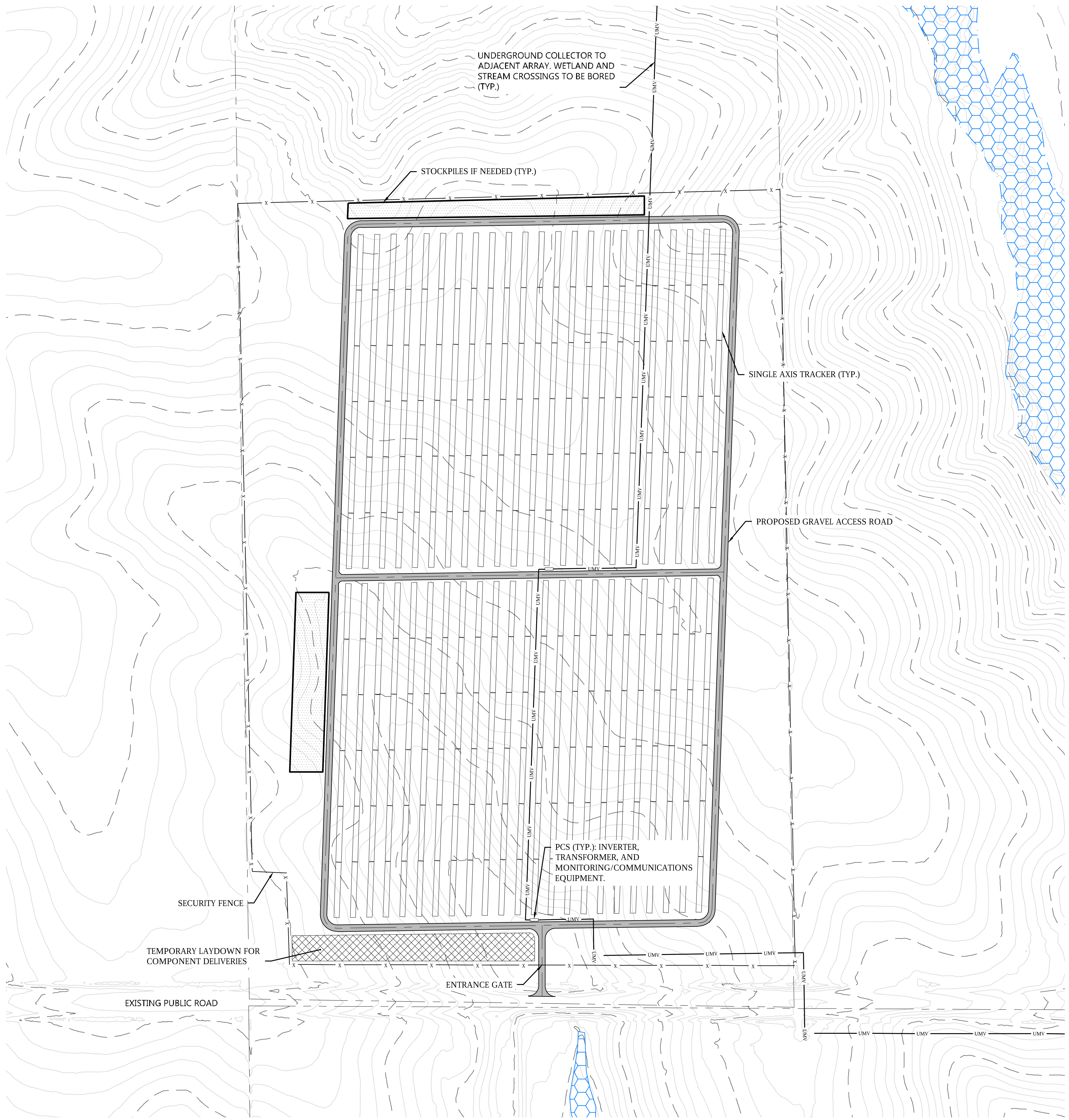
Appendix D

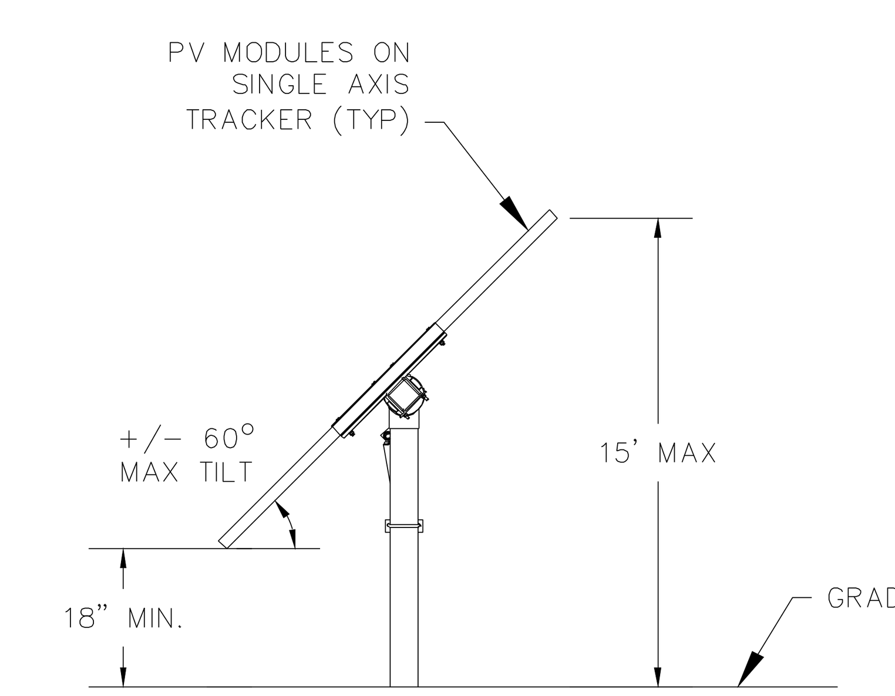
Typical Construction Details



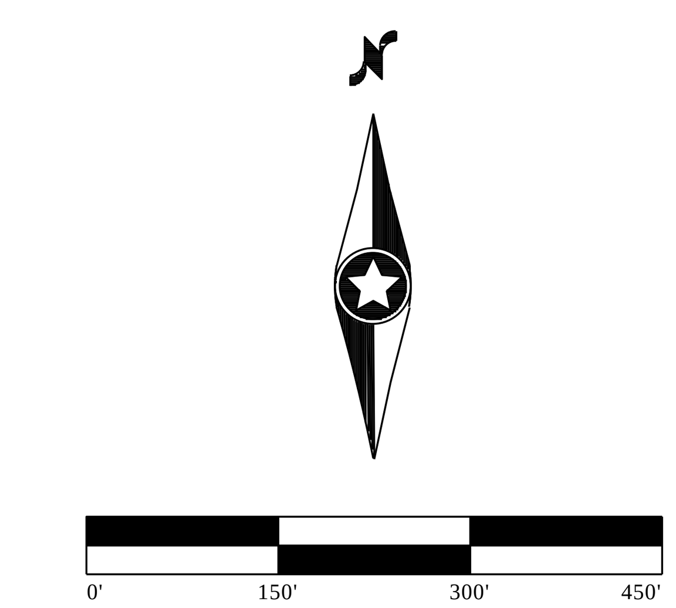
1 Typical Solar Array Plan View

LEGEND:

- PROPOSED SOLAR ARRAY
- PROPOSED ACCESS ROAD
- PROPOSED SECURITY FENCE
- UNDERGROUND COLLECTION
- EXISTING PROPERTY LINE
- EX. INDEX CONTOUR
- EX. INTERVAL CONTOUR
- EX. STREAM CHANNEL
- EX. WETLAND
- EX. WETLAND
- EX. WETLAND



2 Typical Single Axis Tracker
NTS



Westwood
Phone (608) 821-6600 1800 Deming Way, Suite 102 Middleton, WI 53562 westwoodps.com
Westwood Professional Services, Inc.

PREPARED FOR:

Invenergy
One South Wacker Drive, Suite 1900
Chicago, IL 60606

REVISIONS:

#	DATE	COMMENT
A	05/15/20	Engineering Exhibits

Darien Solar Project

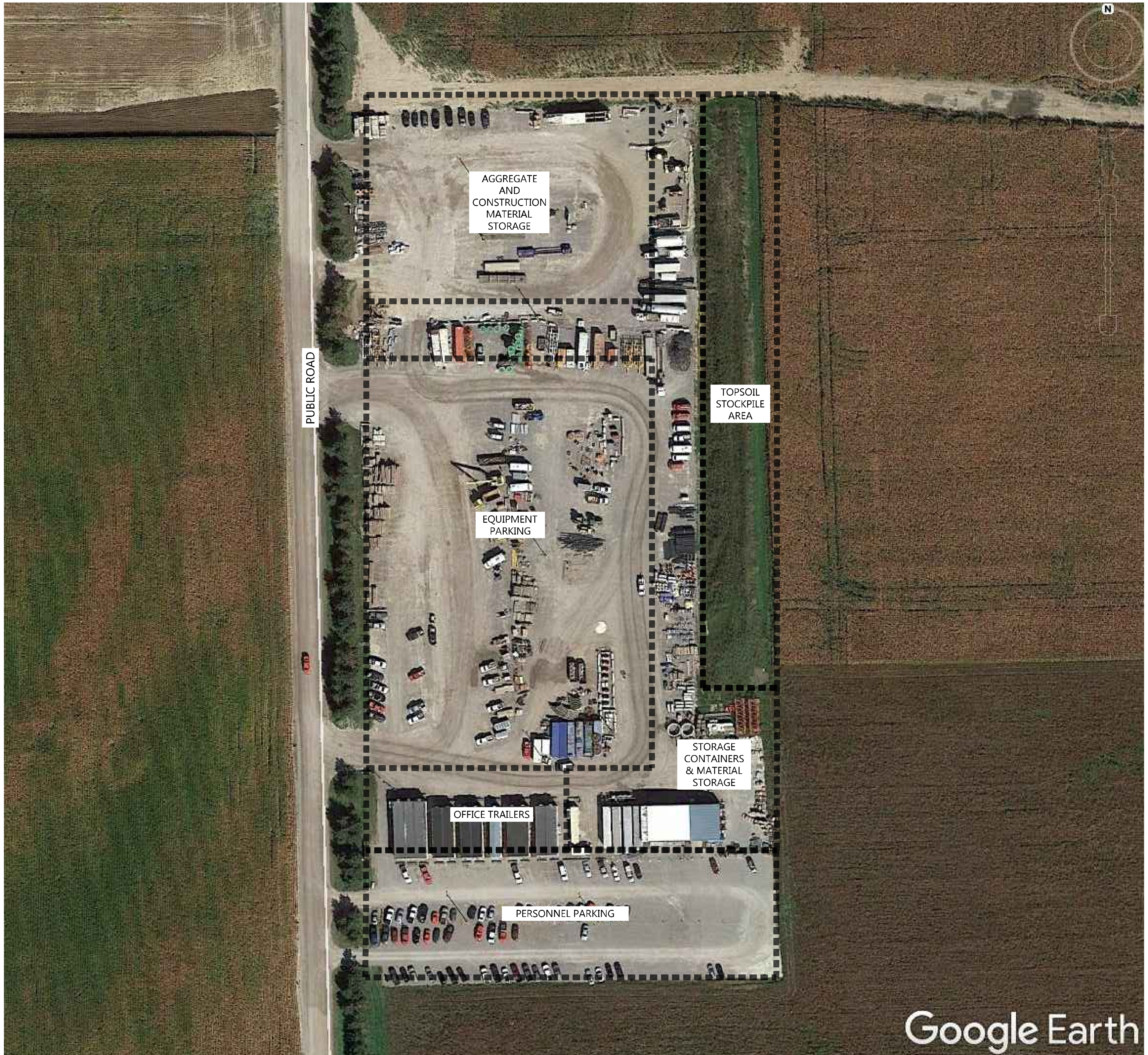
Walworth and Rock Counties, Wisconsin

Typical Solar Array Area Construction Layout

PRELIMINARY
NOT FOR CONSTRUCTION

DATE: 05/15/2020

© 2020 Westwood Professional Services, Inc.
State Hwy 11
State Hwy 89
US Hwy 14
Rock County
Walworth County
BRADFORD TOWNSHIP
DARIEN TOWNSHIP
DELAVAN TOWNSHIP
W Walworth Ave
Delavan
Darien
N Walworth St
Chicago Madison Rd
S Walworth St
State Hwy 14
Legend
Project Boundary
City/Village/Town Boundary
Township Boundary
County Boundary
Primary Access Road
Alternate Access Road
Primary Underground Collection Line
Alternate Underground Collection Line
Gen-Tie Line
Primary Inverter Pad
Alternate Inverter Pad
O&M Building
Point Of Interconnect
Substation
Primary Solar Array Panels
Alternate Solar Array Panels
Battery Energy Storage System
Laydown Yard
Major Road
Power Block ID
4.2MW Power Block
Array Fence ID
Array Fence
Feet
0
1,500
N
Data Source(s): Map has been compiled from a variety of sources and subject to change; Westwood (2020), Wisconsin NAIP Imagery (2018); ESRI WMS National Geographic & World Streets Basemaps (Accessed 2020); Census Bureau (2019); Wisconsin State Cartographer's Office (2018).
Westwood
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.
Darien Solar Energy Center
Rock & Walworth Counties, Wisconsin
Typical Power Block Configuration
4.2MW Power Block Example
Appendix D



Westwood

Phone (608) 821-6600 1800 Deming Way, Suite 102
Middleton, WI 53562
westwoodps.com

Westwood Professional Services, Inc.

PREPARED FOR:

Invenergy

One South Wacker Drive, Suite 1900
Chicago, IL 60606

REVISIONS:

#	DATE	COMMENT
A	05/15/20	Engineering Exhibits

0' 150' 300' 450'

Darien Solar Project

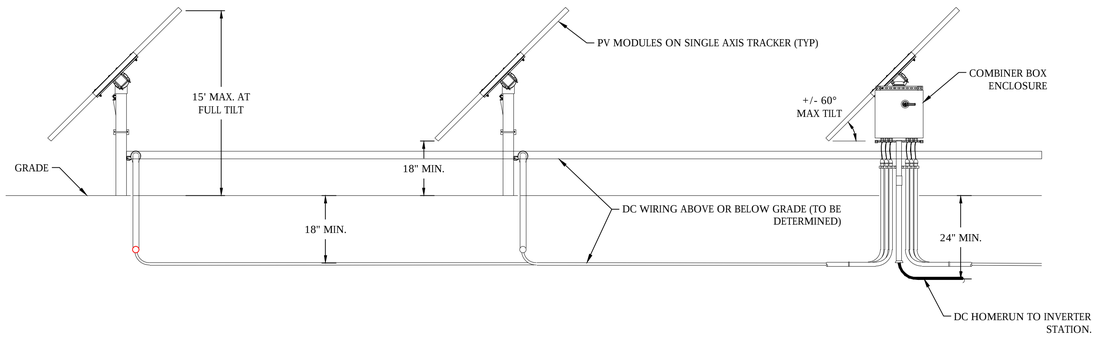
Walworth and Rock Counties, Wisconsin

Typical Laydown Yard Construction Layout

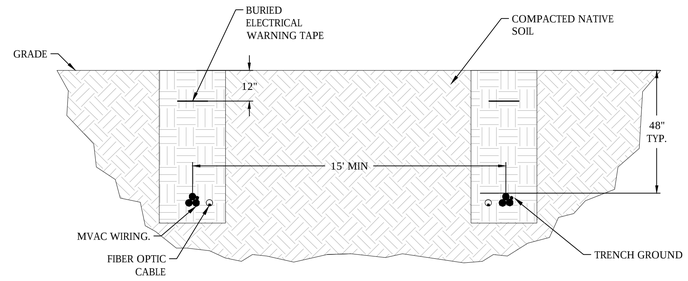
PRELIMINARY
NOT FOR CONSTRUCTION

DATE: 05/15/2020

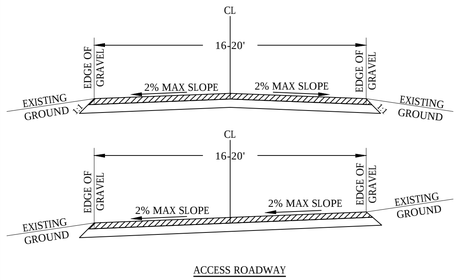
2



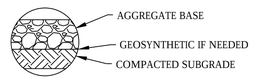
1 Typical Single Access Tracker and DC Wiring
NTS



2 Typical MV and Fiber Optic Trench (Parallel Circuits)
NTS



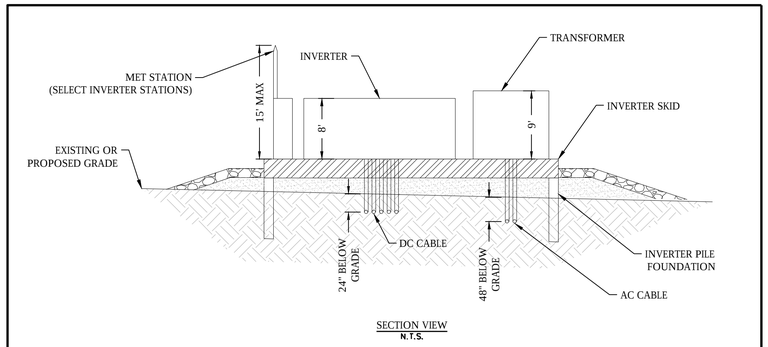
ACCESS ROADWAY



ACCESS ROAD CROSS SECTION

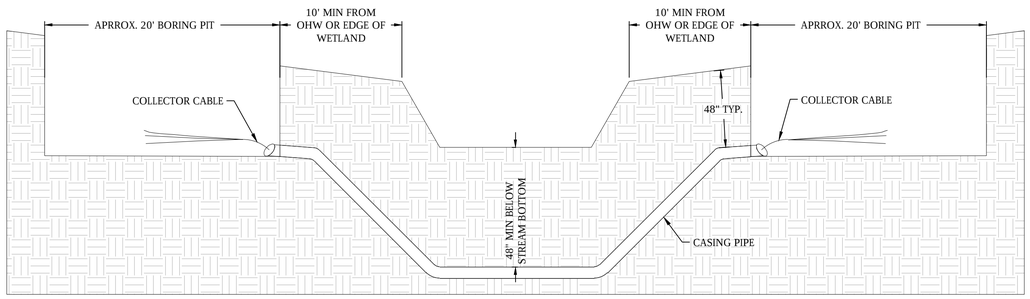
NOTES:
1. CONTRACTOR SHALL CONSTRUCT CROSS-SLOPE ROAD SECTION WHERE ACCESS ROADS ARE CONSTRUCTED ON A SIDE SLOPE TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL DRAINED AT ALL TIMES.
2. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE ACROSS ACCESS ROADS

Westwood | TYPICAL SOLAR ACCESS ROAD



SECTION VIEW
N.T.S.

Westwood | TYPICAL INVERTER SKID



Westwood | TYPICAL UNDERGROUND COLLECTOR BORING (NOT TO SCALE) | LAST REVISED: 05/11/18 | DR01

Westwood

Phone (608) 821-6600
1800 Deming Way, Suite 102
Middleton, WI 53562
westwoodps.com

Westwood Professional Services, Inc.

PREPARED FOR:

Invenergy

One South Wacker Drive, Suite 1900
Chicago, IL 60606

REVISIONS:

#	DATE	COMMENT
A	05/15/20	Engineering Exhibits

Darien Solar Project

Walworth and Rock Counties, Wisconsin

Typical Construction Details

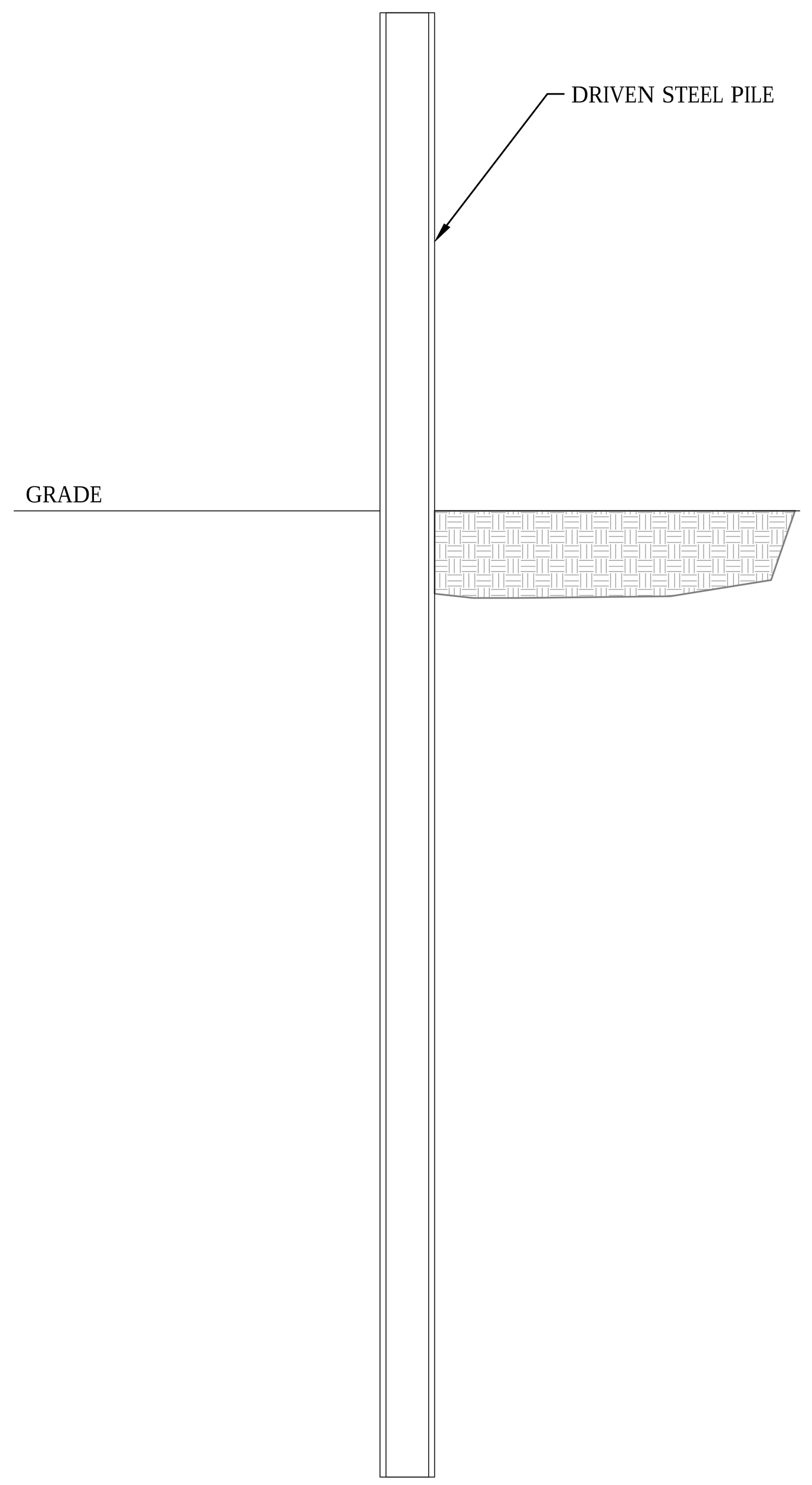
PRELIMINARY
NOT FOR CONSTRUCTION

DATE: 05/15/2020

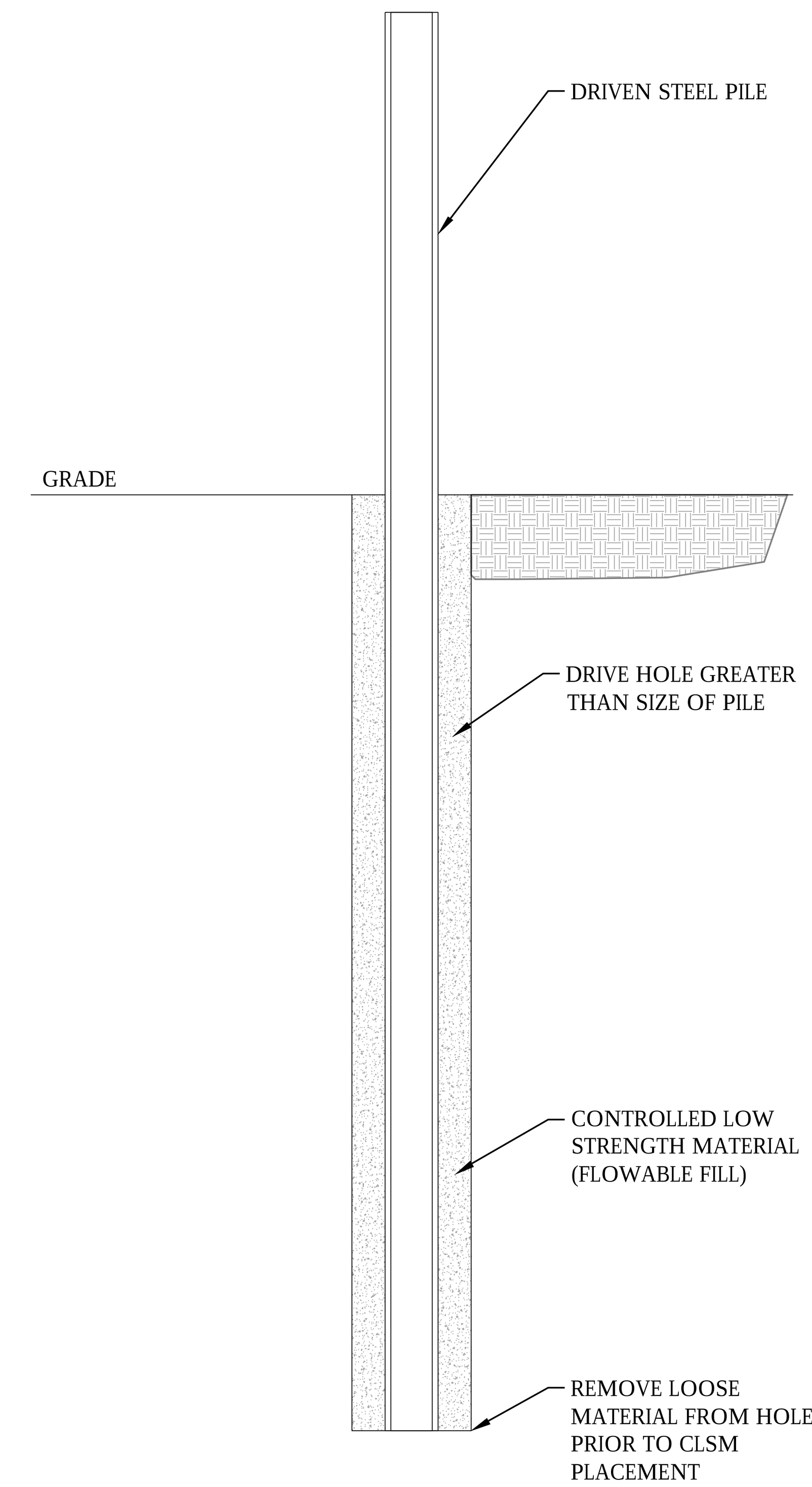
3

GENERAL NOTES:

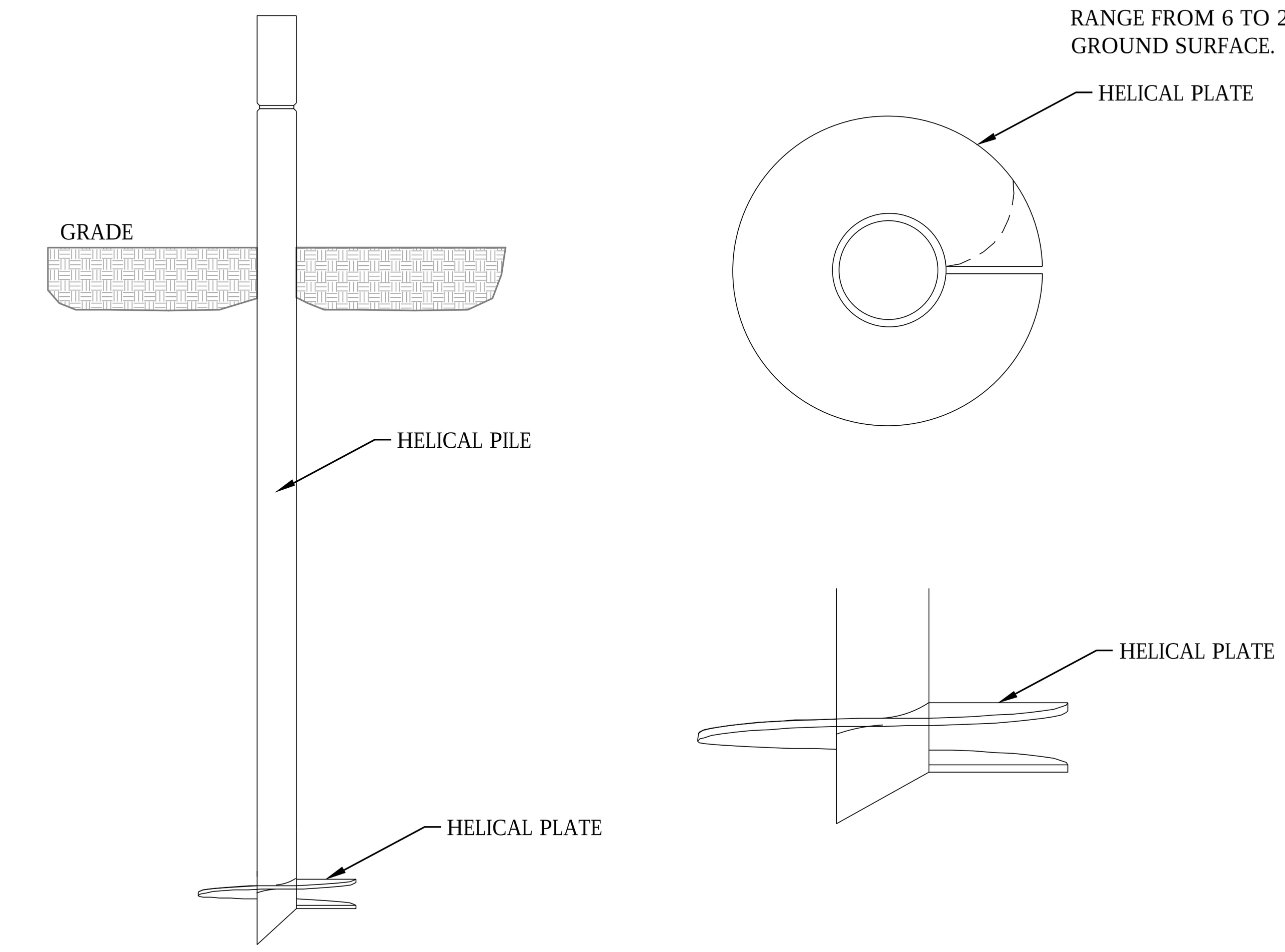
1. ALL DIMENSIONS AND SPECIFICATIONS SHALL BE DETERMINED DURING DESIGN.
2. TYPICAL TRACKER FOUNDATION CROSS SECTION DEPTHS RANGE FROM 6 TO 12 INCHES.
3. TYPICAL TRACKER FOUNDATION LENGTHS RANGE FROM 6 TO 20 FEET BELOW GROUND SURFACE.



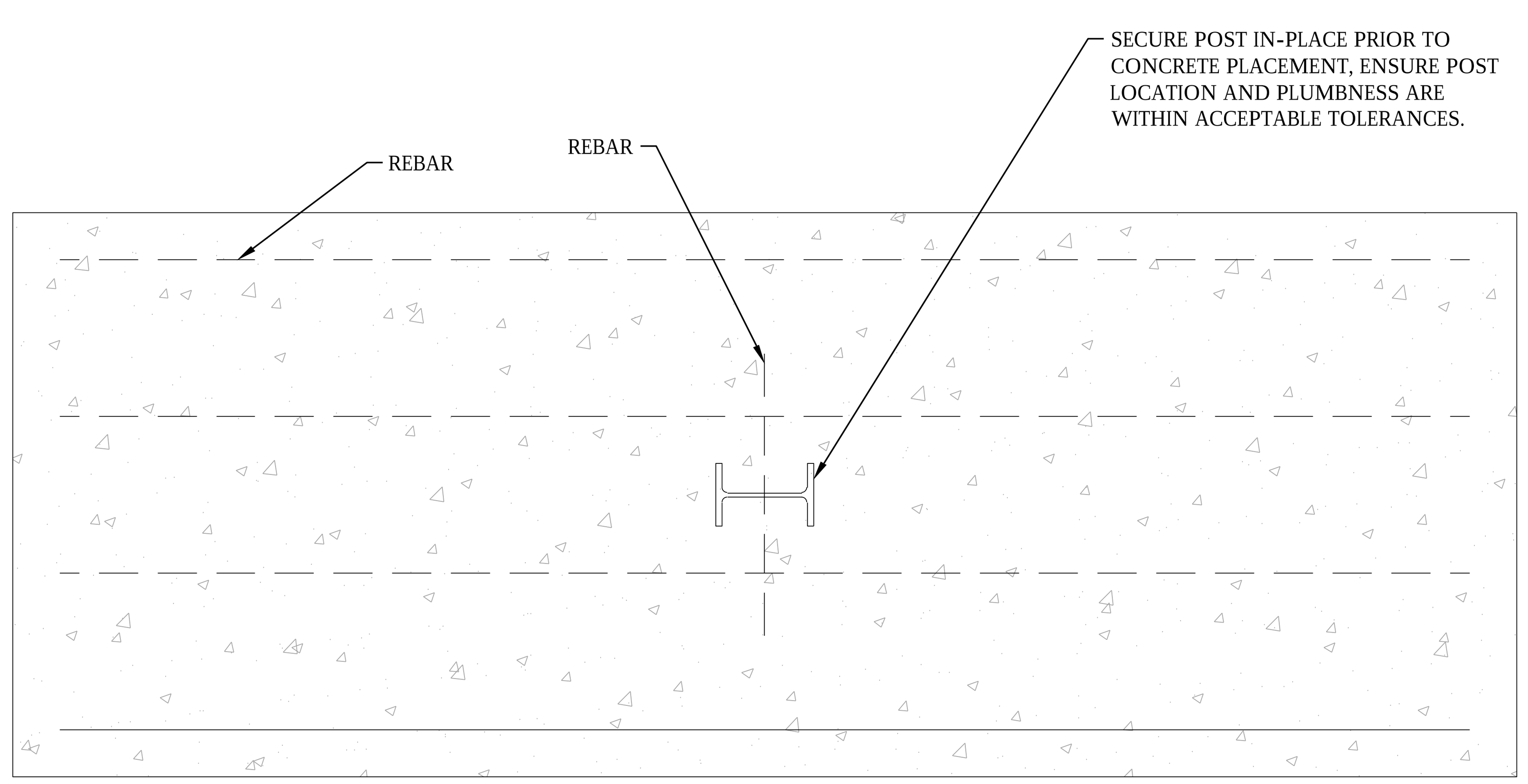
1 Driven Pile Cross Section
NTS



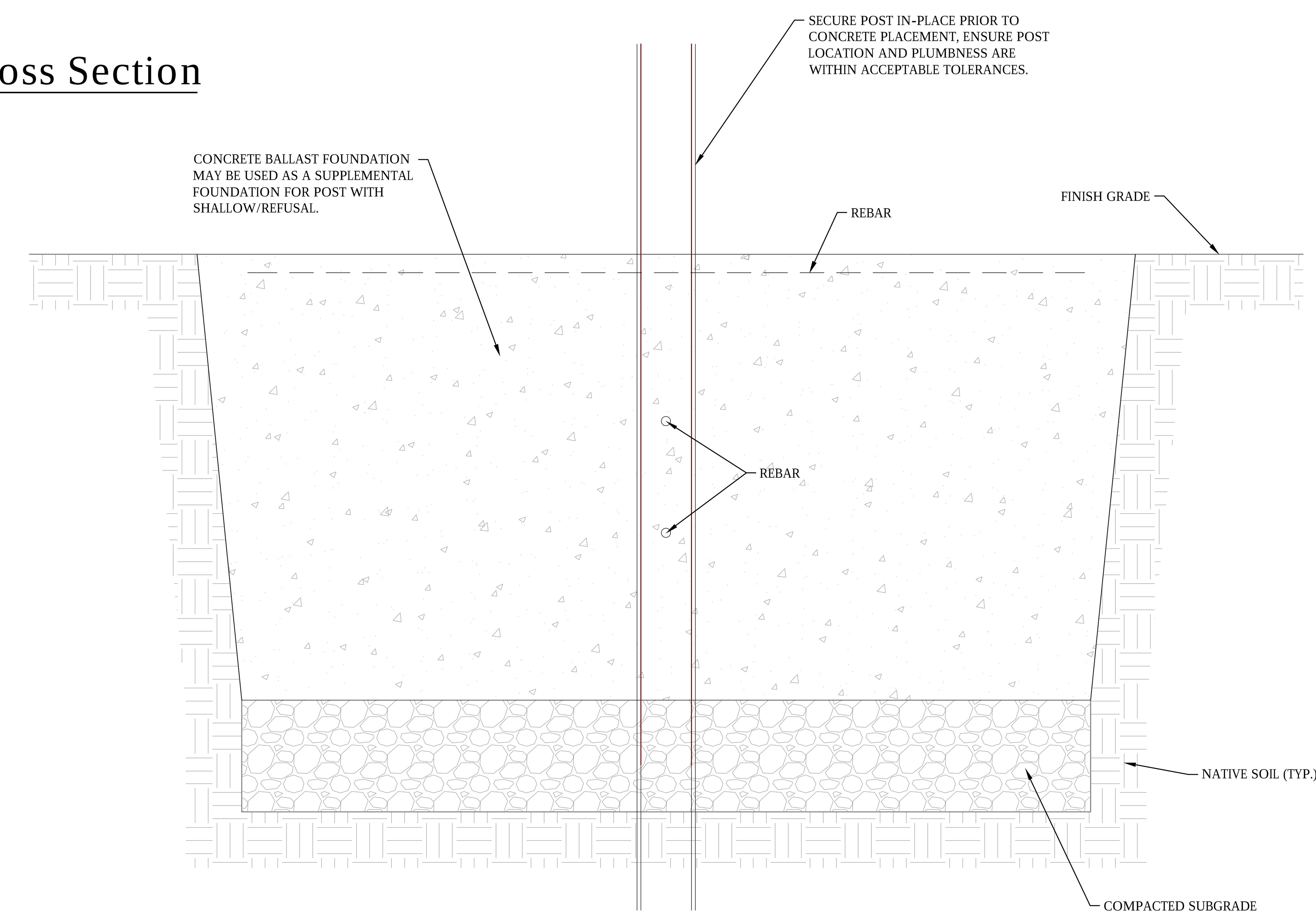
2 Cast-In-Place Cross Section
NTS



3 Helical Pile and Plate Detail
NTS



4 Pile Refusal - Plan View
NTS



5 Pile Refusal - Section View
NTS

Westwood

Phone (608) 821-6600 1800 Deming Way, Suite 102
Middleton, WI 53562
westwoodps.com

Westwood Professional Services, Inc.

PREPARED FOR:

Invenergy

One South Wacker Drive, Suite 1900
Chicago, IL 60606

REVISIONS:

#	DATE	COMMENT
A	05/15/20	Engineering Exhibits

Darien Solar Project

Walworth and Rock Counties, Wisconsin

Typical Construction Details

PRELIMINARY
NOT FOR CONSTRUCTION

DATE: 05/15/2020

Standard Frac-out Plan for Horizontal Directional Drilling

This frac-out plan describes standard measures for underground collector line crossings of sensitive areas, such as wetlands and water bodies using Horizontal Directional Drilling (HDD). HDD is less intrusive than traditional open-cut trenching by avoiding soil disturbance in sensitive areas.

Frac-out, or inadvertent return of drilling lubricant, is a potential concern when the HDD is used under sensitive habitats, waterways, and areas of concern for cultural resources. The HDD procedure uses bentonite slurry, a fine clay material as a drilling lubricant or a similar inert material. The bentonite is non-toxic and commonly used in farming practices, but benthic invertebrates, aquatic plants and fish and their eggs can be smothered by the fine particles if bentonite were discharged to waterways.

The purpose of a Contingency Plan or "Frac-out" plan is to:

- Minimize the potential for a frac-out associated with horizontal directional drilling activities;
- Provide for the timely detection of frac-outs;
- Protect areas that are considered environmentally sensitive (streams, wetlands, other biological resources, cultural resources);
- Ensure an organized, timely, and "minimum-impact" response in the event a frac-out and release of drilling mud occur; minimum-impact methods would be non-mechanized methods to the extent practicable;
- Ensure that all appropriate notifications are made to the site personnel and the appropriate regulatory agencies in 24 hours and that documentation is completed.

The "Frac-out" plan is prepared by the drilling contractor, to ensure that preventive and responsive measures can be implemented by the contractor. To minimize the potential for a frac-out, the Contingency Plan includes:

- Design protocols to be implemented for the protection of sensitive cultural and biological resources;
- Design protocols to require a geotechnical engineer or qualified geologist to make recommendations regarding the suitability of the formations to be bored to minimize the potential for frac-out conditions;

Prior to construction, sensitive cultural and biological resources will be protected by implementing the following measures:

- Where present, sensitive cultural and biological resources will be flagged for avoidance or construction limits will be clearly marked

• Barriers (straw bales or sedimentation fences) will be erected between the bore site and nearby sensitive resources prior to drilling, as appropriate, to prevent released material from reaching the resource.

• On-site briefings will be conducted for the workers to identify and locate sensitive resources at the site to ensure that all field personnel understand their responsibility for timely reporting of frac-outs including:

- Maintaining necessary response equipment on-site or at a readily accessible location and in good working order
- Disallowing fill into waters of the United States unless proper permits have been obtained
- Implement any mitigation measures specified by US Army Corps of Engineers and State and Local Agencies.

To further reduce the potential impacts of a frac-out, the drilling entry and exit areas will be clearly marked, surrounded by construction fencing and silt fencing to minimize the potential for off-site migration of drilling mud. Access and egress locations will be designated and clearly marked.

To minimize the potential extent of impacts from a frac-out, all HDD will be attended by a experienced operator to look for observable "frac-out" conditions or lowered pressure readings on the drilling equipment. Early detection is key to minimizing the area of potential impact.

Contingency Response

Once a frac-out is identified:

All work stops, including the recycling of drilling mud/lubricant, unless it is observed that that material Is no longer leaking out and under these conditions work may continue if in a non sensitive habitat and leaking stops or is controllable with a vacuum truck or immediate response methods identified below. The pressure of water above the pipe in aquatic habitats keeps excess mud from escaping through the fracture.

• Drilling may continue in sensitive areas during cleanup activities if the release is determined to be under control and in accordance with agency approval.

•Determine the location and extent of the frac-out.

If the frac-out is terrestrial:

• Isolate the area with hay bales, sand bags, or silt fencing to surround and contain the drilling mud.

• Consult with appropriate federal or state agency and property owner representative regarding next appropriate action among the following:

- A mobile vacuum truck will be used to pump the drilling mud from the contained area and recycled to the return pit.

- The drilling mud will be left in place to avoid potential damage from vehicles entering the area.

- Once excess drilling mud is removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation.

- Revegetated areas will be monitored twice per year for two years subsequent to frac-out to confirm revegetation is successful.

If the frac-out is in an aquatic (i.e., underwater) habitat:

•Erect isolation/containment environment (underwater and standard containment booms or underwater curtains will be implemented immediately pending existing water flow conditions.

• Agencies (USACOE and WDNR) will be consulted within 4 hrs of the incident identification. Consultation will occur with agencies and property owner representative (as determined necessary) regarding appropriate action

• Monitor frac-out for 4 hours to determine If the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location.

If drilling mud congeals, take no other immediate action that would potentially suspend sediments in the water column. Coordinate with agencies on restoration measures. If bentonite material is spread over a extended area after congealing, manual collection methods would be used that may include use of the following equipment:

- ✓ hay bales
- ✓ sand bags
- ✓ silt fence
- ✓ plastic sheeting
- ✓ turbidity barriers
- ✓ shovels, pails
- ✓ push brooms
- ✓ squeegees
- ✓ pumps and sufficient hose
- ✓ mud storage tanks
- ✓ vacuum truck on 24-hour call; and
- ✓ Light plant/generator.

If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water. It is expected that collection line bore releases will be small scale so that a specialized clean up team would use the same methods as the immediate response methods.

• Phone numbers of spill response teams in the area will be on site.

• Affected aquatic areas will be monitored twice per year for one year subsequent to frac-out to assess aquatic habitat conditions. After frac-out is stabilized and any required removal is completed, the environmental specialist will document post-cleanup conditions with photographs and prepare a frac-out incident report describing time, place, actions taken to remediate frac-out and measures implemented to prevent recurrence. The reports of any necessary sensitive habitat specialists would be incorporated. Incident report will be provided to appropriate federal and state agencies as part of project compliance not more than 30 days after the incident.