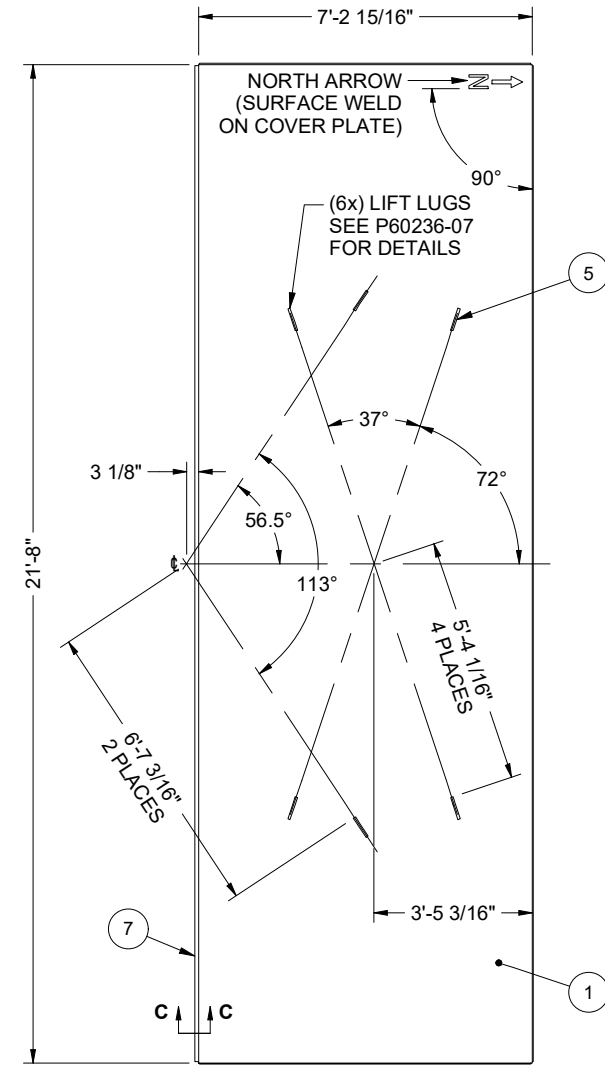


SECTION C-C

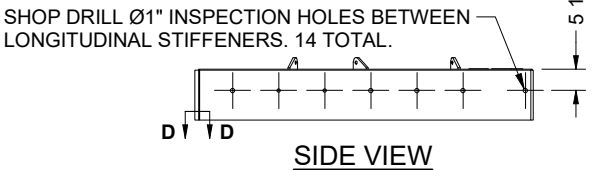
SECTION D-D



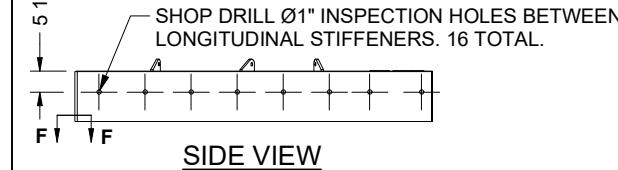
MK# P60236-A-603 - BOTTOM VIEW
TOP PLATE DIMENSIONS



MK# P60236-A-603 - TOP VIEW
TOP PLATE DIMENSIONS



SIDE VIEW

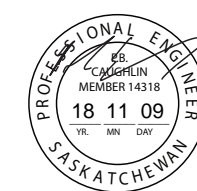


SIDE VIEW

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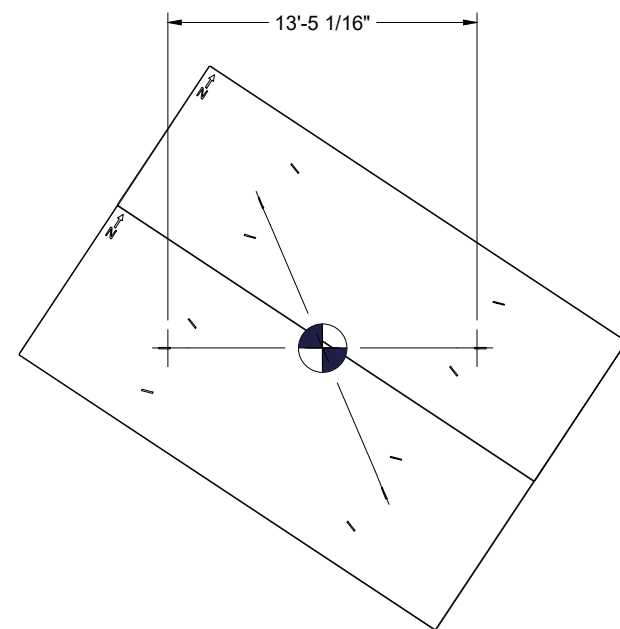
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
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P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



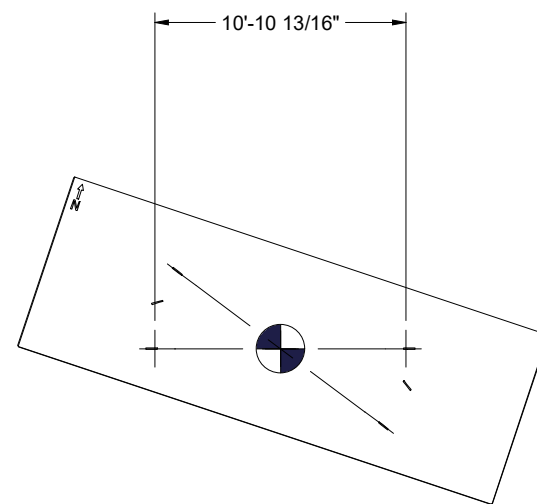
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 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]



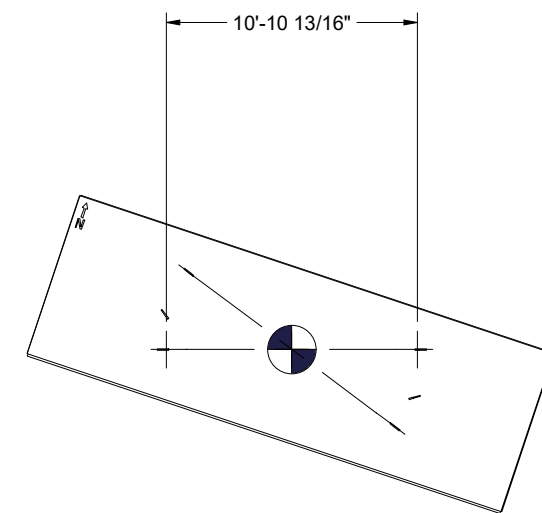
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 3 OPENING
 TOP SECTION COVERS
 LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 6
 DWG. NO.: P60236-06-4



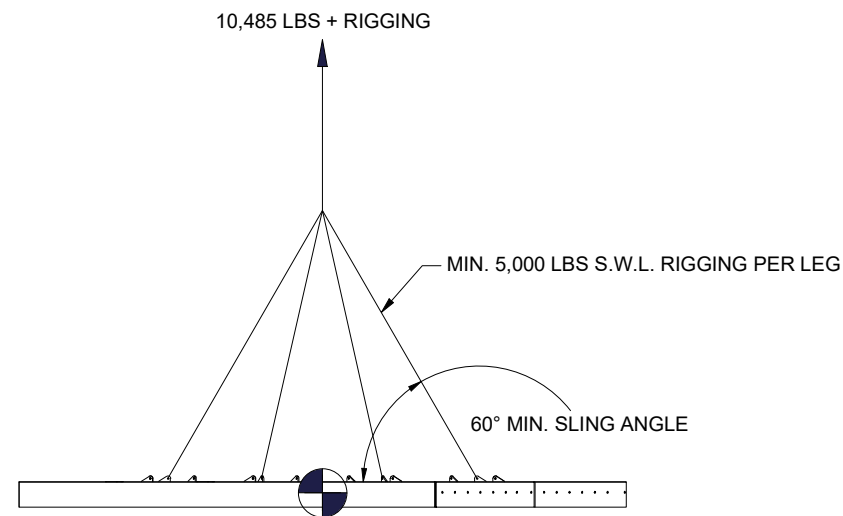
TOP COVER LIFTING DIAGRAM
MK# P60236-A-601



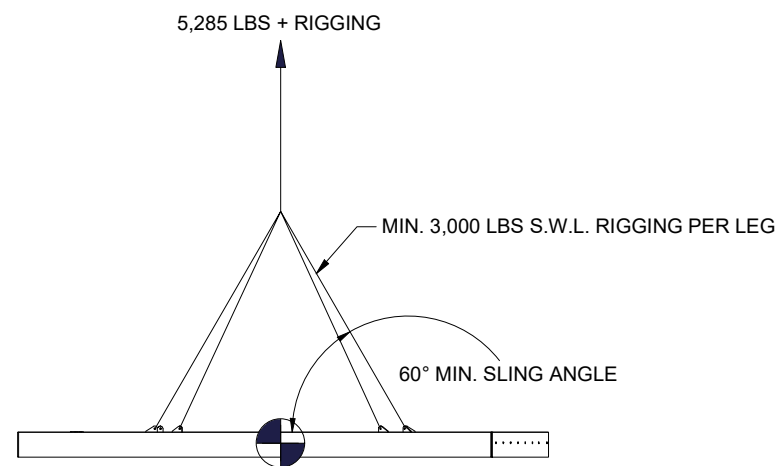
COVER SECTION 1 LIFTING DIAGRAM
MK# P60236-A-602



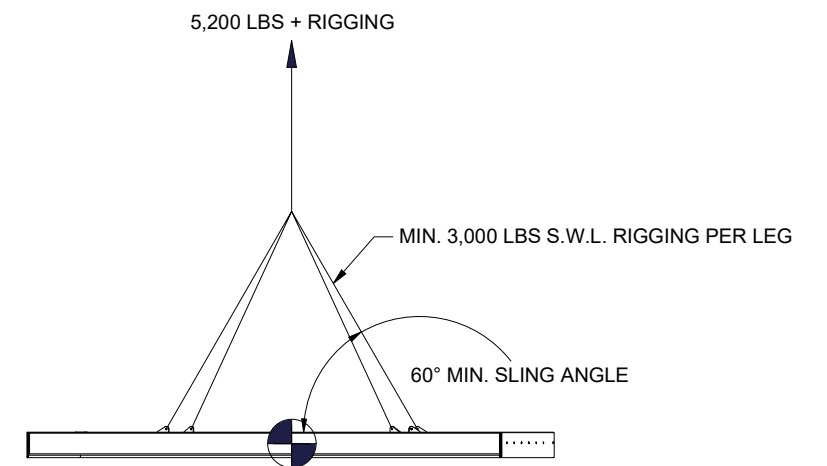
COVER SECTION 2 LIFTING DIAGRAM
MK# P60236-A-603



TOP COVER LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-601



COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-602



COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-603

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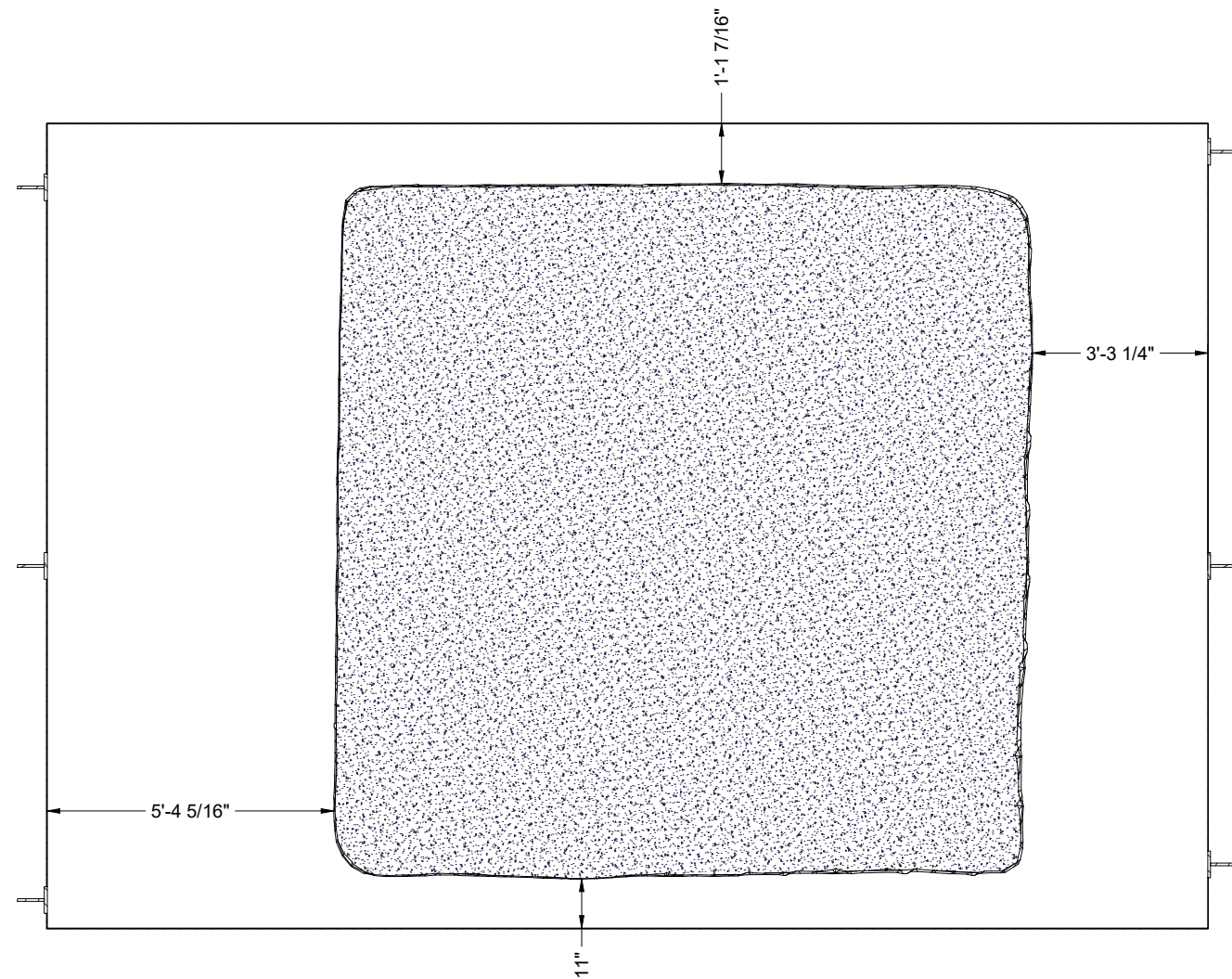
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
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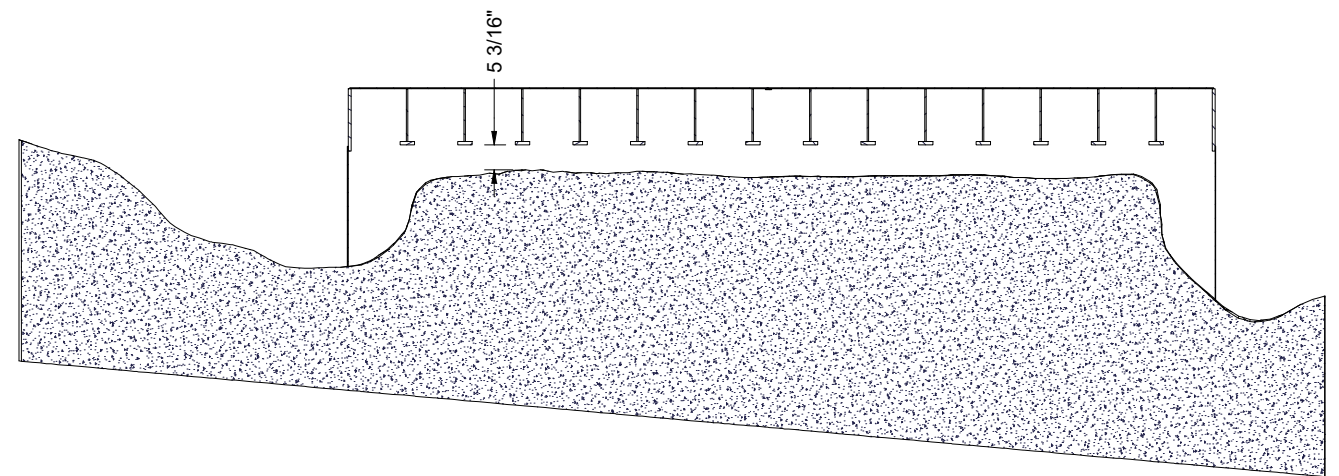
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Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 3 OPENING
LIFTING DETAILS
LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ
DO NOT SCALE DRAWINGS
SHEET NO.: 5 OF 6
DWG. NO.: P60236-06-5



OPENING TO SKIRT CLEARANCE



OPENING TO TOP COVER CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₁₆ MACHINED SURFACES: ¹²⁵ / ₁₆ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	CN	DRWN BY: CN DATE: 08/Nov/17
P60236-07	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	CN	CHK'D BY: ENG BY: PC



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 Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 3 OPENING CLEARANCES
 LOCATION: 59° 34' 1.6"N 108° 25' 17.8"W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 6 OF 6
 DWG. NO.: P60236-06-6

VERNA 8 – Verna Manway



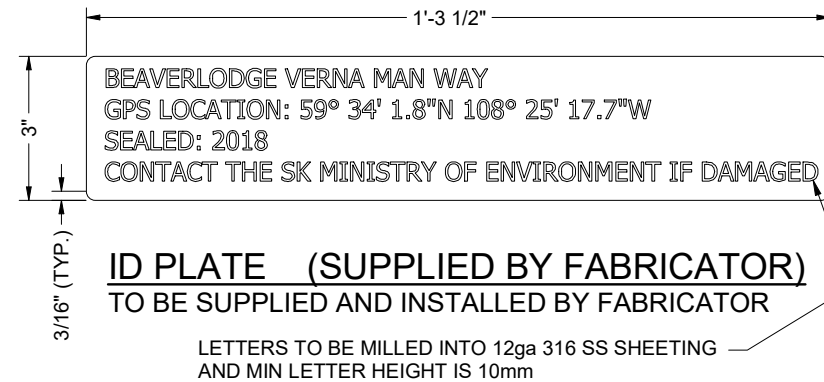
VERNA 8 – Verna Manway

GENERAL NOTES:

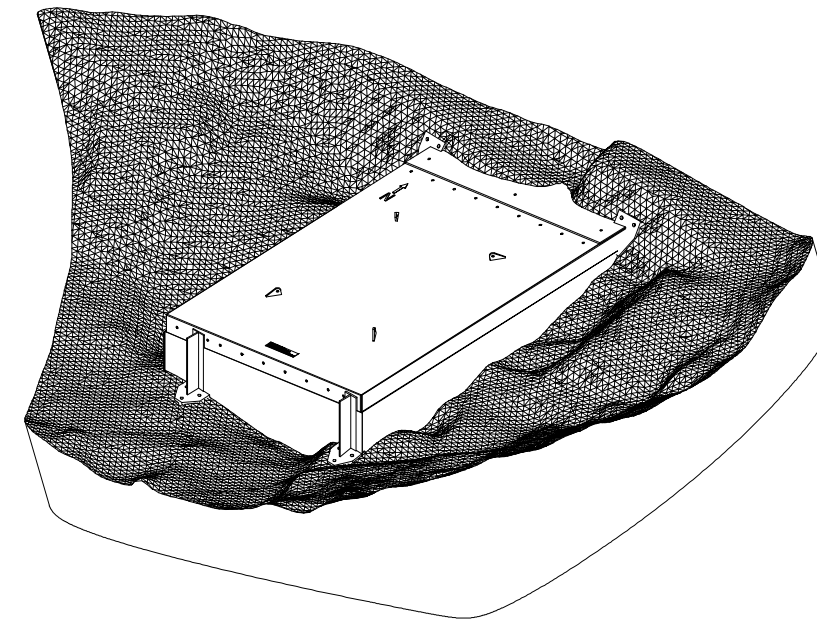
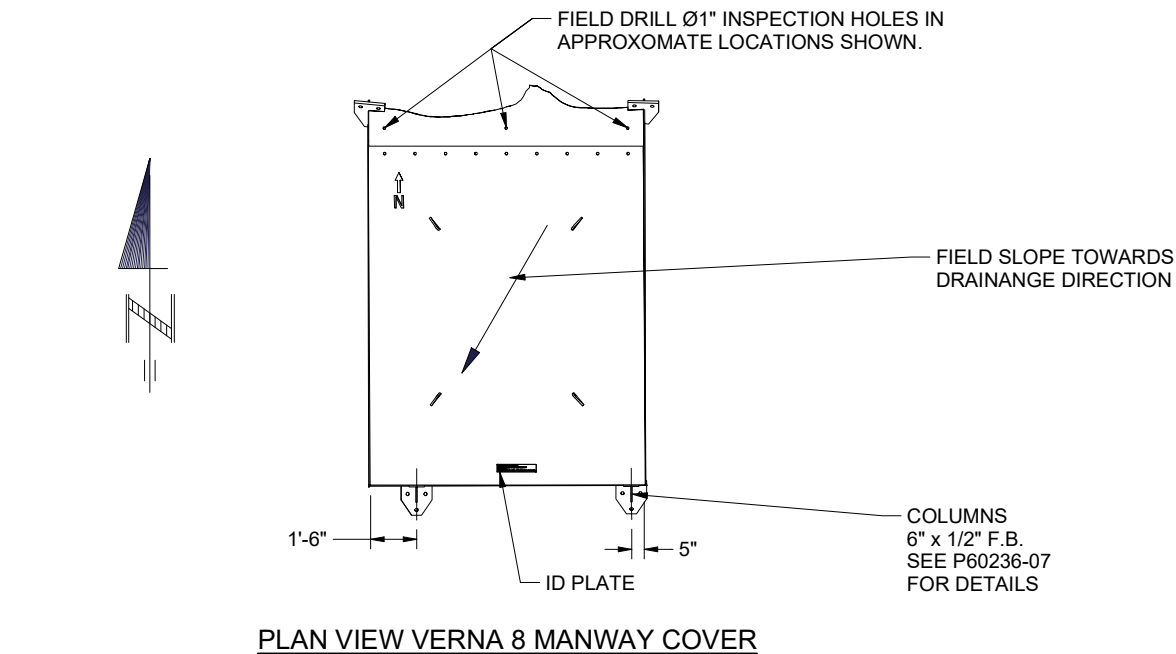
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. CERTIFICATION REQUIRES A NEW SERIAL NUMBER TO BE PROVIDED BY KOVA ENGINEERING (SASKATCHEWAN) LTD. FOR EACH NEW UNIT MADE.
10. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
11. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
12. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
13. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
14. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
15. SEE DRAWING P60236-07 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3kN (4,800 LB) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED STAINLESS STEEL. THEREFORE, KOVA HAS DESIGNED THE COVER CONSIDERING A 1mm CORROSION ALLOWANCE ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS AN INSPECTION BE PERFORMED BY A QUALIFIED ENGINEER AT LEAST ONCE EVERY 20 YEARS OR FOLLOWING NOTIFICATION OF VISUAL DAMAGE
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 3,445 LB
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
TOP COVER ASSEMBLY W/O RIGGING: 2,660 LB
AS INSTALLED: 3,445 LB

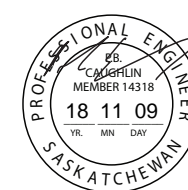


ISO VIEW
LOOKING NORTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.

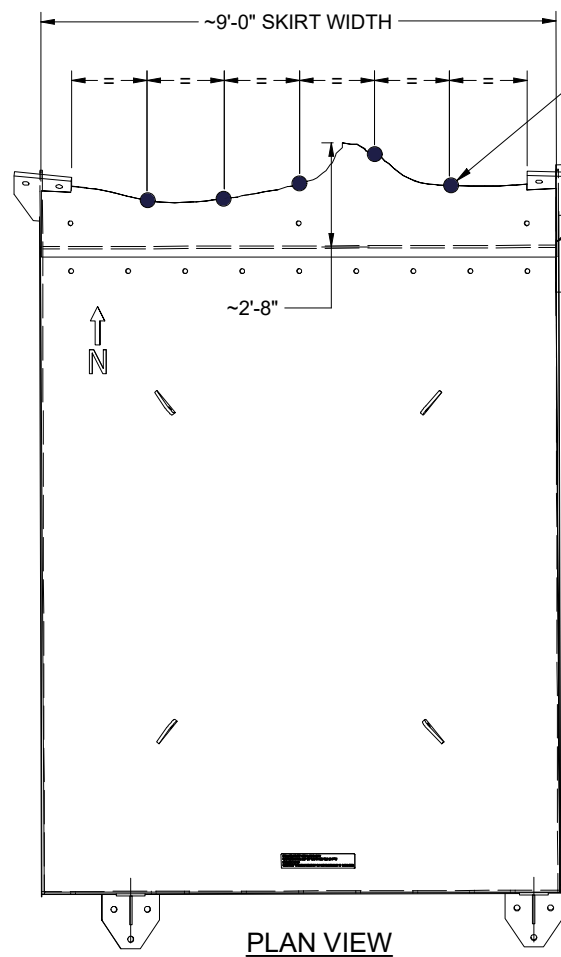


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Number C672
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Discipline Sk. Reg. No. Signature
Structural 14318



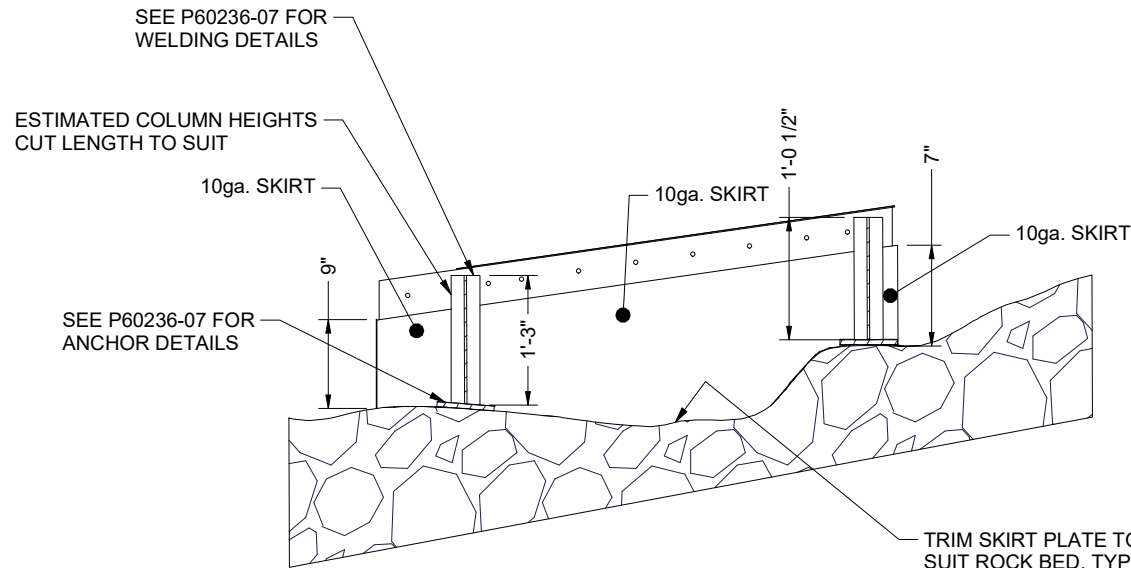
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 8 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59° 34' 1.8"N 108° 25' 17.7"W, NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 4 DWG. NO.: P60236-05-1

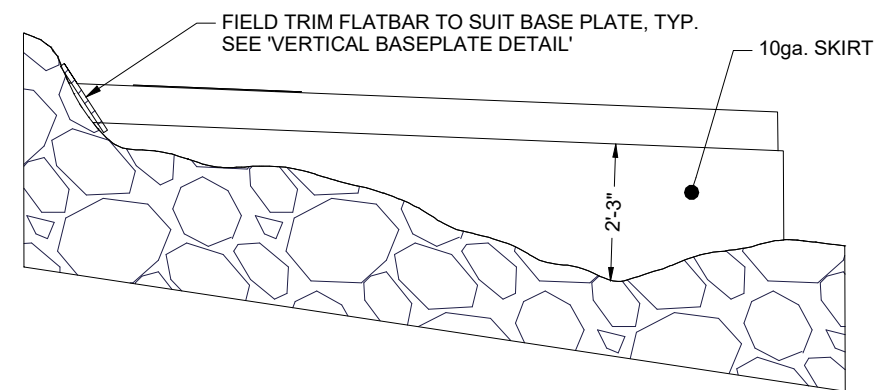


PLAN VIEW

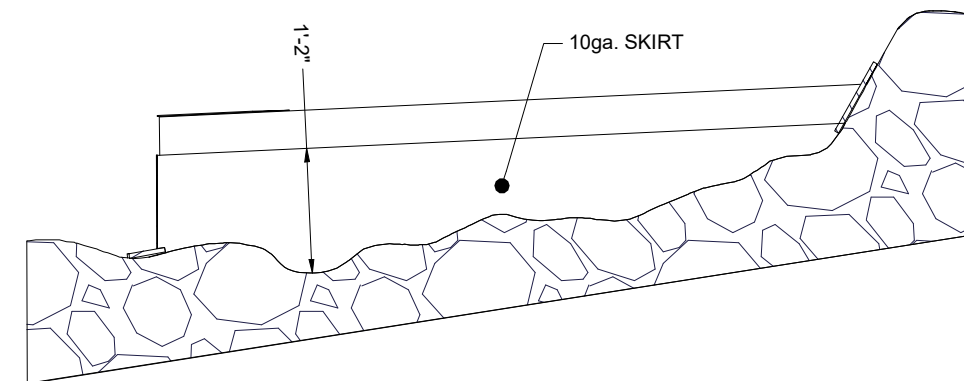
ESTIMATED TOTAL COLUMN LENGTH 52" WITHOUT SCRAP OR EXTRA. KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE OF INSTALLATION CONTRACTOR. SIX (2) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.



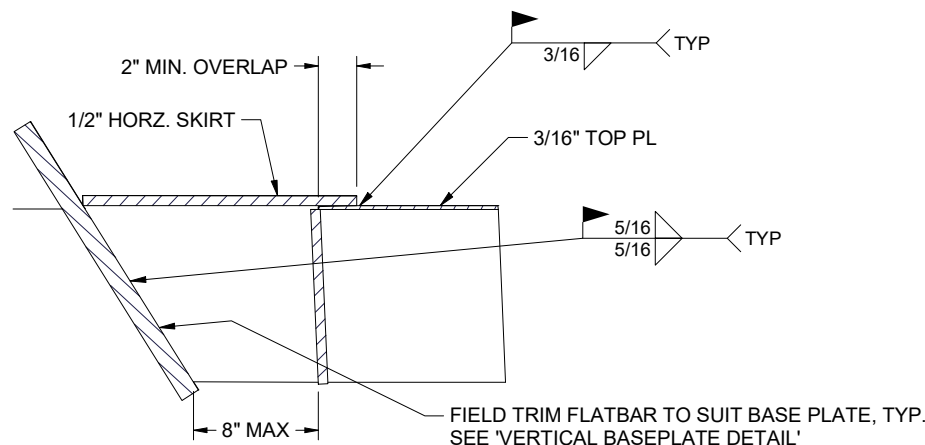
ELEVATION LOOKING NORTH



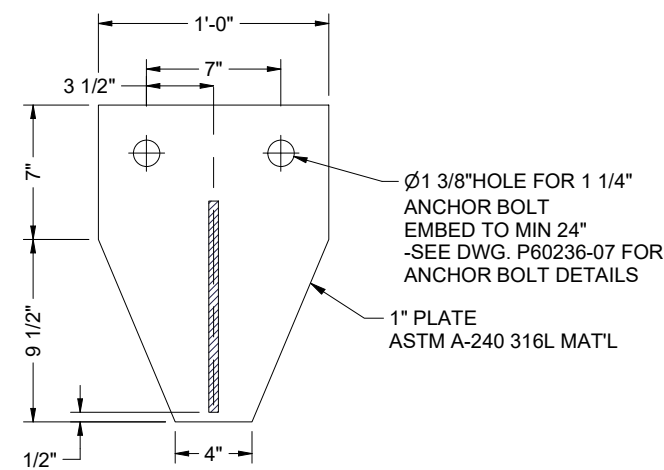
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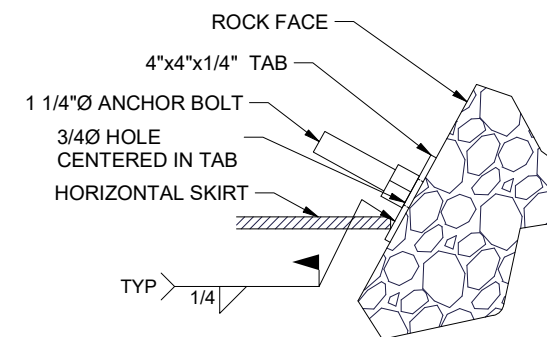
ELEVATION LOOKING WEST



SECTION A-A



VERTICAL BASEPLATE DETAIL
2X REQUIRED



DETAIL 1
HORIZONTAL SKIRT ANCHORS

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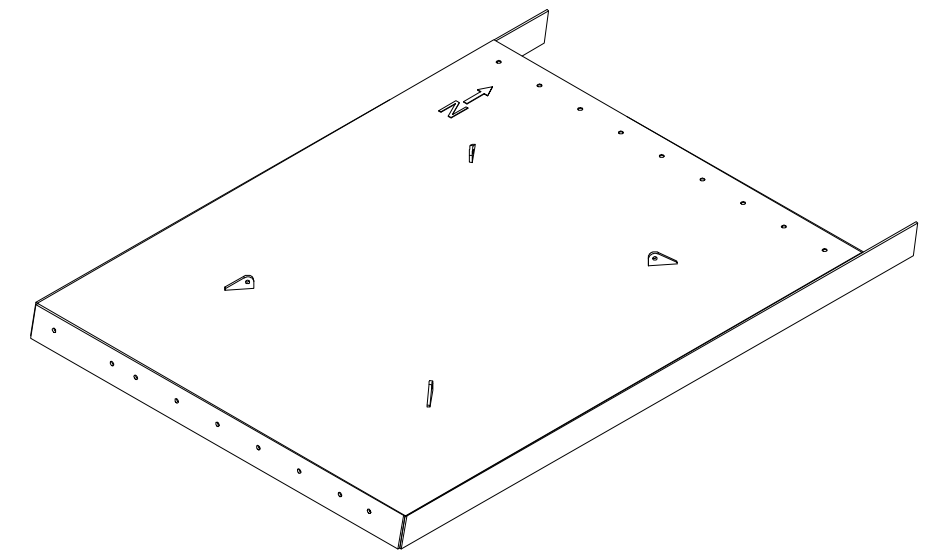
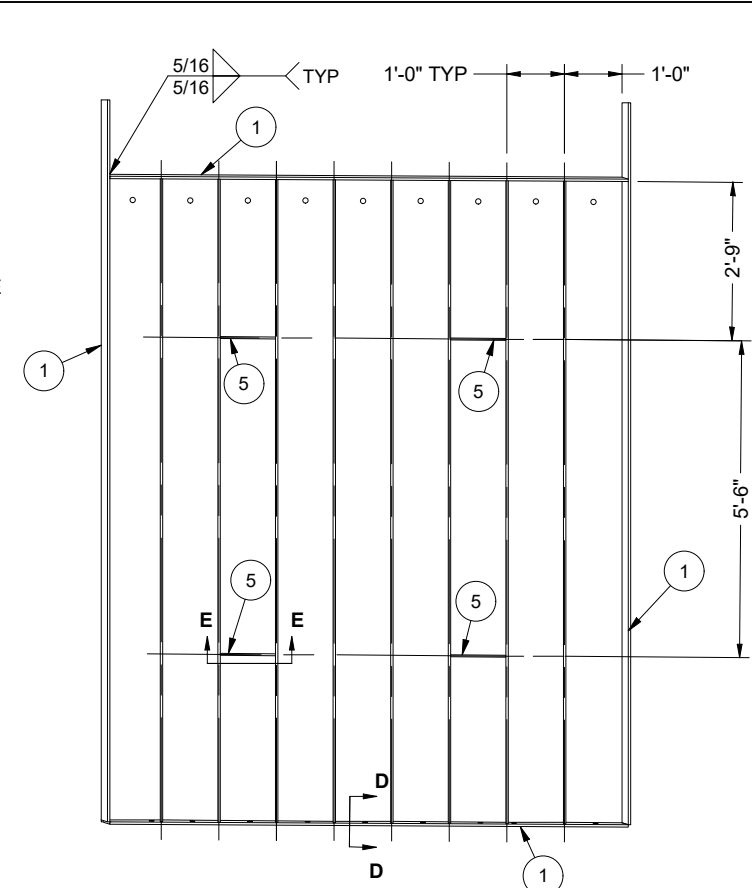
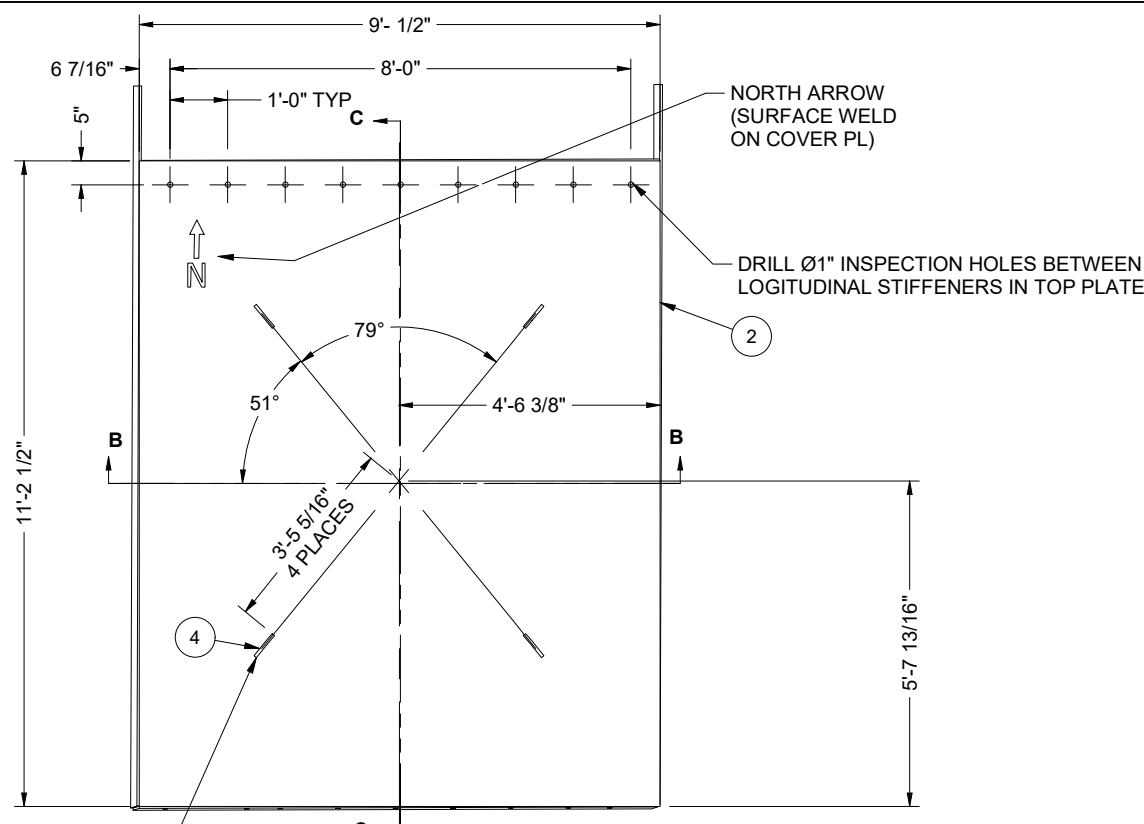
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		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



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Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]



PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 8 OPENING
ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
LOCATION: 59° 34' 1.8"N 108° 25' 17.7"W, NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ
DO NOT SCALE DRAWINGS
SHEET NO.: 2 OF 4
DWG. NO.: P60236-05-2

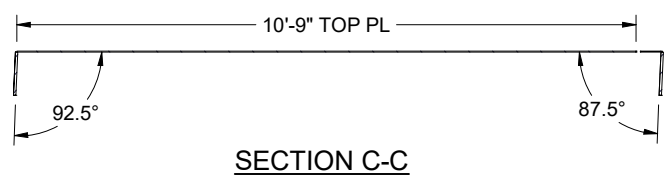
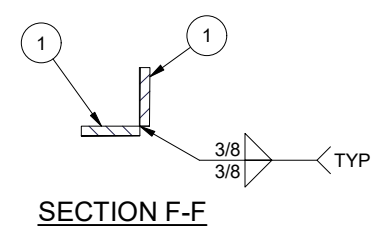
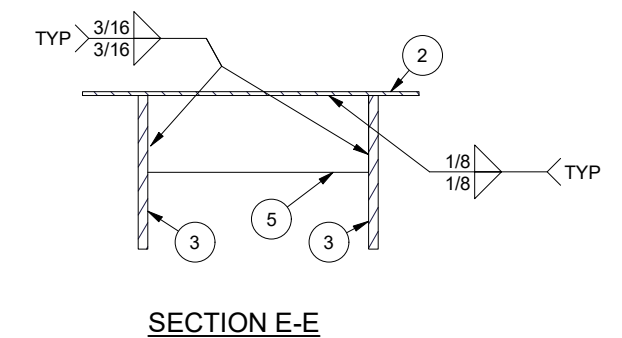
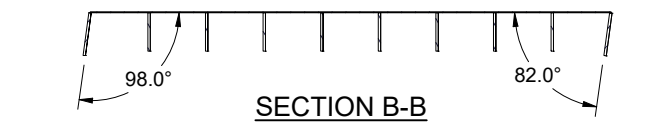
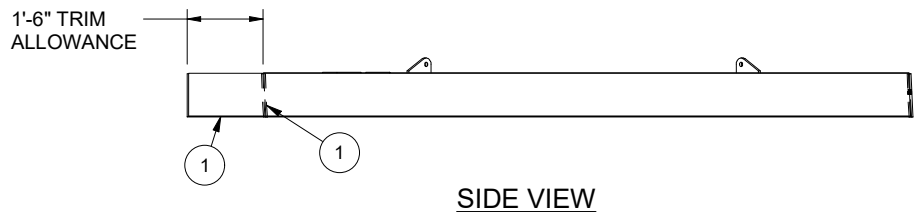
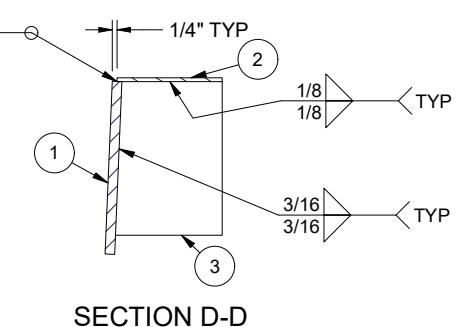
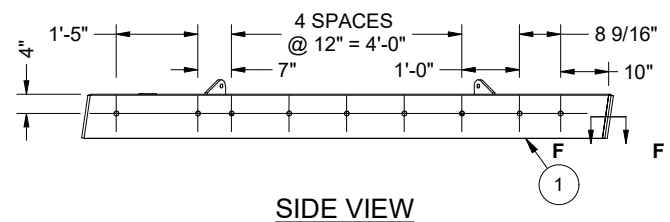


BILL OF MATERIALS		
ITEM	DESCRIPTION	MATERIAL
1	9"x1/2" FB	ASTM A-240 316
2	3/16" PL	ASTM A-240 316
3	8"x1/2" FB	ASTM A-240 316
4	5/8" PL	ASTM A-240 316
5	4"x3/8" FB	ASTM A-240 316

P60236-A-501
TOP PLATE DIMENSIONS

P60236-A-501
STIFFENER LAYOUT

P60236-A-501 - ISO VIEW



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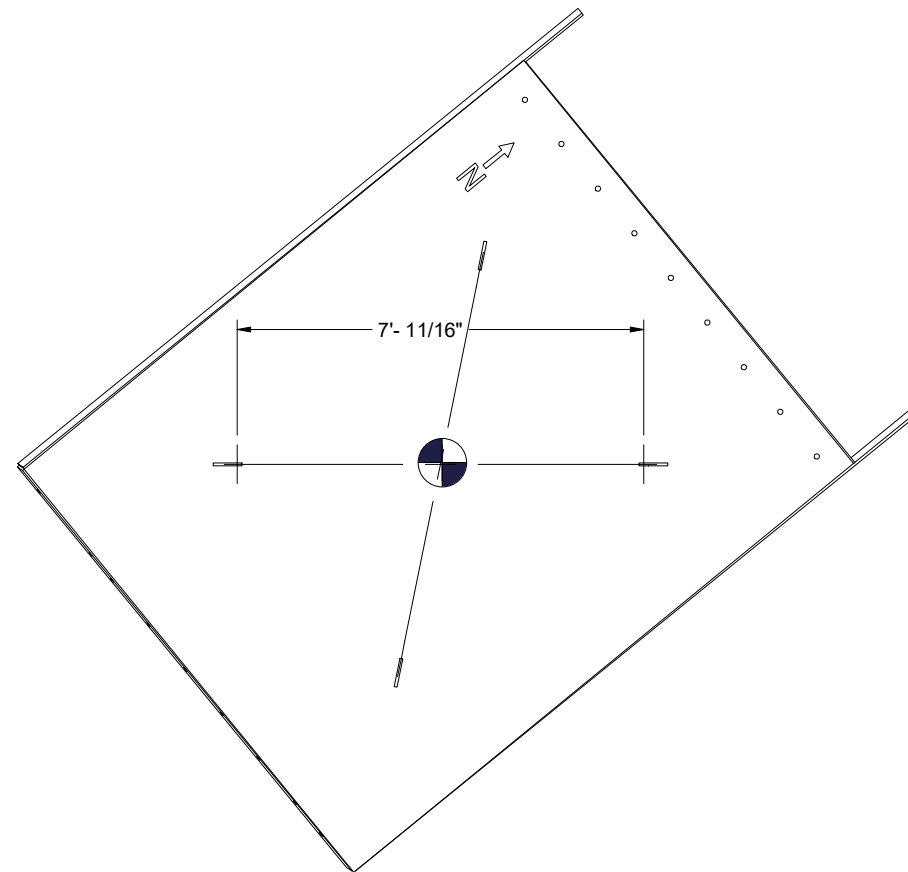
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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
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		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
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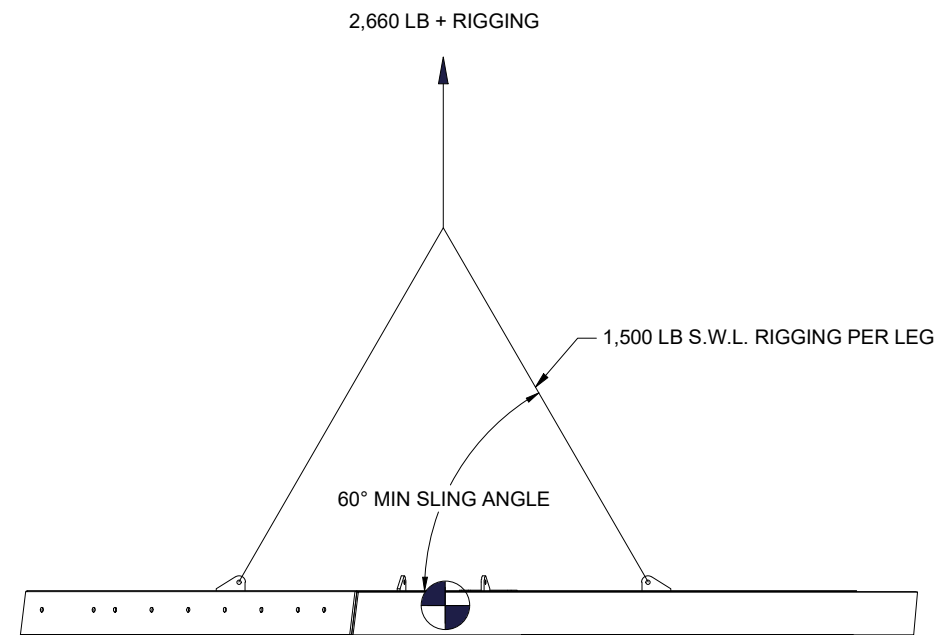


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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No.: 14318 Signature: [Signature]

Kova Engineering
 Saskatchewan Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 8 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 34' 1.8"N 108° 25' 17.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 4
 DWG. NO.: P60236-05-3



TOP COVER LIFTING DIAGRAM
P60236-A-501



TOP COVER LIFTING DIAGRAM - SIDE VIEW
P60236-A-501

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₁₆ MACHINED SURFACES: ¹²⁵ / ₁₆ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS BUILT DETAILS	09/Nov/18	NR	
		△	ISSUED FOR CONSTRUCTION	04/Jan/18	AR	DRWN BY: AR DATE: 08/Nov/17
P60236-07	KOVA DWG. - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/17	AR	CHK'D BY: ENG BY: P.C.



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 Structural 14318



PROJECT: PERMANENT COVER FOR BEAVERLODGE Verna 8 OPENING
 LIFTING DETAILS
 LOCATION: 59° 34' 1.8"N 108° 25' 17.7"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 4
 DWG. NO.: P60236-05-4



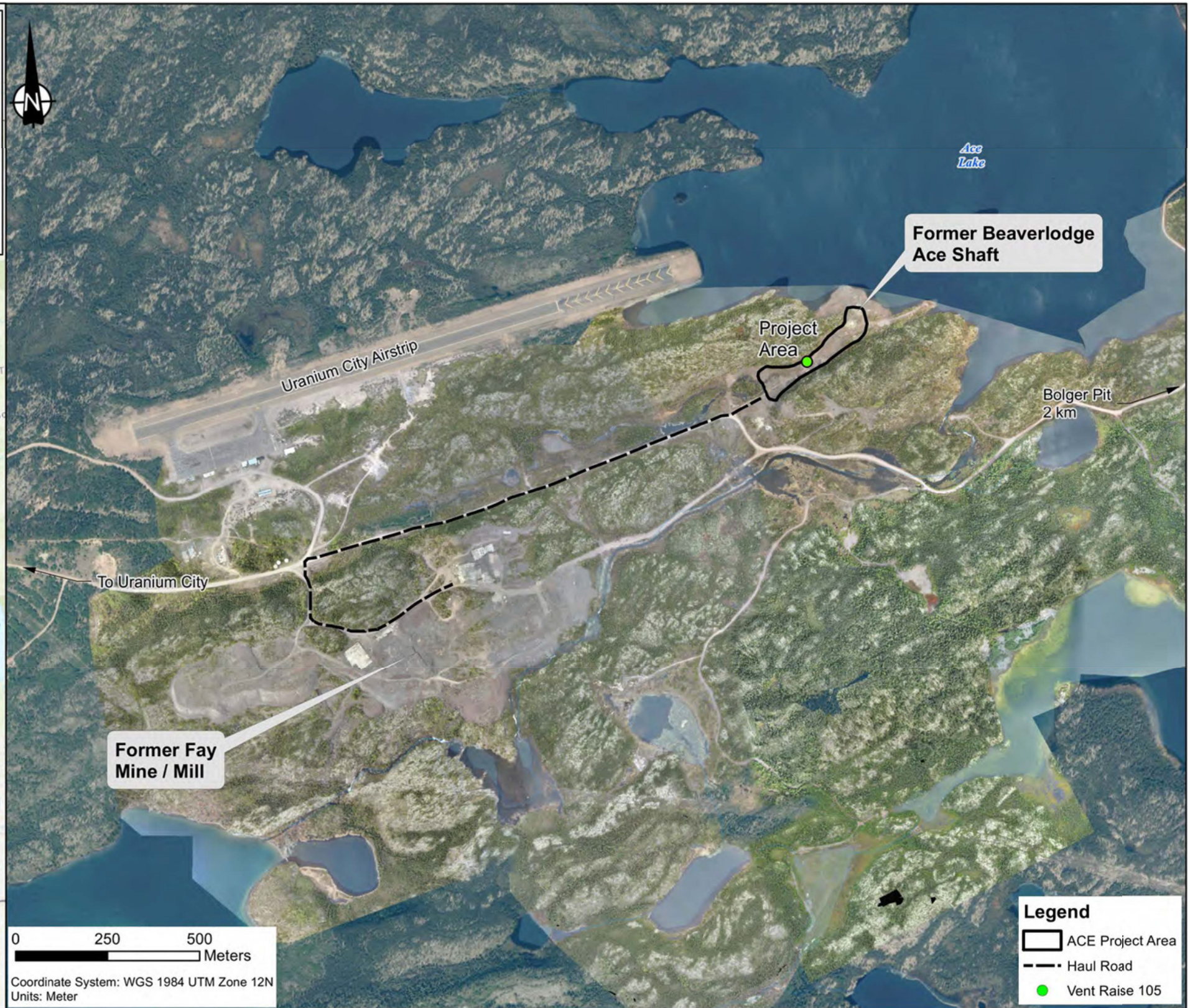
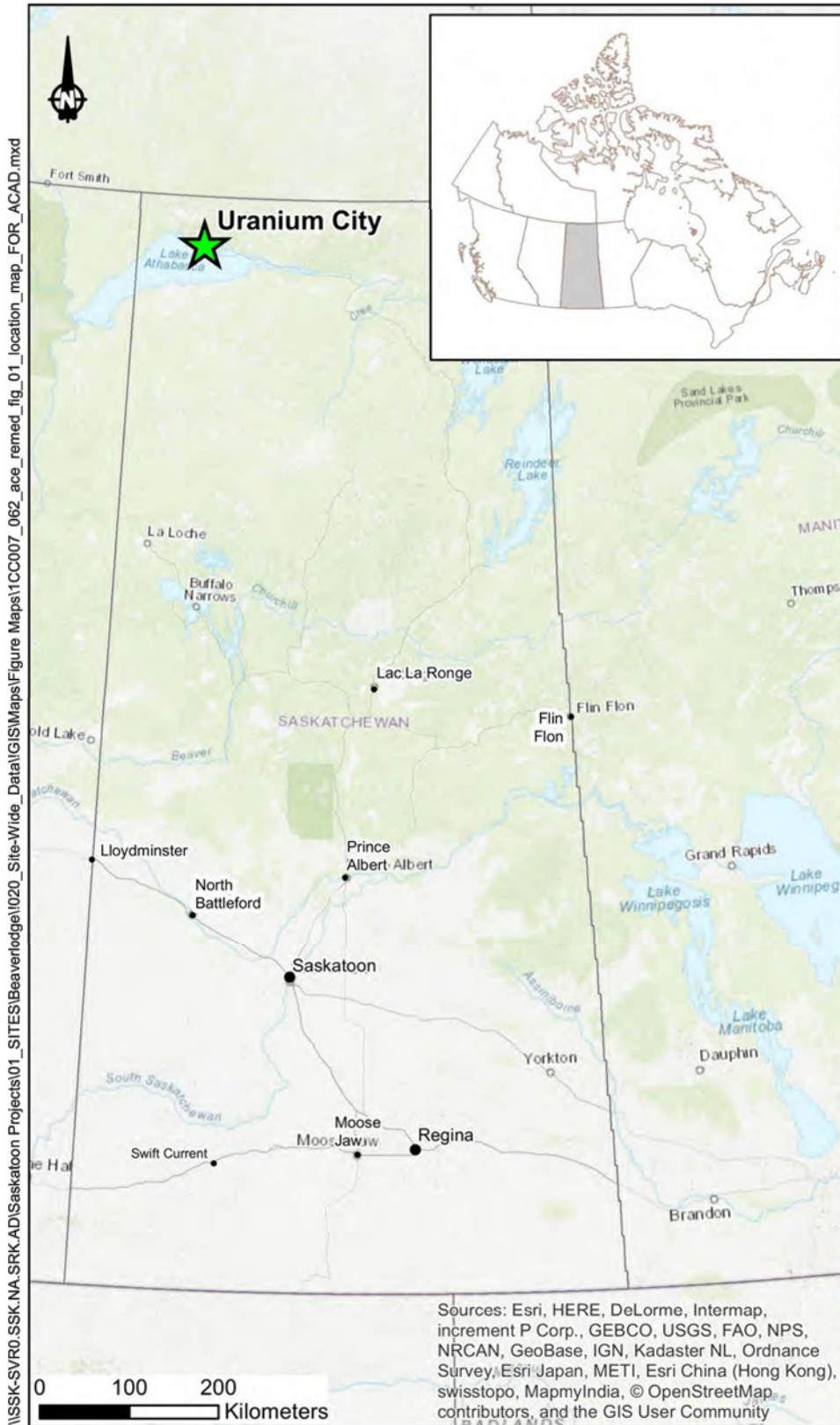
Beaverlodge Ace Mine Property

Ace Vent Raise 105 Closure Cap Design

Active Drawing Status	Drawing Title	Rev	Date
ACE18-00	Title Sheet	AB-1	February 19, 2019
ACE18-01	Project Location Map	AB-1	February 19, 2019
ACE18-02	As-Built General Arrangement Site Plan	AB-1	February 19, 2019
ACE18-03	As-Built Plan and Sections	AB-1	February 19, 2019
ACE18-04	Vent Raise CAP As-Built Construction Steps	AB-1	February 19, 2019
ACE18-05	Completion of North Berm As-Built Construction Steps	AB-1	February 19, 2019

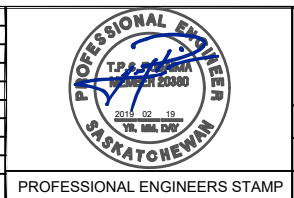


Project Number: 2CC009.007
 Date: February 19, 2019
 Drawing Number: ACE18-00



P:\01_SITES\Beaverlodge\1040_AutoCAD\Ace Vent Raise Closure Design\2009.007 - Site Plan.dwg

DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHKD	APPD	DATE	NO.	DESCRIPTION	CHKD	APPD	DATE
REFERENCE DRAWINGS											
REVISIONS											
AB-1	As-Built			TPP	MWL	19/02/19					
A	Issued for Review			TPP	BM	18/01/29					



srk consulting

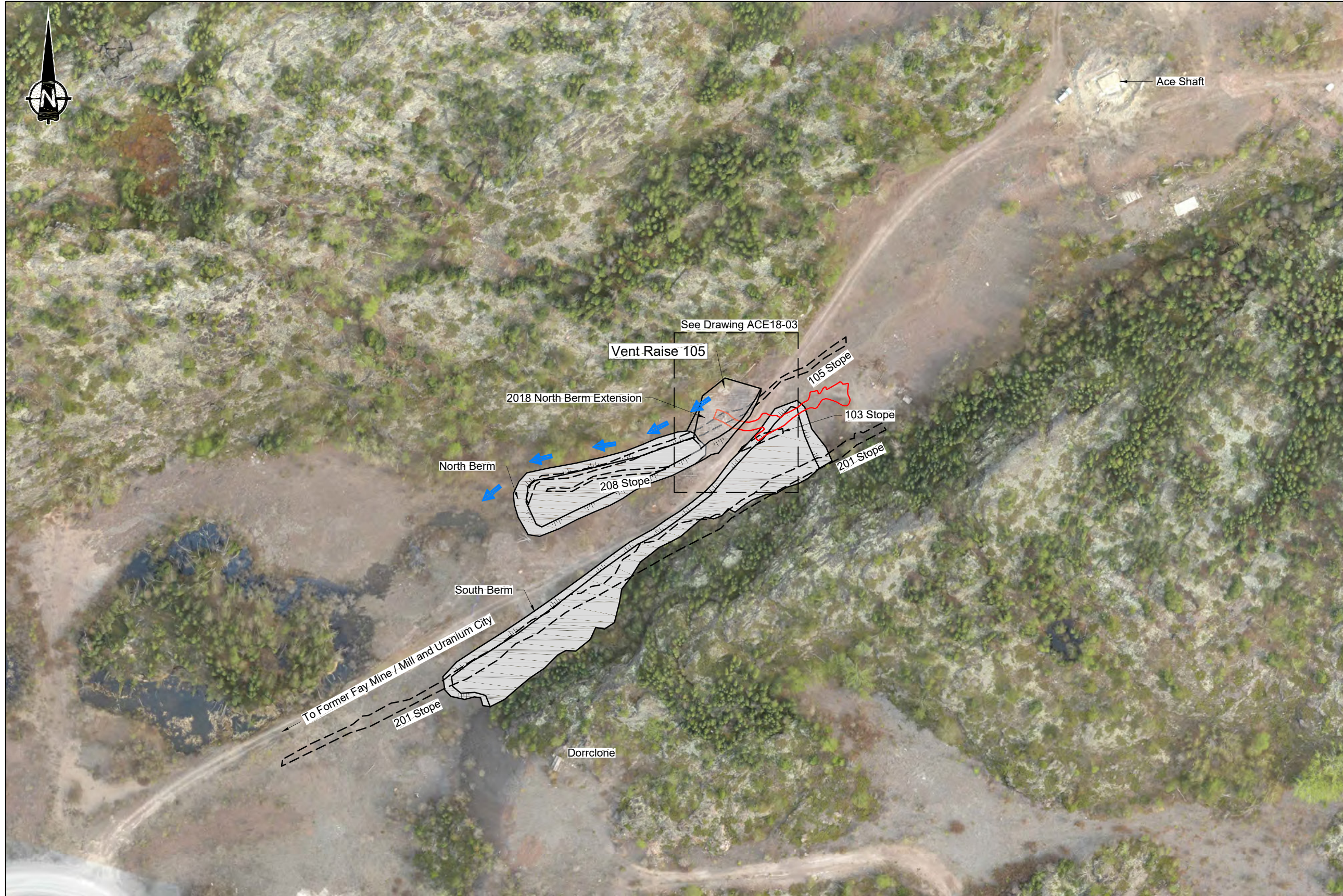
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CHECKED:	TPP	APPROVED:	MWL	DATE:	2019/02/19

FILE NAME: 2CC009.007 - Site Plan.dwg

Cameco
Beaverlodge

SRK JOB NO.: 2CC009.007

Ace Subsidence and Vent Raise 105 Remediation		
DRAWING TITLE: Project Location Map		
DRAWING NO. ACE18-01	SHEET 2 OF 5	REVISION NO. AB-1



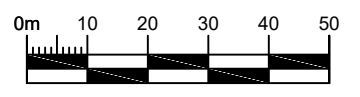
LEGEND

- Flow Direction
- Vertical Projection of Stope Outline
- 105 Stope, Elev. 265.5m
- Interim As-Built of North and South Berms
- As-Built Extents of North Berm Extension and Ace #7 #105 Closure Cap

- NOTES**
1. Interim as-built crests and toes of North and South berms are based on the August 31, 2016 survey. This survey was completed using a Leica Global Navigation Satellite System (GNSS/GPS) unit. The North Berm Extension as-built toes and crests are based on the August 24, 2018 survey, which was completed using a handheld GPS.
 2. A vertical projection method from the Stope Back was used to locate the stopes. (SRK Memo, Beaverlodge Property Ace Mine - 2016 Subsidence Remediation - Optimization Study, August 2016).
 3. 105 Stope Elev. 265.5m digitized from Eldorado Mining and Refining Ltd. Beaverlodge Operation. "105 #2 Raise", drawn by KAR, July 26.

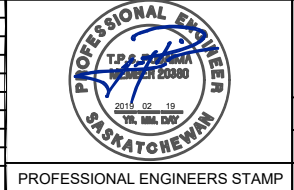
REFERENCE

NAD83 UTM Zone 12.
SRK Drone Imagery, 2016.



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REVISIONS											
AB-1	As-Built			TPP	MWL	19/02/19					
A	Issued for Review			TPP	BM	18/01/29					



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 CHECKED: TPP APPROVED: MWL DATE: 2019/02/19

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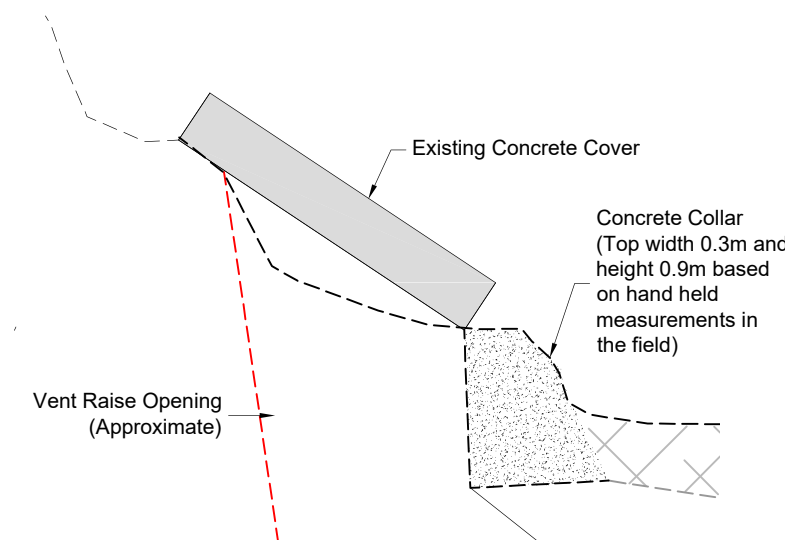
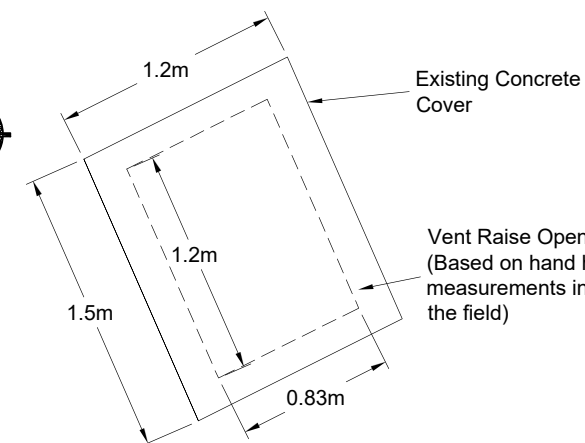
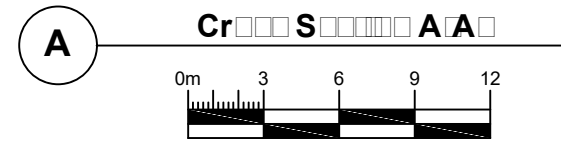
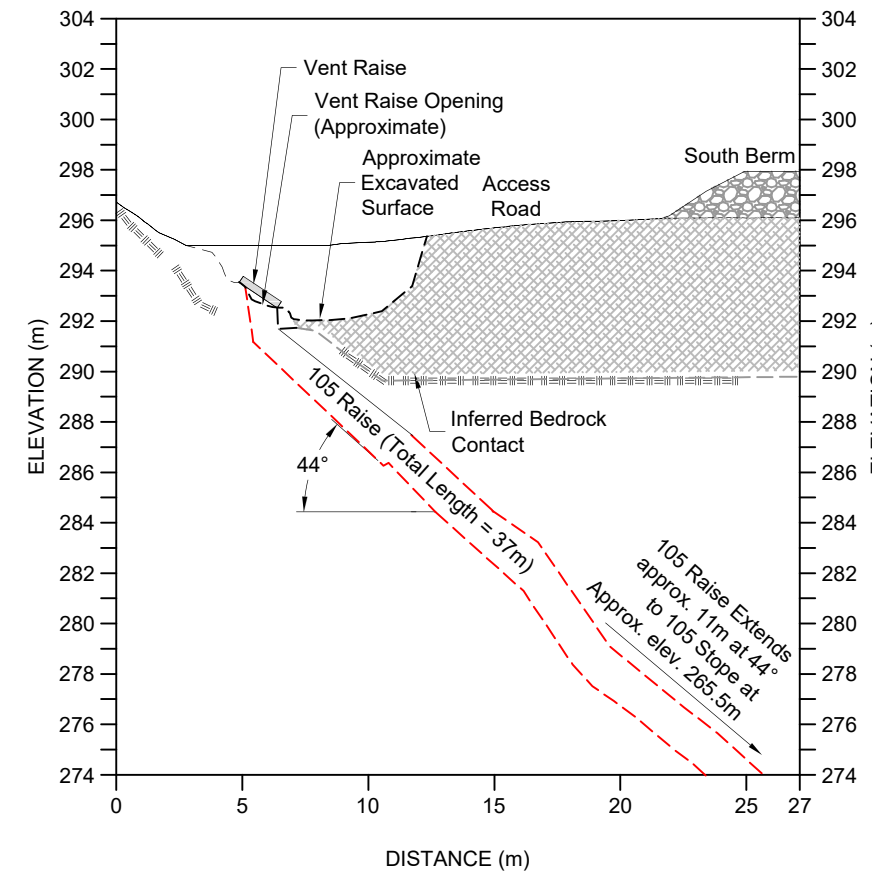
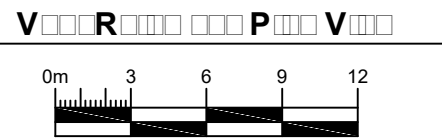
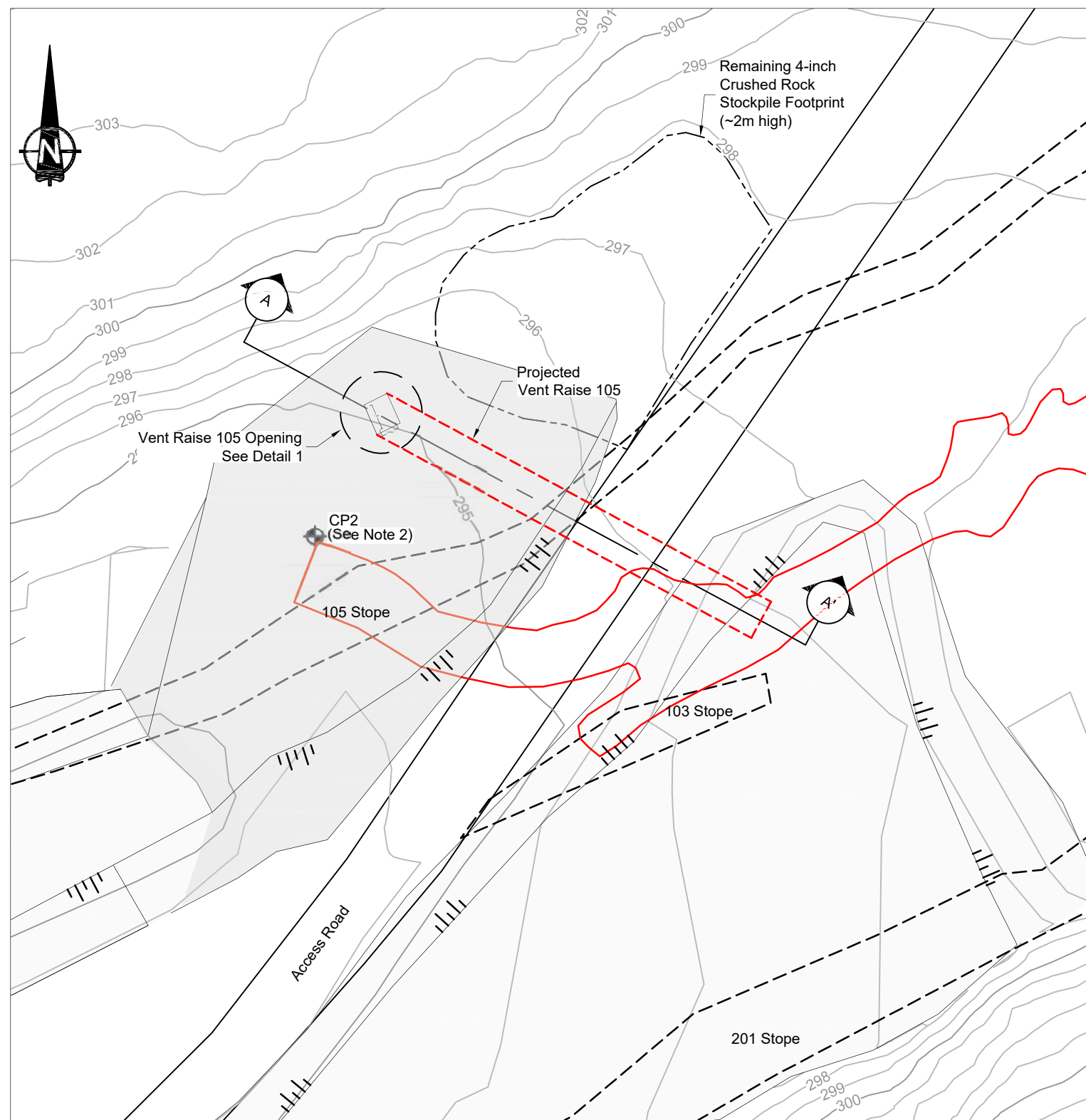
Cameco
Beaverlodge

SRK JOB NO.: 2CC009.007

Ace Subsidence and Vent Raise 105 Remediation

DRAWING TITLE:
As-Built General Arrangement Site Plan

DRAWING NO.: ACE18-02 SHEET 3 OF 5 REVISION NO. AB-1



- LEGEND**
- Overburden, Mine Waste Rock and Tailings
 - Berm Backfill
 - Stockpile Footprint
 - 105 Stope, Elev. 265.5m
 - Vertical Projection of Stope Outline
 - Bedrock

- NOTES**
1. Underground and 105 Raise extents were digitized using Cross Section 5+25W from the "Beaverlodge Property Ace Mine - 2016 Subsidence Remediation - Optimization Study" dated March 1, 2017
 2. CP2 is a projected vertical drill hole that hit a void 8.3m below ground surface / drill hole collar (1983 Surface Pillar Investigation). It also denotes overburden thickness
 3. Vent raise opening location surveyed by SRK Consulting, July 2016.
 4. Bedrock surface in vicinity of Vent Raise 105 based on work completed by Kova Engineering Saskatchewan Ltd. (Drawing Number S17550-03-2, Rev. 0).
 5. 105 Stope Elev. 265.5m digitized from Eldorado Mining and Refining Ltd. Beaverlodge Operation. "105 #2 Raise", drawn by KAR, July 26.

REFERENCE
 Contours shown at 1.0m intervals and are based on 2009-2010 LiDAR survey, 2016 As-built survey by SRK Consulting, and 2018 As-built survey completed using a hand held GPS by SRK Consulting.

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DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
AB-1	As-Built	TPP	MWL	19/02/19							
A	Issued for Review	TPP	BM	18/01/29							



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 CHECKED: TPP APPROVED: MWL DATE: 2019/02/19

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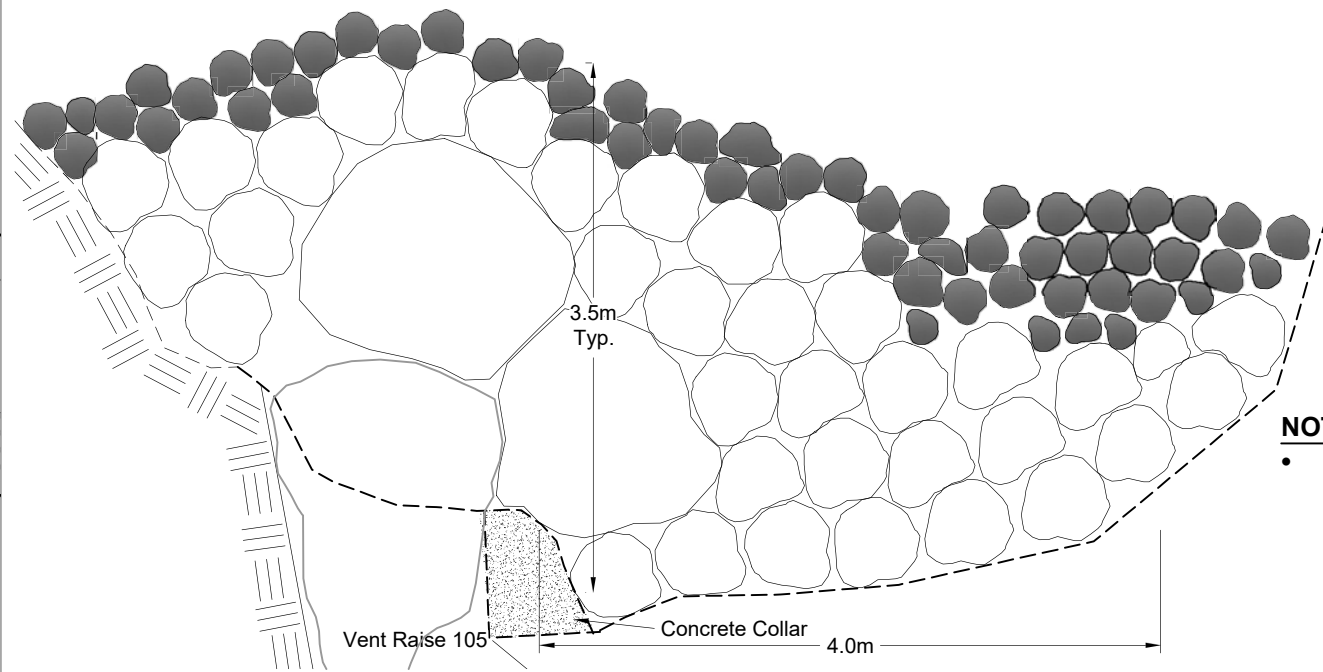
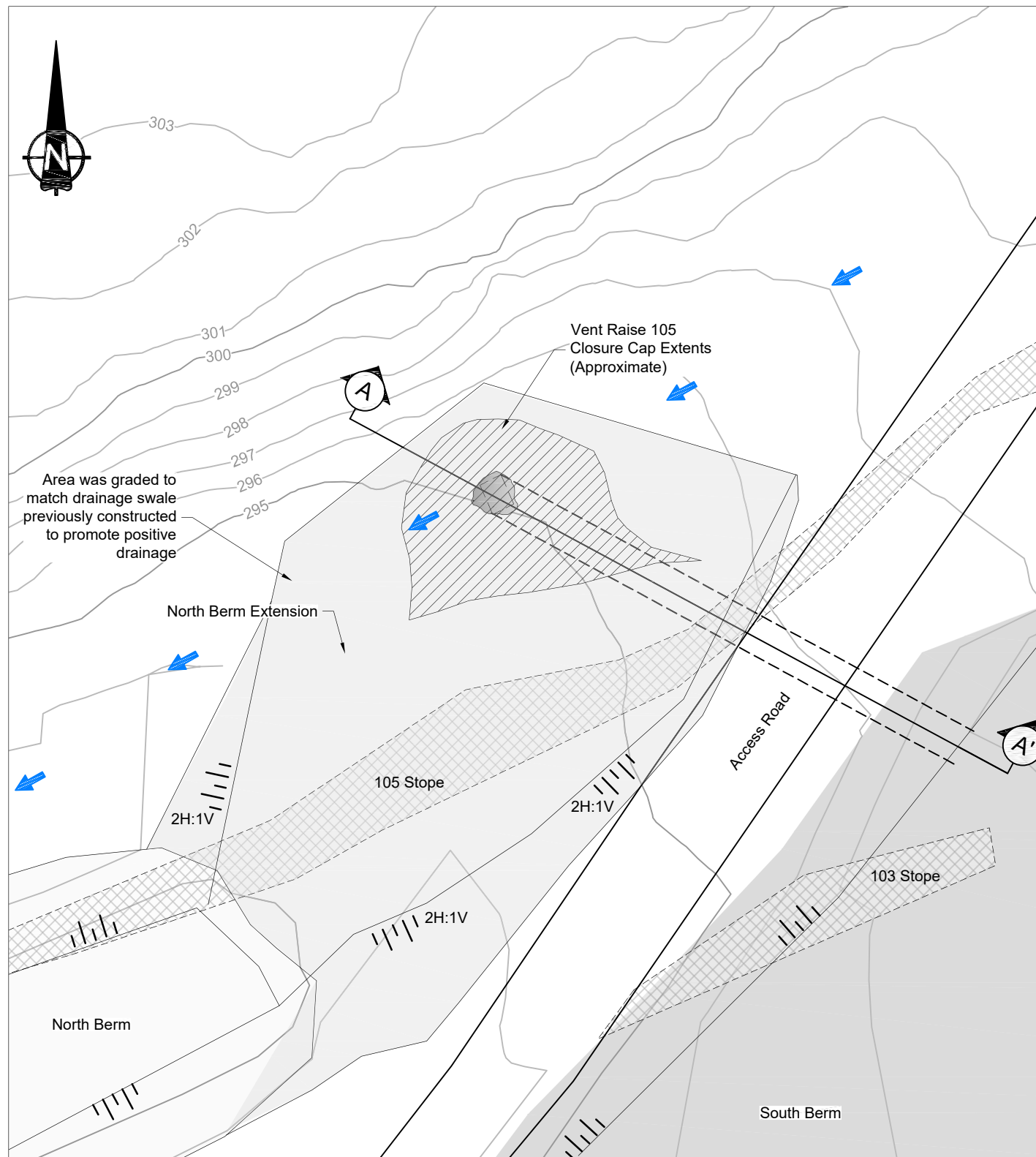
Cameco
 Beaverlodge

SRK JOB NO.: 2CC009.007

Ace Subsidence and Vent Raise 105 Remediation

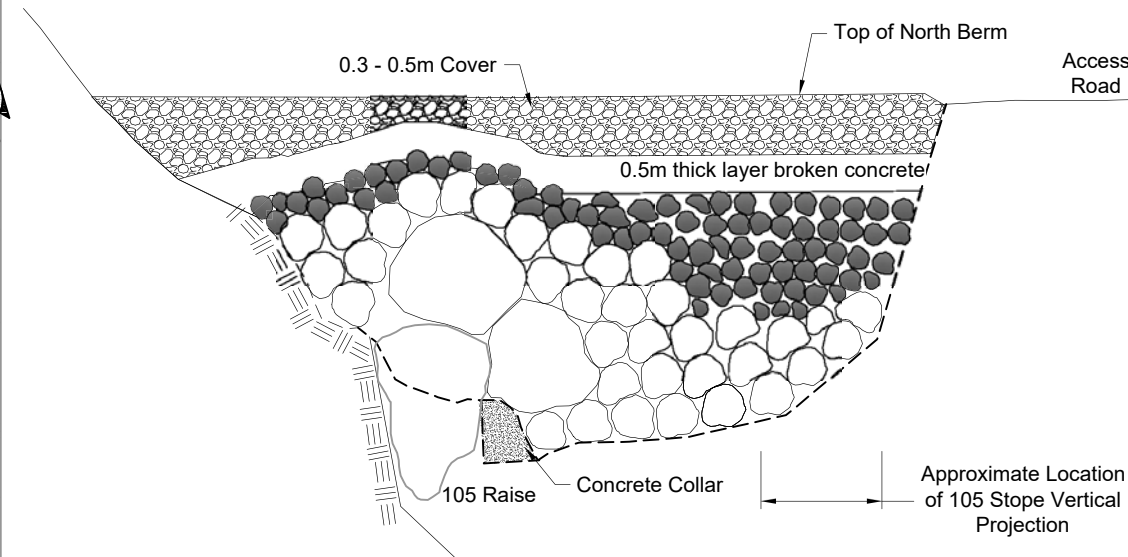
DRAWING TITLE:
Vent Raise Opening Sections and Details

DRAWING NO. **ACE18-03** SHEET **4 OF 5** REVISION NO. **AB-1**



NOTES

- Transition rock with a minimum diameter of 0.3m was placed until the coarse rock was fully encapsulated as shown in Step 5.



NOTES

- The North Berm Extension was completed in accordance with SRK Memorandum "Beaverlodge Property Ace Mine - 2016 Subsidence Remediation - Optimization Study".
- The 4-inch minus crushed rock used as the final cover was already stockpiled on site, which was originally sourced from the Fay Mine Area. The final thickness ranged from 0.3m to 0.5m.

LEGEND

- Flow Direction
- Cover

REFERENCE

Existing ground surface based on 2009-2010 LiDAR survey, and 2016 As-built survey by SRK Consulting.

V R C d N r B r E

S Cr S A A N r B r E

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DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
AB-1	As-Built	TPP	MWL	19/02/19							
A	Issued for Review	TPP	BM	18/01/29							



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DESIGN: TPP DRAWN: TAH REVIEWED: TPP

CHECKED: TPP APPROVED: MWL DATE: 2019/02/19

FILE NAME: 2CC009.007 - Cover Design.dwg

Cameco

Beaverlodge

SRK JOB NO.: 2CC009.007

Ace Subsidence and Vent Raise 105 Remediation		
DRAWING TITLE:		
Completion of North Berm As-Built Construction Steps		
DRAWING NO.	SHEET	REVISION NO.
ACE18-05	5 OF 5	AB-1

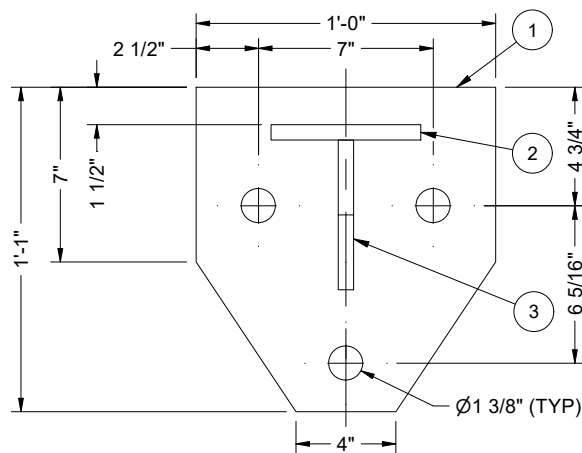
2019 Cover Installations

2019 Stainless Steel Cover Details

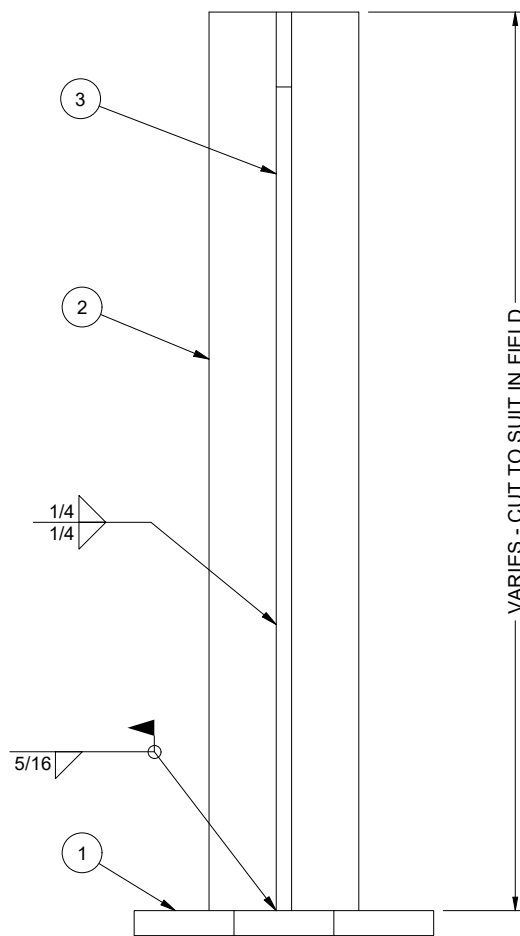
2019 Stainless Steel Cover Details

GENERAL NOTES:

1. ALL STRUCTURAL PLATE MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESS TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION
4. ALL WELD JOINTS TO BE FIELD PICKLED UNDER THE SUPERVISION OF KOVA PERSONNEL.
5. FINAL FABRICATION TO BE INSPECTED BY KOVA ENGINEERING PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
6. CONTRACTOR / FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
7. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
8. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

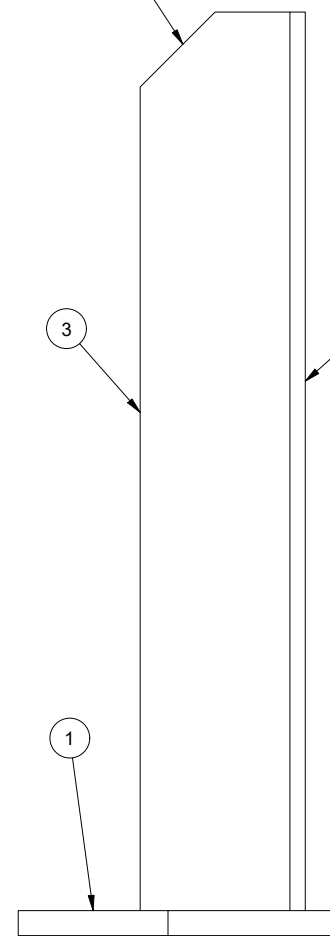


TOP VIEW

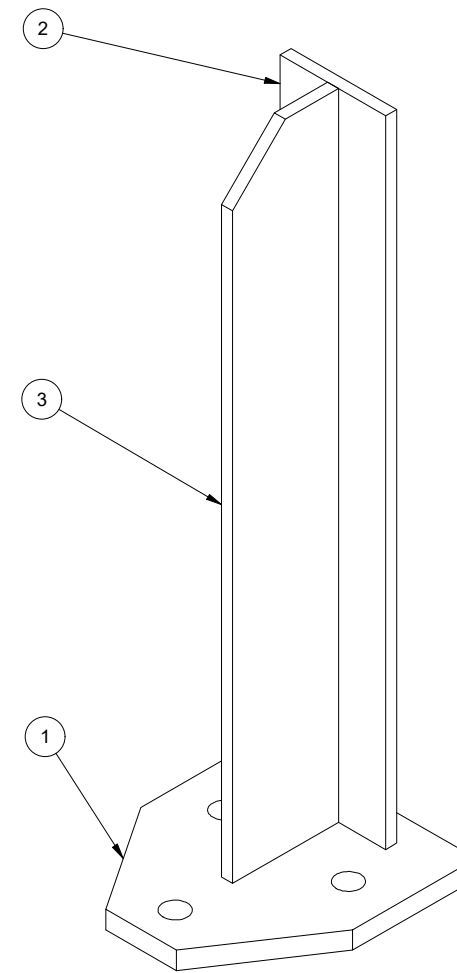


COLUMN DETAIL

FIELD CHAMFER 3" x 3"
FOLLOWING INSTALLATION



SIDE VIEW



ISO VIEW

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	1" PL		ASTM A240-316L	
2	1	6" x 5/8" FB		ASTM A240-316L	
3	1	6" x 5/8" FB		ASTM A240-316L	

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: A.R. DATE: 14/Nov/18
P60236-08 & 09	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



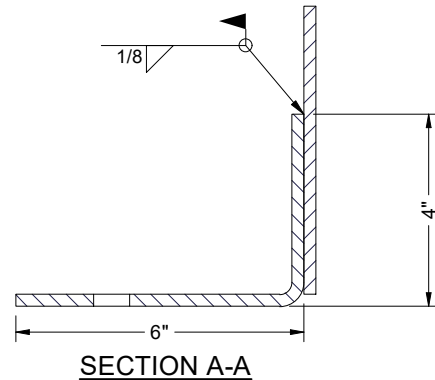
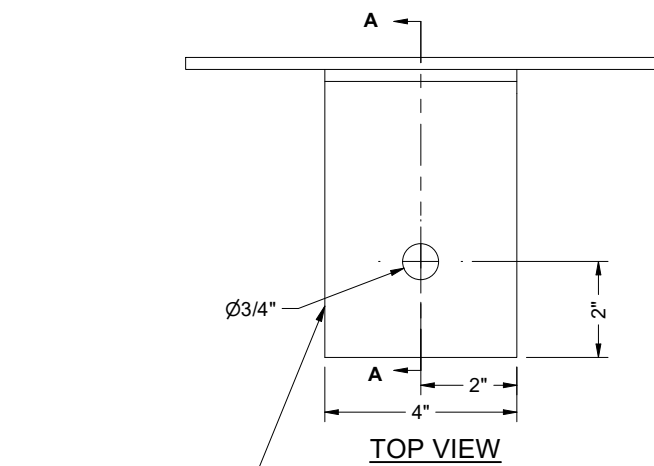
Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
COLUMN DETAILS & NOTES
LOCATION: NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

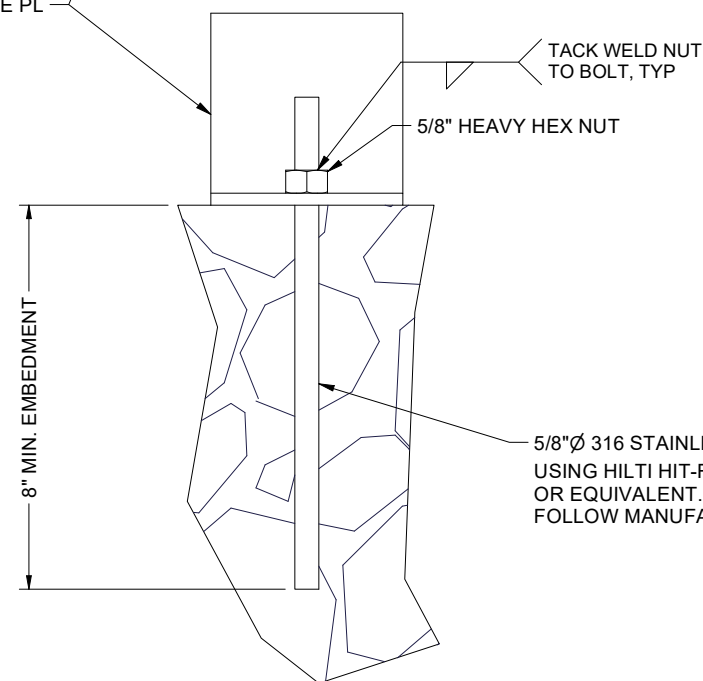
DO NOT SCALE DRAWINGS

SHEET NO.: 1 OF 4

DWG. NO.: **P60236-10-1**

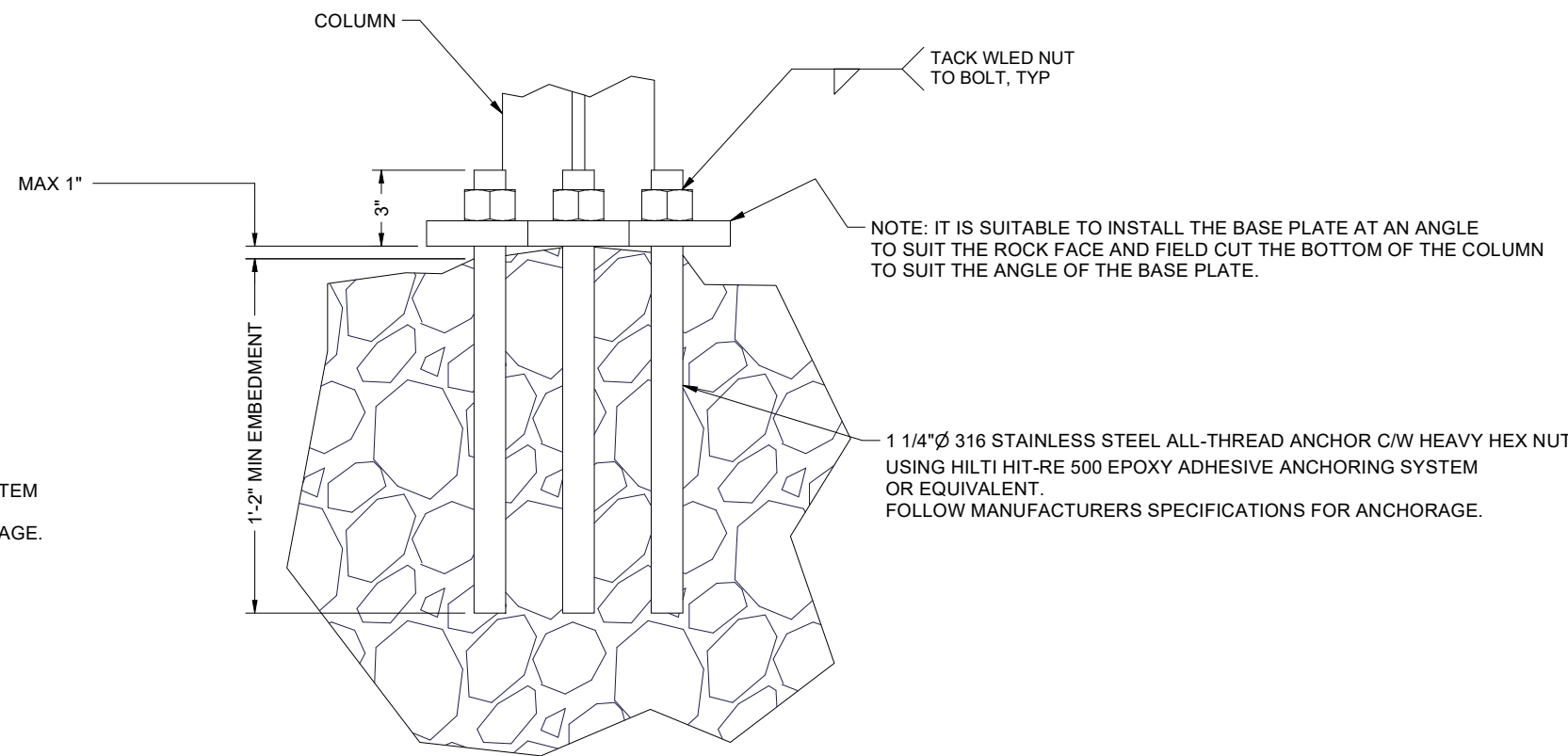


1/4" BROKE PL



TYPICAL SKIRT ANCHOR DETAIL

5/8"Ø 316 STAINLESS STEEL ALL-THREAD ANCHORED USING HILTI HIT-RE 500 EPOXY ADHESIVE ANCHORING SYSTEM OR EQUIVALENT. FOLLOW MANUFACTURERS SPECIFICATIONS FOR ANCHORAGE.



TYPICAL COLUMN ANCHOR BOLT DETAIL

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: A.R. DATE: 14/Nov/18
P60236-08 & 09	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



Kova Engineering Saskatchewan Ltd.

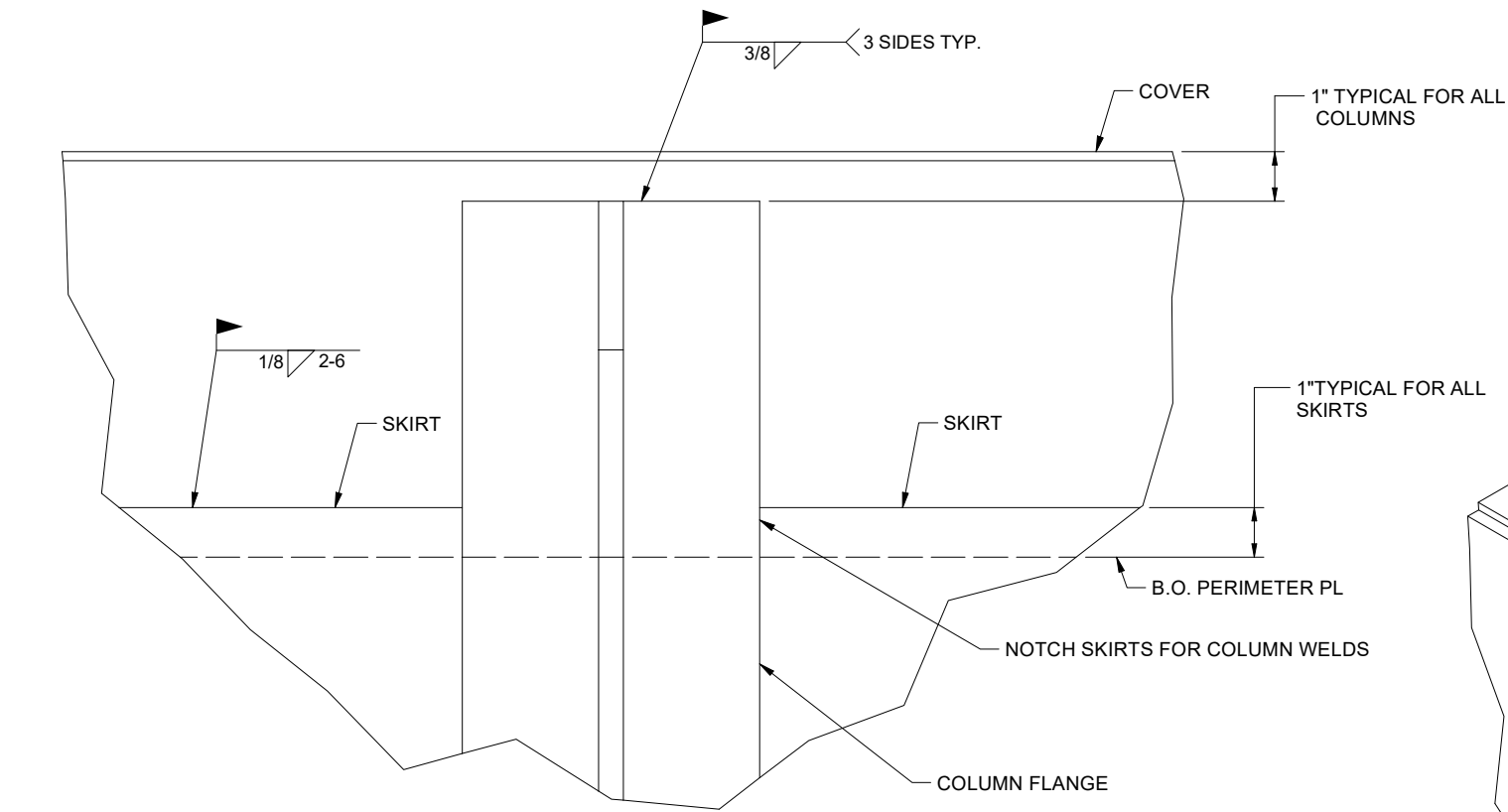
PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
ANCHOR DETAILS
LOCATION: NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

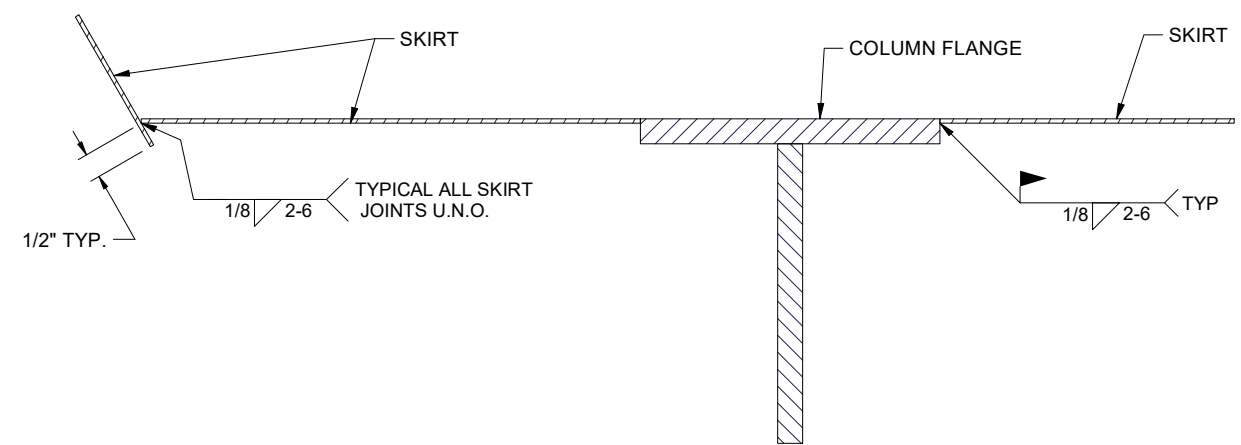
SHEET NO.: 2 OF 4

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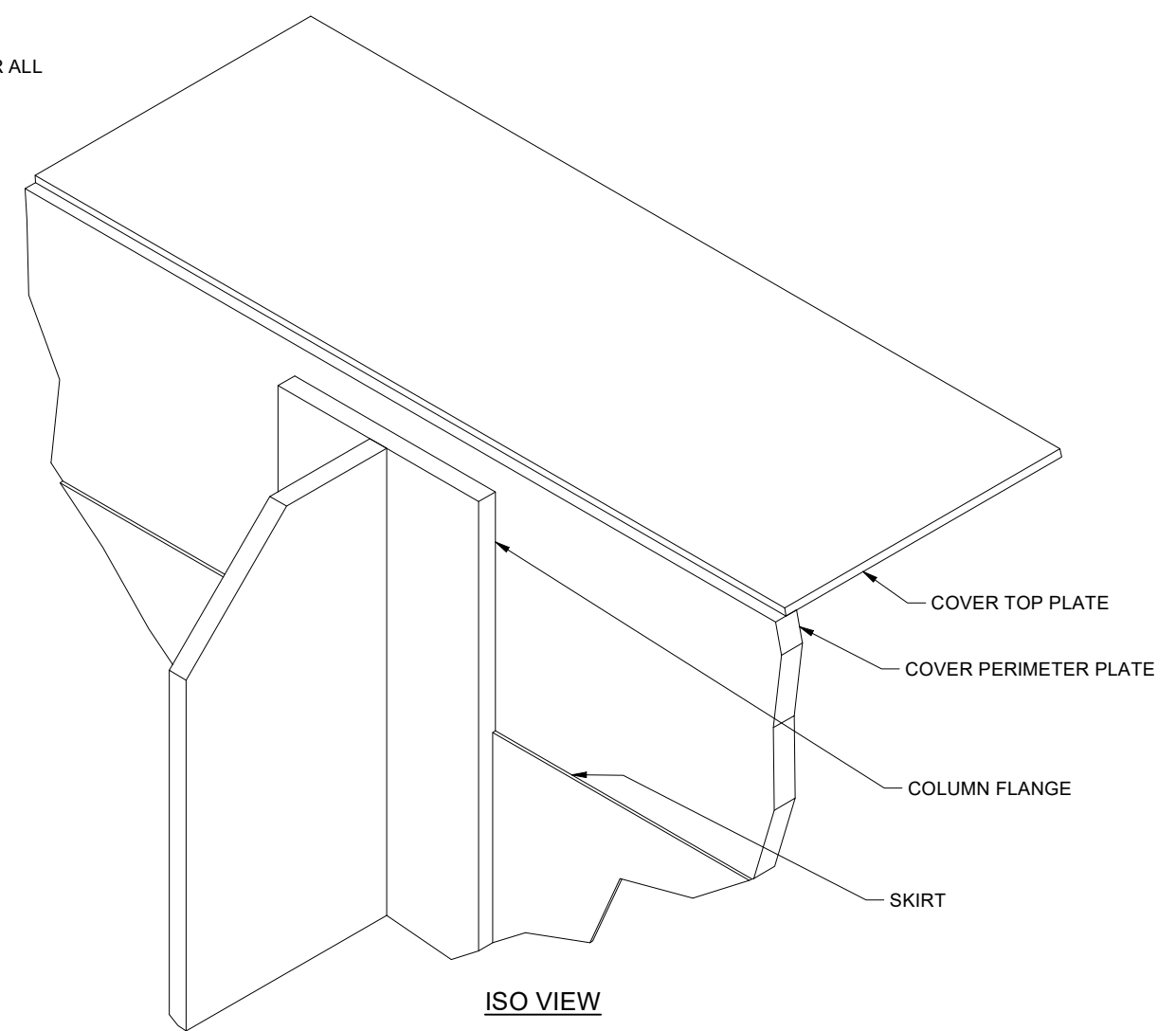
1



WELDING COLUMN AND SKIRT TO COVER



SKIRT WELDING



ISO VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: A.R. DATE: 14/Nov/18
P60236-08 & 09	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

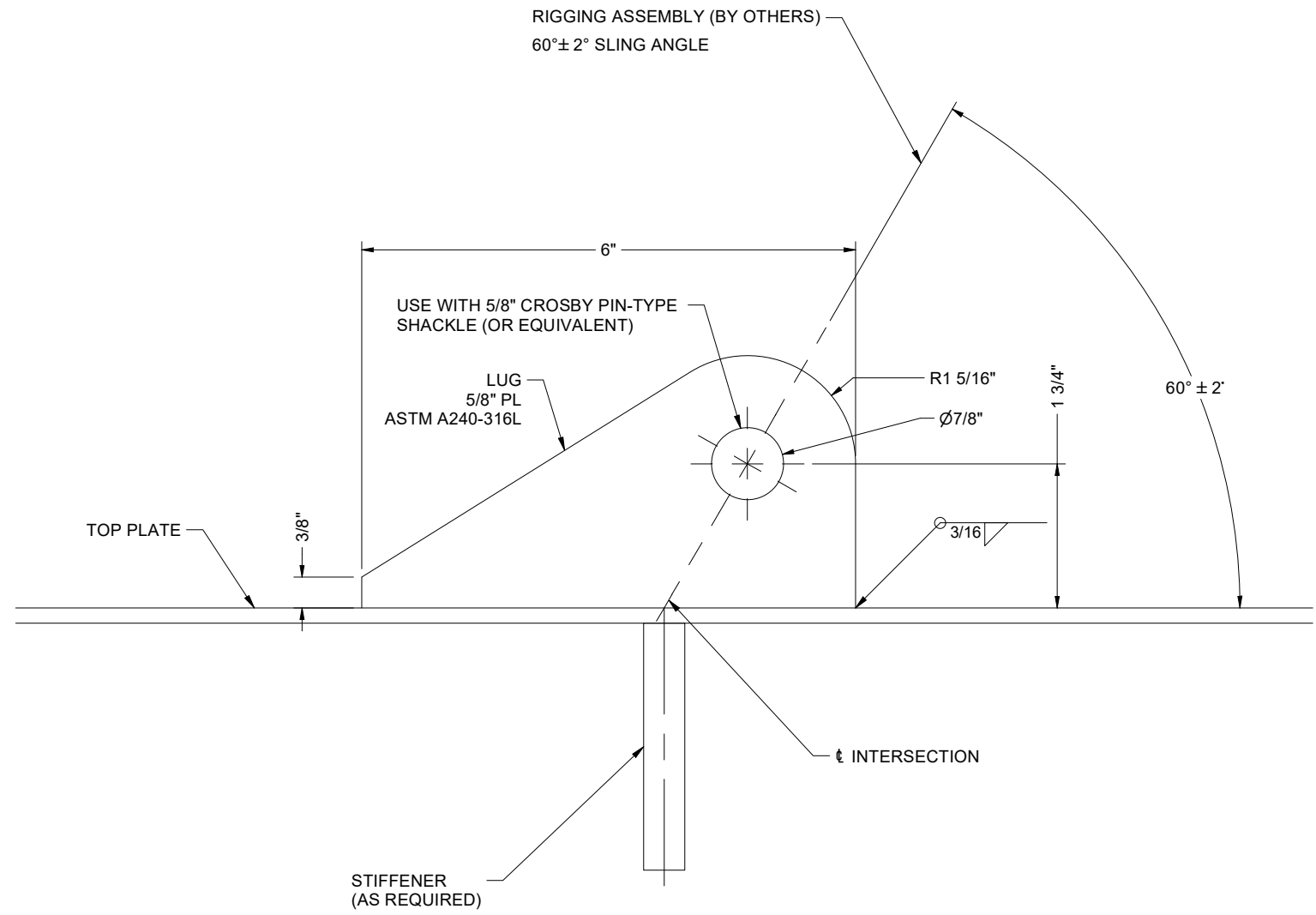
Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 WELDING DETAILS
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 3 OF 4

DWG. NO.: **P60236-10-3**



LUG DETAIL

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: A.R. DATE: 14/Nov/18
P60236-08 & 09	KOVA DWGS - COVERS FOR OPENINGS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



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 Structural 14318

Kova Engineering Saskatchewan Ltd.

PROJECT: BEAVERLODGE PERMANENT COVERS FOR OPENINGS - STANDARD DETAILS
 LIFT LUG DESIGN
 LOCATION: NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 4 OF 4

DWG. NO.: **P60236-10-4**

1

VERNA 2 – 026594 Raise Cover

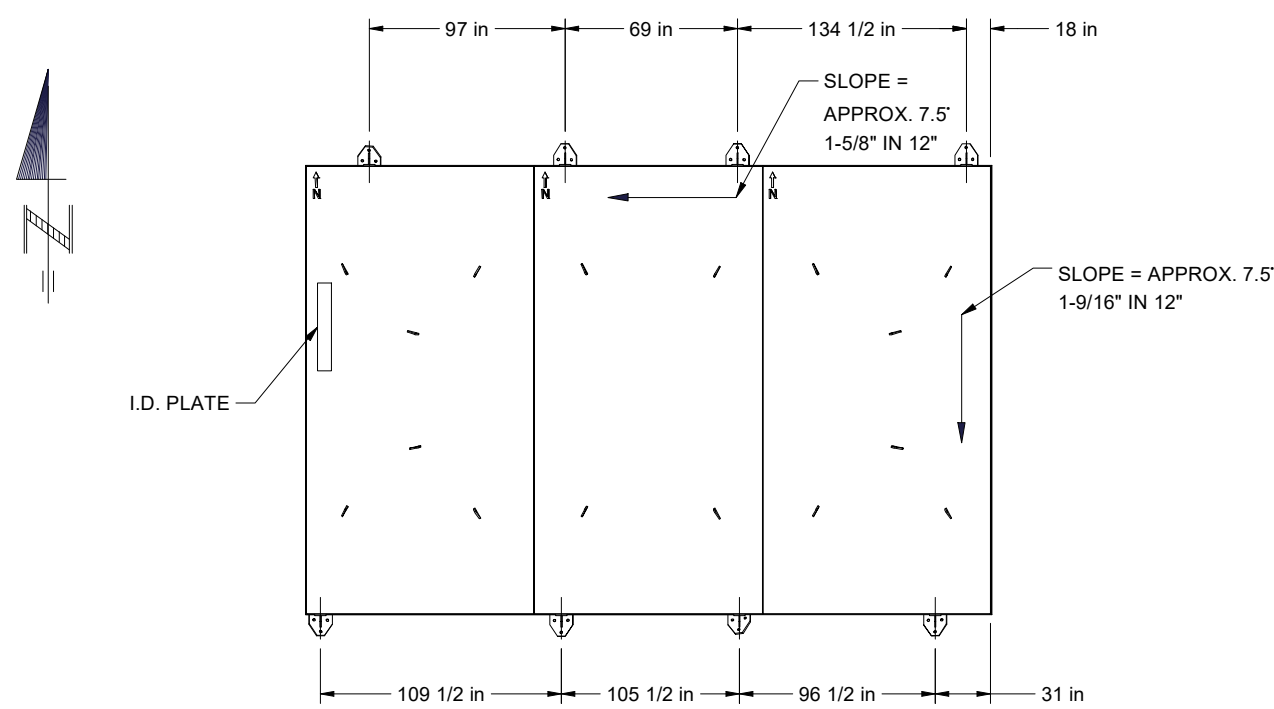
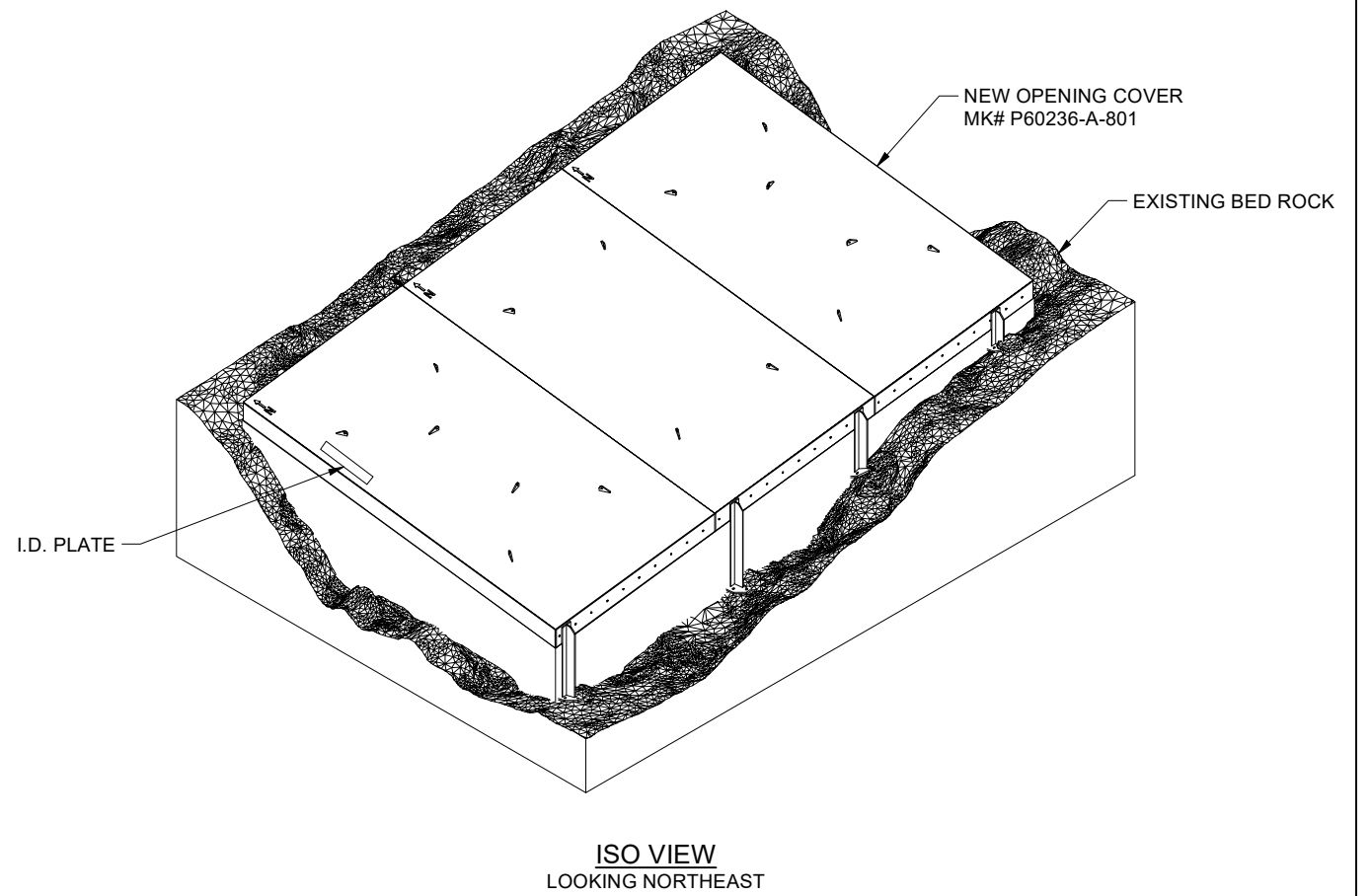
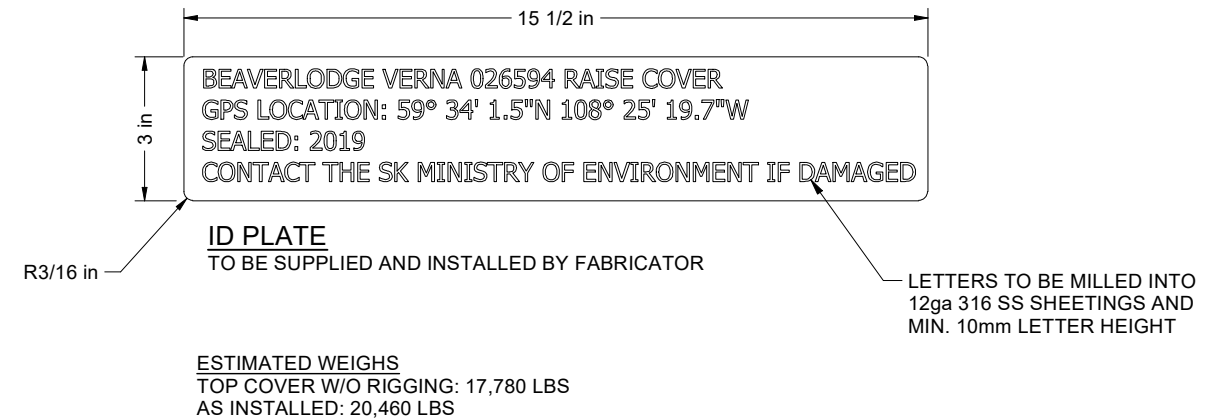
VERNA 2 – 026594 Raise Cover

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED AND PASSIVATED IN ACCORDANCE WITH THE QA/QC PROTOCOL. KOVA PERSONNEL TO REVIEW SURFACES FOLLOWING PICKLING AND PASSIVATING.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
13. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
14. SEE DRAWING P60236-10 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED SURFACES, CONSIDERING THE RESULTS OF THIS RESEARCH AND A CORROSION ALLOWANCE OF 1mm ON ANY SURFACE, THE COVER DEPICTED HAS AN ESTIMATED USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS PERIODIC INSPECTIONS BE PERFORMED AS RECOMMENDED IN THE QA/QC PROTOCOL.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 20,460 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



PLAN VIEW - VERNA RAISE OPENING COVER

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



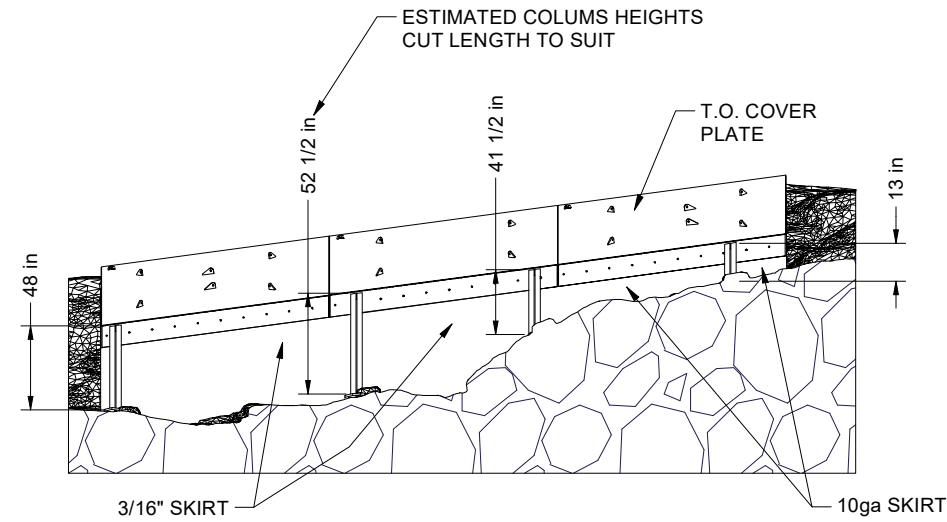
Association of Professional Engineers & Geoscientists of Saskatchewan
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 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

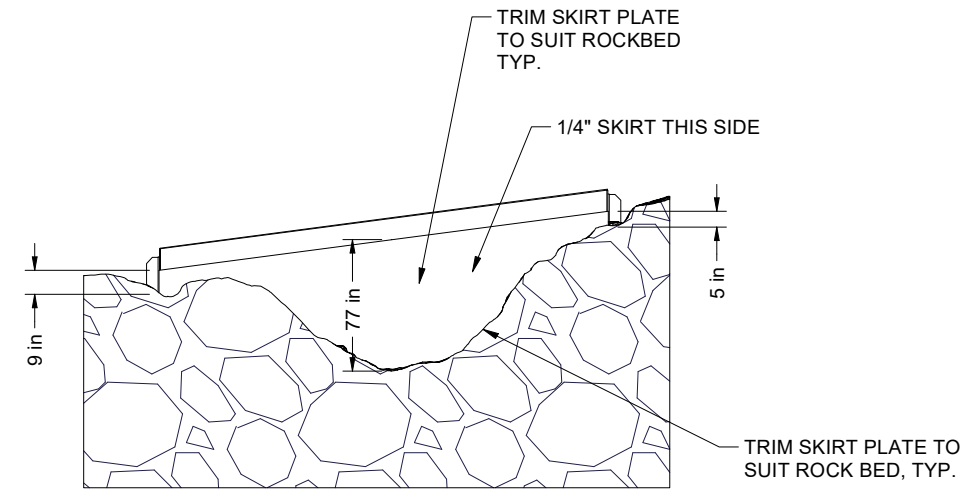
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 1 OF 7

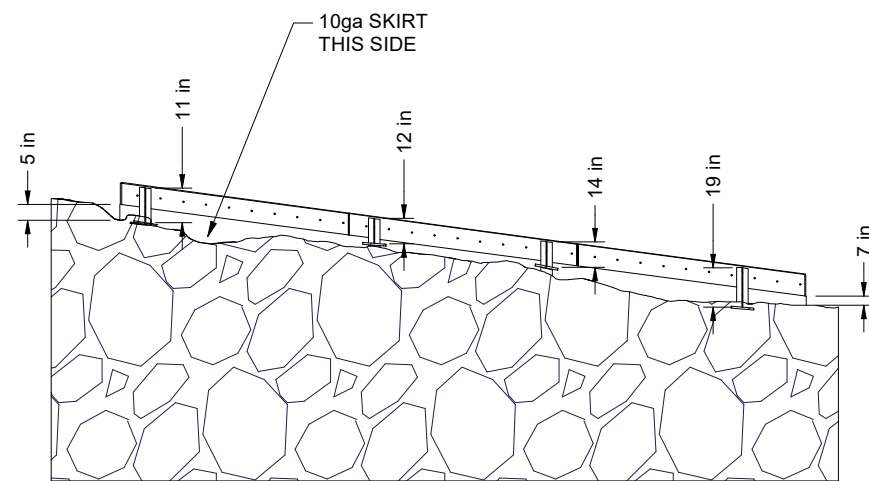
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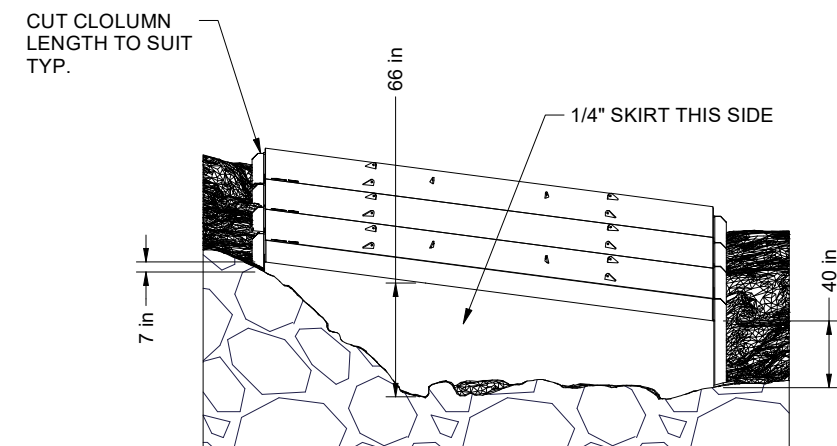
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



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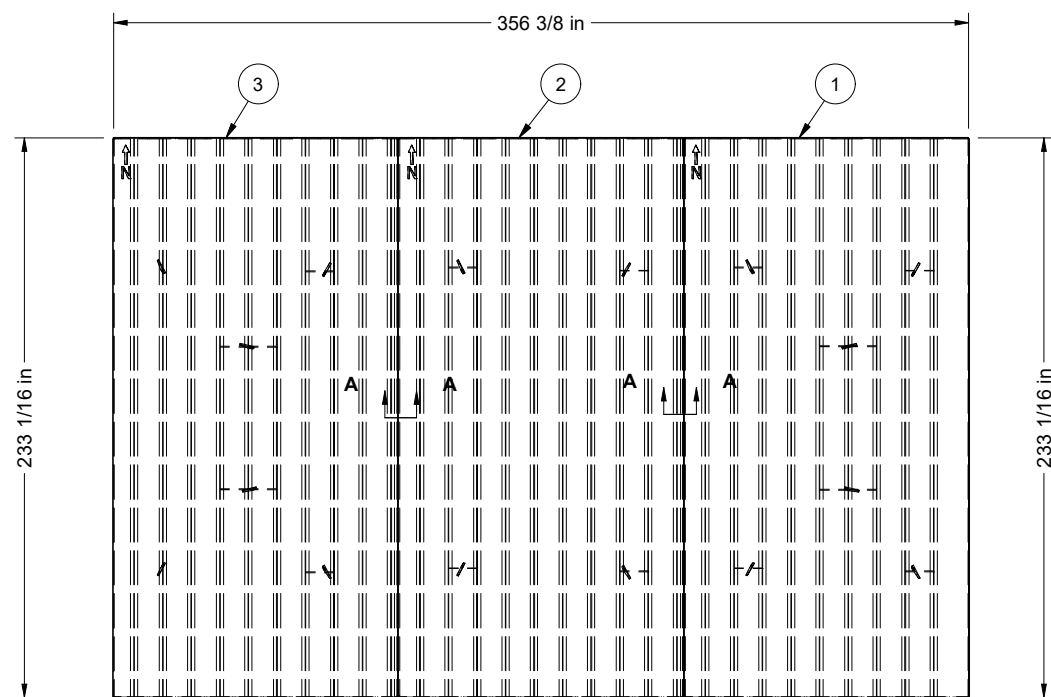
PROJECT: PERMANENT COVER FOR BEAVERLODGE VERA 2 OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

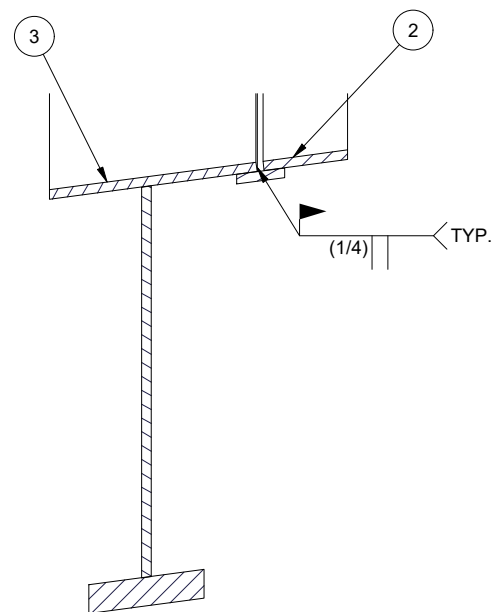
SHEET NO.: 2 OF 7

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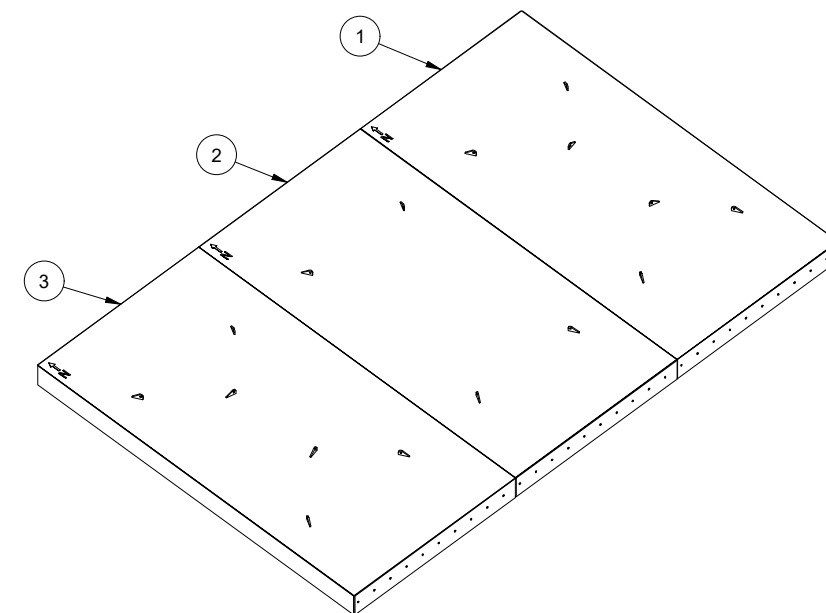
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2	1	COVER SECTION 3	MK# P60236-A-803		5
3	1	COVER SECTION 2	MK# P60236-A-804		5



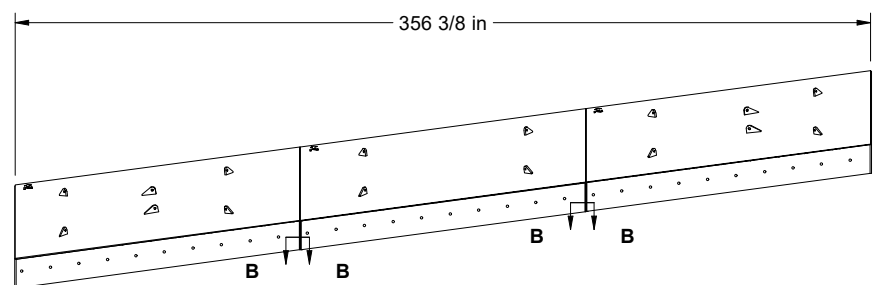
MK# P60236-A-801 - PLAN VIEW



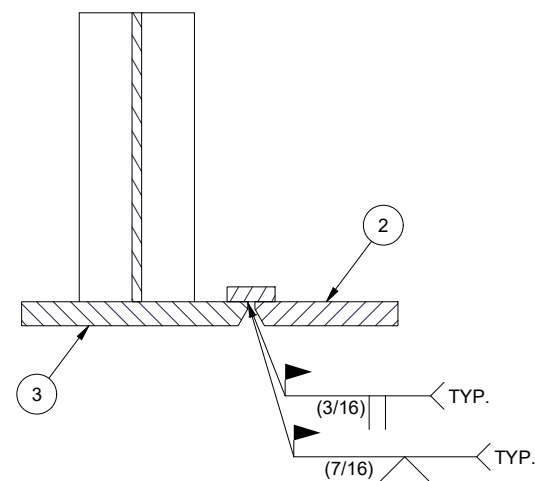
SECTION A-A



MK# P60236-A-801 - ISO VIEW



MK# P60236-A-801 - SIDE VIEW



SECTION B-B

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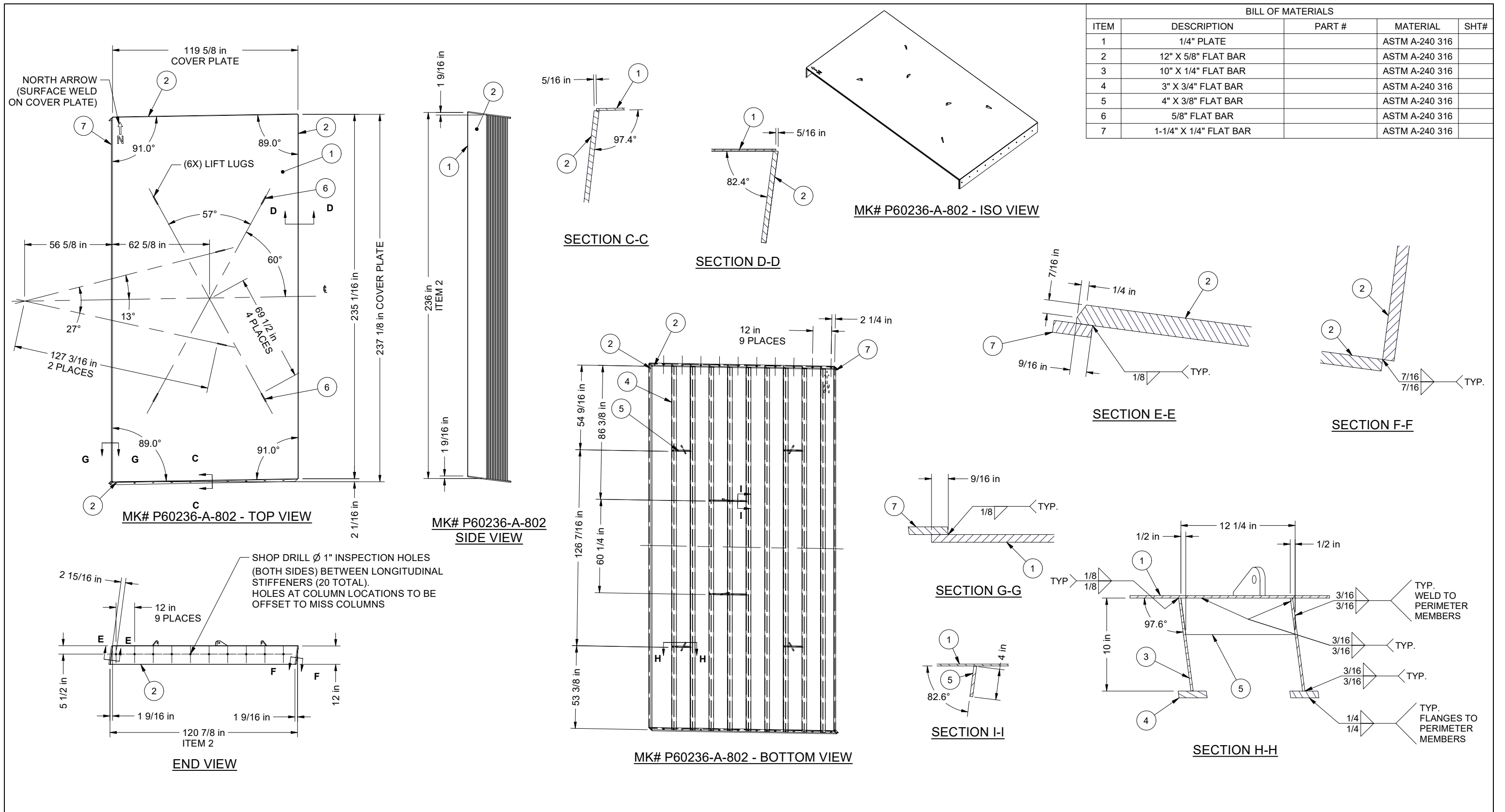
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		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



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 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 7
 DWG. NO.: P60236-08-3



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		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
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P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



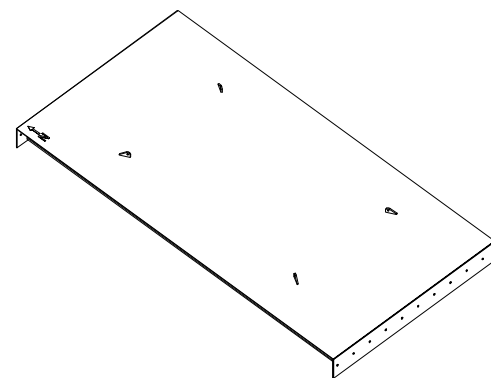
Association of Professional Engineers & Geoscientists of Saskatchewan
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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING
 TOP COVER SECTION -1 DETAIL
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7
 DWG. NO.: P60236-08-4
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

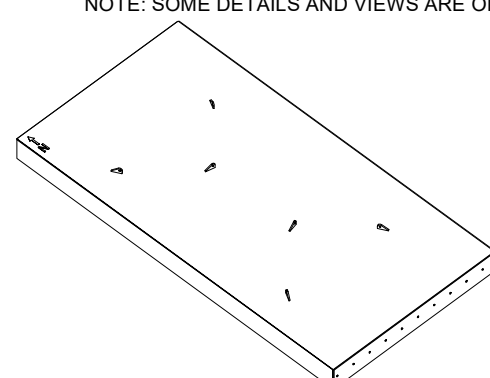
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4	3" X 3/4" FLAT BAR		ASTM A-240 316	
5	4" X 3/8" FLAT BAR		ASTM A-240 316	
6	5/8" FLAT BAR		ASTM A-240 316	

NOTE: SOME DETAILS AND VIEWS ARE ON PREVIOUS SHEET.

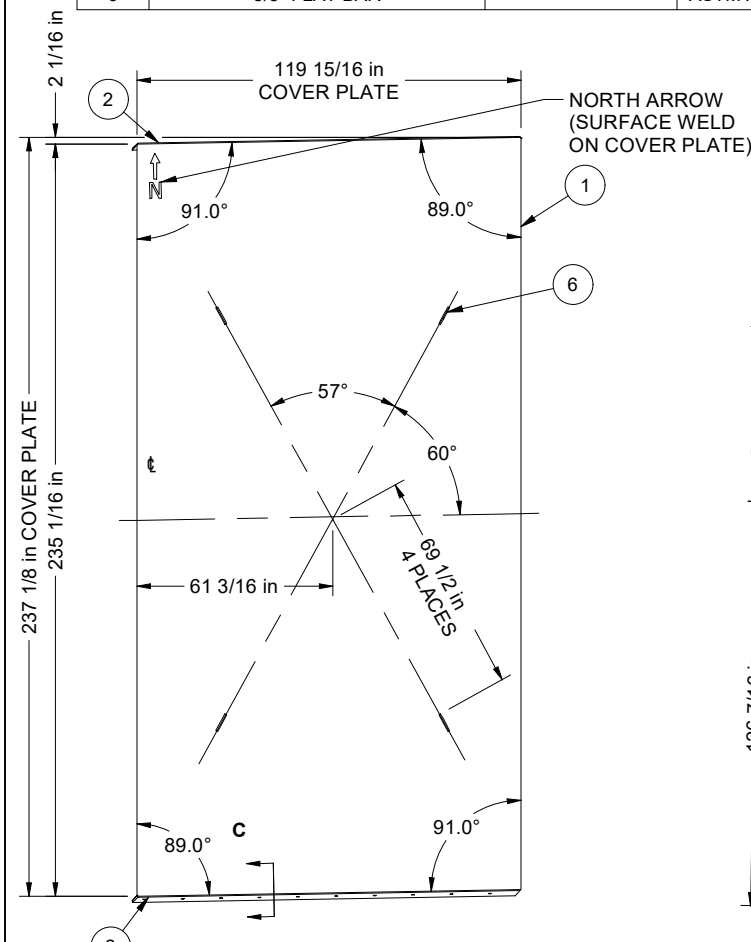
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ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PLATE		ASTM A-240 316	
2	12" X 5/8" FLAT BAR		ASTM A-240 316	
3	10" X 1/4" FLAT BAR		ASTM A-240 316	
4	3" X 3/4" FLAT BAR		ASTM A-240 316	
5	4" X 3/8" FLAT BAR		ASTM A-240 316	
6	5/8" FLAT BAR		ASTM A-240 316	
7	1-1/4" X 1/4" FLAT BAR		ASTM A-240 316	



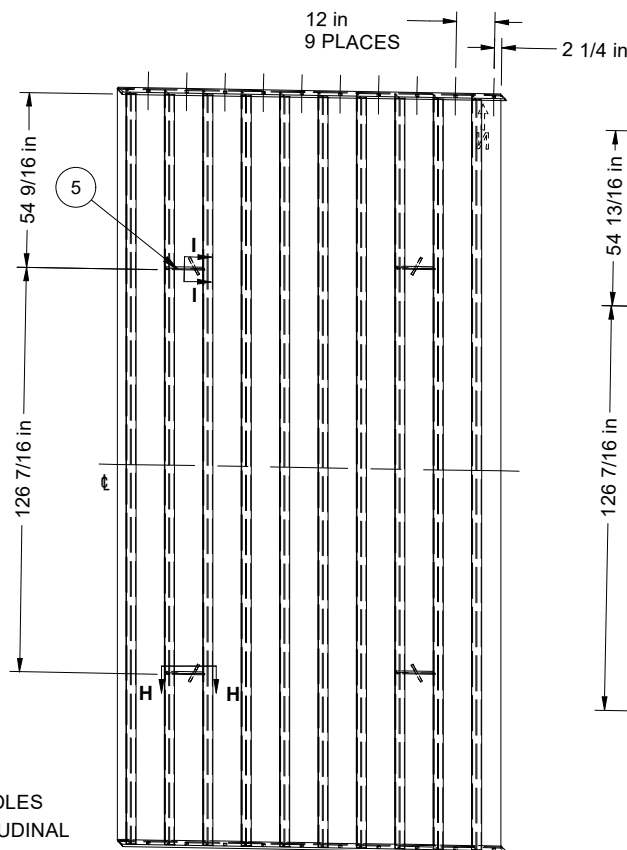
MK# P60236-A-803 - ISO VIEW



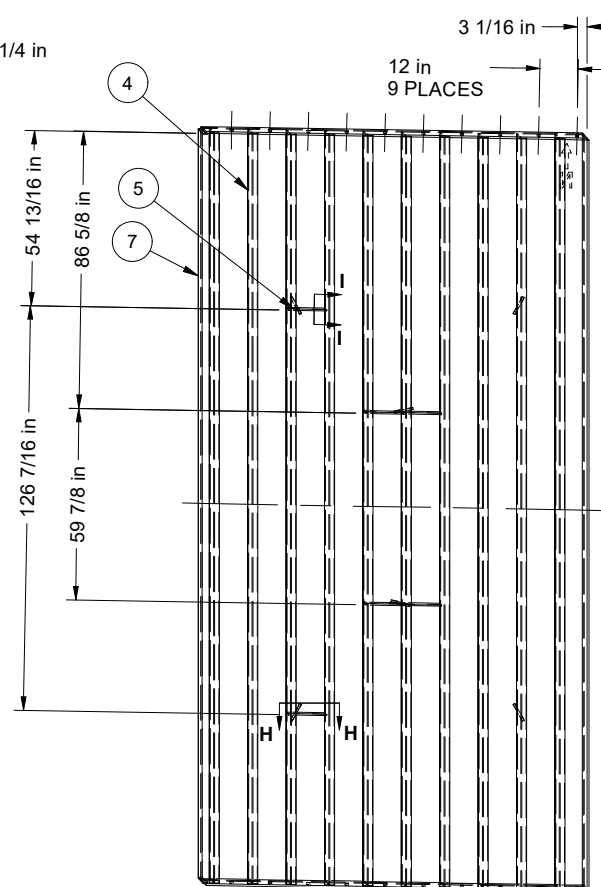
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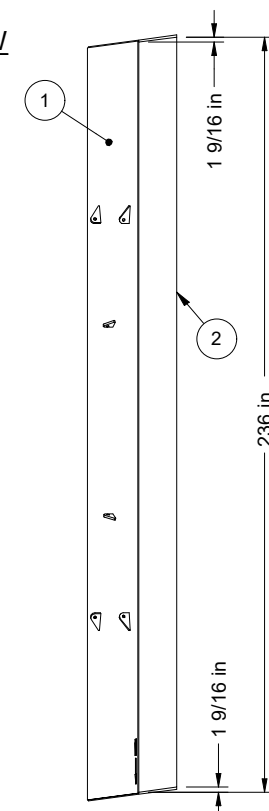
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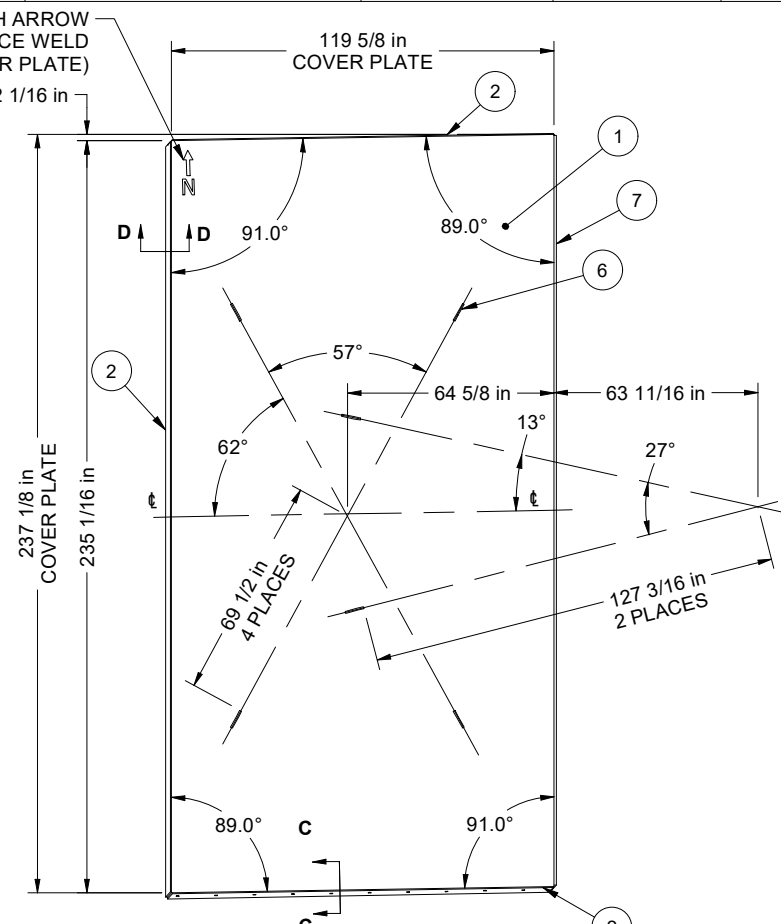
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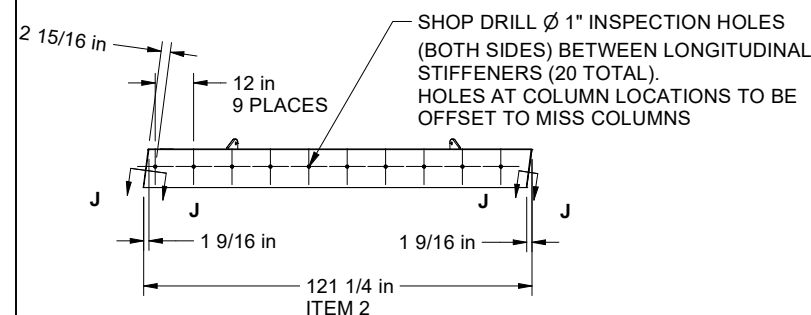
MK# P60236-A-804 - BOTTOM VIEW



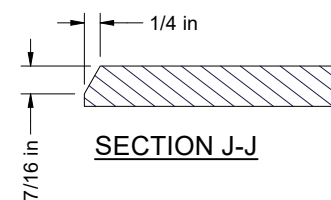
MK# P60236-A-804 SIDE VIEW



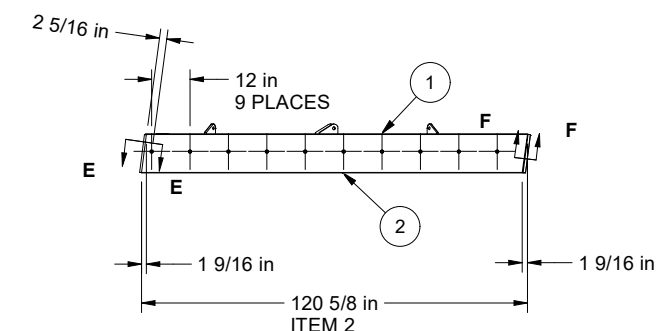
MK# P60236-A-804 - TOP VIEW
TOP PLATE DIMENSIONS



MK# P60236-A-803 - END VIEW



SECTION J-J



MK# P60236-A-804 - END VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.

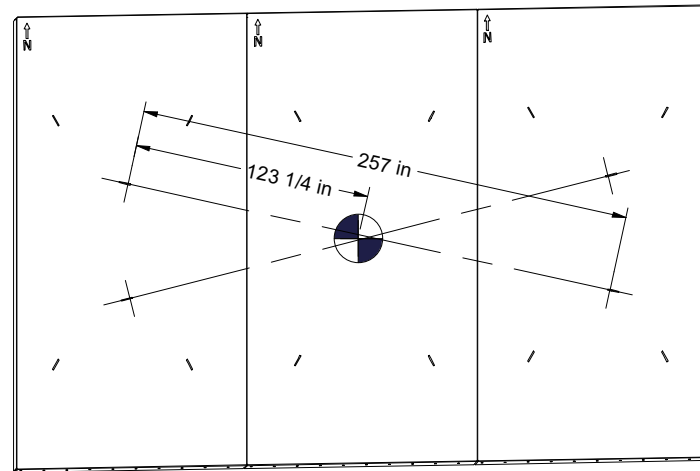


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Kova Engineering (Saskatchewan) Ltd.
 Number C672
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 Discipline Sk. Reg. No. Signature
 Structural 14318

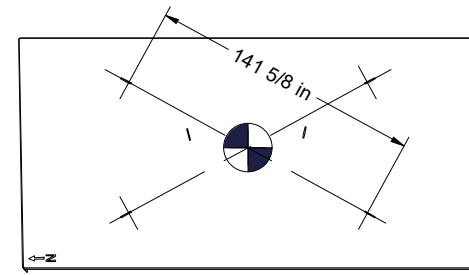
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING
 TOP COVER SECTION 2 & 3 DETAILS
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

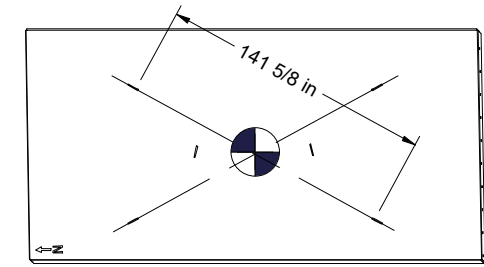
DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 7 DWG. NO.: P60236-08-5



TOP COVER LIFTING DIAGRAM
MK# P60236-A-801

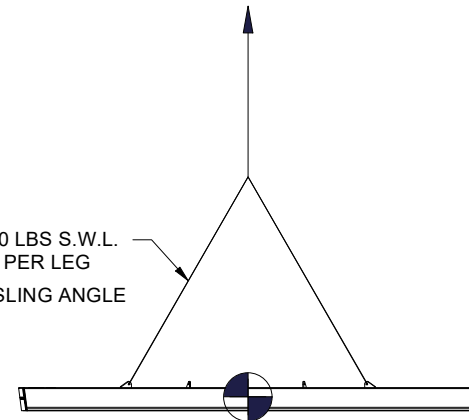


COVER SECTION 1 LIFTING DIAGRAM
MK# P60236-A-802

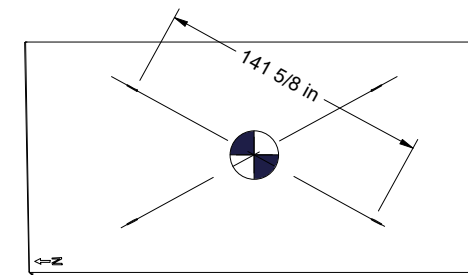


COVER SECTION 3 LIFTING DIAGRAM
MK# P60236-A-804

5,900 LBS + RIGGING

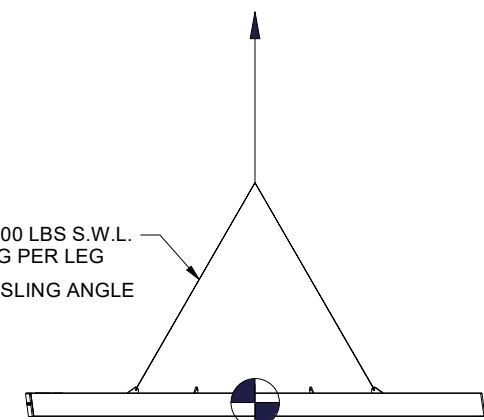


COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-802



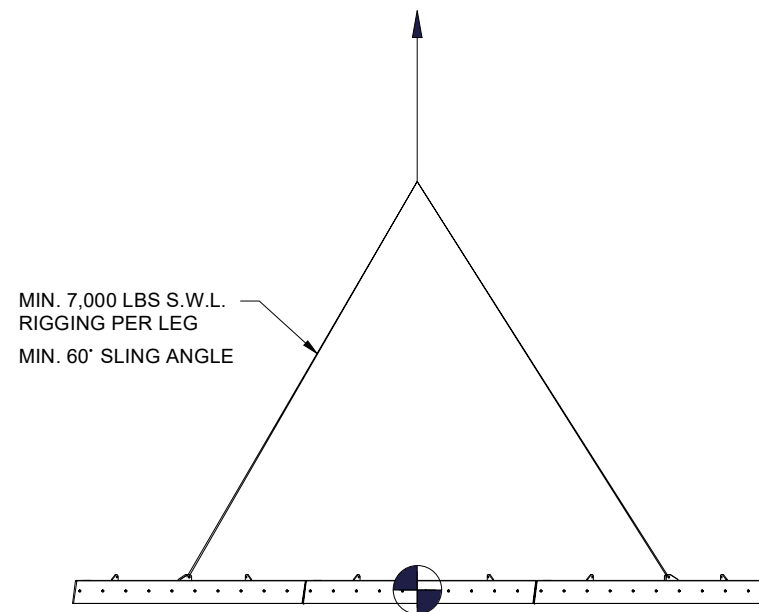
COVER SECTION 2 LIFTING DIAGRAM
MK# P60236-A-803

5,500 LBS + RIGGING



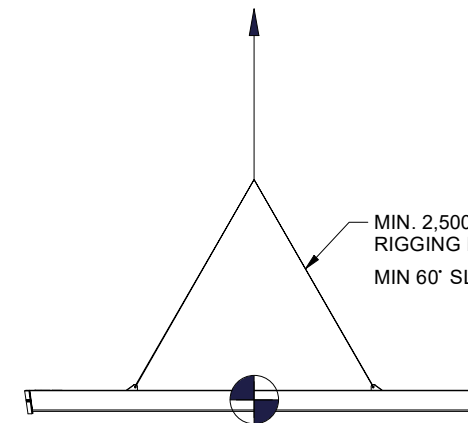
COVER SECTION 3 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-804

17,100 LBS + RIGGING



TOP COVER LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-801

5,700 LBS + RIGGING



COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-803

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



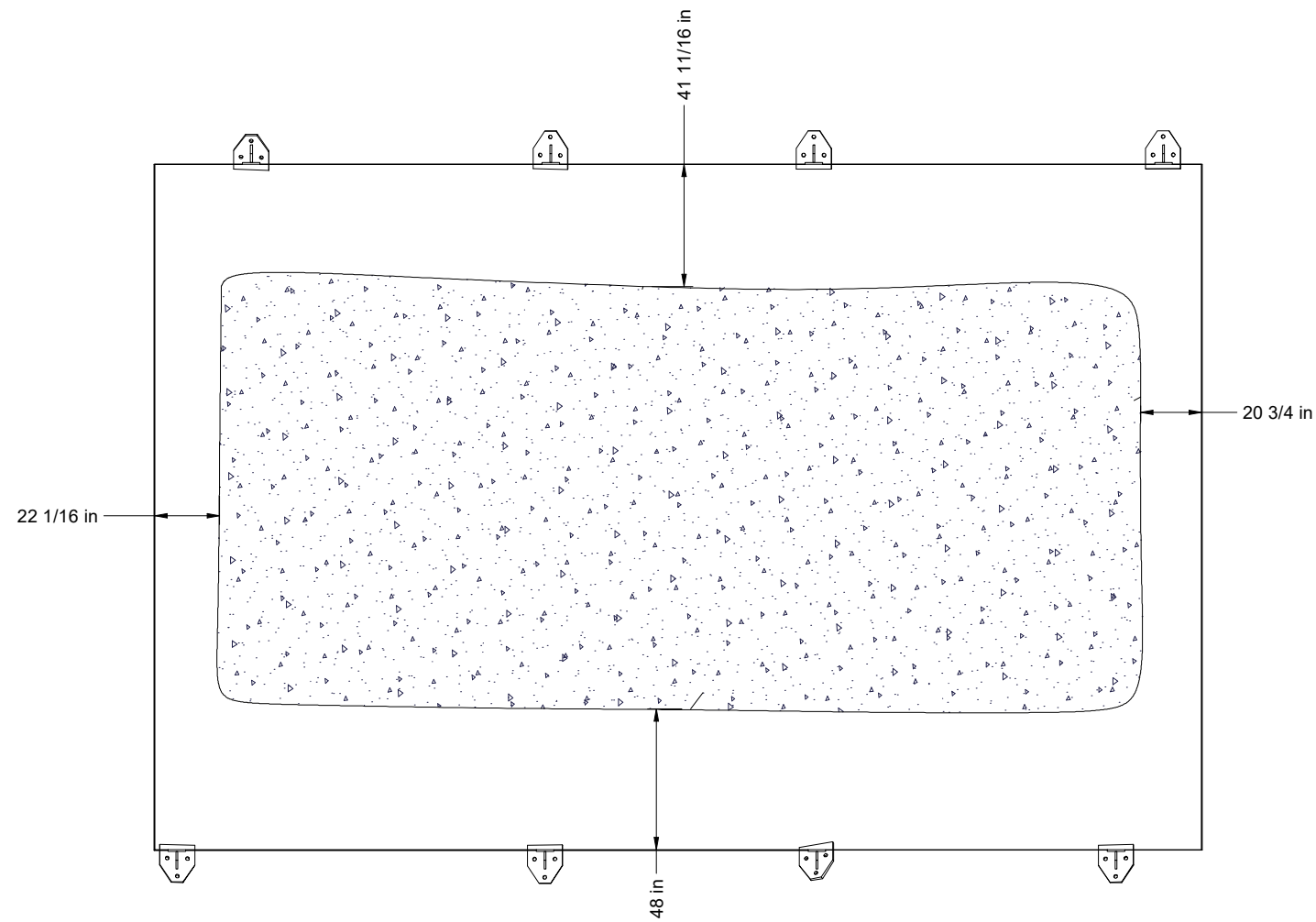
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING
 LIFTING DETAILS
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS
 SHEET NO.: 6 OF 7

DWG. NO.: P60236-08-6



OPENING TO SKIRT CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	14/Nov/18	ANP	CHK'D BY: ENG BY: P.C.



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 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE VERNA 2 OPENING CLEARANCES
 LOCATION: 59° 34' 1.5" N 108° 25' 19.7" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 7 OF 7 DWG. NO.: P60236-08-7

HAB 10 – Heater Raise Cover

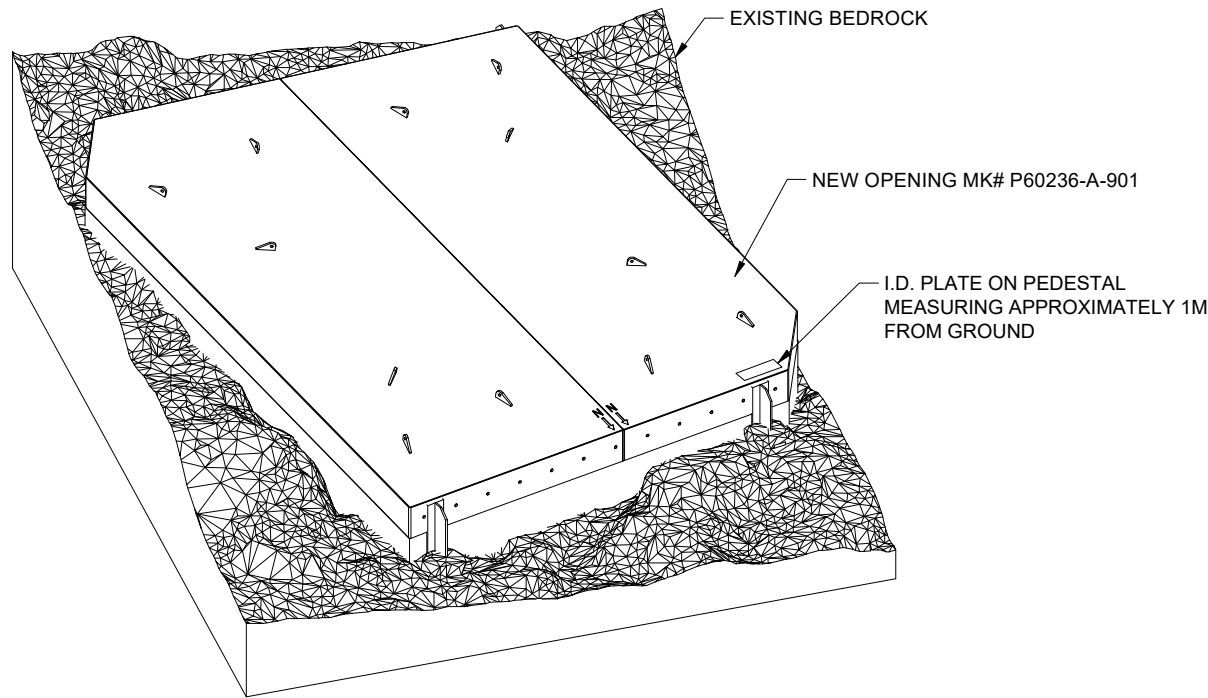
HAB 10 – Heater Raise Cover

GENERAL NOTES:

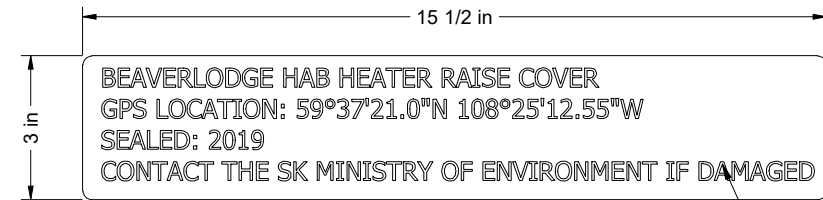
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL WELD JOINTS TO BE FIELD PICKLED AND PASSIVATED IN ACCORDANCE WITH QA/QC PROTOCOL. KOVA PERSONNEL TO REVIEW SURFACES FOLLOWING PICKLING AND PASSIVATING.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
13. SHOP DRILLED INSPECTION HOLES HAVE BEEN PLACED IN LOCATIONS THAT ENSURE THEY ARE NOT PLACED UNDER COLUMN FLANGES. IN THE CASE THAT A COLUMN IS FIELD LOCATED OVER AN INSPECTION HOLE THEN A NEW INSPECTION HOLE IS TO BE DRILLED IN A SIMILAR LOCATION SUCH THAT THE SAME BAY OF COVER STIFFENERS MAY BE EXAMINED.
14. SEE DRAWING P60236-10 FOR TYPICAL DETAILS OMITTED FROM THIS DRAWING SET.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED SURFACES. CONSIDERING THE RESULTS OF THIS RESEARCH AND A CORROSION ALLOWANCE OF 1mm ON ANY SURFACE, THE COVER DEPICTED HAS AN ESTIMATED USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS PERIODIC INSPECTIONS BE PERFORMED AS RECOMMENDED IN THE QA/QC PROTOCOL.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 6,320 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



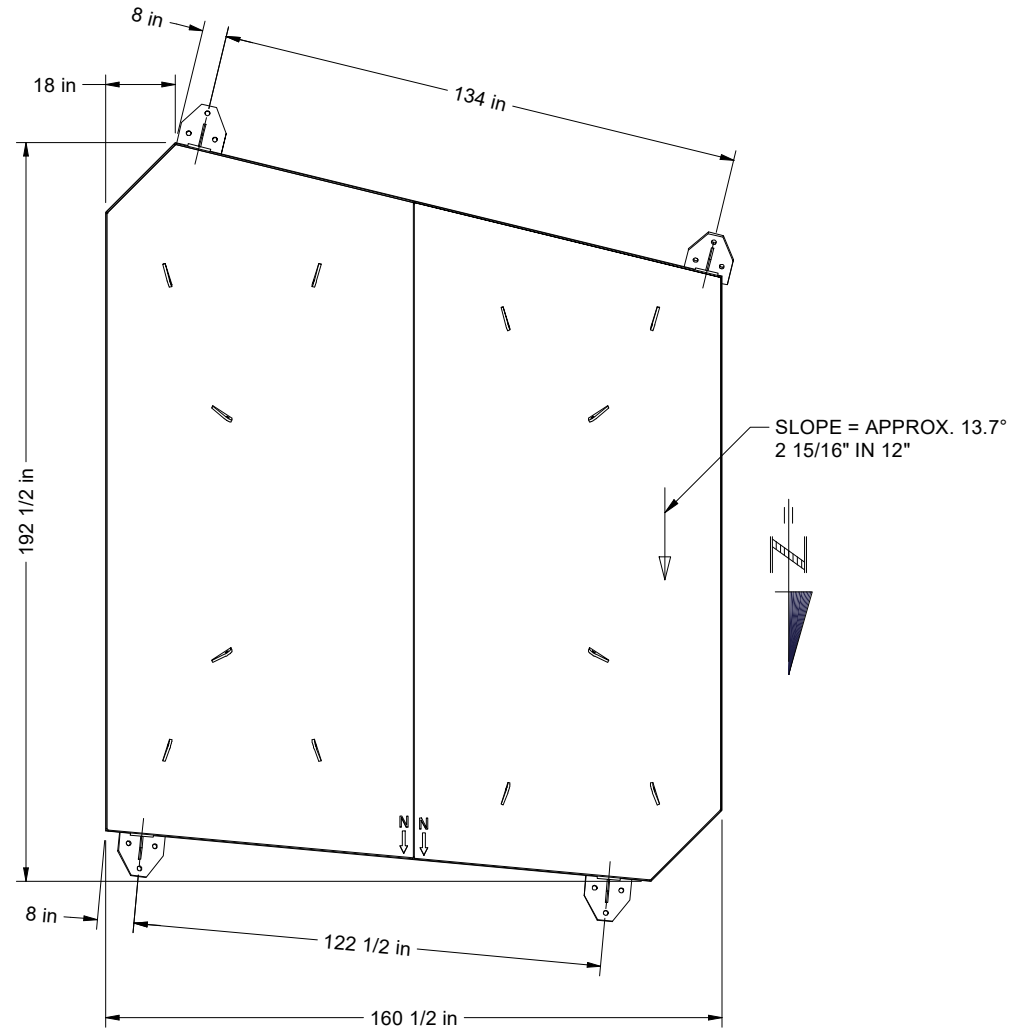
ISO VIEW
LOOKING SOUTHWEST



I.D. PLATE (2 REQUIRED)
TO BE SUPPLIED AND INSTALLED BY FABRICATOR

ESTIMATED WEIGHTS
TOP COVER W/O RIGGING: 5,635 Lbs
AS INSTALLED: 6,320 Lbs

LETTERS TO BE MILLED INTO
12ga SS SHEETING AND MIN.
LETTER HEIGHT IS 10mm



PLAN VIEW - NEW HAB OPENING COVER

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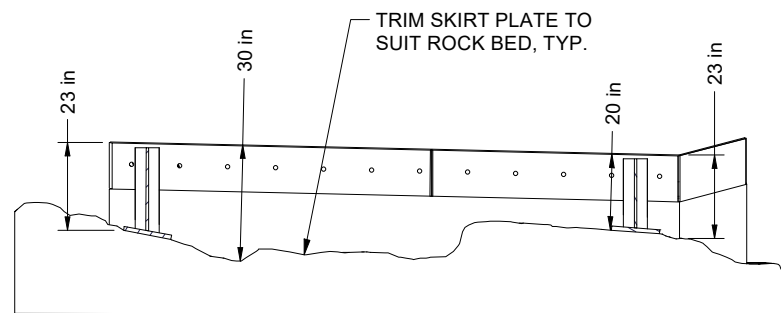
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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₁₂₅ MACHINED SURFACES: ¹²⁵ / ₁₂₅ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.

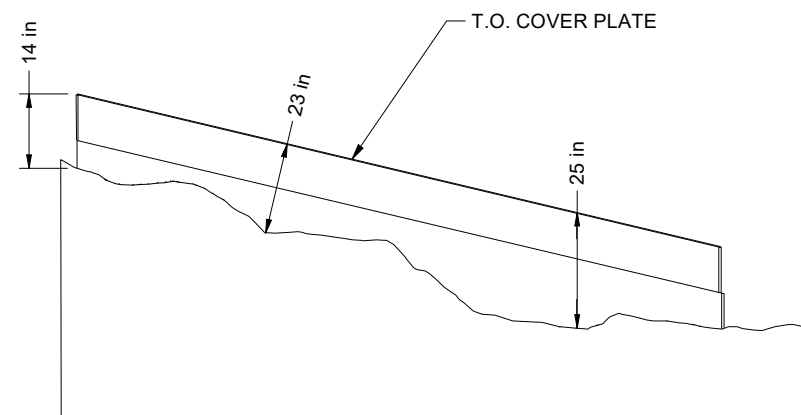


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Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

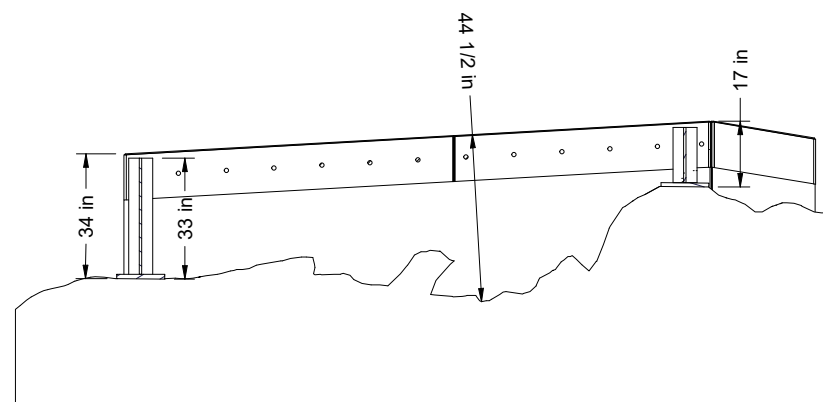
Kova Engineering (Saskatchewan) Ltd.
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ
DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 7
DWG. NO.: P60236-09-1



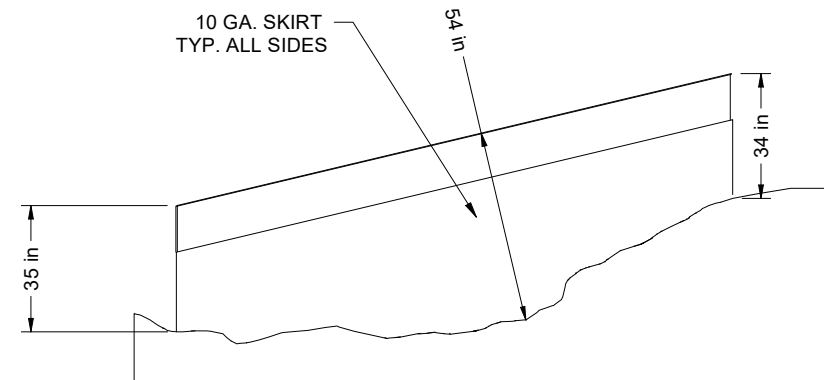
ELEVATION VIEW - LOOKING SOUTH



ELEVATION VIEW - LOOKING WEST



ELEVATION VIEW - LOOKING NORTH



ELEVATION VIEW - LOOKING EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / _{ES} MACHINED SURFACES: ¹²⁵ / _{ES} ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.



Kova Engineering (Saskatchewan) Ltd.

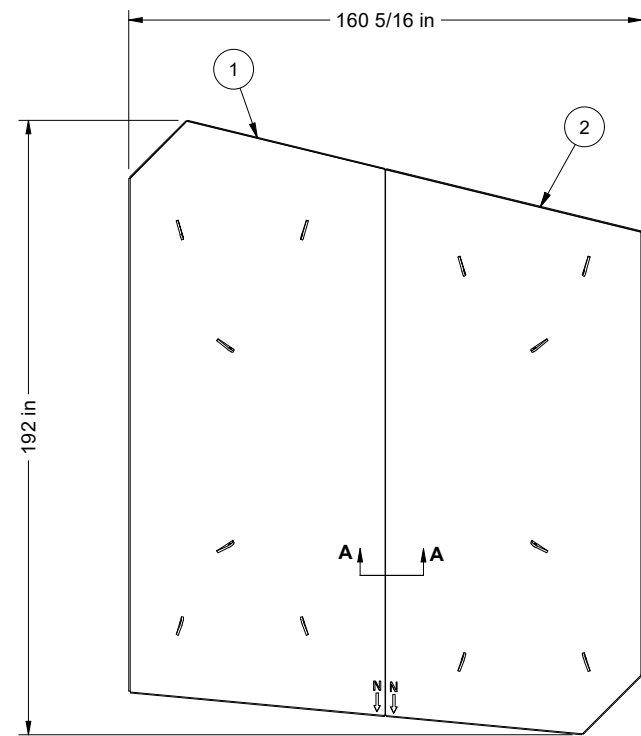
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

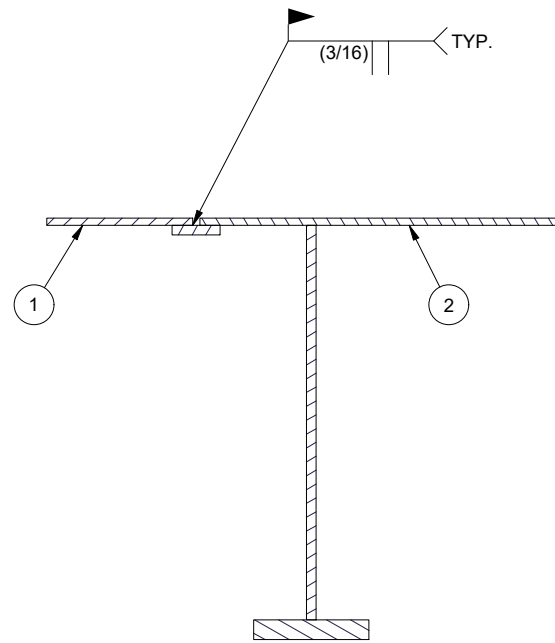
SHEET NO.: 2 OF 7

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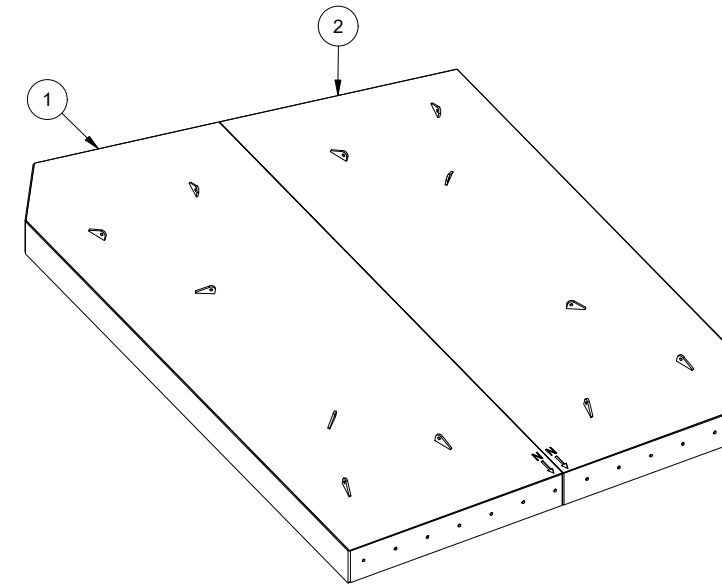
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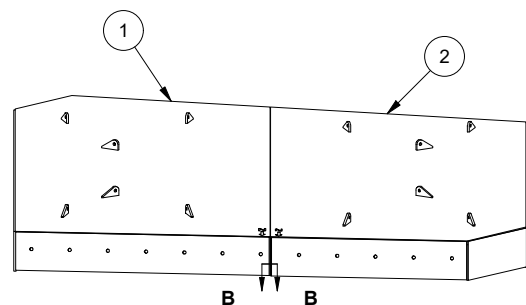
MK# P60236-A-901 - PLAN VIEW



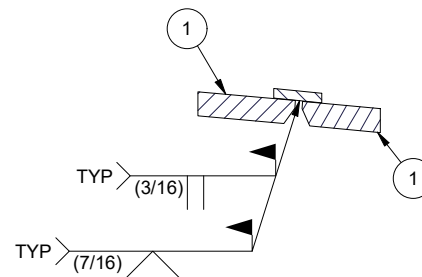
SECTION A-A



MK# P60236-A-901 - ISO VIEW



MK# P60236-A-901 - SIDE VIEW



SECTION B-B

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.



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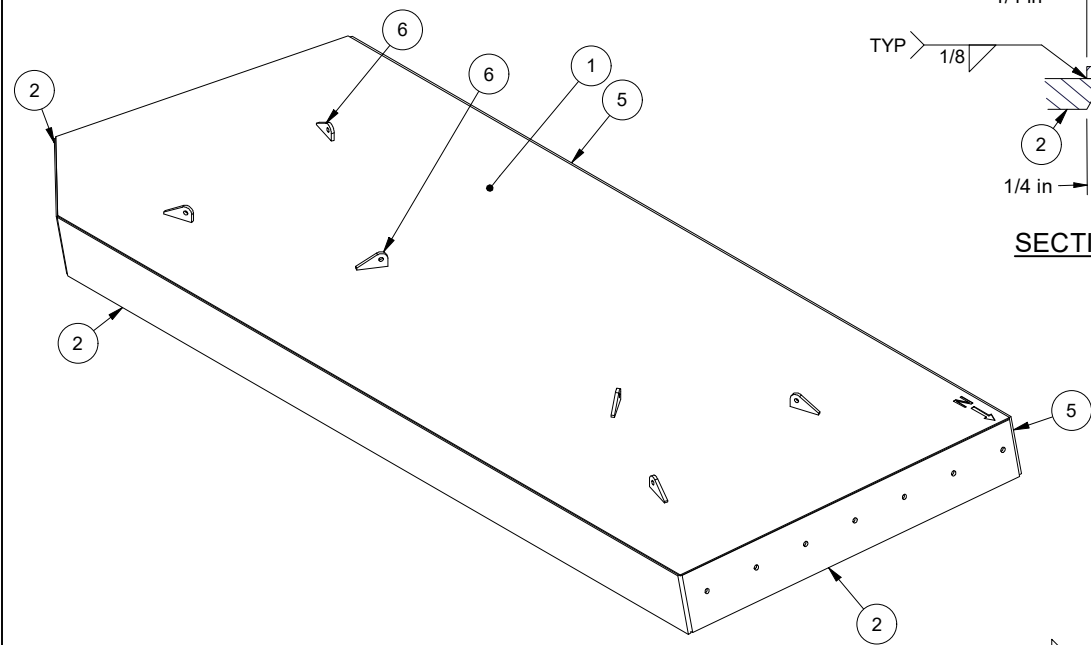
PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
 TOP COVER DETAILS
 LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

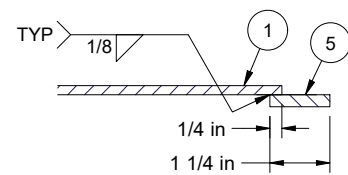
SHEET NO.: 3 OF 7

DWG. NO.: P60236-09-3

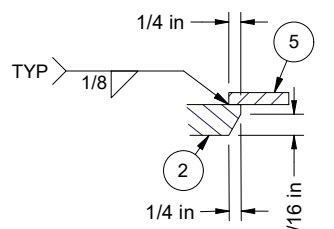
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	3/16" PLATE		ASTM A-240 316	
2	12" X 5/8" FLAT BAR		ASTM A-240 316	
3	10" X 1/4" FLAT BAR		ASTM A-240 316	
4	3" X 1/2" FLAT BAR		ASTM A-240 316	
5	1-1/4" X 1/4" FLAT BAR		ASTM A-240 316	
6	5/8" PLATE		ASTM A-240 316	
7	4" X 3/8" FLAT BAR		ASTM A-240 316	
8	8" X 5/8" FLAT BAR		ASTM A-240 316	



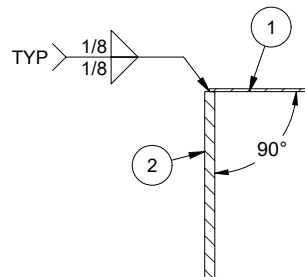
ISO VIEW



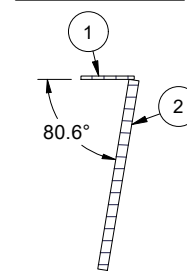
SECTION D-D



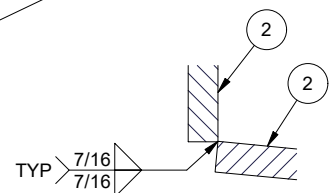
SECTION E-E



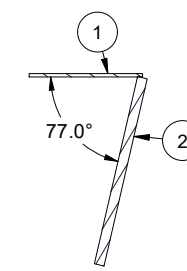
SECTION F-F



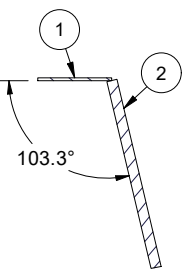
SECTION G-G



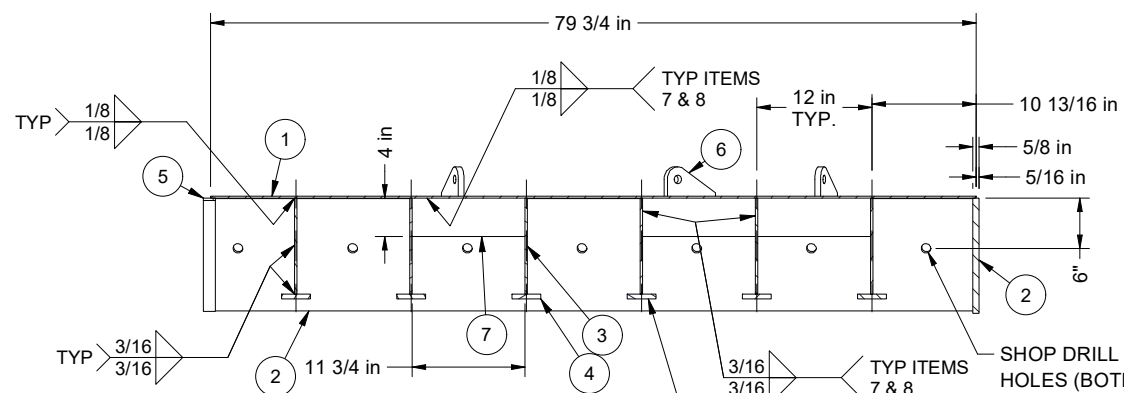
SECTION J-J



SECTION H-H

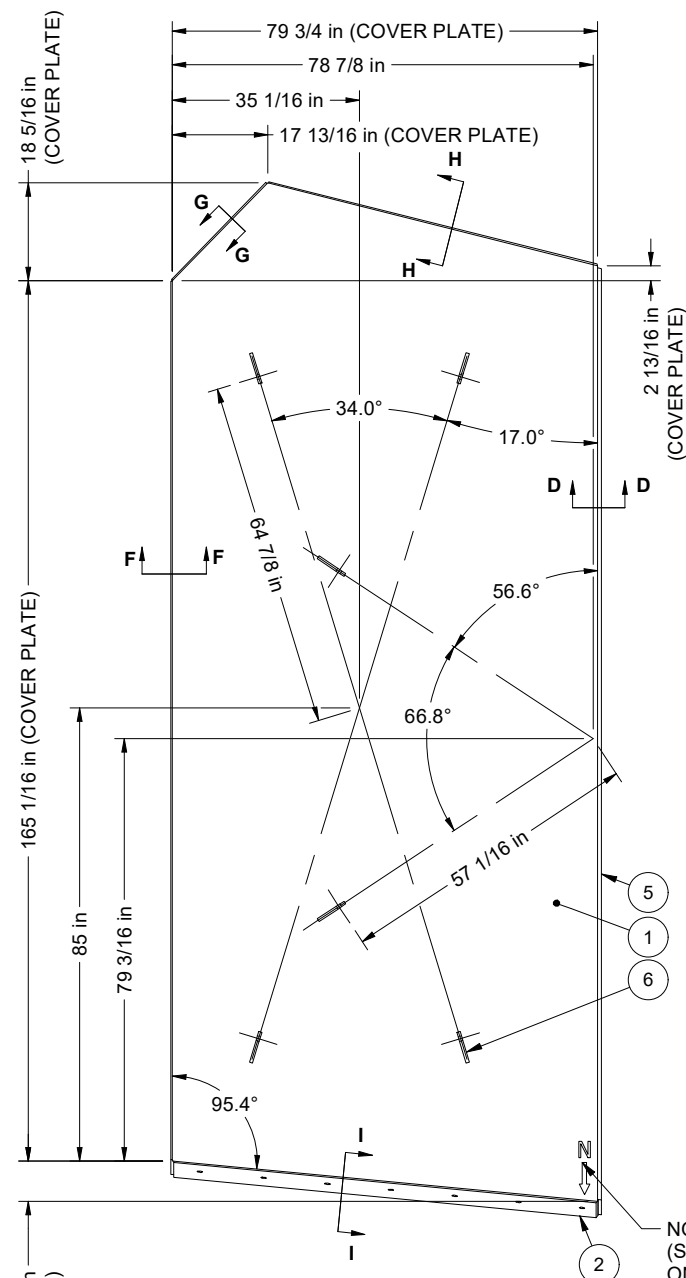


SECTION I-I

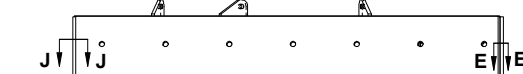


SECTION C-C

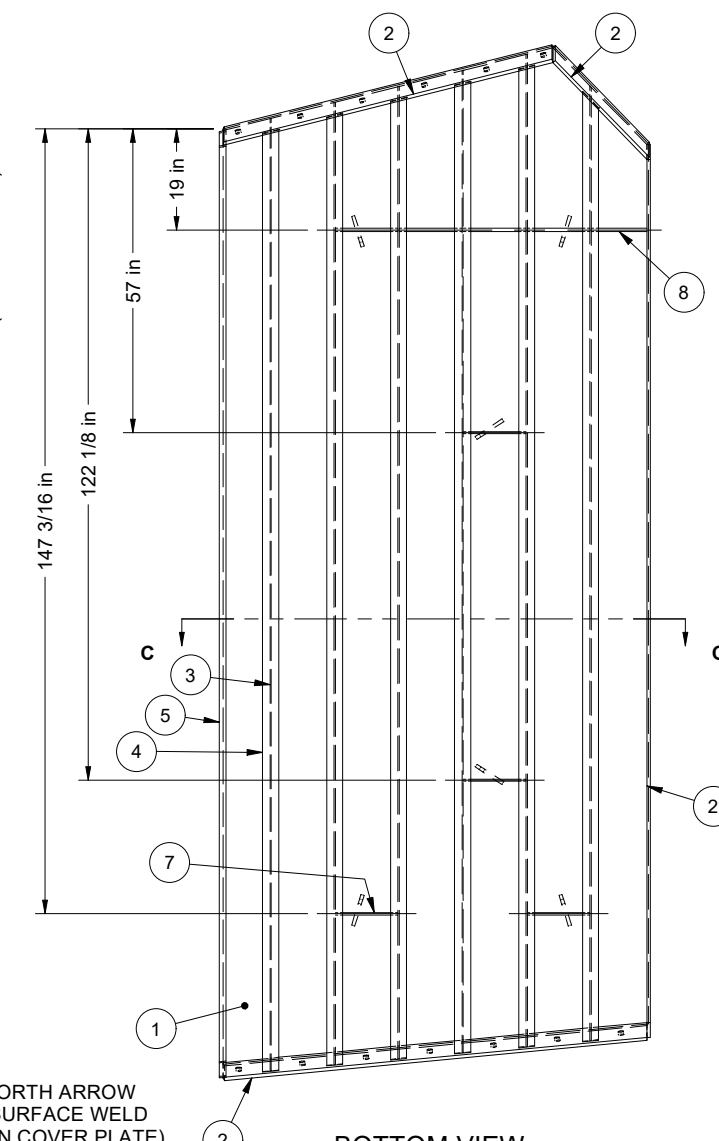
SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (14 TOTAL). HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS



MK# P60236-A-902 - PLAN VIEW



SIDE VIEW



BOTTOM VIEW

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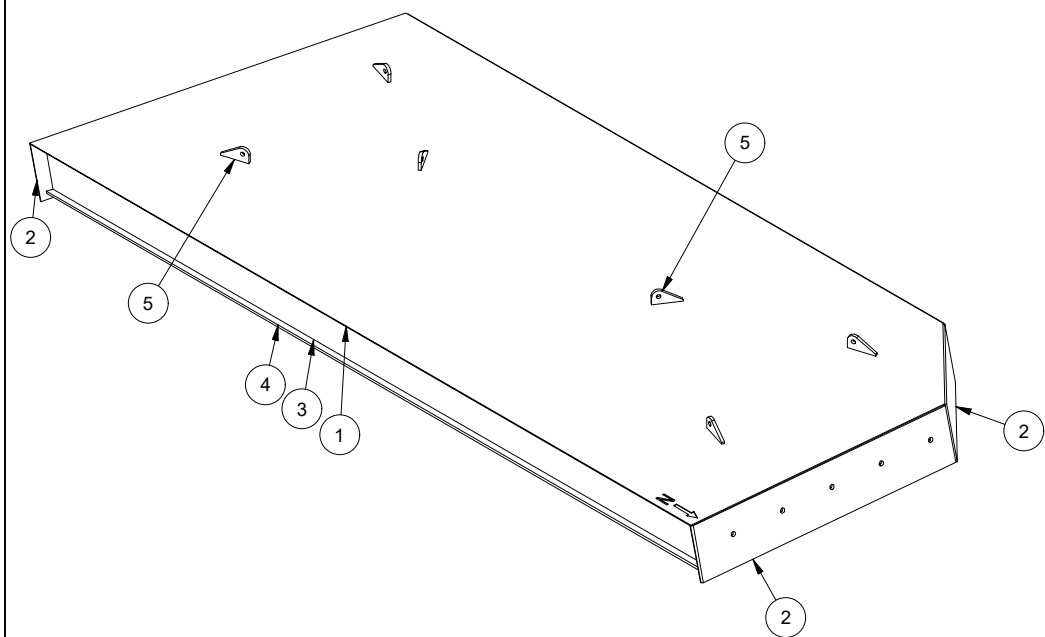
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.



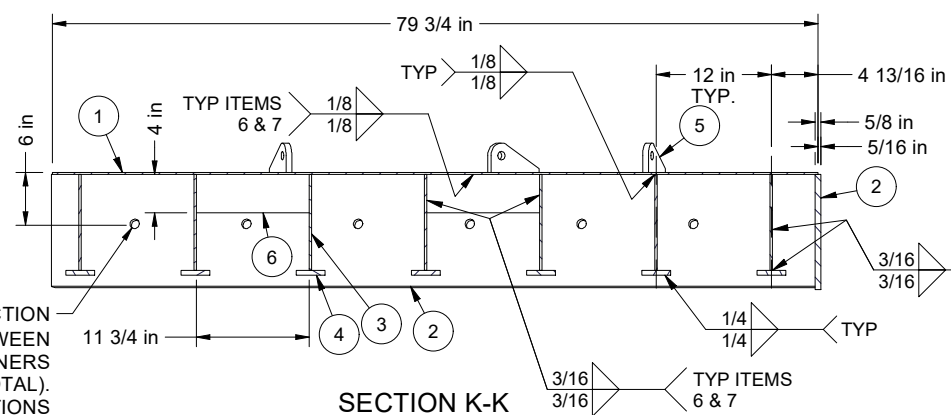
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
 TOP COVER SECTION 1 DETAILS
 LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 7
 DWG. NO.: P60236-09-4

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	3/16" PLATE		ASTM A-240 316	
2	12" X 5/8" FLAT BAR		ASTM A-240 316	
3	10" X 1/4" FLAT BAR		ASTM A-240 316	
4	3" X 1/2" FLAT BAR		ASTM A-240 316	
5	5/8" PLATE		ASTM A-240 316	
6	4" X 3/8" FLAT BAR		ASTM A-240 316	
7	8" X 5/8" FLAT BAR		ASTM A-240 316	

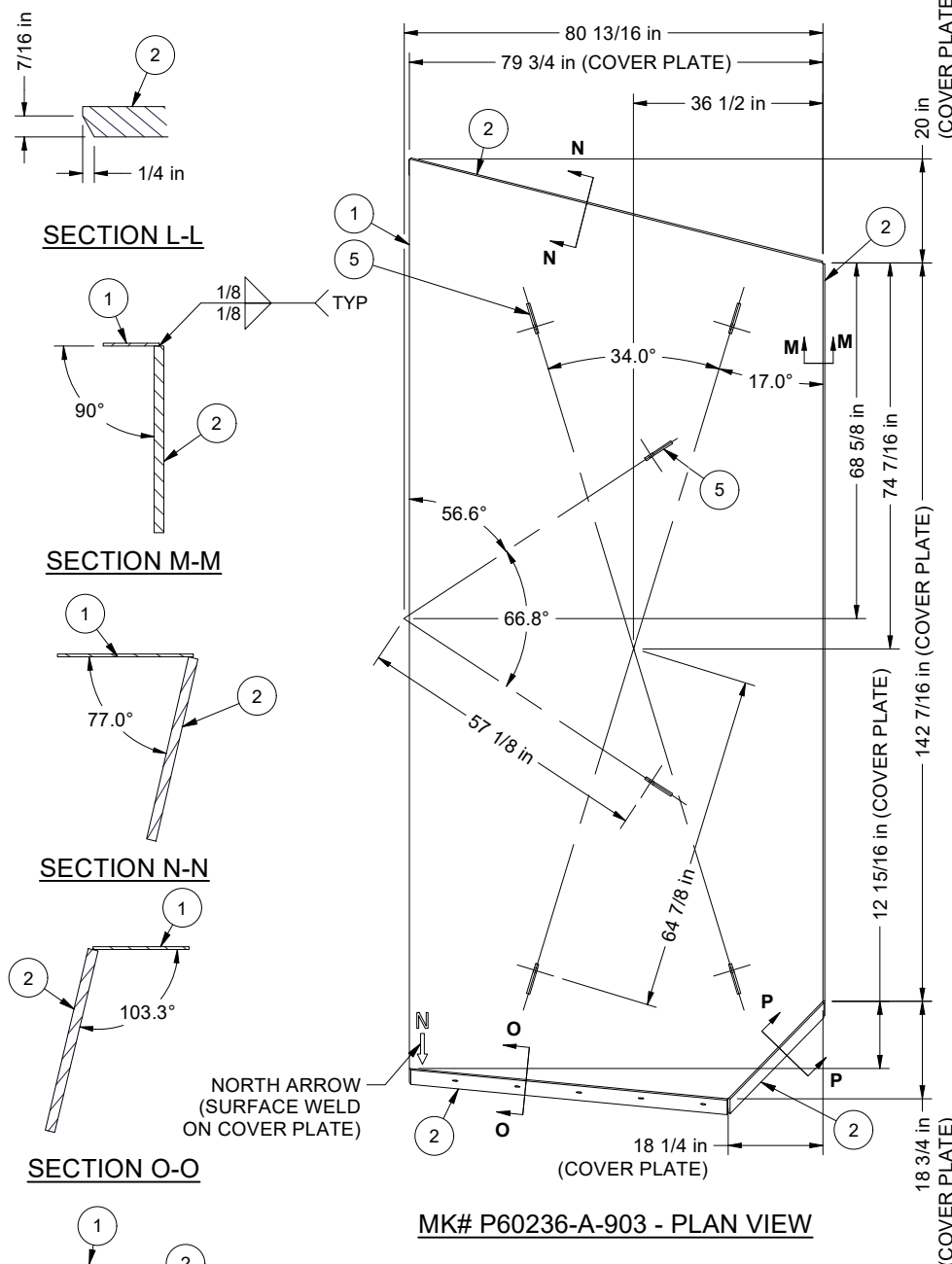


ISO VIEW

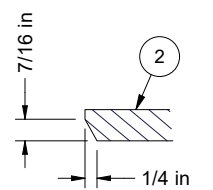


SECTION K-K

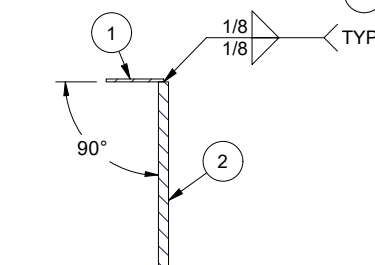
SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (14 TOTAL). HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS



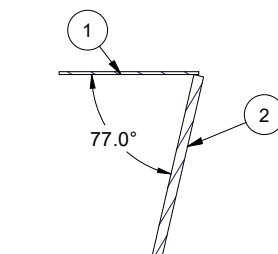
MK# P60236-A-903 - PLAN VIEW



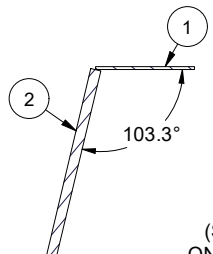
SECTION L-L



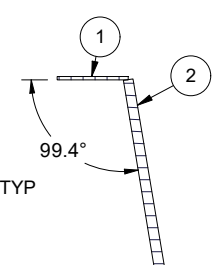
SECTION M-M



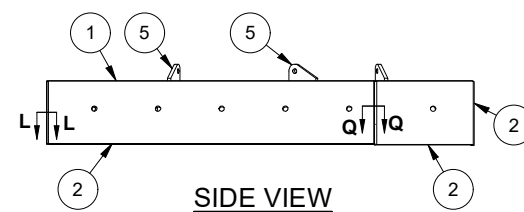
SECTION N-N



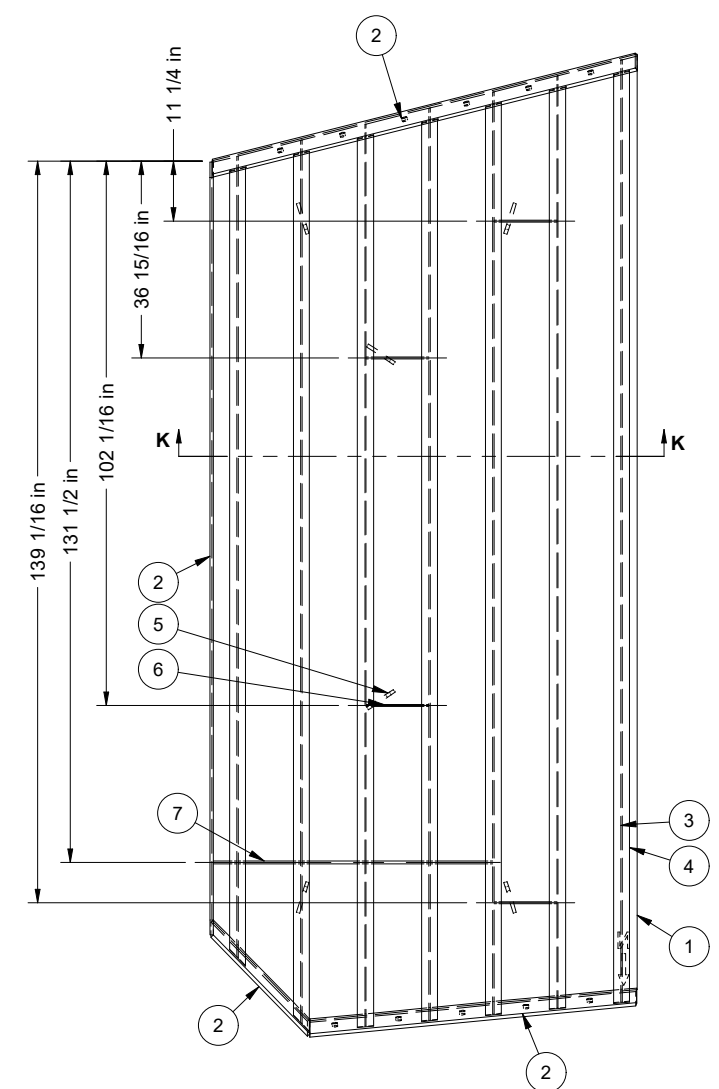
SECTION O-O



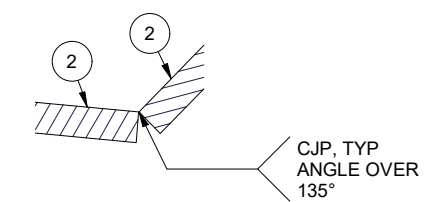
SECTION P-P



SIDE VIEW



BOTTOM VIEW

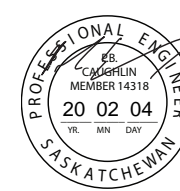


SECTION Q-Q

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.

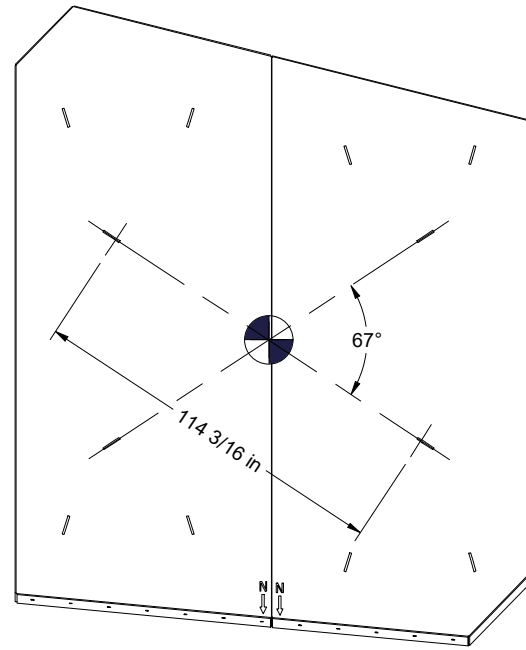


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CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

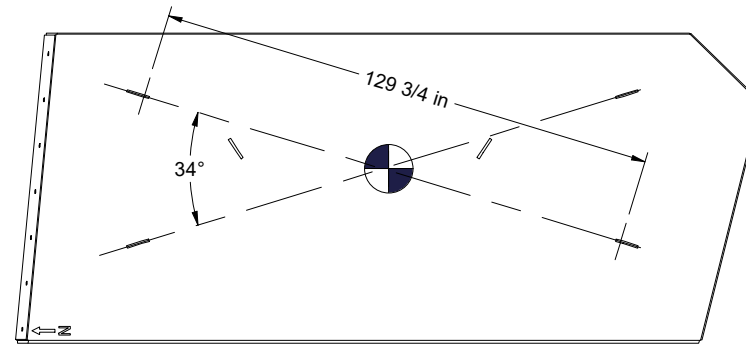
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
 TOP COVER SECTION 2 DETAILS
 LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

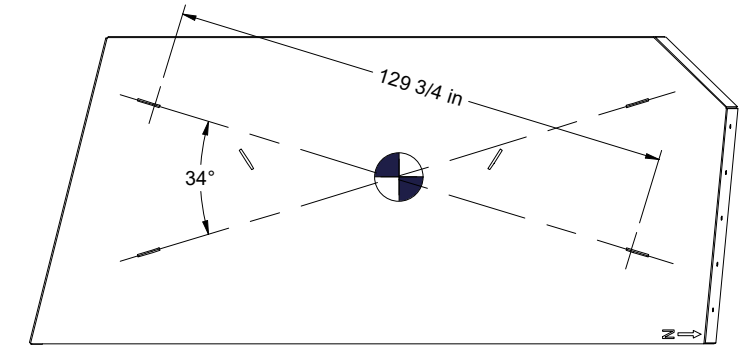
DO NOT SCALE DRAWINGS SHEET NO.: 5 OF 7 DWG. NO.: P60236-09-5



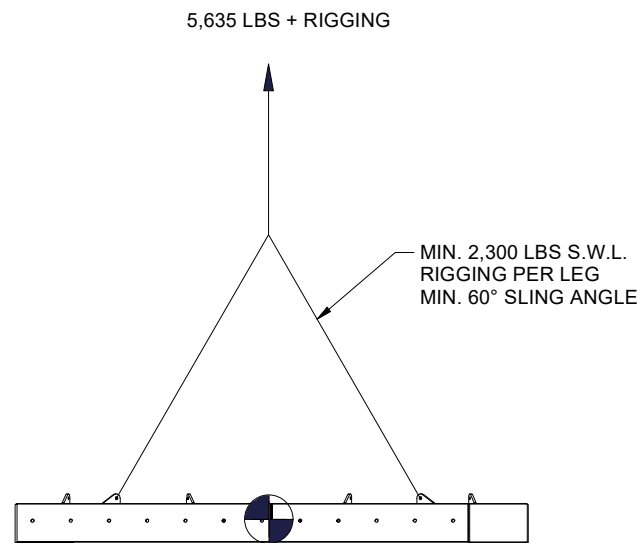
TOP COVER LIFTING DIAGRAM - TOP VIEW
MK# P60236-A-901



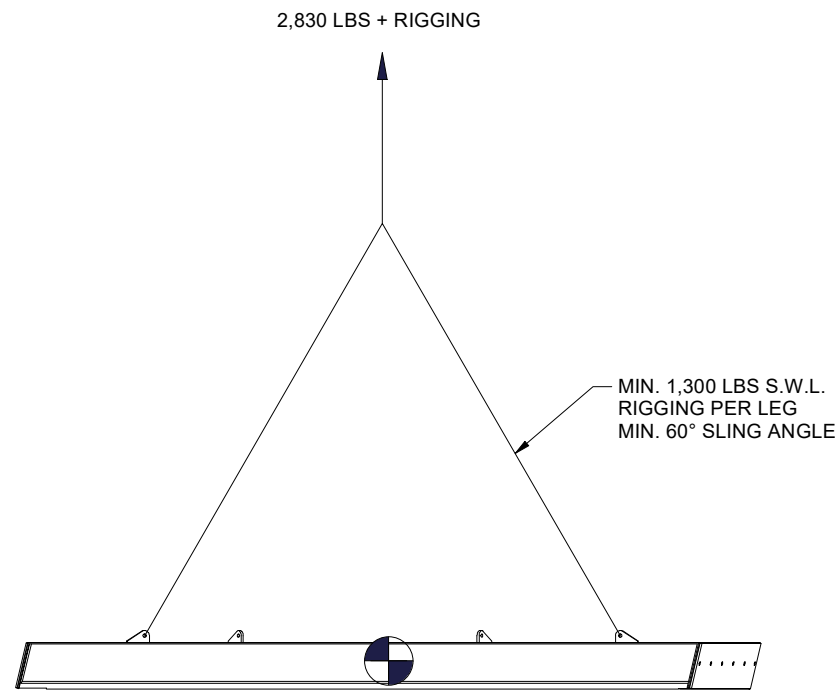
COVER SECTION 1 LIFTING DIAGRAM - TOP VIEW
MK# P60236-A-902



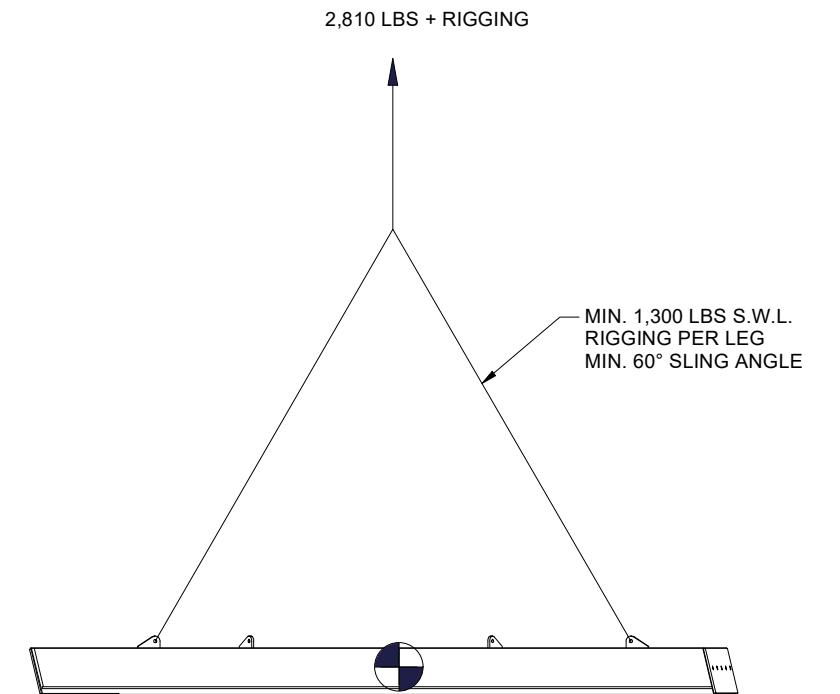
COVER SECTION 2 LIFTING DIAGRAM - TOP VIEW
MK# P60236-A-903



TOP COVER LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-901



COVER SECTION 1 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-902

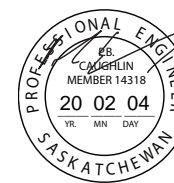


COVER SECTION 2 LIFTING DIAGRAM - SIDE VIEW
MK# P60236-A-903

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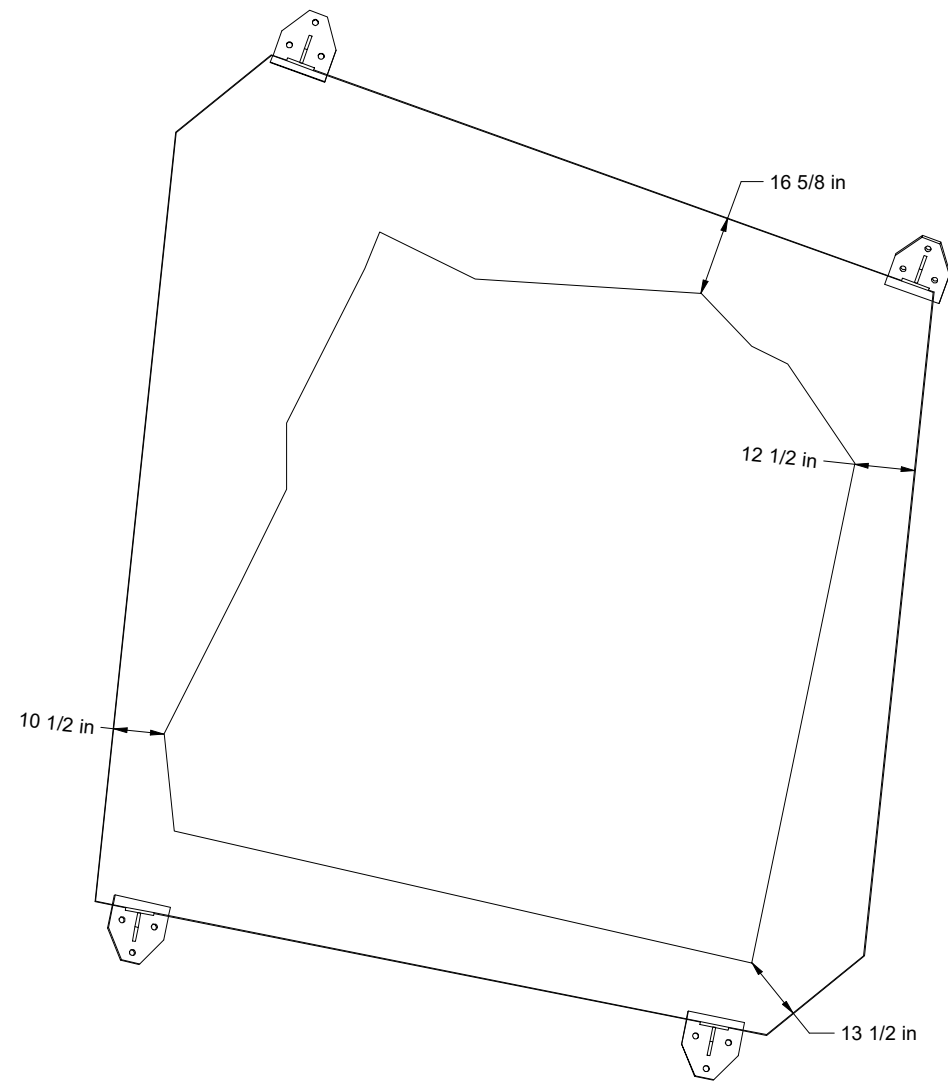
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.



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 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING
 LIFTING DETAILS
 LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 6 OF 7
 DWG. NO.: P60236-09-6

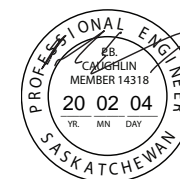


OPENING TO SKIRT CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		△				LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		△	AS-BUILT DRAWING	04/Feb/20	CEG	
		△	ISSUED FOR CONSTRUCTION	07/Jan/19	ANP	DRWN BY: ANP DATE: 14/Nov/18
P60236-10	KOVA DWG - STANDARD DETAILS	△	ISSUED FOR REVIEW	19/Nov/18	NR	CHK'D BY: ENG BY: P.C.



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE HAB 10 OPENING CLEARANCES
 LOCATION: 59° 37' 21.0" N, 108° 25' 12.55" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 7 OF 7 DWG. NO.: P60236-09-7

2020 Cover Installations

FAY 1 - Shaft

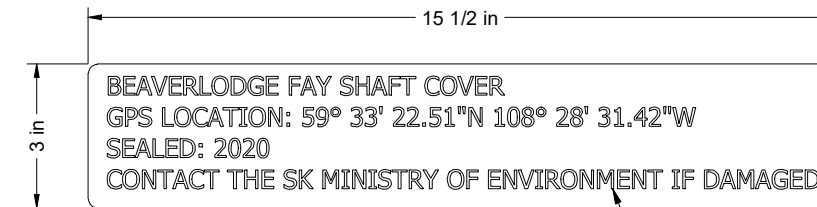
FAY 1 - Shaft

GENERAL NOTES:

1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL SURFACES TO BE FIELD PICKLED AND PASSIVATED FOLLOWING FIELD WELDING IN ACCORDANCE WITH QA/QC PROTOCOL. KOVA PERSONNEL TO REVIEW VISIBLE SURFACES FOLLOWING PICKLING AND PASSIVATING DURING FINAL FIELD INSPECTION.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.
13. SHOP DRAWINGS FOR PARTS USED IN FABRICATION SHALL BE REVIEWED BY KOVA PERSONNEL. KOVA TO PROVIDED CAD MODEL TO FABRICATION FOR REFERENCE IN MAKING PART DRAWINGS.
14. A TEST FIT OF THE TOP COVER COMPONENTS IN THE FABRICATION SHOP IS REQUIRED. KOVA PERSONNEL TO WITNESS THE COMPLETED TEST FIT ASSEMBLY.

COVER CHARACTERISTICS:

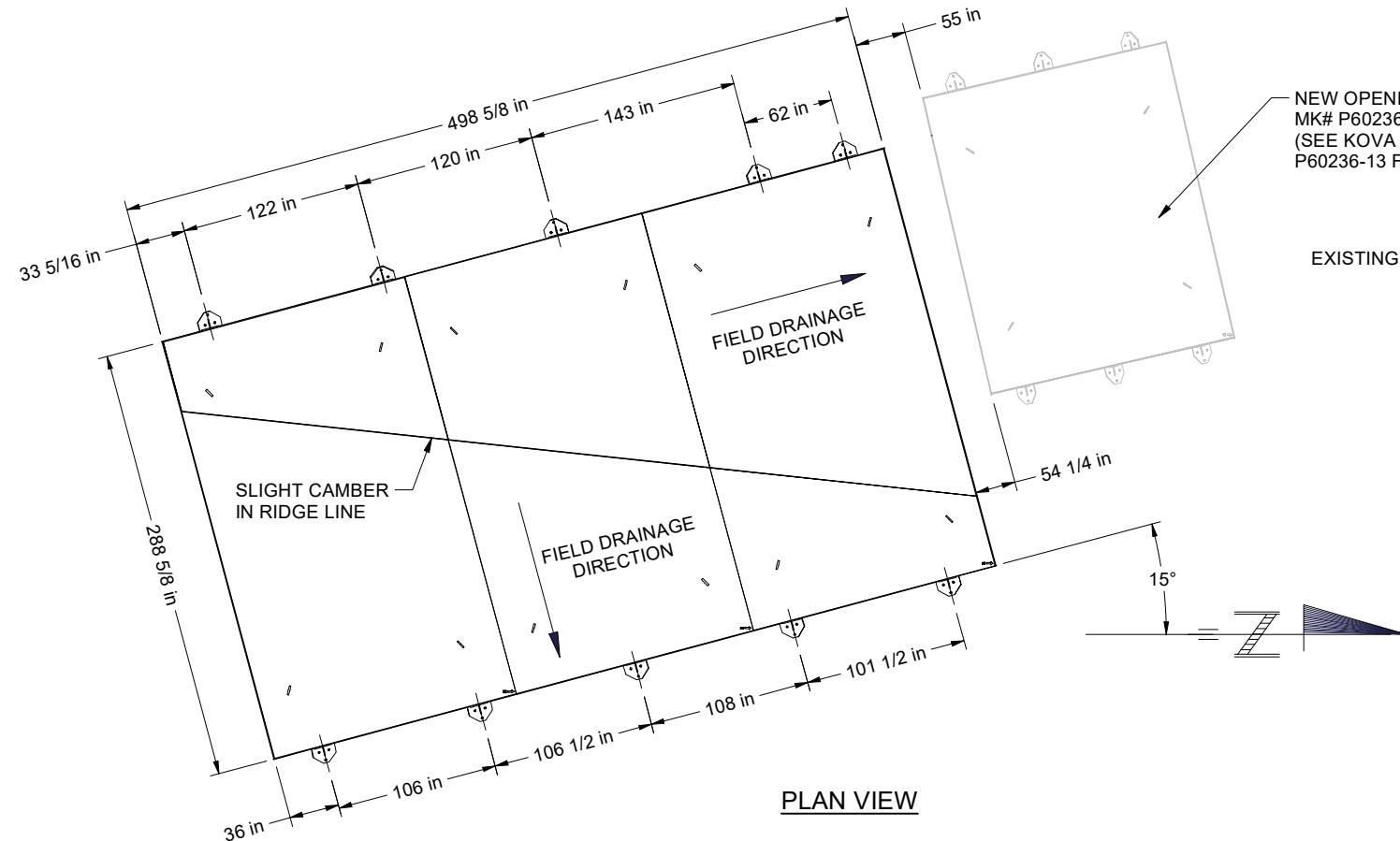
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED SURFACES. CONSIDERING THE RESULTS OF THIS RESEARCH AND A CORROSION ALLOWANCE OF 1mm ON ANY SURFACE, THE COVER DEPICTED HAS AN ESTIMATED USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS PERIODIC INSPECTIONS BE PERFORMED AS RECOMMENDED IN THE QA/QC PROTOCOL.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 44,200 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



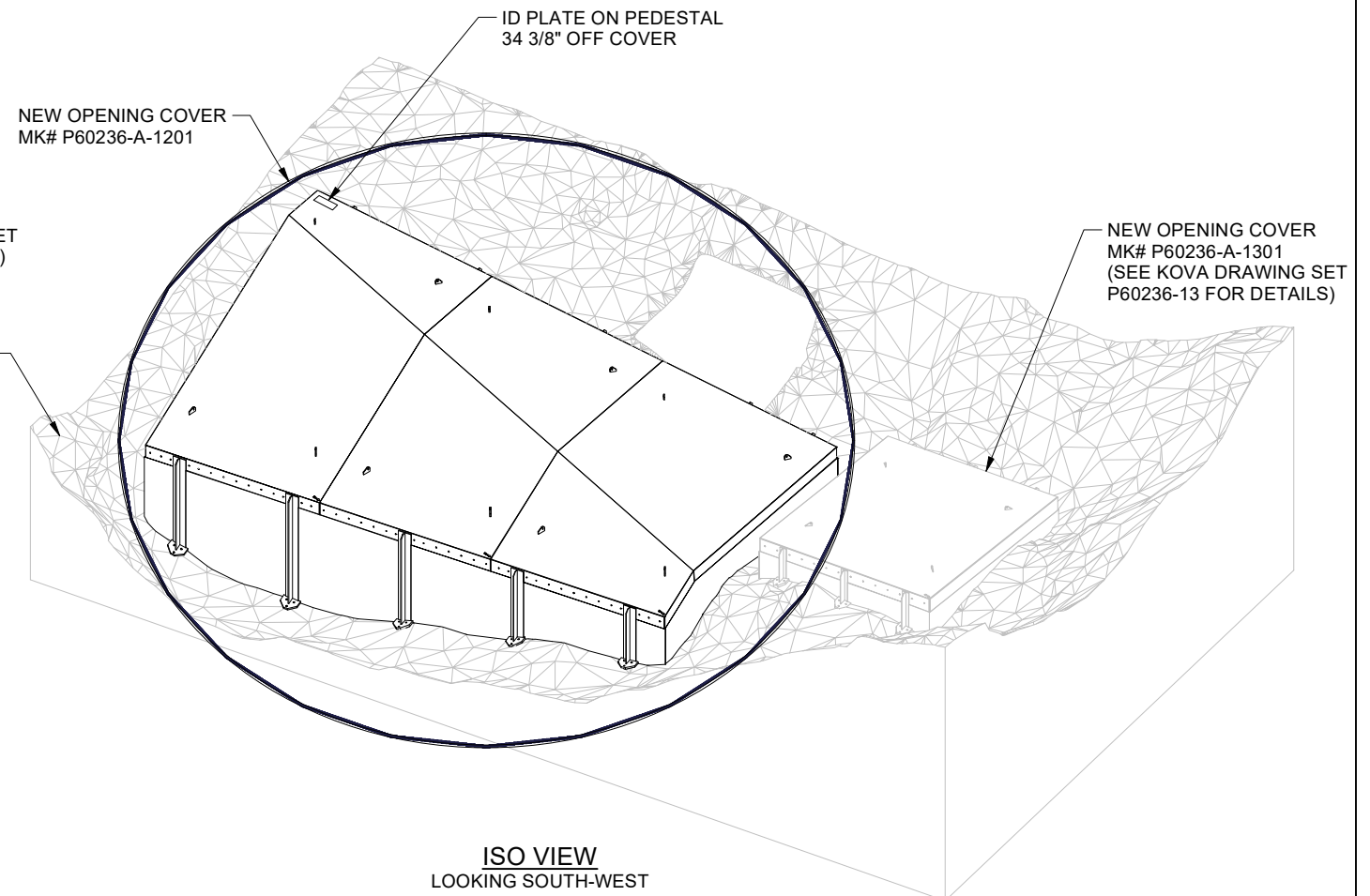
ID PLATE
TO BE SUPPLIED AND
INSTALLED BY FABRICATOR

LETTERS TO BE MILLED INTO
12 GA 316 SS SHEETING.
MIN. 10mm LETTER HEIGHT

ESTIMATED WEIGHTS:
TOP COVER W/O RIGGING: 36,760 LBS
AS INSTALLED: 44,200 LBS



PLAN VIEW



ISO VIEW
LOOKING SOUTH-WEST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: NathanR DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.



Association of Professional Engineers & Geoscientists
of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline Sk. Reg. No. Signature
Structural 14318

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ

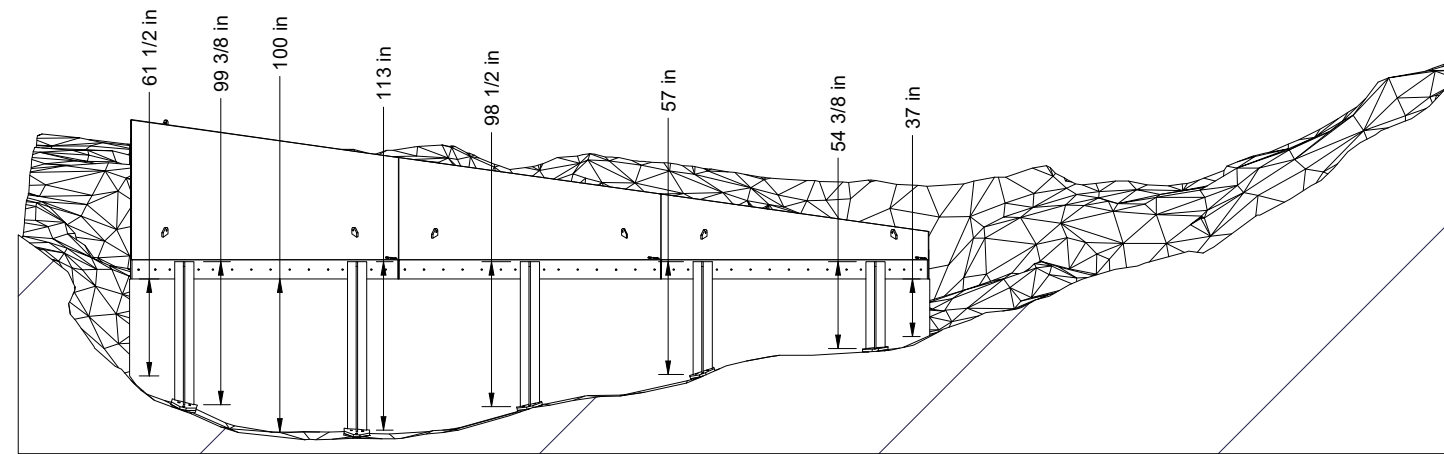
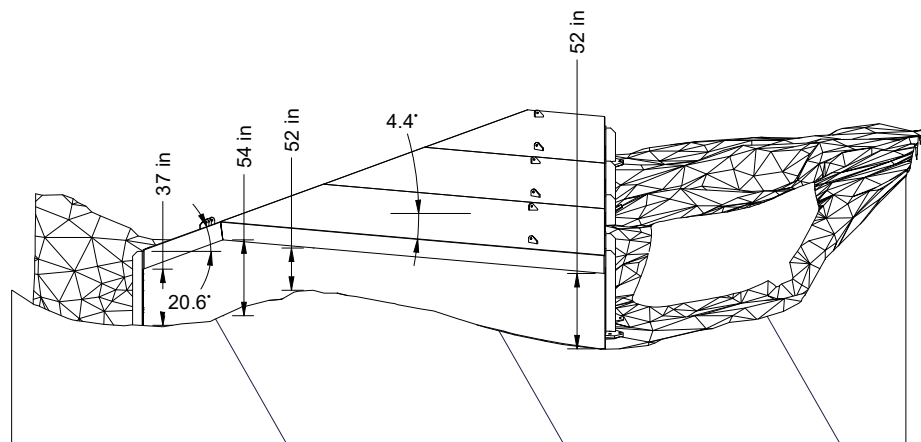
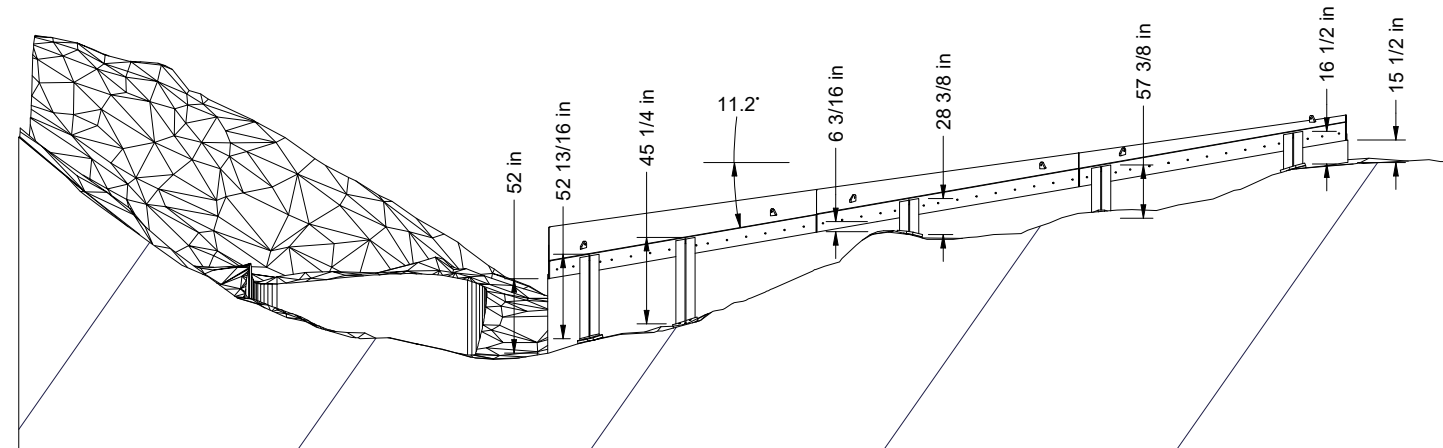
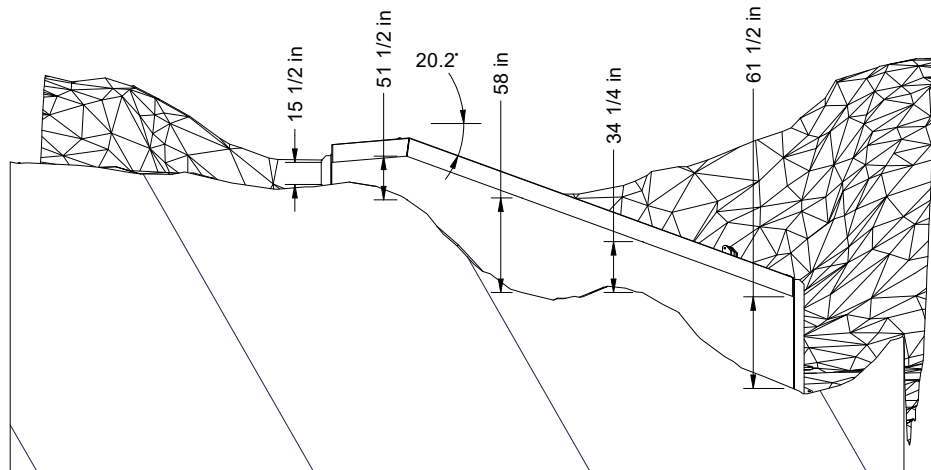
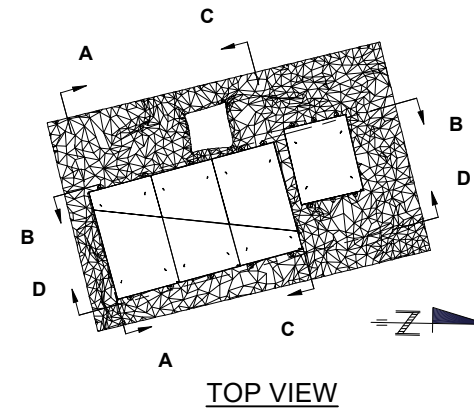
DO NOT SCALE DRAWINGS DWG. NO.: **P60236-12-1** SHEET NO.: 1 OF 13

KOVA RECOMMENDED COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE OF INSTALLATION CONTRACTOR.
SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.

BILL OF MATERIAL FOR SKIRT AND COLUMNS

DISCRIPTION	QTY
COLUMN SECTIONS - 20' LENGTHS (SHIPPED LOOSE)	6
1/4" SKIRT - 5' X 10' SHEETS (SHIPPED LOOSE)	17

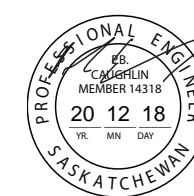
NOTE: QUANTITIES IN BILL OF MATERIALS ARE FOR BIDDING PURPOSES ONLY. SUBJECT TO CHANGE FOLLOWING AWARD.



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: $\frac{250}{125}$ MACHINED SURFACES: $\frac{125}{125}$ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

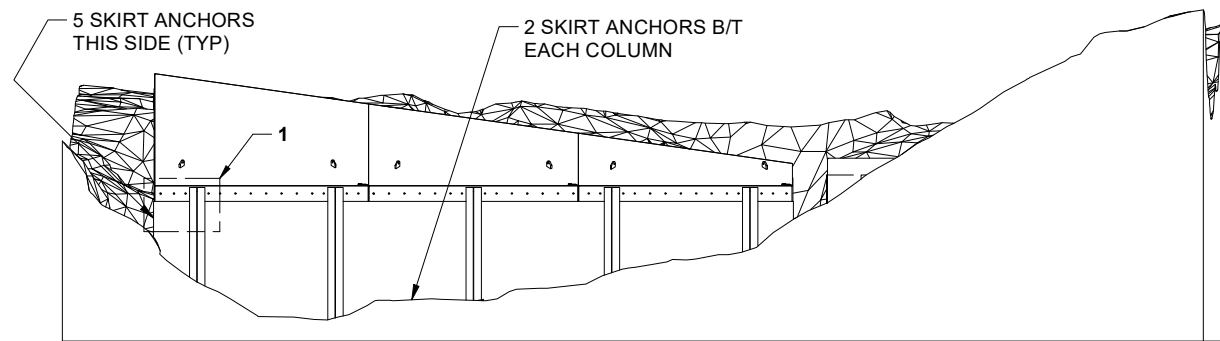
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

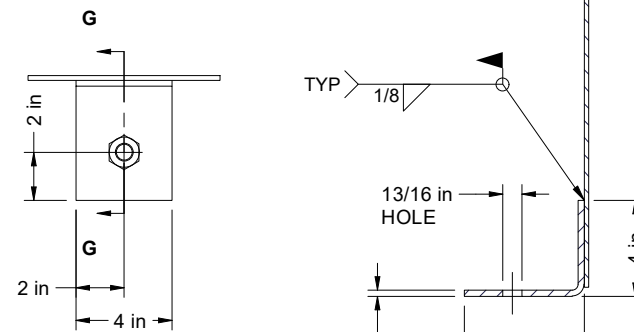
DO NOT SCALE DRAWINGS

SHEET NO.: 2 OF 13

DWG. NO.: P60236-12-2



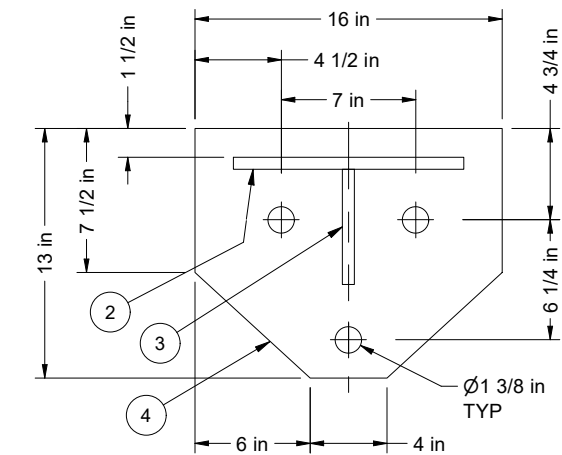
SIDE VIEW



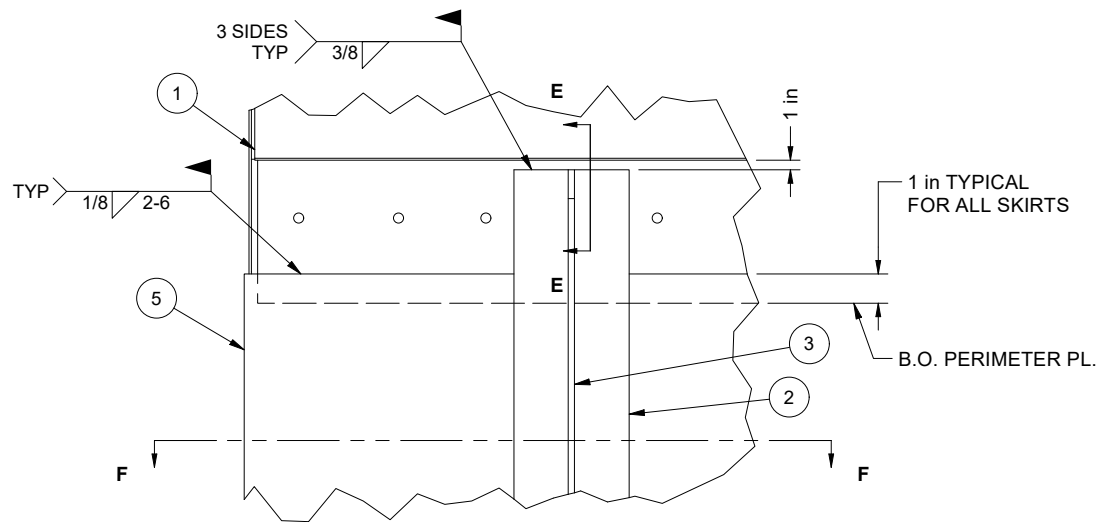
TOP VIEW

SECTION G-G

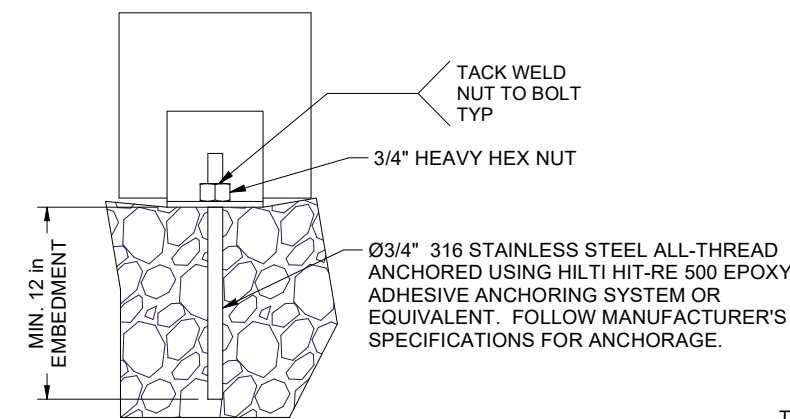
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	TOP COVER ASSEMBLY	MK# P60236-A-1201		4
2	12" X 5/8" FLAT BAR		ASTM A-240 316 L	
3	6" X 5/8" FLAT BAR		ASTM A-240 316 L	
4	1-1/2" PL		ASTM A-240 316 L	
5	1/4" PL		ASTM A-240 316 L	



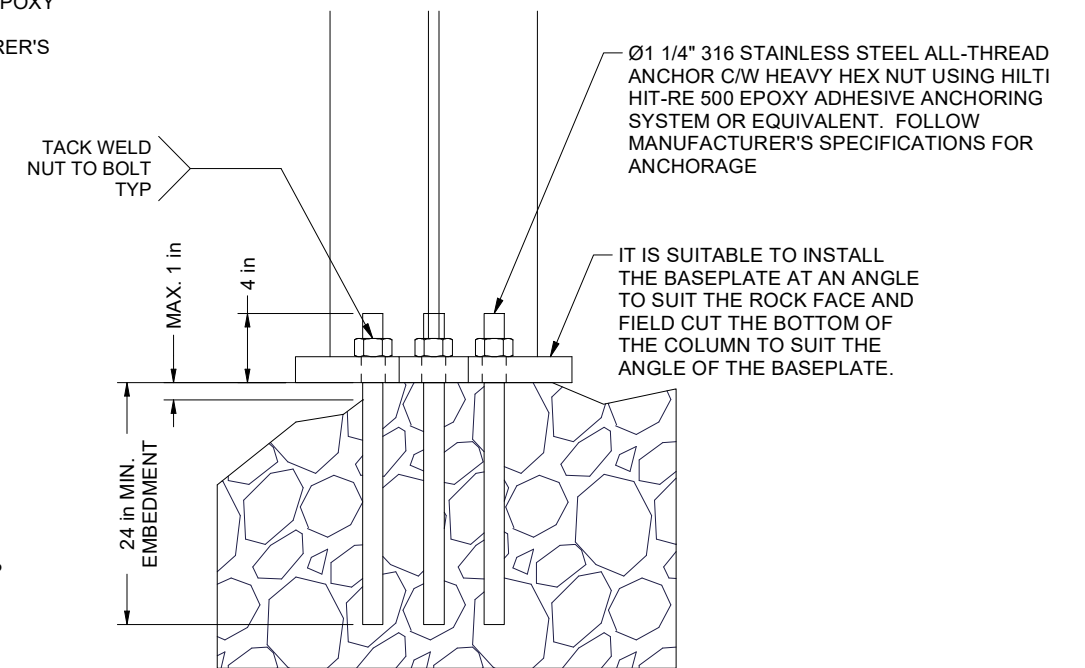
TYPICAL BASEPLATE DETAIL



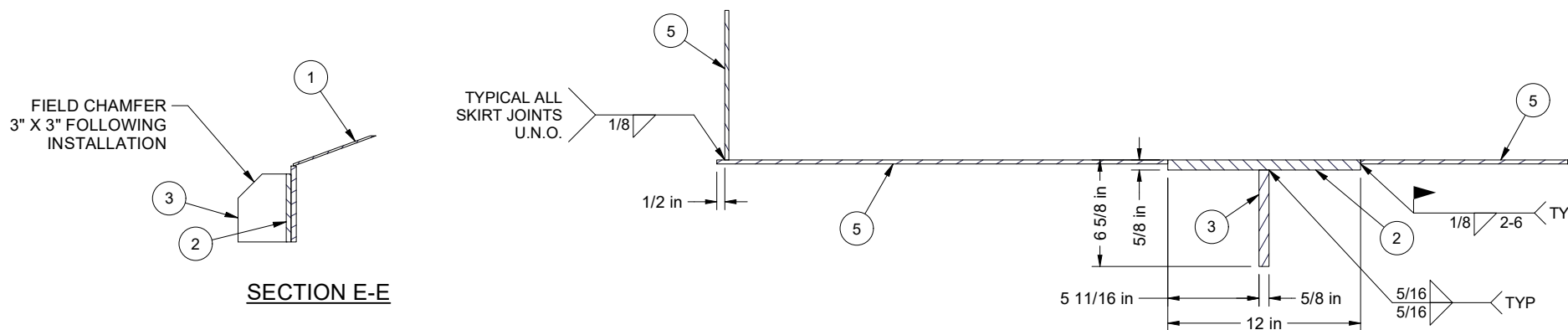
DETAIL 1



TYPICAL SKIRT ANCHOR DETAIL



TYPICAL COLUMN ANCHOR BOLT DETAIL



SECTION E-E

SECTION F-F

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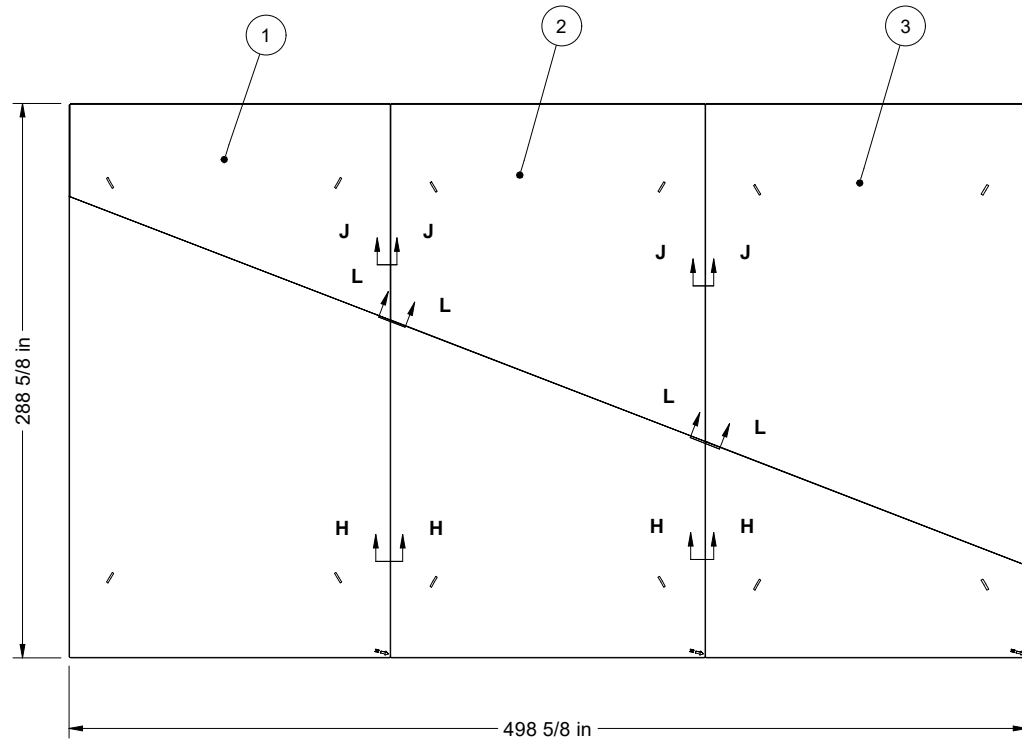
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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: NathanR DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.

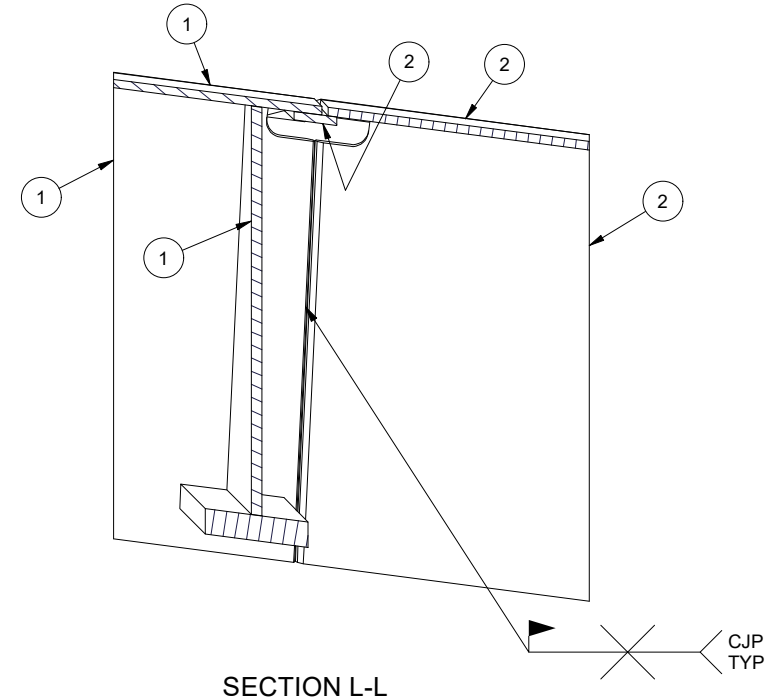


Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 SKIRT AND COLUMN DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 3 OF 13
 DWG. NO.: P60236-12-3
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

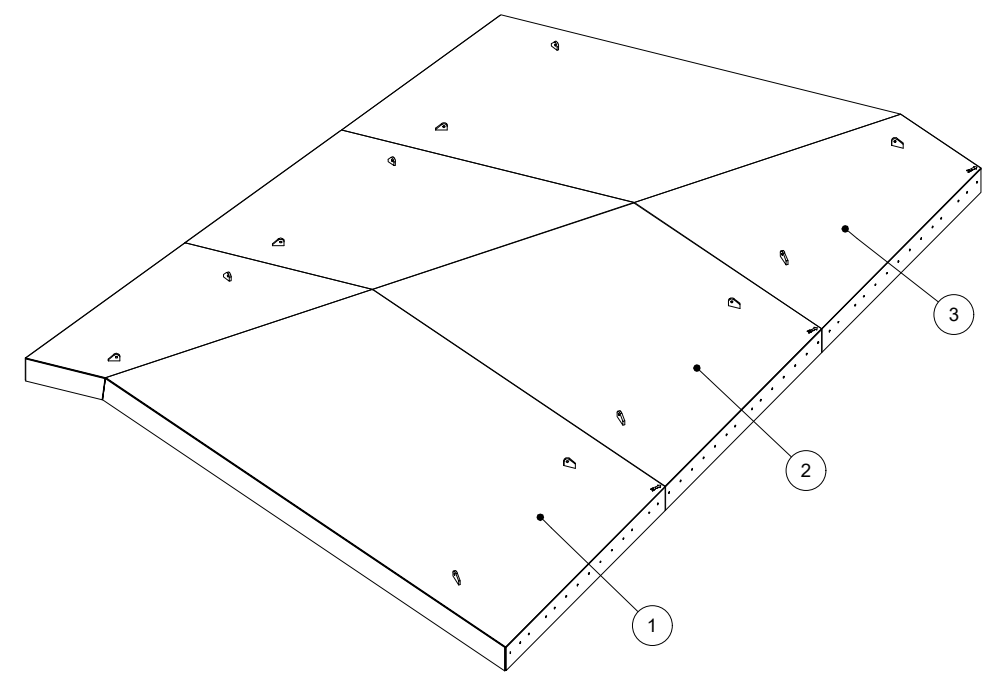


MK# P60236-A-1201 - PLAN VIEW

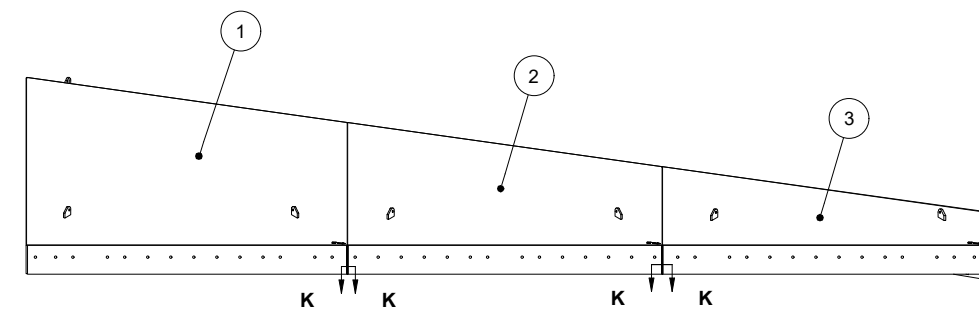


SECTION L-L

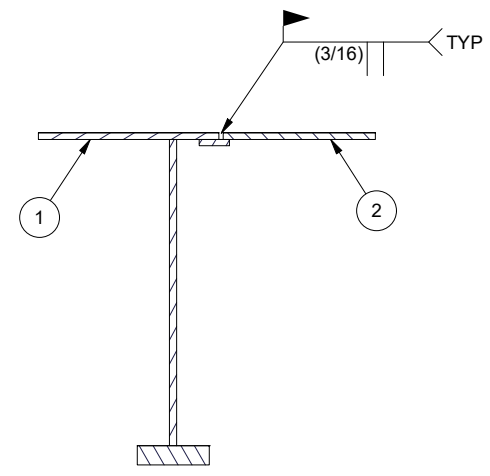
BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	PART #	MATERIAL	SHT#
1	1	COVER SECTION 1	MK# P60236-A-1202		
2	1	COVER SECTION 2	MK# P60236-A-1203		
3	1	COVER SECTION 3	MK# P60236-A-1204		



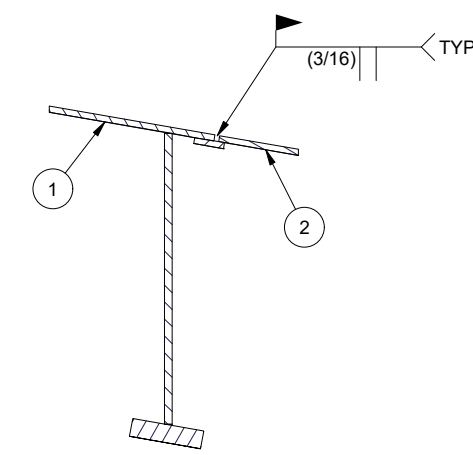
MK# P60236-A-1201 - ISO VIEW



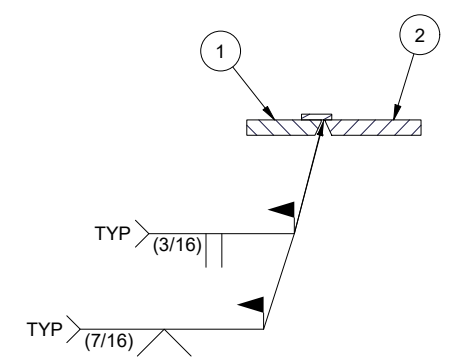
MK# P60236-A-1201 - SIDE VIEW



SECTION H-H



SECTION J-J



SECTION K-K

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	

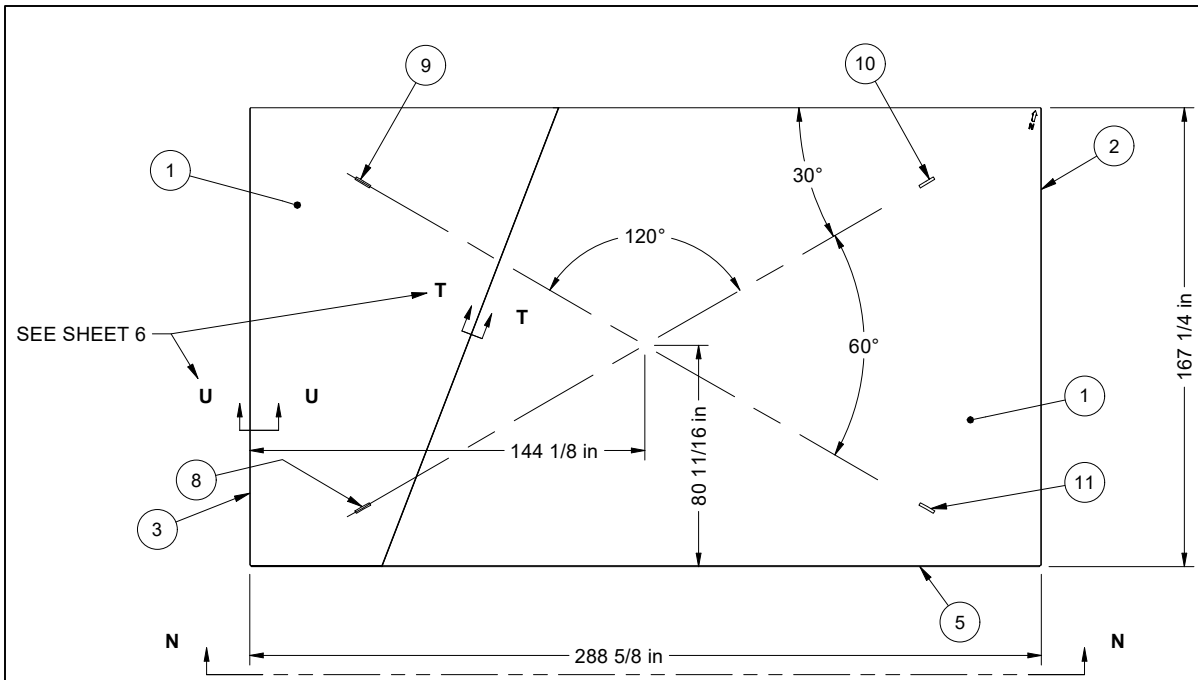


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 Structural 14318

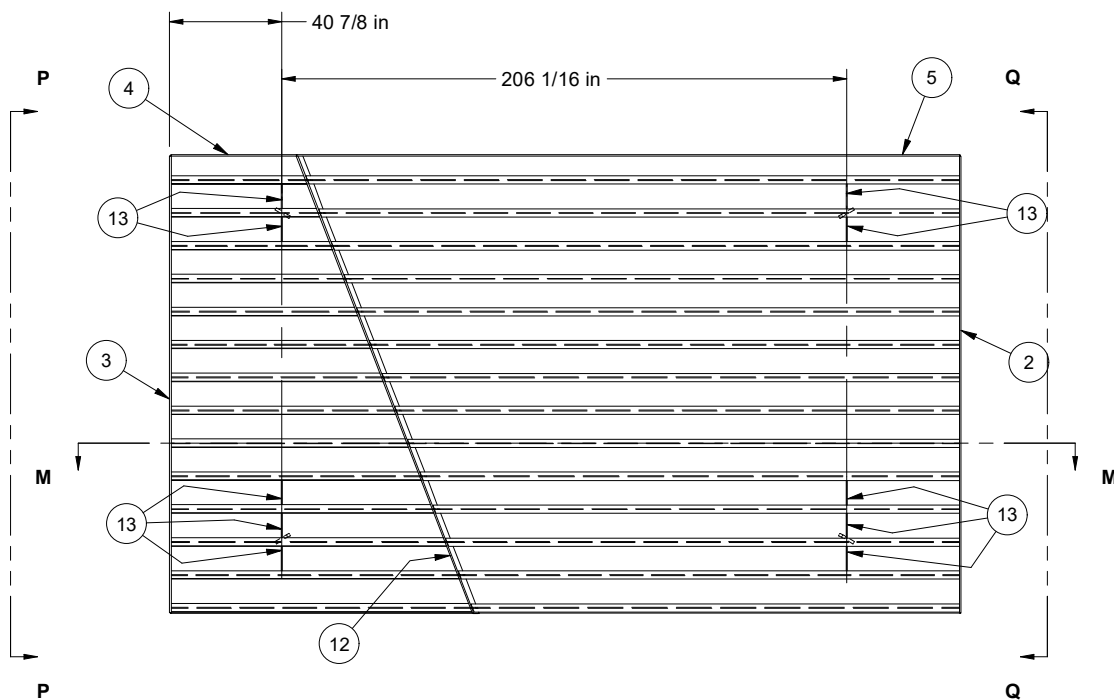
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER FIELD ASSEMBLY DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

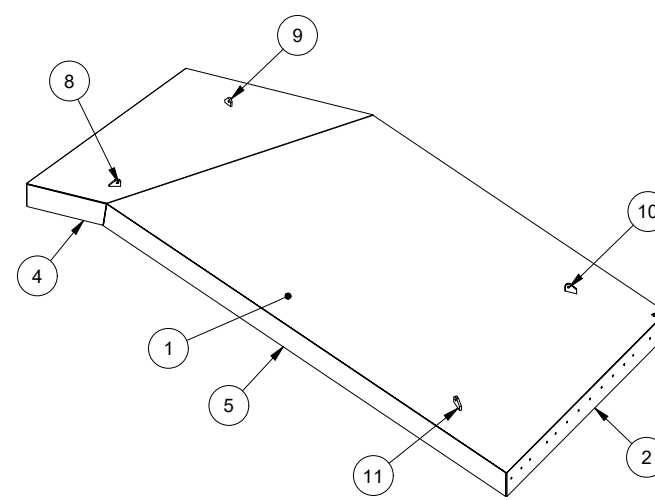
DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 13 DWG. NO.: P60236-12-4



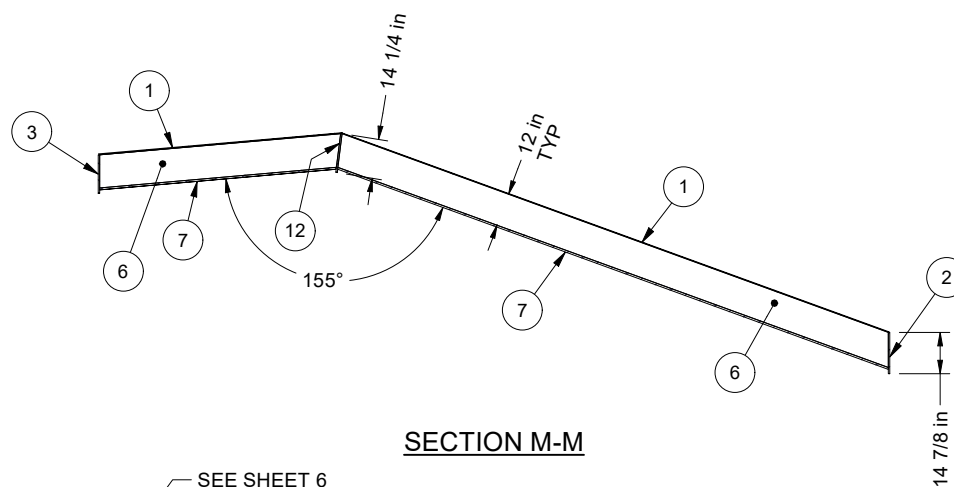
MK# P60236-A-1202 - TOP VIEW



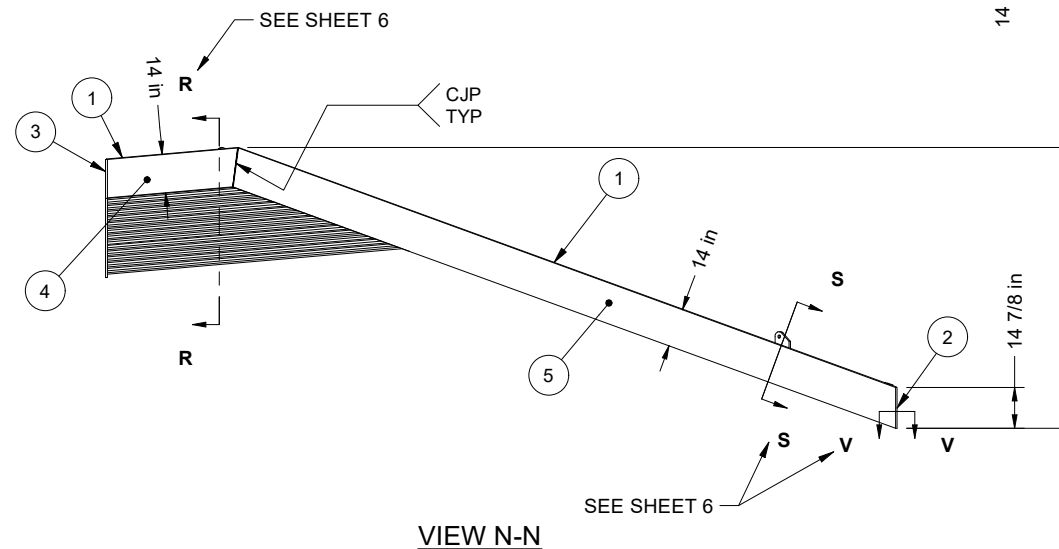
MK# P60236-A-1202 - BOTTOM VIEW



MK# P60236-A-1202 - ISO VIEW

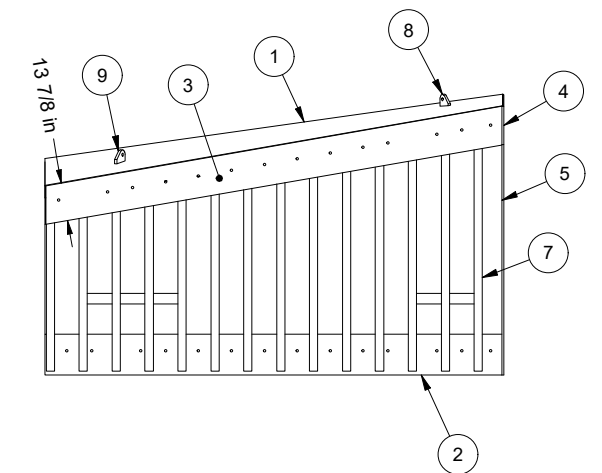


SECTION M-M

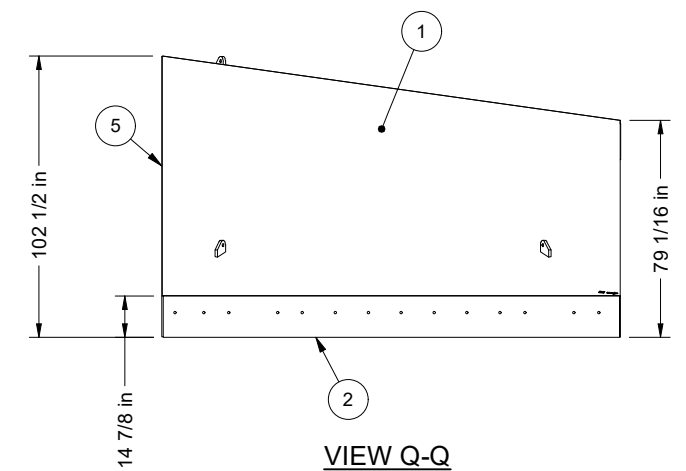


VIEW N-N

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	5/8" PL		ASTM A-240 316L	
5	5/8" PL		ASTM A-240 316L	
6	5/16" PL		ASTM A-240 316L	
7	3" X 3/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	1/2" PL		ASTM A-240 316L	
13	4" X 3/8" FLAT BAR		ASTM A-240 316L	



VIEW P-P



VIEW Q-Q

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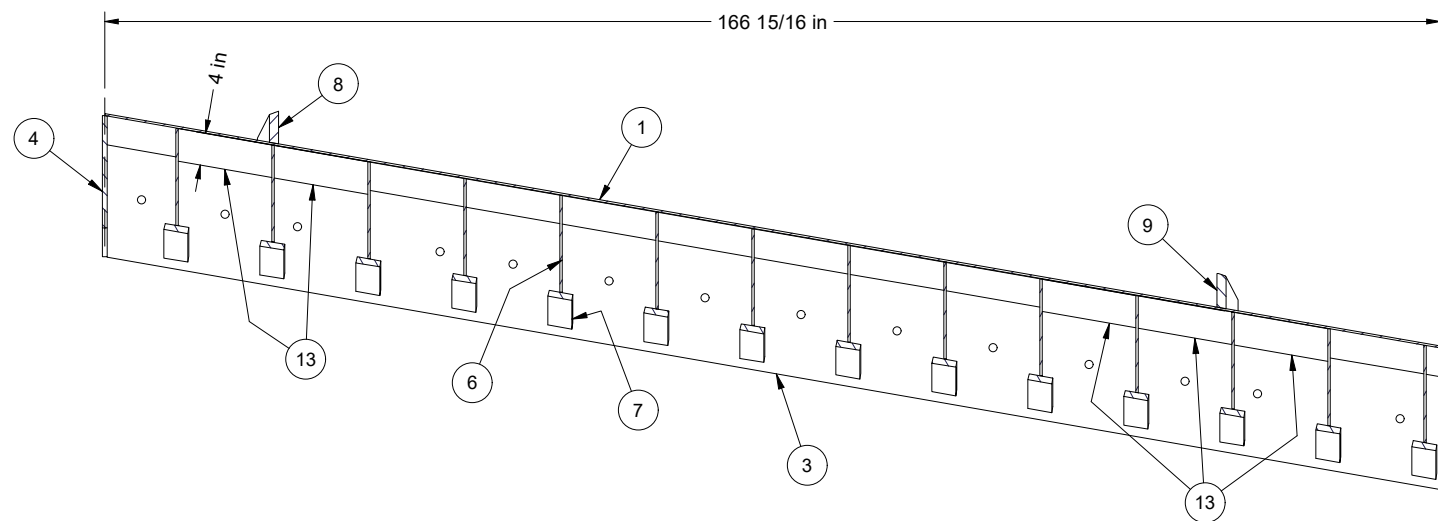
DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



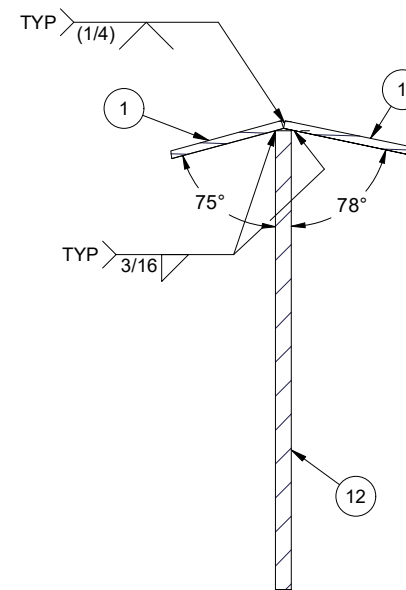
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 1 - ASSEMBLY DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 5 OF 13
 DWG. NO.: P60236-12-5

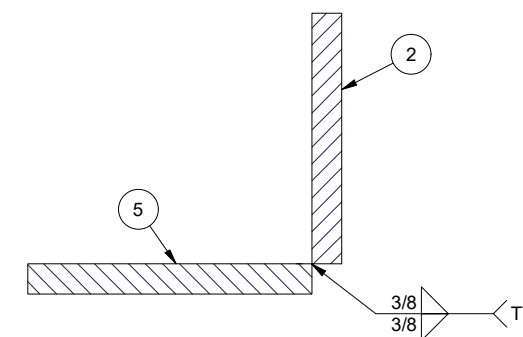
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	5/8" PL		ASTM A-240 316L	
5	5/8" PL		ASTM A-240 316L	
6	5/16" PL		ASTM A-240 316L	
7	3" X 3/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	1/2" PL		ASTM A-240 316L	
13	4" X 3/8" FLAT BAR		ASTM A-240 316L	



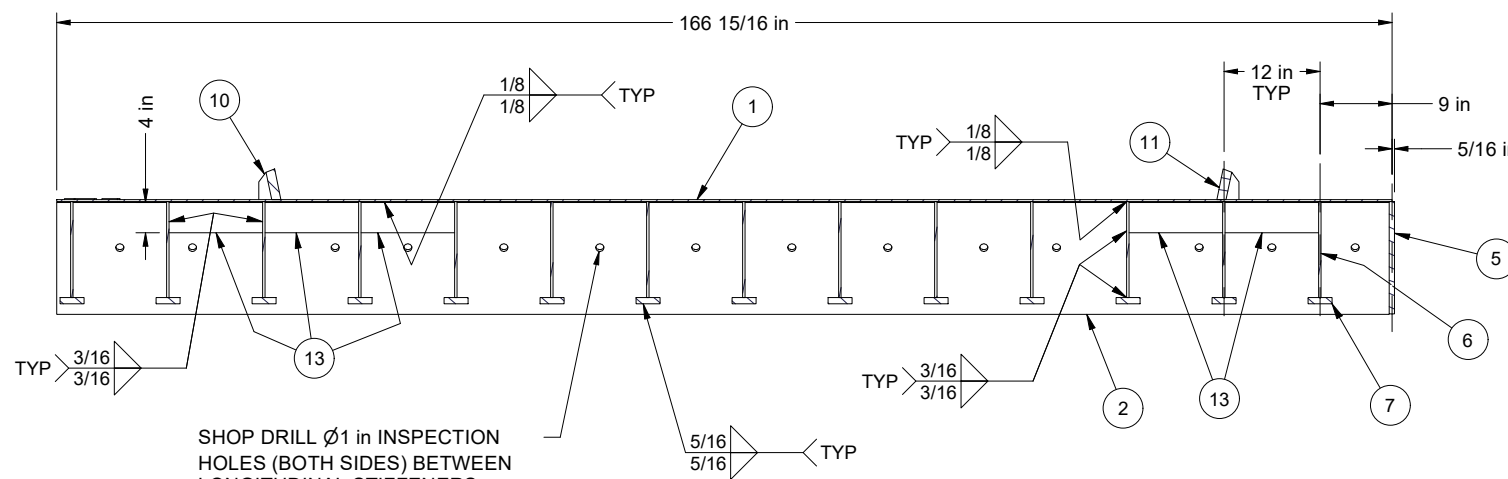
SECTION R-R



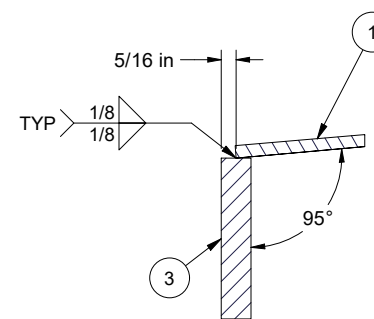
SECTION T-T



SECTION V-V



SECTION S-S



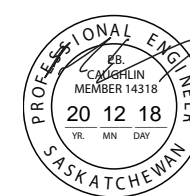
SECTION U-U

SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (14 TOTAL) HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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 Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

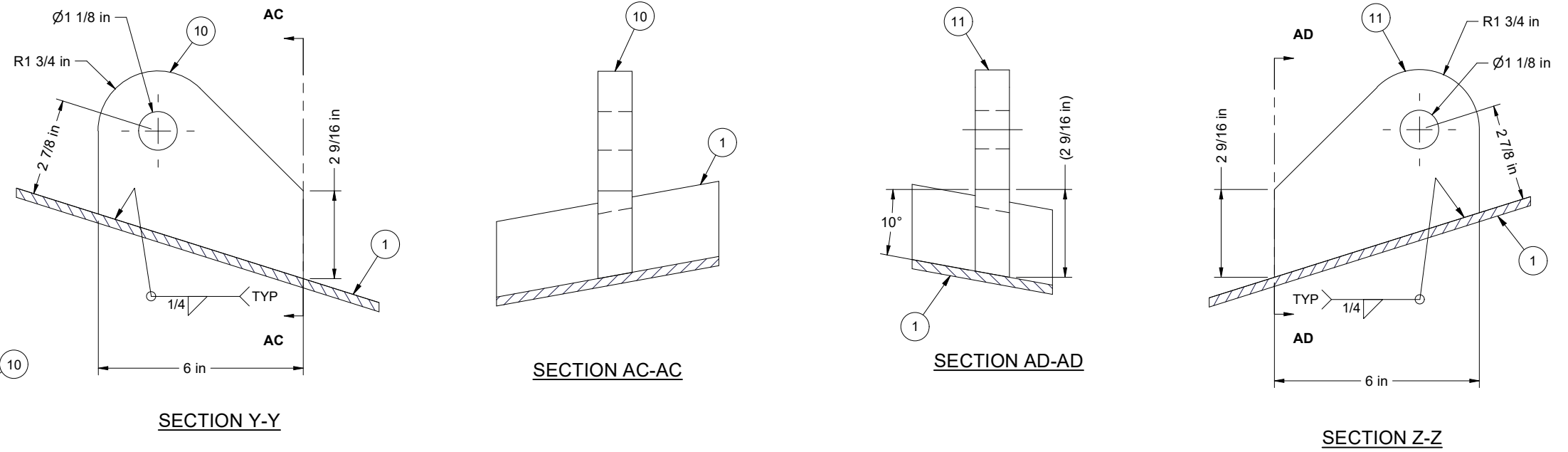
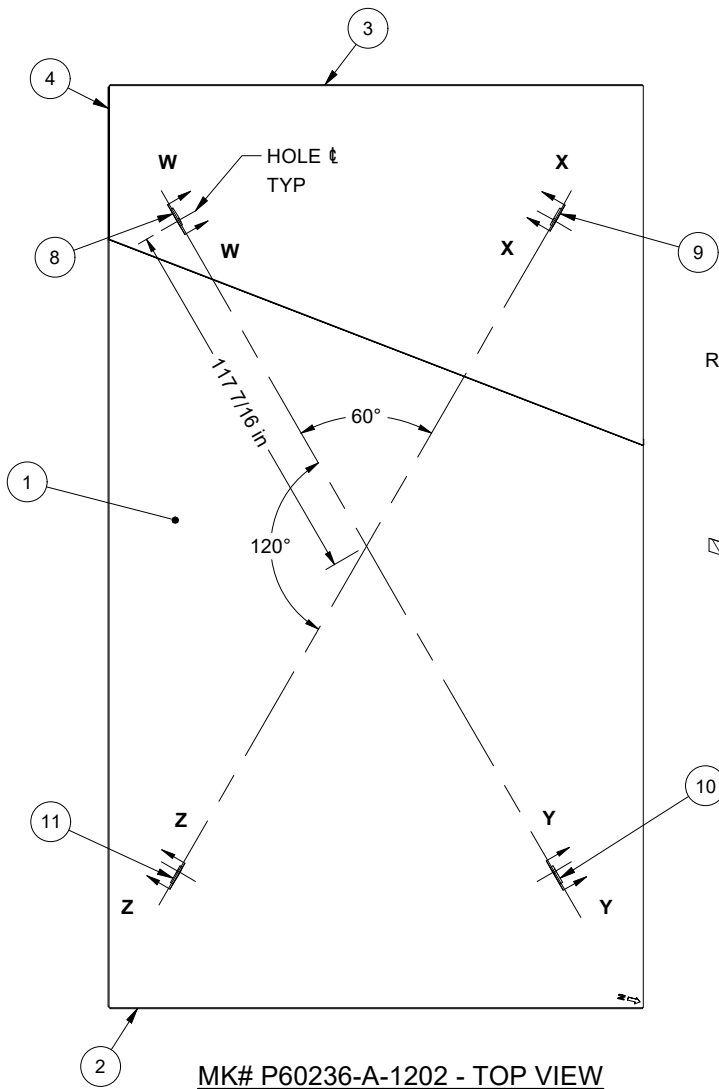
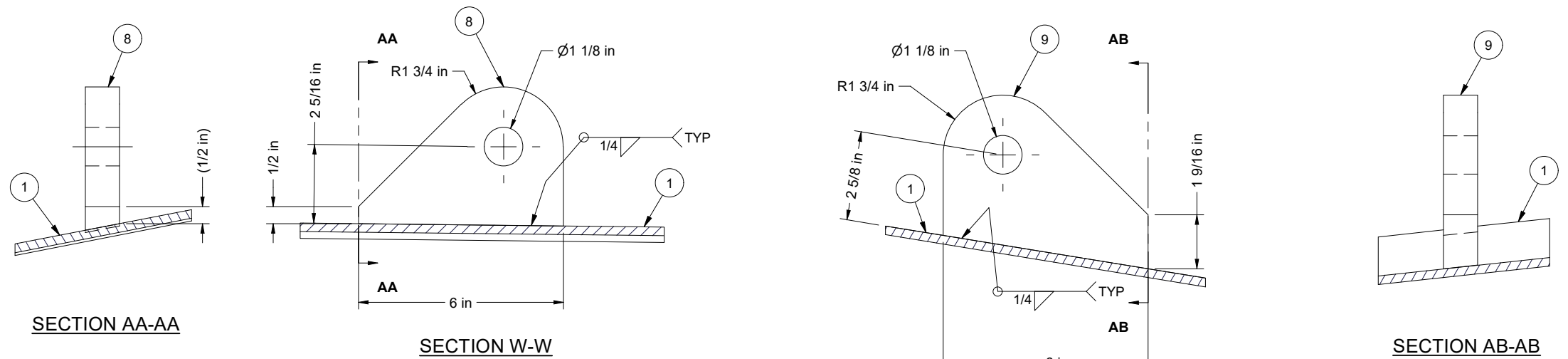
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 1 - PART DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 13 DWG. NO.: P60236-12-6

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	5/8" PL		ASTM A-240 316L	
5	5/8" PL		ASTM A-240 316L	
6	5/16" PL		ASTM A-240 316L	
7	3" X 3/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
12	1/2" PL		ASTM A-240 316L	
13	4" X 3/8" FLAT BAR		ASTM A-240 316L	

NOTE: TYPICAL LUG DETAILS FOR ALL TOP COVERS.



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: NathanR DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.



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CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
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 Permission to Consult held by:
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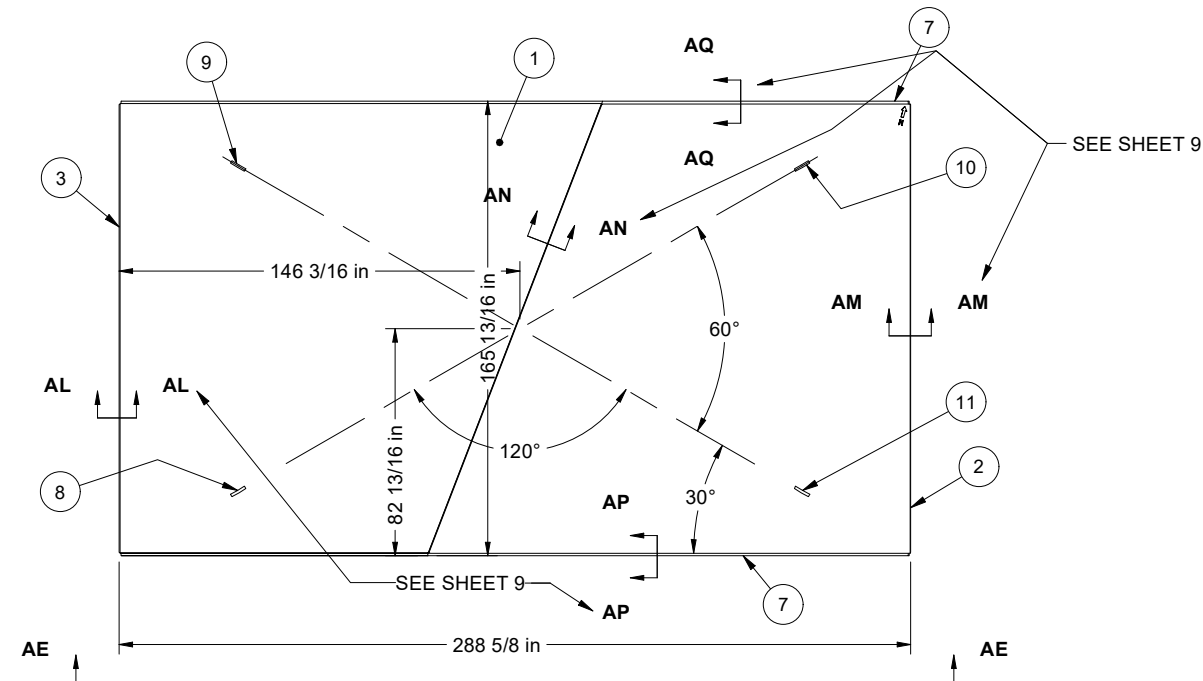
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVERS - LUG DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

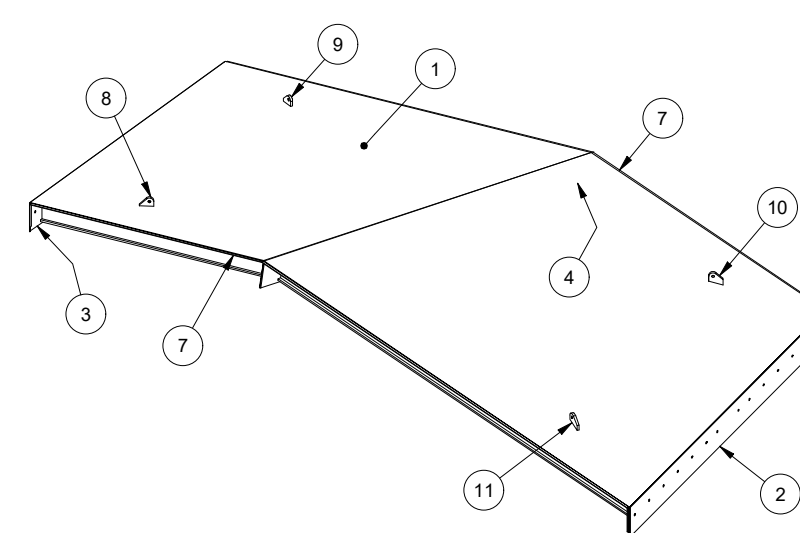
DO NOT SCALE DRAWINGS

SHEET NO.: 7 OF 13

DWG. NO.: P60236-12-7

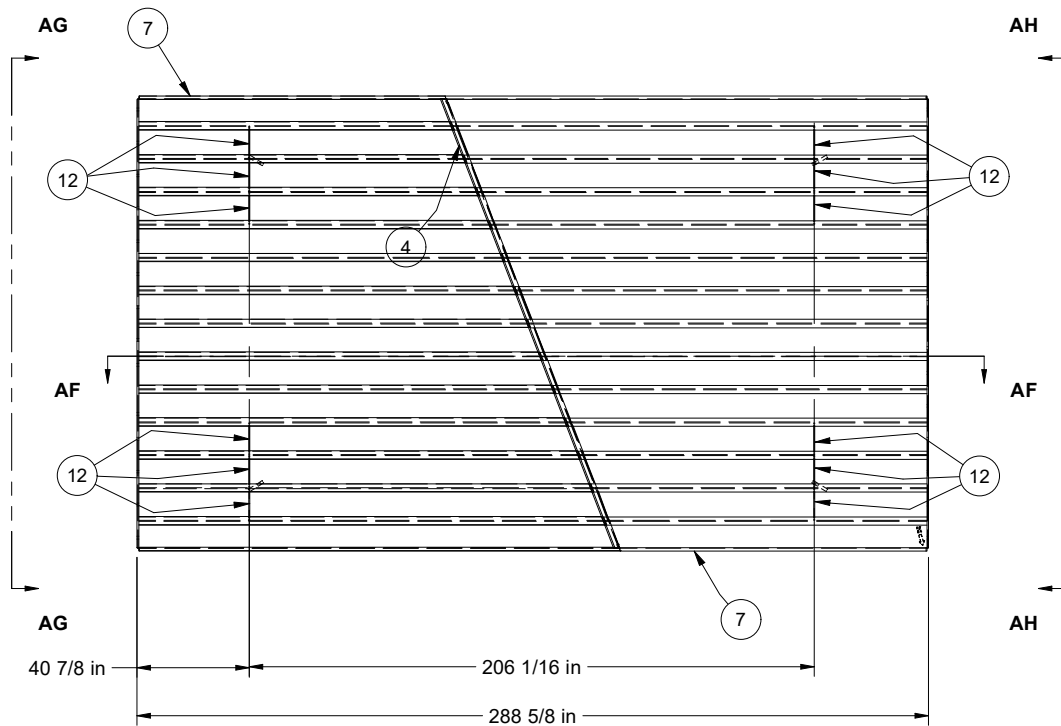


MK# P60236-A-1203 - TOP VIEW

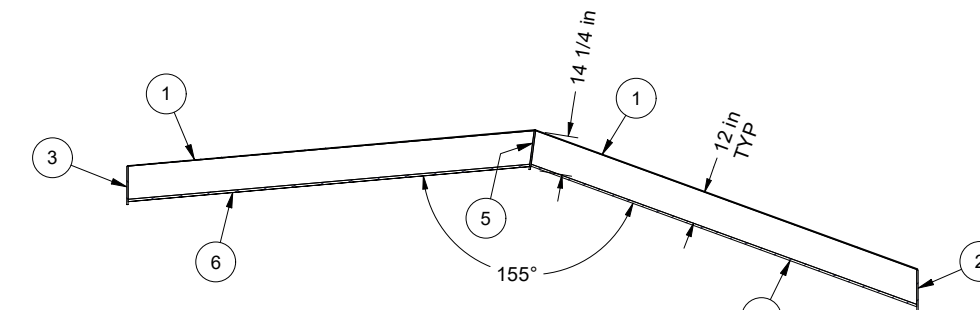


MK# P60236-A-1203

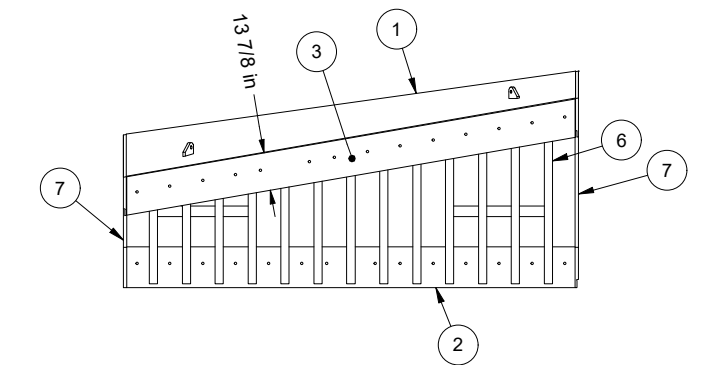
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	1/2" PL		ASTM A-240 316L	
5	5/16" PL		ASTM A-240 316L	
6	3" X 3/4" FLAT BAR		ASTM A-240 316L	
7	1-1/4" X 1/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	4" X 3/8" FLAT BAR		ASTM A-240 316L	



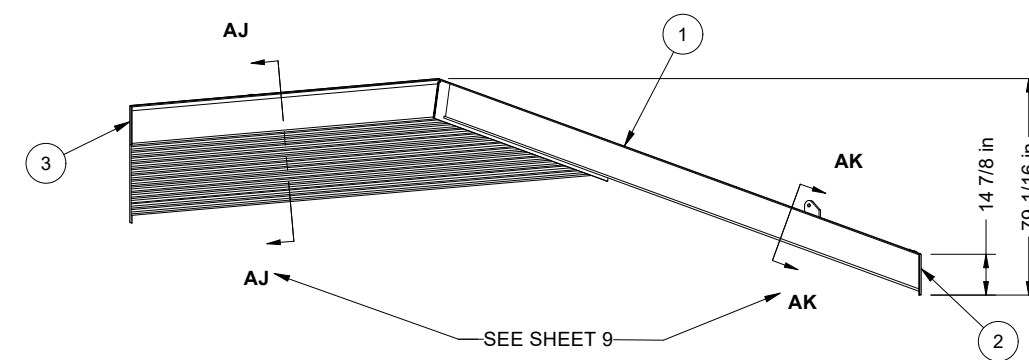
MK# P60236-A-1203 - BOTTOM VIEW



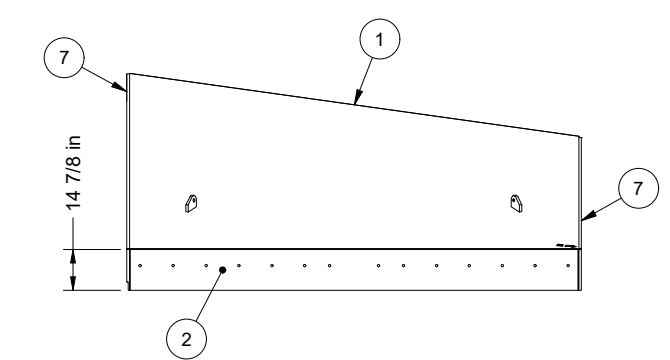
SECTION AF-AF



VIEW AG-AG



VIEW AE-AE

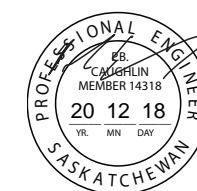


VIEW AH-AH

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

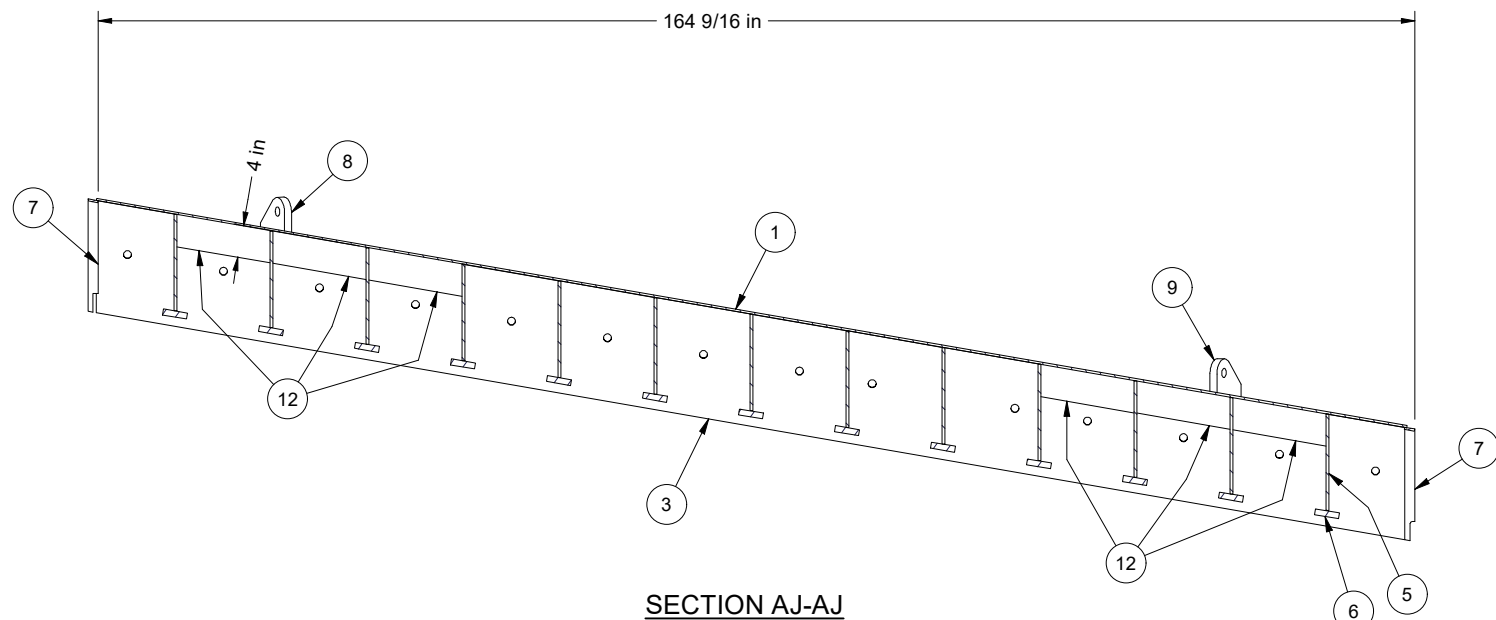
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 2 - ASSEMBLY DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

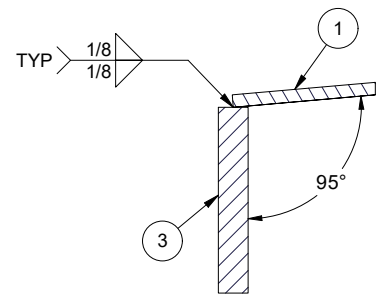
DO NOT SCALE DRAWINGS

SHEET NO.: 8 OF 13

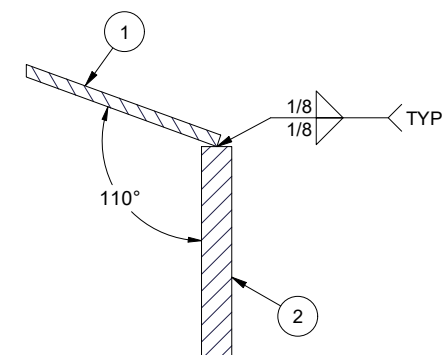
DWG. NO.: P60236-12-8



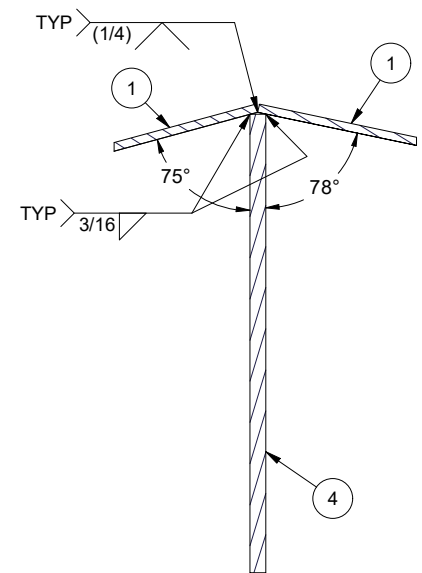
SECTION AJ-AJ



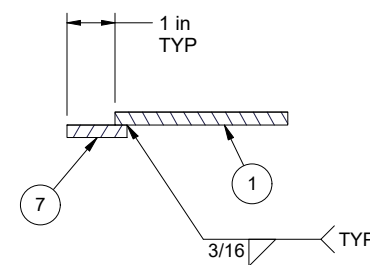
SECTION AL-AL



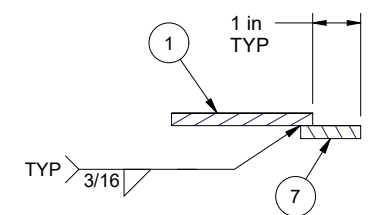
SECTION AM-AM



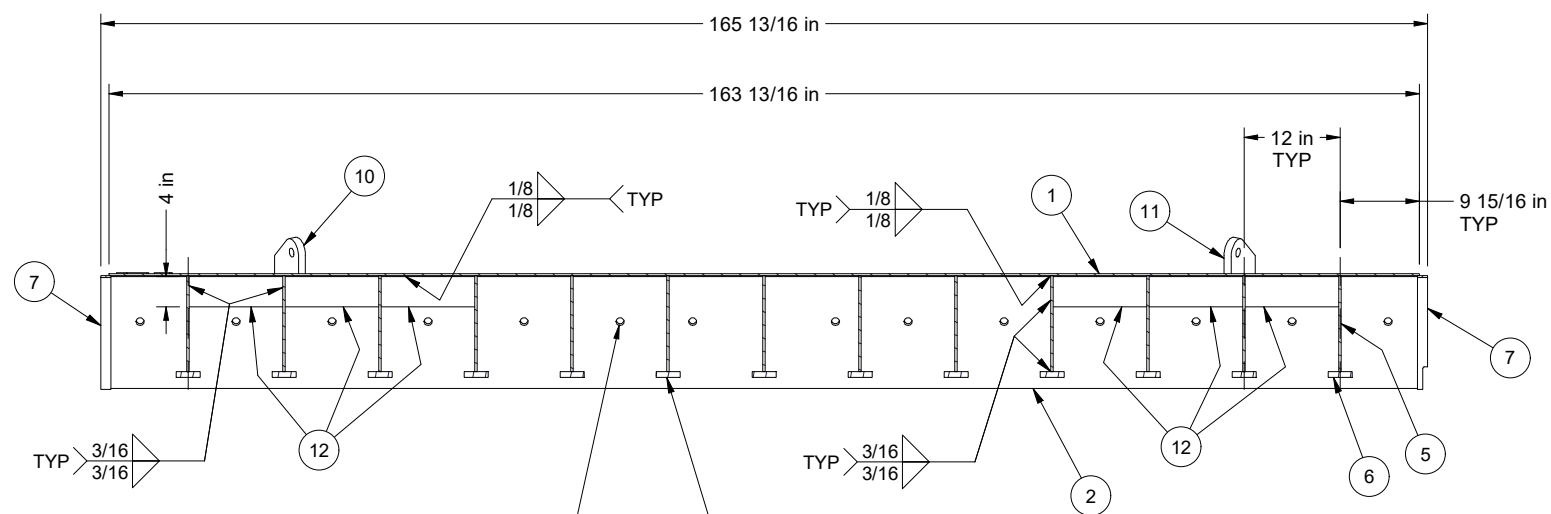
SECTION AN-AN



SECTION AP-AP



SECTION AQ-AQ



SECTION AK-AK

SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (TOTAL 13). HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	1/2" PL		ASTM A-240 316L	
5	5/16" PL		ASTM A-240 316L	
6	3" X 3/4" FLAT BAR		ASTM A-240 316L	
7	1-1/4" X 1/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	4" X 3/8" FLAT BAR		ASTM A-240 316L	

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	

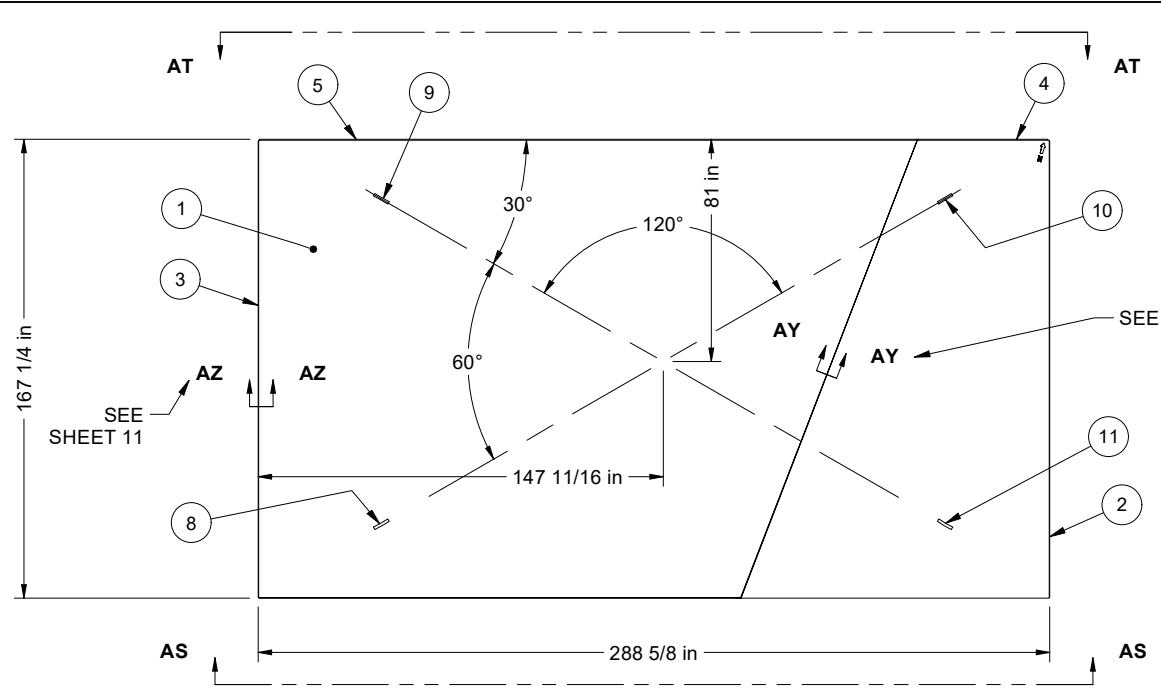


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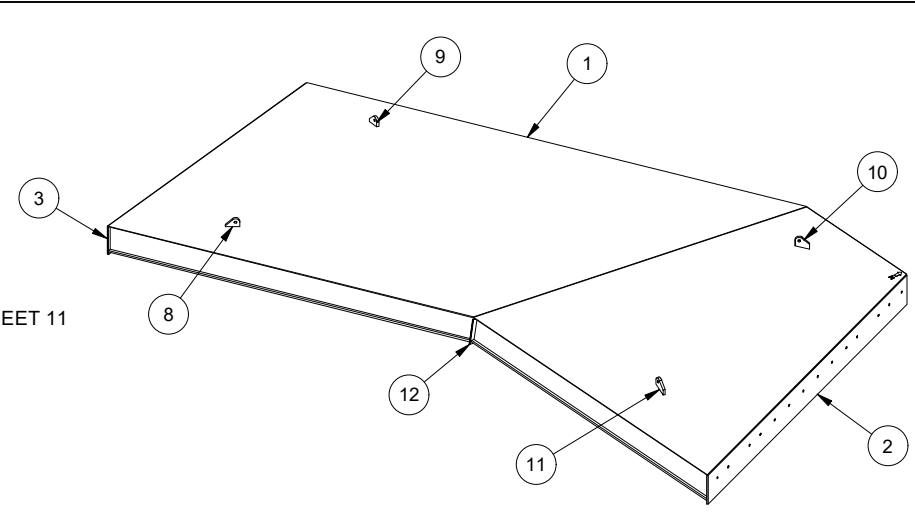
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 2 - PART DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 9 OF 13 DWG. NO.: P60236-12-9

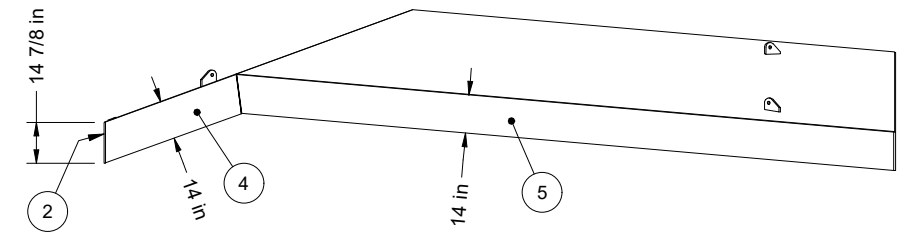


MK# P60236-A-1204 - TOP VIEW

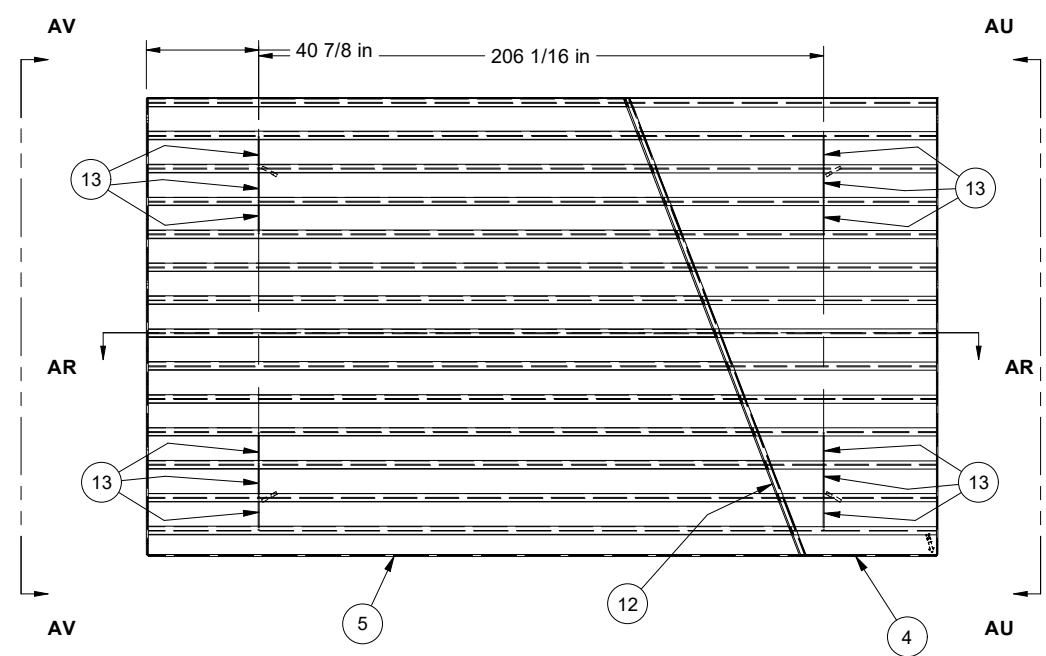


MK# P60236-A-1204 - ISO VIEW

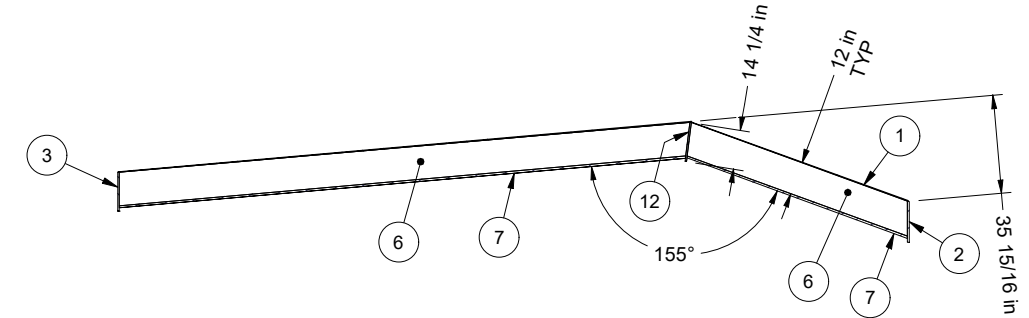
BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	5/8" PL		ASTM A-240 316L	
5	5/8" PL		ASTM A-240 316L	
6	5/16" PL		ASTM A-240 316L	
7	3" X 3/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	1/2" PL		ASTM A-240 316L	
13	4" X 3/8" FLAT BAR		ASTM A-240 316L	



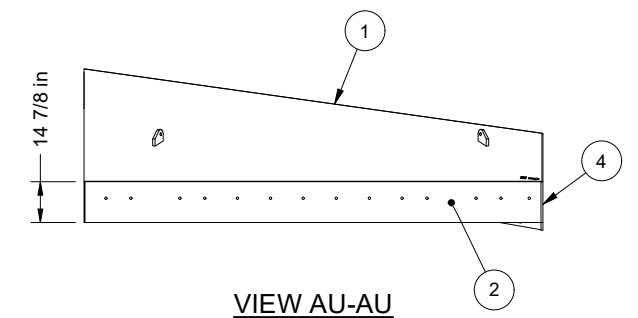
VIEW AT-AT



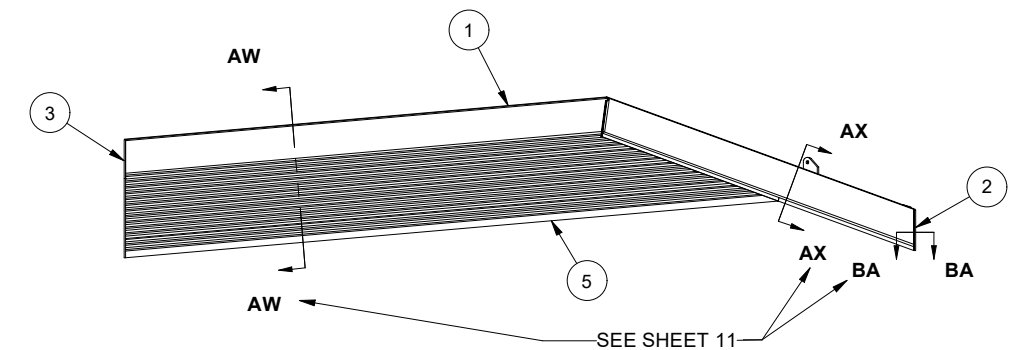
MK# P60236-A-1204 - BOTTOM VIEW



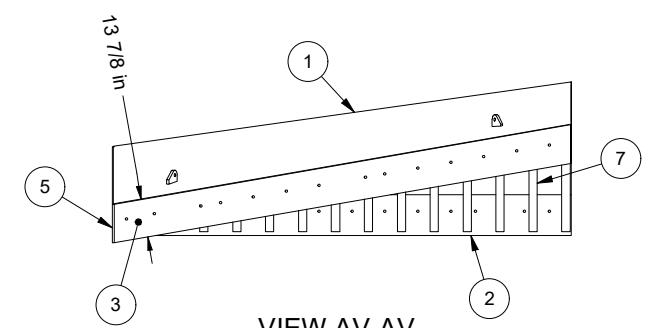
SECTION AR-AR



VIEW AU-AU



VIEW AS-AS

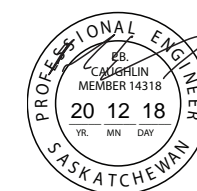


VIEW AV-AV

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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Kova Engineering (Saskatchewan) Ltd.

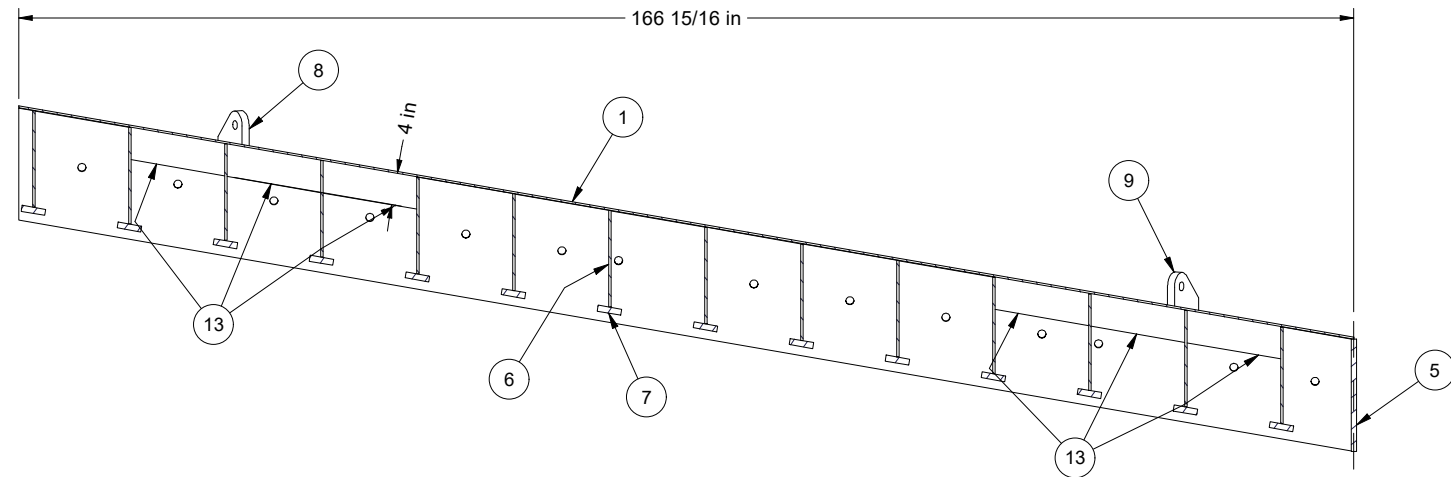
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 3 - ASSEMBLY DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

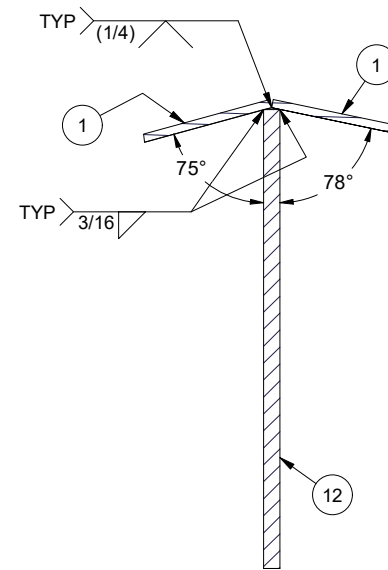
SHEET NO.: 10 OF 13

DWG. NO.: P60236-12-10

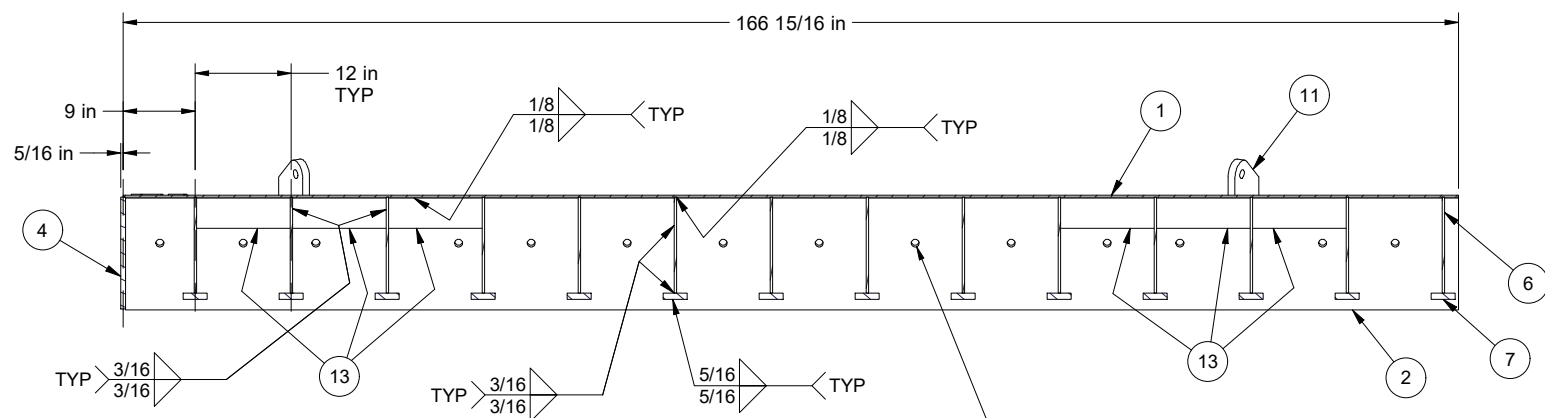
311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059



SECTION AW-AW

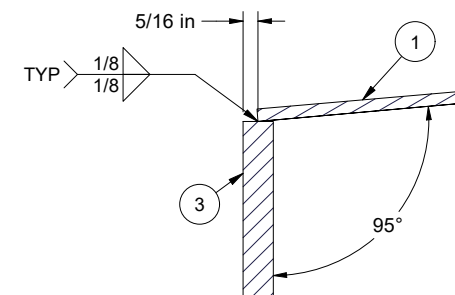


SECTION AY-AY

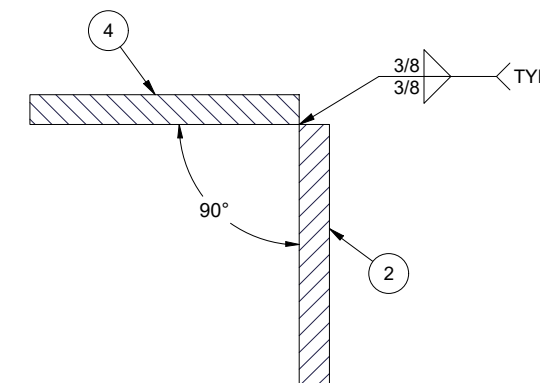


SECTION AX-AX

SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (14 TOTAL) HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMNS



SECTION AZ-AZ



SECTION BA-BA

BILL OF MATERIALS				
ITEM	DESCRIPTION	PART #	MATERIAL	SHT#
1	1/4" PL		ASTM A-240 316L	
2	5/8" PL		ASTM A-240 316L	
3	5/8" PL		ASTM A-240 316L	
4	5/8" PL		ASTM A-240 316L	
5	5/8" PL		ASTM A-240 316L	
6	5/16" PL		ASTM A-240 316L	
7	3" X 3/4" FLAT BAR		ASTM A-240 316L	
8	1" PL		ASTM A-240 316L	
9	1" PL		ASTM A-240 316L	
10	1" PL		ASTM A-240 316L	
11	1" PL		ASTM A-240 316L	
12	1/2" PL		ASTM A-240 316L	
13	4" X 3/8" FLAT BAR		ASTM A-240 316L	

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		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: NathanR DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.



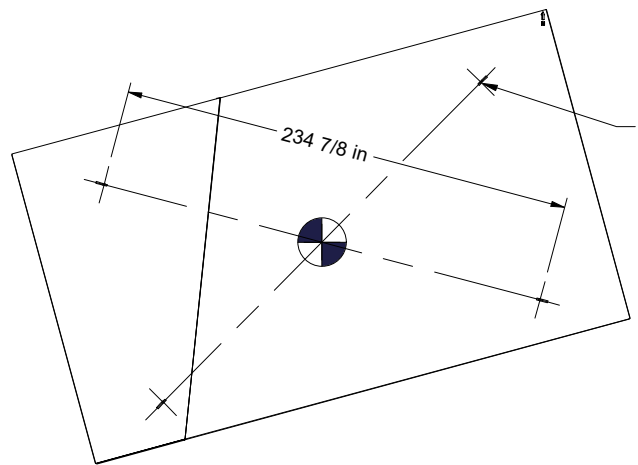
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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVER 3 - PART DETAILS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 11 OF 13
 DWG. NO.: P60236-12-11

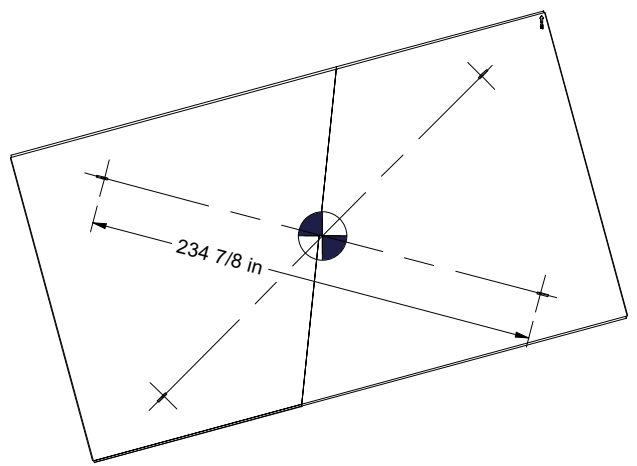
NOTE: THE DETAILS ON SHEET 12 ARE NO LONGER RELEVANT FOR THE AS-BUILT CONDITION OF THE STAINLESS STEEL COVER.

4

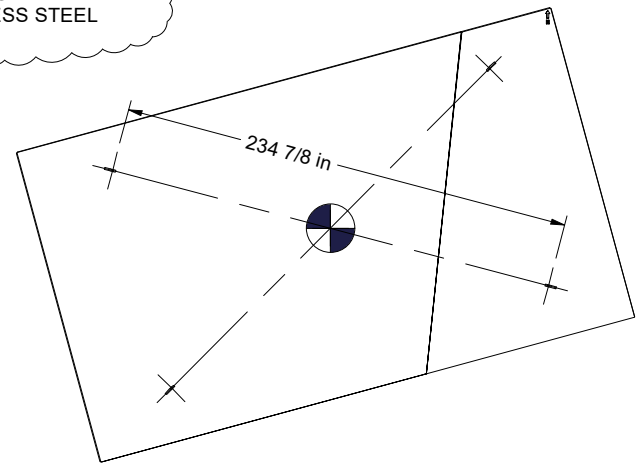


MK# P60236-A-1202 - TOP VIEW

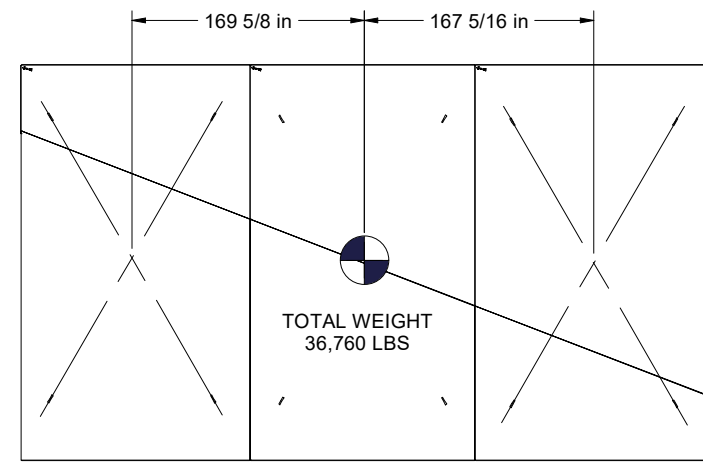
USE WITH 3/4" CROSBY PIN-TYPE SHACKLE (OR EQUIVALENT) TYP



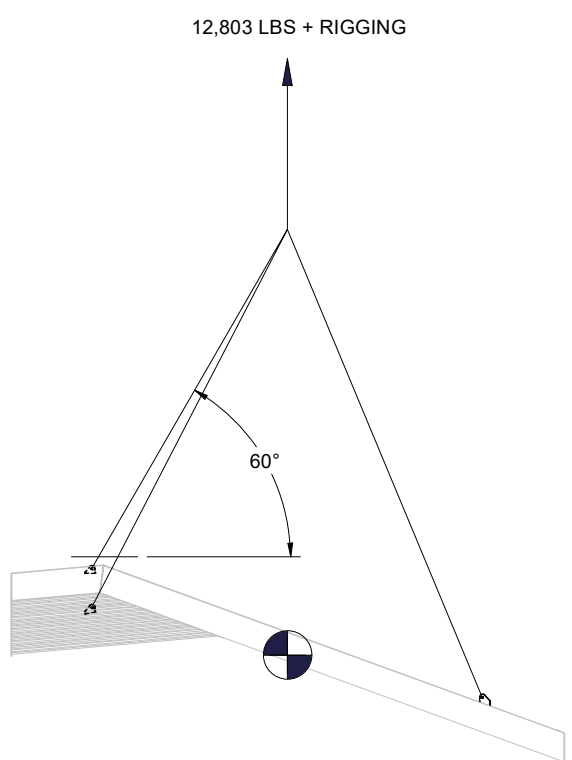
MK# P60236-A-1203 - TOP VIEW



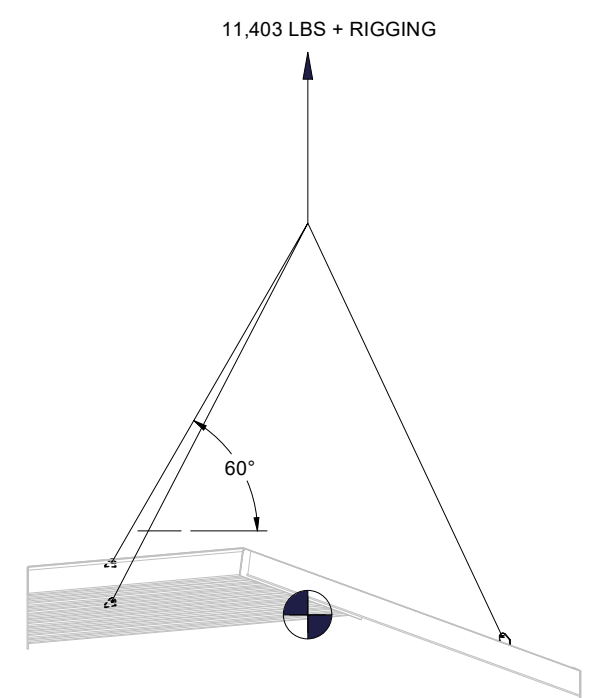
MK# P60236-A-1204 - TOP VIEW



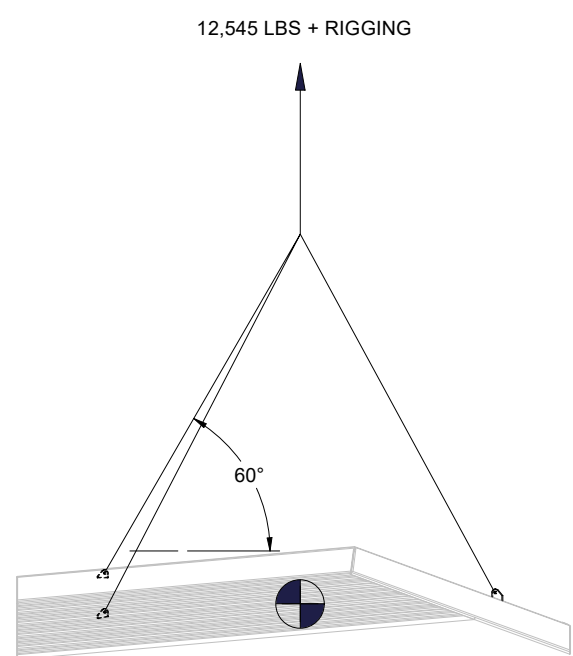
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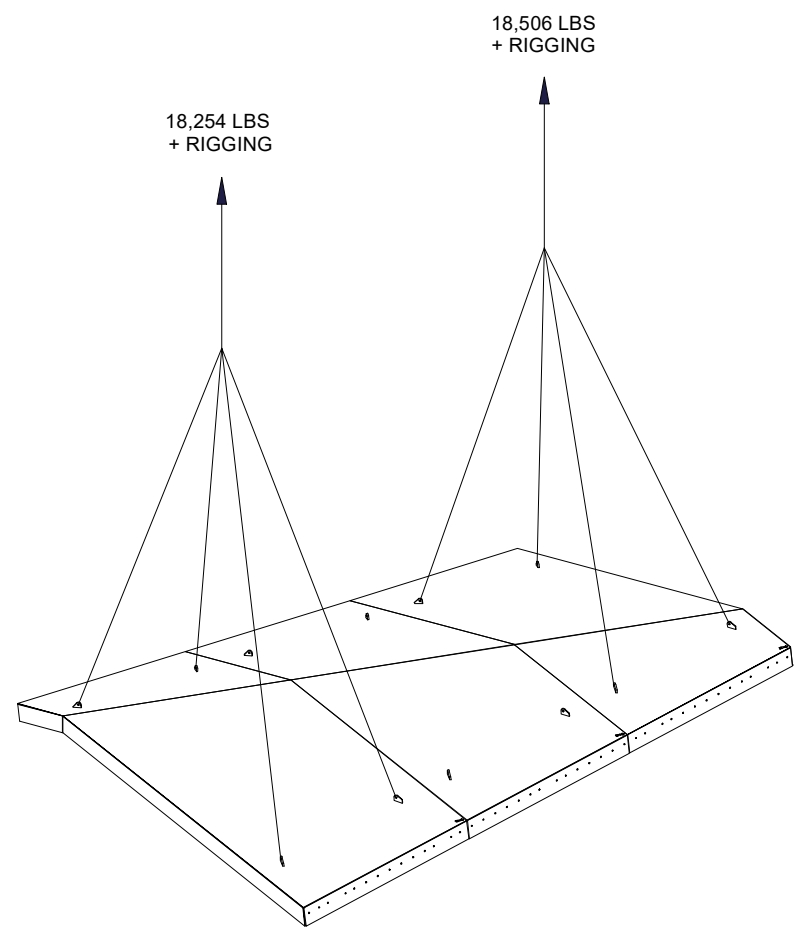
MK# P60236-A-1202 - SIDE VIEW



MK# P60236-A-1203 - SIDE VIEW



MK# P60236-A-1204 - SIDE VIEW



MK# P60236-A-1201 - LIFT DIAGRAM

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		1	ISSUED FOR TENDER	16/Dec/19	NR	



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 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 TOP COVERS - LIFTING DIAGRAMS
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 12 OF 13 DWG. NO.: P60236-12-12



NOTE: THE DETAILS ON THE SHEET 13 ARE THE RECOMMENDATION FOR PLACEMENT OF THE STAINLESS STEEL COVER PROVIDED PRIOR TO INSTALLATION OF THE COVER RATHER THAN AS-BUILT DETAILS. KOVA PERSONNEL DID NOT FIELD-VERIFY THE DETAILS SHOWN PRIOR TO REMOVAL; HOWEVER, THE STAINLESS STEEL COVER COULD NOT HAVE FIT AS SHOWN IN THE AS-BUILT DETAILS WITHOUT COVER PLACEMENT SIMILAR TO THAT SHOWN.

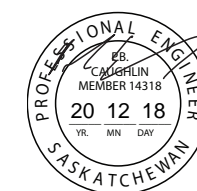
4

OPENING TO SKIRT CLEARANCE

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / _R MACHINED SURFACES: ¹²⁵ / _R ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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 Discipline Sk. Reg. No. Signature
 Structural 14318 *[Signature]*

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY SHAFT OPENING
 INSTALLATION CLEARANCES
 LOCATION: 59° 33' 22.51"N 108° 28' 31.42"W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 13 OF 13 DWG. NO.: P60236-12-13

FAY 8 - Fine Ore Dump

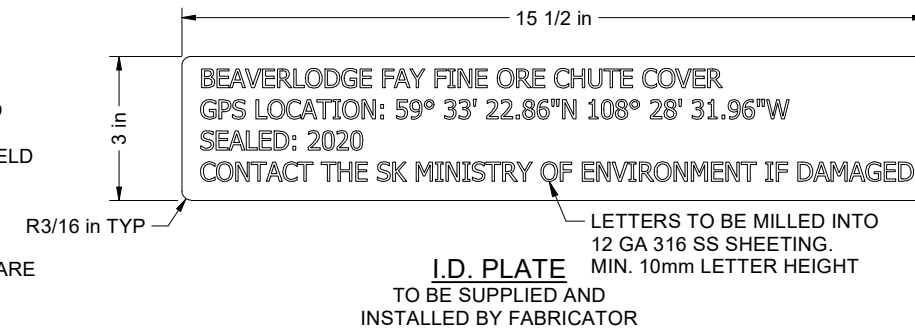
FAY 8 - Fine Ore Dump

GENERAL NOTES:

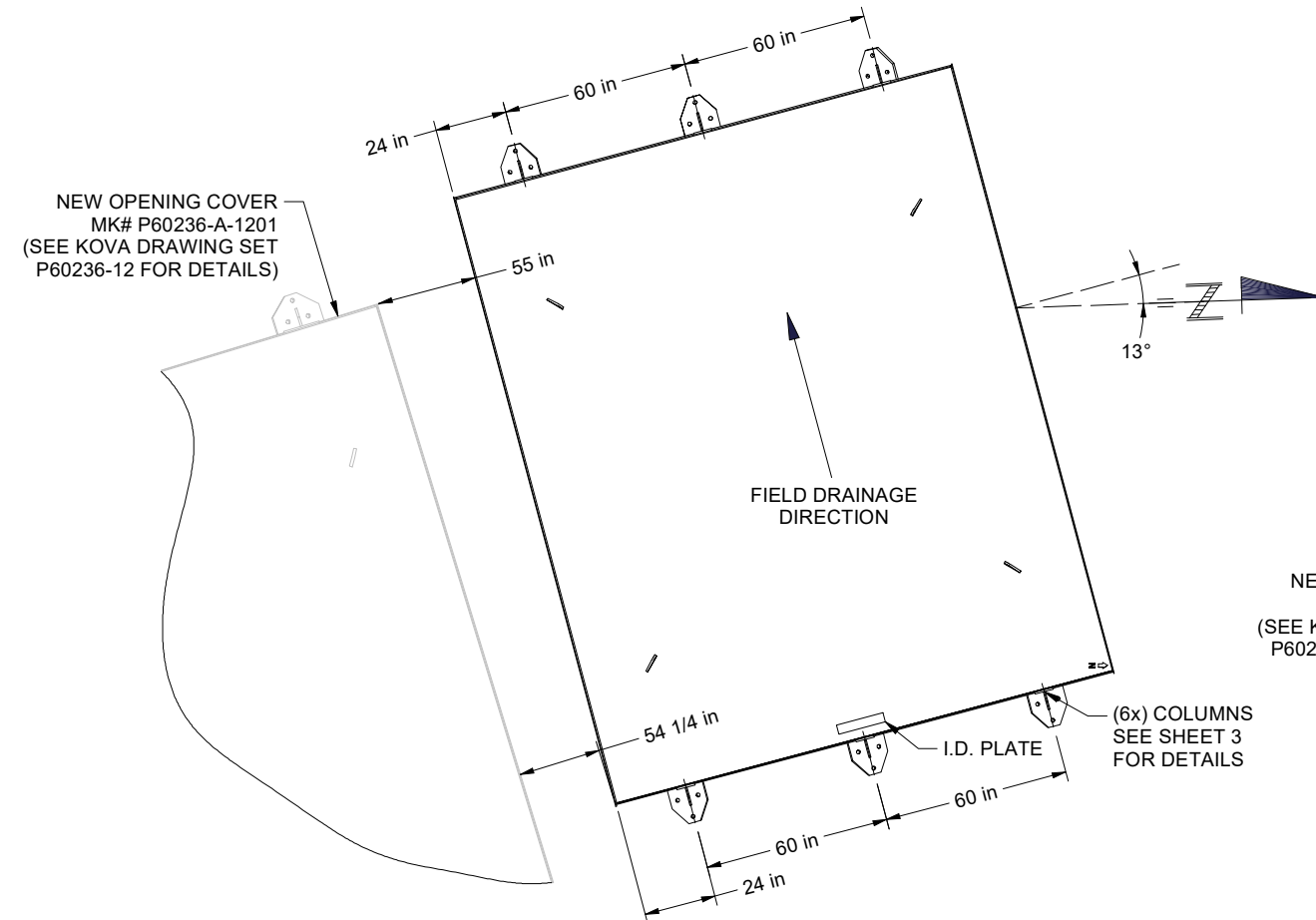
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL SURFACES TO BE FIELD PICKLED AND PASSIVATED FOLLOWING FIELD WELDING IN ACCORDANCE WITH QA/QC PROTOCOL. KOVA PERSONNEL TO REVIEW VISIBLE SURFACES FOLLOWING PICKLING AND PASSIVATING DURING FINAL FIELD INSPECTION.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

COVER CHARACTERISTICS:

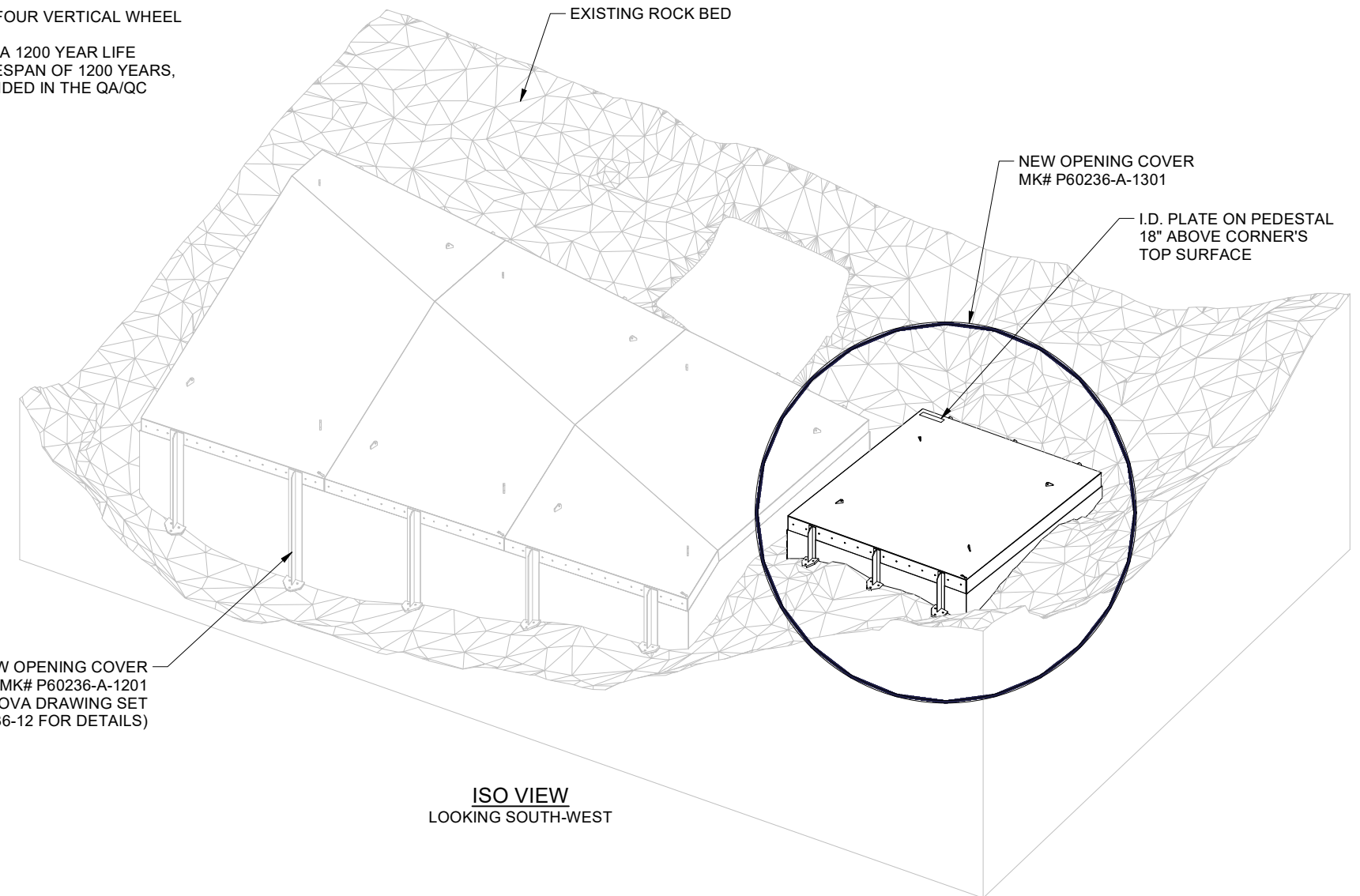
1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL ON ANY SURFACE AND A USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS PERIODIC INSPECTIONS BE PERFORMED AS RECOMMENDED IN THE QA/QC PROTOCOL.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 9,850 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



ESTIMATED WEIGHTS:
 TOP COVER W/O RIGGING: 7,620 LBS
 AS INSTALLED: 9,850 LBS



PLAN VIEW - FAY SHAFT OPENING COVER



**ISO VIEW
 LOOKING SOUTH-WEST**

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / _R MACHINED SURFACES: ¹²⁵ / _R ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline Sk. Reg. No. Signature
 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

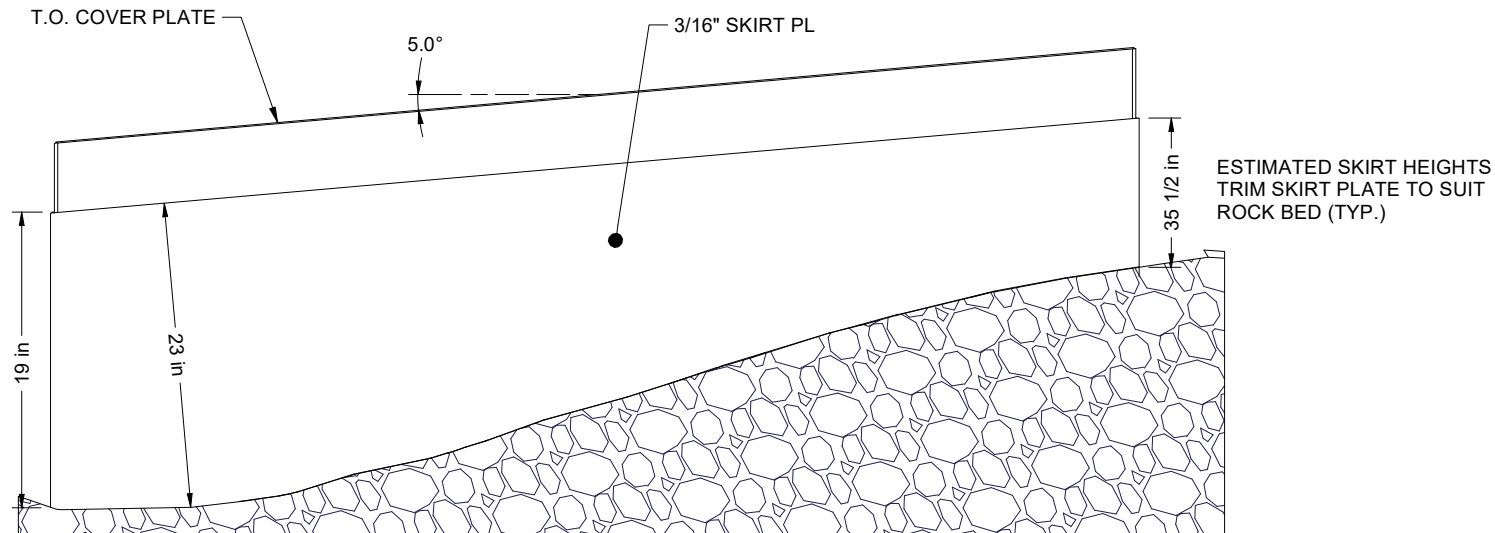
PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 GENERAL ARRANGEMENT AND NOTES
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 1 OF 6 DWG. NO.: P60236-13-1

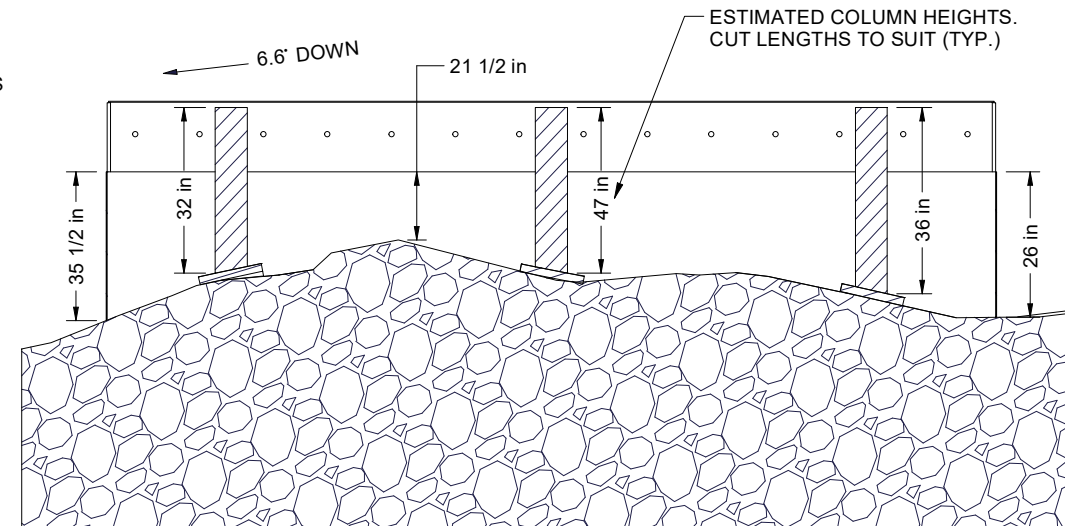
KOVA RECOMMENDS COLUMN LENGTH TO BE SUPPLIED PER GUIDANCE OF INSTALLATION CONTRACTOR. SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.

BILL OF MATERIAL FOR SKIRT AND COLUMNS	
DISCRIPTION	QTY
COLUMN SECTIONS - 20' LENGTHS (SHIPPED LOOSE)	3
3/16" SKIRT - 5' X 10' SHEETS (SHIPPED LOOSE)	5

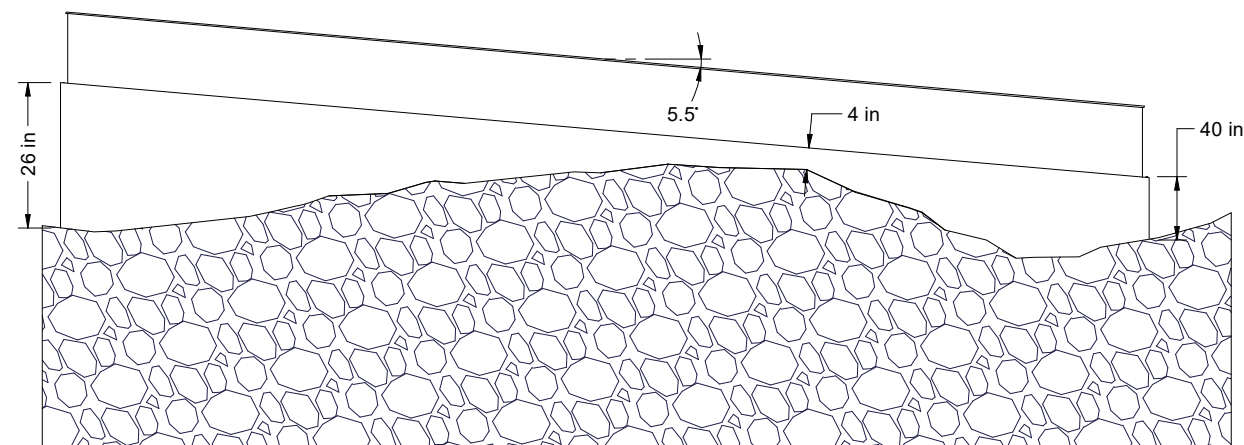
NOTE: QUANTITIES IN BILL OF MATERIALS ARE FOR BIDDING PURPOSES ONLY. SUBJECT TO CHANGE FOLLOWING AWARD.



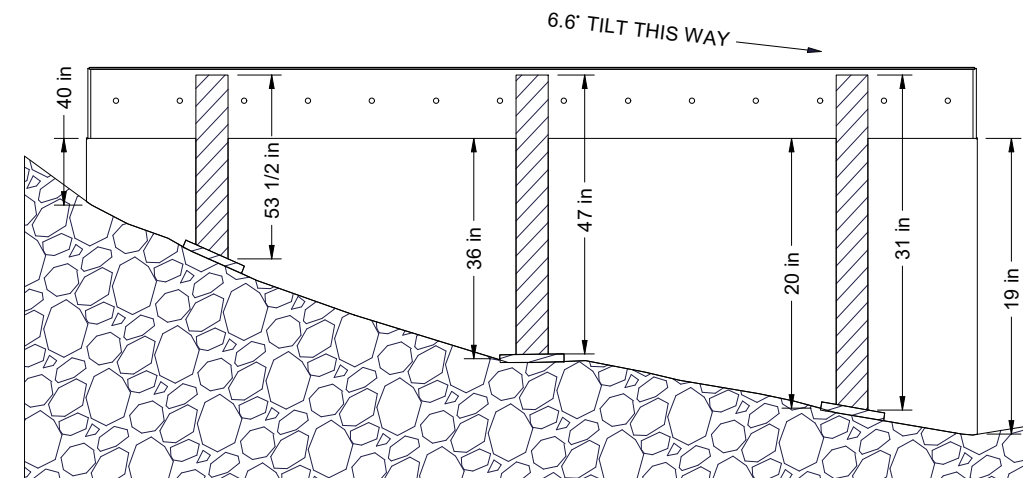
ELEVATION - LOOKING NORTH



ELEVATION - LOOKING WEST



ELEVATION - LOOKING SOUTH



ELEVATION - LOOKING EAST

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	
					NR	

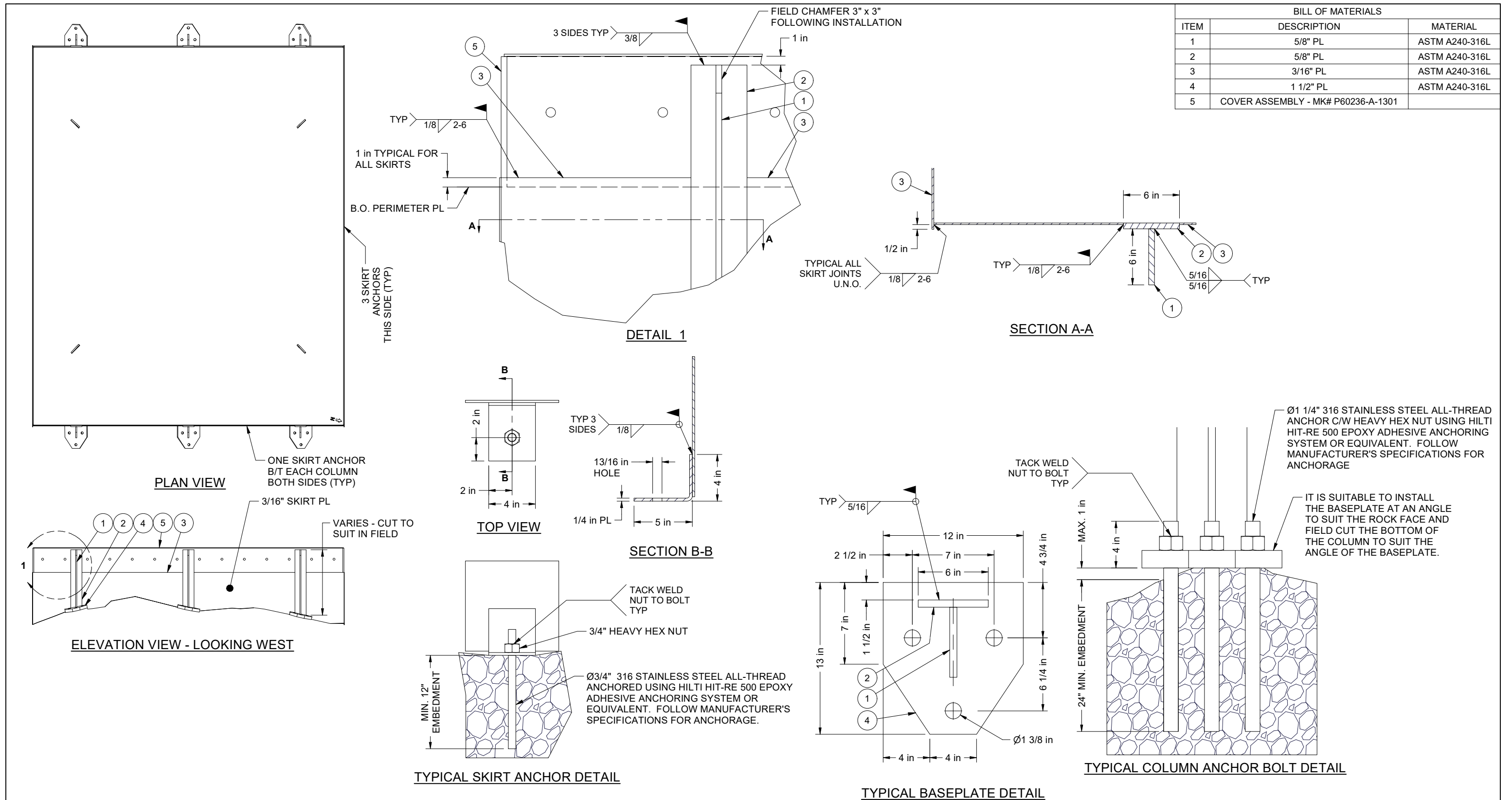


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Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 ELEVATIONS - ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

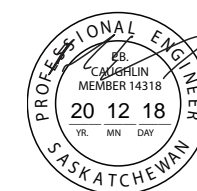
DO NOT SCALE DRAWINGS SHEET NO.: 2 OF 6 DWG. NO.: P60236-13-2



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	
					NR	



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 Number C672
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 Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

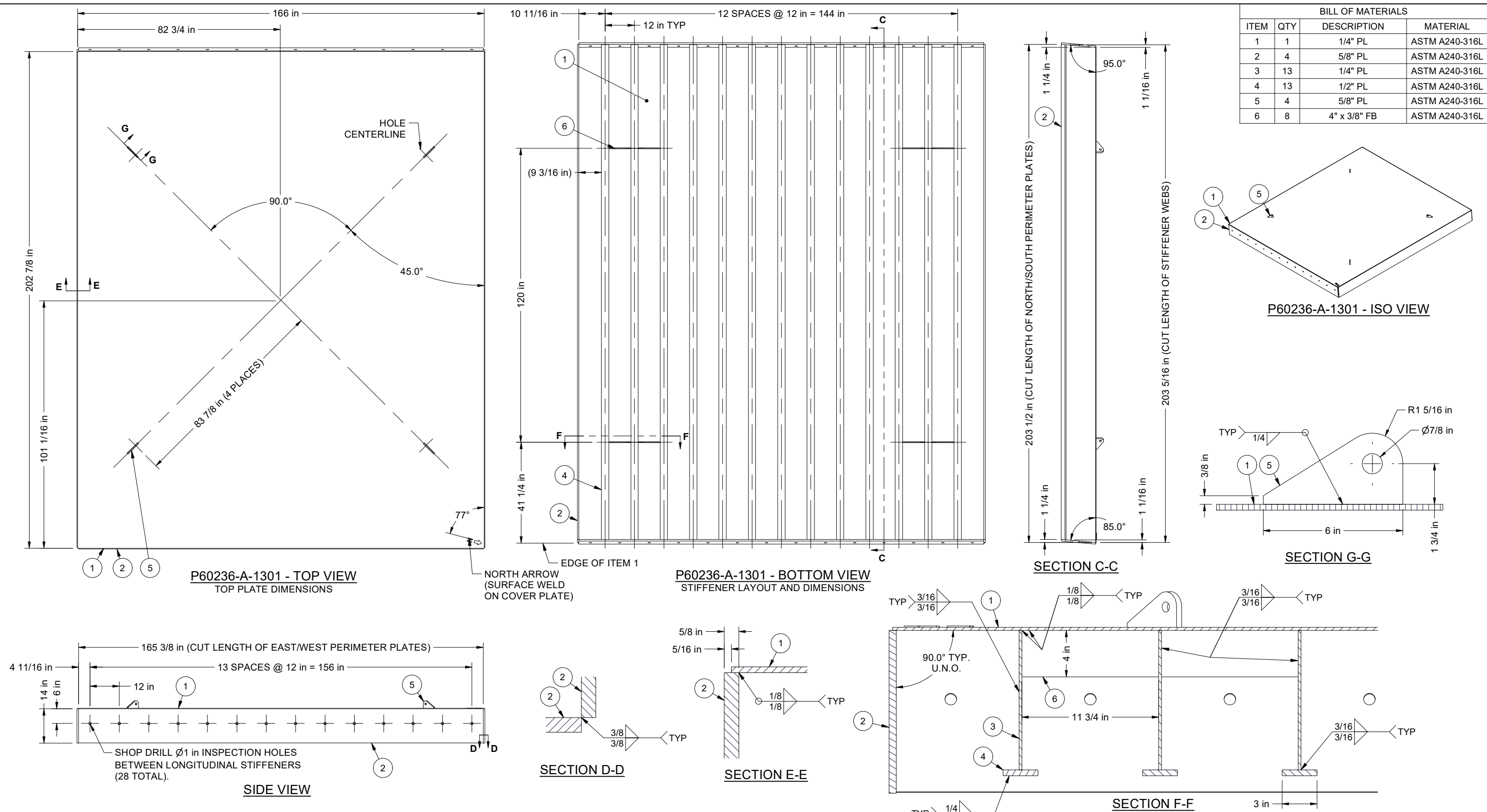
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 SKIRT AND COLUMN DETAILS
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 3 OF 6

DWG. NO.: P60236-13-3



THESE DRAWINGS ARE STRICTLY INTENDED FOR USE FOR THE PURPOSE AND PROJECT EXPRESSLY STATED HEREON. KOVA ENGINEERING (SASKATCHEWAN) LTD. AND ITS PROFESSIONAL ENGINEERS (COLLECTIVELY, "KOVA") ACCEPT NO RESPONSIBILITY OR LIABILITY FOR THE USE OF THESE DRAWINGS FOR ANY OTHER PURPOSE OR PROJECT WHATSOEVER OR BY ANY PARTY INCLUDING THE PARTY TO WHOM THEY ARE ADDRESSED, WITHOUT THE EXPRESS PRIOR CONSENT IN WRITING FROM KOVA.

DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	

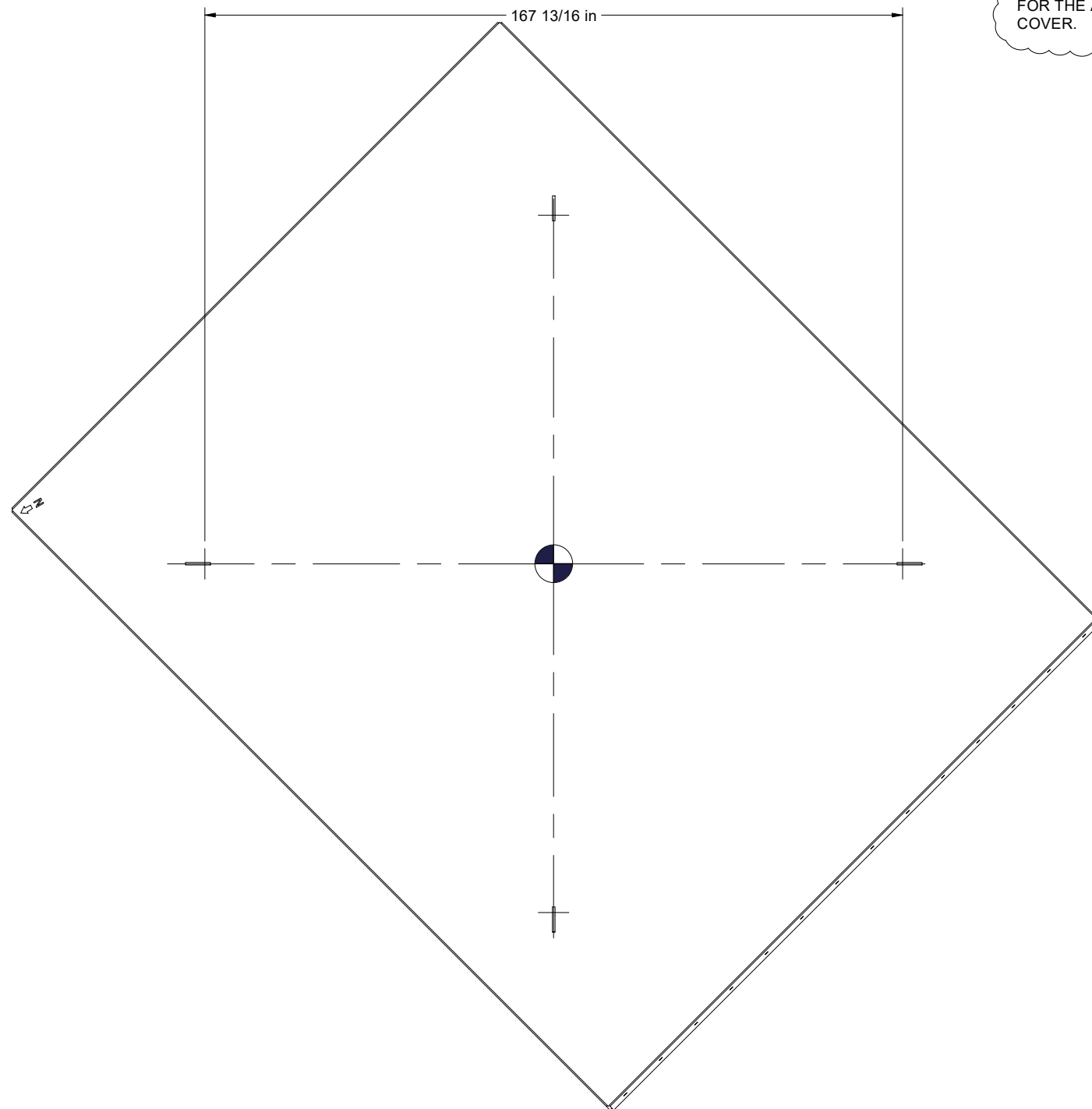


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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No. 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 COVER ASSEMBLY DETAILS
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

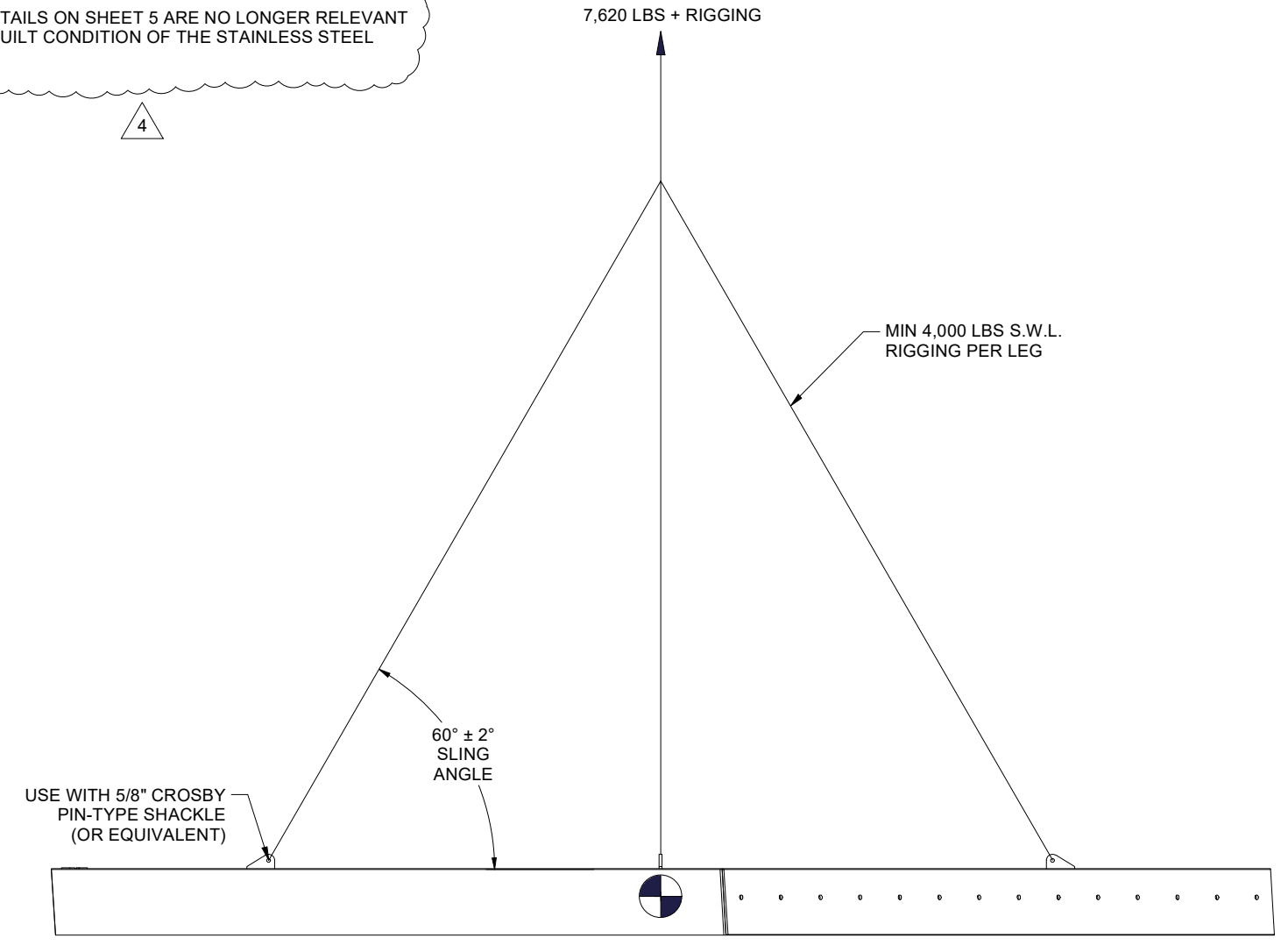
DO NOT SCALE DRAWINGS
 SHEET NO.: 4 OF 6
 DWG. NO.: P60236-13-4



COVER ASSEMBLY LIFTING DIAGRAM

NOTE: THE DETAILS ON SHEET 5 ARE NO LONGER RELEVANT FOR THE AS-BUILT CONDITION OF THE STAINLESS STEEL COVER.

4

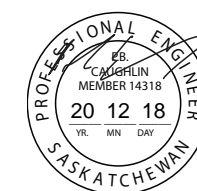


COVER ASSEMBLY LIFTING DIAGRAM - SIDE VIEW

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ / ₃₂ MACHINED SURFACES: ¹²⁵ / ₃₂ ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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 Structural 14318

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 LIFTING DETAILS
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

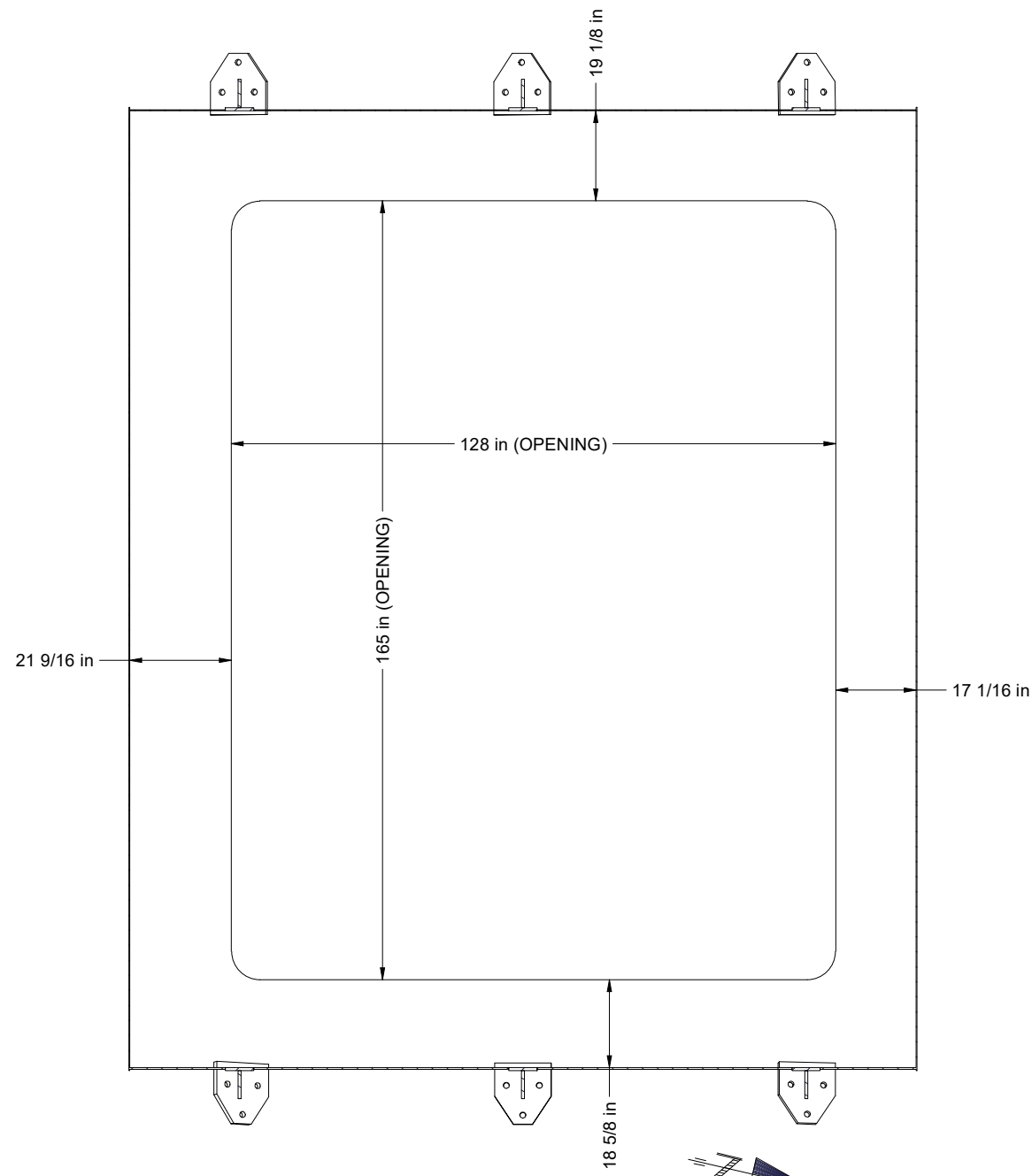
SHEET NO.: 5 OF 6

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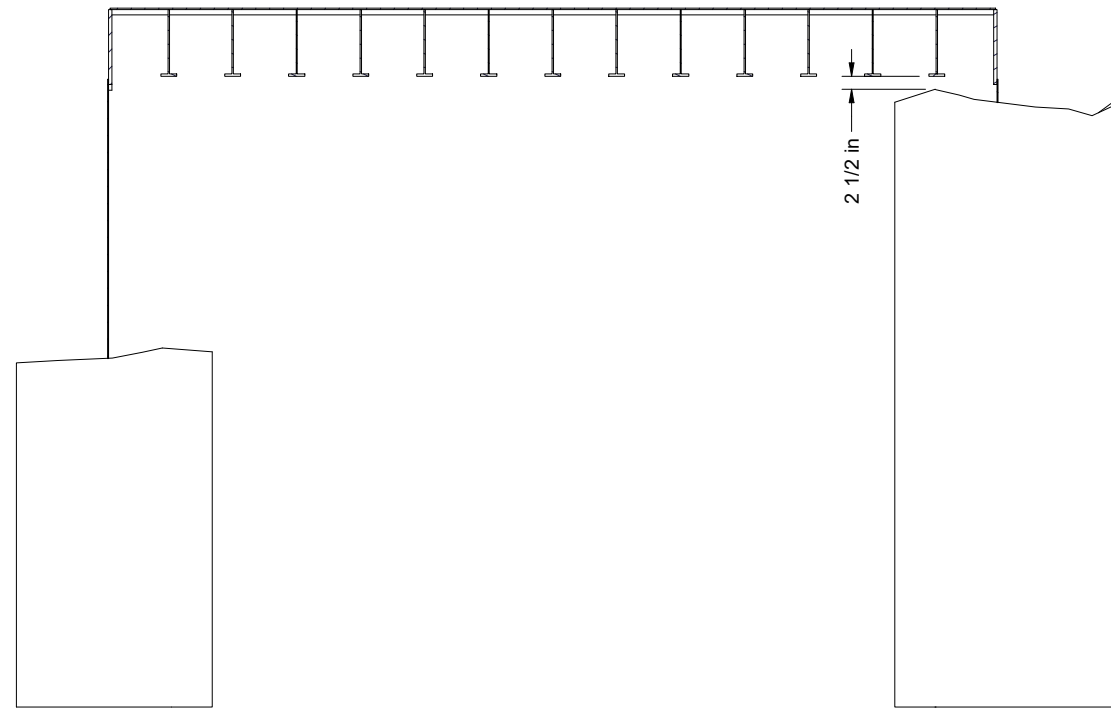
311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

NOTE: THE DETAILS ON SHEET 6 ARE THE RECOMMENDATIONS FOR PLACEMENT OF THE STAINLESS STEEL COVER PROVIDED PRIOR TO INSTALLATION OF THE COVER RATHER THAN AS-BUILT DETAILS. KOVA PERSONNEL DID NOT FIELD-VERIFY THE DETAILS SHOWN PRIOR TO REMOVAL; HOWEVER, THE STAINLESS STEEL COVER COULD NOT HAVE FIR AS SHOWN IN THE AS-BUILT DETAILS WITHOUT COVER PLACEMENT SIMILAR TO THAT SHOWN.

4



OPENING TO SKIRT CLEARANCE

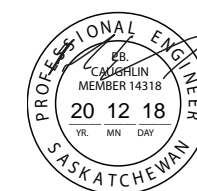


OPENING TO TOP COVER CLEARANCE
(LOOKING WEST)

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		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
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 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FAY FINE ORE CHUTE OPENING
 INSTALLATION CLEARANCES
 LOCATION: 59° 33' 22.86" N 108° 28' 31.96" W NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 6 OF 6

DWG. NO.: P60236-13-6

FH 1 - Fishhook Shaft

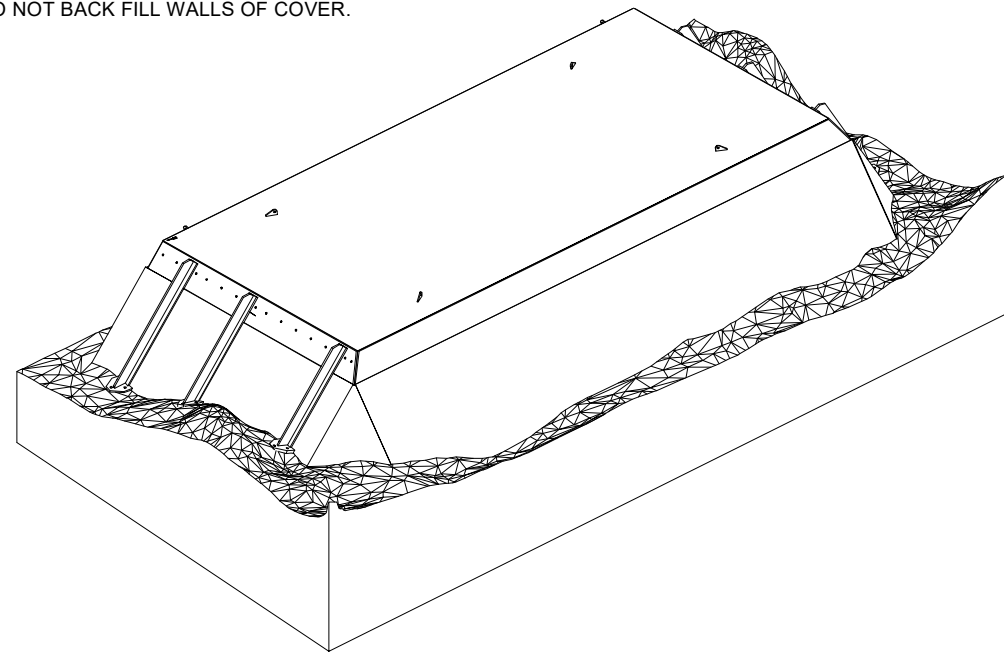
FH 1 - Fishhook Shaft

GENERAL NOTES:

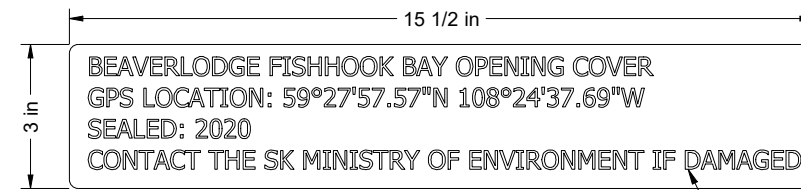
1. ALL MATERIAL TO BE ASTM A240-316L STAINLESS STEEL.
2. MILL CERTIFICATIONS REQUIRED FOR ALL NEW MATERIALS USED.
3. ALL WELDING PROCEDURES AND PROCESSES TO MEET THE REQUIREMENTS OF AWS D1.6 LATEST EDITION.
4. ALL TOP PLATE SEAMS ARE TO BE COMPLETE JOINT PENETRATION WELDS AS REQUIRED.
5. ALL SURFACES TO BE FIELD PICKLED AND PASSIVATED FOLLOWING FIELD WELDING IN ACCORDANCE WITH QA/QC PROTOCOL. KOVA PERSONNEL TO REVIEW VISIBLE SURFACES FOLLOWING PICKLING AND PASSIVATING DURING FINAL FIELD INSPECTION.
6. FINAL FABRICATION TO BE INSPECTED BY KOVA PERSONNEL PRIOR TO CERTIFICATION. AS-BUILT DRAWINGS WILL BE CREATED FOLLOWING FINAL FIELD INSPECTION.
7. CONTRACTOR/FABRICATOR TO CONFIRM ALL NEW MATERIAL DETAILS AND DIMENSIONS FOR PROPER FIT UP.
8. THIS IS A ONE OF A KIND DESIGN AND IS NOT CERTIFIED FOR MASS PRODUCTION.
9. SAFE WORK PROCEDURE FOR INSTALLATION REQUIRED BY OTHERS.
10. ALL INFORMATION CONCERNING EXISTING COMPONENTS AND TOPOGRAPHY HAS BEEN TAKEN FROM SITE MEASUREMENTS. MATERIALS SUPPLIED ARE TO BE AS PER THE GUIDANCE OF THE INSTALLATION CONTRACTOR.
11. FIELD CUT SKIRT TO SUIT ROCK BED ELEVATION. MATERIAL FOR SKIRT TO BE SUPPLIED AS PER THE RECOMMENDATIONS OF THE INSTALLATION CONTRACTOR.
12. ROCK REMOVAL MAY BE REQUIRED DURING FIELD FIT PROCEDURE.

COVER CHARACTERISTICS:

1. SAFE WORKING LOAD CAPACITY OF COVER IS 12 kPa (250 psf) EVENLY DISTRIBUTED VERTICAL LIVE LOAD, COVER WILL SUSTAIN FOUR VERTICAL WHEEL LOADS OF 21.3 kN (4,800 LBS) WITHOUT CATASTROPHIC FAILURE.
2. RESEARCH PERFORMED BY THE BRITISH STAINLESS STEEL ASSOCIATION ESTIMATES THAT 316 STAINLESS STEEL WILL SUSTAIN A 1200 YEAR LIFE PRIOR TO PITTING CORROSION RESULTING IN A 1mm DEPTH IN A RURAL SETTING WITH MILL FINISHED SURFACES. CONSIDERING THE RESULTS OF THIS RESEARCH AND A CORROSION ALLOWANCE OF 1mm ON ANY SURFACE, THE COVER DEPICTED HAS AN ESTIMATED USEABLE LIFESPAN OF 1200 YEARS, PRIOR TO THE POTENTIAL NEED FOR REPLACEMENT. KOVA RECOMMENDS PERIODIC INSPECTIONS BE PERFORMED AS RECOMMENDED IN THE QA/QC PROTOCOL.
3. 316 STAINLESS STEEL CAN NOT BE CLEANLY CUT WITH AN OXYACETYLENE TORCH.
4. APPROX. COVER TOTAL WEIGHT = 19,000 LBS.
5. DO NOT BACK FILL WALLS OF COVER.



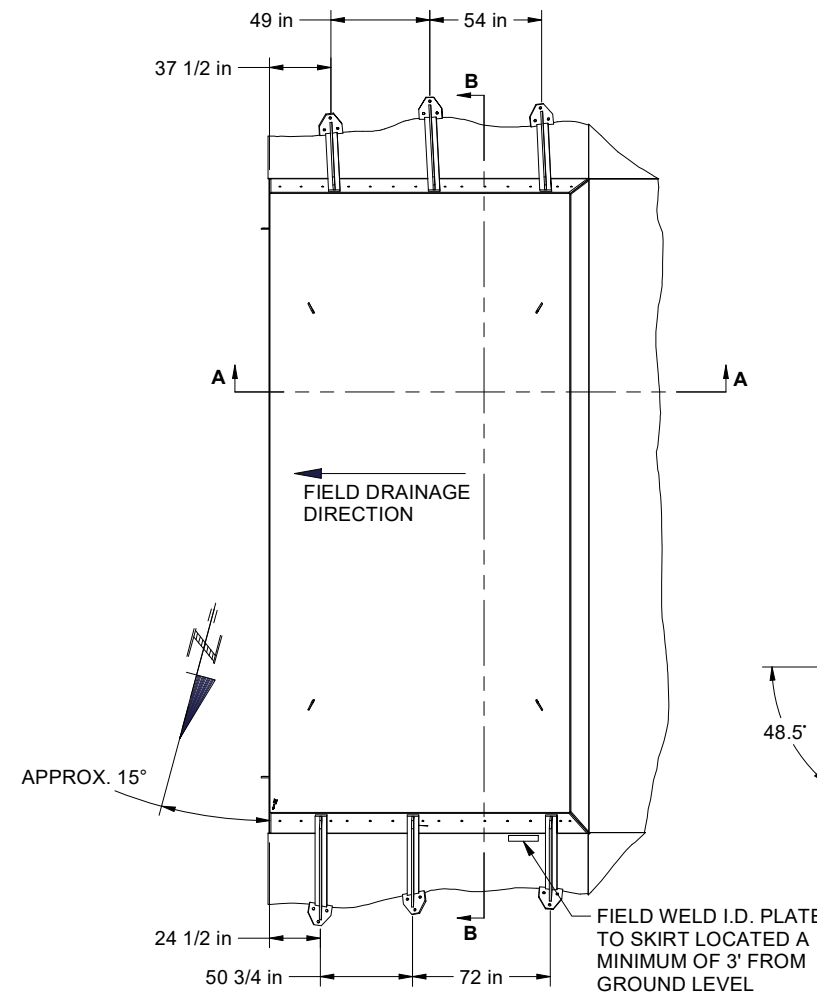
ISO VIEW
LOOKING SOUTHEAST



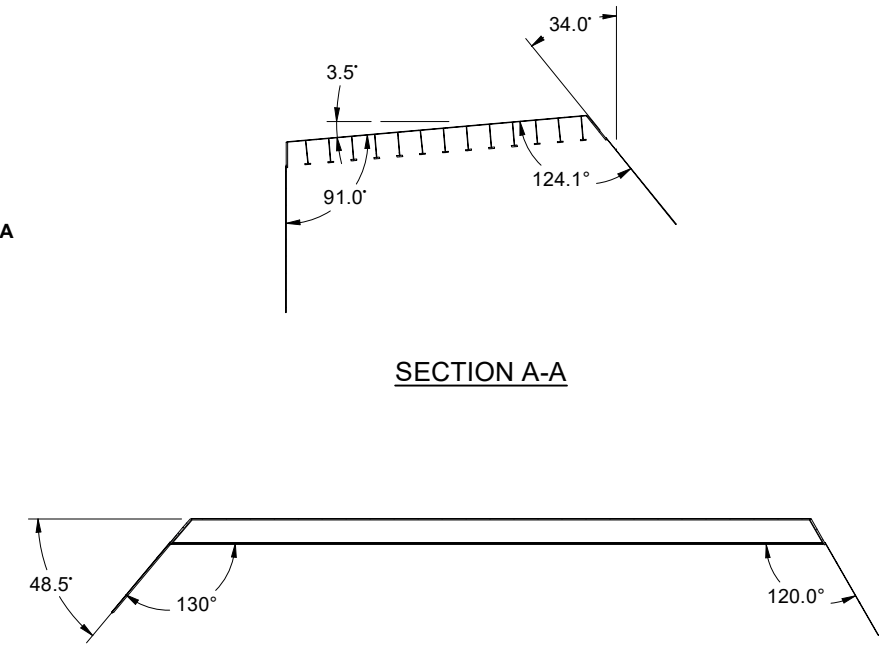
I.D. PLATE (SUPPLIED BY FABRICATOR)
TO BE INSTALLED BY SITE INSTALLATION CONTRACTOR

ESTIMATED WEIGHTS
TOP COVER W/O RIGGING: 12,850 Lbs
AS INSTALLED: 19,000 Lbs

LETTERS TO BE MILLED INTO
12ga SS SHEETING AND MIN.
LETTER HEIGHT IS 10mm



PLAN VIEW - FISHHOOK BAY OPENING COVER



SECTION A-A

SECTION B-B

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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED ID PLATE DIMENSION AND AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL PIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: ANP DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.



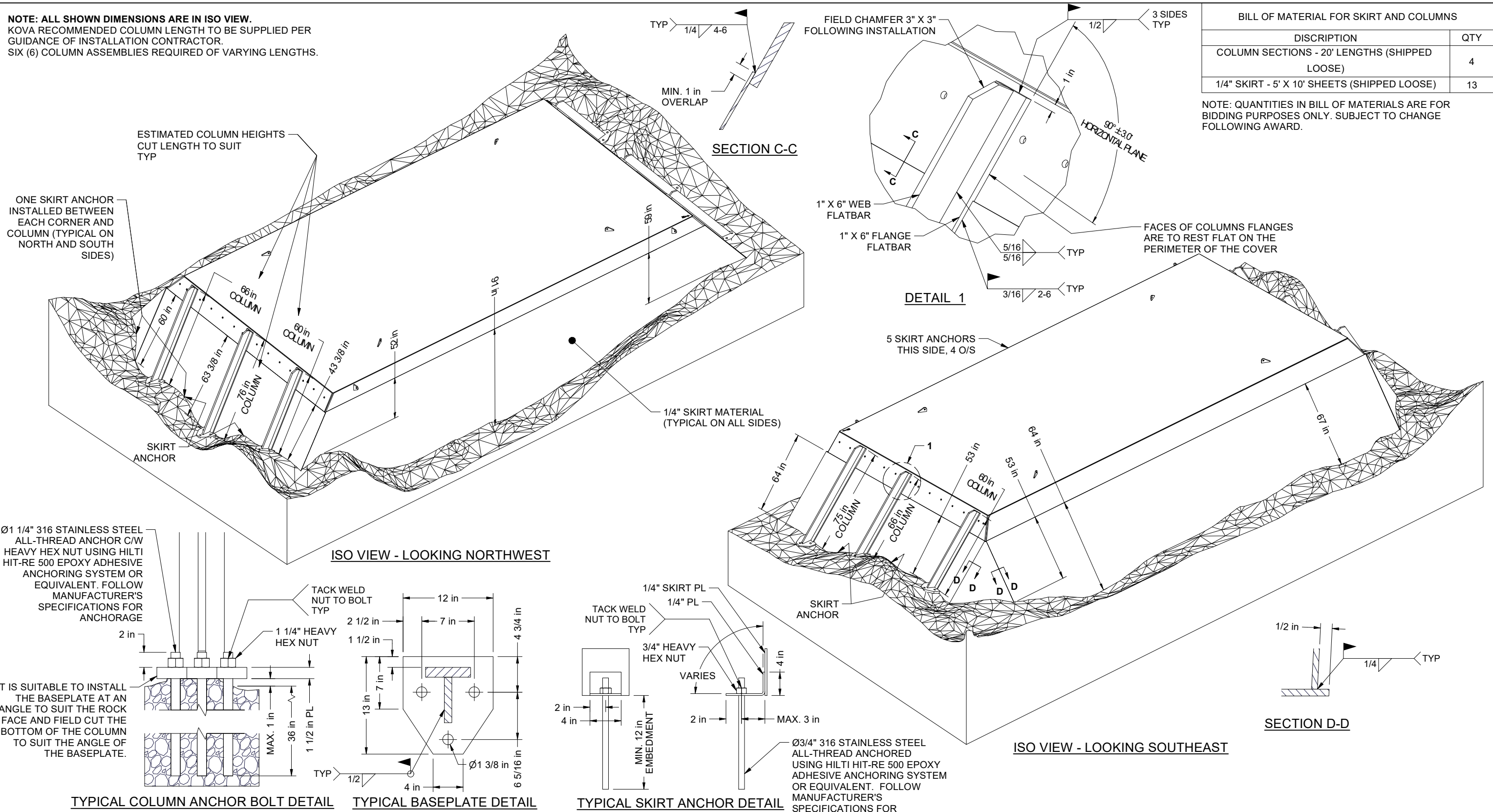
Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Kova Engineering (Saskatchewan) Ltd.
Number C672
Permission to Consult held by:
Discipline: Structural Sk. Reg. No. 14318 Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.
PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
GENERAL ARRANGEMENT AND NOTES
LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
CLIENT: CAMECO SHEQ
DO NOT SCALE DRAWINGS
SHEET NO.: 1 OF 7
DWG. NO.: P60236-11-1

NOTE: ALL SHOWN DIMENSIONS ARE IN ISO VIEW.
 KOVA RECOMMENDED COLUMN LENGTH TO BE SUPPLIED PER
 GUIDANCE OF INSTALLATION CONTRACTOR.
 SIX (6) COLUMN ASSEMBLIES REQUIRED OF VARYING LENGTHS.

BILL OF MATERIAL FOR SKIRT AND COLUMNS	
DISCRIPTION	QTY
COLUMN SECTIONS - 20' LENGTHS (SHIPPED LOOSE)	4
1/4" SKIRT - 5' X 10' SHEETS (SHIPPED LOOSE)	13

NOTE: QUANTITIES IN BILL OF MATERIALS ARE FOR BIDDING PURPOSES ONLY. SUBJECT TO CHANGE FOLLOWING AWARD.



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		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: ANP DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.

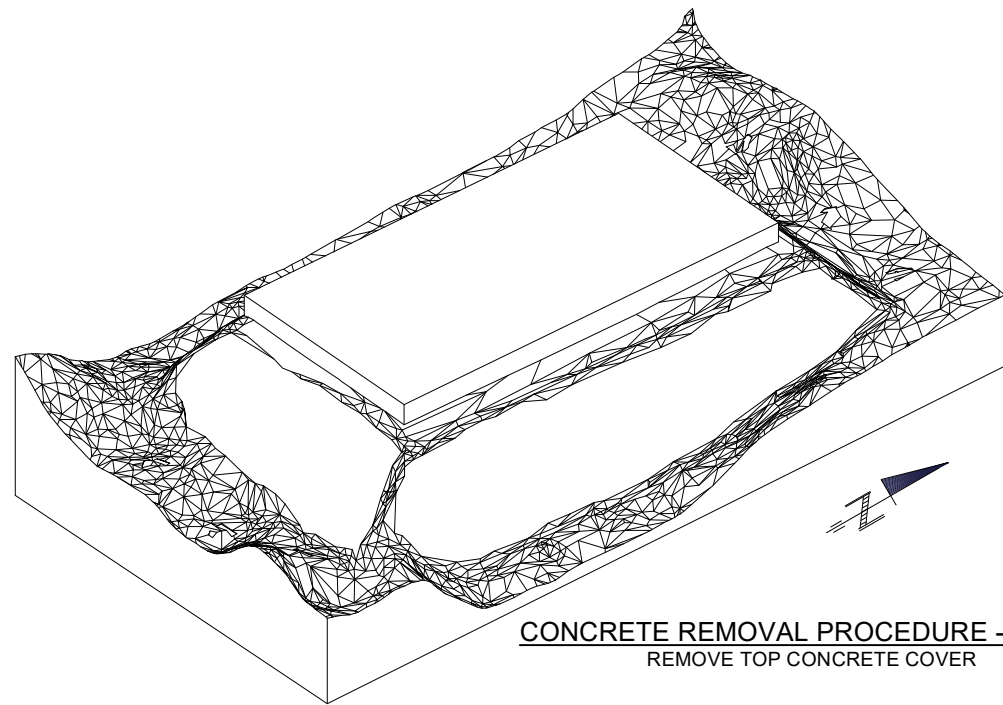


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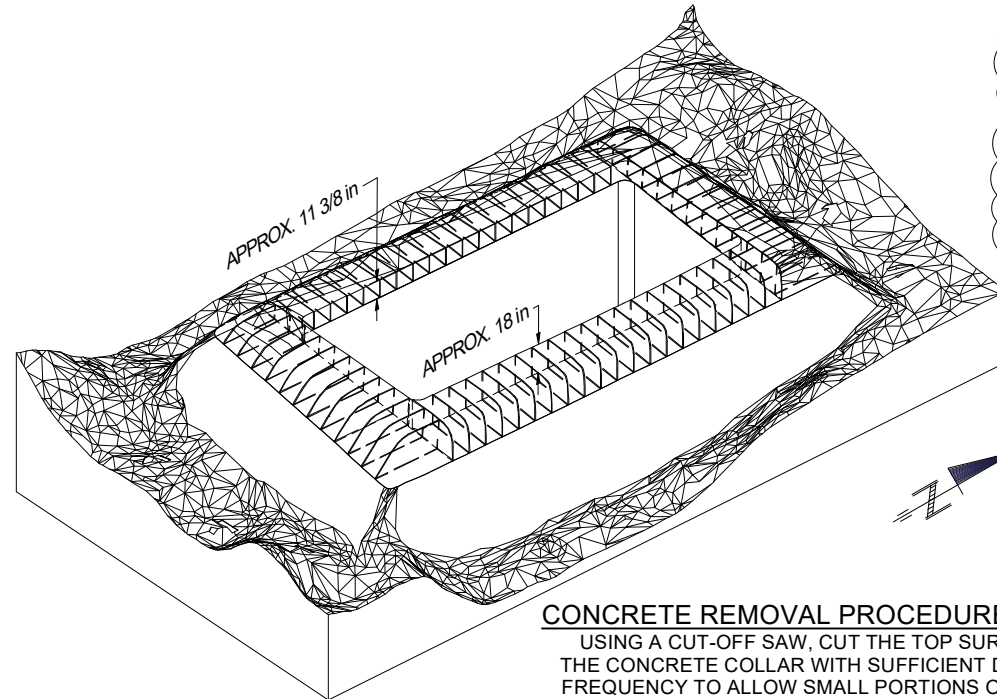
Kova Engineering (Saskatchewan) Ltd.
 PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 ISO VIEWS-ESTIMATED SKIRT AND COLUMN HEIGHTS
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ
 DO NOT SCALE DRAWINGS
 SHEET NO.: 2 OF 7
 DWG. NO.: P60236-11-2
 311 WHEELER PLACE, SASKATOON, SK, S7P 0A4 PHONE: 306.652.9229 FAX: 306.249.1059

NOTE: THE DETAILS ON SHEET 3 ARE RECOMMENDATIONS FOR PARTIAL REMOVAL OF THE PREVIOUS CONCRETE COVER THAT WERE PROVIDED PRIOR TO INSTALLATION OF THE STAINLESS STEEL COVER RATHER THAN THE AS-BUILT DETAILS. KOVA PERSONNEL DID NOT FIELD-VERIFY THE DETAILS OF CONCRETE REMOVAL OF PRIOR TO INSTALLATION OF THE STAINLESS STEEL COVERS. HOWEVER, THE STAINLESS STEEL COVER COULD NOT HAVE FIT AS SHOWN IN THE AS-BUILT DETAILS WITHOUT REMOVAL OF CONCRETE SIMILAR TO THAT SHOWN.

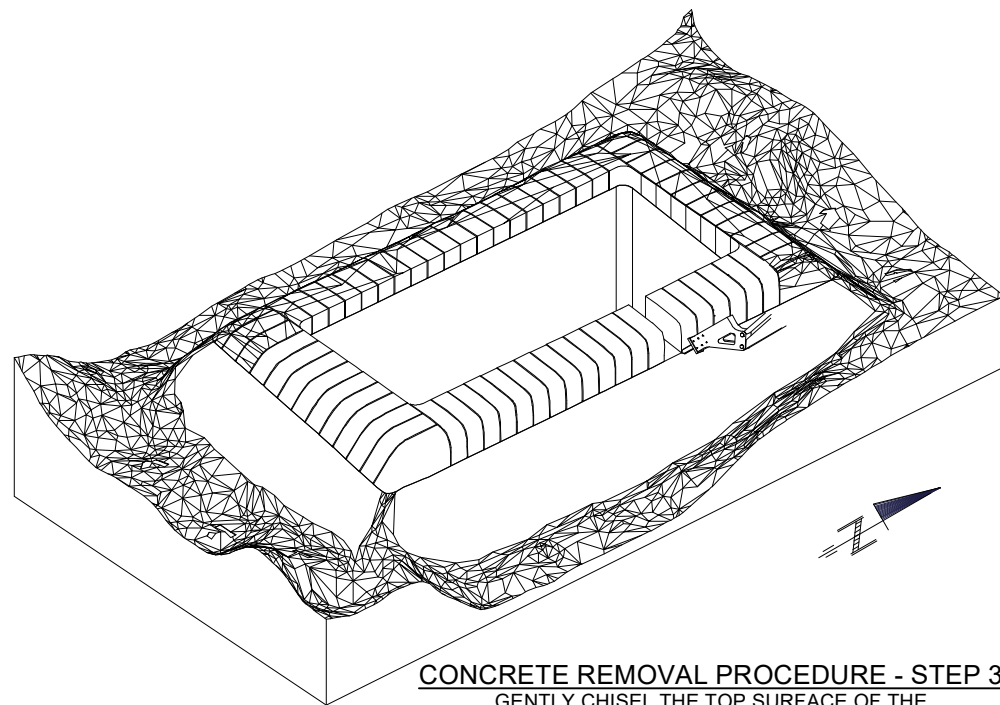
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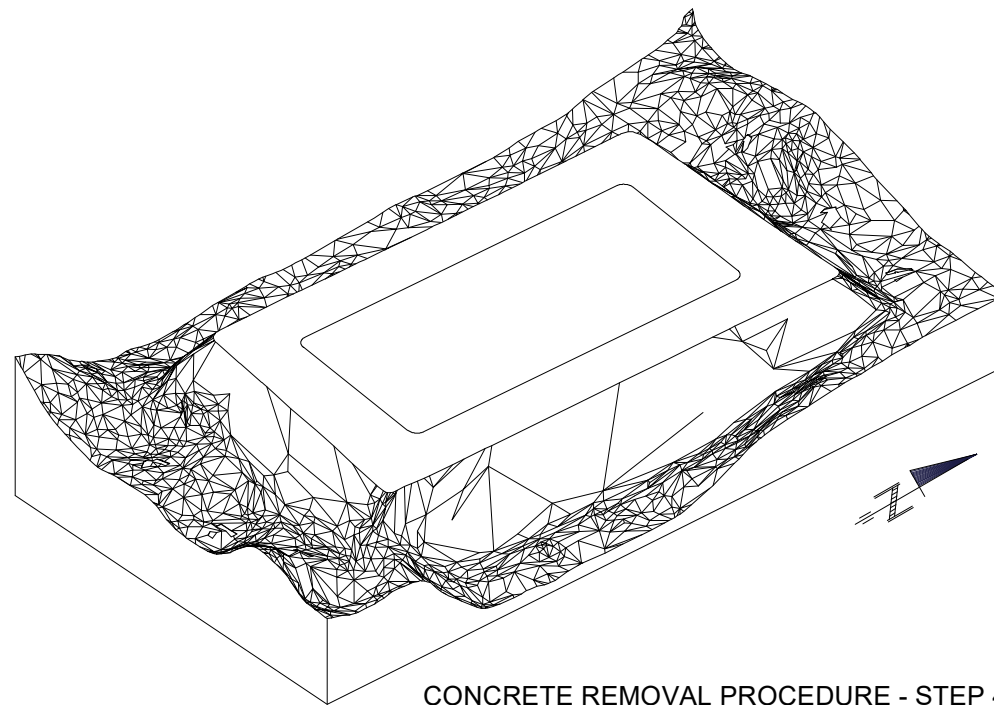
CONCRETE REMOVAL PROCEDURE - STEP 1
REMOVE TOP CONCRETE COVER



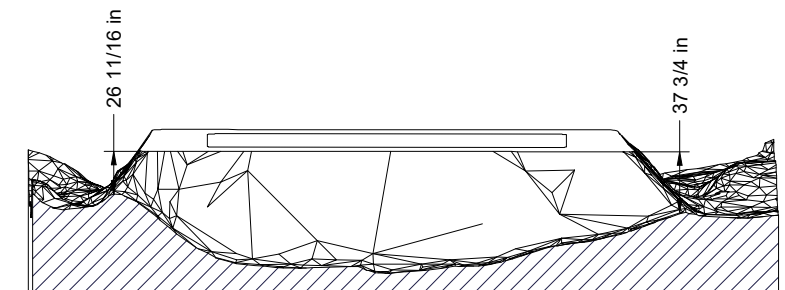
CONCRETE REMOVAL PROCEDURE - STEP 2
USING A CUT-OFF SAW, CUT THE TOP SURFACE OF THE CONCRETE COLLAR WITH SUFFICIENT DEPTH AND FREQUENCY TO ALLOW SMALL PORTIONS OF THE TOP SURFACE TO BE REMOVED WITH A SMALL EXCAVATOR-MOUNTED HAMMER.



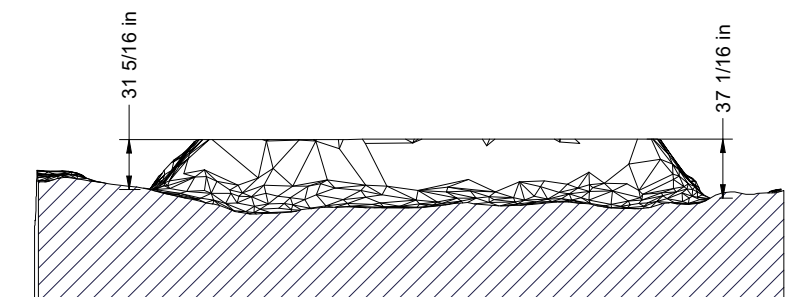
CONCRETE REMOVAL PROCEDURE - STEP 3
GENTLY CHISEL THE TOP SURFACE OF THE CONCRETE AWAY UNTIL THE DIMENSIONS SHOWN IN STEP 4 ARE OBSERVED. DO NOT DAMAGE OR FRACTURE THE MONOLITHIC CONCRETE COLLAR BELOW THE SAW CUTS.



CONCRETE REMOVAL PROCEDURE - STEP 4
MEASURE TO ENSURE THE DIMENSIONS SHOWN ARE OBSERVED, THEN PROCEED WITH INSTALLATION OF THE PERMANENT COVER.



CONCRETE REMOVAL PROCEDURE - STEP 4
(LOOKING WEST)

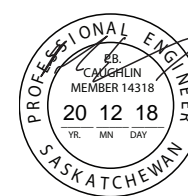


CONCRETE REMOVAL PROCEDURE - STEP 4
(LOOKING EAST)

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		4	ADDED ID PLATE DIMENSION AND AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: 250 MACHINED SURFACES: 125 ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	



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Kova Engineering (Saskatchewan) Ltd.
 Number C672
 Permission to Consult held by:
 Discipline: Structural, Sk. Reg. No.: 14318, Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 CONCRETE REMOVAL PROCEDURE
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

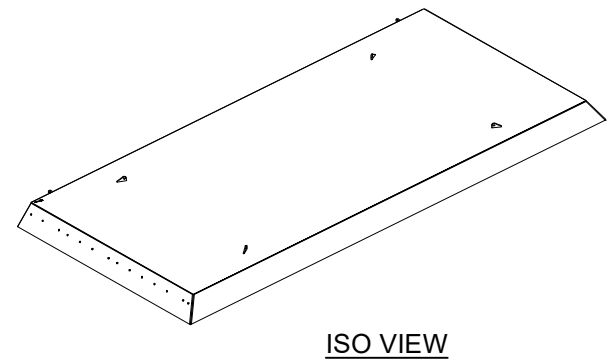
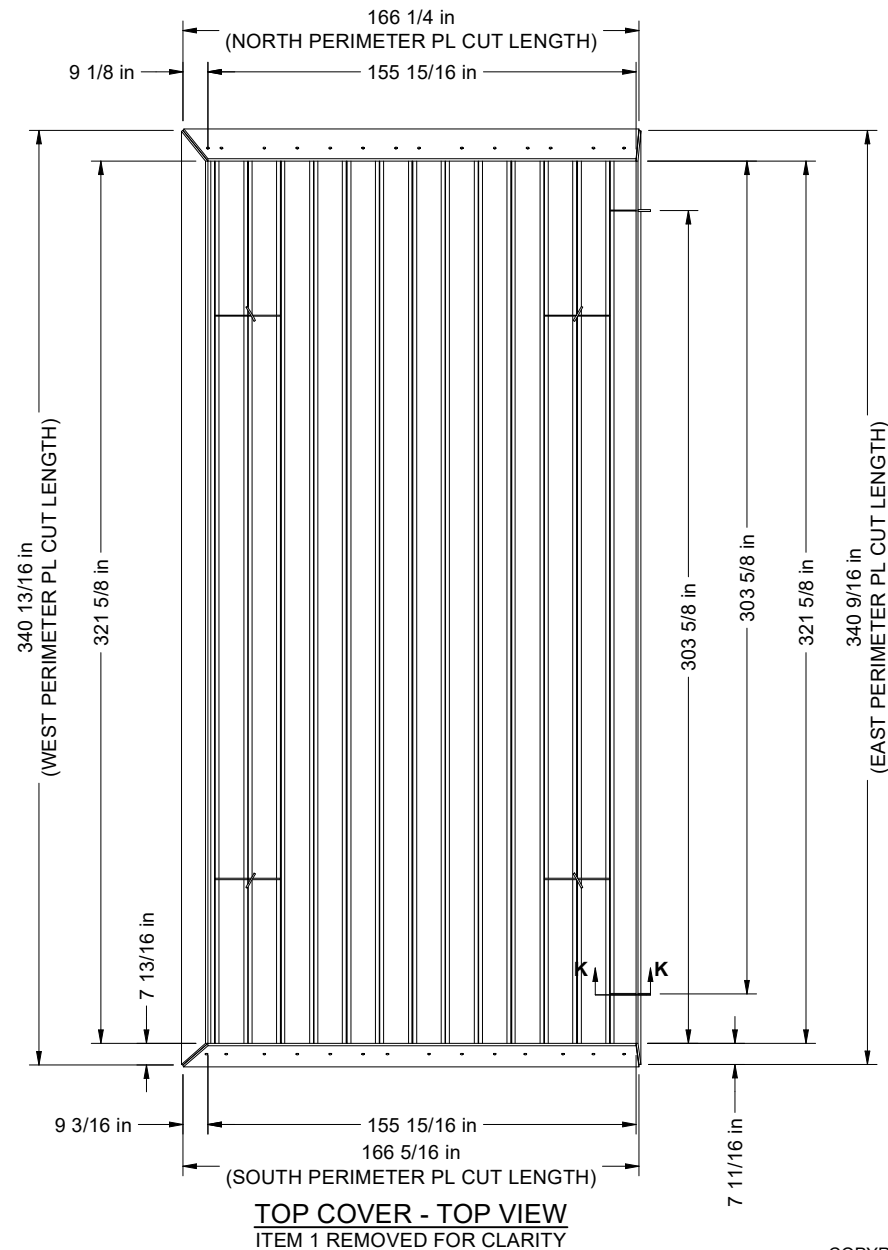
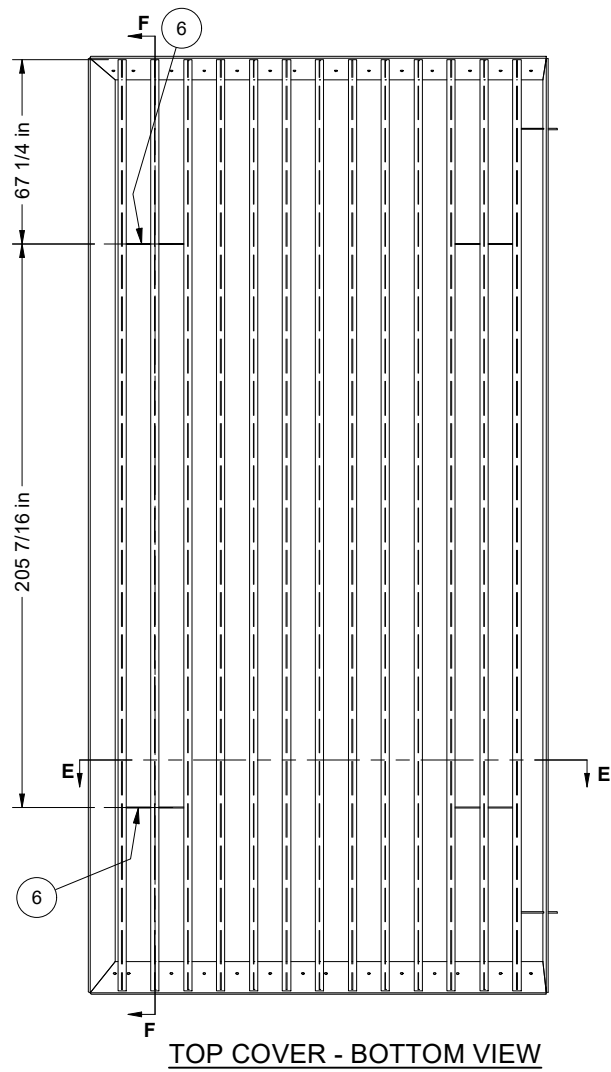
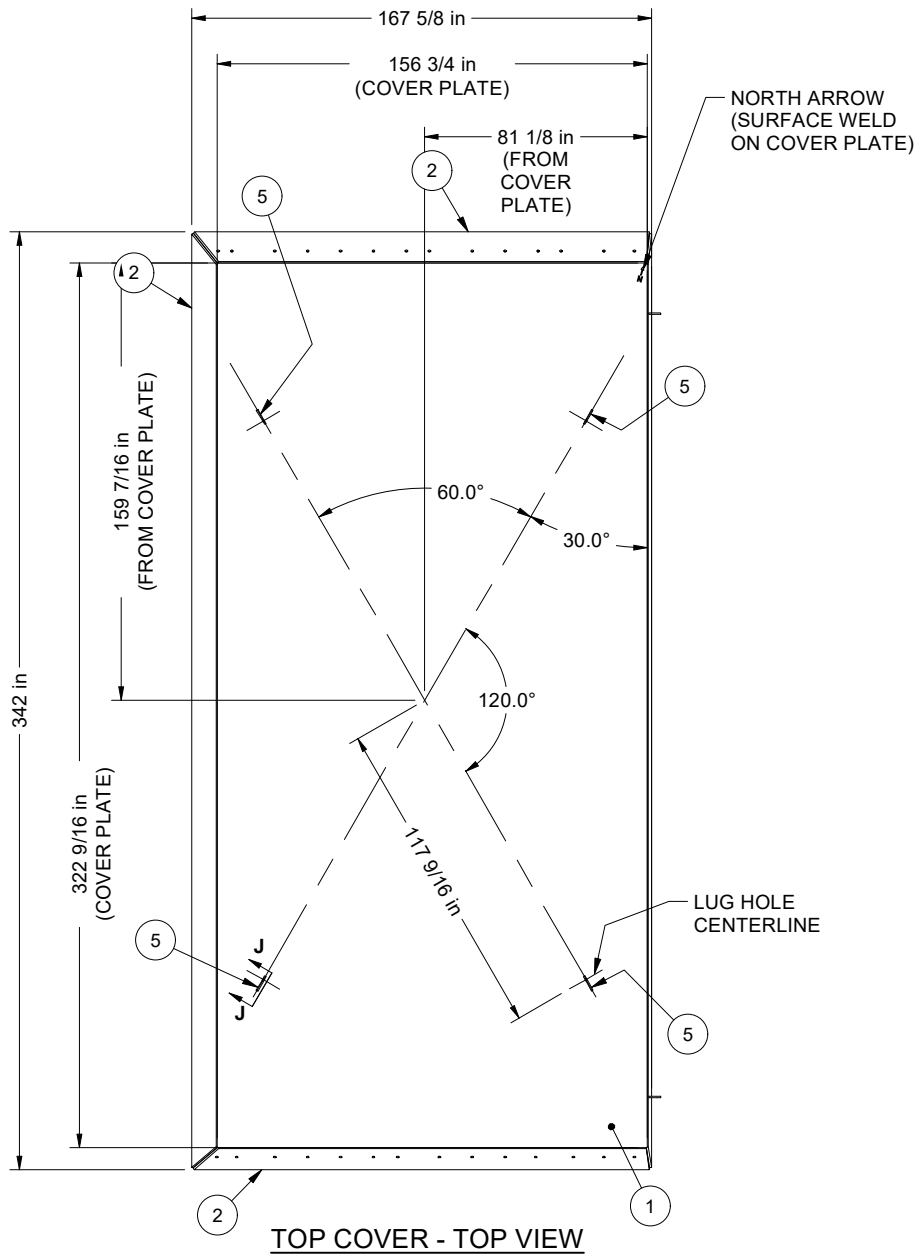
DO NOT SCALE DRAWINGS

SHEET NO.: 3 OF 7

DWG. NO.: P60236-11-3

4

BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	1/4" PL	ASTM A-240 316L
2	4	3/4" PL	ASTM A-240 316L
3	13	12" X 1/4" FLAT BAR	ASTM A-240 316L
4	13	3" X 5/8" FLAT BAR	ASTM A-240 316L
5	4	5/8" PL	ASTM A-240 316L
6	8	4" X 3/8" FLAT BAR	ASTM A-240 316L
7	2	5/8" PL	ASTM A-240 316L
8	2	4" X 3/8" FLAT BAR	ASTM A-240 316L



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DWG #	REFERENCE DRAWINGS	REV	REVISIONS	DATE	BY	TOLERANCES-U.N.O.
		4	ADDED ID PLATE DIMENSION AND AS-BUILT NOTES	18/Dec/20	ANP	LINEAR DIMS: ± 1/16" ANGULAR DIMS: ± 1 deg. CUT SURFACES: ²⁵⁰ MACHINED SURFACES: ¹²⁵ ALL FIN TOL. TO BE ANSI RC8 ALL DIMENSIONS IN INCHES
		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	
		1	ISSUED FOR TENDER	16/Dec/19	NR	

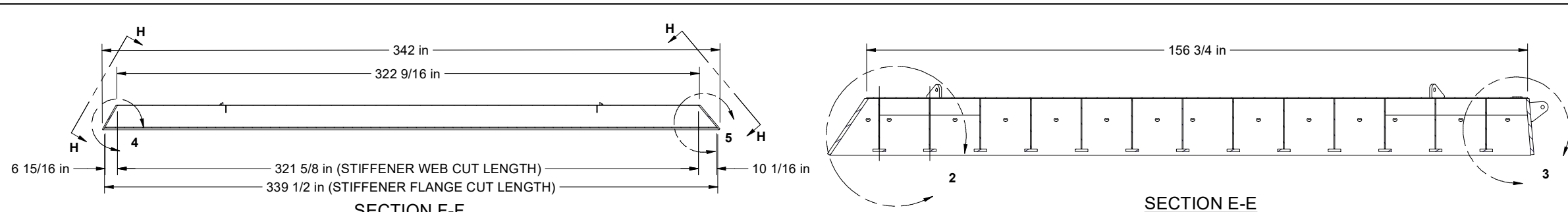


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 Discipline: Structural Sk. Reg. No. 14318 Signature: *[Signature]*

Kova Engineering (Saskatchewan) Ltd.

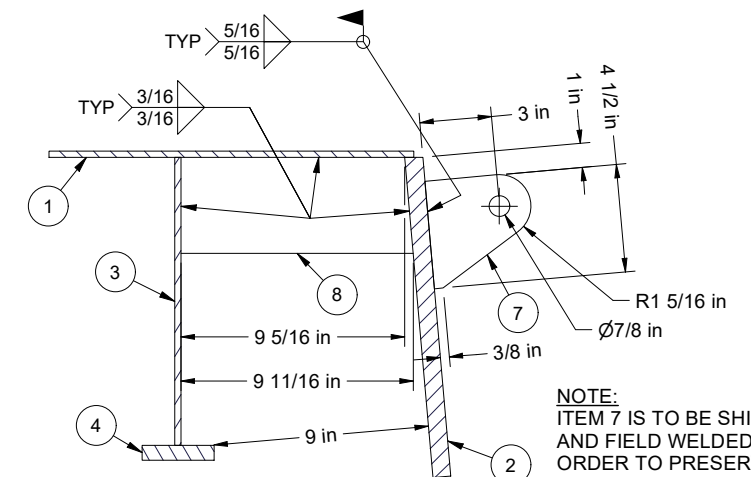
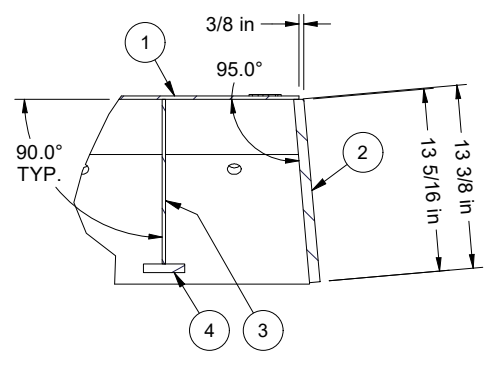
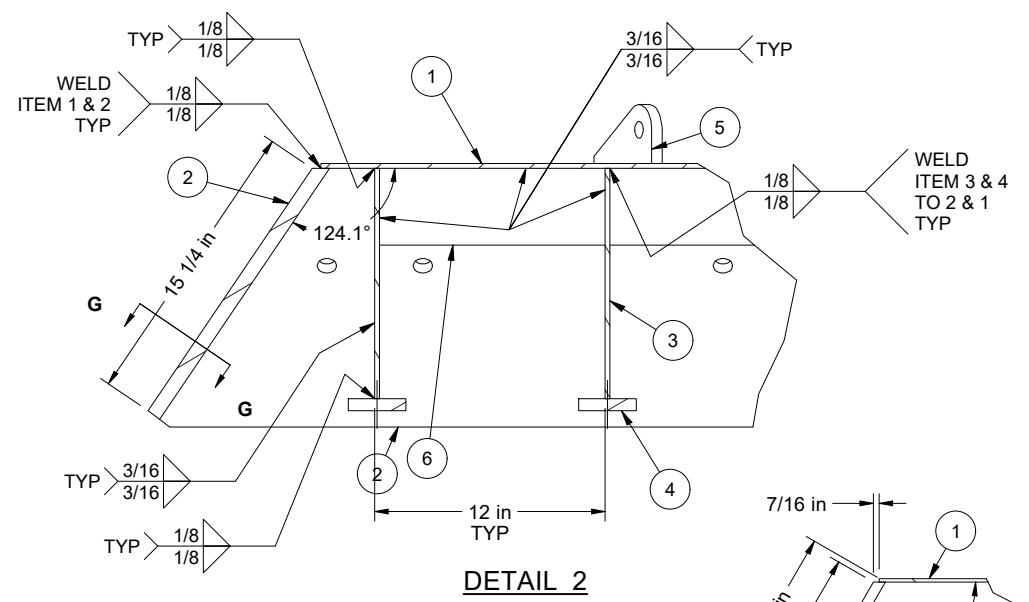
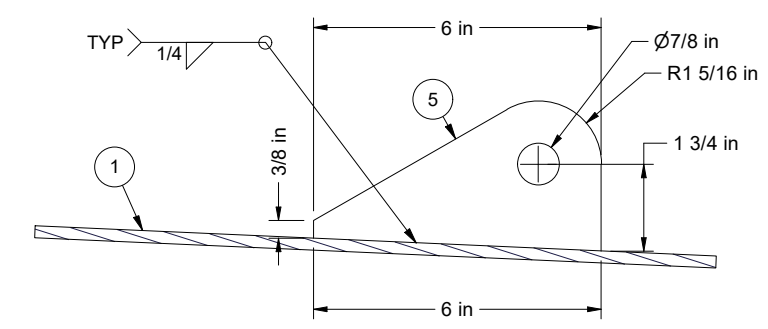
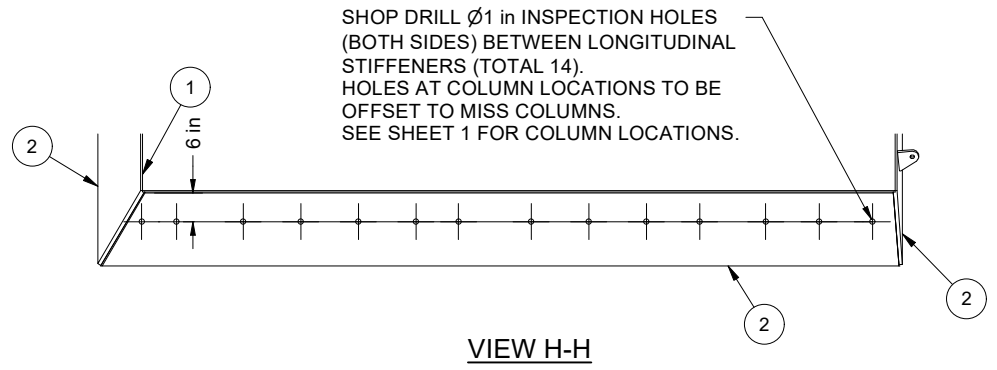
PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 TOP COVER SECTION DETAILS
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 4 OF 7 DWG. NO.: P60236-11-4

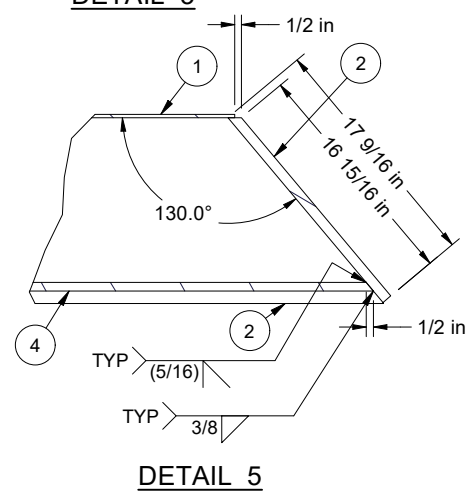
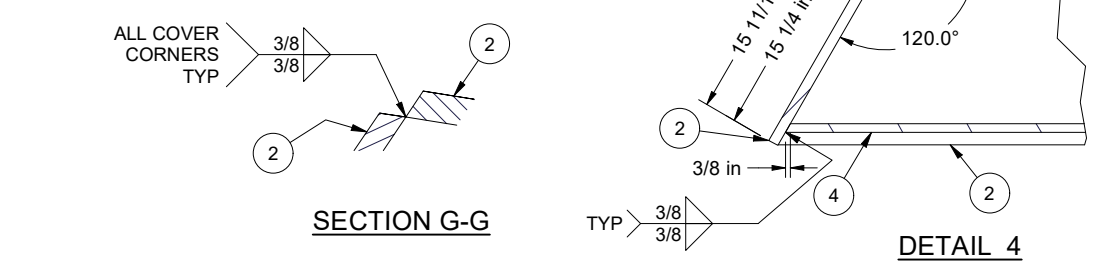


BILL OF MATERIALS			
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5	4	5/8" PL	ASTM A-240 316L
6	8	4" X 3/8" FLAT BAR	ASTM A-240 316L
7	2	5/8" PL	ASTM A-240 316L
8	2	4" X 3/8" FLAT BAR	ASTM A-240 316L

SHOP DRILL Ø1 in INSPECTION HOLES (BOTH SIDES) BETWEEN LONGITUDINAL STIFFENERS (TOTAL 14). HOLES AT COLUMN LOCATIONS TO BE OFFSET TO MISS COLUMN LOCATIONS. SEE SHEET 1 FOR COLUMN LOCATIONS.



NOTE: ITEM 7 IS TO BE SHIPPED LOOSE AND FIELD WELDED ON-SITE IN ORDER TO PRESERVE SHIPPING DIMENSIONS.



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		3	AS-BUILT	04/Dec/20	ANP	
		2	ADDED BOM FOR SKIRT AND COLUMN MATERIALS	03/Jan/20	ANP	DRWN BY: ANP DATE: 16/Dec/19
		1	ISSUED FOR TENDER	16/Dec/19	NR	CHK'D BY: P.C. ENG BY: P.C.



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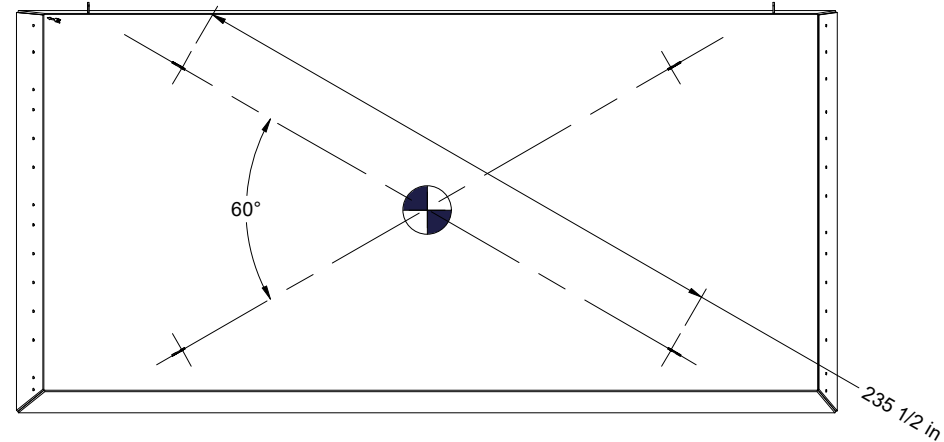
Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 TOP COVER SECTION DETAILS 2
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

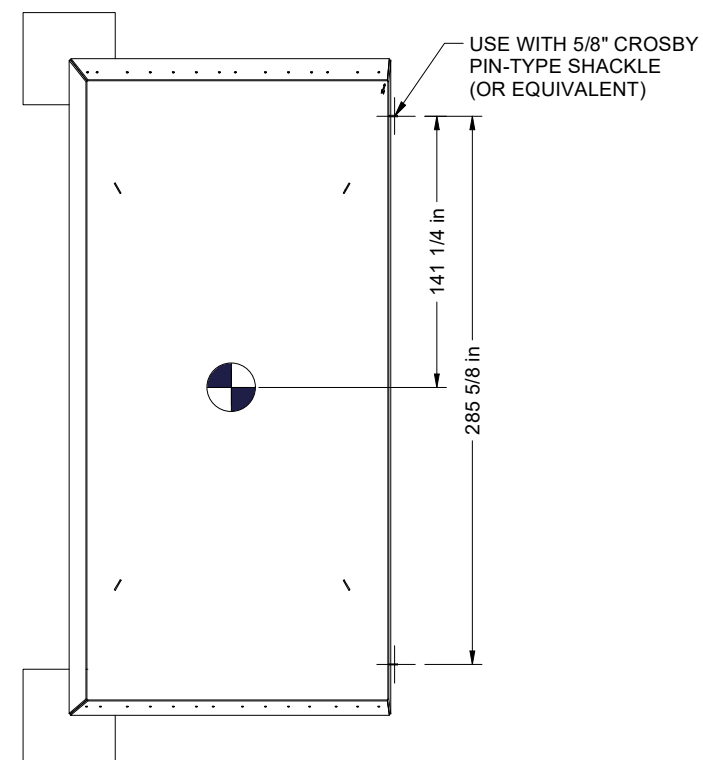
DO NOT SCALE DRAWINGS

SHEET NO.: 5 OF 7

DWG. NO.: P60236-11-5

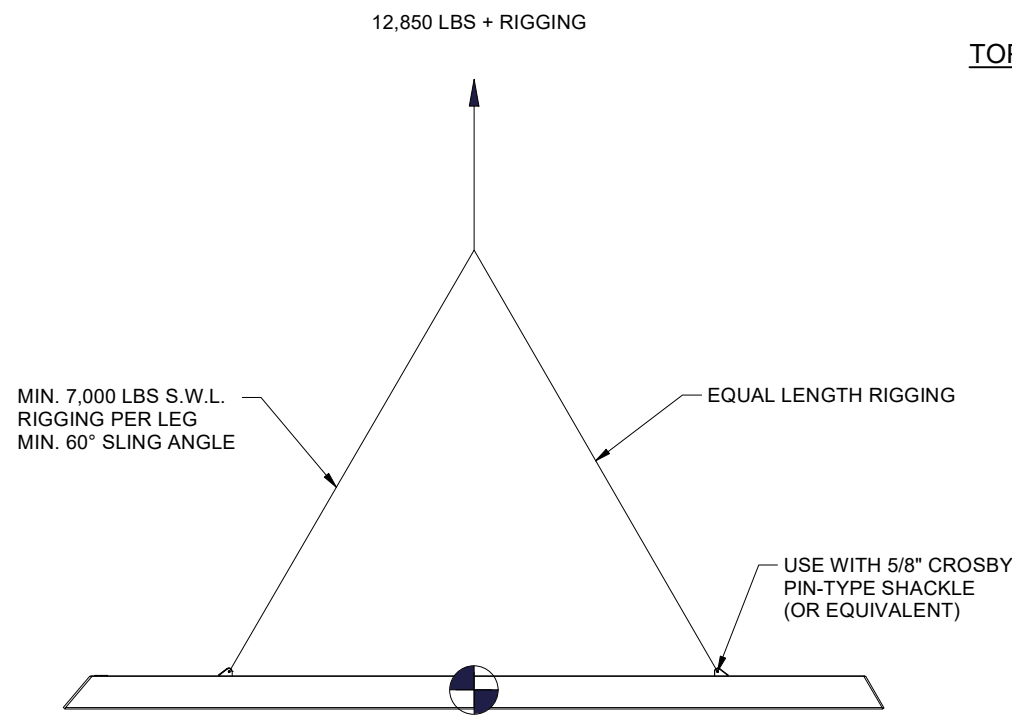


COVER SECTION LIFTING DIAGRAM - TOP VIEW

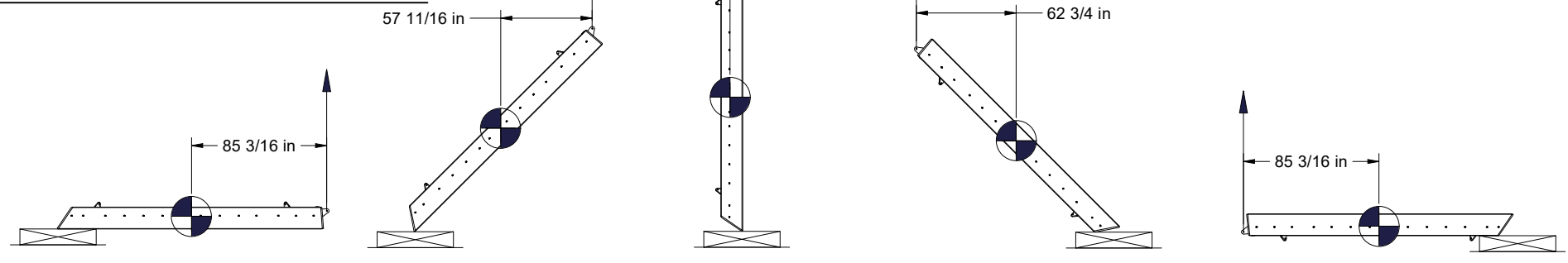


TOP COVER FLIPPING DIAGRAM - TOP VIEW

NOTE: THE DETAILS ON SHEET 6 ARE NO LONGER RELEVANT FOR THE AS-BUILT CONDITION OF THE STAINLESS STEEL COVER.



TOP COVER LIFTING DIAGRAM - SIDE VIEW



TOP COVER FLIPPING DIAGRAM

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		1	ISSUED FOR TENDER	16/Dec/19	NR	



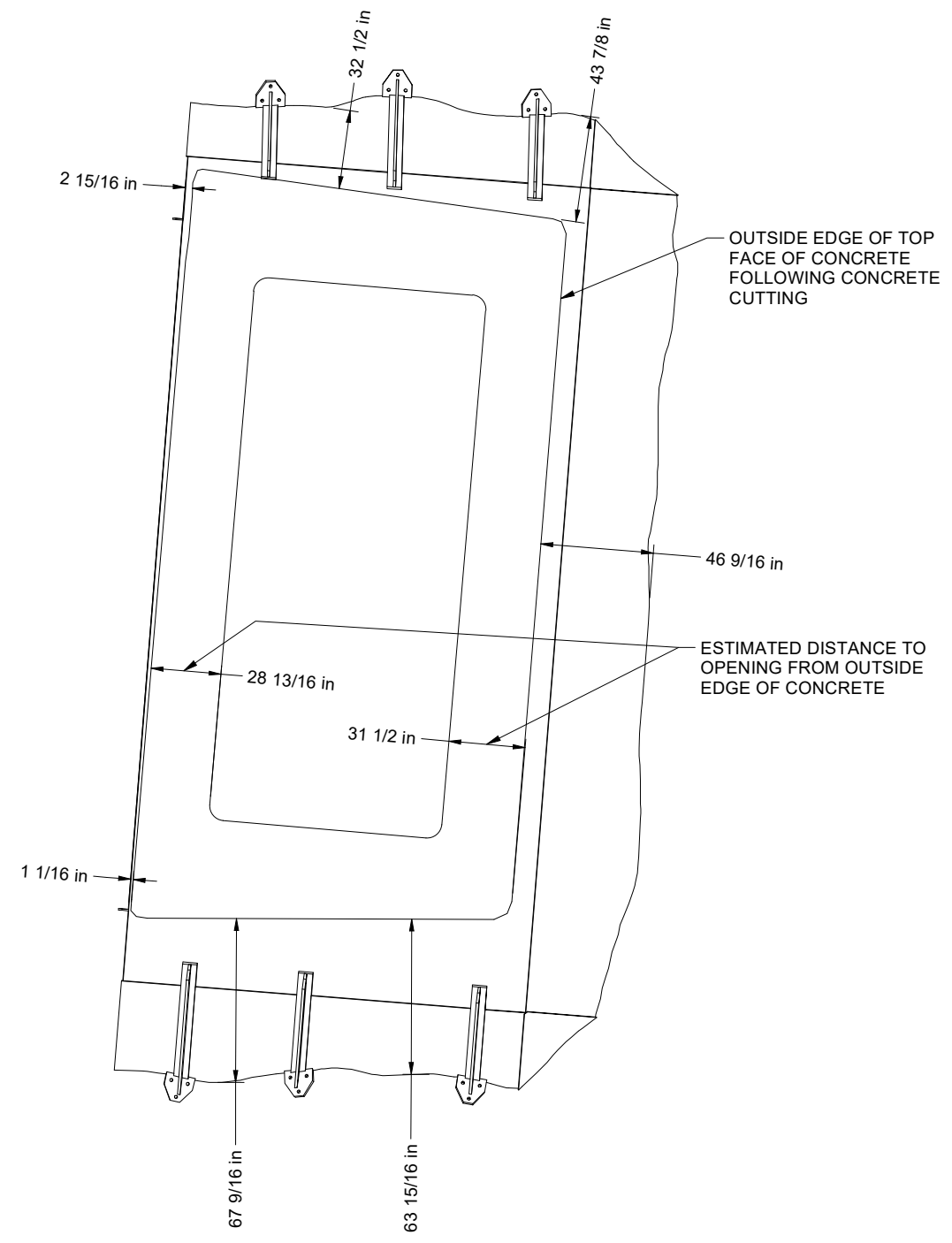
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 Discipline: Structural Sk. Reg. No.: 14318 Signature: [Signature]

Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 LIFTING DETAILS
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS SHEET NO.: 6 OF 7 DWG. NO.: P60236-11-6

NOTE: THE DETAILS ON SHEET 7 ARE THE RECOMMENDATIONS FOR THE PLACEMENT OF THE STAINLESS STEEL COVER PROVIDED PRIOR TO INSTALLATION OF THE COVERS RATHER THAN AS-BUILT DETAILS. KOVA PERSONNEL DID NOT FIELD-VERIFY THE DETAILS SHOWN PRIOR TO REMOVAL; HOWEVER, THE STAINLESS STEEL COVER COULD NOT HAVE FIT AS SHOWN IN THE AS-BUILT DETAILS WITHOUT COVER PLACEMENT SIMILAR TO THAT SHOWN.



OPENING TO SKIRT CLEARANCE

4

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		3	AS-BUILT	04/Dec/20	ANP	
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		1	ISSUED FOR TENDER	16/Dec/19	NR	



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Kova Engineering (Saskatchewan) Ltd.

PROJECT: PERMANENT COVER FOR BEAVERLODGE FISHHOOK BAY SHAFT OPENING
 INSTALLATION CLEARANCES
 LOCATION: 59° 27' 57.57" N 108° 24' 37.69" W, NEAR URANIUM CITY, SK
 CLIENT: CAMECO SHEQ

DO NOT SCALE DRAWINGS

SHEET NO.: 7 OF 7

DWG. NO.: P60236-11-7

FAY 2, 3, 13 - Custom Crusher Openings

FAY 2, 3, 13 - Custom Crusher Openings



Photo 1: GPS location of the Custom Crusher Raises Site.



Photo 2: Overview of the Custom Crusher Raises Site.

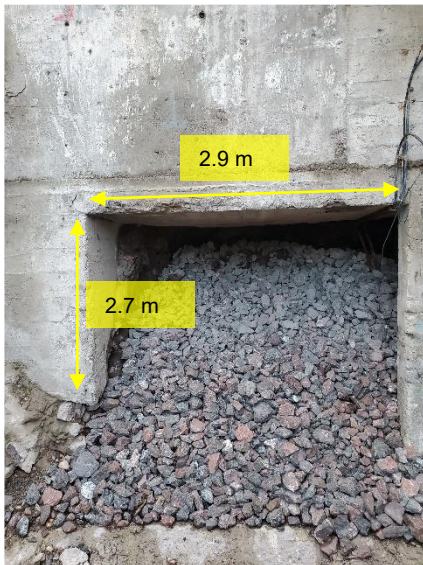


Photo 3: Close-up of Raise 1 that was backfilled with -5 to -8 inch material.

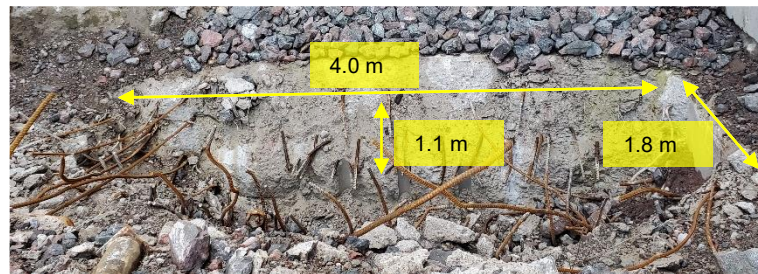


Photo 4: Close-up of Raise 2 that was excavated.

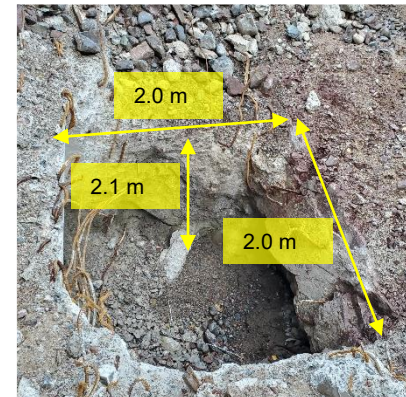


Photo 5: Close-up of Raise 3 that was excavated.



		Custom Crusher Raises Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 1



Photo 6: Location of the boulder for Raise 3, from an area approximately 9.0 km southwest of Uranium City.



Photo 8: Boulders sourced by UCC and inspected by the SRK field engineer.



Photo 7: Dimensions of the pyramid-shaped boulder placed within Raise 3.



		Custom Crusher Raises Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 2



Photo 9: Rock Number 2 contributing to the wedging effect at Raise 3.



Photo 10: Top view of the 15 boulders placed at Raise 3.



Photo 11: Total of 15 boulders placed for the permanent closure of Raise 3.



		Custom Crusher Raises Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 3



Photo 12: Placement of coarse waste rock over the boulders at Raise 3 to safely access Raise 2.



Photo 14: Total of 11 boulders placed for the permanent closure of Raise 2.

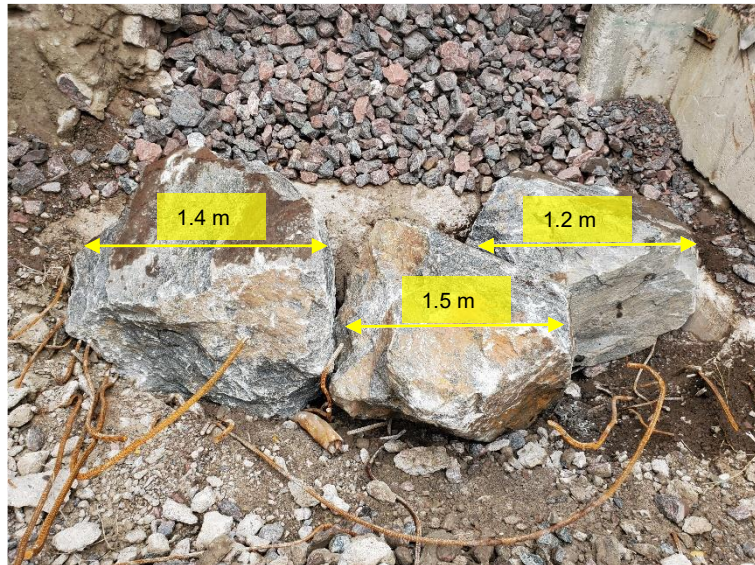




Photo 13: Three boulders creating a wedging effect at Raise 2.



Photo 15: Top view of the 11 boulders placed at Raise 2.

			Custom Crusher Raises Remediation Project	
	Beaverlodge		Field Photographs	
Job No: 1CC007.069 Filename: BL_1CC007.069		Date: 2020/09/28	Approved: BM/ML	Photo Page: 4

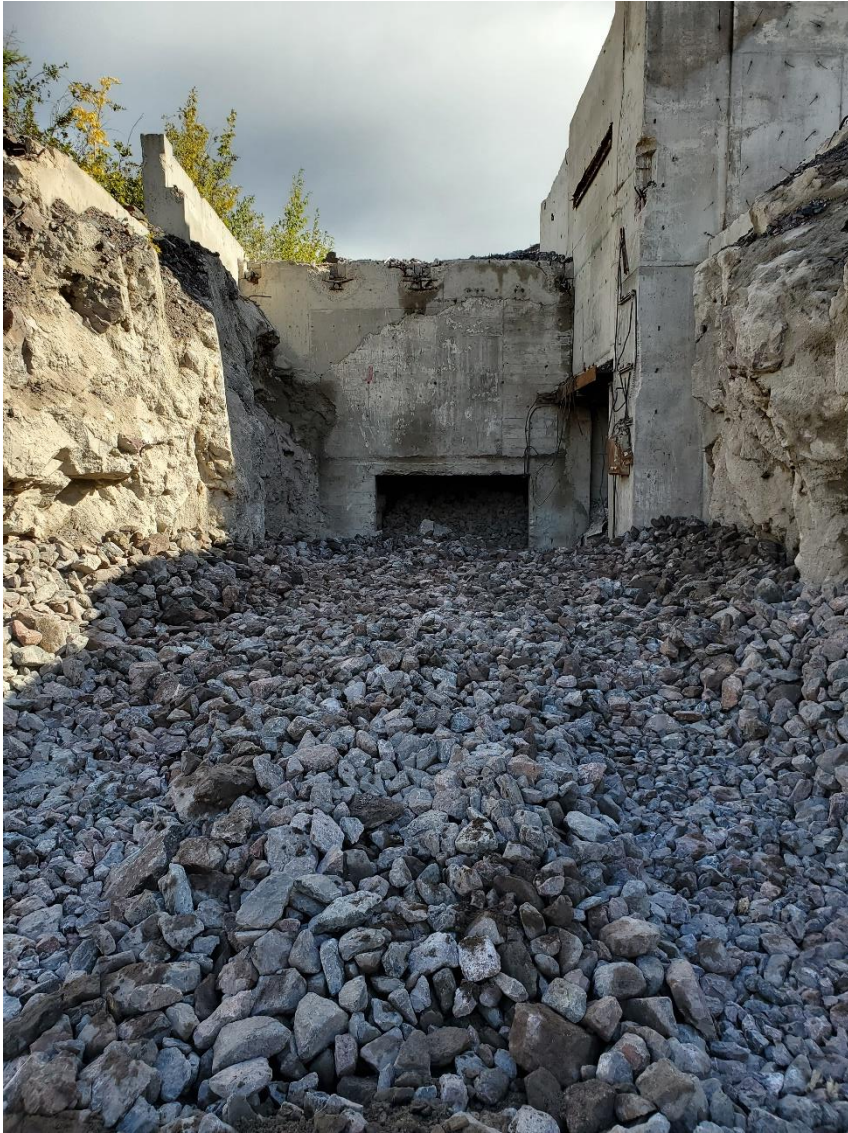


Photo 16: Placement of coarse waste rock over Raise 3 and 2, up to the entrance at Raise 1.



Photo 17: Additional placement of coarse waste rock over Raise 3 and 2, up to the entrance at Raise 1.





		Custom Crusher Raises Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 5



Photo 18: Demolition of the concrete dump chute.



Photo 19: Final placement of the gravel cover layer.

		Custom Crusher Raises Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 6

FH 3 - Adit

Fishhook 3 - Adit



Photo 1: GPS locations of the Adit Entrance and the Toe of the Placed Backfill Material.

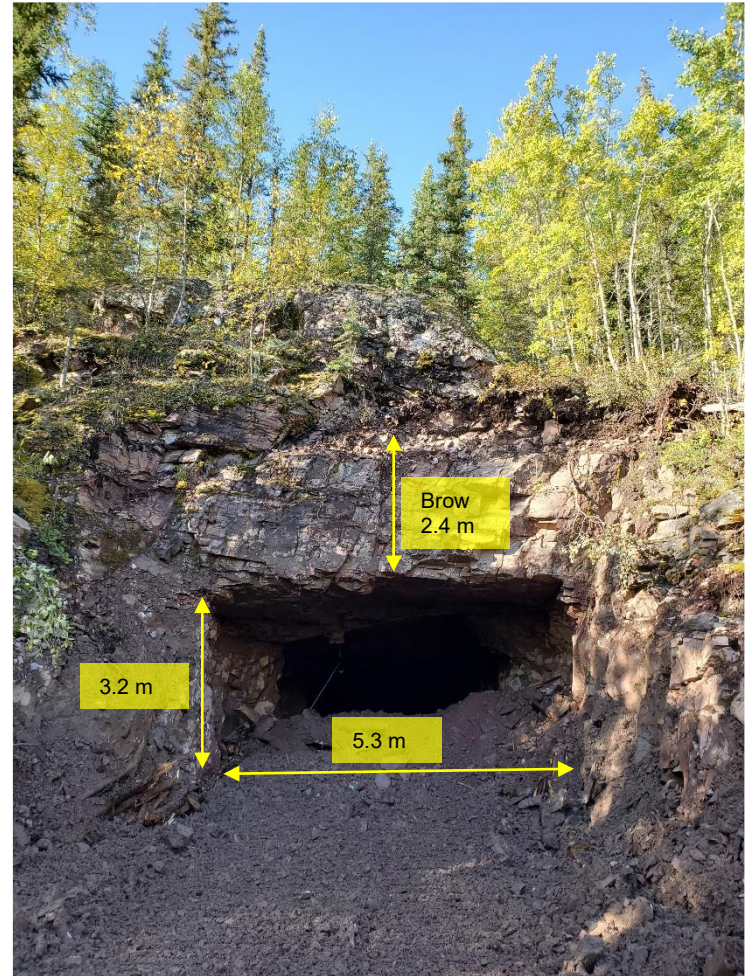


Photo 2: Overview of the Fishhook Adit and Dimensions



		Fishhook Adit Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 1



Photo 3: Stages of Backfill placed in the Fishhook Bay Adit



Photo 4: Stages of Backfill placed in the Fishhook Bay Adit



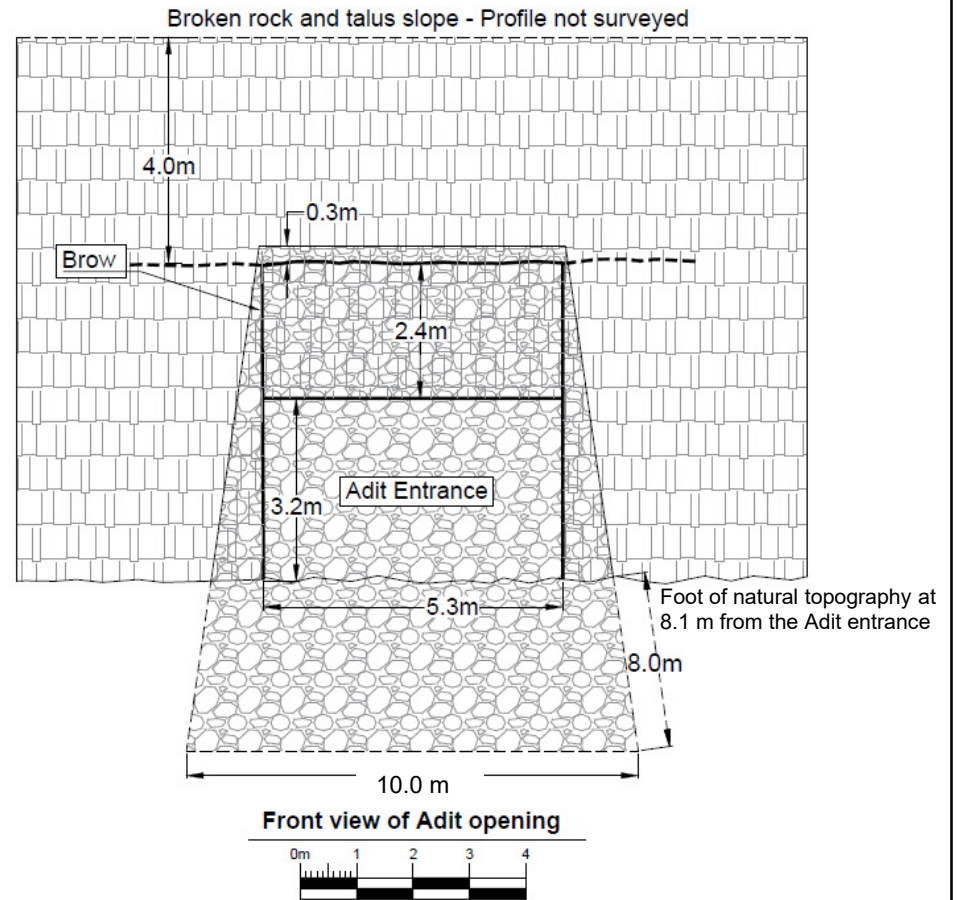
		Fishhook Adit Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 2



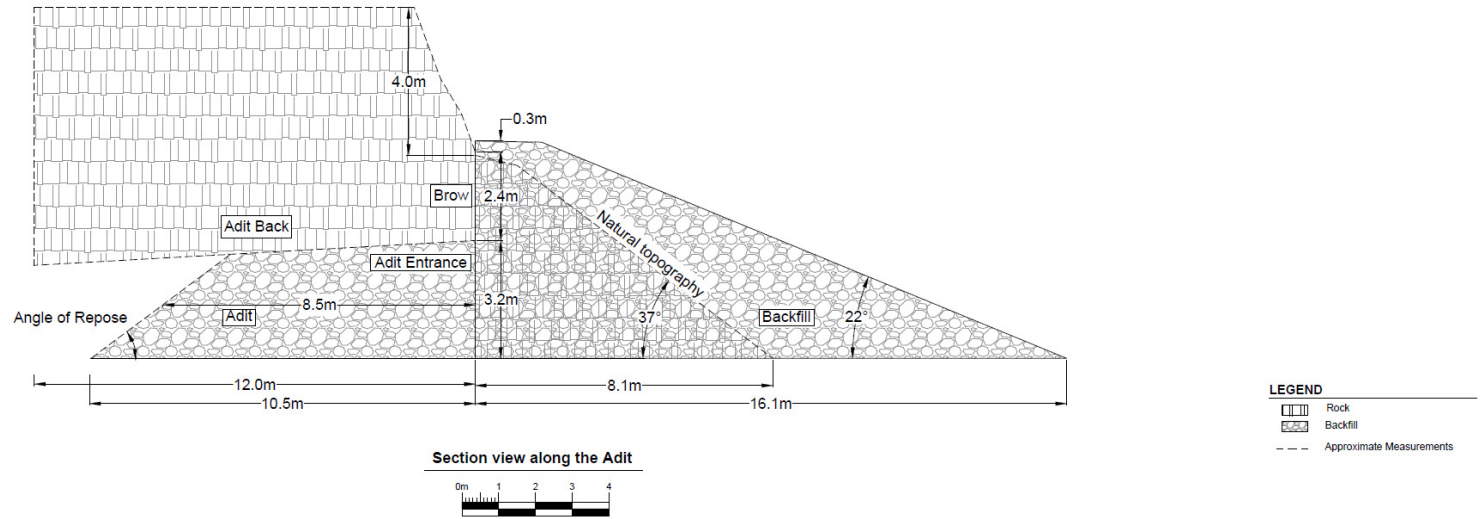
Photo 5: Final Placement of Backfill material along the Fishhook Bay Adit.



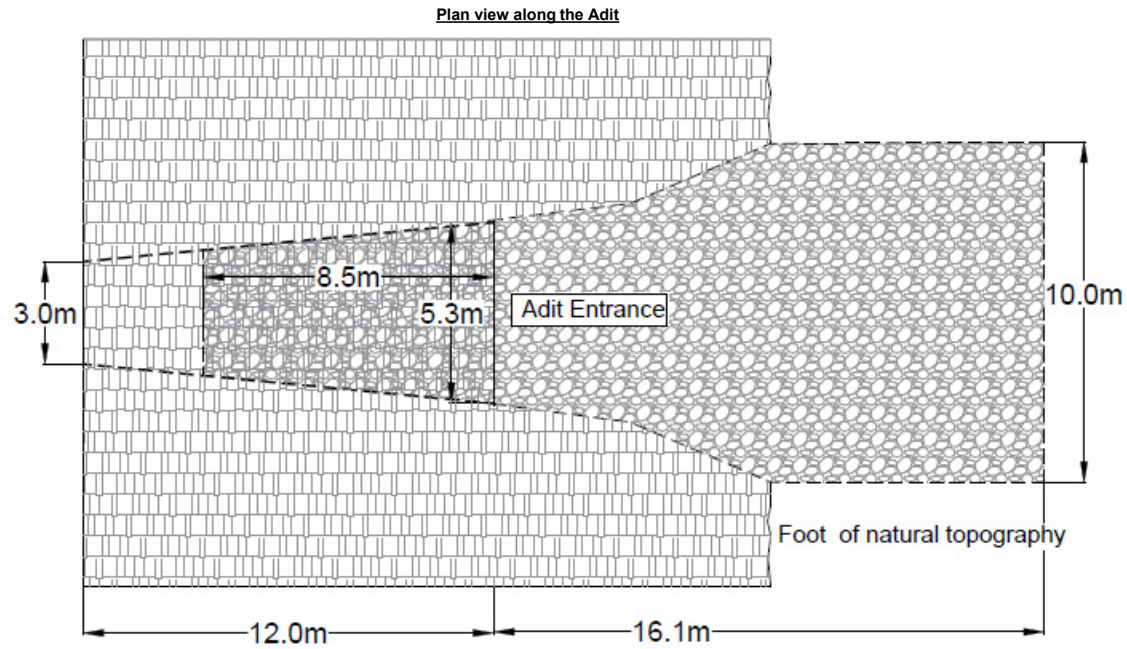
Drawing 1: Front View of the Backfill.

LEGEND	
	Rock
	Backfill
	Approximate Measurements



		Fishhook Adit Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 3



Drawing 2: Section View of the Backfill.



Drawing 3: Plan View of the Backfill.

		Fishhook Adit Remediation Project		
		Field Photographs		
Job No: 1CC007.069 Filename: BL_1CC007.069	Beaverlodge	Date: 2020/09/28	Approved: BM/ML	Photo Page: 4

2021 Cover Installation

FAY 4 - CB-1 Access Raise

FAY 4 - CB-1 Access Raise



Photo 1: GPS locations of the CB-1 Mine Opening Entrance and the Toe of the Placed Backfill Material.

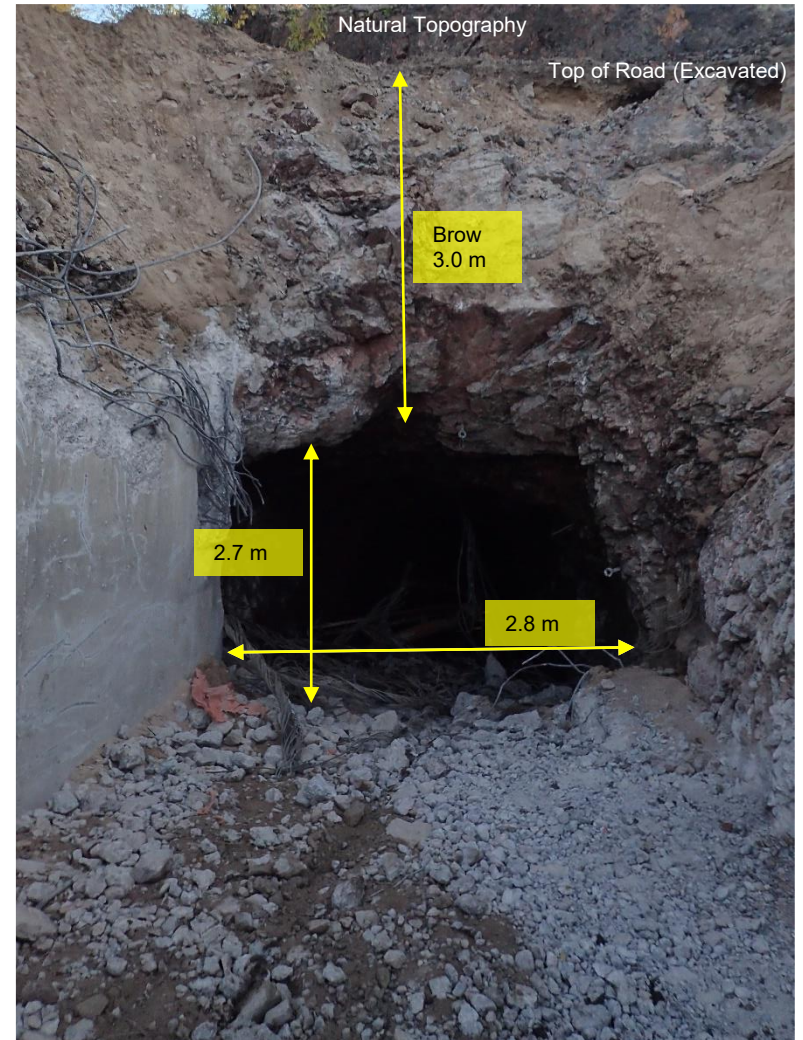


Photo 2: Overview of the CB-1 Mine Opening and Dimensions. Cables and conveyer belt visible within the opening.



CB-1 Mine Opening Remediation Project

Field Photographs

Job No: 1CC007.073
 Filename: BL_1CC007.073

Beaverlodge

Date: Nov 2021

Approved: ML/TP

Photo Page: **1**



Photo 8: Placement of sorted waste rock (competent rock passing approximately 200 mm).



Photo 9: Placement of sorted waste rock, tight against the back (competent rock passing approximately 200 mm).



Photo 10: Placement of sorted waste rock over the brow (competent rock passing approximately 200 mm).



Photo 11: Looking southwest - Placement of sorted waste rock to level (competent rock passing approximately 200 mm).



Photo 12: Looking southwest - Placement of waste rock (various sizes).



CB-1 Mine Opening Remediation Project

Field Photographs

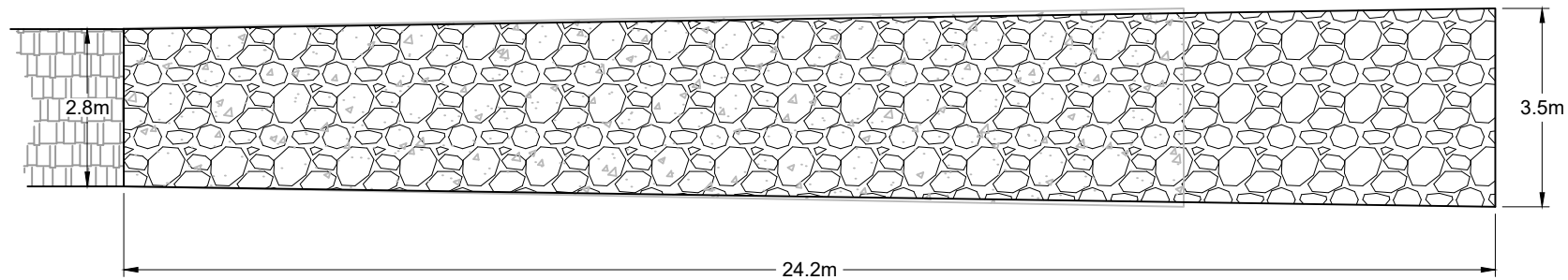
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Beaverlodge

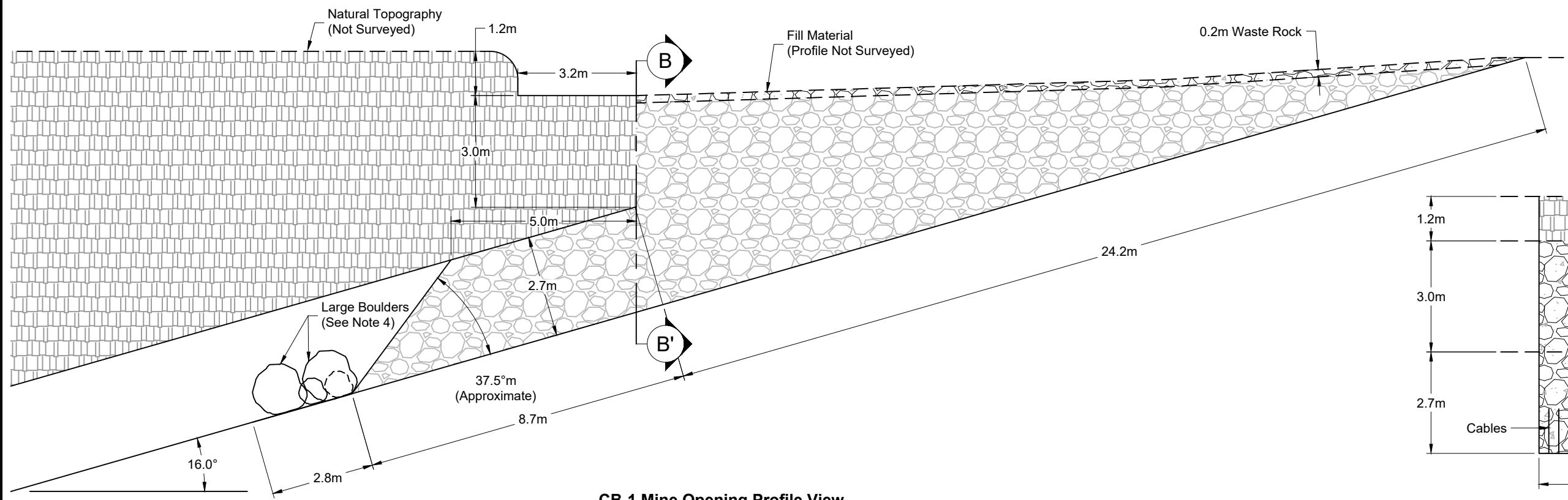
Date:
 Nov 2021

Approved:
 ML/TP

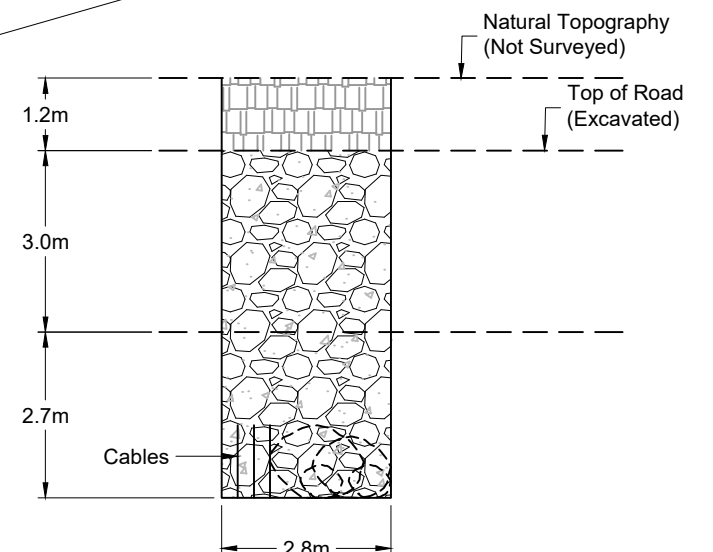
Photo Page: **3**



CB-1 Mine Opening Plan View



CB-1 Mine Opening Profile View



B CB-1 Mine Opening - Front View

LEGEND

- Approximate Measurements
- Rock
- Sorted Waste Rock (~200mm)
- Waste Rock (Various Sizes)

NOTES

1. Measurements were recorded along the mine opening area and the profile using a measuring tape and are approximate.
2. The surrounding areas were trimmed of loose rocks prior to any work being conducted.
3. Material and equipment (e.g., cables) was removed from the opening, where possible. However, not all cables could be removed and was left in the opening. The cables in no way impacts the integrity of this closure design.
4. The concrete sill and concrete culvert were removed. Solid rock was exposed at the mine opening:
 - Two large boulders (minimum 1.3m diameter) were placed along the width (2.8m) of the excavation at approximately 8.7m inside from the mine opening's entrance.
 - Two additional boulders (minimum 0.7 m diameter) were placed along the width (2.8m), on the right-hand side of the excavation at approximately 8.7m inside from the mine opening's entrance. Cables were present on the left-hand side (that could not be removed). The cables in no way impacts the integrity of this closure design.
5. The material used for backfill was located on site and consisted of sorted, competent waste rock passing approximately 200mm.
6. Material was placed inside the opening for approximately 8.7m back from the entrance, up to the boulder's location, and was packed tightly against the back.
7. The material was placed 3.0m above the mine opening to counter-act potential settling. The material used to backfill the mine opening was placed using machines only.
8. Sufficient material existed to fill up the whole excavated area outside of the mine opening.
9. A layer of waste rock of various sizes was placed on top of the sorted waste rock to conform with the natural topography.
10. The final placement of the sorted waste rock was inspected and approved by the SRK field engineer.

CLOSURE MATERIAL QUANTITIES FOR THE CB-1 MINE OPENING

Material	Units	Quantities
Large Boulders (minimum 0.7m diameter)	Each	2
Large Boulders (minimum 1.3m diameter)	Each	2
Sorted waste rock (competent rock passing approximately 200mm)	m ³	266
Waste Rock (various sizes)	m ³	56



srk consulting

SRK JOB NO.: 1CC007.073
FILE NAME: 1CC007.073 - CB-1 Mine Opening.dwg

Cameco

Beaverlodge

CB-1 Mine Opening

DRAWING TITLE:
As-built Drawing

DATE: November 2021
APPROVED: ML/TP
FIGURE: BL-01

APPENDIX F: BOLGER FLOW PATH RECONSTRUCTION

Memo

To:	Mike Webster, Remediation Coordinator Compliance & Licensing	Client:	Cameco Corporation
From:	Colin Boese, PEng Trevor Podaima, PEng	Project No:	1CC007.061
Reviewed By:	Maritz Rykaart, PEng		
Cc:	Shawn Hiller, Specialist, Compliance & Licensing	Date:	December 11, 2017
Subject:	Bolger Flow Path Reconstruction - 2017 Geotechnical Inspection		

1 Introduction

1.1 Background

Historically, the Bolger Waste Rock Pile (the Site) consisted of waste rock and overburden from the historic Bolger Pit and Verna Shaft (Figure 1). This pile occupied a narrow valley next to the pit, which overlaid the former location of both Down Lake and a small creek (Zora Creek). Zora Creek linked Zora Lake to Down Lake, which then drained into Verna Lake. Zora Creek flowed intermittently (low to no flows in winter) through the base of the waste rock pile. The waste rock pile also contained a build-up of ice that impeded flow of water through the pile, which increased the extent of contact between creek water and the waste rock.

In June 2014, the Bolger Flow Path Reconstruction (the Project) commenced, which in general consisted of excavating a channel through the Site to re-establish flow in Zora Creek and limit the waste rock in direct contact with Zora Creek and water previously stored within the pile (Figure 2). The reconstructed flow path was predicted to result in improved water quality in Zora Creek, which may lead to improved water quality in Verna Lake. The Project was carried out over three construction seasons and completed in late August 2016 (SRK 2017).

The as-built channel configuration consists of a top excavation width that varies across the top flanks between approximately 40 and 90 m, a minimum base width of 2 m and a total channel length of approximately 400 m. To achieve this geometry, a series of benches (approximately 5 m wide by 6 m high) were excavated with overall side slopes that varied between approximately 1.6 horizontal:1.0 vertical (H:V) to 3.7H:1V (average is approximately 2.5H:1V).

From Station 0+000 to Station 0+090 m, the bottom 0.5 to 1.0 m of the channel was sub-cut into overburden and lined with erosion protection material comprised of boulders with sand and gravel. From Station 0+090 to Station 0+260, this sub-cut was excavated through waste rock where a small portion of the historical Down Lake remains, which has ponded water that varies seasonally from approximately 0.5 m to 0.8 m in depth. From Station 0+260 to Station 0+275, the channel is founded in bedrock. From Station 0+275 to Station 0+313, the northern side slope

of the channel is in bedrock and the southern side slope is comprised of waste rock. From Station 0+260 to Station 0+313, the flow depth is 0.1 m and increases to approximately 0.17 m as the channel approaches the settling basin situated at the outlet of the channel at Station 0+313. The settling basin is founded in natural ground and is contained by bedrock outcrops. The ponding depth in the basin is approximately 0.85 m. Full details of the as constructed channel are provided in the As-Built Report (SRK 2017). The current configuration of the reconstructed channel is shown in Figures 2, 3 and 4.

1.2 Scope of Work

Cameco Corporation retained SRK Consulting (Canada) Inc. to carry out a geotechnical inspection of the Site in 2017. The inspection fulfills the recommendation to complete such an inspection in each of the first two years following construction (SRK 2014). The inspection frequency will be assessed as part of the 2018 geotechnical inspection and it is likely that the inspection frequency will be reduced.

This memo focuses on the geotechnical components of the inspection and concludes with recommendations for maintenance and future inspections. Maritz Rykaart, PhD, PEng, and Colin Boese, PEng with SRK, conducted the geotechnical inspection on September 29, 2017. The detailed site inspection was carried out on foot to visually inspect the various components of the reconstructed Zora Creek flow path. The weather conditions during the inspection were sunny and calm.

2 Inspection

2.1 General

The inspection was carried out in accordance with the Geotechnical Inspection Form and Check List prepared specifically for the Bolger Flow Path Reconstruction. The form and check list were developed as part of Cameco's response to the Canadian Nuclear Safety Commission (CNSC) comments regarding the Final As-Built Report for the Bolger Flow Path Reconstruction and provide a template that can be followed for future inspections. The inspection forms focus on the key design components of the reconstructed flow path, which include: access roads, channel side slopes, channel base, channel inlet and channel outlet. The checklist was developed for assessment of each of these design components, which includes: stability, vegetation, rip-rap, seepage, ponding, sediment accumulation, channel blockages, and channel flow. Completed inspection forms are included in Appendix A, which form the basis of this memorandum. The following should be read in conjunction with Figures 1 to 7, which include specific inspection photos. Photo locations are illustrated on Figure 3.

2.2 Access Roads

The front gate is locked restricting public vehicle access to the Site (Figure 2). On-site traffic controls included speed limit signage of 30 km/hr and road blockages reducing road width to promote decreased speeds prior to driving down towards the excavated channel.

Recommendations:

- No recommendations, as the access roads are in good condition.

2.3 Channel Inlet

A beaver dam and heavy vegetation were observed at the inlet of the channel restricting flow from Zora Lake into the channel (Photos 2 and 3, Figure 5). Based on discussions with Cameco, it is understood that the beaver dam was present well prior to channel excavation. The beaver dam has a stepped configuration that creates a cascading effect as the flow for Zora Lake migrates through the dam and into the channel. A portion of the flow is directed to the south, which then enters the channel as seepage through the south sidewall of the channel from approximately Station 0+015 to 0+030. The beaver dam and associated seeps do not impact the geotechnical stability of the channel. However, should there be a failure of the beaver dam, it is likely that scour of the channel will occur as well as sedimentation loading downstream. Such failure will not result in instability of the channel, but maintenance would likely be required.

Recommendations:

- At the time of the site visit, the channel was still flowing and at a rate of approximately 0.5 L/s, which was measured in the field. No maintenance is required at the channel inlet at this time. The channel inlet will be re-inspected as part of the 2018 geotechnical inspection, and if required, will include options for removing the blockages.

2.4 Channel Side Slope Crest

During the inspection, several small voids (typically 0.15 to 0.3 m) in the waste rock were observed, which reflects how the material was originally placed to form the Bolger Pile. Such voids make the site difficult to traverse but this does not impact the geotechnical stability or performance of the channel. The vegetation growth was none to very sparse on the slope crest. Overall the slope crest was in good condition and there are no geotechnical concerns. Current conditions of the slope crest are shown in Figure 4.

Recommendations:

- No maintenance required at this time.

2.5 Channel Side Slopes

As stated in the As-Built Report (SRK 2016), the lower portion of the channel slope from approximately Station 0+015 to Station 0+060 was steeper than the design slope of 1.5H:1V. This configuration was not deemed a geotechnical stability concern, which is discussed in the report; however, it was recommended to inspect this area as part of the geotechnical inspection. This area was inspected and there were no apparent changes since 2016.

There was no vegetation on the side slopes at the time of inspection. A high-water mark was observed and measured at approximately 0.25 m above the current water level. Iron staining was evident from approximately Station 0+240 and Station 0+285 along the bottom portion of the side slopes and base of the channel, which are founded in bedrock (Photo 7, Figure 5). This was discussed with Cameco and it is understood that the water quality data indicates that there is no evidence of acid rock drainage.

Recommendations:

- No maintenance required at this time.
- It is understood that Cameco will continue to monitor water quality within and downstream of the channel.

2.6 Channel Base

Overall, vegetation was observed to be sparse throughout the channel with the exception of the inlet from approximately Station 0+015 to Station 0+030 where it is moderate (Photo 4, Figure 5). At the time of inspection, this heavier vegetation growth was not restricting channel flow and is therefore not a concern related to channel performance.

Sediment accumulation was observed throughout most of the channel, which was more noticeable at two localized locations (Station 0+090 and Station 0+215) (Photo 5, Figure 5). Station 0+090 is where the channel transitions from overburden to waste rock and sedimentation was initially observed in 2016 subsequent to the placement of the erosion control material and may be attributed to washout of fine material (SRK 2017). The sediment was not impeding the flow of the channel and does not need to be removed. No apparent changes of this area were observed during the inspection and thus leaving the sediment in-place is not expected to impact channel performance. The channel base from Station 0+100 to 0+215 appeared to be in good condition (Photo 6, Figure 5).

Station 0+215 is immediately downstream of the channel crossing where channel flow appeared to be stagnant up until approximately Station 0+240 (Photo 8, Figure 6). This area was observed to have sediment that was approximately 1.5 m deep, which unlike Station 0+090 was easily resuspended when the surface is agitated. As identified in the as-built (SRK 2017), this is primarily lake bottom sediments as this portion of the channel was founded on the western extent of the historical Down Lake. Photos 9 and 10 on Figure 4 show before and after sediment resuspension, respectively. There are no geotechnical related concerns with the sediment; however, should it become resuspended due to scour, transportation of sediments downstream is likely to occur.

Recommendations:

- No immediate action is required; however, this may need to be reassessed if total suspended solids (TSS) is identified as a concern during Cameco's routine water quality monitoring of the channel. This location of the channel will be reassessed during the 2018 geotechnical inspection to determine what and if any maintenance actions are required.

2.7 Channel Outlet

The channel outlet was observed to have sparse vegetation and heavy sedimentation (Photo 11, Figure 6). At the time of the inspection, discharge was observed to be clear and flowing at a rate considered a trickle due to the low flow conditions in late September 2017.

Recommendations:

- No maintenance is required at this time; however, accumulated sediment should be reassessed as part of the 2018 geotechnical inspection.

2.8 Bolger Pit

The Bolger Pit, which was further backfilled with waste rock as part of the channel reconstruction was inspected and there were no geotechnical concerns (Photos 12 and 13, Figure 7).

Recommendations:

- No maintenance is required at this time.

3 Conclusions

The memo provides a geotechnical performance assessment of the reconstructed Zora Creek flow path. The findings are based on a walkover inspection on September 29, 2017. This is the first inspection completed by SRK since the completion of the channel reconstruction in 2016. There are no immediate or significant areas of concern with regards to the performance or geotechnical stability of the reconstructed flow path based on the 2017 physical inspection. However, subject to routine water quality monitoring, future maintenance may be required due to sediment accumulation in the channel, particularly at Station 0+215. This will be reassessed as part of the 2018 geotechnical inspection.

Prepared by: SRK Consulting (Canada) Inc.

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Colin Boese, PEng
Consultant

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Trevor Podaima, PEng
Senior Consultant

Reviewed by:

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Maritz Rykaart, PhD. PEng
Principal Consultant

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The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

4 References

SRK Consulting (Canada) Inc. (SRK 2014). Beaverlodge – Design Report for the Flow Path Reconstruction at the Bolger Waste Rock Pile. SRK Project Number 1CC007.044. Report prepared for Cameco Corporation, February 2014.

SRK Consulting (Canada) Inc., 2017. Bolger Flow Path Reconstruction 2016 Final As-Built Report. SRK Project Number 1CC007.062. Report prepared for Cameco Corporation, February 2017.

Figures

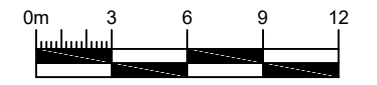


LEGEND

- Historical Flow Path
- Waste Rock Extents

NOTES

1. Inferred historical flow path prior to channel excavation.



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srk consulting

SRK JOB NO.: 1CC007.061
 FILE NAME: 1CC007.061 - PreExisting Conditions.dwg

Cameco

Bolger Flow Path Reconstruction

2017 Geotechnical Inspection		
Conditions Prior to Flow Path Reconstruction		
DATE: December 2017	APPROVED: -	FIGURE: 1

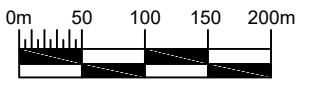


NOTES

- 1. Channel as-built configuration September 2016.

REFERENCE

NAD83 UTM Zone 12.
Imagery collaboration 2012 - 2016, and SRK Drone Imagery 2016.



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srk consulting

SRK JOB NO.: 1CC007.061
FILE NAME: 1CC007.061 - Site.dwg

Cameco

Beaverlodge

2017 Geotechnical Inspection		
Bolger Site Overview Subsequent Flow Path Reconstruction		
DATE: 2017/12/05	APPROVED: TPP	FIGURE: 2



645600 E

645700 E

645800 E

645900 E

646000 E

Verna Lake

6606300 N

6606200 N

Zora Lake

6606100 N

Access Road

Upper Lake

Historical Access Road

LEGEND

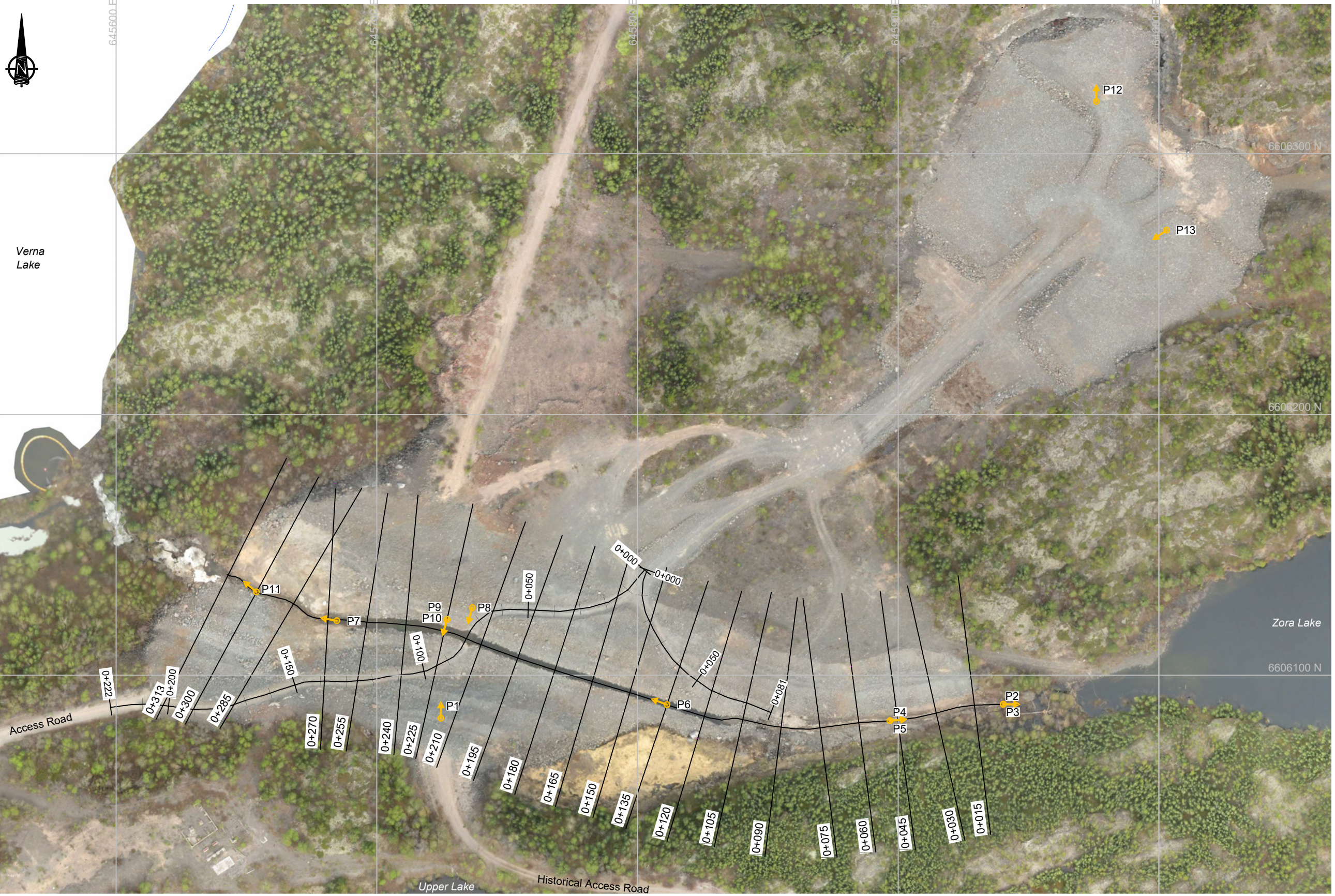
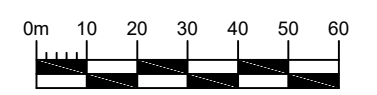
Photo Direction and Location

NOTES

1. All dimensions are in meters unless noted otherwise.

REFERENCE

NAD83 UTM Zone 12.
 Imagery from Saskatchewan Geospatial Imagery collaboration 2012-2016, and SRK Drone Imagery 2016.



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srk consulting

Job No.: 1CC007.061
 Filename: 1CC007.061 - GA.dwg

Cameco

Bolger Flow Path Reconstruction

2017 Geotechnical Inspection		
As-built Plan View with Channel Section Stations		
Date: December 2017	Approved: CDB	Figure: 3



Photo 1: Looking North at Bolger Flow Path Reconstruction



		2017 Geotechnical Inspection		
		Site Inspection Photos		
Job No: 1CC007.061 Filename: Bolger Flow Path Inspection Photos.pptx	Bolger Flow Path Reconstruction	Date: November 2017	Approved: CDB	Figure: 4



Photo 2: Looking East at Beaver Dam in Channel Inlet



Photo 3: Looking East at Vegetation/Ponding along the south flank of Channel Inlet



Photo 4: Looking West at Channel Base from Station 0+015 to Station 0+030



Photo 5: Looking East at Vegetation Growth in Channel Base at approximately Station 0+100



Photo 6: Looking West along channel base from approximately Station 0+135



Photo 7: Looking West along channel base from approximately Station 0+270



		2017 Geotechnical Inspection		
		Site Inspection Photos		
Job No: 1CC007.061 Filename: Bolger Flow Path Inspection Photos.pptx	Bolger Flow Path Reconstruction	Date: November 2017	Approved: CDB	Figure: 5



Photo 8: Looking South and downstream of Channel Crossing



Photo 9: Looking South at Channel Base Sedimentation (Station 0+215)



Photo 10: Looking South at Channel Base Sedimentation after resuspension (Station 0+215)



Photo 11: Looking West at Channel Outlet



		2017 Geotechnical Inspection		
		Site Inspection Photos		
Job No: 1CC007.061 Filename: Bolger Flow Path Inspection Photos.pptx	Bolger Flow Path Reconstruction	Date: November 2017	Approved: CDB	Figure: 6



Photo 12: Looking at Northeast flank of Bolger Pit



Photo 13: Looking Southwest from Northeast flank of Bolger Pit

		2017 Geotechnical Inspection		
		Site Inspection Photos		
Job No: 1CC007.061 Filename: Bolger Flow Path Inspection Photos.pptx	Bolger Flow Path Reconstruction	Date: November 2017	Approved: CDB	Figure: 7

Appendix A: Inspection Forms

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 2 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL SIDE SLOPES

A) Stability

Photographs: None

- | | | | |
|----------------|------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| scour at base | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| cracking | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| slumping | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| rilling | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| bulging | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| sloughing | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| erosion | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| animal burrows | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| other | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | North slope at east end of channel was a previously identified area that was observed to be over-steepened at toe. Area was inspected in 2017 and there were no apparent changes. |

B) Vegetation

Photographs: N/A

- | | | |
|----------|-------------------------------------|------------------------------------------------------|
| none | <input checked="" type="checkbox"/> | <u>No vegetation observed on channel side slopes</u> |
| sparse | <input type="checkbox"/> | |
| moderate | <input type="checkbox"/> | |
| heavy | <input type="checkbox"/> | |

C) Rip-rap

Photographs: Channel base and high water mark (Photos 4 and 5)

- | | | | |
|-------------------------|------------------------------------------|-------------------------------------|--------------------------------------------------------------|
| erosion/movement | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| dis-coloration | <input checked="" type="checkbox"/> none | <input type="checkbox"/> | |
| high water mark visible | <input type="checkbox"/> none | <input checked="" type="checkbox"/> | High water mark measured at 0.25 m above current water level |
| adequate armor | <input checked="" type="checkbox"/> yes | <input type="checkbox"/> | |
| other | <input type="checkbox"/> yes | <input type="checkbox"/> | |

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 3 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL SIDE SLOPES (Continued)

E) Seepage

Photographs: N/A

Seepage none Location 1 Station 0+015 to Station 0+030 along south slope

Rate: damp trickle steady ____ (L/s)

Clarity: clear muddy _____

Sample taken: yes no

Photographs: None

Location 2 _____

Rate: damp trickle steady ____ (L/s)

Clarity: clear muddy _____

Sample taken: yes no

Additional Comments:

Do any inspection items require corrective action? If yes, what is the degree of severity? Is immediate action required or monitor?

- No corrective action is required.

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 4 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL BASE

A) Rip-rap

Photographs: Sedimentation in Rip Rap at Station 0+090 (Photo 6)

erosion/movement none _____
dis-coloration none _____
Adequate armor Yes _____

other Sedimentation observed at Station 0+090

B) Ponding

Photographs: N/A

Positive drainage No Location 1 _____

Clarity: clear muddy _____

Sample taken: yes no

Photographs: _____

Location 2 _____

Clarity: clear muddy _____

Sample taken: yes no

C) Sediment Accumulation

Photographs: Downstream sedimentation accumulation (Photos 7 and 8)

Present none Location 1 Heavy sediment accumulation west of channel road crossing (Station 0+215).
Sediments are primarily lake bottom sediments as this portion of the channel was
founded on the western extent of the historical Down Lake

Sample taken: yes no

Photographs: _____

Location 2 _____

Sample taken: yes no

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 5 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL BASE (Continued)

D) Vegetation

Photographs: Upstream Vegetation (Photo 6)

- none
- sparse
- moderate
- heavy

Sparse vegetation and moss were observed along the channel base. Upstream Vegetation observed.

E) Blockage

Photographs: Sedimentation build up (Photos 6, 7, 8, 9 and 10)

- none
- debris
- beaver dam
- siltation
- vegetation

Minor blockage at select rip rap location near Station 0+090 and Station 0+145. No current issues with channel flow. Area should be monitored during future inspections for additional build up of debris or vegetation that restricts flow of water

Becomes stagnant at Station 0+215, heavy siltation on west side of road crossing

Correction action: taken
 to follow

Priority Rating (Immediate Action or Monitor): _____

Additional Comments:

Do any inspection items require corrective action? If yes, what is the degree of severity? Is immediate action required or monitor?

- Sedimentation is quite thick and extremely fluffy. During the inspection a rock was dropped into the sediment causing sediment to form a thick cloud and become suspended.
- Vegetation is currently not a concern.
- No corrective action is required.
- Vegetation and sedimentation accumulation should be re-inspected in 2018 to determine if maintenance is required.

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL INLET

A) Blockage

Photographs: Beaver Dam, Vegetation and Ponding (Photos 11 and 12)

- none
- debris
- beaver dam
- siltation
- ice

Heavy debris and vegetation is observed and restricting flow at the channel inlet.

A beaver dam is creating a blockage and restricting flow at the channel inlet.

Correction action: taken
 to follow

Priority Rating (Immediate Action or Monitor): _____

B) Erosion

Photographs: N/A

- erosion/movement of rip rap none

C) Vegetation

Photographs: Vegetation and Ponding (Photos 11 and 12)

- none
- sparse
- moderate
- heavy

Heavy vegetation is restricting flow at the channel inlet. Water level from the lake to the inlet was observed to be ponding and stepping down in water level as it migrates through the blockages to the channel base.

D) Flow

Photographs: N/A

In-flow none Rate: damp trickle steady 0.5 (L/s)

Clarity: clear muddy _____

Sample taken: yes no

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 7 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL INLET (Continued)

Additional Comments:

Do any inspection items require corrective action? If yes, what is the degree of severity? Is immediate action required or monitor?

- Water is continuing to migrate through the beaver dam and heavy vegetation.
- Inlet conditions should be re-inspected in 2018 to check that water continues to flow.
- No corrective action is required.

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 8 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL OUTLET

A) Blockage

Photographs: Sedimentation at outlet (Photos 13 and 14)

- none
- debris
- beaver dam
- siltation
- ice

Moderate siltation observed at channel outlet.

Correction action: taken
 to follow

Priority Rating (Immediate Action or Monitor): _____

B) Erosion

Photographs: N/A

- erosion/movement of rip rap none

C) Vegetation

Photographs: N/A

- none
- sparse
- moderate
- heavy

D) Flow

Photographs: V-Notch Weir

- Discharge none Rate: damp trickle steady _____ (L/s)
- Clarity: clear muddy _____
- Sample taken: yes no

**FIELD INSPECTION FORM
CHANNEL INSPECTION
BOLGER FLOW PATH RECONSTRUCTION**

Sheet 9 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

CHANNEL OUTLET (Continued)

Additional Comments:

Do any inspection items require corrective action? If yes, what is the degree of severity? Is immediate action required or monitor?

- Flow depth at V-Notch Weir was 50 mm at time of inspection.
- No immediate concerns with the channel outlet.
- No corrective action required.

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 10 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

PHOTOS – Access Roads

1



2



Comments:

Photos:

1. Road blockage using large boulders
2. Speed limit signage

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 11 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

PHOTOS – Channel Side Slope Crest

3



Comments:

Photo:

3. Typical void observed on Crest

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 12 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017
(DD/MM/YR)

PHOTOS – Channel Side Slopes

4



5



Comments:

Photos:

- 4. Channel side slopes along base of channel
- 5. High Water Mark

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 13 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

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PHOTOS – Channel Base

6



Comments:

Photos:
6. Upstream vegetation and sedimentation at Station 0+090 looking east

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 15 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

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PHOTOS – Channel Base

7



8



Comments:

Photos:

7. Downstream sedimentation at Station 0+215
8. Sedimentation extends towards downstream exposed bedrock

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 14 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/09/2017

(DD/MM/YR)

PHOTOS – Channel Base

9



10



Comments:

Photos:

- 9. Upstream channel base with partial riprap blockage due to sediment build up (Station 0+145)
- 10. Downstream channel base (Station 0+150 to 0+210), no concerns

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 16 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

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PHOTOS – Channel Inlet

11



12



Comments:

- Photos:
11. Inlet Beaver Dam
12. Inlet Vegetation and Ponding

**FIELD INSPECTION FORM
CHANNEL INSPECTION BOLGER
FLOW PATH RECONSTRUCTION**

Sheet 17 of 17

Inspector: MER/CDB

Inspector's Employer: SRK

Inspection Date: 29/092017

(DD/MM/YR)

PHOTOS – Channel Outlet

13



14



Comments:

- Photos:
13. Outlet Sedimentation
14. Fow at V-Notch Weir