Westwood

STORM WATER POLLUTION PREVENTION PLAN

# Sunflower Wind Project

Stark and Morton County, North Dakota

August, 2015



**Prepared For:**

Mortenson Construction
700 Meadow Lane North
Minneapolis, MN 55422

# Storm Water Pollution Prevention Plan (SWPPP) Narrative

## Sunflower Wind Project

Stark and Morton County, North Dakota

NPDES Permit Identification #: NDR10-

Prepared for:

Mortenson Construction
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Minneapolis, MN 55422

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July 31, 2015

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## ATTACHMENTS

Attachment A: NDR10-0000 Construction General Permit
Attachment B: Permitting Documentation (NOI, Permit Card, Permit Letters, Blank NOT/MOD)
Attachment C: Soil Maps
Attachment D: Pre and Post Drainage Maps
Attachment E: Site Plans, Erosion and Sediment Control Plans, Details
Attachment F: Training Documentation
Attachment G: Inspection and Corrective Action Forms

# 1.0 INTRODUCTION AND PURPOSE

This SWPPP is prepared in accordance with the National Pollutant Discharge Elimination System (NPDES) regulations as established by the Clean Water Act and guided by the State of North Dakota. The North Dakota Department of Health Construction General Permit NDR10-0000 (Expiration date: March 31, 2020) provides the frame work of requirements for compliance to discharge stormwater from a construction site.

This SWPPP is for implementation by the Owner and Operator, as listed in Section 5.1 of this SWPPP, at the Sunflower Wind Project, with the project location as defined in Section 4.0 of this SWPPP. This report shall be on the site at all times during construction.

The following are outlined in this site specific SWPPP:

- Control measures for storm water pollution prevention during each phase of construction
- Control measures for storm water pollution prevention after construction
- Sources of storm water and non-storm water pollution
- Inspection and maintenance procedures

## 2.0 OWNER SWPPP CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

| | Assistant Secretary | July 31, 2015 |
|---|---|---|
| Signature | Title | Date |
| Dane Peacock | (415) 671-4449 | |
| Printed Name | Contact Number | |

# 3.0 SWPPP AMENDMENTS

This plan and the attachments must be amended to include additional requirements or modified requirements which take place during construction if one or more of the following occur:

1. There is a change in design, construction, operation, maintenance, weather or seasonal conditions that significantly impacts the discharge of pollutants from the site to surface or groundwater.
2. Inspections or investigations by the site owner, operator, Environmental Protection Agency, North Dakota Department of Health officials indicate this plan is not effective in eliminating or significantly minimizing the discharge of pollutants.
3. This SWPPP is not achieving the general objectives of minimizing pollutants in stormwater discharges or if this plan is not consistent with the NDR10-0000 Construction General Permit.
4. If the NDDH notifies the Owner and / or Operator (i.e. permittees) that additional requirements are needed, requirements are not being met for TMDL or other water quality standards, or that the SWPPP did not incorporate the necessary requirements.

## 3.1 SWPPP Amendment Log

The following table should be completed as necessary during construction to document changes and amendments to this document. Place the Amendment Number next to all application changes, redlines and information in the document to reference back to the changes summarized below. If an additional sheet is necessary attach the additional sheet to the SWPPP.

**Table 1: Amendment Log**

| Amend # | Date | Reason, location and brief description of change or amendment | Requested by: | Prepared by: |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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# 4.0 SITE INFORMATION

## 4.1 Site Location and Vicinity Map

The Antelope Wind Project site is located in Stark and Morton County near the City of Hebron. A central intersection is approximately 40th Street and County Road 90. The site is bordered upon the north by I-94 and 2nd Street NW, upon the south by 43rd Street SW, the west by 80th Avenue SW and the east by County Road 89. Refer to Appendix E of this SWPPP for the full vicinity map.

**Table 2: Project Location**

| Section | Township | Range |
|---|---|---|
| 16, 19-23, 26-32 | 139 N | 90 W |
| 24-26, 36 | 139 N | 91 W |
| **Latitude and Longitude Points (Decimal)** | | |
| Latitude | 46.83357 | |
| Longitude | -102.05476 | |

## 4.2 Existing Conditions

The slope and terrain of the site generally consists of rolling hills and to lesser degree steeper slopes. The site currently has stormwater runoff flowing via overland to road ditches, field conveyances, and unnamed tributaries to the east, west and north/north west.

### 4.2.1 Nonvegetative Cover

The project area includes the following nonvegetative cover; however there is no non-vegetative cover within the disturbed limits:

- Gravel Roads
- Farmsteads
- Paved Roads

### 4.2.2 Vegetative Cover

The project area contains the following types of vegetation:

- Pasture Grasses
- Hay fields with harvesting activity
- Row crops (corn / soybeans)
- Shrubs, trees and other woody species
- Agricultural vegetation such as sorghum or cotton
- Wetland vegetation in various areas

### 4.2.3 Land Use

Prior to construction the site area was primarily used for / as pasture or agricultural fields. Secondary uses include fallow vegetated fields with rural farmsteads, fences, gravel and paved roads and other utilities or improvements. There are no known existing land use conditions which present environmental concerns for stormwater pollution within the disturbed limits.

### 4.3 Soil Names and Types

The site area contains more than 85 different soil types; the site is primarily loamy soils. The list below represents the soils which are found in more than 3% of the site area and is representative of the soils expected. For more detail and soils information see the soil map in Attachment C and the geotechnical report which will be available on site or by request. The soils present in more than 3% of the site area are:

- Daglum-Rhoades complex 0-6% slopes (E0454B)
- Rhoades-Rhoades, Barren- Daglum complex, 0-9% slopes (E0541C)
- Belfiedl-Grail clay loams, 0-2% slopes (E0605A)
- Regent-Janesburg complex, 3-6% slopes (E0651B)
- Vebar-Cohagen fine sandy loams, 6-9% slopes (E1333C)
- Beisigl-Flasher-Telfer loamy fine sandys, 6-15% slopes (E1403D)
- Flasher-Vebar-Parshall complex, 9-35% slopes (E1423F)
- Cabba-Chama-Shambo loams, 9-50% slopes (E2617F)
- Chama-Chabba-Sen silt loams, 6-9% slopes (E2737C)
- Chabba-Chama-Sen silt loams, 9-15% slopes (E2741D)

#### 4.3.1 Soil Erosivity

**Table 3: Soil K Factors and Erosivity Hazards**

| Soil Name / Type | K Factor | Erosivity Hazard | | | | Reason(s) for Erosivity Rating |
|---|---|---|---|---|---|---|
| | | Slight | Moderate | Severe | Very Severe | |
| E0454B | .37 | X | | | | |
| E0541C | .43 | X | | | | |
| E0605A | .24 | X | | | | |
| E0651B | .32 | X | | | | |
| E1333C | .15 | X | | | | |
| E1403D | .15 | X | | | | |
| E1423F | .20 | | X | | | Slope / Erodibility |
| E2617F | .37 | | | X | | Slope / Erodibility |
| E2737C | .37 | X | | | | |
| E2741D | .37 | | X | | | Slope / Erodibility |

4.3.2 Soil Particle Size

**Table 4: Soil Particle Sizes**

| Soil Type | % Sand | % Clay | % Silt | % Site Area |
|---|---|---|---|---|
| E0454B | 27.3 | 38.1 | 34.6 | 5.7 |
| E0541C | 11.0 | 38.2 | 50.8 | 3.7 |
| E0605A | 24.3 | 35.6 | 40.1 | 4.4 |
| E0651B | 7.6 | 42.9 | 49.5 | 8.2 |
| E1333C | 75.4 | 9.8 | 14.8 | 3.2 |
| E1403D | 81.1 | 5.2 | 13.7 | 3.7 |
| E1423F | 82.2 | 5.2 | 12.6 | 3.6 |
| E2617F | 27.7 | 21.2 | 51.1 | 3.8 |
| E2737C | 10.7 | 22.6 | 66.7 | 5.5 |
| E2741D | 17.8 | 20.5 | 61.8 | 7.5 |

# 5.0 PROJECT INFORMATION

## 5.1 Owner and Operator Information

| Owner Information | Operator Information |
|---|---|
| Sunflower Wind Project, LLC | Mortenson Construction |
| Dane Peacock, Assistant Secretary | Tim Kannmacher, Construction Executive |
| 179 Lincoln Street, Suite 500, Boston, MA 02111 | 700 Meadow Lane North, Minneapolis, MN 55422 |
| (415) 671-4449 , dpeacock@sunedison.com | 763-287-5179; tim.kannmacher@mortenson.com |

### 5.1.1 Owner Responsibilities

The owner responsibilities include:

- Development of a SWPPP prior to submittal of the Notice of Intent (NOI).
- Submittal of a complete and accurate NOI.
- Compliance with all terms and conditions of the Construction General Permit.
- Keeping the permit up to date (partial, whole, contractor, builders, etc.)
- Submittal of the Notice of Termination (NOT) within 30 days of meeting requirement of final stabilization.
- Develop a chain of responsibility with the operators to ensure NPDES and SWPPP compliance

### 5.1.2 Operator Responsibilities

The operator responsibilities include:

- Completion of an accurate NOI with the Owner
- Compliance with the permit conditions as they pertain to the construction activities delegated and where the operator has day to day supervision of the activity
- Keeping the permit up to date with the Owner (partial, whole, contractor, builders, etc.)

## 5.2 Project Type and Proposed Conditions

### 5.2.1 Non-vegetative Cover

Non-vegetative cover will include the permanent facilities and infrastructure such as the access roads, substation gravel / rock base, the permanent operation and maintenance building and gravel parking lot and turbine pedestals.

### 5.2.2 Vegetative Cover

The vegetated cover which existed preconstruction will be restored during restoration activities after construction with the same or similar vegetative species. Agricultural vegetation will be replanted by the land operators and farmers with grasslands vegetated with similar species of vegetation which existed preconstruction.

#### 5.2.3 Land Use

The land use post construction will be similar to the preconstruction land use with the addition of wind energy conversion infrastructure including wind turbines, gravel minimum maintenance access roads, met towers, underground electrical, substation, and operation and maintenance facilities.

### 5.3 Pre and Post Project Estimates

**Table 5: Project Area Estimates**

| Project Area | Disturbed Area | Existing Impervious Area | Post Construction Impervious Area* |
|---|---|---|---|
| 12,022 Acres | 430 Acres | 53 Acres | 78 Acres |

*Gravel and rock surfaces have been included in the estimate

### 5.4 Construction Activity Description

Construction activity should include installation of up to 53 wind turbines. Construction of the wind turbines requires, but is not limited to, the installation of a substation, three meteorological towers, an operations and maintenance building, a temporary laydown and temporary concrete batch plant, underground electrical collection, and 16-foot wide gravel access roads with temporary 50 foot wide disturbance due to temporary compacted shoulders (10 feet on each side) for truck transport of materials and crane walking paths. Minor construction activity will be necessary for some existing road and radii. The crane paths are specifically designed to follow access roads to limit disturbance of streams and other sensitive areas such as steep slopes and will be approximately 36 feet wide where located away from access roads. All temporary crane paths should be restored to preconstruction conditions after the use of the paths. The SWPPP shall be amended to show locations and disturbance areas as necessary should locations change during construction.

**Project Activity Descriptions**

**NOTE**: All sensitive areas shall be marked prior to start of earth disturbance activities. If any subsurface and/or surface drainage features are altered during construction restore to pre-construction conditions and drainage patterns. Coordinate the work with the Land Owner.

1. Access road construction activity and phasing information:
   a. Strip and stockpile top soil along one or both sides of the road in a linear berm
   b. Apply perimeter sediment controls and temporary stabilization of ditch (erosion control blanket or turf reinforcement mat)
   c. Compact subgrade
   d. Apply gravel base
   e. Following turbine erection the soils should be decompacted
   f. Apply topsoil for non-aggregate areas during final grade
   g. Apply final gravel cap to road
   h. Maintain pre-construction drainage patterns and runoff
   i. If any subsurface and/or surface drainage features are altered during construction, restore to pre-construction condition and drainage patterns
   j. Return disturbed areas not part of the final road to pre-construction condition.

2. Turning radius and temporary intersections construction activity and phasing information:
   a. Strip and stockpile top soil

b. Install culvert as called for in plan; apply perimeter sediment controls and temporary stabilization of ditch and banks of road (erosion control blanket or turf reinforcement mat)
c. Fill with native material to grade
d. Apply gravel base
e. Following turbine component delivery or turbine erection, the turning radius should be removed by removing gravel and fill soils
f. Remove any extra culvert lengths
g. Reapply topsoil and final grade
h. Apply seed and erosion control blanket, TRM, or mulch cover for restoration to pre-construction condition

3. Turbine Area
a. Strip and segregate topsoil; apply topsoil in a soil berm around the down grade perimeter of the turbine pad area
b. Install silt fence at the perimeter as necessary and as shown on the plans
c. Excavate areas required for the foundation and stockpile the subsoils
d. Dewater accumulated ground water or stormwater via pump as necessary, dewatering bag and ensure discharged water does not contribute sedimentation to receiving waters
e. Provide temporary stabilization measures (mulch, erosion control blanket and turf re-enforcement mat)
f. Temporary cover the stockpiles with hydromulch or other temporary cover BMP for water and wind erosion protection
g. Construct concrete washout area or use a common concrete washout during concrete work of mud mat and foundation work
h. Back fill subsoils and topsoil with a rough grade
i. Grade crane pad turbine erection
j. Erect the turbine
k. Return disturbed areas not part of the final road to pre-construction condition.

4. Temporary Crane Walk
a. Plan crane walks according to unique area conditions where crane walk will occur.
b. Walk cranes across waterways/conveyances during dry conditions
c. Provide timber mat crossings for grass waterway crossings, swale crossings and other gradual conveyance crossings
d. Install down grade perimeter controls such as fiber logs or silt fence to protect conveyances as field conditions dictate
e. Provide temporary creek/waterway crossing BMPs according to details shown on plans and explained in this SWP3 narrative.
f. Restore all disturbed areas to pre-construction condition following crane walk activity by tilling to agricultural condition or applying necessary mulch/erosion control blanket and seeding to areas for restoration to pre-construction condition.

5. Electrical Underground
a. Open trench or plow collection line across fields; if drain tile is encountered locate, repair/restore as necessary.
b. Topsoil should be segregated from subsoils unless otherwise agreed upon by the landowner
c. If required, dewater accumulated ground water or stormwater via pump and dewatering bag, and ensure discharged water does not contribute sedimentation to receiving waters

d. If open trenching or plowing through a waterway or conveyance, a perimeter control such as logs, silt fence or rock check should be used for perimeter control. Apply seed and erosion control blanket or mulch to restore grass waterway to pre-construction condition

6. Lay Down Yard
   a. Provide stable accesses to area; install culverts as necessary and according to the plan for the accesses
   b. Install silt fence and other sediment controls as necessary and as detailed in the plan
   c. Strip and stockpile topsoil around the up-gradient perimeter of the lay down yard for a diversion of water or downgrade perimeter of the yard for runoff control.
   d. Apply rock base to designed thickness
   e. Temporarily cover the stockpiles with hydromulch or wood after seeding with temporary seed mix
   f. Provide necessary secondary containment, secure storage and maintenance activities during operation
   g. Remove rock; decompact and reapply topsoil to the area after the lay down yard is no longer needed.
   h. Return disturbed areas to preconstruction condition which may include applying seed and mulch cover for restoration

7. Batch Plant
   a. Provide stable accesses to area; install culverts as necessary and according to the plan for the accesses
   b. Install silt fence and other sediment controls as necessary and as detailed in the plan
   c. Strip and stockpile topsoil around the up-gradient perimeter of the plant yard for a diversion of water or downgrade perimeter of the yard for runoff control.
   d. Apply rock base to designed thickness
   e. Temporarily cover the stockpiles with hydromulch or wood mulch after seeding with temporary seed mix
   f. Provide necessary secondary containment, secure storage and maintenance activities during operation
   g. Provide a designated and contained concrete washout area as per detail and SWPPP specifications; properly dispose of washout water or recycle as needed
   h. Sample all discharges from concrete batch plant area
   i. Provide dust control and material control as required
   j. Remove rock; decompact and reapply topsoil to the area after the batch plant is no longer needed.
   k. Return disturbed areas to preconstruction condition which may include applying seed and mulch cover for restoration

8. Met Tower
   a. Strip and stockpile top soil along one or both sides of the access road and tower area in a linear berm
   b. Apply perimeter sediment controls
   c. Compact subgrade
   d. Apply gravel base to tower access
   e. Following tower erection the soils should be decompacted
   f. Apply topsoil during final grade
   g. Apply final gravel cap to tower access

h. Maintain pre-construction drainage patterns and runoff
i. Return disturbed areas not part of the final road or tower area by applying seed and mulch cover for restoration to pre-construction condition

9. Collector Substation
   a. Provide stable accesses to area; install culverts as necessary and according to the plan for the accesses
   b. Install silt fence and other sediment controls as necessary and as detailed in the plan
   c. Strip and stockpile topsoil around the up-gradient perimeter for a diversion of water or downgrade perimeter of the substation for runoff control
   d. Apply rock base to designed thickness
   e. Temporarily cover the stockpiles with hydromulch or wood mulch after seeding with temporary seed mix
   f. Concrete washout area needed prior to concrete work
   g. Construction of electrical components and fencing
   h. Return disturbed areas not part of the final gravel pad to agricultural condition or apply seed and mulch cover for restoration to preconstruction condition.

10. Operation and Maintenance Facility
   a. Provide stable accesses to area; install culverts as necessary and according to the plan for the accesses
   b. Install silt fence and other sediment controls as necessary and as detailed in the plan
   c. Strip and stockpile topsoil around the up-gradient perimeter for a diversion of water or downgrade perimeter of the area for runoff control
   d. Temporarily cover the stockpiles with hydromulch or straw mulch after seeding with temporary seed mix
   e. Concrete washout area needed prior to concrete work
   f. Concrete work and building construction
   g. Apply rock base to designed thickness
   h. Apply rock base for parking areas as designed
   i. Provide mulch and seed or blanket and seed following final grade

### 5.5 Project Activity Schedule

**Table 6: Project Schedule**

| Activity | Start Date | End Date |
|---|---|---|
| Overall Project | 08/15/2015 | 06/01/2017 |
| Temporary Laydown / Staging and Batch Plant | 08/17/2015 | 09/04/2015 |
| Access Roads | 08/31/2015 | 10/30/2015 |
| Turbine Pads / Turbine Erection | 06/06/2016 | 09/17/2015 |
| Underground Collection (Electrical) | 05/30/2016 | 07/19/2016 |
| Crane Walk Paths | 05/16/2016 | 06/24/2016 |
| Meteorological Towers | 06/06/2016 | 07/15/2016 |

| | | |
|---|---|---|
| Substation | 09/21/2015 | 07/29/2016 |
| Operation and Maintenance Facility | 09/21/2015 | 07/15/2016 |

### 5.6 Project Phasing

The project will generally start with the laydown yard and access road grading while then concurrently starting other activities such as foundation excavation, turbine pads, turbine erection, met towers, crane walk, substation, operation and maintenance facility. The contractor means and methods will dictate the start and completion from north to south or east to west but much of the project activity will occur concurrently with restoration starting and continuing as activity is completed.

### 5.7 Project Contacts and Chain of Responsibility

**Table 7: Project Contacts**

| Company | Name or Position | Responsibility | Contact Number |
|---|---|---|---|
| Sunflower Wind Project, LLC | Dane Peacock | Site Development | (415) 671-4449 |
| Mortenson Construction | | Dirt Work / Grading / Turbine / Cranes / Excavation | |
| | | Underground Electrical | |
| | | Met Towers | |
| | | Substation | |
| | | O&M Facility | |
| | | Laydown / Batch Plant | |
| | | Routine SWPPP Inspections | |
| Westwood Professional Services | Aaron Mlynek, CPESC | SWPPP development | 952-697-5710 |
| | | Restoration | |
| | | BMP installation | |

# 6.0 ADDITIONAL SITE OR PROJECT CONSIDERATIONS

## 6.1 Chemical Treatments

At the time of SWPPP completion the use of chemical additives or polymers for purposes of sediment flocculation are not anticipated for this project.

**Table 8: Flocculation Plan Summary (deleted as not applicable to project)**

## 6.2 Documentation of Infeasibility

The project is able to address NDR10-0000 Part II and III(A). There is no need for documentation of infeasibility for this project.

## 6.3 Environmental Review Document

At the time of SWPPP completion there were no environmental review documents provided. The contractor and owner should review documents prior to construction commencing. Should environmental documentation relating to, but not limited to, cultural avoidance areas, endangered species or recognized environmental conditions become available the SWPPP should be updated.

# 7.0 RECEIVING WATERS

The table below summarizes the immediate receiving waters from the site. Where necessary the receiving waters has been designated immediate (for the first surface water receiving drainage from the site) and ultimate (for the surface water receiving runoff from site after the immediate receiving waters). The receiving waters listed are located within a mile, and receive water from the site discharge location(s).

The site area is divided by five (5) HUC12 drainage areas and various unnamed immediate receiving waters contributing to three (3) ultimate receiving waters. The site generally drains northerly with the northwestern most drainage area in Branch Knife River Headwaters; the northeastern drainage area contributing to Big Muddy Creek and Lower Heart River, the southwestern and south-central drainage area contributing to Upper Heart River. The southeast area contributes to Heart Butte Creek and Lower Heart River. Refer to Attachment D for drainage maps.

**Table 9: Receiving Waters**

| Name of Waterbody | Immediate (I) or Ultimate (U) | Type (wetland, lake, stream, ditch) | Impaired? Y/N |
|---|---|---|---|
| Unnamed tributaries | I | Creeks | N |
| Heart Butte Creek | U | Creek | N |
| Big Muddy Creek | U | Creek | N |
| Knife River | U | River | N |
| Upper Heart River | U | River | N |
| Lower Heart River | U | River | N |

## 7.1 Impaired Waters

There are no impaired waterbodies which receiving stormwater discharge from the site disturbed area according to the Integrated Reports from the North Dakota Department of Health website:

http://www.ndhealth.gov/WQ/SW/Z2_TMDL/Integrated_Reports/B_Integrated_Reports.htm

(accessed 06/30/2015).

# 8.0 STORMWATER MANAGEMENT

## 8.1 Temporary Practices

There are no anticipated temporary stormwater management practices at the time of SWPPP completion.

### 8.1.1 Calculations

Calculations are not applicable to this project as there are no temporary stormwater management practices requiring calculations. Should a temporary basin(s) be necessary the inspector should complete the table below for documentation (if necessary).

**Table 10: Temporary Sediment Basin Calculations**

| Basin # | Storm Frequency | Rainfall Amount | Runoff Area | Runoff Volume | Capacity Needed |
|---|---|---|---|---|---|
| 1 | 2 yr. / 24 hr. | 2.0 | Acres | ac ft. | ac ft. |
| 2 | 2 yr. / 24 hr. | 2.0 | Acres | ac ft. | ac ft. |
| 3 | 2 yr. / 24 hr. | 2.0 | Acres | ac ft. | ac ft. |

## 8.2 Permanent Practices

There are no permanent stormwater practices. However, the access roads should be graded and blended into the fields to allow for drainage to occur across the proposed roads. Changes or alterations of the pre-construction drainage patterns within the fields should not be adversely affected by the construction of the access roads. The runoff water from the roads should be allowed to drain into the fields and infiltrate into the topsoil to mimic pre-construction runoff and hydrologic conditions. The use of surface drainage across flatter slopes of less than 3% should promote infiltration into the topsoil and treatment should occur though filtration / infiltration with drainage through the soil.

### 8.2.1 Calculations

Calculations are not applicable to this project as there are no permanent stormwater management practices requiring calculations.

# 9.0 TEMPORARY BEST MANAGEMENT PRACTICES

## 9.1 Soil Management

After clearing and grubbing, the grading contractor will strip and stockpile topsoil material for reapplication on all future permanent pervious surface areas. During development, grading and utility construction the subsoils will be compacted as necessary for construction using typical excavation techniques. During final grade, reapplication of top soil will be done by a wide-pad dozer and other equipment to minimize compaction of the top soil material.

## 9.2 Natural Buffers and No Disturbance Areas

### 9.2.1 Natural Buffers

Due to the vast project area there are various buffer applications and impacts. The use of natural buffers is not applicable to portions of this project as there are no surface waters within 50 feet of disturbed areas and the use of natural buffers is not applicable to this project as there are no existing natural buffers due to the site area being a previous agricultural field.

The use of buffers is not feasible due to grading operations needed for cut / fill. In lieu of a 50 foot undisturbed buffer the use of redundant sediment controls will be implemented. A combination of silt fence, fiber logs and/or topsoil berms will be installed prior to or concurrent with disturbance activity of up-gradient areas. The contractor should make a reasonable effort to start and finish work in the 50 foot area first so additional stabilization controls can be applied.

An undisturbed 50 foot buffer zone will be preserved for various unnamed creeks, tributaries and wetlands. The use of linear sediment controls will be installed upgrade to provide sediment control and delineate the 50 foot buffer. Refer to the site erosion and sediment control plan for the location of the buffer. The following activities are prohibited to take place within the buffer area:

- Placement of stockpiles
- Vegetation disturbance
- Placement of construction material
- Storage of gas, oils, other potential pollutant material

### 9.2.2 No Disturbance Areas

The no disturbance areas include the following:

- Areas outside of the disturbed limits on the plans;
- Areas outside of the construction easements and corridors;
- Wetlands not accounted for impacts in the plans.

## 9.3 Erosion Prevention Practices

The following controls are anticipated to minimize soil loss from the construction site area. The controls should help to minimize soil from being transported from water and wind as well as aide in establishment of temporary and permanent vegetation. Prior to grading and during clearing and grubbing, the areas of vegetation preservation, buffers and other areas of no disturbance should be flagged, staked or otherwise delineated.

<u>Timing for disturbed areas and slopes</u>

Temporary erosion prevention practices should be initiated immediately after construction activity disturbing soil in an area is temporarily or permanently ceased for a period of 14 days (7 days for slopes of 3:1 and steeper). The application of temporary erosion control management practices should be

completed prior to the 14th day (7th day for slopes of 3:1 and steeper) of temporarily or permanently ceasing construction activity in an area of the project.

Timing for waterways, ditches and swales and stream diversions

Unless the temporary or permanent drainage ditch or swale is part of a designed sediment retention system, all areas within 200 linear feet of the property edge or from the point of discharge need to be stabilized prior to connection with the surface water. The remaining portion of the ditch must be stabilized within 14 calendar days from permanent or temporarily ceasing construction.

For temporary or permanent drainage ditch or trench or for stream divisions shall have stabilization controls applied and functional prior to connection with surface waters. The stabilization controls must be applied for the channels and banks to the appropriate "bank full" elevations.

**Table 11: Erosion Controls**

| Potential BMPs | Construction Phase or Activity | | | | | | | | | Application Notes | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Temp Laydown / Batch Plant | Access Roads | Turbine Pads / Erection | UG Collection | Temp Crane Paths | Met. Towers | Collector Substation | O&M Facility | | | |
| Construction Phasing | X | X | X | X | X | X | X | X | | Minimize soil disturbance, as feasible, per phase. Stake/flag areas that are to be left undisturbed. | |
| Buffer Strips | | X | X | X | X | | | | | See Section 9.2 and 7.1 for more info. | |
| Slope Roughing | | X | | X | X | | | | | Use tracked equipment perpendicular to contour on steep slopes for temp/short term erosion control. | |
| Straw / Hay Mulch | X | X | X | X | X | X | X | X | | Apply at 2 tons / acre. Disc anchor to soil. Weed Free mulch should be used. | |
| Erosion Control Blanket | X | X | | X | X | X | X | X | | Blanket types may vary depending (typical blanket material is doubled sided netting with wood fiber). Install per manufacturer's recommendations. | |
| Hydroseed | X | X | X | X | X | X | X | X | | Apply at a minimum of 1,800 pounds per acre from 2 directions to prevent shadowing. Could use in lieu of mulch. | |
| Temporary Seed Mix Oats | X | X | | | | | | X | | Application Rate = 100 lbs/ac | Prepare soil prior to seeding. Broadcast and rake seed into soil prior to mulch or blanket. |
| Permanent Seed Mix Winter Wheat | X | X | | X | X | X | X | X | | Application Rate = 100 lbs/ac | |
| Permanent Seed Mix Mesic Mix | | X | X | X | X | X | X | X | | Application Rate = 59 lbs/ac | |
| Permanent Seed Mix Ag Roadside Mix | | X | X | X | X | X | X | X | | Application Rate = 45 lbs/ac | |

The following are potential seed mixes adapted from Minnesota mixes. Seed mixes may need to be amended and should be approved by land owners prior to application.

Temporary Seed Mixes:

| Common Name | Scientific Name | Rate (kg/ha) | Rate (lb/ac) | % of Mix (% by wt) | Seeds/ sq ft |
|---|---|---|---|---|---|
| Oats | *Avena sativa* | 112.08 | 100.00 | 100.00% | 44.54 |
| | **Totals:** | **112.08** | **100.00** | **100.00%** | **44.54** |
| **Purpose:** | Temporary cover crop for spring and summer plantings | | | | |

| Common Name | Scientific Name | Rate (kg/ha) | Rate (lb/ac) | % of Mix (% by wt) | Seeds/ sq ft |
|---|---|---|---|---|---|
| Winter Wheat | *Triticum aestivum* | 112.09 | 100.00 | 100.00% | 26.08 |
| | **Totals:** | **112.09** | **100.00** | **100.00%** | **26.08** |
| **Purpose:** | Temporary cover crop for fall plantings | | | | |

Permanent Seed Mixes:

| Common Name | Scientific Name | Rate (kg/ha) | Rate (lb/ac) | % of Mix (% by wt) | Seeds/ sq ft |
|---|---|---|---|---|---|
| Smooth Brome | *Bromus inermis* | 8.69 | 7.75 | 13.14% | 25.42 |
| slender wheatgrass | *Elymus trachycaulus* | 2.24 | 2.00 | 3.40% | 5.08 |
| Perennial Ryegrass | *Lolium perenne* | 14.85 | 13.25 | 22.46% | 66.00 |
| Park Kentucky bluegrass | *Poa pratensis Park* | 17.65 | 15.75 | 26.69% | 502.50 |
| Canada bluegrass | *Poa compressa* | 8.41 | 7.50 | 12.71% | 412.00 |
| switchgrass | *Panicum virgatum* | 1.68 | 1.50 | 2.54% | 7.70 |
| fowl bluegrass | *Poa palustris* | 4.48 | 4.00 | 6.78% | 191.00 |
| Timothy | *Phleum pratense* | 1.96 | 1.75 | 2.97% | 49.50 |
| | **Total Grasses** | **59.97** | **53.50** | **90.69%** | **1259.20** |
| Alfalfa | *Medicago sativa* | 3.92 | 3.50 | 5.92% | 18.20 |
| White Clover | *Trifolium repens* | 2.24 | 2.00 | 3.39% | 32.70 |
| | **Total Forbs** | **6.16** | **5.50** | **9.31%** | **50.90** |
| | **Totals:** | **66.13** | **59.00** | **100.00%** | **1310.10** |
| **Purpose:** | General non-native mix for roadsides with mesic soils. | | | | |

| Common Name | Scientific Name | Rate (kg/ha) | Rate (lb/ac) | % of Mix (% by wt) | Seeds/ sq ft |
|---|---|---|---|---|---|
| fowl bluegrass | *Poa palustris* | 6.73 | 6.00 | 13.33% | 286.50 |
| Smooth Brome | *Bromus inermis* | 8.69 | 7.75 | 17.23% | 25.43 |
| slender wheatgrass | *Elymus trachycaulus* | 2.24 | 2.00 | 4.45% | 5.08 |
| Perennial Ryegrass | *Lolium perenne* | 15.13 | 13.50 | 30.00% | 67.25 |
| switchgrass | *Panicum virgatum* | 1.68 | 1.50 | 3.33% | 7.70 |
| Timothy | *Phleum pratense* | 1.96 | 1.75 | 3.89% | 49.43 |
| | **Total Grasses** | **36.43** | **32.50** | **72.23%** | **441.39** |
| Alfalfa | *Medicago sativa* | 14.01 | 12.50 | 27.77% | 65.07 |
| | **Total Forbs** | **14.01** | **12.50** | **27.77%** | **65.07** |
| | **Totals:** | **50.44** | **45.00** | **100.00%** | **506.46** |
| **Purpose:** | General non-native roadside for areas that will be cut for hay. | | | | |

### 9.4 Sediment Control Practices

The following controls are anticipated to minimize sediment discharge, capture sediment in suspension and minimize sedimentation offsite.

**Table 12: Sediment Controls**

| Potential BMPs | Construction Phase or Activity | | | | | | | | | Application Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | Temp Laydown / Batch Plant | Access Roads | Turbine Pads / Erection | UG Collection | Temp Crane Paths | Met. Towers | Collector Substation | O&M Facility | | |
| Silt fence | X | | X | | | | X | X | | Machine sliced install w/ wood posts at 6' spacing. Install perimeter sf prior to grading |
| Fiber rolls | | X | | X | X | X | | | | Install on contour, minimum of 6" roll, wood or straw fiber. Secure with 2" posts every 2' on center. |
| Topsoil Berms | | X | X | X | X | | | | | Side slopes of 3:1 with at least 1' height. Use temporary erosion control to stabilize berm.. |

### 9.5 Run-on and Runoff Controls

The following controls are anticipated to minimize scour, transport water across or down steep slopes or critical areas, divert clean water, and / or provide temporary conveyances to maintain drainage.

**Table 13: Run-on and Runoff Controls**

| Potential BMPs | Construction Phase or Activity | | | | | | | | | Application Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | Temp Laydown / Batch Plant | Access Roads | Turbine Pads / Erection | UG Collection | Temp Crane Paths | Met. Towers | Collector Substation | O&M Facility | | |
| Riprap Apron | X | X | | | | | X | X | | See detail in plans. Install within 24 hours of connection to surface waters. |
| Diversion Berm | X | | | | | | | | | See detail, use temp erosion control to stabilize berm. Install prior to disturbing down gradient areas. |
| Culvert Protection | X | X | | X | X | | X | X | | See details in plan set. Install within 24 hours of installation of culverts. |

### 9.6 Tracking Controls

The following controls are anticipated to minimize or prevent sediment track-out from construction site exits to paved surfaces or to retrieve material tracked onto paved surfaces to minimize or prevent the material from being washed into surface waters or storm water inlets.

**Table 14: Tracking Controls**

| Potential BMPs | Construction Phase or Activity | | | | | | | | | Application Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | Temp Laydown / Batch Plant | Access Roads | Turbine Pads / Erection | UG Collection | Temp Crane Paths | Met. Towers | Collector Substation | O&M Facility | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rock Pad | X | X | | | | | X | X | | See detail in plans. Install at all site exits prior to grading. Maintain for duration of project. |
| Gravel or Aggregate Road Base | X | X | X | | | | X | X | | See detail and notes in plans. |
| Street Scraping | X | X | | | | | X | X | | Scrape large clumps/amounts of material with soft tracked or wheeled equipment prior to sweeping. |
| Street Sweeping | X | X | | X | | | X | X | | Sweep paved surfaces within 24 hours of discovery. |

### 9.7 Dewatering and Basin Draining Practices

Dewatering Accumulated Water (via pump, trench, temporary ditch or grade cuts)

Dewatering of turbid water (water that is visibly cloudy or brown in color) should be discharged via pump and hose or overland flow to a temporary sediment basin for pretreatment. The use of riprap apron (energy dissipation) should be used for the discharge location. If riprap is not used, an alternative form of energy dissipation should be used to prevent scour and re-suspension of soil at the discharge point of the hose. If discharge to a temporary sediment basin is not feasible, the use of dewatering dumpsters, dewatering bags or other prefabricated product should be used. The use of rock checks, erosion control blanket and sumps or traps may be considered for overland flow. After the use of BMPs, the water could be discharged through a vegetated buffer and energy dissipation. The discharge of water from the site should be visibly clear in appearance.

The discharge of accumulated water should not:

- Contain oil, grease, a sheen, odor, or concrete washout;
- Adversely impact adjacent properties with water or sediment;
- Adversely impact waters of the state;
- Cause erosion of slopes and channels;
- Cause nuisance conditions ;
- Contribute to inundation of wetlands which negatively impact the wetlands.

# 10.0 POLLUTION PREVENTION MANAGEMENT

## 10.1 Storage, Handling and Disposal of Construction Materials

Storage and Handling

- All products shall be kept in their original container, with original labels still attached, unless the container is not re-sealable.
- Hazardous materials shall be returned to the hazardous material storage area at the end of each day.
- An effort should be made to store only enough products to do the required job.
- The contractor shall provide tanks or barrels to collect liquid byproducts that pose a pollution hazard.
- The pollutants shall be removed from the site on a weekly basis and disposed of in accordance with federal, state and local regulations.
- All spills shall be cleaned up immediately after discovery, in accordance with the manufacture's recommended methods.
- Hazardous materials shall be properly stored to prevent vandalism or unauthorized access.
- Containment units shall be installed in accordance with federal, state, and local regulations.
- No hazardous material shall be stored within 200 feet of an identified critical area.
- If building materials, chemicals, or general refuse is being used, stored, disposed of, or otherwise managed inappropriately, the contractor shall correct such defects within 24 hours of detection or notification.

Disposal (Dumpsters)

- Locate dumpsters away from watercourses, streams, creeks and other surface waters or conveyances.
- Site inspector shall regularly observe for and report excess litter and solid waste and request pickup and retrieval of wastes.
- Wastes, litter, debris shall be deposited into dumpsters in a central location and / or in various satellite locations where work is active.
- Dumpsters should be supplied by and regularly maintained, emptied and removed by a waste management company.

## 10.2 Fueling and Maintenance of Equipment and Vehicles; Spill Response

- Routine maintenance of vehicles shall occur in staging areas only if necessary.
- Maintenance of equipment and vehicles should be avoided and done off site where feasible.
- If fueling is done by mobile tank and dispenser, the transfer of fuel should be done under close supervision and there should be drip pans and spill containment and cleanup materials readily available.
- If fueling is done via temporary tank: the tank should be stored within a bermed area and away from surface waters.
- Spill Kits with absorbent materials shall be available on site for use in cleaning up small spills.

- In the event of a spill or discharge of hazardous material of reportable quantity, contact the Department of Health (701-328-5210) and the National Response Center within 24 hours of the spill at 800-424-8802.

**Table 15: Reportable Spill Quantities**

| Material | Reportable Spill Quantities |
|---|---|
| Petroleum Material | Any Amount which may impact waters of the state (surface or ground) |
| Other Material | Quantity that causes odor, color, sheen, foam, or other obvious indicator of pollutants. |

### 10.3 Vehicle and Equipment Washing

If necessary, the contractor shall develop a designated wash area with basin containment to prevent the untreated water from discharging from the site to surface waters. BMPs include: temporary basins, inspecting the vehicles and equipment for leaks prior to washing and prohibiting washing activity until discovered leaks are repaired and maintenance is completed of the equipment or vehicle. The area shall be noted on the site plan. The water shall be contained and pumped from the site into a truck for proper disposal at a waste water facility. No engine degreasing shall be done on site.

### 10.4 Concrete Washout and Other Washout

Mobile Concrete or Mortar Mixers

The following BMPs should be considered with the use of mortar or concrete mixers:

- Store bags of concrete and mortar in dry storage.
- Position mixers 100 feet from the nearest watercourse or conveyance.
- If mixers must be positioned closer than 100 feet from a conveyance and temporary berm shall be installed to prevent runoff from the mixer from flowing into the conveyance.
- Use Tarpaulins or plastic sheeting as a liner to prevent concrete or mortar from contacting the soil.
- Use buckets to contain washout / rinse water when cleaning the mobile mixer.
- Dump buckets of washout water in a designated concrete washout area.

Concrete Washout

The following BMPs and considerations should be implemented for concrete washout areas:

- Washout water from the tools, equipment and the chutes of concrete trucks, mobile mixers or other containers with concrete material must be contained and not allowed to be discharged into waters of the state or drain onto adjacent properties.
- The washout area should be a defined area with signage notifying the contactors of the location and use.
- The washout area should be a sufficient size to contain the expected washout material. 10’x10’x3’ area should suffice for most activities.
- Multiple washout areas may be needed. Locations of the washouts should be noted on the construction plans by the contractor.
- When noting the location of the concrete washout areas, include the date of install, date of last maintenance and date of removal.
- The use of thick poly sheeting should be used to prevent contamination of the soil and prevent infiltration of the washout material.

Once the material is hardened it can be disposed of in a dumpster. If the material is water or not hardened, the material should be vacuumed and hauled off site to be properly disposed of or recycled at a facility. Some sites will not need the separate washout area if a truck chute washout is available from the concrete supplier.

Truck Chute Washout

Truck washout facility: where available all trucks with self-contained washout and water recycle systems must be used for every truck chute, tool and equipment rinse and washout. The truck should be positioned in a flat area away from inlets and surface waters where feasible.

### 10.5 Portable Sanitary Facilities

- Locate facilities away from watercourses, streams, creeks and other surface waters or conveyances.
- Facilities should be placed upgrade from perimeter sediment controls and not on paved or other impervious surfaces.
- Secure facilities to the soil with stakes or tether to other non-movable structure to prevent tipping from wind or other factors.
- Schedule routine and regular cleanout and maintenance of facility from a reliable company.

### 10.6 Potential Non-stormwater Pollutant Sources and BMPs

Non-storm water discharges shall be eliminated or reduced to the extent feasible, with the exception of those necessary for the completion of certain construction activities. A list of allowable non-stormwater discharges include the items below.

**Table 16: Non-stormwater Discharges and Potential BMPs**

| Type of Allowable Non-Stormwater Discharge | Likely to be Present at Site? |
|---|---|
| Discharges from emergency fire-fighting activities | ☐ YES ☒ NO |
| Fire hydrant flushings (uncontaminated and not hyperchlorinated) | ☐ YES ☒ NO |
| Waters used to wash vehicles, buildings, structures and pavement (Detergents and soaps are not allowed) to remove mud, dirt or dust. | ☒ YES ☐ NO |
| Potable water including uncontaminated waterline flushings (not hyperchlorinated) | ☒ YES ☐ NO |
| Uncontaminated air conditioning or compressor condensate | ☒ YES ☐ NO |
| Uncontaminated, non-turbid discharges of ground water, spring water, or foundation or footing drains | ☒ YES ☐ NO |
| Landscape irrigation | ☐ YES ☒ NO |

These authorized non-storm water discharges should be conducted in accordance with the requirements of the Construction General Permit (CGP), and every effort should be made to minimize non-storm water runoff from these site activities.

The operators are responsible to implement the following BMPs and management for non-stormwater discharges.

Waters Used to Wash Vehicles, Buildings, Structures and Pavement (without detergents): Should washing be necessary to remove soil, mud, dirt and / or dust will likely be needed, the washing of components consists of using high powered sprayers with water could be used to clean off accumulated soil and earth materials. The washing should take place within a defined area. Existing BMPs and infiltration will likely control associated water and runoff due to the washing activity. If existing BMPs are overloaded or not functional maintenance or additional perimeter controls (such as silt fence) may be needed at the discretion of the inspector.

Potable Water Including Water Line Flushing: The flushing of well water for potable water supply during the installation may be necessary. The water should be flushed via hose or pipe and include energy dissipation at the discharge point to limit scour and erosion. The water shall be discharged via vegetated swale or other non-erosive means to a conveyance for discharge off site.

Uncontaminated Air Conditioning or Compressor Condensate: This is not anticipated to be a contamination / pollution issue. During periods when running air conditioning as needed the minimal amount of water is anticipated to be absorbed into the soil. If any runoff does occur, the standard BMP's (such as silt fence, mulch and erosion control blanket, inlet controls and stormwater traps) should adequately control the runoff from reaching off site surface waters.

Uncontaminated Excavation Dewatering: Clean water should be discharged to a vegetated area, ditches or other conveyance via hose. Energy dissipation should be applied to the discharge location to minimize scour. Alternatively, uncontaminated water could be discharged to receiving waters as allowed by local permits and regulations or as long as positive drainage is provided, the water could be discharged into the surrounding areas and allowed to infiltrate or drain along existing drainage patterns provided that the water does not cause flooding, prolonged or damaging inundation, or vegetation damage.

# 11.0 INSPECTION AND MAINTENANCE

Construction activity and all support activities must be inspected (using the inspection form found in Attachment G or an alternative form) within the parameters of the schedule below. The inspector shall be a person trained and familiar with the requirements of this SWPPP and the NDR10-0000 permit. This person is delegated by the owner and listed in Section 5.7 and 12.0.

Inspections must be written with the following information and retained in Appendix G:

- Date and time of inspections
- Inspector name
- Findings of the inspection
- Recommendations and schedule for corrective actions
- Corrective actions taken
    - Best Management Practice corrected
    - Date and time of corrective action
    - Name of person performing corrective actions
    - Corrective actions taken
    - Corrective actions/maintenance records shall be signed in accordance with Part IV(A)(6)
- Date and amount of rainfall**
- Documentation that the SWPPP has been amended when changes are made to BMPs in response to inspections
- Describe discharge with color, odor, floating, settled, solids, foam, oil sheen)

*All inspections should be documented within 24 hours after completing the field inspection and available in paper or electronic form on site.

**Rainfall amounts should be taken from an onsite rain gauge. If a rain gauge is not feasible, the rainfall data should be observed from the following website:

http://forecast.weather.gov/MapClick.php?CityName=Hebron&state=ND&site=BIS&textField1=46.9028&textField2=-102.044&e=0

## 11.1 Inspection Schedule

**Table 17: Inspection Schedule**

| If the site is: | Then an inspection is needed: | Notes and Information |
|---|---|---|
| Active | Once every 14 calendar days and within 24 hours of a rainfall ≥ 0.25". | A rain gauge should be used or rain data should be taken from the link listed above. Inspections should only be conducted during normal working hours. |
| Inactive and stabilized areas | Once every 30 calendar days | Allowed in areas where work is completed and vegetation is established. Other/active areas must follow above. |
| Subject to Winter/Frozen Conditions | Not Applicable / Not Needed if no construction activity is occurring. | Inspections are not needed for inactive sites where snow cover or frozen conditions exist for an extended period of time. The inspection must continue as soon as runoff occurs from the site or within 24 hours of resuming construction. |

## 11.2 Maintenance Schedule

**Table 18: Maintenance Schedule**

| BMP | Observed Condition for Maintenance | Maintenance Interval |
|---|---|---|
| All non-functional BMPs | Sediment overtopping, under water, scoured ends, undermined, destroyed, non- functional as designed. etc. | Maintenance or replacement should be done by end of the next business day after discovery or notification or prior to the next rainfall (whichever is soonest) or as soon as field conditions allow. |
| Perimeter Sediment Control (silt fence, fiber logs, berms, etc.) | ½ full of sediment, flattened to ½ height, driven over, undermined, scoured, moved for access etc. | Within 24 hours of discovery or notice or as field conditions allow. |
| Inlet protection BMPs, conveyances, surface waters | Sediment deposition, sediment deltas and accumulation of sediment material. | Removal/cleanout of accumulated sediment and deltas to be removed within 7 days. Stabilize as needed if soils are exposed during removal/cleanout. |
| Temp sed basins and traps; permanent sediment basins | Sediment deposition and accumulation to ½ of the storage volume. | Cleanout, remove accumulated sediment material within 72 hours of observation, or as field conditions allow access. |
| Site exit locations, rock exit pads, other anti-tracking practices | Accumulated sediment in rock or other anti-tracking BMP, tracking of sediment from the site onto paved surfaces | Top dress rock, maintain rock exit or other anti-tracking controls, scrap paved surfaces, and sweep paved surfaces within 24 hours of discovery. |
| Paved surfaces; adjacent streets | Tracked sediment and soil material from the site hauling or access | Sweep within 24 hours of discovery; additional and/or more frequent sweeping may be needed to maintain public safety or prevent washing from forecasted rains. |

# 12.0 TRAINING AND DOCUMENTATION

Annual training should be done on site and include new employees or responsibility parties which are responsible for design, installation, maintenance and report of the stormwater controls and conduction inspections. See attachment F for the training log and records.

Training Topics:

- The purpose of the SWPPP
- Requirements of the SWPPP
- SWPPP implementation
- Location of BMPs identified in the SWPPP
- Correct BMP installation
- BMP function, maintenance and removal

Inspection personnel should understand the following topics:

- When inspections should be conducted
- What must be inspected
- Record of findings
- Initiate corrective actions
- Document corrective actions

Maintenance personnel must understand the following topics:

- When maintenance must be performed
- Maintaining properly functioning BMPs
- What must be recorded for corrective actions and maintenance records

# 13.0 FINAL STABLIZATION

Final stabilization is achieved for the project when permanent erosion control BMPs are applied to the site. The permanent erosion control BMPs may be a combination of vegetative and no vegetative cover types. Additional requirements to achieving final stabilization are outlined below.

## 13.1 Non-arid Areas

Final stabilization is achieved for the project when permanent erosion control BMPs are applied and functioning on the site. The permanent erosion control BMPs may be a combination of vegetative and non-vegetative cover types. Additional requirements to achieving final stabilization include:

- All soil disturbing activity is completed
- Permanent stormwater treatment system (if required) is constructed and accumulated sediment has been removed from construction activity.
- All temporary, synthetic BMPs have been removed from the site.
- In agricultural areas (as applicable), the construction activity area has been restored to the preconstruction agricultural use.
- The vegetative cover for the site is at a density, with a uniform perennial cover of 70% of the expected final growth density.
- Drainage ditches, constructed to drain water from the site after construction is complete, must be vegetated to or otherwise stabilized to preclude erosion.

## 13.2 Semi-arid Areas

In areas where there is less The requirements include:

- All soil disturbing actives at the site are complete; and
- Temporary erosion control measures (mulch, blanket, hydromulch) are selected, designed and installed with appropriate seed base; and
- The temporary erosion control measures and seed will provide erosion control for at least three years without active maintenance by the operator; and
- The controls and seed installed and applied will achieve 70% perennial cover of the preconstruction conditions.

# 14.0 NOTICE OF TERMINATION

The project permit may be terminated in one of the following scenarios:

1. All construction activity is complete, temporary synthetic BMPs are removed, accumulated sediment from construction is removed, and final stabilization is completed with vegetative and / or non-vegetative cover. The Notice of Termination form from the NDDH should be completed within 30 days of meeting the conditions above. OR;
2. Another owner / operator / permittee has assumed control, in accordance with the transfer provisions (Part I(F) of the general permit), over all areas of the site that have not achieved final stabilization.

# 15.0 RECORD RETENTION

### 15.1 During construction

This report, amendments and attachments, inspections, and maintenance records should be kept on site during normal business hours. The records should be kept by the owner or operator listed on the permit application. The records should be in a mailbox, in a vehicle or in an on-site office trailer or other structure.

### 15.2 Post Construction / Notice of Termination (NOT)

The site owner must retain all the following records for a period of at least three years after the submittal of the NOT.

- The final SWPPP with all field notes / amendments;
- Other stormwater related permits in addition to the NPDES permit from NDDH;
- Inspection and maintenance records;
- All permanent operation and maintenance agreements; and
- All required calculations for design of the temporary and permanent stormwater management systems.

# Attachment A

## NDR10-0000 Construction General Permit

Permit No: NDR10-0000
Effective Date: April 01, 2015
Expiration Date: March 31, 2020

AUTHORIZATION TO DISCHARGE UNDER THE

NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Chapter 33-16-01 of the North Dakota Department of Health rules as promulgated under Chapter 61-28 (North Dakota Water Pollution Control Act) of the North Dakota Century Code,

Facilities both qualifying for and satisfying the requirements identified in Part I of the permit

are authorized to discharge stormwater associated with **construction activity**

to waters of the state

in accordance with conditions set forth in this permit.

This permit and the authorization to discharge shall expire at midnight,

March 31, 2020.

Signed this 31 day of March, 2015.

Karl H. Rockeman, P.E.
Director
Division of Water Quality

BP 2014.06.12

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# I. PERMIT COVERAGE AND LIMITATIONS

## A. Discharges Covered

1. This permit applies to all areas within the state of North Dakota, except for those areas defined as Indian Country. Construction activity located within Indian Country within the state of North Dakota must obtain a permit through the United States Environmental Protection Agency. If the construction activity is located with the jurisdiction of the state of North Dakota, and the United States Environmental Protection Agency, a permit must be obtained from both regulatory entities.

2. This permit applies to stormwater discharges associated with construction activity and small construction activity as defined in Title 40 of the Code of Federal Regulations (CFR), Parts 122.26(b)(14)(x) and (b)(15), respectively. The reference to construction activity in this permit includes both large construction activity and small construction activity as described below.

    a. Large construction activity includes clearing, grading and excavation, that disturbs land of equal to or greater than five (5) acres and includes the disturbance of less than five (5) acres of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb five (5) acres or more.

    b. Small construction activity includes clearing, grading and excavation, that disturbs land of equal to or greater than one (1) acre, and includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater that one (1) and less than five (5) acres.

    c. Discharges of stormwater from oil and gas exploration, production, processing or treatment operations, or transmission facilities composed of contaminated runoff by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished product, byproduct, or waste products located on the site of such operations.

3. Stormwater discharges from support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) may be covered by this permit as part of a related construction site. The support activities may only be in association with one project. If the support activity is associated with more than one project, a separate stormwater permit (Industrial or mining, extraction or paving material preparation) is required.

4. Certain non-stormwater discharges from facilities covered by this permit and meeting the requirements specified in Part II(A).

5. Stormwater discharges from construction activity covered by the previous permit, issued October 12, 2009, where a notice has been submitted to obtain coverage under this permit.

6. Projects which have obtained coverage under this permit shall amend and implement a Stormwater Pollution Prevention Plan (SWPPP) that meets the requirements of this permit within ninety (90) days of the effective date of this permit.

7. Discharges from dewatering activities related to construction activities (discharges of uncontaminated stormwater).

8. Local Authority. This permit does not preempt or supersede the authority of local agencies or operators of municipal separate storm sewer systems to prohibit, restrict, or control discharges of stormwater to storm sewer systems or other water courses within their jurisdiction.

## B. Discharges Not Covered

1. Stormwater discharges associated with industrial activity from any source other than construction activities described in Part I(A).

2. Post-construction discharges from industrial activity that originate from the site after construction activities have been completed at the site. Industrial and post-construction stormwater discharges may need to be covered by a separate stormwater permit.

3. The placement of fill into waters of the state requiring local, state, or federal authorizations (such as U.S. Army Corps of Engineers Section 404 permits).

4. This permit does not substitute for obligations under the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Wild and Scenic Rivers Act, or National Historic Preservation Act (NHPA), it is your responsibility to ensure the project and resulting discharges comply with the respective requirements.

5. Discharges to waters for which there is a total maximum daily load (TMDL) allocation for sediment and/or parameters associated with sediment transport are not covered unless you develop a Stormwater Pollution Prevention plan (SWPPP) that is consistent with the assumptions and requirements in the approved TMDL. To be eligible for coverage under this general permit, the SWPPP must incorporate the conditions applicable to the discharge necessary for consistency with the assumptions, allocations and requirements of the TMDL. If a specific numeric wasteload allocation has been established that would apply to discharges from construction activity, the permittee must incorporate that allocation into the SWPPP and implement necessary steps to meet that allocation. Information about TMDL allocations may be found at the following website: www.ndhealth.gov/WQ/SW/Z2_TMDL/default.htm.

6. Stormwater discharges that the department determines will cause, or have the reasonable potential to cause or contribute to a violation of the standards for quality for waters of the state (North Dakota Administrative Code (N.D.A.C.) 33-16-02.1).

7. Discharges from hydrostatic testing, well points, water line disinfection and treatment of gasoline or diesel contaminated groundwater.

8. Discharges of wash water using detergents, wastewater, or sanitary waste.

## C. Obtaining Coverage and Authorization Effective Date

1. To obtain authorization under this general permit for stormwater discharges you must submit a complete application and develop a SWPPP in accordance with Part II(C) of this permit. A SWPPP must be in place as a condition of the permit and a copy of the SWPPP must be retained by the permittee.

2. Permit coverage will become effective seven (7) days after you submit a complete application unless otherwise notified by the department (based on the department receipt date).

3. Upon the effective date of permit coverage you, as the permit applicant, are authorized to discharge stormwater from eligible activities under the terms and conditions of this permit.

## D. Application (Notice of Intent) Process

1. You must use a Notice of Intent (NOI) to complete your application. An NOI form (or a replacement application form) is available at the following website: www.ndhealth.gov/WQ/Storm/Construction/ConstructionHome.htm.

2. Application Content and Conditions.

   a. The owner, or owner jointly with the operator (usually the general contractor), shall submit a completed application for this permit. The owner is responsible for compliance with all terms and conditions of this permit. The operator has day to day supervision of construction activities and is jointly responsible with the owner for compliance with the permit conditions as they pertain to the construction activities delegated to the operator.

   b. The application (Notice of Intent) shall contain, at a minimum, the following information:

      (1) Owner name, mailing address and phone number;
      (2) Project contact name and phone number;
      (3) Project/site name;
      (4) Project/site location (street address; section, township, range; or latitude and longitude) and county;
      (5) A brief description of the construction activity;
      (6) The anticipated start date and the anticipated completion date for the project (if known);
      (7) The estimated total area of the site and the total area of disturbance in acres;
      (8) The name of receiving water(s), or the name of the municipal storm sewer system and receiving water(s);
      (9) The signature of the applicant(s), owner (and operator if co-applicants) signed in accordance with the signatory requirements in Part IV(A)(6) of this permit.

   c. A SWPPP (Part II(C)) for the project must be prepared and available for review, upon request, by the department at the time of application. A partially complete plan is acceptable when it clearly identifies the item(s) to be completed, the person(s) responsible for completing the item(s) and the deadline for completing the item(s). The SWPPP must be completed prior to the start of construction (or the applicable construction phase). You are not required to submit the SWPPP with the application unless otherwise notified by the department.

3. For residential construction activity occurring within a common plan of development (such as a subdivision) subject to the permit requirements, coverage may be obtained by the following:

   a. The owner of the lot(s) shall submit one (1) NOI for all of the owner's construction activity within the common plan of development, or

   b. The operator, such as a homebuilder who may represent one (1) or more lot owners, shall submit one (1) NOI for all of the operator's construction activity within each addition of the common plan of development.

      In addition, a SWPPP must be developed and implemented for the permittee's activities within the common plan of development. Additional phases of the common plan of development may be included under the initial application and permit coverage provided the SWPPP is amended to include the additional area or phases.

4. For oil and gas exploration, production, processing, treatment operations, or transmission facilities, which discharge contaminated stormwater, permit applications may be submitted for individual project sites or for an area of operations such as well field or by county.

5. Completed applications and any reports required by this permit shall be submitted to:

North Dakota Department of Health
Division of Water Quality
918 East Divide Avenue
Bismarck, ND 58501-1947

**E. Notice of Termination (NOT)**

1. Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) or other written request identifying the facility, reason why the permit is no longer needed and signed in accordance with Part IV(A)(6) of this permit. Compliance with the conditions of this permit is required until a NOT is submitted to the department.

2. Permittees may only submit a NOT after one of the following conditions have been met:

   a. Final stabilization (Part II(E)) has been achieved on all portions of the site for which the permittee is responsible.

   b. Another owner/operator/permittee has assumed control, in accordance with the transfer provisions (Part I(F)), over all areas of the site that have not achieved final stabilization.

   c. For residential construction only, a NOT is not required for each lot that is sold, transferred, or has achieved final stabilization. The permittee must modify their SWPPP to indicate that permit coverage is no longer required for that lot. The SWPPP shall indicate the reason why coverage is no longer needed and the date the lot was sold, transferred, or achieved final stabilization. In order to terminate coverage, all lots under the control of the owner or operator must be sold, transferred, or achieved final stabilization (Part II(E)).

**F. Transfer of Ownership or Control**

1. When the owner or operator of a construction project changes, the new owner or operator must submit a written request for permit transfer/modification within fourteen (14) days of assuming control of the site or commencing work on-site, or of the legal transfer, sale or closing on the property; except as provided in Part I(F)(2). Late submittals will not be rejected; however the department reserves the right to take enforcement for any unpermitted discharges or permit noncompliance. For stormwater discharges from construction activities where the owner or operator changes, the new owner or operator can implement the original SWPPP created for the project or develop and implement their own SWPPP. Permittee(s) shall ensure either directly or through coordination with other operators that their SWPPP meets all terms and conditions of this permit and that their activities do not interfere with another party's erosion and sediment control practices.

2. A permit transfer/modification request is not required for the legal transfer, sale or closing on a property between permittees covered by this permit. Examples include the sale of a property parcel from a developer to a builder, or the transfer of an easement from a developer to a local government authority. If the new party is not covered by this permit at the time of transfer or sale, then the new owner/operator must submit a completed application/NOI within 14 days of assuming control of the site.

## II. STORMWATER DISCHARGE REQUIREMENTS

### A. Prohibition of Non-Stormwater Discharges

The discharge of wastewater is not authorized by this permit. The following sources of non-stormwater discharges are allowed if they are not a significant source of pollution and are identified in the SWPPP: fire-fighting, fire hydrant flushing, potable water line flushing, equipment wash down without detergents or hazardous cleaning products, uncontaminated foundation drains, springs, surface water, lawn watering, chemical treatment of stormwater and air conditioning condensate. Impervious surface wash water may not be directed into any surface water or storm drain inlet unless appropriate pollution prevention measures have been implemented. Discharges may not come into contact with oil and grease deposits or any other toxic or hazardous materials (unless cleaned up using dry clean-up methods). The SWPPP must include a description of the pollution prevention measures to be implemented while non-stormwater discharges are occurring.

If chemical treatment for sediment removal is intended to be used on-site, the permittee shall provide the department with the information outlined in Appendix 1(A)(14) of this permit for approval prior to use. This information shall be provided to the department no later than sixty (60) days prior to use.

### B. Releases in Excess of Reportable Quantities

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302, nor the reporting requirements found in Chapter 33-16-02.1 of the North Dakota Administrative Code. Any releases which meet any reporting requirement, must be reported to the agencies identified in Part IV(A)(7).

### C. Stormwater Pollution Prevention Plans

All permittees shall implement a SWPPP for any construction activity requiring this permit until final stabilization is achieved. The SWPPP and revisions are subject to review by the department. The objectives of the SWPPP is to identify potential sources of sediment and other sources of pollution associated with construction activity, and to ensure practices are implemented and maintained to reduce the contribution of pollutants in stormwater discharges from the construction site to waters of the state and storm sewer systems. Stormwater management documents developed under other regulatory programs may be included or incorporated by reference in the SWPPP, or used in whole as a SWPPP if it meets the requirements of this part.

The SWPPP may identify more than one permittee and may specify the responsibilities of each permittee by task, area, and/or timing. Permittees may coordinate and prepare more than one SWPPP to accomplish this. However, in the event there is a requirement under the SWPPP for which responsibility is ambiguous or is not included in the SWPPP, each permittee shall be responsible for implementation of that requirement. Each permittee is responsible for assuring that their activities do not render another permittee's controls ineffective.

The SWPPP must incorporate the requirements provided in Appendix 1 and shall include the following information.

1. **Site Description**. Each plan shall provide a description of the construction activity and potential sources of pollution as indicated below:

    a. A description of the overall project and the type of construction activity;

b. Estimates of the total area of the site and the total area that is expected to be disturbed by excavation, grading, grubbing, or other activities during the life of the project;

c. A proposed timetable/schedule, or chart, of activities that includes major phases/stages, BMP implementation, BMP removal, disturbances, and stabilization for major portions of the site;

d. A description of the soil within the disturbed area(s);

e. The name of the surface water(s) and municipal storm sewer system at or near the disturbed area that will receive stormwater runoff from the project site; and

f. A site map which indicates the following items as applicable (more than one (1) map may be needed). If an item is not applicable, provide rationale describing why the item is not applicable to the construction activity:

1) Project boundaries;
2) Areas of ground disturbance during each phase/stage of the project;
3) Areas where disturbance will not occur, such as avoidance areas (e.g. wetlands, critical habitat, Threatened and Endangered Species, etc);
4) Drainage patterns including: flow direction (run-on and runoff);
5) Dividing lines, discharge points, and storm sewer system inlets which the site drains to or may be affected by the activity;
6) Pre-existing and final grades;
7) Location of all temporary and permanent sediment and erosion controls during each particular phase;
8) Location of any stormwater conveyances such as: retention ponds, detention ponds, ditches, pipes, swales, stormwater diversions, culverts, and ditch blocks;
9) Location of potential sources of pollution (e.g. portable toilets, trash receptacles, etc.);
10) Location of soil stockpiles;
11) Identify steep slopes;
12) Surface waters, including an aerial extent of wetland acreage;
13) Location of surface water crossings;
14) Locations where stormwater is discharged to surface waters;
15) Location of dewatering discharge points;
16) Locations of where chemical treatment of stormwater will be performed, including discharge points;
17) Fueling locations, vehicle and equipment maintenance areas, designated wash water collection site, lubricant and chemical storage, paint storage, material storage, staging areas, and debris collection area;
18) Location of any impervious surfaces upon completion of construction; and
19) Where included as part of the project, the site maps for off-site concrete/asphalt batch plants, equipment staging areas, borrow sites or excavated fill material disposal sites. Site maps must show items 1 through 18 of this section.

g. Projects that discharge stormwater which flows to a water body listed as impaired under section 303(d) of the Federal Clean Water Act due to sediment, suspended solids or turbidity must identify the water body and impairment in the SWPPP. The Department's 303(d) list may be found at the following website under Integrated Reports: www.ndhealth.gov/WQ/SW/Z2_TMDL/Integrated_Reports/B_Integrated_Reports.htm.

h. For water bodies which have a TMDL, the SWPPP must describe and conform to the Waste Load Allocations (WLA) of the water body as per Part II(C)(4)(g) of this permit. Information about TMDL allocations may be found at the following website: www.ndhealth.gov/WQ/SW/Z2_TMDL/default.htm.

2. **Narrative.** The SWPPP must include a narrative description of the selected operational controls and sediment and erosion controls as outlined in Part II(C)(3), Part II(C)(4), and Appendix 1 of this permit. When applicable, a description of the requirements for any additional environmental regulations (federal) and local requirements related to the project, as it relates to waters of the state, must also be included or incorporated by reference (e.g. The Wild and Scenic Rivers Act, The National Historic Preservation Act, The Endangered Species Act, Fish and Wildlife Coordination Act, National Environmental Policy Act, Section 404 of the Clean Water Act, etc.).

   The narrative shall describe at a minimum:

   a. The installation, removal (if applicable), and maintenance requirements of selected Best Management Practices (BMPs) for each phase/stage of construction activity;
   b. The rationale for the selection of all BMPs (calculations should be included if appropriate);
   c. Whether selected BMPs are temporary or permanent;
   d. Any descriptions of infeasibility or explanations as required in Part II, Part III(A), and Appendix 1 of this permit.

3. **Operational Controls**. The SWPPP shall describe the BMPs used in day to day operations on the project site that reduce the contribution of pollutants in stormwater runoff.

   a. The SWPPP must identify a person knowledgeable and experienced in the application of erosion and sediment control BMPs who will oversee the implementation of the SWPPP, and the installation, inspection and maintenance of the erosion and sediment control BMPs before and during construction, until a NOT is filed or the permit is transferred. A knowledgeable and experienced person is someone who meets the requirements of Part II(C)(3)(e) of this permit.

      The owner shall develop a chain of responsibility with all operators on the site to ensure that the SWPPP will be implemented and stay in effect until the construction project is complete, the entire site has undergone final stabilization, and a NOT has been submitted to the department.

   b. The SWPPP must include a description of good housekeeping practices used to maintain a clean and orderly site. The SWPPP shall describe how litter, debris, chemicals and parts will be handled to minimize exposure to stormwater. The SWPPP also shall describe what measures will be used to reduce and remove sediment tracked off-site by vehicles or equipment. In addition, the SWPPP shall describe methods which will be used to reduce the generation of dust.

   c. The SWPPP shall describe preventative maintenance practices used to ensure the proper operation of erosion and sediment control devices (e.g., fiber rolls, erosion control blankets and silt fences) and equipment used or stored on site. The SWPPP shall describe proper inspection procedures for ensuring proper operation of erosion and sediment control devices.

   d. The SWPPP shall describe spill prevention and response procedures where potential spills can occur. Specific handling procedures, storage requirements, spill containment, cleanup procedures, and disposal must be identified. Storage structures for petroleum products and other chemicals shall have adequate leak and spill protection to prevent any spilled materials from entering waters of the state or storm sewer systems.

      The potential discharge of hazardous substances in stormwater discharges shall be minimized by including measures onsite, detailed in the SWPPP to prevent and respond to releases of hazardous substances. If a reportable quantity release occurs, the SWPPP shall be revised to prevent the reoccurrence of such a release.

e. The SWPP shall outline how employees and responsible parties shall be trained on the implementation of the SWPPP. Training must be provided at least annually, as new employees or responsible parties are hired or as necessary to ensure compliance with the SWPPP and the general permit. Employees and responsible parties include individuals who are responsible for design, installation, maintenance and repair of stormwater controls and conducting inspections.

    1) On-site personnel must understand the requirements of this permit as it pertains to their role in implementing the SWPPP. On-site personnel must know:

        a. The purpose of the SWPPP, requirements of the SWPPP, and how the SWPPP will be implemented;

        b. The location of all BMPs identified in the SWPPP; and

        c. Correct installation, function, maintenance and removal (if applicable) of BMPs identified in the SWPPP.

    2) Personnel responsible for performing site inspections must understand when inspections must be conducted (Part III(A)), what must be inspected (Part II(C)(7), how to record findings, when to initiate corrective actions, and properly document corrective actions.

    3) Maintenance personnel must understand when maintenance must be performed on BMPs in order to maintain properly functioning BMPs and what needs to be recorded for corrective actions/maintenance records in accordance with Part III(A)(5) of this permit.

f. The SWPPP must describe how concrete grindings and slurry will be managed. Wastewater from concrete washout, cleanout or washout from: stucco, paint, joint compound, and other building materials shall not be discharged to waters of the state, storm sewer systems or curb and gutter systems.

    1) Wash water must be collected in leak-proof containers or leak-proof pits. Containers or pits must be designed and maintained so that overflows cannot occur due to inadequate sizing, precipitation events, or snowmelt.

g. The SWPPP shall describe any dewatering activities planned at the site. Dewatering or basin draining (e.g., pumped discharges, trench/ditch cuts for drainage) related to the permitted activity must be managed with appropriate BMPs, such that the discharge does not adversely affect the receiving water. The following conditions apply to dewatering activities:

    1) Dewatering is limited to un-contaminated stormwater, surface water, and groundwater that may collect on-site and those sources identified in Part II(A), if they are not a significant source of pollution. A separate permit must be obtained to discharge water from other sources such as hydrostatic testing of pipes, tanks, or other similar vessels; disinfection of potable water lines; pump testing of water wells; and the treatment of gasoline or diesel contaminated groundwater or surface water.

    2) The permittee(s) must operate the discharge to minimize the release of sediment and provide adequate BMPs where necessary to minimize erosion due to the discharge. Discharges must not lead to the deposition of sediment within stormwater conveyance systems or surface waters. Discharges must not cause or potentially cause a visible plume within a surface water body.

3) When dewatering, utilize structures or BMPs which allow for draw down to occur from the surface of the water, unless infeasible. If infeasible, documentation must be provided in the SWPPP. In addition, you must describe what BMP(s) will be used in its place.

4) In addition to the inspection requirements in Part III, dewatering activities shall be inspected daily. The inspection must include the dewatering site, areas where BMPs are being implemented and the discharge location. A record shall be maintained to document the inspections of the dewatering operation and actions taken to correct any problems that may be identified.

   a. Records shall contain at a minimum:

      i. Date and time of the inspection,
      ii. Inspector name,
      iii. Approximate volume of water discharged,
      iv. Findings of the inspection, including recommendations and schedule for corrective actions;
      v. Corrective actions taken (including dates, times, and party completing maintenance activities); and
      vi. Documentation that the SWPPP has been amended when changes are made to the dewatering activity in response to inspections.

5) Local authorities may require specific BMPs for discharges affecting their storm sewer system.

4. **Erosion and Sediment Controls**. Erosion and sediment controls and stabilization requirements must be implemented for each major phase of site activity (e.g., clearing, grading, building, and landscaping phases). A description of the erosion and sediment controls and site stabilization methods must be provided in accordance with Part II(C)(2) of this permit. Erosion and sediment controls, and site stabilization must conform to the requirements provided in Appendix 1. The description and implementation of controls shall address the following minimum components:

   a. The selection of erosion and sediment controls, and site stabilization shall consider the following:

      1. The expected amount, frequency, intensity, and duration of precipitation events;

      2. The nature of stormwater run-on and runoff from the site as well as changes during, and as a result of, construction activity. This includes changes to impervious surfaces, slopes, seasonal changes, and drainage features on-site;

      3. Channelized flow, must be handled in order to minimize erosion at outlets and to minimize impacts to downstream receiving waters;

      4. Soil types (wind and water erodibility, and settling time); and

      5. Seasonal conditions.

   b. Sediment basins, or an appropriate combination of equivalent sediment controls such as smaller sediment basins and/or sediment traps, silt fences, fiber logs, vegetative buffer strips, berms, etc., are required for all down slope boundaries of the disturbance area and for those side slope boundaries as may be appropriate for site conditions.

c. Temporary or permanent erosion protection and stabilization (such as cover crop planting or mulching) must be initiated immediately, as described in Appendix 1(A), for all exposed soil areas where activities have been completed or temporarily ceased.

d. All control measures must be properly selected, installed and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or incorrectly, the permittee must replace or modify the control for site situations. Corrective actions must be made prior to the next anticipated rainfall event of within 24 hours of discovery (whichever comes first) or as soon as field conditions allow. Documentation must be provided in the maintenance records if field conditions do not allow access along with a plan of action for performing maintenance activities.

   The permittee may deviate from the manufacturer's specifications and erosion and sediment control requirements in Appendix 1 if they provide justification for the deviation and document the rationale for the deviation in the SWPPP. Any deviation must provide equivalent erosion and sediment control.

e. If sediment escapes from the site, off-site accumulations of sediment must be removed in a manner and frequency sufficient to minimize off-site impacts as outlined in Appendix 1(B). The SWPPP must be modified to prevent further sediment deposition off-site.

f. Stormwater controls are expected to withstand and function properly during precipitation events of up to the 2-year, 24-hour storm event. Visible erosion and/or off-site sediment deposition from such storm events should be minimal. The 2-year, 24-hour rainfall event in North Dakota ranges from about 1.9 inches in the west to 2.3 inches in the east.

g. For projects that discharge stormwater which flows to a water body for which there is a TMDL allocation for sediment and/or parameters associated with sediment transport, the SWPPP must be consistent with the assumptions, allocations, and requirements in the approved TMDL. If a TMDL specifies certain BMPs or controls to meet a WLA applicable to the project's discharges, the BMPs or controls must be incorporated into the SWPPP. Information about TMDL allocations may be found at the following website: www.ndhealth.gov/WQ/SW/Z2_TMDL/default.htm.

5. **Stormwater Management**. The SWPPP must identify permanent practices incorporated into the project to control pollutants in stormwater discharges occurring after construction operations have been completed.

   a. Identify stormwater ponds; flow reduction methods; infiltration of runoff on-site; sequential systems which combine several practices or other post-construction stormwater management features.

   b. Identify velocity / energy dissipation devices placed at discharge locations and appropriate erosion protection for outfall channels and ditches.

   c. Maintenance for on-site stormwater management features is the responsibility of the permittee until the NOT is submitted or the feature is accepted by the party responsible for long term maintenance.

   d. The design, installation and use of stormwater management features must comply with applicable local, state or federal requirements.

6. **Maintenance**. All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. The SWPPP must indicate, as appropriate, the maintenance or clean out interval for sediment controls. If site inspections, required in Part III of this permit, identify BMPs that are not operating effectively, maintenance shall be arranged and accomplished in accordance to Appendix 1 or as soon as practicable.

7. **Inspections**. The SWPPP must provide for site inspections as outlined in Part III. The permittee shall ensure that personnel conducting site inspections are familiar with permit conditions and the proper installation and operation of control measures. Inspectors must be knowledgeable in their role of the SWPPP, as outlined in Part II(C)(3)(e) of this permit. The erosion and sediment control measures and stabilized areas identified in the SWPPP shall be observed to ensure they are operating correctly and in serviceable condition. Inspections shall include areas used for storage of materials, permanent stormwater control measures and vehicle maintenance areas. These areas shall be inspected for evidence of, or the potential for, pollutants entering a drainage system. If necessary, the plan shall be revised based on the observations and deficiencies noted during the inspection.

8. **SWPPP Review and Revisions**.

    a. The SWPPP shall be signed in accordance with the Signatory Requirements, Part IV(A)(6), and retained on-site for the duration of activity as outlined in Part III(B).

    b. The permittee shall make the SWPPP available upon request to the department, EPA, or, in the case of discharges to a municipal storm sewer system, the operator of the municipal system.

    c. The permittee shall amend the SWPPP whenever there is a change in design, construction, operation, maintenance, or BMPs. The SWPPP shall be amended if the plan is found to be ineffective in controlling pollutants present in stormwater. The SWPPP shall be amended as soon as practicable.

## D. Local Requirements

All stormwater discharges must comply with the requirements, policies, or guidelines of municipalities and other local agencies as applicable to the construction site. Any discharges to a storm sewer, ditch or other water course under the jurisdiction of a municipality must comply with any specific conditions or BMPs required by the municipality or agency.

## E. Final Stabilization

The permittee(s) must ensure final stabilization of the site. The permittee(s) should submit a NOT within 30 days after final stabilization has been achieved, or another owner/operator (permittee) has assumed control according to Part I(F) for all areas of the site that have not undergone final stabilization. Final stabilization can be achieved in one of the following ways.

1. All soil disturbing activities at the site have been completed and all soils must be stabilized by a uniform perennial vegetative cover with a density of 70 percent of the pre-existing cover over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;

    a. All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion;

b. All temporary erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization; and

c. The permittee(s) must remove all sediment from conveyances and temporary sedimentation basins that will be used as permanent water quality management basins. Sediment must be stabilized to prevent it from being washed into basins, conveyances or drainage ways discharging off-site or to surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

2. For areas of the state where the average annual rainfall is less than 20 inches, all soil disturbing activities at the site have been completed and erosion control measures (e.g., degradable rolled erosion control product) and stabilization methods are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years and achieve 70 percent of the pre-existing vegetative cover within three (3) years without active maintenance. Sites must meet the criteria outlined in items 1(a), (b), and (c) above.

3. Disturbed areas on land used for agricultural purposes that are restored to their pre-construction agricultural use are not subject to these final stabilization criteria. If the construction activity removed standing crop, the area must be restored in accordance with the landowner.

   Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to waters of the state, and areas which are not being returned to their pre-disturbance use must meet the final stabilization criteria in (1) or (2) above.

4. For residential construction only, final stabilization may be achieved when soil is stabilized (see Appendix 1(A)(3)) and down gradient perimeter control for individual lots has been implemented and the residence has been transferred to the homeowner. Additionally, the permittee must distribute a “homeowner fact sheet” to the homeowner to inform the homeowner of the need for, and benefits of, final stabilization. The permittee also must demonstrate that the homeowner received the fact sheet.

## III. SELF MONITORING AND REPORTING

### A. Inspection and Maintenance Requirements

1. Inspections shall be performed by or under the direction of the permittee at least once every 14 calendar days and within 24 hours after any storm event of greater than 0.25 inches of rain per 24-hour period. Inspections are only required during normal working hours. The permittee shall use a rain gauge on-site or utilize the nearest National Weather Service precipitation gauge station. Rain gauge locations or stations must be representative of the site.

   a. “Within 24 hours after any storm event greater than 0.25 inches rain per 24-hour period” means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. If there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

2. There may be times when a site inspection may not be practical at the specified time. Adverse climatic conditions, such as flooding, high winds, tornadoes, electrical storms, site access constraints, etc., may prohibit inspections. The permittee must include a description of why the inspection(s) could not be performed at the designated time in the next inspection record. If an inspection is delayed due to adverse weather conditions or rain events outside normal working hours, an inspection must be conducted during the next working day, or as conditions allow.

3. Some erosion and sediment control measures may require more frequent inspection based on location (e.g., sensitive areas or waters of the state) or as a result of recurring maintenance issues. Erosion or sediment control measures found in need of maintenance between inspections must be repaired or supplemented with appropriate measures as soon as practicable. Erosion and sediment control measures which require more frequent inspection based on location or as a result of recurring maintenance issues must be identified in the SWPPP.

4. All inspections conducted during construction must be recorded in writing and these records must be retained in accordance with Part III(B). Records of each inspection activity shall include:

    a. Date and time of inspections;

    b. Name of person(s) conducting inspections;

    c. Findings of inspections, including recommendations and schedule for corrective actions;

    d. Date and amount of all rainfall events greater than 1/4 inch (0.25 inches) in 24 hours; and

    e. Documentation that the SWPPP has been amended when changes are made to BMPs in response to inspections.

    f. All inspection reports shall be signed in accordance with Part IV(A)(6) of this permit.

5. Corrective actions (maintenance activities) performed during construction must be recorded in writing and these records must be retained in accordance with Part III(B). Records for maintenance activity shall include:

    a. Best Management Practice corrected;

    b. Date and time of corrective action;

    c. Name of person(s) performing corrective actions;

    d. Corrective actions taken; and

    e. Corrective actions/maintenance records shall be signed in accordance with Part IV(A)(6) of this permit.

6. Completed areas that have been stabilized but do not meet the 70 percent perennial vegetative cover criteria for final stabilization may be inspected once per month. Inspections may be suspended for parts of the construction site that meet final stabilization requirements of Part II(E) of this permit. The SWPPP must update to identify any areas which meet this condition.

7. Inspections may be suspended where earthwork has been suspended due to frozen ground conditions. The required inspections and maintenance must resume as soon as runoff occurs or the ground begins to thaw at the site. The permittee must record freeze/thaw and runoff dates as part of the inspection records.

## B. Records Location

A copy of the completed and signed NOI, coverage letter from the department, SWPPP, site inspection records, and this general permit shall be kept at the site of the construction activity in a field office, trailer, shed, or in a vehicle that is on-site during normal working hours. If the site does not have a reasonable on-site location, then the documents must be retained at a readily available alternative location; preferably with the individual responsible for overseeing the implementation of the SWPPP. Electronic copies of records are acceptable if the records can be accessed on-site. If the site is inactive, then the documents may be stored at a local office. Permittees should avoid using personal electronic devices for storing electronic records.

## IV. STANDARD CONDITIONS

### A. COMPLIANCE RESPONSIBILITIES BP 2014.12.08

**1. Duty to Comply**
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

**2. Proper Operation and Maintenance**
The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. If necessary to achieve compliance with the conditions of this permit, this shall include the operation and maintenance of backup or auxiliary systems.

**3. Planned Changes**
The department shall be given advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance. Any anticipated facility expansions, production increase, or process modifications which might result in new, different, or increased discharges of pollutants shall be reported to the department as soon as possible. Changes which may result in a facility being designated a "new source" as determined in 40 CFR 122.29(b) shall also be reported.

**4. Duty to Provide Information**
The permittee shall furnish to the department, within a reasonable time, any information which the department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the department, upon request, copies of records required to be kept by this permit. When a permittee becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or any report, it shall promptly submit such facts or information.

**5. Records Retention**
All records and information (including calibration and maintenance) required by this permit shall be kept for at least three years or longer if requested by the department or EPA.

**6. Signatory Requirements**
All applications, reports, or information submitted to the department shall be signed and certified.

All permit applications shall be signed by a responsible corporate officer, a general partner, or a principal executive officer or ranking elected official.

All reports required by the permit and other information requested by the department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the department; and

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

If an authorization under 6. Signatory Requirements is no longer accurate for any reason, a new authorization satisfying the above requirements must be submitted to the department prior to or together with any reports, information, or applications to be signed by an authorized representative.

Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**7. Twenty-four Hour Notice of Noncompliance Reporting**

1. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The following occurrences of noncompliance shall be included in the oral report to the department at 701.328.5210:

    a. Any lagoon cell overflow or any unanticipated bypass which exceeds any effluent limitation in the permit under 8. Bypass of Treatment Facilities;

    b. Any upset which exceeds any effluent limitation in the permit under 9. Upset Conditions; or

    c. Violation of any daily maximum effluent or instantaneous discharge limitation for any of the pollutants listed in the permit.

2. A written submission shall also be provided within five days of the time that the permittee became aware of the circumstances. The written submission shall contain:

    a. A description of the noncompliance and its cause;

    b. The period of noncompliance, including exact dates and times;

    c. The estimated time noncompliance is expected to continue if it has not been corrected; and

    d. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

    Reports shall be submitted to the address in **Part I(D) Application (Notice of Intent) Process**. The department may waive the written report on a case by case basis if the oral report has been received within 24 hours by the department at 701.328.5210 as identified above.

    All other instances of noncompliance shall be reported no later than at the time of the next Discharge Monitoring Report submittal. The report shall include the four items listed in this subsection.

**8. Bypass of Treatment Facilities**

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to any of the following provisions in this section.

Bypass exceeding limitations-notification requirements.

a. Anticipated Bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of bypass.

b. Unanticipated Bypass. The permittee shall submit notice of an unanticipated bypass as required under 7. Twenty-four Hour Notice of Noncompliance Reporting.

2. Prohibition of Bypass. Bypass is prohibited, and the department may take enforcement action against a permittee for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. The permittee submitted notices as required under the 8(a). Anticipated Bypass subsection of this section.

The department may approve an anticipated bypass, after considering its adverse effects, if the department determines that it will meet the three (3) conditions listed above.

**9. Upset Conditions**

An upset constitutes an affirmative defense to an action brought for noncompliance with erosion and sediment or site stabilization methods if the requirements of the following paragraph are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and the permittee can identify its cause(s);

2. The permitted facility was, at the time being, properly operated;

3. The permittee submitted notice of the upset as required under 7. Twenty-four Hour Notice of Noncompliance Reporting and

4. The permittee complied with any remedial measures required under 10. Duty to Mitigate.

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

**10. Duty to Mitigate**

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The permittee, at the department's request, shall provide accelerated or additional monitoring as necessary to determine the nature and impact of any discharge.

**11. Removed Materials**

Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner to prevent any pollutant from entering any waters of the state or creating a health hazard.

**12. Duty to Reapply**

Any request to have this permit renewed should be made 15 days prior to its expiration date.

## B. GENERAL REQUIREMENTS

**1. Inspection and Entry**

The permittee shall allow department and EPA representatives, at reasonable times and upon the presentation of credentials if requested, to enter the permittee's premises to inspect the construction activity and monitoring equipment, to sample any discharges, and to have access to and copy any records required to be kept by this permit.

**2. Availability of Reports**

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the department and EPA. As required by the Act, permit applications, permits, and effluent data shall not be considered confidential.

**3. Transfers**

This permit is not transferable except upon the filing of a Transfer/Modification request (Part I(F)) by the new party. The current permit holder should inform the new controller, operator, or owner of the existence of this permit and also notify the Department of the possible change.

**4. New Limitations or Prohibitions**

The permittee shall comply with any effluent standards or prohibitions established under Section 306(a), Section 307(a), or Section 405 of the Act for any pollutant (toxic or conventional) present in the discharge or removed substances within the time identified in the regulations even if the permit has not yet been modified to incorporate the requirements.

**5. Permit Actions**

This permit may be modified, revoked and reissued, or terminated for cause. This includes the establishment of limitations or prohibitions based on changes to Water Quality Standards, the development and approval of waste load allocation plans, the development or revision to water quality management plans, or the establishment of prohibitions or more stringent limitations for toxic or conventional pollutants and/or sewage sludges. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

**6. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

**7. State Laws**

Nothing in this permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation preserved under Section 510 of the Act.

**8. Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

**9. Property Rights**

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

**10. Severability**

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

## V. DEFINITIONS Permit Specific BP 2009.02.05

"303(d) List" or "Section 303(d) List" means a list of North Dakota's water quality-limited waters needing total maximum daily loads or TMDLs developed to comply with section 303(d) of the Clean Water Act. A copy of the latest integrated report is available on the state's web site at: www.ndhealth.gov/WQ/SW/Z2_TMDL/Integrated_Reports/B_Integrated_Reports.htm.

"Act" means the Clean Water Act.

"Bankfull" means the channel is filled to the top of one or both of its banks.

"BMP" or "Best Management Practices" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment requirements, operating procedures and practices to control construction site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

"Common Plan of Development or Sale" means a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

"Construction Activity" means construction activity as defined in 40 CFR part 122.26(b)(14)(x) and small construction activity as defined in 40 CFR part 122.26(b)(15). This includes a disturbance to the land that results in a change in topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated stormwater runoff, leading to soil erosion and movement of sediment into surface waters or drainage systems. Examples of construction activity may include clearing, grading, filling and excavating. Construction activity includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb one (1) acre or more. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility.

"Department" means the North Dakota Department of Health, Division of Water Quality.

"Energy Dissipation" means methods employed at pipe outlets to prevent erosion. Examples include, but are not limited to: concrete aprons, riprap, splash pads, and gabions that are designed to prevent erosion.

"Indian Country" means (1) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservations; (2) All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and (3) All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.

"Infeasible" means not technologically possible or not economically practicable and achievable in light of best industry practices.

"Immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

“Large Construction Activity” means land disturbance of equal to or greater than five (5) acres. Large construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale, if the larger common plan will ultimately disturb equal to or greater that five acres.

“Normal Wetted Perimeter” means the area of a conveyance, such as a ditch, channel, or pipe that is in contact with water during flow events that are expected to occur once every year.

“Non-Stormwater Discharges” means discharges other than stormwater. The term includes both process and non-process sources. Process wastewater sources that require a separate NDPDES permit include, but are not limited to industrial processes, domestic facilities and cooling water. Non-stormwater sources that may be addressed in this permit include, but are not limited to: fire-fighting, fire hydrant flushing, potable water line flushing, equipment wash down without detergents or hazardous cleaning products, uncontaminated foundation drains, springs, surface water, lawn watering, chemical treatment of stormwater and air conditioning condensate.

“Operator” means the person (usually the general contractor) designated by the owner who has day to day operational control and/or the ability to modify project plans and specifications related to the SWPPP. The person must be knowledgeable in those areas of the permit for which the operator is responsible and must perform those responsibilities in a workmanlike manner.

“Owner” means the person or party possessing the title of the land on which the construction activities will occur; or if the construction activity is for a lease holder, the party or individual identified as the lease holder; or the contracting government agency responsible for the construction activity.

“Permanently Ceased” means clearing and excavation within any area of your construction site that will not include permanent structures has been completed.

“Permanent Cover” means final stabilization. Examples include grass, gravel, asphalt, and concrete.

"Severe Property Damage" means substantial physical damage to property, damage to best management practices which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in construction.

"Significant Materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

"Significant Spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or Section 102 of CERCLA (see 40 CFR 302.4).

“Small Construction Activity” means land disturbance of equal to or greater than one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale, if the larger common plan will ultimately disturb equal to or greater than one and less than five acres

"Stabilized" means the exposed ground surface has been covered by appropriate materials such as mulch, staked sod, riprap, erosion control blanket, or other material that prevents erosion from occurring. Grass seeding alone is not stabilization. Snow cover and frozen ground conditions are not considered stabilized.

“Steep Slopes” means slopes which are fifteen (15) percent or greater in grade.

"Stormwater" means stormwater runoff, snow melt runoff, and surface runoff and drainage.

“Stormwater Associated with Industrial Activity” means stormwater runoff, snow melt runoff, or surface runoff and drainage from industrial activities as defined in 40 CFR 122.26(b)(14).

“Stormwater Associated with Small Construction Activity” means the discharge of stormwater from:

(i) Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than once acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility.

(ii) Any other construction activity designated by EPA or the department, based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the state.

“Temporarily Ceased” means clearing, grading, and excavation within any area of the site that will not include permanent structures, will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future.

"Temporary Erosion Protection" means methods employed to prevent erosion. Examples of temporary cover include; mulch, straw, erosion control blanket, wood chips, tackifiers, and erosion netting.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with permit requirements because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed erosion and sediment controls or site stabilization methods, inadequate erosion and sediment controls or site stabilization methods, lack of preventive maintenance, or careless or improper operation.

“Waters of the State” means any and all surface waters that are contained in or flow in or through the state of North Dakota as defined in NDCC 61-28-02. This definition includes all water courses, even if they are usually dry.

“You” means the owner, operator or permittee as appropriate.

**Appendix 1 – Erosion and Sediment Control Requirements**

Requirements for designing, implementing and maintaining erosion and sediment controls.

## A. Erosion and Sediment Control Practices

1. Sites using temporary (or permanent) sediment basins must meet the following requirements:

    a. Sediment basins shall be designed for a calculated volume of runoff from a 2-year, 24-hour storm per acre drained to the basin and provides not less than 1,800 cubic feet of sediment storage below the invert of the outlet pipe from each acre drained to the basin; or

    b. Basins shall be sized to provide 3,600 cubic feet of sediment storage below the invert of the outlet pipe per acre drained to the basin if calculations are not performed.

    c. Basin outlets must be designed to avoid short-circuiting and the discharge of floating debris. Basins must be designed with the ability to allow complete basin drawdown for maintenance activities. Basins must release the storage volume in at least 24 hours. Outlet structures must be designed to withdraw water from the surface, unless not practicable. If not practicable, rationale must be provided in the SWPPP. The basin must have a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.

2. Erosion, sediment, and stabilization practices shall be provided. Erosion, sediment and stabilization practices include such things as: silt fences, fiber logs, vegetative buffer strips, erosion control blankets, mulch, hydro-seeding combined with mulch or tackifiers, etc.

3. All exposed soil areas must be stabilized (see definitions). Stabilization must be initiated immediately where activities have been permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding fourteen (14) calendar days. Stabilization must be completed as soon as practicable, but no later than fourteen (14) calendar days after the initiation of soil stabilization. Temporary stockpiles without significant silt, clay or organic components (e.g., clean aggregate stockpiles, demolition concrete stockpiles, sand stockpiles) are exempt from this requirement.

    a. For slopes with a grade of 3:1 or greater, stabilization must be initiated immediately once activities have been completed or temporarily ceased. Stabilization must be completed as soon as practicable, but no later than seven (7) calendar days after the initiation of soil stabilization.

4. Temporary soil stockpiles must have effective sediment controls, and cannot be placed in surface waters, including stormwater conveyances such as curb and gutter systems, or conduits and ditches.

5. The normal wetted perimeter of any temporary or permanent drainage ditch that drains water from a construction site, or diverts water around a site, must be stabilized at least 200 linear feet from the property edge, or from the point of discharge to any surface water. Stabilization shall be completed prior to connection with a surface water. Any remaining portion of the temporary or permanent drainage ditch must be stabilized within fourteen (14) calendar days for portions which construction activities have temporarily or permanently ceased.

6. If stabilization requirements cannot be met due to circumstances beyond the control of the permittee, the permittee may comply with following:

    a. If vegetative stabilization is to be used, immediately initiate, and within 14 calendars days complete, the installation of temporary non-vegetated stabilization; or

    b. Complete all methods of initiating stabilization as soon as conditions or circumstances allow.

If any conditions in parts a or b above are encountered, the permittee must document the circumstances which prevented you from meeting the stabilization requirements in the SWPPP of this paragraph and provide a schedule in the SWPPP which will be followed in order to meet the stabilization requirements.

Permittees are responsible for implementing winter stabilization methods during frozen ground conditions if the site was not stabilized prior to the ground freezing.

7. Stream diversions or any temporary or permanent drainage ditch or trench, which will have continuous flow, shall be stabilized with appropriate controls prior to connection with any surface water. The entire area (channel and bank) of the stream diversion or temporary or permanent drainage ditch, or trench, must be appropriately stabilized to bankfull height.

8. While working in or around surface waters, sediment and erosion controls must be used above the anticipated level of the surface water. Floating silt curtain does not satisfy the down slope and side slope boundary requirements in Part II(C)(4)(b) of this permit, unless the construction activity is on or below the elevation of the surface water. The floating silt curtain must be placed as close to shore as possible. Sediment control must be installed where exposed soils drain to the surface water immediately after construction activity along the waterline has been completed.

9. Pipe and culvert outlets must be provided with energy dissipation within 24 hours of connection to a surface water.

10. Splash pads and/or downspout extensions must be provided for roof drains to prevent erosion from roof runoff.

11. All storm drain inlets in the immediate vicinity of the construction site must be protected by appropriate BMPs during construction until all disturbed areas and stockpiles with the potential to discharge to the inlet have been stabilized. This includes storm drain inlets which may be affected by sediment tracked onto paved surfaces by vehicles or equipment.

12. Inlet protection devices are a last line of control – erosion and sediment control practices must be used on-site. Inlet protection devices must conform to local ordinances or regulations. In general, inlet protection devices need to provide for adequate drainage to prevent excessive roadway flooding. Inlet protection may be removed for a particular inlet if a specific concern (i.e., street flooding/freezing, snow removal) has been identified and documented in the SWPPP. In this situation, additional erosion and sediment control practices, or stabilization methods must be used to supplement the loss of the inlet protection device to prevent sediment from entering the storm sewer system.

13. Vegetated buffers must have a minimum width of 1 foot for every 5 feet of disturbed area that drains to the buffer. The width of the buffer shall have a slope of 5 percent or less and the area draining to the buffer shall have a slope of 6 percent or less. Concentrated flows should be minimized throughout the buffer.

    Buffers shall consist of dense grassy vegetation, 3 to 12 inches tall with uniform coverage over 90 percent of the buffer. Woody vegetation shall not be counted for the 90 percent coverage. No more than 10 percent of the overall buffer may be comprised of woody vegetation.

14. A 50 foot natural buffer or equivalent erosion and sediment controls must be provided when a project is within 50 feet of a surface water and stormwater flows to the surface water. If equivalent erosion and sediment controls are used, rationale for using equivalent controls must be provided in the SWPPP.

If working within 100 feet of a surface water listed as impaired for sediment, suspended solids or turbidity, a 100 foot natural buffer or equivalent sediment and erosion controls must be provided. If equivalent erosion and sediment controls are to be used, rationale for using equivalent controls must be provided in the SWPPP.

15. If the permittee(s) intend to use chemical treatment for sediment removal, they must be used in accordance with the manufacturer's specifications. Treatment chemicals must be selected appropriately for the anticipated soil particle size and characteristics of the stormwater (pH, turbidity, flow rate of stormwater flowing into the chemical treatment system, etc.). A description of the chemical treatment process must be included in the SWPPP.

    a. To ensure selection and management of chemicals minimize the potential for harmful effects in the discharge, the permittee shall provide a written request to the department for review and approval. Additional monitoring and reporting may be required as a condition for the approval to discharge.

       A request to discharge chemically treated water shall include all of the following information and be provided sixty (60) days prior to use:

       i. Material Safety Data Sheet/Safety Data Sheet (MSDS/SDS);
       ii. Proposed water additive discharge concentration;
       iii. Discharge frequency (i.e., number of hours per day and number of days per year);
       iv. Monitoring point for product discharge;
       v. Type of removal treatment, if any, that the water additive receives prior to discharge;
       vi. Product function (e.g., coagulant, flocculant, etc.);
       vii. A 48-hour $LC_{50}$ or $EC_{50}$ for a North American freshwater planktonic crustacean (*Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp.); and
       viii. Results for a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean).

    b. Discharges from the chemical treatment of stormwater must not cause a violation of the standards of quality for waters of the state (N.D.A.C. § 33-16-02.1). The discharge must meet the dewatering or basin draining requirements provided in Part II(C)(3)(g) of this permit.

16. Minimize the duration of exposed soils on steep slopes.

**B. Maintenance Requirements for Erosion and Sediment Controls**

1. All erosion prevention and sediment control BMPs must be inspected to ensure integrity and effectiveness. All nonfunctional BMPs must be repaired, replaced, maintained or supplemented with functional BMPs. If a nonfunctioning BMP is supplemented, the nonfunctional BMP shall be removed. Corrective actions must be made prior to the next anticipated rainfall event or within 24 hours of discovery (whichever comes first), or as soon as field conditions allow access. Documentation must be provided in the maintenance records if field conditions do not allow access along with a plan of action for performing maintenance activities.

   Permittee(s) must investigate and comply with the following inspection and maintenance requirements:

   a. All control devices similar to, and including, silt fence or fiber rolls must be repaired, replaced, maintained or supplemented when they become nonfunctional (torn from posts, visible tears, etc.). Collected sediment must be removed as it approaches 1/2 of the above ground capacity of the control device.

   b. Fiber rolls must be replaced when 1/2 of the original above ground height of the device when it was installed has been lost as a result of flattening or other damage.

c. Sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access. Documentation must be provided in the maintenance records if field conditions do not allow access along with a plan of action for performing maintenance activities.

d. Maintenance and cleaning of inlet protection devices must be performed when sediment accumulates, the filter becomes clogged, and/or performance is compromised.

2. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment deposited by erosion. Permittees must remove all deltas and sediment deposits in surface waters, drainage ways, catch basins, and other drainage systems. Areas where sediment removal results in exposed soil must be stabilized. Removal and stabilization must take place immediately, but no more than, seven (7) calendar days after the discovery unless precluded by legal, regulatory or physical access constraints. Permittees shall use all reasonable efforts to obtain access. If precluded, removal and stabilization shall take place immediately, but no more than, seven (7) calendar days after obtaining access. Permittees are responsible for contacting all local, regional, state, and federal authorities, and receiving any applicable permits prior to conducting any work.

3. Vehicle tracking of sediment from the site must be minimized by BMPs. This may include having a designated egress with aggregate surfacing from the site or by designating off-site parking. Permittees are responsible for (or making the arrangements for) street sweeping and/or scraping if BMPs are not adequate to prevent sediment from being tracked onto the street from the site.

   Construction site egress locations must be inspected for evidence of sediment being tracked offsite by vehicles or equipment onto paved surfaces. Accumulations of tracked and deposited sediment must be removed from all off-site paved surfaces by the end of the work day, shift or if applicable, within a shorter time specified by local authorities or the department.

4. If sediment escapes the construction site, off-site accumulations of sediment must be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in streets could be washed into storm sewers by the next rain event and/or pose a safety hazard to users of public streets).

5. Vegetative buffers must be inspected for proper distribution of flows, sediment accumulation and signs of rill formation. If a buffer becomes silt covered, contains rills, or is otherwise rendered ineffective, other control measures shall be implemented. Eroded areas shall be repaired and stabilized within 24 hours of discovery, or as soon as conditions allow access. Documentation must be provided in the maintenance records if field conditions do not allow access along with a plan of action for performing maintenance activities.

**C**. **Operational Controls**

1. Properly handle construction debris and waste materials.

   a. Debris and waste must be handled appropriately until disposal. Litter and debris shall be collected and stored to reduce the potential for wind and water to carry the materials off-site or leachate discharging from a site. Collected material shall be taken to the appropriate facility for disposal or recycling.

   b. Liquid or soluble materials including oil, fuel, paint and any other hazardous substances must be properly stored, to prevent spills, leaks or other discharges. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of liquid or soluble material must be in compliance with applicable regulations.

2. Wash water containments must be cleaned out (solids and liquid) before 80 percent of storage capacity is attained.

3. Best management practices used in surface waters must be cleaned immediately upon removal from surface waters to prevent the transfer of aquatic nuisance species.

# Attachment B

## Permitting Documentation (NOI, Permit Card, Permit Letters, Blank NOT/MOD)

# APPLICATION (NOTICE OF INTENT) TO OBTAIN COVERAGE UNDER NDPDES GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (NDR10-0000)

NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF WATER QUALITY
SFN 19145 (04/15)

FOR DEPT. USE ONLY

| Application No. |
|---|
| Date Received |

## GENERAL INFORMATION

| 1. Name of Owner of Construction Project | 2. Contact First Name | 3. Contact Last Name | 4. Contact Phone No. |
|---|---|---|---|
| Sunflower Wind Project, LLC | Dane | Peacock | (415) 671-4449 |

| 5. Contact E-mail Address |
|---|
| dpeacock@sunedison.com |

| 6. Mailing Address | 7. City | 8. State/Province | 9. Zip Code |
|---|---|---|---|
| 179 Lincoln Street, Suite 500 | Boston | MA | 02111 |

| 10. Name of Operator Working at Site | 11. Contact First Name | 12. Contact Last Name | 13. Contact Phone No. |
|---|---|---|---|
| MA Mortenson Construction | Tim | Kannmacher | (763) 287-5179 |

| 14. Contact E-mail Address |
|---|
| tim.kannmacher@mortenson.com |

| 15. Mailing Address | 16. City | 17. State/Province | 18. Zip Code |
|---|---|---|---|
| 700 Meadow Lane North | Minneapolis | MN | 55422 |

## PROJECT INFORMATION

| 19. Name of Construction Project |
|---|
| Sunflower Wind Project |

| 20. Brief Description of Construction Activity |
|---|
| Install of up to 53 turbines, substation, met towers, operation and maintenance building, temporary laydown yard and temporary concrete batch plant. Underground elec collection, gravel access roads and crane paths |

| 21. Project Start Date | 22. Estimated Completion Date | 23. Estimated Total Area of Site (acres) | 24. Estimated Area of Disturbance (acres) |
|---|---|---|---|
| 08/15/2015 | 06/01/2017 | 12,022 | 430 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Project Location | 25. Physical Address: Near 40th Street and County Road 90 | | | 26. City: near Hebron | | |
| | OR | 27. Township: 139 | 28. Range: 90 | 29. Section: 16 | 30. Quarter Section (ABCD Format): Mult | 31. County: Stark and Morto |
| | | 32. Latitude (Decimal Degrees): 46.83 | | | 33. Longitude (Decimal Degrees): -102.05 | |
| Receiving Waters | 34. Name of Municipal Storm Sewer System or Description of Receiving Water: Heart Butte Ck, Big Muddy Ck, Knife River, Upper Heart River, Lower Heart River | | | | | |

35. A SWPPP must be prepared and available for review at the time of application. You are not required to submit the SWPPP with the application unless otherwise notified by the department. The SWPPP must be completed prior to the start of construction (or the applicable construction phase). Please refer to Part I(D)(2)(c) of the permit.

**RETURN COMPLETED APPLICATION TO:**

North Dakota Department of Health
Division of Water Quality, 4th Floor
918 East Divide Avenue
Bismarck, ND 58501-1947

Telephone: (701) 328-5210
Fax: (701) 328-5200

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

| 36. Printed Name of Owner(s) | 37. Title |
|---|---|
| Dane Peacock | Assistant Secretary |
| 38. Signature of Owner(s): Dane Peacock | 39. Date: August 5, 2015 |
| 40. Printed Name of Operator(s) | 41. Title |
| Tim Kannmacher | Construction Executive |
| 42. Signature of Operator(s): Tim Kannmacher | 43. Date: 8/5/2015 |

Submission of this application is notice that the owner(s) and operator(s) identified on the application intend to discharge stormwater associated from construction activity to waters of the state in accordance with conditions set forth in North Dakota Pollution Discharge Elimination System general permit NDR10-0000.

Permit coverage becomes effective seven days after a complete application is submitted (based on the department receipt date) unless otherwise notified by the department.

## General Information

1. **Name of Owner of Construction Project.** Enter the individual, company, organization or state who owns the property where the construction project is to take place. "Owner" means the person or party possessing the title of the land on which the construction activities will occur; or . . . for a lease holder, the party or individual identified as the lease holder; or the contracting government agency responsible for the construction activity.

2-3. **Contact Person.** Provide the contact person for the owner. If the contact person is an agent of the owner, such as a consultant, provide this information on a separate page.

4. **Contact Phone No.** Provide a valid phone number for the contact person.

5. **E-mail Address.** Provide a valid e-mail address for the contact.

6-9. **Mailing Address.** Provide a valid mailing address for the owner.

10. **Name of Operator Working at Site (attach additional, if needed).** List the operator(s) who will be responsible for the construction activities at the site. The operator is someone who has day to day supervision of construction activities and is jointly responsible with the owner for compliance with the permit conditions as they pertain to the construction activities delegated to the operator.

11-12. **Contact Person Name.** State the contact person who will be responsible for overseeing construction activities at the site for the operator.

13. **Contact Phone No.** Provide a valid phone number for the contact person.

14. **E-mail Address.** Provide a valid e-mail address for the contact.

15-18. **Mailing Address.** Provide a valid mailing address for the operator.

## Project Information

19. **Name of Construction Project.** Provide a descriptive, but brief, name of the construction project. Limit the name to 75 characters.

20. **Brief Description of Construction Activity.** Provide a brief description of the scope of work for the construction project.

21. **Project Start Date.** Provide the estimated project start date.

22. **Project end date.** Provide the estimated project end date, if known. The date provided does not imply that the permit will expire on the projected end date. The permit will be terminated only after a notice of termination is submitted to the department.

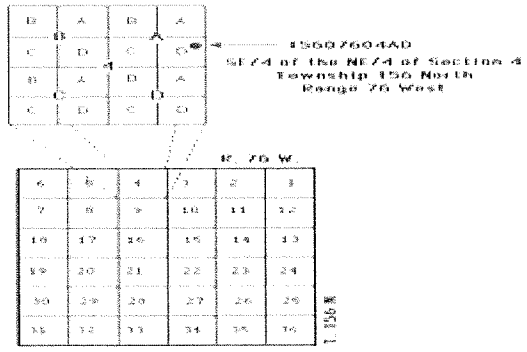
23. **Estimated Total Area of Site.** Enter the estimated acreage of the site/property in acres.

24. **Estimated Area of Disturbance.** Enter the estimated total acreage of land to be disturbed by construction activity.

25. **Physical Address.** Enter a physical address if one is available. For residential construction, avoid using a recorded plat survey, such as lot and block number. If a street addresses it not available, please use an alternative project location description (boxes 23 through 26).

26. **City.** Enter city in which project is located. If the project is located in a rural area, enter the nearest city.

Provide the quarter section in the ABCD format. See below.




31. **County.** Provide the county in which the project is occurring.

32-33. **Latitude and Longitude.** Provide the latitude and longitude in decimal degrees at the center of the site.

34. **Municipal Storm Sewer System or Description of Receiving Water.** If the project is located within city limits, enter the name of the city along with receiving water of the city storm sewer. Provide the name of the receiving body of water if outside city limits (i.e. Red River, unnamed tributary to Cherry Creek, wetlands, etc.).

## Stormwater Pollution Prevention Plan (SWPPP) Requirements

35. As part of the permit, a SWPPP must be developed and available for review at the time of application. You are not required to submit the SWPPP with the application unless otherwise notified by the department. The SWPPP must be completed prior to the start of construction (or the applicable construction phase). Please refer to Part I(D)(2)(c) of the permit.

## Signature Information

36-39. **Owner Information.** The signatory must be a responsible corporate officer, general partner, principal executive officer, or ranking elected official as required in Part IV.6.a of the permit number NDR10-0000.

40-43. **Operator Information.** The signatory must be a responsible corporate officer, general partner, principal executive officer, or ranking elected official as required in Part IV.6.a of the permit number NDR10-0000.

Please Note: Some internet browsers may not display the form properly and some features of the form may not be available or displayed. If you experience issues viewing the form, please read the following options for possible solutions:

In Firefox® browser: Go to the tools menu>options>applications. Under the actions column for Portable Document Format, change to Use Adobe® Reader in the drop down menu.

In Google Chrome™ Browser: Go to the address bar and type in chrome://plugins/ and click enter. Once in the plugin menu, go to the Chrome pdf viewer and click disable. Then go to the Adobe® Reader viewer and click enable. Once these changes are made, refresh the document.

# Sunflower NOI Addendum

Project Location Additional Information

#27-31:

The Sunflower Wind Project site is located in Stark and Morton County near the City of Hebron. A central intersection is approximately 40th Street and County Road 90. The site is bordered upon the north by I-94 and 2nd Street NW, upon the south by 43rd Street SW, the west by 80th Avenue SW and the east by County Road 89. Refer to Appendix E of this SWPPP for the full vicinity map.

| Section | Township | Range |
|---|---|---|
| 16, 19-23, 26-32 | 139 N | 90 W |
| 24-26, 36 | 139 N | 91 W |
| **Latitude and Longitude Points (Decimal)** | | |
| Latitude | 46.83357 | |
| Longitude | -102.05476 | |

# NOTICE OF TRANSFER/MODIFICATION OF COVERAGE UNDER (NDPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (NDR10-0000)

NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF WATER QUALITY
SFN 54242 (05/15)

**For Dept. Use Only**

Date Received:___/___/___

This form may be used to modify existing permit information for a permitted site. The form also may be used when an owner or operator of a construction project changes (see Part I.F of NDR10-0000). The new owner or operator may implement the original SWPP plan or develop a new SWPP plan. New permittees must ensure either directly or through coordination with others that their SWPP plan will meet the terms and conditions of the permit and will not interfere with another party's SWPP plan.

**PERMIT ID NUMBER: NDR10-** ____

**REASON FOR MODIFICATION :**

☐ Add Owner ☐ Add Contractor ☐ Remove Contractor

☐ Change from Sole-Permittee to Co-Permittee

**MODIFICATION INFORMATION**

| Company Name | Contact Person | | Phone Number |
|---|---|---|---|
| | | | |
| **Mailing Address** | **City** | **State/Province** | **Zip Code** |
| | | | |

**OR:**

☐ New Owner ☐ New Contractor ☐ Address Change ☐ Company Name Change

**OLD INFORMATION**

| Company Name | Contact Person | | Phone Number |
|---|---|---|---|
| | | | |
| **Mailing Address** | **City** | **State/Province** | **Zip Code** |
| | | | |

**NEW INFORMATION**

| Company Name | Contact Person | | Phone Number |
|---|---|---|---|
| | | | |
| **Mailing Address** | **City** | **State/Province** | **Zip Code** |
| | | | |

**OTHER:**

☐ New Project Name

☐ Other

**CERTIFICATION STATEMENT**

**Return Completed Form to:**

North Dakota Department of Health
Division of Water Quality, 4th Floor
918 East Divide Avenue
Bismarck, ND 58501-1947

Telephone: 701.328.5210
Fax: 701.328.5200

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Printed Name of Owner | Title |
|---|---|
| | |
| **Signature of Owner** | **Date** |
| | |

(Attach additional pages if needed)

# NOTICE OF TERMINATION TO CANCEL COVERAGE UNDER NDPDES GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (NDR10-0000)

NORTH DAKOTA DEPARTMENT OF HEALTH
DIVISION OF WATER QUALITY
SFN 19146 (04/15)

**FOR DEPT. USE ONLY**

Date Received: ____/____/_____

## GENERAL INFORMATION

| Name of Construction Project | | Permit ID Number **NDR10-** | |
|---|---|---|---|
| Name of Owner of Construction Project | Contact Person Name ( Mr / Ms ) | Contact Phone No. | |
| Mailing Address | City | State/Province | Zip Code |

Please indicate which condition has been met before submitting the NOT.

☐ The site has achieved final stabilization. In order to achieve final stabilization, one of the following conditions must be met. Please indictate which condition has been met.

☐ All soil disturbing activities are complete and all soils are stabilized by a uniform perennial vegetative cover with a density of 70 percent of the pre-existing cover over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;

i. All drainage ditches which drain water from the site have been stabilized;

ii. All temporary erosion prevention and sediment control BMPs (e.g., silt fence) have been removed; and

iii. All sediment has been removed from conveyances and temporary sediment basins used for permanent water quality management, and the sediment has been stabilized. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

☐ For areas with an average annual rainfall of less than 20 inches, all soil disturbing activities at the site have been completed and erosion control measures and stabilization methods have been selected, designed and installed along with an appropriate seed base to provided erosion control for three years and achieve 70 percent vegetative coverage within three (3) years without active maintenance. Sites must meet the conditions above.

☐ Disturbed areas on land used for agricultural purposes that are restored to their pre-construction agricultural use are not subject to these final stabilization criteria. If the construction activity removed standing crop, the area must be restored in accordance with the landowner.

Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to waters of the state, and areas which are not being returned to their pre-disturbance use must mee the final stablization criteria above.

☐ For residential construction, all lots have been sold with temporary erosion protection and down gradient perimeter controls installed; a homeowner fact sheet has been given to the homeowner(s); and all other lots have achieved final stabilization.

If another operator/permittee has assumed control in accordance with the transfer provision (Part I(F) of the permit over all areas of the site that have not achieved final stabilization please file a Notice of Transfer/Modification Form (SFN 54242).

## CERTIFICATION STATEMENT

**Return Completed Form to:**

North Dakota Department of Health
Division of Water Quality, 4th Floor
918 East Divide Avenue
Bismarck, ND 58501-1947

Telephone: 701.328.5210
Fax: 701.328.5200

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

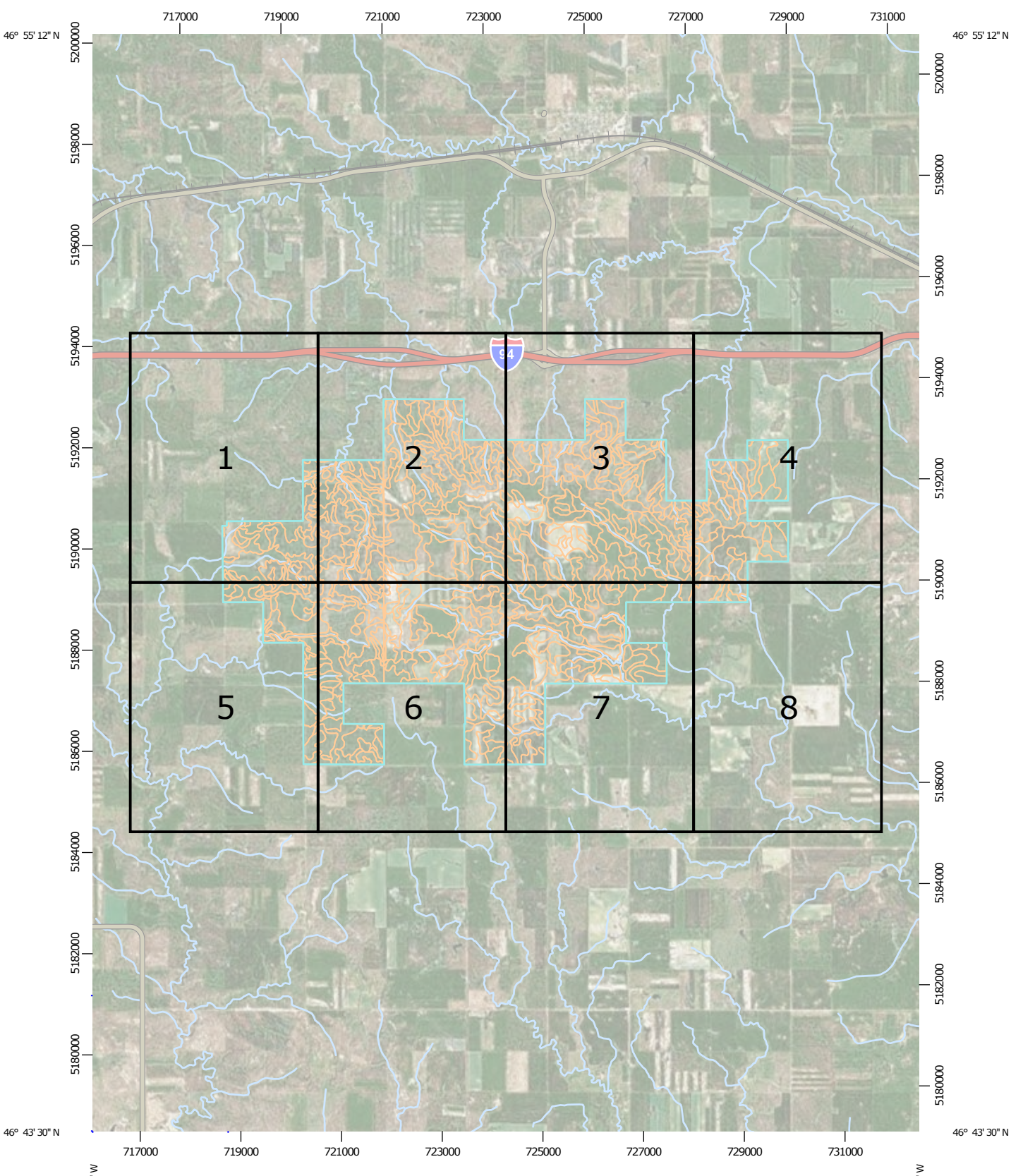
| Printed Name of Owner | Title |
|---|---|
| Signature of Owner | Date |

(Attach additional pages if needed)

# Attachment C

# Soil Maps

Soil Map—Morton County, North Dakota, and Stark County, North Dakota
(Sunflower Wind Project)
Index Sheet




Map Scale: 1:106,000 if printed on A portrait (8.5" x 11") sheet.

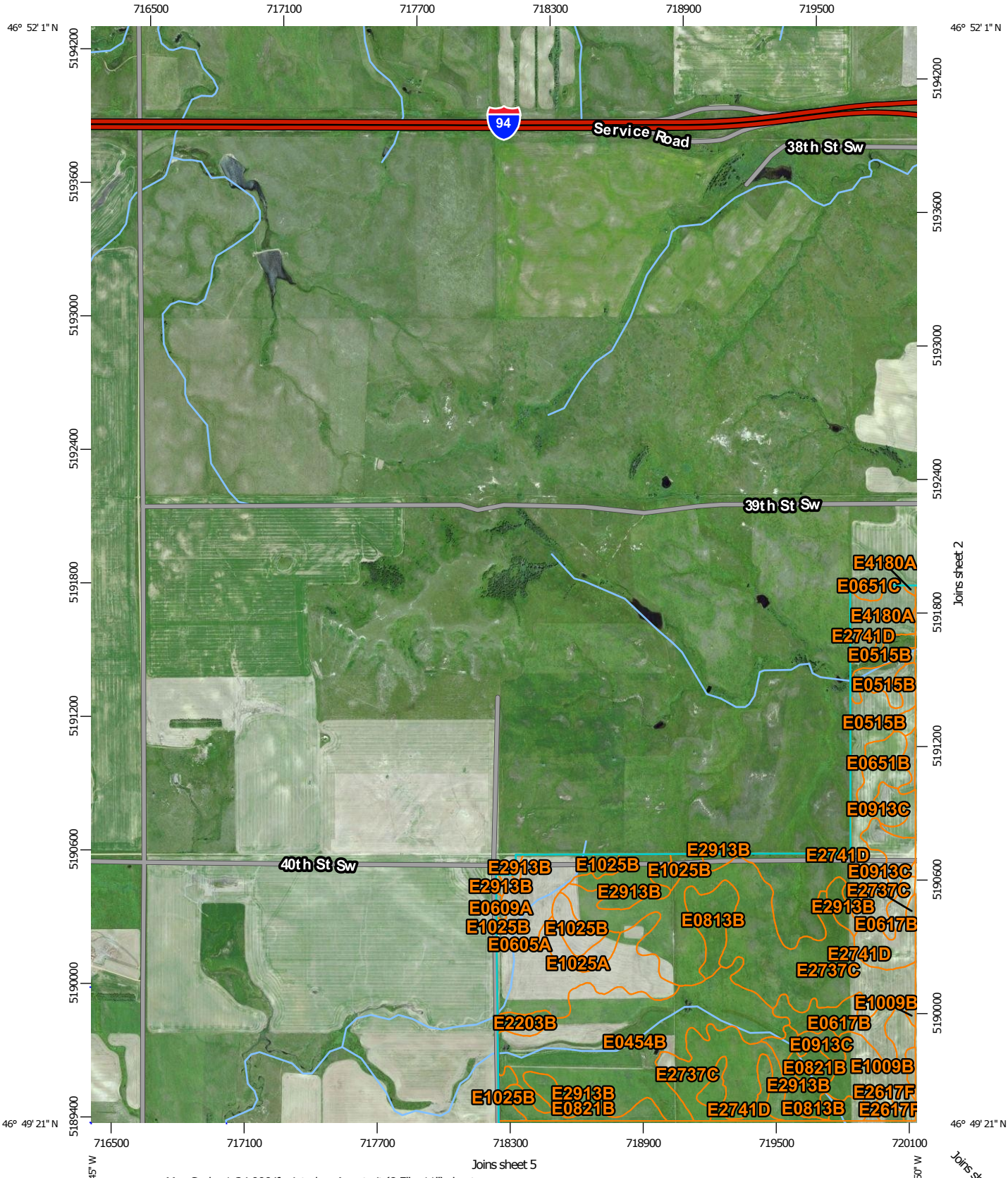
N

Meters
0 1500 3000 6000 9000

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

Soil Map—Morton County, North Dakota, and Stark County, North Dakota
(Sunflower Wind Project)
Map sheet 1 of 8



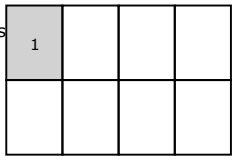

Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.

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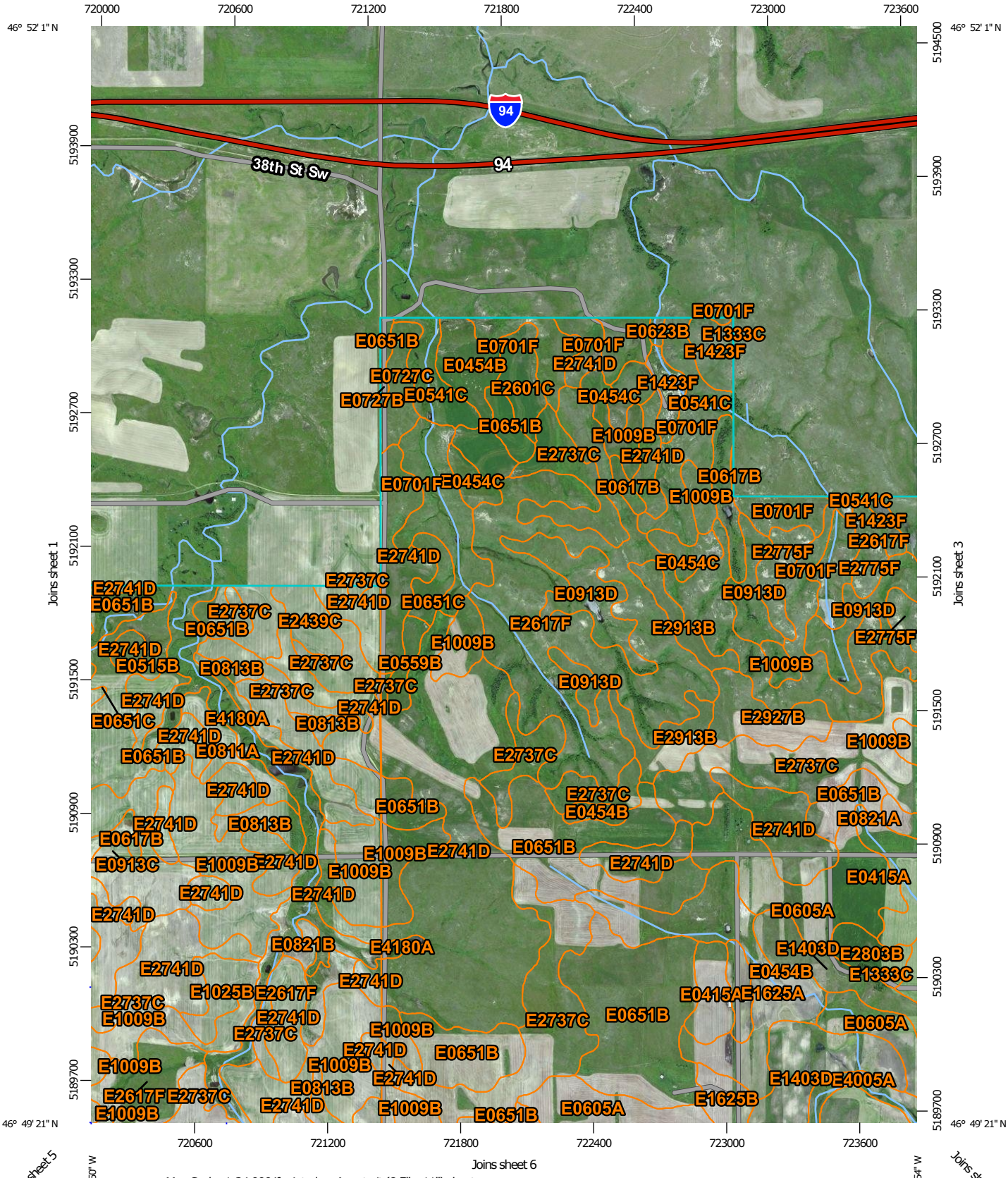
0 350 700 1400 2100 Meters

0 1000 2000 4000 6000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84




Map Sheet Location



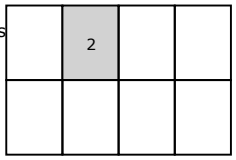

Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.

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0 350 700 1400 2100 Meters

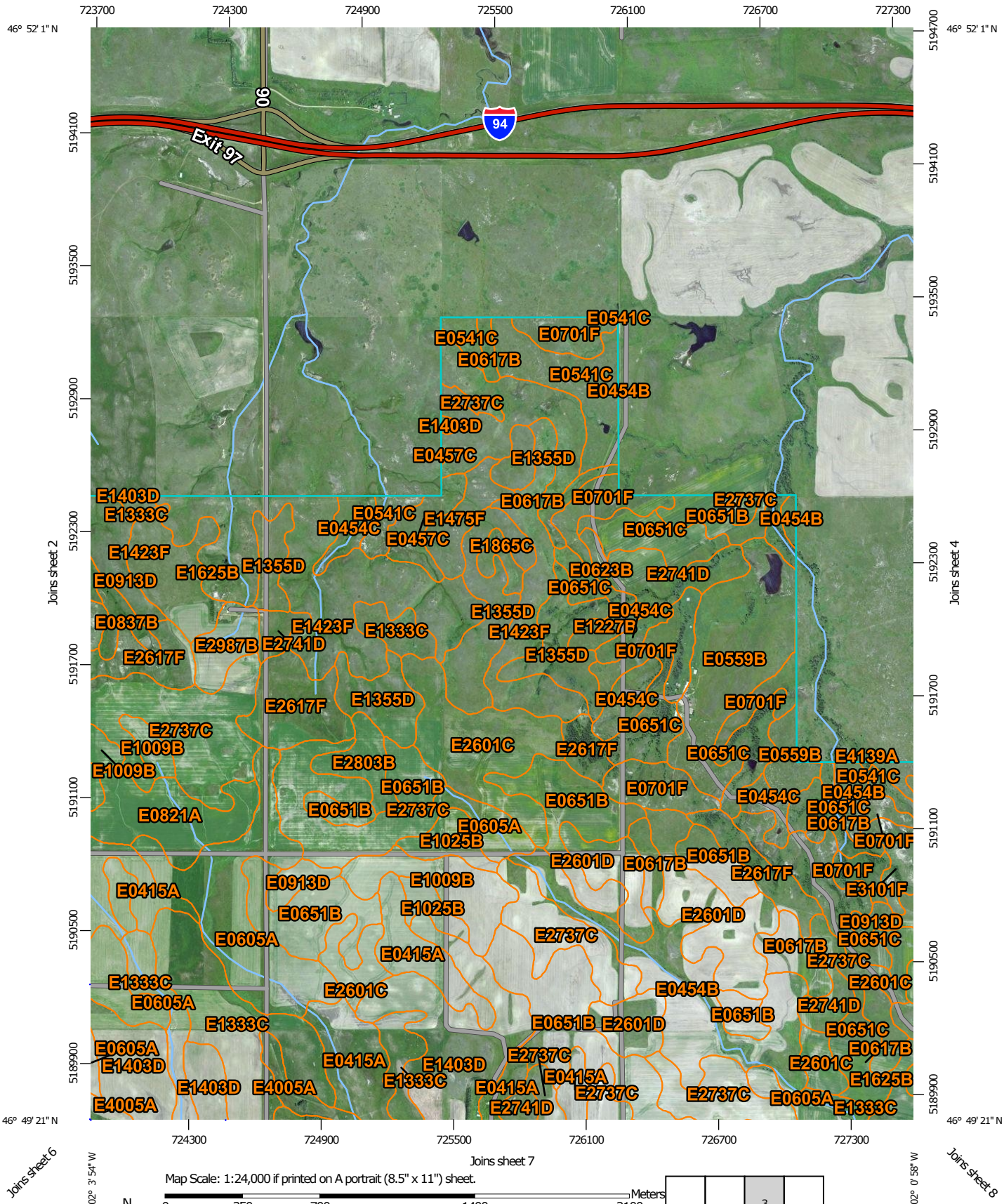
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Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

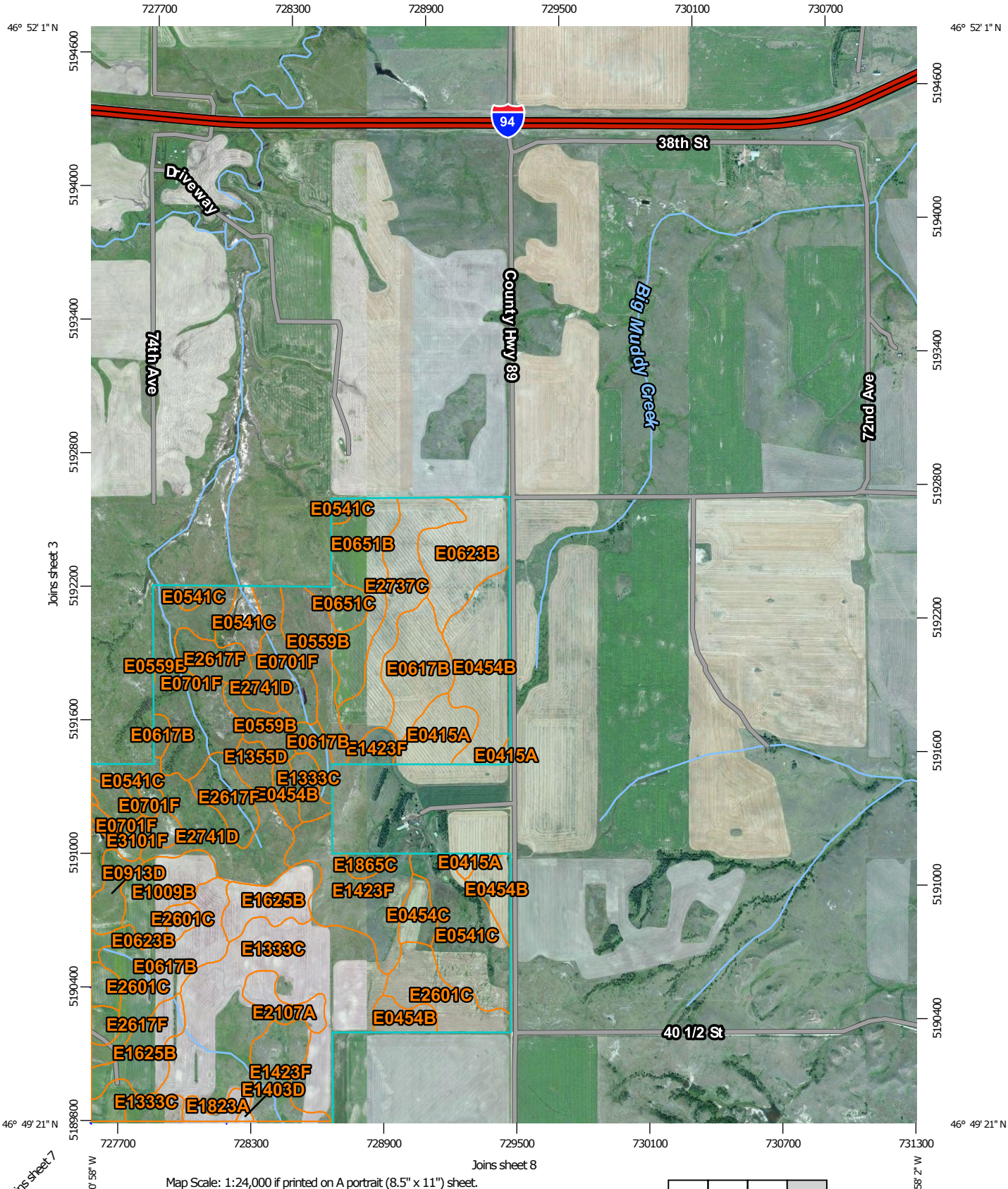



Map Sheet Location

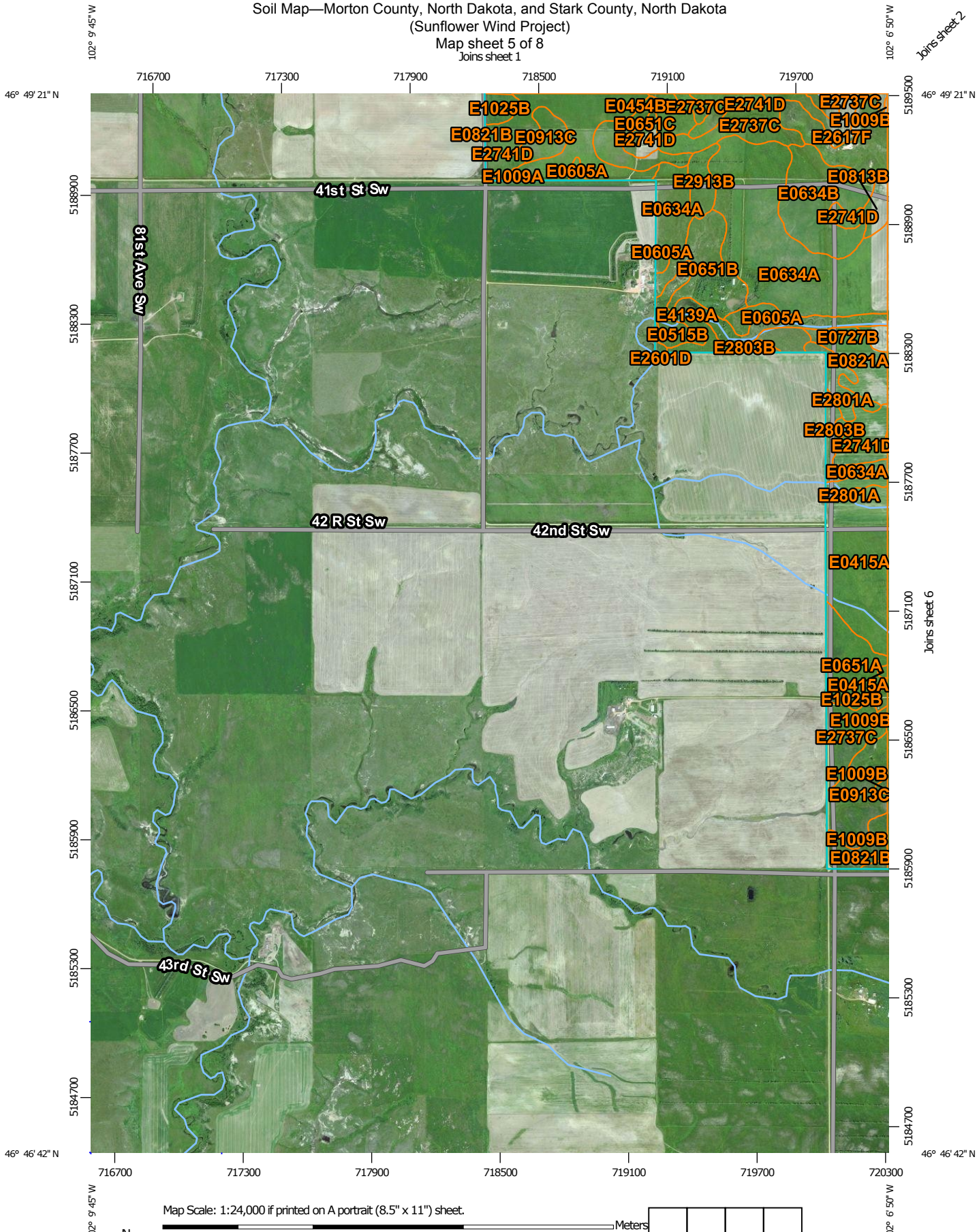
Soil Map—Morton County, North Dakota, and Stark County, North Dakota
(Sunflower Wind Project)
Map sheet 3 of 8



Soil Map—Morton County, North Dakota, and Stark County, North Dakota
(Sunflower Wind Project)
Map sheet 4 of 8



Soil Map—Morton County, North Dakota, and Stark County, North Dakota
(Sunflower Wind Project)
Map sheet 5 of 8



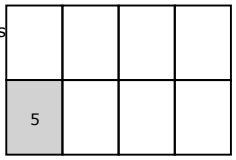

Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.

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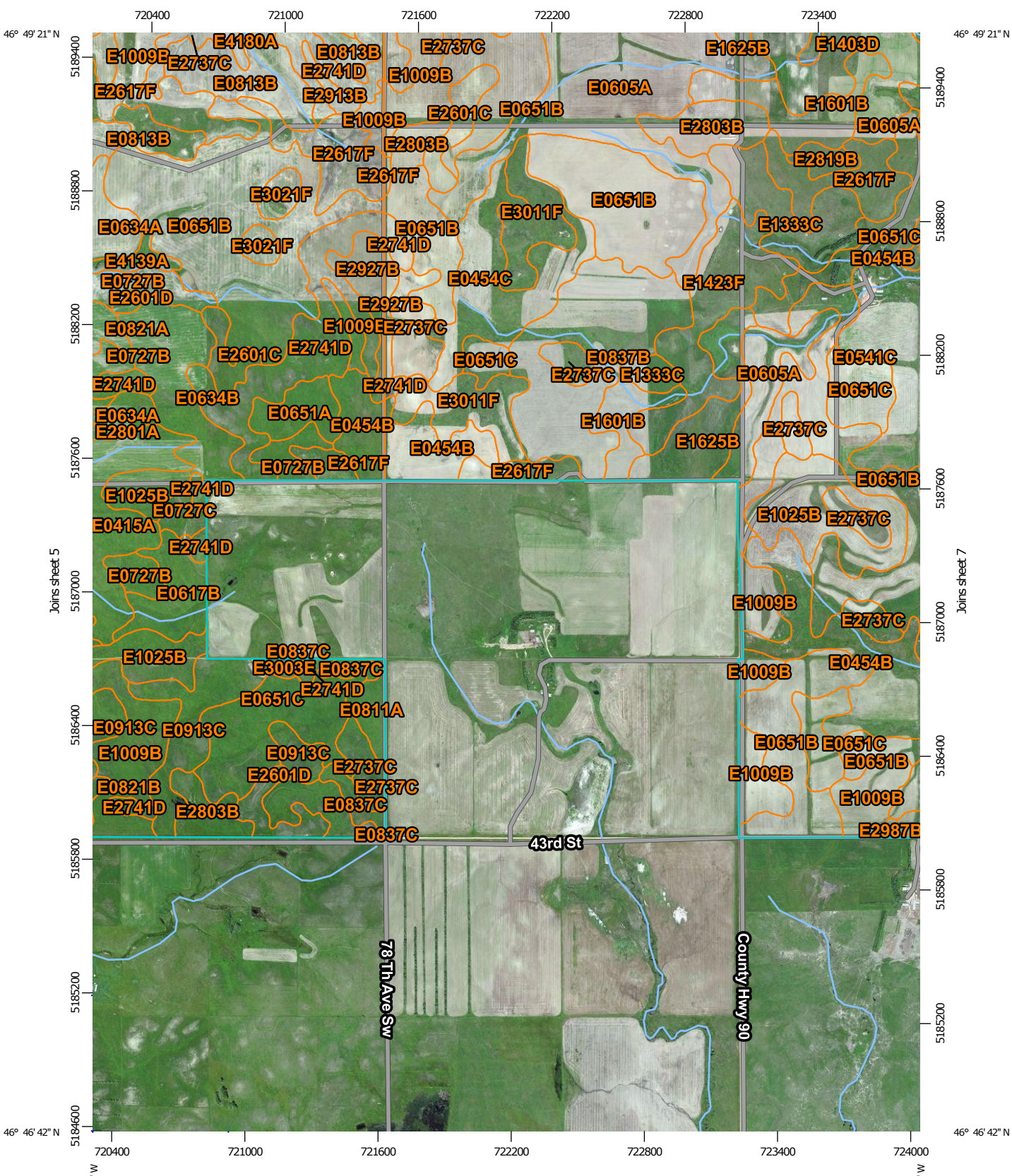
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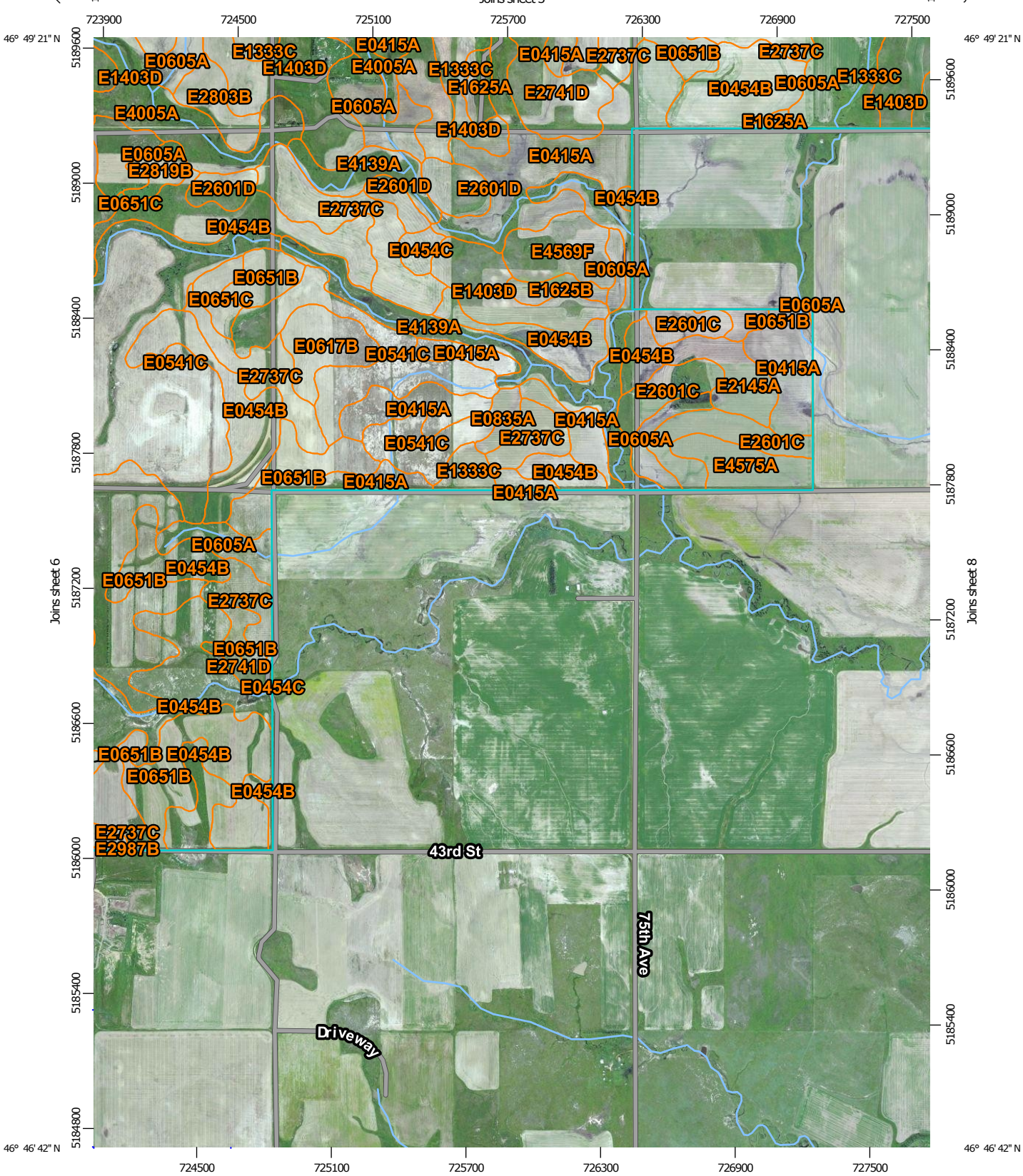
Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84




Map Sheet Location


Joins sheet 1
Joins sheet 2
Joins sheet 3
Joins sheet 5
Joins sheet 7
102° 6' 50" W
102° 3' 54" W
46° 49' 21" N
46° 46' 42" N
720400
721000
721600
722200
722800
723400
724000
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5188800
5188200
5187600
5187000
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E1009B
E0913C
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E0651B
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E0821B
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E2741D
E2803B
E0837C
E0837C
E2987B
43rd St
78 Th Ave Sw
County Hwy 90
Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.
Meters
0
350
700
1400
2100
Feet
0
1000
2000
4000
6000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84
6
Map Sheet Location



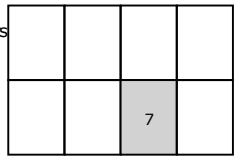

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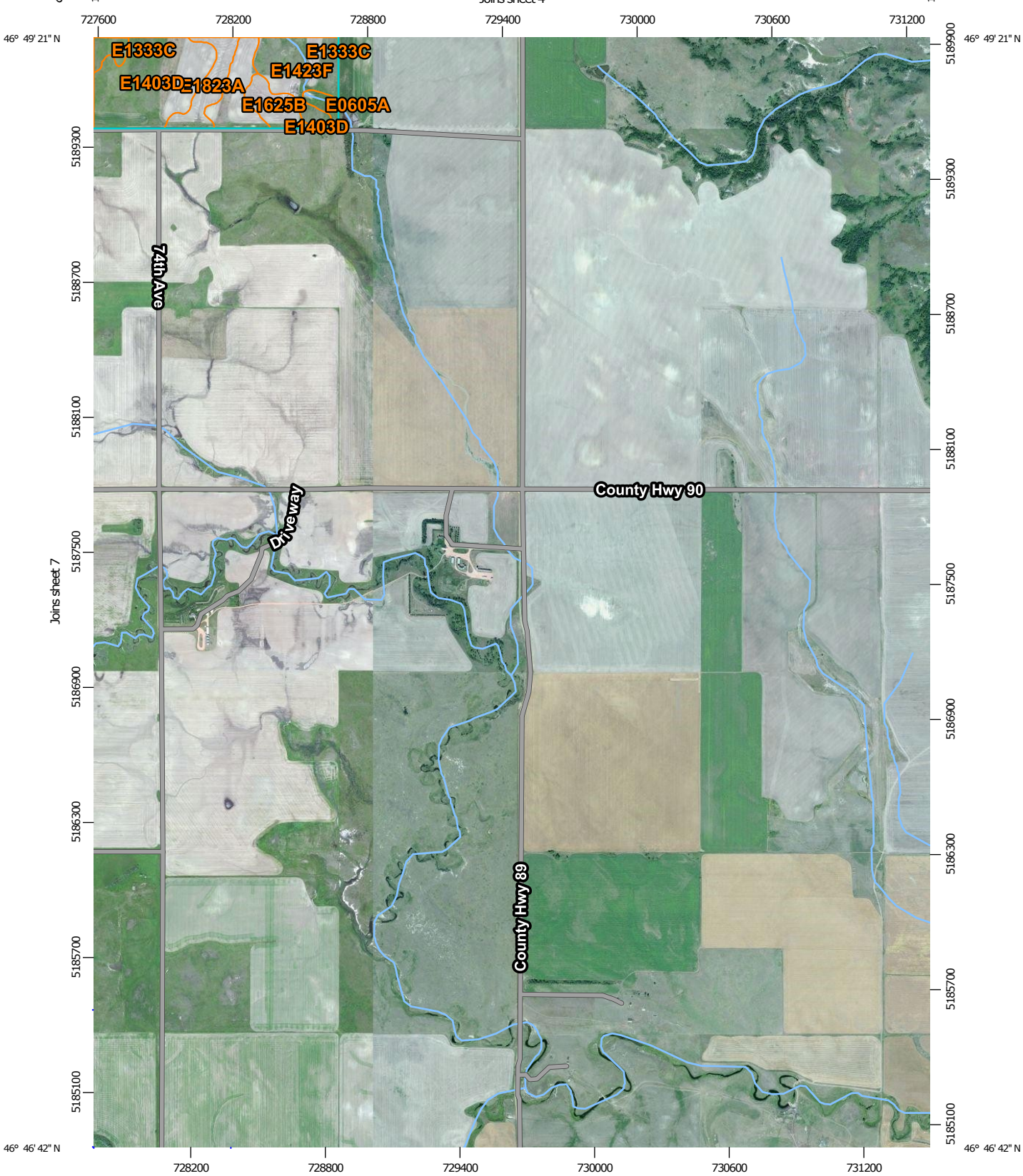
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Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84




Map Sheet Location



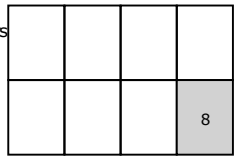

Map Scale: 1:24,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 350 700 1400 2100

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84




Map Sheet Location

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morton County, North Dakota
Survey Area Data: Version 17, Sep 22, 2014

Soil Survey Area: Stark County, North Dakota
Survey Area Data: Version 14, Sep 19, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 16, 2010—Jun 28, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Morton County, North Dakota (ND059) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E0415A | Belfield-Daglum complex, 0 to 2 percent slopes | 354.3 | 2.9% |
| E0454B | Daglum-Rhoades complex, 0 to 6 percent slopes | 691.7 | 5.7% |
| E0454C | Daglum-Rhoades complex, 6 to 9 percent slopes | 161.2 | 1.3% |
| E0457C | Rhoades-Daglum-Ekalaka fine sandy loams, 0 to 9 percent slopes | 17.8 | 0.1% |
| E0541C | Rhoades-Rhoades, barren-Daglum complex, 0 to 9 percent slopes | 442.3 | 3.7% |
| E0559B | Dogtooth-Janesburg silt loams, 0 to 6 percent slopes | 148.3 | 1.2% |
| E0605A | Belfield-Grail clay loams, 0 to 2 percent slopes | 533.5 | 4.4% |
| E0617B | Belfield-Savage-Daglum complex, 2 to 6 percent slopes | 210.3 | 1.7% |
| E0623B | Grail-Belfield clay loams, 2 to 6 percent slopes | 56.9 | 0.5% |
| E0651B | Regent-Janesburg complex, 3 to 6 percent slopes | 989.9 | 8.2% |
| E0651C | Regent-Janesburg complex, 6 to 9 percent slopes | 218.4 | 1.8% |
| E0701F | Dogtooth-Janesburg-Cabba complex, 6 to 35 percent slopes | 354.3 | 2.9% |
| E0727B | Barkof-Janesburg complex, 3 to 6 percent slopes | 1.2 | 0.0% |
| E0727C | Barkof-Janesburg complex, 6 to 9 percent slopes | 16.5 | 0.1% |
| E0821A | Lawther silty clay, 0 to 2 percent slopes | 53.3 | 0.4% |
| E0835A | Savage-Grail silty clay loams, 0 to 2 percent slopes | 7.6 | 0.1% |
| E0837B | Savage silty clay loam, 2 to 6 percent slopes | 113.7 | 0.9% |
| E0837C | Savage silty clay loam, 6 to 9 percent slopes | 0.0 | 0.0% |
| E0913D | Moreau-Wayden silty clays, 9 to 15 percent slopes | 106.5 | 0.9% |
| E1009B | Moreau-Barkof silty clays, 3 to 6 percent slopes | 232.6 | 1.9% |

| Morton County, North Dakota (ND059) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E1025B | Regent-Savage silty clay loams, 3 to 6 percent slopes | 75.8 | 0.6% |
| E1227B | Desart-Ekalaka-Telfer complex, 0 to 6 percent slopes | 9.7 | 0.1% |
| E1333C | Vebar-Cohagen fine sandy loams, 6 to 9 percent slopes | 387.9 | 3.2% |
| E1355D | Vebar-Flasher-Tally complex, 9 to 15 percent slopes | 126.9 | 1.1% |
| E1403D | Beisigl-Flasher-Telfer loamy fine sands, 6 to 15 percent slopes | 443.8 | 3.7% |
| E1423F | Flasher-Vebar-Parshall complex, 9 to 35 percent slopes | 436.7 | 3.6% |
| E1475F | Flasher-Rock outcrop-Vebar complex, 9 to 70 percent slopes | 20.1 | 0.2% |
| E1601B | Beisigl-Lihen loamy fine sands, 0 to 6 percent slopes | 54.4 | 0.5% |
| E1625A | Vebar-Parshall fine sandy loams, 0 to 3 percent slopes | 21.2 | 0.2% |
| E1625B | Vebar-Parshall fine sandy loams, 3 to 6 percent slopes | 156.3 | 1.3% |
| E1823A | Parshall fine sandy loam, 0 to 2 percent slopes | 18.2 | 0.2% |
| E1865C | Tally-Parshall fine sandy loams, 6 to 9 percent slopes | 11.6 | 0.1% |
| E2107A | Arnegard loam, 0 to 2 percent slopes | 11.8 | 0.1% |
| E2145A | Shambo loam, 0 to 2 percent slopes | 24.4 | 0.2% |
| E2601C | Amor-Cabba loams, 6 to 9 percent slopes | 221.8 | 1.8% |
| E2601D | Amor-Cabba loams, 9 to 15 percent slopes | 126.2 | 1.0% |
| E2617F | Cabba-Chama-Shambo loams, 9 to 50 percent slopes | 463.2 | 3.8% |
| E2737C | Chama-Cabba-Sen silt loams, 6 to 9 percent slopes | 663.0 | 5.5% |
| E2741D | Cabba-Chama-Sen silt loams, 9 to 15 percent slopes | 466.3 | 3.9% |
| E2775F | Cabba-Rock outcrop-Chama complex, 15 to 70 percent slopes | 31.5 | 0.3% |
| E2803B | Amor-Shambo loams, 3 to 6 percent slopes | 85.1 | 0.7% |

| Morton County, North Dakota (ND059) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E2819B | Reeder-Farnuf loams, 3 to 6 percent slopes | 18.6 | 0.2% |
| E2913B | Chama-Sen-Cabba silt loams, 3 to 6 percent slopes | 32.7 | 0.3% |
| E2927B | Morton-Farland silt loams, 3 to 6 percent slopes | 34.4 | 0.3% |
| E2987B | Sen-Chama silt loams, 3 to 6 percent slopes | 20.9 | 0.2% |
| E3011F | Brandenburg-Cabba-Savage complex, 6 to 70 percent slopes | 62.0 | 0.5% |
| E3101F | Badland-Cabba complex, 9 to 70 percent slopes | 30.6 | 0.3% |
| E4005A | Harriet loam, 0 to 2 percent slopes, occasionally flooded | 87.4 | 0.7% |
| E4139A | Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded | 105.5 | 0.9% |
| E4180A | Korell-Daglum-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded | 2.9 | 0.0% |
| E4569F | Wabek-Cabba-Shambo complex, 6 to 35 percent slopes | 29.7 | 0.2% |
| E4575A | Wanagan loam, 0 to 2 percent slopes | 25.2 | 0.2% |
| **Subtotals for Soil Survey Area** | | **9,015.9** | **74.9%** |
| **Totals for Area of Interest** | | **12,035.8** | **100.0%** |

| Stark County, North Dakota (ND089) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E0415A | Belfield-Daglum complex, 0 to 2 percent slopes | 93.9 | 0.8% |
| E0454B | Daglum-Rhoades complex, 0 to 6 percent slopes | 131.0 | 1.1% |
| E0515B | Rhoades-Daglum complex, 0 to 6 percent slopes | 32.1 | 0.3% |
| E0605A | Belfield-Grail clay loams, 0 to 2 percent slopes | 81.2 | 0.7% |
| E0609A | Belfield-Grail-Arnegard complex, saline, 0 to 2 percent slopes | 0.9 | 0.0% |
| E0617B | Belfield-Savage-Daglum complex, 2 to 6 percent slopes | 66.6 | 0.6% |
| E0634A | Lawther-Daglum complex, 0 to 2 percent slopes | 133.9 | 1.1% |

| Stark County, North Dakota (ND089) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E0634B | Lawther-Daglum complex, 2 to 6 percent slopes | 100.0 | 0.8% |
| E0651A | Regent-Janesburg complex, 0 to 3 percent slopes | 42.5 | 0.4% |
| E0651B | Regent-Janesburg complex, 3 to 6 percent slopes | 256.7 | 2.1% |
| E0651C | Regent-Janesburg complex, 6 to 9 percent slopes | 99.1 | 0.8% |
| E0727B | Barkof-Janesburg complex, 3 to 6 percent slopes | 56.6 | 0.5% |
| E0727C | Barkof-Janesburg complex, 6 to 9 percent slopes | 9.1 | 0.1% |
| E0811A | Grail silty clay loam, 0 to 2 percent slopes | 28.3 | 0.2% |
| E0813B | Grail-Savage silty clay loams, 2 to 6 percent slopes | 104.1 | 0.9% |
| E0821A | Lawther silty clay, 0 to 2 percent slopes | 23.6 | 0.2% |
| E0821B | Lawther silty clay, 2 to 6 percent slopes | 78.2 | 0.6% |
| E0837C | Savage silty clay loam, 6 to 9 percent slopes | 12.3 | 0.1% |
| E0913C | Moreau-Wayden silty clays, 6 to 9 percent slopes | 146.2 | 1.2% |
| E1009A | Moreau-Barkof silty clays, 0 to 3 percent slopes | 0.8 | 0.0% |
| E1009B | Moreau-Barkof silty clays, 3 to 6 percent slopes | 200.1 | 1.7% |
| E1025A | Regent-Savage silty clay loams, 0 to 3 percent slopes | 8.9 | 0.1% |
| E1025B | Regent-Savage silty clay loams, 3 to 6 percent slopes | 68.2 | 0.6% |
| E1333C | Vebar-Cohagen fine sandy loams, 6 to 9 percent slopes | 18.2 | 0.2% |
| E2203B | Farland silt loam, 2 to 6 percent slopes | 5.2 | 0.0% |
| E2439C | Sen-Janesburg silt loams, 6 to 9 percent slopes | 15.1 | 0.1% |
| E2601C | Amor-Cabba loams, 6 to 9 percent slopes | 11.6 | 0.1% |
| E2601D | Amor-Cabba loams, 9 to 15 percent slopes | 18.8 | 0.2% |
| E2617F | Cabba-Chama-Shambo loams, 9 to 50 percent slopes | 145.7 | 1.2% |
| E2737C | Chama-Cabba-Sen silt loams, 6 to 9 percent slopes | 325.4 | 2.7% |

| Stark County, North Dakota (ND089) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| E2741D | Cabba-Chama-Sen silt loams, 9 to 15 percent slopes | 431.6 | 3.6% |
| E2801A | Amor-Arnegard loams, 0 to 3 percent slopes | 13.9 | 0.1% |
| E2803B | Amor-Shambo loams, 3 to 6 percent slopes | 33.7 | 0.3% |
| E2913B | Chama-Sen-Cabba silt loams, 3 to 6 percent slopes | 54.4 | 0.5% |
| E2927B | Morton-Farland silt loams, 3 to 6 percent slopes | 16.7 | 0.1% |
| E3003E | Amor-Brandenburg complex, 3 to 25 percent slopes | 2.4 | 0.0% |
| E3021F | Dogtooth-Janesburg-Brandenburg complex, 9 to 35 percent slopes | 27.4 | 0.2% |
| E4139A | Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded | 28.2 | 0.2% |
| E4180A | Korell-Daglum-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded | 97.3 | 0.8% |
| **Subtotals for Soil Survey Area** | | **3,019.9** | **25.1%** |
| **Totals for Area of Interest** | | **12,035.8** | **100.0%** |

# Attachment D

## Pre and Post Drainage Maps

© 2015 Westwood Professional Services, Inc.

Name: Branch Knife River Headwaters
HUC12: 101302010501
Drains To: Knife River
Project Area: Approx. 2,520 Acres

Name: Eagles Nest-Lower Heart River
HUC12: 101302030301
Drains To: Lower Heart River
Project Area: Approx.1,790 Acres

Name: Unnamed Watershed - 101302020603
HUC12: 101302020603
Drains To: Upper Heart River
Project Area: Approx. 1,800 Acres

Name: Unnamed Watershed - 101302020607
HUC12: 101302020607
Drains To: Upper Heart River
Project Area: Approx. 150 Acres

Name: SE Hebron-Lower Heart River
HUC12: 101302030102
Drains To: Lower Heart River
Project Area: Approx. 5,770 Acres

| Discharge ID | Latitude | Longitude |
|---|---|---|
| 1 | 46.826437 | -102.122648 |
| 2 | 46.836162 | -102.101872 |
| 3 | 46.845851 | -102.040665 |
| 4 | 46.811089 | -102.090540 |
| 5 | 46.816559 | -102.077462 |
| 6 | 46.823024 | -102.065478 |
| 7 | 46.824268 | -102.059989 |
| 8 | 46.828464 | -102.055309 |
| 9 | 46.827159 | -102.049621 |
| 10 | 46.820774 | -102.020151 |
| 11 | 46.825057 | -102.006879 |
| 12 | 46.826139 | -102.005092 |

Data Source(s): USGS Topographic Map via Esri WMS (Accessed 2015); Westwood (2015).

**Legend**

- Dischage Location
- Drainage Direction
- NHD Flowline
- HUC12 Boundary
- Primary Turbine
- Primary Access Road
- Primary Crane Path
- Primary Underground Collection
- Project Area
- Laydown
- O&M
- Substation

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Westwood Professional Services, Inc.

# Sunflower Wind Project

Stark and Morton Counties, ND

## Drainage Map

N

0 3,000 Feet

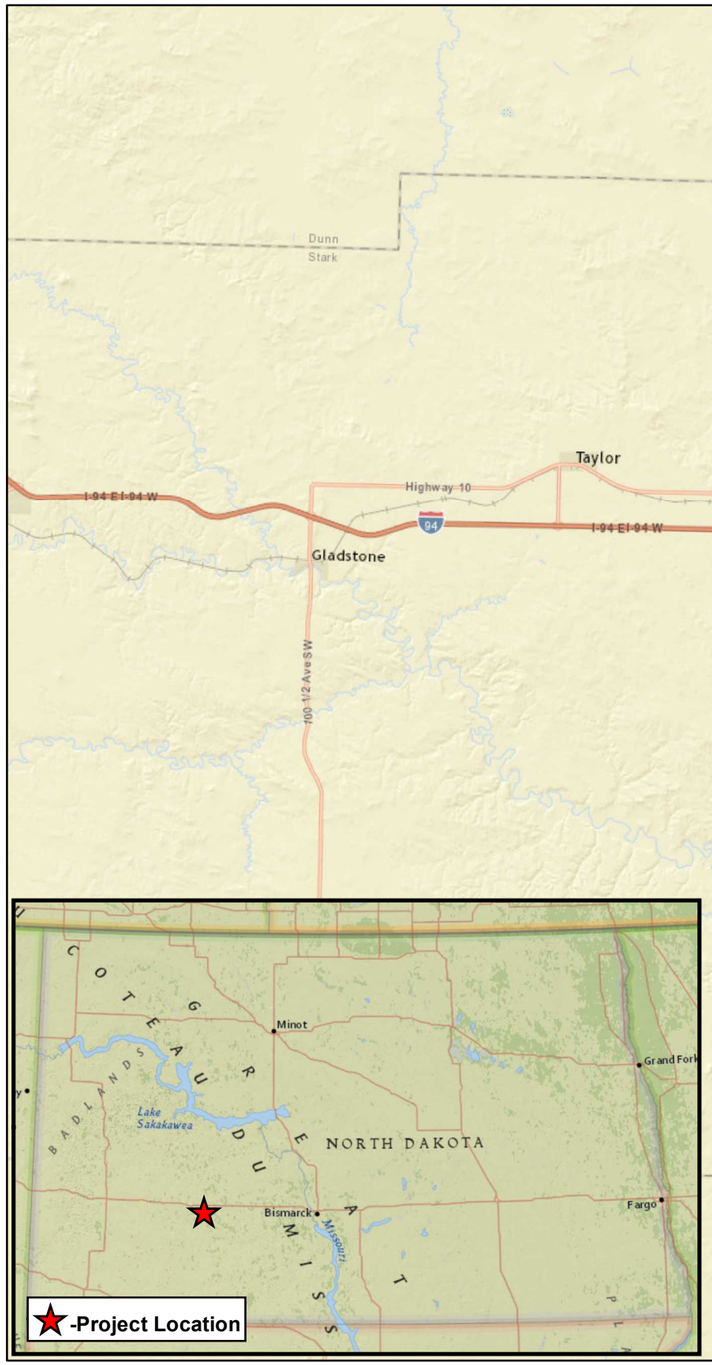
August 04, 2015

Map Document: P:\0006214.00\GIS\SF_DrainageMap_150804.mxd LSArnquist 8/4/2015 3:16:42 PM

# Attachment E

## Site Plans, Erosion and Sediment Control Plans, Details

© 2015 Westwood Professional Services, Inc.




Data Source(s): World Street Map via Esri WMS (Accessed 2015); Westwood (2015).

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Westwood Professional Services, Inc.

## Legend

Project Area

N

0 4 Miles

# Sunflower Wind Project

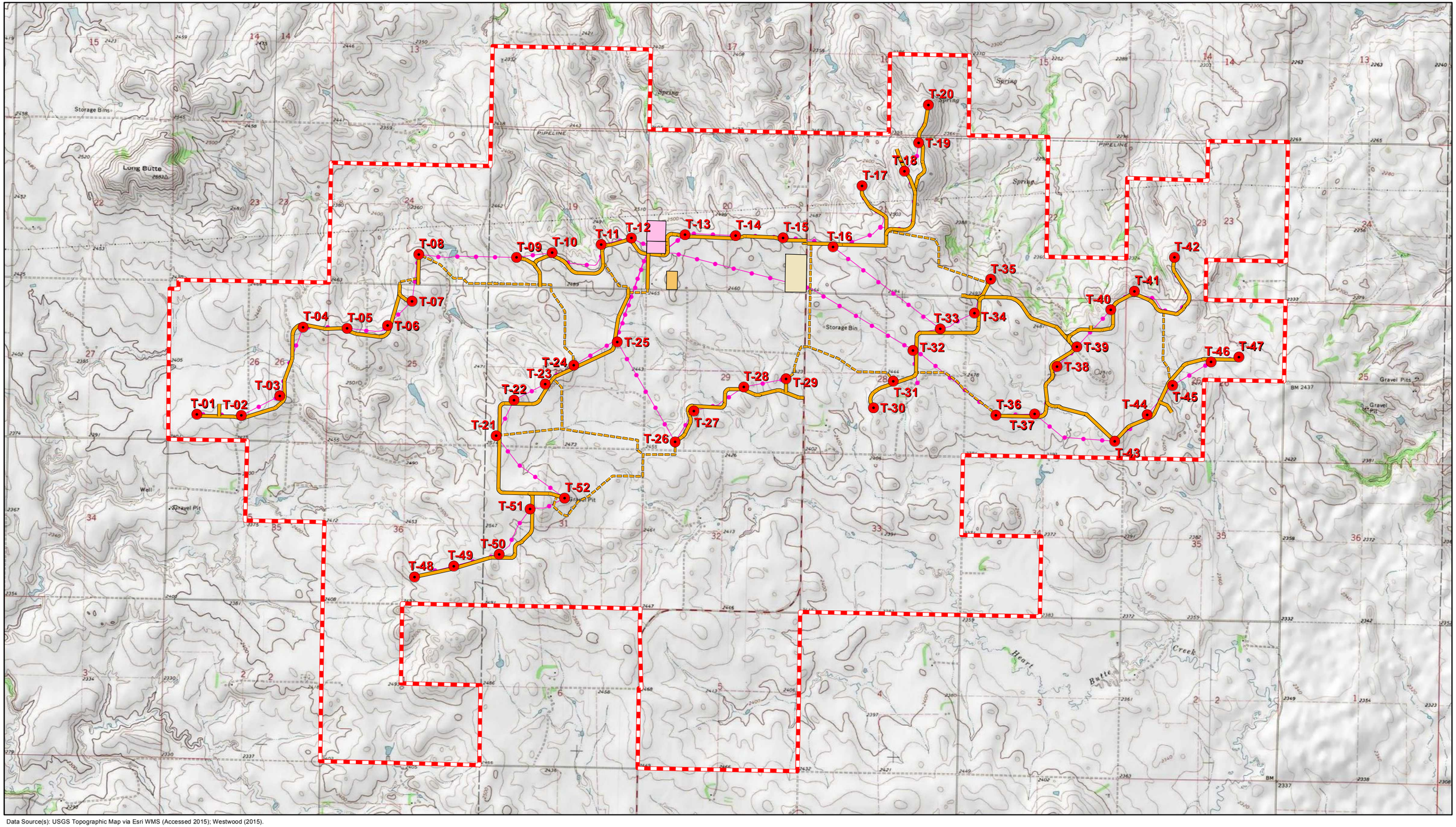
Stark and Morton Counties, ND

Vicinity Map

August 04, 2015

Map Document: P:\0006214.00\GIS\SF_VicinityMap_150626.mxd LSArnquist 8/4/2015 3:32:27 PM

© 2015 Westwood Professional Services, Inc.




Data Source(s): USGS Topographic Map via Esri WMS (Accessed 2015); Westwood (2015).

Map Document: P:\9006214.00\GIS\SF_USGSTopoMap_150804.mxd LSAmquist 8/4/2015 3:30:09 PM

**Legend**

- Primary Turbine
- Primary Access Road
- Primary Crane Path
- Primary Underground Collection
- Project Area
- Laydown
- O&M
- Substation

N

0 3,000 Feet

# Sunflower Wind Project

Stark and Morton Counties, ND

## USGS Topographic Map

August 04, 2015

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# 90% Civil Construction Plans

for

# Wind Turbine Generators, Access Roads, Drainage & Erosion Control

for

# Sunflower Wind Project

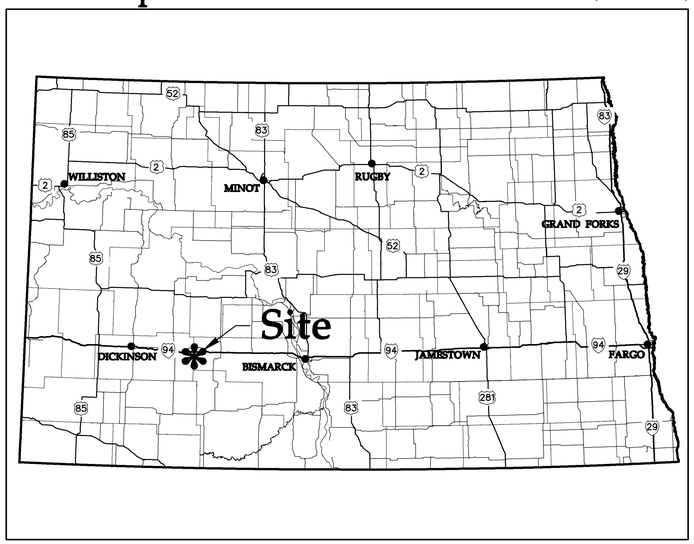
## Stark and Morton Counties, North Dakota

| DATA SET INFORMATION | | | |
|---|---|---|---|
| **BASE FILE** | **FILE NAME** | **PROVIDER** | **DATE** |
| AERIAL IMAGE | 0002298 Aerial WorldImagery 1ft.jp2 | ESRI | 04/23/15 |
| ALTA SURVEY | 14000866BB.dwg | ATWELL | 10/17/14 |
| TOPOGRAPHY | 14-102_Sunflower_WF_DTM.DWG | SUNEDISON | 05/11/15 |
| TURBINE ARRAY | sunflower_layout_microsited_20150616.shp | SUNEDISON | 06/16/15 |
| UNDERGROUND COLLECTION | SUN - Collection Routing_07242015.shp | ULTEIG | 07/24/15 |
| WETLANDS | FIELD_GPS_SURVEY_DATA_.gdb.zip | STANTEC | 07/31/15 |
| GEOTECH REPORT | Sunflower_Geotechnical Report_Final_2015-01-16_RRC.pdf | RRC | 01/16/15 |
| CULTURAL RESOURCES | . | . | . |

| NO. | DATE | REVISION | SHEETS |
|---|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS | ALL |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS | ALL |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS | ALL |
| | | | |
| | | | |
| | | | |

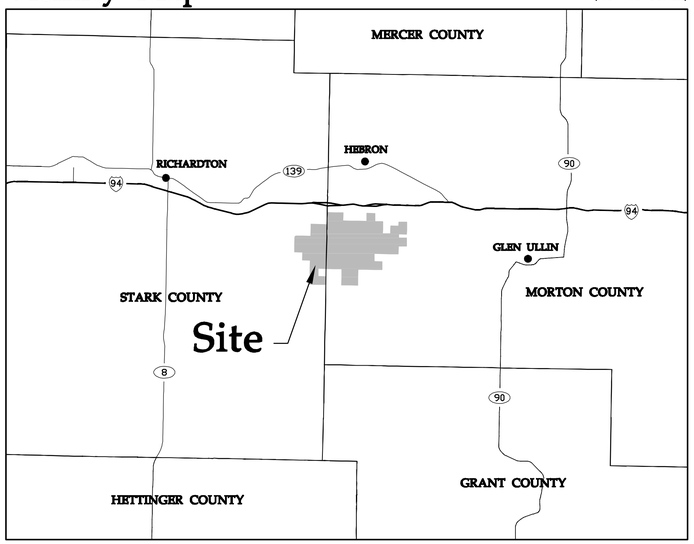
### State Map

(NOT TO SCALE)




### Vicinity Map

(NOT TO SCALE)




| Sheet List Table | |
|---|---|
| **Sheet Number** | **Sheet Title** |
| 1 | Cover |
| 2 | Overall Site Plan |
| 3 | Delivery Flow Plan |
| 4 | Turbine Index and Drainage Schedule |
| 5 | Crossing Schedules |
| 6 | Construction Details |
| 7 | Construction Details |
| 8 | Construction Details |
| 9 | Construction Details |
| 10 | Construction Details |
| 11 | Construction Details |
| 12 | Construction Details |
| 13 | Construction Notes |
| 14 | Construction Notes |
| 15 | Site Plan - S24, T139N, R91W |
| 16 | Site Plan - S19, T139N, R90W |
| 17 | Site Plan - S20, T139N, R90W |
| 18 | Site Plan - S21, T139N, R90W |
| 19 | Site Plan - S16, T139N, R90W |
| 20 | Site Plan - S22, T139N, R90W |
| 21 | Site Plan - S23, T139N, R90W |
| 22 | Site Plan - S26, T139N, R91W |
| 23 | Site Plan - S25, T139N, R91W |
| 24 | Site Plan - S30, T139N, R90W |
| 25 | Site Plan - S29, T139N, R90W |
| 26 | Site Plan - S28, T139N, R90W |
| 27 | Site Plan - S27, T139N, R90W |
| 28 | Site Plan - S26, T139N, R90W |
| 29 | Site Plan - S36, T139N, R91W |
| 30 | Site Plan - S31, T139N, R90W |
| 31 | Site Plan - S32, T139N, R90W |
| 32 | Public Improvements Plan |
| 33 | Public Improvements - 40th Street Culvert |
| 34 | Intersection Improvements I-94 & Co. Rd. 90 |
| 35 | Intersection Improvements 40th St & Co. Rd. 90 |
| 36 | Substation Grading Plan |
| 37 | O&M Grading Plan |
| 38 | Laydown Yard Grading Plan |
| 39 | Road A - Sta 104+00-96+00 |
| 40 | Road A - Sta 96+00-72+00 |
| 41 | Road A - Sta 72+00-48+00 |
| 42 | Road A - Sta 48+00-24+00 |
| 43 | Road A - Sta 24+00-0+00 |
| 44 | Road T - Sta 0+00-6+00 |
| 45 | Road B - Sta 0+00-11+00 |
| 46 | Road C - Sta 0+00-22+00 |
| 47 | Road C - Sta 22+00-46+00 |
| 48 | Road C - Sta 46+00-70+00 |
| 49 | Road C - Sta 70+00-94+00 |
| 50 | Road C - Sta 94+00-118+00 |
| 51 | Road R - Sta 0+00-8+00 |
| 52 | Road D - Sta 0+00-16+00 |
| 53 | Road E - Sta 0+00-20+00 |
| 54 | Road E - Sta 20+00-40+00 |
| 55 | Road E - Sta 40+00-60+00 |
| 56 | Road E - Sta 60+00-80+00 |
| 57 | Road F - Sta 0+00-24+00 |
| 58 | Road F - Sta 24+00-48+00 |
| 59 | Road F - Sta 48+00-72+00 |
| 60 | Road F - Sta 72+00-84+00 |
| 61 | Road G - Sta 0+00-13+00 |
| 62 | Road I - Sta 58+00-48+00 |
| 63 | Road I - Sta 48+00-24+00 |
| 64 | Road I - Sta 24+00-0+00 |
| 65 | Road J - Sta 0+00-6+00 |
| 66 | Road K - Sta 0+00-26+00 |
| 67 | Road K - Sta 26+00-50+00 |
| 68 | Road L - Sta 0+00-18+00 |
| 69 | Road L - Sta 18+00-36+00 |
| 70 | Road L - Sta 36+00-54+00 |
| 71 | Road M - Sta 0+00-9+00 |
| 72 | Road N - Sta 0+00-24+00 |
| 73 | Road N - Sta 24+00-48+00 |
| 74 | Road N - Sta 48+00-72+00 |
| 75 | Road N - Sta 72+00-96+00 |
| 76 | Road N - Sta 96+00-109+00 |
| 77 | Road O - Sta 64+00-48+00 |
| 78 | Road O - Sta 48+00-32+00 |
| 79 | Road O - Sta 32+00-16+00 |
| 80 | Road O - Sta 16+00-0+00 |
| 81 | Road P - Sta 0+00-8+00 |
| 82 | Road Q - Sta 49+00-25+00 |
| 83 | Road Q - Sta 25+00-0+00 |
| 84 | Road S - Sta 0+00-24+00 |
| 85 | Road S - Sta 24+00-48+00 |
| 86 | Road S - Sta 48+00-72+00 |
| 87 | Road S - Sta 72+00-82+00 |
| 88 | Alignment Tables |
| 89 | Alignment Tables |
| 90 | Alignment Tables |
| 91 | Alignment Tables |

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westwoodps.com

**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |
| . | | |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

**GEODETIC INFORMATION**

PROJECT COORDINATE SYSTEM:
NORTH DAKOTA SOUTH ZONE,
INTERNATIONAL FEET, NAD83(HARN)

**Sunflower Wind Project**
**Stark and Morton Counties, North Dakota**

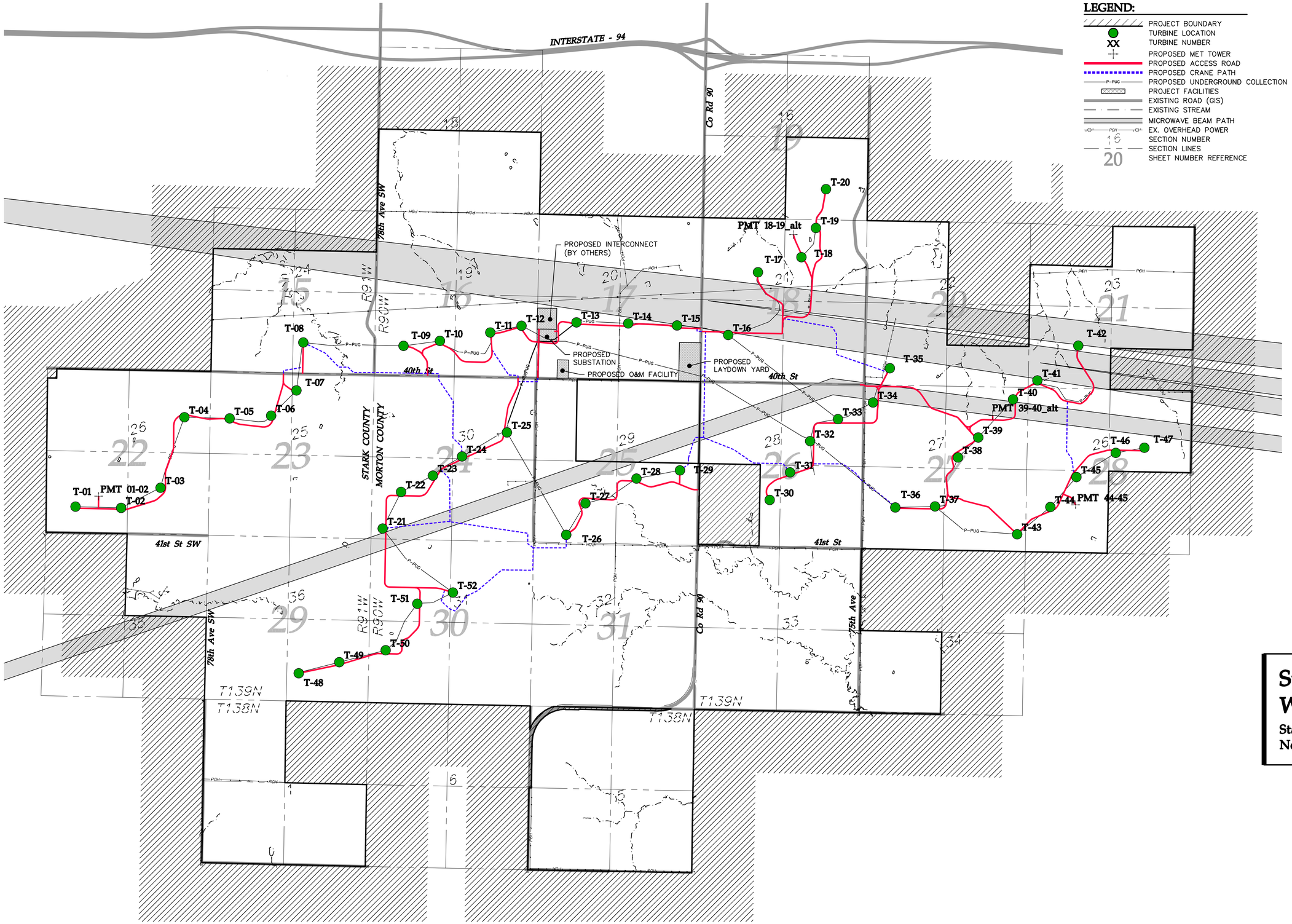
**Cover**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**
**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15
**Sheet:** 1 OF 91

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## LEGEND:

- PROJECT BOUNDARY
- TURBINE LOCATION
- XX TURBINE NUMBER
- PROPOSED MET TOWER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- P-PUG PROPOSED UNDERGROUND COLLECTION
- PROJECT FACILITIES
- EXISTING ROAD (GIS)
- EXISTING STREAM
- MICROWAVE BEAM PATH
- POH EX. OVERHEAD POWER
- 15 SECTION NUMBER
- SECTION LINES
- 20 SHEET NUMBER REFERENCE

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| | |
|---|---|
| Designed: | DPK |
| Checked: | RSC |
| Drawn: | TBR |
| Record Drawing by/date: | |

Revisions:

| # | DATE | DESCRIPTION |
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Minneapolis, MN 55440

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Boston, MA 02111

0' 1500' 3000' 4500'

# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Overall Site Plan

90% Civil Construction Plans
NOT FOR CONSTRUCTION

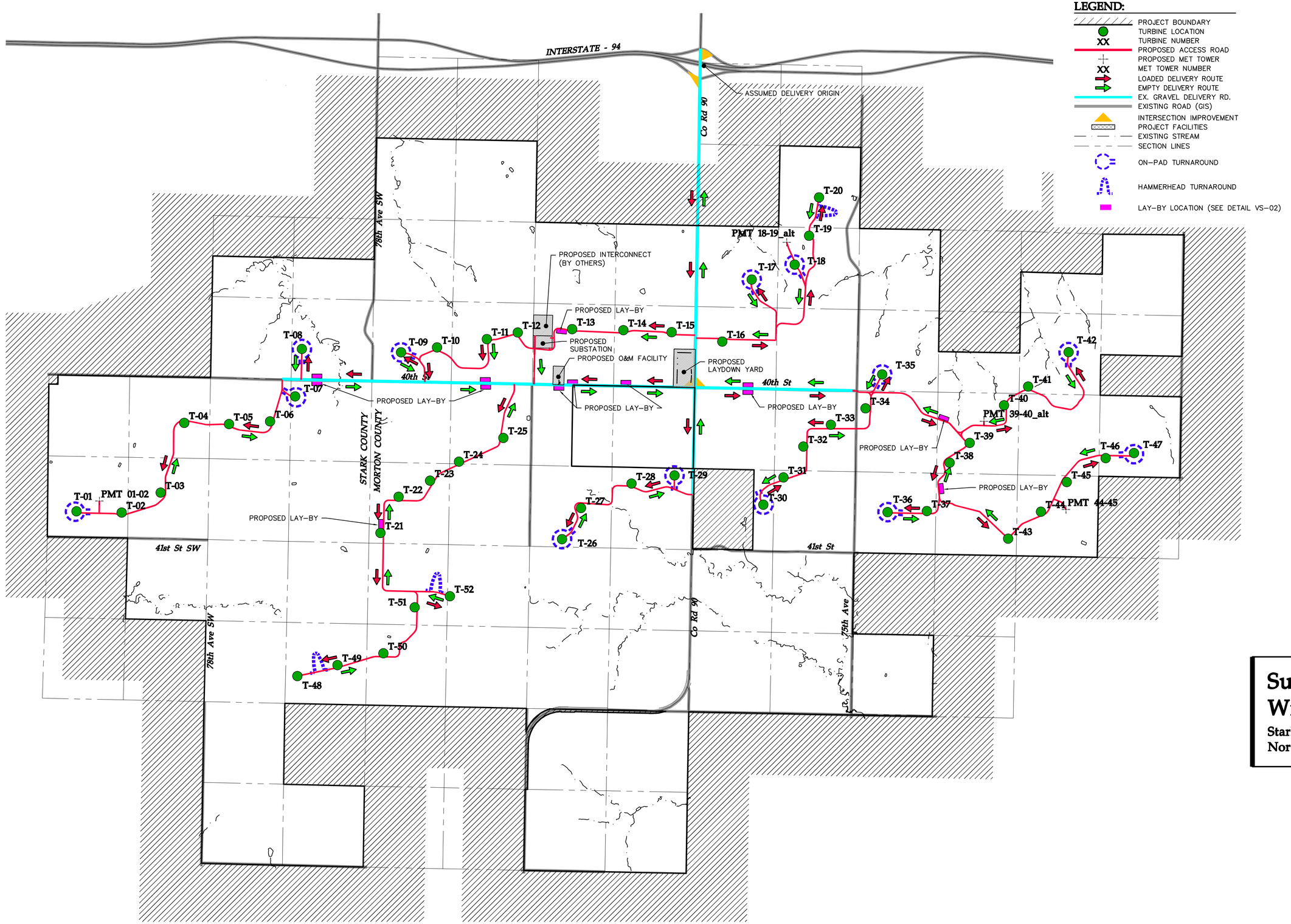
Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15

Sheet: 2 OF 91

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## LEGEND:

- PROJECT BOUNDARY
- TURBINE LOCATION
- XX TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED MET TOWER
- XX MET TOWER NUMBER
- LOADED DELIVERY ROUTE
- EMPTY DELIVERY ROUTE
- EX. GRAVEL DELIVERY RD.
- EXISTING ROAD (GIS)
- INTERSECTION IMPROVEMENT
- PROJECT FACILITIES
- EXISTING STREAM
- SECTION LINES
- ON-PAD TURNAROUND
- HAMMERHEAD TURNAROUND
- LAY-BY LOCATION (SEE DETAIL VS-02)

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| | |
|---|---|
| Designed: | DPK |
| Checked: | RSC |
| Drawn: | TBR |
| Record Drawing by/date: | |

Revisions:

| # | DATE | DESCRIPTION |
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0' 1500' 3000' 4500'

# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Delivery Flow Plan

90% Civil Construction Plans
NOT FOR CONSTRUCTION

Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15

Sheet: 3 OF 91

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| WTG COORDINATES (HARN / NORTH DAKOTA SOUTH INTERNATIONAL FT) | | | | | |
|---|---|---|---|---|---|
| TURBINE ID | NORTHING (Y) | EASTING (X) | EXISTING GROUND ELEVATION * | PROPOSED PEDESTAL ELEVATION ** | STUB ROAD LENGTH FOR DRIVE-BY TURBINES (LF) |
| T-01 | 425373.52 | 1559266.22 | 2444.92 | 2446.40 | N/A |
| T-02 | 425333.11 | 1560737.46 | 2464.50 | 2464.20 | 97 |
| T-03 | 425981.79 | 1562006.12 | 2503.03 | 2499.00 | 161 |
| T-04 | 428252.57 | 1562774.83 | 2494.87 | 2492.80 | 79 |
| T-05 | 428213.81 | 1564231.61 | 2527.24 | 2526.70 | 68 |
| T-06 | 428300.89 | 1565568.56 | 2479.06 | 2480.60 | 88 |
| T-07 | 429114.46 | 1566383.97 | 2472.77 | 2467.50 | N/A |
| T-08 | 430658.41 | 1566604.15 | 2422.88 | 2420.30 | N/A |
| T-09 | 430549.63 | 1569831.87 | 2476.35 | 2476.50 | N/A |
| T-10 | 430709.72 | 1571004.62 | 2508.84 | 2507.70 | 97 |
| T-11 | 430980.02 | 1572624.95 | 2496.51 | 2497.60 | 118 |
| T-12 | 431195.89 | 1573632.25 | 2503.99 | 2505.50 | 98 |
| T-13 | 431304.13 | 1575402.63 | 2512.99 | 2514.50 | 80 |
| T-14 | 431272.65 | 1577070.32 | 2520.42 | 2521.90 | 86 |
| T-15 | 431206.42 | 1578641.48 | 2511.18 | 2508.70 | 80 |
| T-16 | 430900.07 | 1580289.67 | 2510.18 | 2509.40 | 95 |
| T-17 | 432918.82 | 1581249.16 | 2480.46 | 2480.70 | N/A |
| T-18 | 433404.96 | 1582647.48 | 2496.79 | 2492.00 | N/A |
| T-19 | 434345.89 | 1583114.49 | 2482.03 | 2480.10 | 75 |
| T-20 | 435594.84 | 1583439.56 | 2471.78 | 2471.50 | N/A |
| T-21 | 424668.14 | 1569160.70 | 2518.65 | 2520.10 | 100 |
| T-22 | 425846.28 | 1569752.51 | 2507.79 | 2507.10 | 118 |
| T-23 | 426372.04 | 1570776.69 | 2499.46 | 2496.30 | 119 |
| T-24 | 426989.21 | 1571717.54 | 2494.11 | 2492.40 | 80 |
| T-25 | 427762.22 | 1573162.94 | 2469.76 | 2471.30 | 95 |
| T-26 | 424465.76 | 1575072.80 | 2446.84 | 2448.30 | N/A |
| T-27 | 425479.40 | 1575692.04 | 2465.12 | 2463.50 | 192 |
| T-28 | 426277.66 | 1577335.65 | 2432.60 | 2433.60 | 95 |
| T-29 | 426541.70 | 1578734.98 | 2429.96 | 2431.50 | N/A |
| T-30 | 425588.53 | 1581626.56 | 2434.18 | 2432.50 | N/A |
| T-31 | 426476.07 | 1582281.92 | 2448.92 | 2450.40 | 78 |
| T-32 | 427482.18 | 1582929.08 | 2476.57 | 2478.10 | 115 |
| T-33 | 428192.71 | 1583824.49 | 2465.09 | 2466.60 | 130 |
| T-34 | 428726.18 | 1584953.71 | 2470.05 | 2466.40 | 162 |
| T-35 | 429829.69 | 1585495.54 | 2494.76 | 2496.30 | N/A |
| T-36 | 425346.49 | 1585671.21 | 2440.28 | 2439.30 | N/A |
| T-37 | 425380.34 | 1586950.07 | 2423.24 | 2421.70 | 79 |
| T-38 | 426957.10 | 1587690.95 | 2477.45 | 2466.90 | 159 |
| T-39 | 427599.94 | 1588344.05 | 2483.85 | 2480.60 | 109 |
| T-40 | 428825.82 | 1589463.42 | 2464.12 | 2462.70 | 76 |
| T-41 | 429437.83 | 1590248.41 | 2450.86 | 2457.30 | 109 |
| T-42 | 430556.09 | 1591564.76 | 2386.92 | 2386.50 | N/A |
| T-43 | 424483.28 | 1589596.83 | 2438.80 | 2436.20 | 84 |
| T-44 | 425360.75 | 1590665.08 | 2424.75 | 2418.70 | 124 |
| T-45 | 426325.15 | 1591504.12 | 2430.22 | 2418.00 | 155 |
| T-46 | 427103.71 | 1592773.80 | 2417.20 | 2418.70 | 86 |
| T-47 | 427268.72 | 1593693.83 | 2438.15 | 2436.20 | N/A |
| T-48 | 420008.53 | 1566456.28 | 2522.58 | 2521.80 | N/A |
| T-49 | 420365.25 | 1567762.43 | 2517.85 | 2519.40 | 80 |
| T-50 | 420749.62 | 1569256.19 | 2528.37 | 2527.40 | 113 |
| T-51 | 422247.51 | 1570275.54 | 2519.87 | 2522.30 | 78 |
| T-52 | 422608.04 | 1571422.28 | 2537.54 | 2528.50 | N/A |

TURBINE ARRAY: SUNFLOWER_LAYOUT_MICROSITED_20150616.SHP (T53 REMOVED)
* EXISTING GROUND ELEVATION BASED ON PROJECT SPECIFIC DTM PROVIDED BY SUNEDISON.
** ASSUMES 1.5' ABOVE FINISHED GROUND ELEVATION (EXISTING GROUND ELEVATION IS ASSUMED TO BE THE FINISHED GROUND ELEVATION IF THE TURBINE PAD GRADING WAS NOT DESIGNED). SEE GENERAL NOTE 20 ON SHEET 13.

| DRAINGE CROSSING SCHEDULE | | | | | | | |
|---|---|---|---|---|---|---|---|
| CROSSING NO. | TYPE | PROPOSED IMPROVEMENT | TEMPORARY | DRAINAGE AREA (AC) | CULVERT SIZE | | |
| | | | | | 2-YR | 5-YR | 10-YR |
| 1001 | Field | Access Road & Crane Path | | 142.3 | 36'' | 2-36'' | 2-36'' |
| 1004 | Entrance | Access Road & Crane Path | | 0.3 | 12'' | 12'' | 12'' |
| 1005 | Entrance | Access Road & Crane Path | | 0.6 | 12'' | 12'' | 12'' |
| 1006 | Field | Access Road & Crane Path | | 10.3 | LWC | | |
| 1007 | Field | Crane Path | Yes | 740.1 | 60'' | 66'' | 72'' |
| 1008 | Entrance | Access Road & Crane Path | | 0.2 | 12'' | 12'' | 12'' |
| 1009 | Field | Access Road & Crane Path | | 2.1 | LWC | | |
| 1010 | Field | Access Road & Crane Path | | 4.8 | 15'' | 15'' | 15'' |
| 1011 | Field | Access Road & Crane Path | | 3.9 | LWC | | |
| 1012 | Entrance | Access Road & Crane Path | | 3.3 | 12'' | 12'' | 15'' |
| 1013 | Field | Access Road & Crane Path | | 118.3 | LWC | | |
| 1014 | Entrance | Access Road & Crane Path | | 0.9 | 12'' | 12'' | 12'' |
| 1015 | Field | Access Road & Crane Path | | 11.3 | 15'' | 18'' | 18'' |
| 1016 | Field | Access Road & Crane Path | | 7.0 | 15'' | 18'' | 18'' |
| 1017 | Field | Access Road & Crane Path | | 47.2 | 2-24'' | 2-24'' | 36'' |
| 1018 | Field | Substation Driveway | | 1.4 | 12'' | 12'' | 12'' |
| 1019 | Field | Access Road & Crane Path | | 5.5 | LWC | | |
| 1020 | Field | Access Road & Crane Path | | 9.2 | 15'' | 15'' | 18'' |
| 1021 | Entrance | Access Road & Crane Path | | 0.6 | 12'' | 12'' | 12'' |
| 1022 | Entrance | Access Road & Crane Path | | 1.1 | 12'' | 12'' | 12'' |
| 1023 | Field | Access Road & Crane Path | | 6.7 | 15'' | 18'' | 18'' |
| 1024 | Entrance | Laydown Yard Driveway | Yes | 17.7 | 18'' | 24'' | 24'' |
| 1025 | Entrance | Laydown Yard Driveway | Yes | 22.0 | 18'' | 24'' | 24'' |
| 1026 | Entrance | Laydown Yard Driveway | Yes | 95.8 | 3-18'' | 36'' | 42'' |
| 1027 | Entrance | Laydown Yard Driveway | Yes | 86.8 | 2-18'' | 36'' | 36'' |
| 1028 | Field | Access Road & Crane Path | | 13.3 | 18'' | 18'' | 24'' |
| 1029 | Field | Access Road & Crane Path | | 82.4 | LWC | | |
| 1030 | Field | Access Road & Crane Path | | 4.6 | 12'' | 15'' | 15'' |
| 1031 | Entrance | Laydown Yard Driveway | Yes | 0.3 | 12'' | 12'' | 12'' |
| 1032 | Field | Crane Path | Yes | 84.2 | 30'' | 36'' | 36'' |
| 1033 | Field | Access Road & Crane Path | | 852.0 | 2-36'' | 2-36'' | 2-42'' |
| 1034 | Field | Access Road & Crane Path | | 246.9 | 48'' | 2-42'' | 2-42'' |
| 1036 | Entrance | Access Road & Crane Path | | 8.1 | 15'' | 15'' | 18'' |
| 1038 | Field | Access Road & Crane Path | | 207.9 | 36'' | - | - |
| 1039 | Entrance | Access Road & Crane Path | | 4.4 | 12'' | 15'' | 15'' |
| 1041 | Field | Access Road & Crane Path | | 9.3 | 15'' | 18'' | 18'' |
| 1044 | Field | Access Road & Crane Path | | 480.7 | 42'' | 2-42'' | 3-42'' |
| 1047 | Field | Access Road & Crane Path | | 71.0 | LWC | | |
| 1048 | Field | Access Road & Crane Path | | 7.5 | LWC | | |
| 1050 | Field | Access Road & Crane Path | | 47.0 | LWC | | |
| 1051 | Field | Access Road & Crane Path | | 43.1 | 30'' | 30'' | 36'' |
| 1053 | Field | Access Road & Crane Path | | 137.9 | 36'' | 2-36'' | 2-36'' |
| 1054 | Field | Access Road & Crane Path | | 20.0 | LWC | | |
| 1055 | Field | Access Road & Crane Path | | 5.9 | LWC | | |

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Drawn: TBR
Record Drawing by/date:

Revisions:

| # | DATE | DESCRIPTION |
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Prepared for:

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

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Boston, MA 02111

# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Turbine Index and Drainage Schedule

90% Civil Construction Plans
NOT FOR CONSTRUCTION
Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15
Sheet: 4 OF 91

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## UTILITY CROSSING SCHEDULE

| CROSSING NO. | PROPOSED IMPROVEMENT | LANDOWNER | SECTION TOWNSHIP RANGE | TRACT ID | TYPE OF UTILITY TO BE CROSSED | UTILITY/EASEMENT OWNER | EASEMENT ID | EASTING | NORTHING |
|---|---|---|---|---|---|---|---|---|---|
| 4001 | ACCESS ROAD | LYNN J. UNDERDAHL | SEC 20 TWP 139N RAN 90W | TRACT 18 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1574133 | 429518 |
| 4002 | ACCESS ROAD & CRANE PATH | RUSSELL C. KREIS | SEC 20 TWP 139N RAN 90W | TRACT 31 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1576791 | 431192 |
| 4005 | ACCESS ROAD & CRANE PATH | RUSSELL C. KREIS | SEC 21 TWP 139N RAN 90W | TRACT 32 | OVERHEAD TRANSMISSION LINE | WESTERN AREA POWER ADMINISTRATION | 32-2 | 1581410 | 432383 |
| 4006 | ACCESS ROAD & CRANE PATH | DAVID J. & CLAUDIA K. MEBERG | SEC 21 TWP 139N RAN 90W | TRACT 8 | OVERHEAD TRANSMISSION LINE | WESTERN AREA POWER ADMINISTRATION | 8-2 | 1582988 | 432470 |
| 4007 | ACCESS ROAD | ROGER W. VETTER | SEC 27 TWP 139N RAN 90W | TRACT 23 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | 9-5 | 1584707 | 429265 |
| 4008 | ACCESS ROAD & CRANE PATH | ROGER W. VETTER | SEC 27 TWP 139N RAN 90W | TRACT 23 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1584687 | 428061 |
| 4009 | CRANE PATH | KERRY L. VETTER | SEC 27 TWP 139N RAN 90W | TRACT 22 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1584653 | 426168 |
| 4011 | CRANE PATH | DALE C. & CONSTANACE R. HEINLE | SEC 32 TWP 139N RAN 90W | TRACT 2 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | 2-5 | 1575071 | 424169 |
| 4012 | CRANE PATH | DAVID J. & CLAUDIA K. MEBERG | SEC 22 TWP 139N RAN 90W | TRACT 9 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | 9-5 | 1585295 | 429747 |
| 4014 | ACCESS ROAD & CRANE PATH | RUSSELL C. KREIS | SEC 20 TWP 139N RAN 90W | TRACT 31 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1576778 | 430315 |
| 4015 | CRANE PATH | LYNN J. UNDERDAHL | SEC 29 TWP 139N RAN 90W | TRACT 19 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1574133 | 429395 |
| 4016 | ACCESS ROAD & CRANE PATH | ROGER W. VETTER | SEC 27 TWP 139N RAN 90W | TRACT 23 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1584695 | 428599 |
| 4017 | COLLECTION | LYNN J. UNDERDAHL | SEC 29 TWP 139N RAN 90W | TRACT 19 | OVERHEAD DISTRIBUTED POWER | MOR-GRAN-SOU ELECTRIC COOPERATIVE, INC. | | 1574082 | 426170 |
| 4018 | | | | | | | | | |
| 4019 | | | | | | | | | |

## EASEMENT CROSSING SCHEDULE

| CROSSING NO. | PROPOSED IMPROVEMENT | LANDOWNER | SECTION TOWNSHIP RANGE | TRACT ID | TYPE OF UTILITY TO BE CROSSED | UTILITY/EASEMENT OWNER | EASEMENT ID | ENCROACHMENT AGREEMENT NEEDED | EASTING | NORTHING |
|---|---|---|---|---|---|---|---|---|---|---|
| 5001 | ACCESS ROAD & CRANE PATH | DENNIS & DONNA REICH | SEC 25 TWP 139N RAN 90W | TRACT 38 | TELEPHONE | US WEST COMMUNICATIONS, INC. | 38-5 | Y | 1565964 | 429593 |
| 5002 | CRANE PATH | DENNIS & DONNA REICH | SEC 24 TWP 139N RAN 90W | TRACT 37 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY | 37-9 | Y | 1568801 | 429691 |
| 5003 | CRANE PATH | LYNN J. UNDERDAHL | SEC 30 TWP 139N RAN 90W | TRACT 21 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 21-1, 21-3 | Y | 1571100 | 429509 |
| 5004 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | SEC 30 TWP 139N RAN 90W | TRACT 20 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY | 20- | Y | 1570519 | 429441 |
| 5005 | ACCESS ROAD & CRANE PATH | MILES J. SCHANTZ | SEC 21 TWP 139N RAN 90W | TRACT 12 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 12-2, 12-3 | | 1579506 | 431108 |
| 5006 | ACCESS ROAD & CRANE PATH | RUSSELL C. KREIS | SEC 21 TWP 139N RAN 90W | TRACT 32 | TELEPHONE & ELECTRIC | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 32-3, 32-2 | Y | 1581874 | 431998 |
| 5007 | ACCESS RD, CRANE PATH, TURBINE PAD | LYNN J. UNDERDAHL | SEC 19 TWP 139N RAN 90W | TRACT 42 | RURAL WATER LINE (BLANKET EASEMENT) | SOUTHWEST WATER AUTHORITY | 42-1, 17-4, 18-2 | | 1571210 | 430525 |
| 5008 | CRANE PATH | DENNIS & DONNA REICH | SEC 24 TWP 139N RAN 91W | TRACT 37 | COMMUNICATIONS (BLANKET EASEMENT) | MONTANA-DAKOTA UTILITIES, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 37-4, 37-10 | - | 1568277 | 429690 |
| 5009 | ACCESS RD, CRANE PATH, TURBINE PAD | LYNN J. UNDERDAHL | SEC 30 TWP 139N RAN 90W | TRACT 20 | COMMUNICATIONS & WATER (BLANKET EASEMENT) | WEST RIVER TELECOMMUNICATIONS COOPERATIVE, SOUTHWEST WATER AUTHORITY | 20-2, 20-3 | - | 1573525 | 427690 |
| 5010 | CRANE PATH | MILES J. SCHANTZ | SEC 28 TWP 139N RAN 90W | TRACT 13 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 13-1, 13-3 | - | 1579439 | 427602 |
| 5013 | CRANE PATH | DALE C. & CONSTANACE R. HEINLE | SEC 31 TWP 139N RAN 90W | TRACT 1 | RURAL WATER LINE (BLANKET EASEMENT) | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 1-1 | - | 1573393 | 423331 |
| 5014 | ACCESS ROAD & CRANE PATH | DAVID J. & CLAUDIA K. MEBERG | SEC 21 TWP 139N RAN 90W | TRACT 8 | GAS PIPELINE | WILLISTON BASIN INTERSTATE PIPELINE CO, MDU RESOURCES GROUP, INC. | 8-1 | Y | 1583128 | 434529 |
| 5015 | COLLECTION | DENNIS & DONNA REICH | SEC 24 TWP 139N RAN 91W | TRACT 37 | COMMUNICATIONS (BLANKET EASEMENT) | MONTANA-DAKOTA UTILITES, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 37-4, 37-10 | - | 1568247 | 430587 |
| 5016 | COLLECTION | DENNIS & DONNA REICH | SEC 24 TWP 139N RAN 91W | TRACT 37 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY | 37-9 | Y | 1568819 | 430574 |
| 5017 | COLLECTION | MILES J. SCHANTZ | SEC 21 TWP 139N RAN 90W | TRACT 12 | TELEPHONE | NORTHWESTERN BELL TELEPHONE COMPANY, WEST RIVER TELECOMMUNICATIONS COOPERATIVE | 12-2, 12-3 | - | 1579478 | 429556 |
| 5019 | COLLECTION | DENNIS & DONNA REICH | SEC 25 TWP 139N RAN 90W | TRACT 38 | TELEPHONE | US WEST COMMUNICATIONS, INC. | 38-5 | Y | 1566442 | 429568 |

* DETAILED EASEMENT DESCRIPTIONS CAN BE FOUND IN THE SUNFLOWER WIND PROJECT ALTA SURVEY PDF, SCHEDULE B ON PAGES 29–32 FROM 11/6/2014

** COORDINATE SYSTEM: HARN/NORTH DAKOTA STATE PLANE SOUTH ZONE INTERNATIONAL FEET

DRAFT TO BE UPDATED PENDING:
FINAL COLLECTION ROUTING (ULTEIG)
REVISED ALTA SURVEY

## FENCE CROSSING SCHEDULE

| CROSSING NO. | PROPOSED IMPROVEMENT | LANDOWNER | DETAIL NO. | REMOVAL LENGTH | CROSSING NO. | PROPOSED IMPROVEMENT | LANDOWNER | DETAIL NO. | REMOVAL LENGTH |
|---|---|---|---|---|---|---|---|---|---|
| 3001 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3026 | CRANE PATH | JUSTIN HEINLE | FN01 | |
| 3002 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3027 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | |
| 3003 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3030 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | |
| 3004 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3031 | ACCESS ROAD & CRANE PATH | JUSTIN HEINLE | GA02 | |
| 3005 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3038 | CRANE PATH | KERRY L. VETTER | FN01 | |
| 3006 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3039 | ACCESS ROAD & CRANE PATH | KERRY L. VETTER | GA02 | |
| 3007 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3040 | ACCESS ROAD & CRANE PATH | ROGER W. VETTER | GA02 | |
| 3008 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3041 | ACCESS ROAD & CRANE PATH | JEFFREY HEINLE | GA02 | |
| 3013 | ACCESS ROAD & CRANE PATH | RUSSELL C. KREIS | GA02 | | 3043 | ACCESS ROAD & CRANE PATH | LYLE & LYNDA HOERAUF | GA02 | |
| 3014 | ACCESS ROAD & CRANE PATH | DAVID & CLAUDIA MEBERG | GA02 | | 3045 | CRANE PATH | JEFFREY HEINLE | FN01 | |
| 3015 | ACCESS ROAD & CRANE PATH | MILES J. SCHANTZ | GA02 | | 3047 | ACCESS ROAD & CRANE PATH | BRIAN KITZAN | GA02 | |
| 3016 | ACCESS ROAD & CRANE PATH | DAVID & CLAUDIA MEBERG | GA02 | | 3049 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | |
| 3017 | CRANE PATH | DAVID & CLAUDIA MEBERG | FN01 | | 3050 | ACCESS ROAD & CRANE PATH | DAVID & CLAUDIA MEBERG | GA02 | |
| 3018 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3051 | FACILITY ROAD | LYNN J. UNDERDAHL | GA01 | |
| 3019 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3056 | ACCESS ROAD & CRANE PATH | JEFFREY HEINLE | GA02 | |
| 3020 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3057 | ACCESS ROAD | LYNN J. UNDERDAHL | GA01 | |
| 3021 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | | 3058 | CRANE PATH | LYNN J. UNDERDAHL | FN01 | |
| 3022 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3059 | CRANE PATH | DALE & CONSTANCE HEINLE | FN01 | |
| 3023 | ACCESS ROAD & CRANE PATH | LYNN J. UNDERDAHL | GA02 | | 3060 | CRANE PATH | DALE & CONSTANCE HEINLE | FN01 | |
| 3024 | ACCESS ROAD & CRANE PATH | JUSTIN HEINLE | GA02 | | 3061 | CRANE PATH | KERRY L. VETTER | FN01 | |
| 3025 | CRANE PATH | STEVEN & KATIE KITZAN | FN01 | | | | | | |

## FENCE CROSSING SCHEDULE

| CROSSING NO. | PROPOSED IMPROVEMENT | LANDOWNER | DETAIL NO. | REMOVAL LENGTH |
|---|---|---|---|---|
| 3501 | COLLECTION | STEVEN & KATIE KITZAN | FN02 | |
| 3502 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3503 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3504 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3505 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3506 | COLLECTION | RUSSELL C. KREIS | FN02 | |
| 3509 | COLLECTION | DAVID & CLAUDIA MEBERG | FN02 | |
| 3513 | COLLECTION | KERRY L. VETTER | FN02 | |
| 3514 | COLLECTION | DAVID & CLAUDIA MEBERG | FN02 | |
| 3515 | COLLECTION | DAVID & CLAUDIA MEBERG | FN02 | |
| 3517 | COLLECTION | KERRY L. VETTER | FN02 | |
| 3518 | COLLECTION | JEFFREY HEINLE | FN02 | |
| 3519 | COLLECTION | LARRY & MARGARET DITTUS | FN02 | |
| 3520 | COLLECTION | LARRY & MARGARET DITTUS | FN02 | |
| 3521 | COLLECTION | LARRY & MARGARET DITTUS | FN02 | |
| 3522 | COLLECTION | LARRY & MARGARET DITTUS | FN02 | |
| 3523 | COLLECTION | JUSTIN HEINLE | FN02 | |
| 3524 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3525 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3526 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3527 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3528 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3529 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3531 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3532 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3533 | COLLECTION | LYNN J. UNDERDAHL | FN02 | |
| 3535 | COLLECTION | LARRY & MARGARET DITTUS | FN02 | |
| 3536 | COLLECTION | RUSSELL C. KREIS | FN02 | |

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Designed: DFK
Checked: RSC
Drawn: TBR
Record Drawing by/date:

Revisions:

| # | DATE | DESCRIPTION |
|---|---|---|
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| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |
| . | | |

Prepared for:

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

Stark and Morton Counties, North Dakota

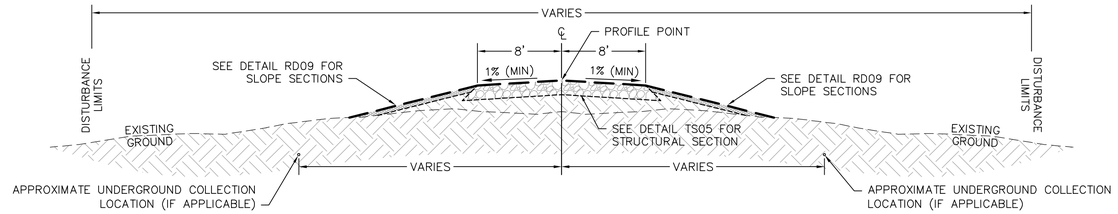
## Crossing Schedules

90% Civil Construction Plans
NOT FOR CONSTRUCTION
Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15
Sheet: 5 OF 91

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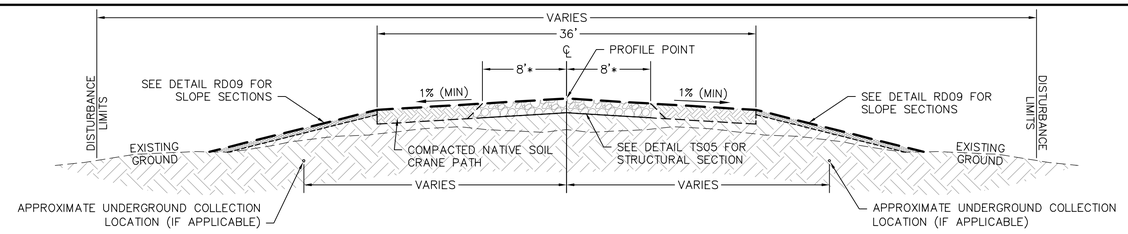



**NOTES:**

1. CONTRACTOR TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL-DRAINED AT ALL TIMES.
2. SLOPES SHOWN ARE IN HORIZONTAL TO VERTICAL (H:V) FORMAT.
3. ALL DISTURBED GROUND NOT COVERED WITH GRAVEL SHALL BE STABILIZED. SLOPES SHOWN ARE TYPICAL. SOME ROAD LOCATIONS MAY REQUIRE VARIATIONS IN SLOPE.
4. IF EXCESS TOPSOIL IS AVAILABLE, ADDITIONAL TOPSOIL CAN BE PLACED ON FILL SLOPES INCREASING THE DEPTH OF TOPSOIL.
5. CROWN/CROSS SLOPE SHOWN IS MINIMUM.
6. REFER TO PLAN FOR LOCATION AND NUMBER OF UNDERGROUND COLLECTION CIRCUITS.

**TYPICAL SECTION NOT DRAWN TO SCALE**

| | | |
|---|---|---|
| Westwood | 16' WIDE ACCESS ROAD TYPICAL SECTION (CROWNED) | LAST REVISED: 06/16/15<br>RD01-E |

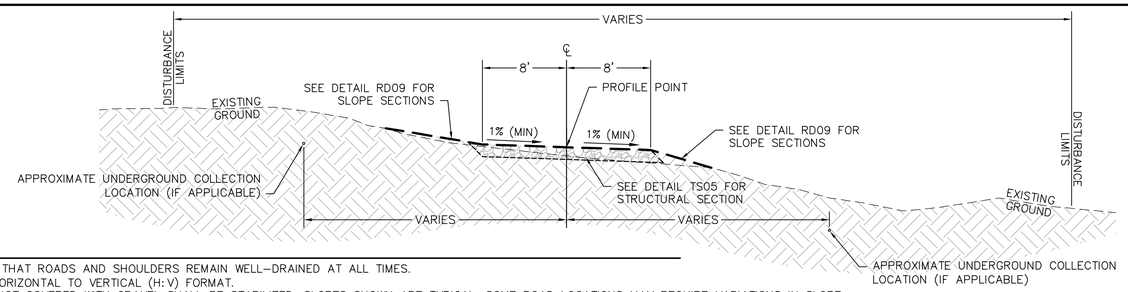



**NOTES:**

1. CONTRACTOR TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL-DRAINED AT ALL TIMES.
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3. ALL DISTURBED GROUND NOT COVERED WITH GRAVEL SHALL BE STABILIZED. SLOPES SHOWN ARE TYPICAL. SOME ROAD LOCATIONS MAY REQUIRE VARIATIONS IN SLOPE.
4. IF EXCESS TOPSOIL IS AVAILABLE, ADDITIONAL TOPSOIL CAN BE PLACED ON FILL SLOPES INCREASING THE DEPTH OF TOPSOIL.
5. CROWN/CROSS SLOPE IS 1% MAXIMUM FOR CRANE TRAVEL.
6. REFER TO PLAN FOR LOCATION AND NUMBER OF UNDERGROUND COLLECTION CIRCUITS.
* ROAD D (SUBSTATION/INTERCONNECT ACCESS NORTH FROM 40TH STREET) TO BE GRAVELED WITH 12' LANES (24' GRAVEL WIDTH)

**TYPICAL SECTION NOT DRAWN TO SCALE**

| | | |
|---|---|---|
| Westwood | 16' WIDE ACCESS ROAD WITH CRANE TRAVEL TYPICAL SECTION (CROWNED) | LAST REVISED: 06/16/15<br>RD01-F |

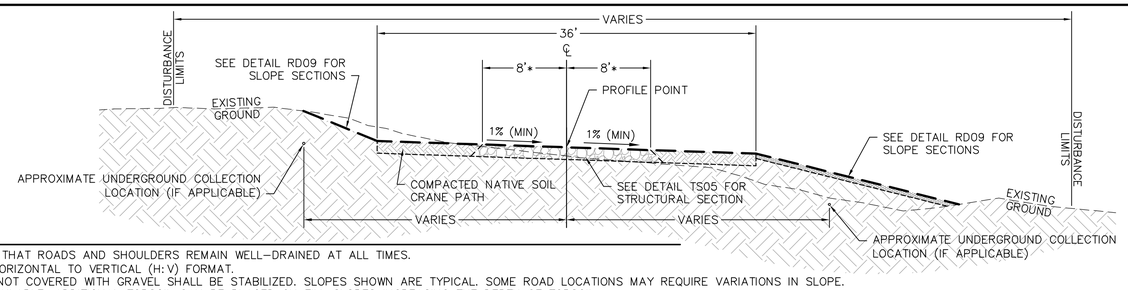



**NOTES:**

1. CONTRACTOR TO ENSURE THAT ROADS AND SHOULDERS REMAIN WELL-DRAINED AT ALL TIMES.
2. SLOPES SHOWN ARE IN HORIZONTAL TO VERTICAL (H:V) FORMAT.
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6. REFER TO PLAN FOR LOCATION AND NUMBER OF UNDERGROUND COLLECTION CIRCUITS.

**TYPICAL SECTION NOT DRAWN TO SCALE**

| | | |
|---|---|---|
| Westwood | 16' WIDE ACCESS ROAD TYPICAL SECTION (CROSS SLOPED) | LAST REVISED: 06/16/15<br>RD01-G |

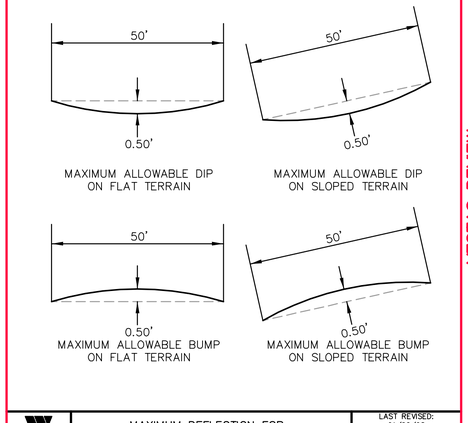



**NOTES:**

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* ROAD D (SUBSTATION/INTERCONNECT ACCESS NORTH FROM 40TH STREET) TO BE GRAVELED WITH 12' LANES (24' GRAVEL WIDTH)

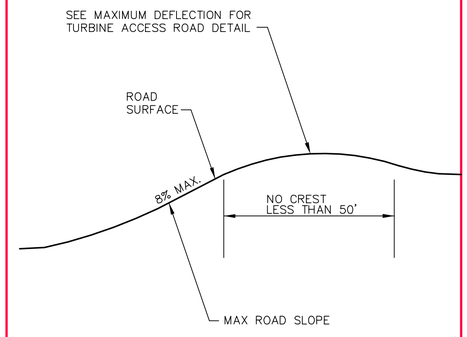
**TYPICAL SECTION NOT DRAWN TO SCALE**

| | | |
|---|---|---|
| Westwood | 16' WIDE ACCESS ROAD WITH CRANE TRAVEL TYPICAL SECTION (CROSS SLOPED) | LAST REVISED: 06/16/15<br>RD01-H |




| | | |
|---|---|---|
| Westwood | MAXIMUM DEFLECTION FOR TURBINE ACCESS ROAD | LAST REVISED: 01/02/08<br>RD02 |

VESTAS REVIEW

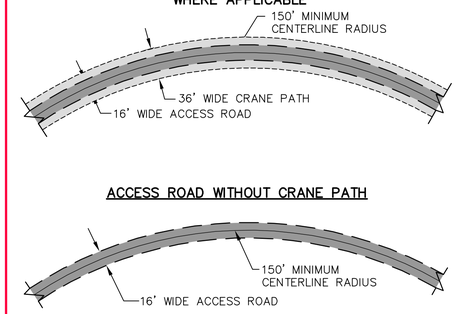



**NOTES:**

1. ROAD SLOPE SHALL NOT EXCEED 8% WITHOUT OWNER APPROVAL

| | | |
|---|---|---|
| Westwood | MAXIMUM VERT. SLOPE FOR TURBINE ACCESS ROAD/CRANE TRAVEL PATH | LAST REVISED: 3/19/12<br>RD03 |

VESTAS REVIEW




**NOTE:**

1. SOME RADII MAY REQUIRE ADDITIONAL SOIL COMPACTION OR GRAVEL OUTSIDE OF THE WIDTH SHOWN ABOVE TO ACCOMMODATE TRACTORS OR TRAILERS TRACKING OFF THE ACCESS ROAD.

| | | |
|---|---|---|
| Westwood | MINIMUM RADIUS FOR TURBINE ACCESS ROAD | LAST REVISED: 04/20/11<br>RD05 |

VESTAS REVIEW

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**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

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| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

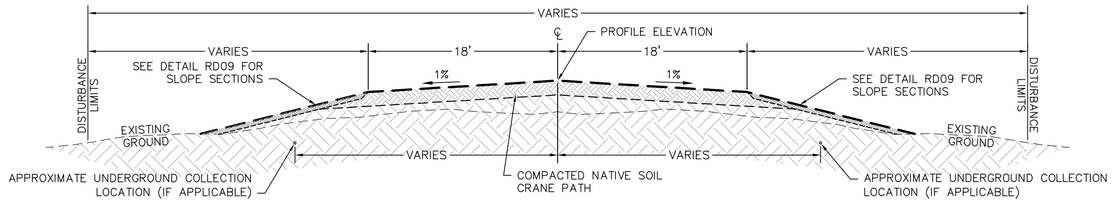
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**Date:** 08/03/15

**Sheet:** 6 OF 91

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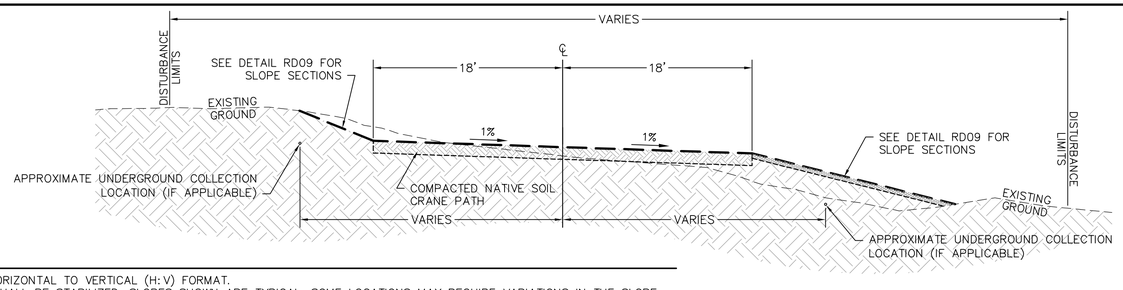



**NOTES:**

1. SLOPES SHOWN ARE IN HORIZONTAL TO VERTICAL (H:V) FORMAT.
2. ALL DISTURBED GROUND SHALL BE STABILIZED. SLOPES SHOWN ARE TYPICAL. SOME LOCATIONS MAY REQUIRE VARIATIONS IN THE SLOPE
3. IF EXCESS TOPSOIL IS AVAILABLE, ADDITIONAL TOPSOIL CAN BE PLACED ON FILL SLOPES INCREASING THE DEPTH OF TOPSOIL.
4. CROWN/CROSS SLOPE SHOWN IS MAXIMUM FOR CRANE TRAVEL.
5. REFER TO PLAN FOR LOCATION AND NUMBER OF UNDERGROUND COLLECTION CIRCUITS.

**TYPICAL SECTION NOT DRAWN TO SCALE**

| | | |
|---|---|---|
| Westwood | 36' WIDE CRANE TRAVEL TYPICAL SECTION (CROWNED) | LAST REVISED: 06/16/15 RD01–I |

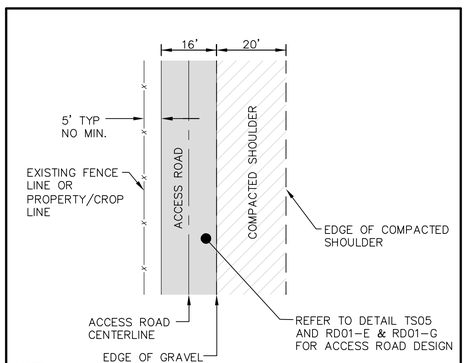



**NOTES:**

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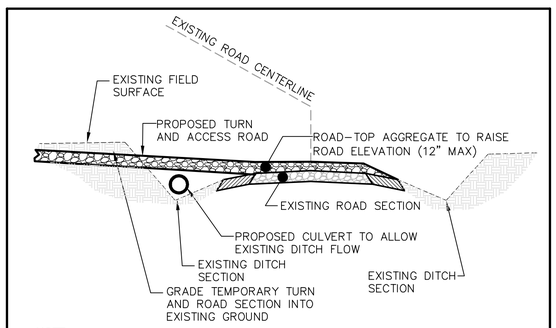
| | | |
|---|---|---|
| Westwood | 36' WIDE CRANE TRAVEL TYPICAL SECTION (CROSS SLOPED) | LAST REVISED: 06/16/15 RD01–J |




**NOTE:**

1. COMPACTED SHOULDER SHALL BE RETURNED TO NATIVE CONDITION FOLLOWING TURBINE GENERATOR CONSTRUCTION.
2. THE ACCESS ROAD MAY NEED TO BE CONSTRUCTED FARTHER FROM THE PROPERTY LINE IF OBSTRUCTIONS SUCH AS TREES FOLLOW THE PROPERTY LINE.

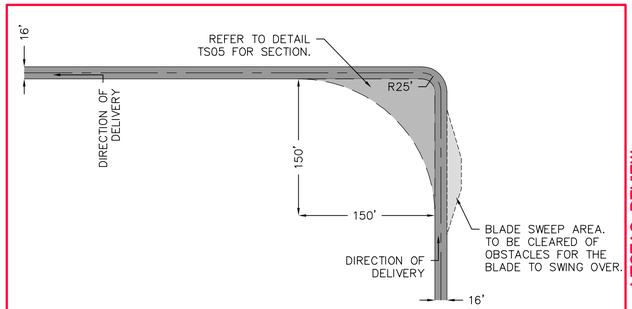
| | | |
|---|---|---|
| Westwood | TURBINE ACCESS ROAD ALONG FENCE/PROPERTY/CROP LINE | LAST REVISED: 3/19/12 RD04 |




**NOTE:**

1. VERTICAL DIMENSIONS ARE TO ADHERE TO THOSE SPECIFIED IN DETAILS RD02 AND RD03.
2. HORIZONTAL DIMENSIONS ARE TO ADHERE TO THOSE SPECIFIED IN DETAIL VS–01.
3. CULVERTS SHALL BE SIZED AS TO NOT IMPAIR EXISTING DITCH FLOW.
4. AGGREGATE ADDITION ON COUNTY ROAD NEEDS TO BE BLENDED/TAPERED BACK INTO EXISTING ROAD TO AVOID HUMP IN COUNTY ROAD.

| | | |
|---|---|---|
| Westwood | PUBLIC ROAD GRADED TO ELEVATED ADJACENT FIELD | LAST REVISED: 09/25/14 RD17 |

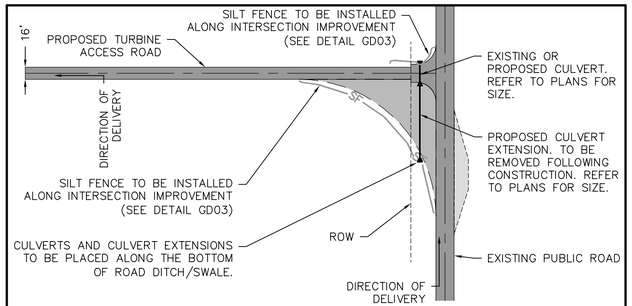



**NOTE:**

1. TO BE VERIFIED BY VESTAS PRIOR TO CONSTRUCTION.
2. INTERSECTION WIDENING BASED ON BLADE VEHICLE ANALYSIS CONDUCTED BY WESTWOOD USING AUTOTURN 9.0 AND AS DIRECTED BY VESTAS. REFER TO DELIVERY MANUAL FOR ADDITIONAL REQUIREMENTS.
3. TEMPORARY GRAVEL WIDENING TO BE REMOVED AND RESTORED FOLLOWING CONSTRUCTION. REFER TO SWPPP FOR ADDITIONAL RESTORATION REQUIREMENTS.
4. ADDITIONAL GRAVEL MAY BE NEEDED BASED ON TURNING MOVEMENT DETERMINED IN THE FIELD

| | | |
|---|---|---|
| Westwood | TYPICAL VESTAS TEMPORARY 90° INTERSECTION WIDENING | LAST REVISED: 09/24/14 VS–01 |

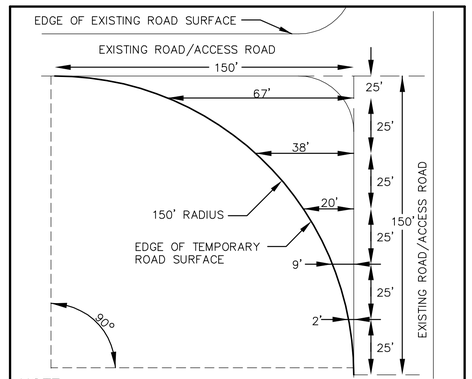
VESTAS REVIEW




**NOTE:**

1. IF TEMPORARY INTERSECTION IS WITHIN 50 LF OF WETLAND/SURFACE WATER, REDUNDANT SEDIMENT CONTROLS ARE NEEDED. REFER TO SWPPP FOR ADDITIONAL INFORMATION.
2. TEMPORARY GRAVEL WIDENING TO BE REMOVED AND RESTORED FOLLOWING CONSTRUCTION. REFER TO SWPPP FOR ADDITIONAL RESTORATION REQUIREMENTS.
3. ADDITIONAL GRAVEL MAY BE NEEDED BASED ON TURNING MOVEMENT DETERMINED IN THE FIELD

| | | |
|---|---|---|
| Westwood | TYPICAL INTERSECTION IMPROVEMENT SEDIMENT CONTROL MEASURES | LAST REVISED: 09/24/14 RD30 |




**NOTE:**

1. UPON DELIVERY VEHICLE COMPLETION, TEMPORARY INTERSECTION WIDENING TO BE REMOVED AND ALL DISTURBED AREA RESTORED.
2. DIMENSIONS SHOWN ARE FOR REFERENCE GIVEN AN IDEAL INTERSECTION. IMPROVEMENTS SHALL BE APPROVED BY VESTAS PRIOR TO DELIVERIES.

| | | |
|---|---|---|
| Westwood | INTERSECTION WIDENING DIMENSIONS | LAST REVISED: 3/7/14 RD06 |

**Westwood**
Westwood Professional Services, Inc.
7699 Anagram Drive, Eden Prairie, MN 55344
Phone (952) 937-5150 Toll Free (888) 937-5150
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| | |
|---|---|
| Designed: | DFK |
| Checked: | RSC |
| Drawn: | TBR |
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| . | | |
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

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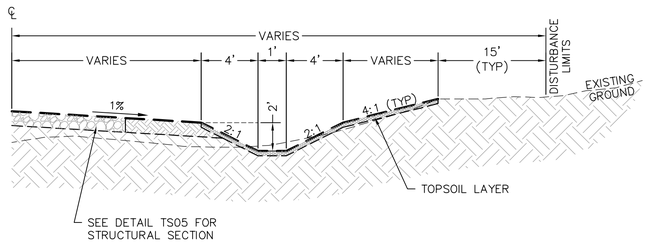
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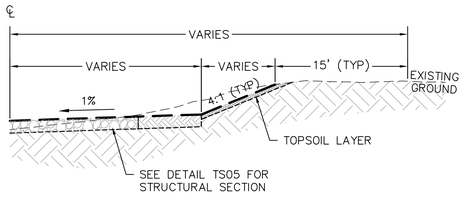
Sheet: 7 OF 91

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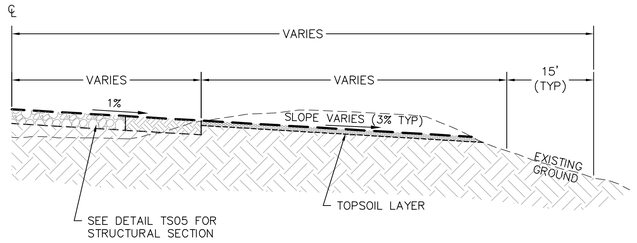
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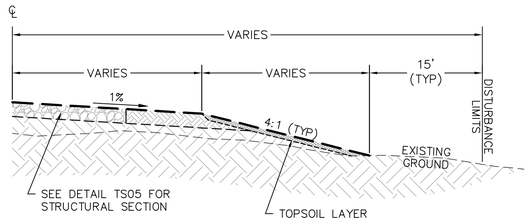

CUT SLOPE (DITCH)




CUT SLOPE




DRAIN CUT EDGE



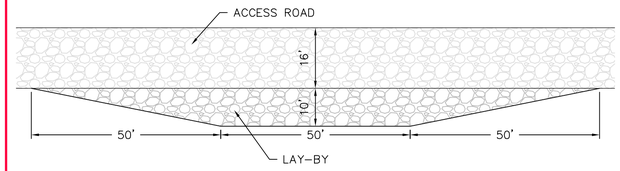

FILL SLOPE

**NOTES:**

1. SLOPES SHOWN ARE IN HORIZONTAL TO VERTICAL (H:V) FORMAT.
2. ALL DISTURBED GROUND NOT COVERED WITH GRAVEL SHALL BE STABILIZED. SLOPES SHOWN ARE TYPICAL. SOME ROAD LOCATIONS MAY REQUIRE VARIATIONS IN THE SLOPE
3. IF EXCESS TOPSOIL IS AVAILABLE, ADDITIONAL TOPSOIL CAN BE PLACED ON FILL SLOPES INCREASING THE DEPTH OF TOPSOIL.
4. CROWN/CROSS SLOPE SHOWN IS MAXIMUM FOR CRANE TRAVEL.

TYPICAL SECTION NOT DRAWN TO SCALE

| | | |
|---|---|---|
| Westwood | TYPICAL ROAD SLOPE SECTIONS | LAST REVISED: 06/16/15<br>RD09 |

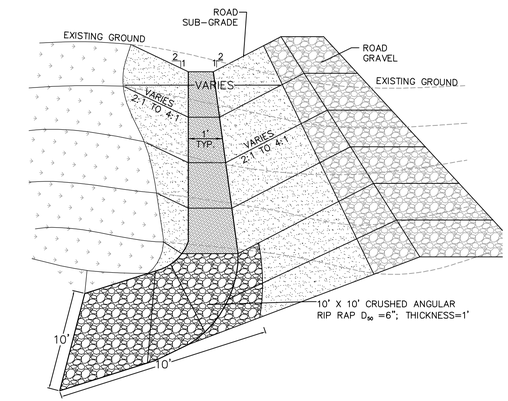



**NOTE:**

1. LAY-BYS SHALL BE REQUIRED, AT 1.5 MILE INTERVALS, ON ALL ACCESS ROADS LONGER THAN 3 MILES.
2. EXACT LAY-BY LOCATIONS TO BE COORDINATED WITH VESTAS AND DELIVERY COMPANY. ANTICIPATED LOCATIONS ARE SHOWN ON THE PLANS.

| | | |
|---|---|---|
| Westwood | TYPICAL LAY-BY | LAST REVISED: 07/21/15<br>VS-02 |

VESTAS REVIEW

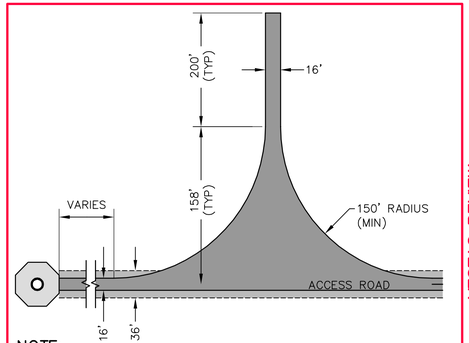



**NOTES:**

1. DITCH OUTLET RIPRAP SHALL BE CRUSHED ANGULAR ROCK $D_{50}$ =6"
2. INSTALL GEOTEXTILE FABRIC UNDERNEATH RIP RAP OUTLET
3. OUTLET SIZE SHALL BE 10' X 10' X 1.0'
4. STABILIZE SIDE SLOPES PER SWPPP GUIDANCE.
5. STABILIZE DITCH WETTED PERIMETER PER SWPPP GUIDANCE.
6. INSTALL ROCK CHECKS IN DITCH PER PLAN AND SWPPP REQUIREMENTS.
7. DITCH OUTLET SHALL BE CLEARED AS PART OF FINAL RESTORATION.

TYPICAL SECTION NOT DRAWN TO SCALE

| | | |
|---|---|---|
| Westwood | LEVEL SPREADER DITCH OUTLET | LAST REVISED: 06/16/15<br>GD25 |

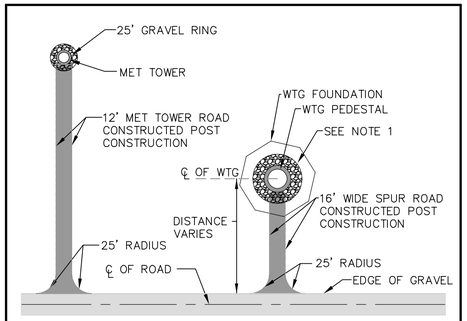



**NOTE:**

1. TEMPORARY TURNAROUND BASED ON VESTAS DELIVERY REQUIREMENTS. REFER TO MANUAL FOR ADDITIONAL REQUIREMENTS. IN LIEU OF DETAIL SHOWN, TURNAROUND MAY BE PROVIDED AROUND EXTENTS OF TURBINE PAD DISTURBANCE.
2. TEMPORARY TURNAROUND TO BE REMOVED AND RESTORED FOLLOWING CONSTRUCTION. REFER TO SWPPP FOR ADDITIONAL RESTORATION REQUIREMENTS.
4. SPECIFICATION FOR TURNAROUND COMPACTION/MATERIALS SHALL FOLLOW PROJECT ROAD SPECIFICATION ON SHEETS 13 & 14.

| | | |
|---|---|---|
| Westwood | TEMPORARY HAMMERHEAD TURNAROUND | LAST REVISED: 06/11/13<br>TS07 |

VESTAS REVIEW




**NOTE:**

1. REFER TO ELECTRICAL PLANS BY ULTEIG FOR GRAVEL RING REQUIREMENTS SURROUNDING TOWER, STAIRS, AND JUNCTION BOX.

| | | |
|---|---|---|
| Westwood | TYPICAL SPUR AND MET TOWER ROAD | LAST REVISED: 11/04/14<br>TS06 |

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**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

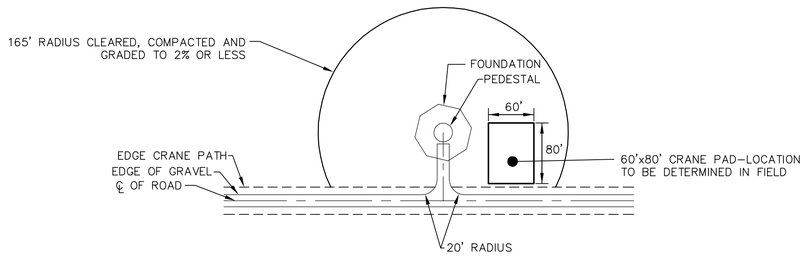
**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**
**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 8 OF 91

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**NOTE:**

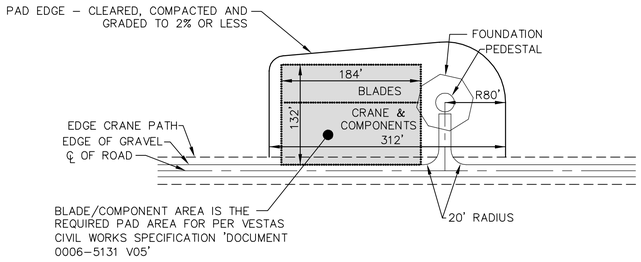
1. ACTUAL CRANE PAD LOCATION TO BE DETERMINED BY CONTRACTOR.
2. DISTANCE BETWEEN CENTER OF TURBINE AND EDGE OF GRAVEL ROAD VARIES BY TURBINE SITE
3. COMPACTED SHALL BE DEFINED AS PASSING A PROOF ROLL AS LISTED ON SHEET 13 UNDER TESTING REQUIREMENTS.
4. PAD EDGE, SIZE, & SHAPE MAY BE ADJUSTED TO OPTIMIZE GRADING AT EACH TURBINE SITE.
5. REFER TO PLANS FOR TYPE OF WTG SITE PLAN AT EACH TURBINE.

TYPICAL WTG SITE – PLAN VIEW – DRIVE BY

LAST REVISED: 06/11/15

TS01

VESTAS REVIEW




**NOTE:**

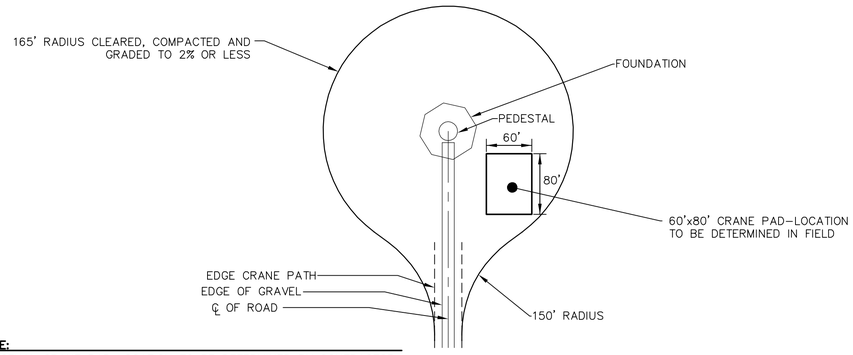
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3. COMPACTED SHALL BE DEFINED AS PASSING A PROOF ROLL AS LISTED ON SHEET 13 UNDER TESTING REQUIREMENTS.
4. DISTURBANCE LIMITS AND TIE–IN SLOPES MAY VARY BASED ON ACTUAL TERRAIN AT EACH TURBINE SITE.
5. PAD EDGE, SIZE, & SHAPE MAY BE ADJUSTED TO OPTIMIZE GRADING AT EACH TURBINE SITE.
6. REFER TO PLANS FOR TYPE OF WTG SITE PLAN AT EACH TURBINE.

NON–TYPICAL WTG SITE – PLAN VIEW – DRIVE BY

LAST REVISED: 06/11/15

TS03

VESTAS REVIEW




**NOTE:**

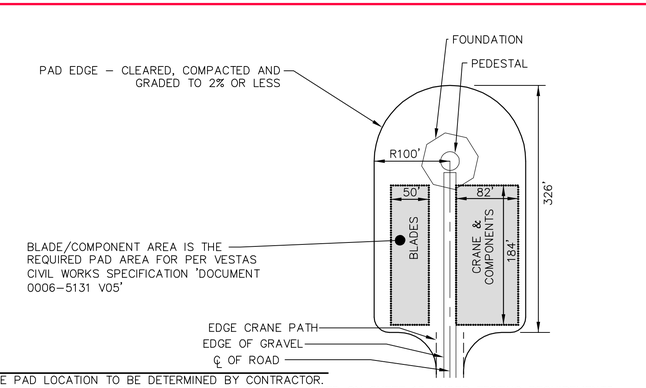
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2. COMPACTED SHALL BE DEFINED AS PASSING A PROOF ROLL AS LISTED ON SHEET 13 UNDER TESTING REQUIREMENTS.
3. PAD EDGE, SIZE, & SHAPE MAY BE ADJUSTED TO OPTIMIZE GRADING AT EACH TURBINE SITE.
4. REFER TO PLANS FOR TYPE OF WTG SITE PLAN AT EACH TURBINE.

TYPICAL WTG SITE – PLAN VIEW – DEAD END

LAST REVISED: 06/11/15

TS02

VESTAS REVIEW




**NOTE:**

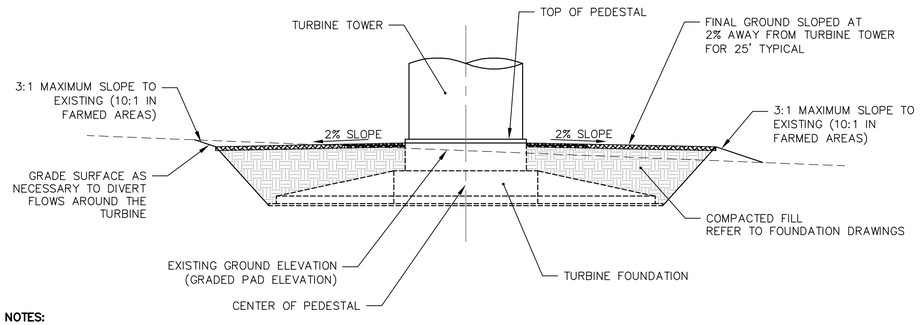
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2. COMPACTED SHALL BE DEFINED AS PASSING A PROOF ROLL AS LISTED ON SHEET 13 UNDER TESTING REQUIREMENTS.
3. DISTURBANCE LIMITS AND TIE–IN SLOPE MAY VARY BASED ON ACTUAL TERRAIN AT EACH TURBINE SITE.
4. PAD EDGE, SIZE, & SHAPE MAY BE ADJUSTED TO OPTIMIZE GRADING AT EACH TURBINE SITE.
5. REFER TO PLANS FOR TYPE OF WTG SITE PLAN AT EACH TURBINE.

NON–TYPICAL WTG SITE – PLAN VIEW – DEAD END

LAST REVISED: 06/11/15

TS04

VESTAS REVIEW



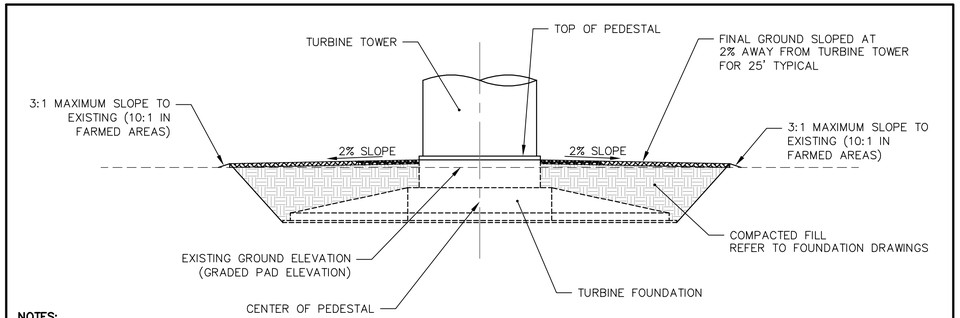

**NOTES:**

1. SET THE TOP OF FOUNDATION PEDESTAL 18" (TYPICAL) AT CENTERLINE OF FOUNDATION ABOVE EXISTING GROUND ELEVATION OR GRADED PAD ELEVATION. INCREASE 18" DIMENSION AS NEEDED TO 1) MAINTAIN 25' WIDE FINISH GRADE AT 2% SLOPE, AND 2) ACCOMMODATE STEEPER CROSS SLOPES OF GRADED PAD ELEVATION.
2. GRADE FINAL GROUND AROUND THE BASE OF THE TURBINE TO A MINIMUM 2% SLOPE FOR 25' (TYPICAL) TO PROVIDE DRAINAGE AWAY FROM TURBINE BASE.
3. PROPOSED TOP OF PEDESTAL ELEVATIONS ARE SUBJECT TO CHANGE BASED UPON VERIFICATION OF FIELD CONDITIONS.
4. FINAL PEDESTAL ELEVATION SHALL NOT EXCEED GROUND ELEVATIONS BY MORE THAN 3' UNLESS APPROVED BY OWNER.
5. CONTRACTOR TO VERIFY GEOTECHNICAL/STRUCTURAL PLAN REQUIREMENTS PRIOR TO DETERMINING PEDESTAL ELEVATION. CONTACT ENGINEER IF THERE ARE ANY DISCREPANCIES.

TYPICAL FOUNDATION PEDESTAL ELEVATION – GRADED PAD WITH CROSS SLOPE

LAST REVISED: 3/19/12

TS03A




**NOTES:**

1. SET THE TOP OF FOUNDATION PEDESTAL 18" (TYPICAL) AT CENTERLINE OF FOUNDATION ABOVE EXISTING GROUND ELEVATION OR GRADED PAD ELEVATION.
2. GRADE FINAL GROUND AROUND THE BASE OF THE TURBINE TO A MINIMUM 2% SLOPE FOR 25' (TYPICAL) TO PROVIDE DRAINAGE AWAY FROM TURBINE BASE.
3. PROPOSED TOP OF PEDESTAL ELEVATIONS ARE SUBJECT TO CHANGE BASED UPON VERIFICATION OF FIELD CONDITIONS.
4. FINAL PEDESTAL ELEVATION SHALL NOT EXCEED GROUND ELEVATIONS BY MORE THAN 3' UNLESS APPROVED BY OWNER.
5. CONTRACTOR TO VERIFY GEOTECHNICAL/STRUCTURAL PLAN REQUIREMENTS PRIOR TO DETERMINING PEDESTAL ELEVATION. CONTACT ENGINEER IF THERE ARE ANY DISCREPANCIES.

TYPICAL FOUNDATION PEDESTAL ELEVATION – GRADED PAD WITH NO SLOPE

LAST REVISED: 3/19/12

TS03B

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| | |
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| Record Drawing by/date: | |

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| . | | |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
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Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

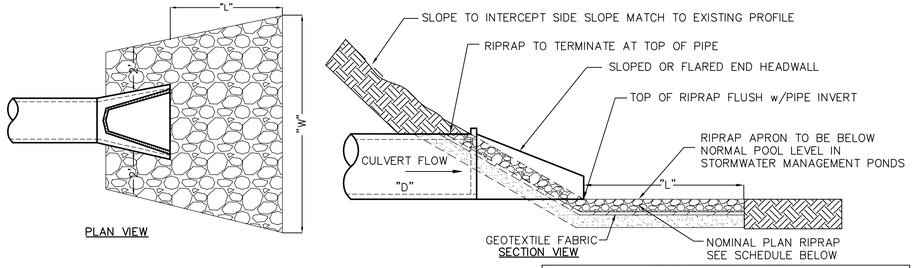
**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 9 OF 91

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| SCHEDULE FOR STORM DRAIN | | | | |
|---|---|---|---|---|
| CULVERT DIAMETER (D) | LENGTH (L) | WIDTH (W) | STONE $ds_{50}$ | RIPRAP THICKNESS |
| 12" | 8' | 12' | 6" | 14" |
| 15" | 8' | 12' | 6" | 14" |
| 18" | 10' | 12' | 6" | 14" |
| 21" | 10' | 12' | 6" | 14" |
| 24" | 12' | 14' | 6" | 14" |
| 30" | 16' | 20' | 12" | 27" |
| 36" | 20' | 23' | 12" | 27" |

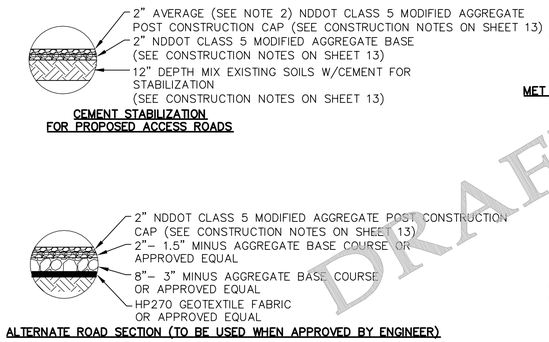
NOTES

1. RIPRAP GRADATION AND PLACEMENT – THE RIPRAP GRADATION SHALL BE A WELL-GRADED MIX FROM ABOUT 1.5 TIMES THE D SIZE TO ABOUT 25 PERCENT OF THE D SIZE. THE RIPRAP STONES SHALL BE CAREFULLY PLACED WORKING FROM THE TOE OF THE SLOPED UPWARD. THE STONES SHOULD BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12 INCHES ONTO THE GEOTEXTILE. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH UNIFORMLY SLOPED SURFACE.

PIPE/CULVERT OUTLET APRON W/OUT DISPERSION BERM

LAST REVISED: 12/23/11

LA10




DRAFT

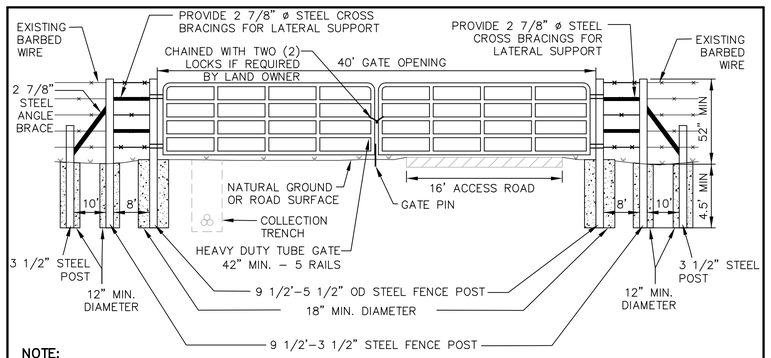
**NOTE:**

1. STRUCTURAL SECTIONS SHOWN ARE THE MINIMUM THICKNESS REQUIREMENTS DURING NORMAL FIELD CONDITIONS. THE SECTIONS MAY NEED TO BE INCREASED BASED ON ACTUAL FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. CONDITIONS INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION DURING THE FREEZE/THAW CYCLE, UNUSUALLY WET PERIODS, OR IN LOW/WET AREAS.
2. THE POST CONSTRUCTION CAP SHALL BE APPLIED SO 3" OF POST CONSTRUCTION AGGREGATE REMAINS. IT IS ANTICIPATED THAT BETWEEN 1" AND 3" OF AGGREGATE WILL NEED TO BE APPLIED.

TYPICAL STRUCTURAL CROSS SECTIONS

LAST REVISED: 04/15/14

TS05



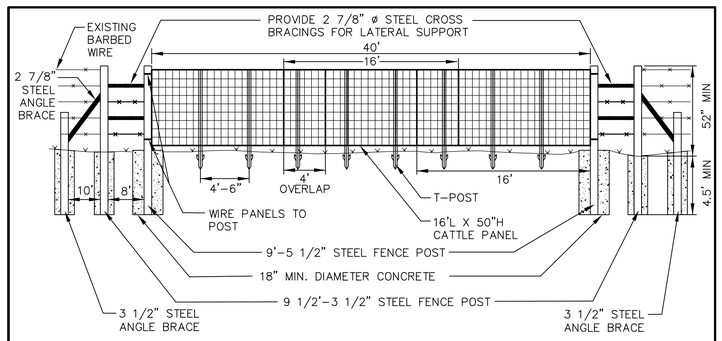

**NOTE:**

1. H–FRAME MUST BE PLACED IN EXISTING FENCE LINE & EXISTING FENCE ATTACHED TO NEW SUPPORTS PRIOR TO CUTTING OF EXISTING FENCE.
2. ALL FITTINGS, HARDWARE AND OTHER APPURTENANCES SHALL BE FABRICATED AND FITTED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.
3. ALL DIRECT BURIED POSTS SHALL BE BACKFILLED WITH APPROX. 5 CF OF QUICKRETE℠, OR APPROVED EQUAL.
4. INSTALL GATE HINGES SO THAT GATES CAN BE OPENED FULLY (180 DEGREES) BACK TO THE FENCE.

DOUBLE SWING GATE FOR BARBWIRE CROSSINGS

LAST REVISED: 05/09/14

GA02



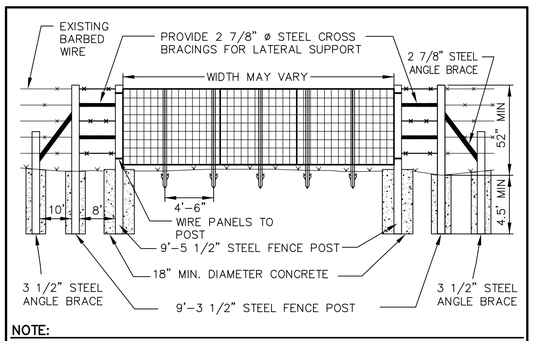

**NOTE:**

1. TO BE USED AT CRANE PATH CROSSINGS.
2. ALL FITTINGS, HARDWARE AND OTHER APPURTENANCES SHALL BE FABRICATED AND FITTED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.
3. ALL DIRECT BURIED POSTS SHALL BE BACKFILLED WITH APPROX. 5 CF OF QUICKRETE℠, OR APPROVED EQUAL.
4. BARBED WIRE SHALL MATCH EXISTING 4, 5, OR 6 WIRE FENCE.
5. H–FRAME MUST BE PLACED IN EXISTING FENCE LINE & EXISTING FENCE ATTACHED TO NEW SUPPORTS PRIOR TO CUTTING OF EXISTING FENCE.

TEMPORARY FENCE FOR CRANE PATH CROSSINGS OF BARBED WIRE

LAST REVISED: 05/09/14

FN01



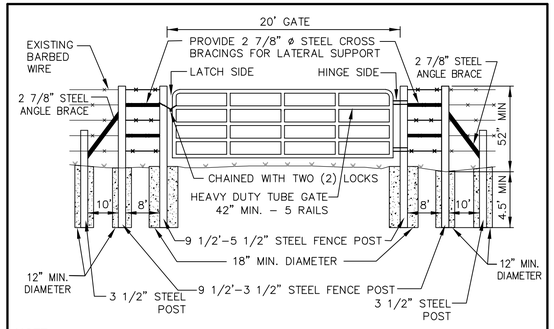

**NOTE:**

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3. ALL DIRECT BURIED POSTS SHALL BE BACKFILLED WITH APPROX. 5 CF OF QUICKRETE℠ OR APPROVED EQUAL.
4. BARBED WIRE SHALL MATCH EXISTING 4, 5, OR 6 WIRE FENCE.

TEMPORARY FENCE FOR COLLECTION CROSSINGS OF BARBED WIRE

LAST REVISED: 05/09/14

FN02



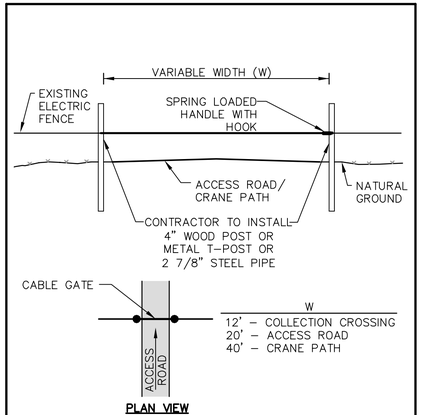

**NOTE:**

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4. H–FRAME MUST BE PLACED IN EXISTING FENCE LINE & EXISTING FENCE ATTACHED TO NEW SUPPORTS PRIOR TO CUTTING OF EXISTING FENCE.
5. INSTALL GATE HINGES SO THAT GATE OPENS FULLY (180 DEGREES) BACK TO THE FENCE.

GATE TYPE A – SINGLE GATE FOR BARBWIRE CROSSINGS

LAST REVISED: 05/09/14

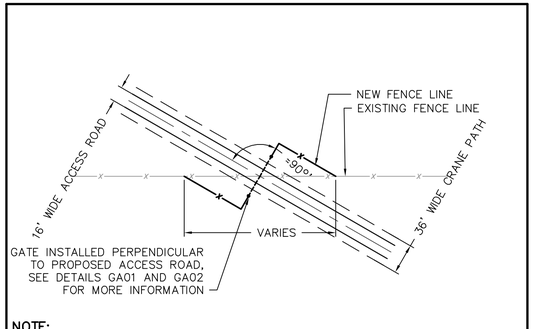
GA01




SINGLE ELECTRICAL FENCE GATE

LAST REVISED: 1/20/15

GA05



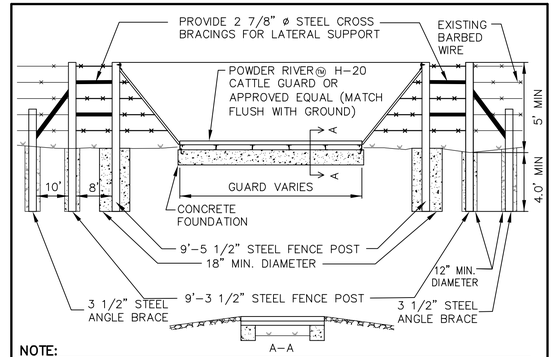

**NOTE:**

1. FENCE DIMENSIONS WILL VARY BASED ON PROPOSED ROAD ALIGNMENT AND EXISTING FENCE ANGLE.

TYPICAL SKEWED FENCE CROSSING FOR ACCESS ROADS

LAST REVISED: 07/28/15

FN03




**NOTE:**

1. ALL FITTINGS, HARDWARE AND OTHER APPURTENANCES SHALL BE FABRICATED AND FITTED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.
2. ALL DIRECT BURIED POSTS SHALL BE BACKFILLED WITH APPROX. 5 CF OF, QUICKRETE℠, OR APPROVED EQUAL.
3. H–FRAME MUST BE PLACED IN EXISTING FENCE LINE & EXISTING FENCE ATTACHED TO NEW SUPPORTS PRIOR TO CUTTING OF EXISTING FENCE.
4. GUARD TO BE INSTALLED AFTER CRANE TRAVEL AND DELIVERY COMPLETIONS.

CATTLE GUARD TYPE A – CATTLE GUARD ONLY

LAST REVISED: 03/12/14

CG01

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Designed: DPK
Checked: RSC
Drawn: TBR
Record Drawing by/date:

Revisions:

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**Stark and Morton Counties, North Dakota**

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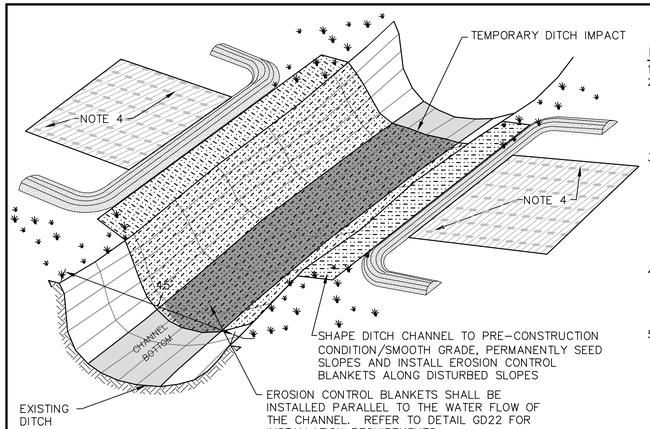
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Date: 08/03/15

Sheet: 10 OF 91

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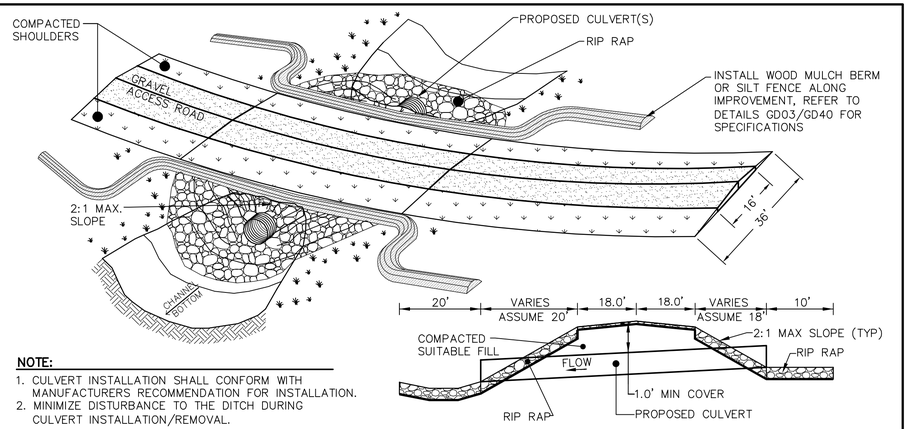

**NOTES:**

1. DRAWING IS NOT TO SCALE.
2. UPON REMOVAL OF TEMPORARY DITCH CROSSING, THE DISTURBED AREA SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS. REFER TO THE PROJECT SWPPP FOR RESTORATION AND SEEDING SPECIFICATIONS.
3. REMOVE RIP RAP, FILL MATERIAL AND SHAPE CHANNEL TO PRE-CONSTRUCTION CONDITION. PERMANENTLY SEED ALL DISTURBED SLOPES IN CONFORMANCE WITH THE PROJECT SWPPP. INSTALL EROSION CONTROL BLANKETS, ADEQUATE FOR FLOW CONDITIONS, ON ALL DISTURBED SLOPES GREATER THAN 4:1, WHERE ANY FLOWS ARE CONCENTRATED AND WITHIN THE DITCHES WETTED PERIMETER.
4. DECOMPACT, REAPPLY TOPSOIL AND TILL DISTURBED AREA TO RESTORE TO PRE-CONSTRUCTION AGRICULTURAL CONDITION AND RESTORE ANY VEGETATED BUFFER THAT EXISTED PRE-CONSTRUCTION.
5. REMOVE WOOD MULCH BERM OR SILT FENCE ONCE FINAL STABILIZATION HAS OCCURRED WITH A MINIMUM OF 70% VEGETATION UPDITCH OF SILT FENCE.

TYPICAL TEMPORARY DITCH CROSSING RESTORATION

LAST REVISED: 3/19/12

RD09-2



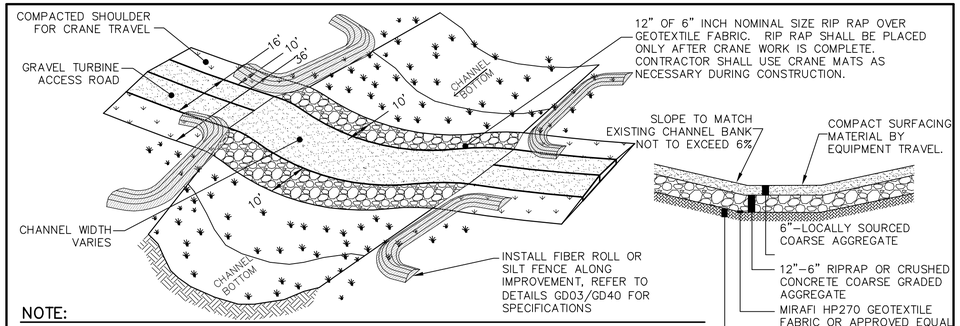

**NOTE:**

1. CULVERT INSTALLATION SHALL CONFORM WITH MANUFACTURERS RECOMMENDATION FOR INSTALLATION.
2. MINIMIZE DISTURBANCE TO THE DITCH DURING CULVERT INSTALLATION/REMOVAL.

TYPICAL TURBINE ACCESS ROAD DITCH CROSSING

LAST REVISED: 3/19/12

RD10



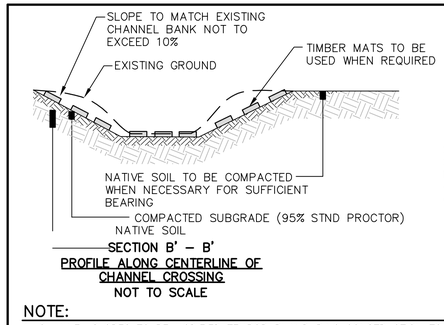

**NOTE:**

1. CHANNEL SLOPES TO BE MODIFIED TEMPORARILY DURING CONSTRUCTION TO ALLOW FOR ADEQUATE TURBINE COMPONENT DELIVERY AND RESTORE TO ORIGINAL CONDITIONS UPON SITE RESTORATION.
2. CROSSINGS SHALL HAVE THE TOP-MOST SURFACE LAYER A MINIMUM OF 2.5 INCHES BELOW THE DITCH CHANNEL BOTTOM.
3. THE ACCESS ROAD SHALL CROSS THE DITCH AT 90° ANGLE.
4. THE TOP BED OF THE ROCK CHANNEL CROSSING SHALL CONFORM TO THE EXISTING DITCH CROSS SECTIONAL SLOPES.
5. MATERIAL THICKNESSES SHOWN ARE MINIMUMS. IT MAY BE NECESSARY TO FIELD ADJUST THICKNESSES TO ACHIEVE SUFFICIENT BEARING CAPACITIES AS ARE NECESSARY FOR ANTICIPATED ROAD USE.
6. GRAVEL BAG BERMS MAY BE NECESSARY IF FLOWS AND DRAINAGE AREAS REQUIRE. SEE DETAIL RD13 FOR GRAVEL BAG BERM INSTALLATION.

PERMANENT TURBINE ACCESS ROAD LOW WATER CROSSING

LAST REVISED: 3/29/12

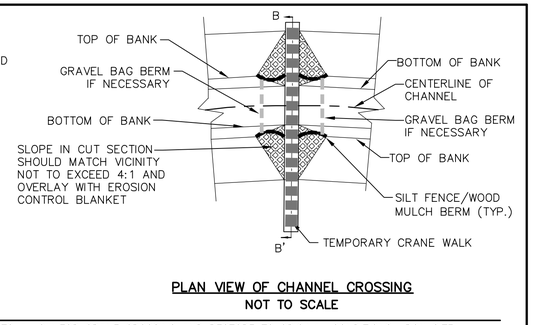
RD11




SECTION B' – B'

PROFILE ALONG CENTERLINE OF CHANNEL CROSSING

NOT TO SCALE




PLAN VIEW OF CHANNEL CROSSING

NOT TO SCALE

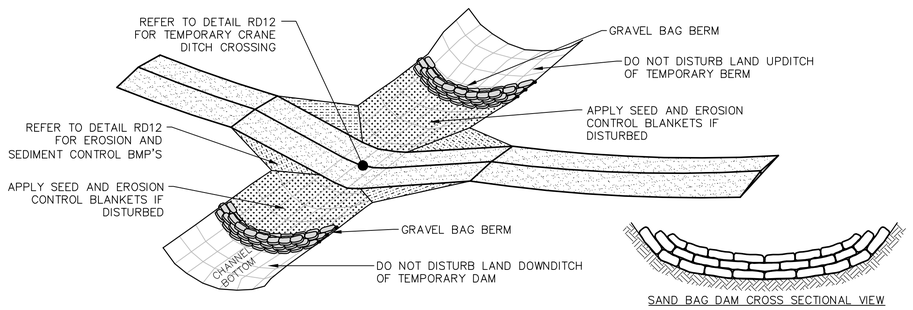
**NOTE:**

1. CHANNEL SLOPES TO BE MODIFIED TEMPORARILY DURING CONSTRUCTION TO ALLOW FOR CRANE CROSSING AND RESTORE TO ORIGINAL CONDITIONS UPON SITE RESTORATION.
2. ALL DISTURBED AREAS SHALL BE RESTORED TO EXISTING CONDITIONS ACCORDING TO THE PROJECT SWPPP.
3. THE CRANE WALK SHALL CROSS THE DITCH AT AS CLOSE TO 90° ANGLE AS PRACTICAL.
4. THE TOP OF THE CHANNEL CROSSING SHALL CONFORM TO THE EXISTING DITCH CROSS SECTIONAL SLOPES.
5. COMPACTION MAY BE FIELD ADJUSTED TO ACHIEVE SUFFICIENT BEARING CAPACITIES AS ARE NECESSARY FOR CRANE TRAVEL
6. GRAVEL BAG BERMS MAY BE NECESSARY IF FLOWS AND DRAINAGE AREAS REQUIRE. SEE DETAIL RD13 FOR GRAVEL BAG BERM INSTALLATION.
7. IF FIELD CONDITIONS AT THE TIME OF CROSSING REQUIRE A CULVERT IN LIEU OF TIMBER MAT CROSSING, CONTACT ENGINEER FOR APPROPRIATE CULVERT SIZE.

DITCH DRAINAGE SWALE TIMBER MAT CRANE CROSSING

LAST REVISED: 3/19/12

RD12






SAND BAG DAM CROSS SECTIONAL VIEW

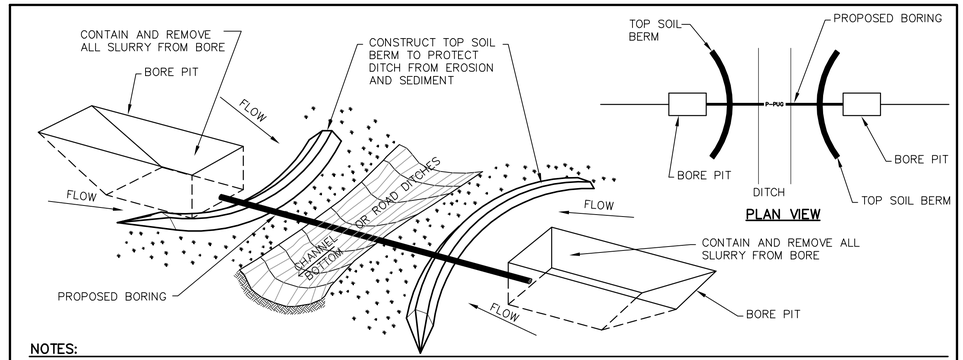
**NOTE:**

1. REFER TO DETAIL RD12 FOR TEMPORARY CRANE DITCH CROSSING.
2. MINIMIZE DISTURBANCE TO THE DITCH/DITCH DURING GRAVEL BAG BERM INSTALLATION.
3. GRAVEL USED WITHIN THE BAGS SHALL BE PEA ROCK.
4. GRAVEL BAG BERMS SHALL SPAN LATERALLY ACROSS THE DITCH FROM TOP OF BANK TO TOP OF BANK.
5. UPON CRANE TRAVEL COMPLETION, REMOVE GRAVEL BAG BERM AND RESTORE TO ORIGINAL CONDITION.

TEMPORARY GRAVEL BAG BERM AT DRAINAGE CROSSING LOCATIONS

LAST REVISED: 3/19/12

RD13




PLAN VIEW

**NOTES:**

1. CONSTRUCT TOPSOIL BERM TO PROTECT EXISTING CHANNELS WHERE BORING WILL OCCUR FOR UNDERGROUND COLLECTION SYSTEM INSTALLATION.
2. MINIMIZE DISTURBANCE TO THE DITCH DURING CONSTRUCTION.
3. SILT FENCE MAY BE SUBSTITUTED FOR THE TOPSOIL BERM.
4. UPON REMOVAL OF THE BORE PITS, THE DISTURBED AREAS SHALL BE RESTORED TO NATIVE CONDITIONS. REFER TO THE PROJECT SWPPP
5. SLOPE BORE PIT PER OSHA STANDARDS OR SHORE

TYPICAL UNDERGROUND COLLECTION SYSTEM DITCH CROSSING

LAST REVISED: 09/23/08

UT06

NOTES

1. LOW WATER CROSSINGS MAY BE USED IN LIEU OF CULVERT IF EXISTING DITCH IS NOT WELL DEFINED OR MINIMUM COVER OVER THE PIPE CANNOT BE ACHIEVED. SEE DETAIL RD11 FOR DETAIL.
2. CONTRACTOR SHALL PLACE CULVERTS AS NECESSARY FOR TEMPORARY CRANE PATHS CROSSING EXISTING TOWNSHIP AND COUNTY ROADS.
3. TEMPORARY CRANE CROSSINGS THAT REQUIRE CULVERTS SHALL BE SIZED AS DETERMINED IN THE FIELD TO HANDLE NUISANCE FLOWS.
4. DETAILS PROVIDED ON SHEETS 11-12 ARE TO BE USED AS SPECIFIED IN THE PROJECT SWPPP. IT IS THE CONTRACTOR'S/OPERATOR'S RESPONSIBILITY TO MAINTAIN COMPLIANCE.

* DEPTH OF DITCHES ARE APPROXIMATE, FIELD VERIFY.

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| | |
|---|---|
| Designed: | DFK |
| Checked: | RSC |
| Drawn: | TBR |
| Record Drawing by/date: | |

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

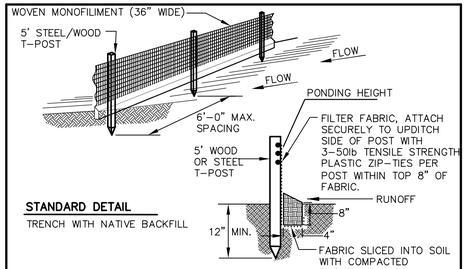
Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15

Sheet: 11 OF 91

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**STANDARD DETAIL**

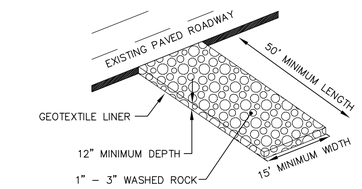
TRENCH WITH NATIVE BACKFILL

**NOTE:**

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN ACCUMULATED TO 1/3 THE HEIGHT OF THE FABRIC OR MORE.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
4. ALL ENDS OF THE SILT FENCE SHALL BE WRAPPED UPSLOPE SO THE ELEVATION OF THE BOTTOM OF FABRIC IS HIGHER THAN "PONDING HEIGHT".

| | | |
|---|---|---|
| Westwood | SILT FENCE | LAST REVISED: 11/24/08 GD03 |

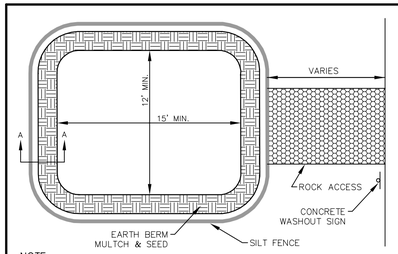
****ACCESS ROADS SHALL BE CONSTRUCTED FROM PUBLIC ROADS WHERE THE CONSTRUCTION DELIVERY TRAFFIC WILL TRAVEL ON THE CONSTRUCTED ACCESS ROAD. SEDIMENT TRACKING ONTO PUBLIC PAVED ROADS IS NOT ANTICIPATED. IF SEDIMENT TRACKING DOES OCCUR, THE SEDIMENT SHALL BE REMOVED AND A ROCK CONSTRUCTION ENTRANCE CONSTRUCTED****




**NOTE:**

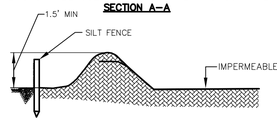
ROCK CONSTRUCTION ENTRANCE SHOULD BE A MINIMUM THICKNESS OF 12" AND CONTAIN MAXIMUM SIDE SLOPES OF 4:1. ROCK ENTRANCE SHOULD BE INSPECTED AND MAINTAINED REGULARLY. ROCK ENTRANCE LENGTH MAY NEED TO BE EXTENDED IN CLAY SOILS.

| | | |
|---|---|---|
| Westwood | ROCK CONSTRUCTION ENTRANCE | LAST REVISED: 11/24/08 GD05 |

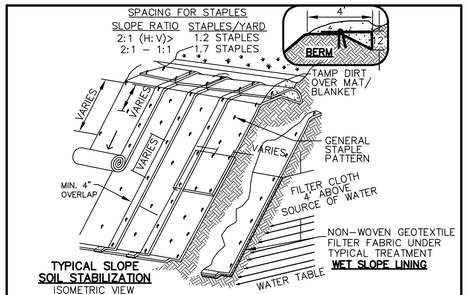



NOTE:
CONCRETE WASHOUT AREAS WILL HAVE AN IMPERMEABLE LINER TO PREVENT CONCRETE WASHOUT WATER FROM INFILTRATING/CONTACTING SOIL. IMPERMEABLE LINER INCLUDES 10 MIL POLYLINER OR COMPACTED CLAY LINER. WASHOUT SYSTEMS CAN BE USED AS ALTERNATE WASHOUT AREAS.

**SECTION A-A**




| | | |
|---|---|---|
| Westwood | CONCRETE WASHOUT AREA | LAST REVISED: 08/26/08 GD08 |



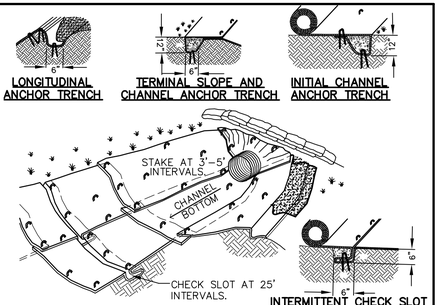

**TYPICAL SLOPE SOIL STABILIZATION**

ISOMETRIC VIEW

**NOTE:**

1. REFER TO THE PROJECT SWPPP FOR IMPLEMENTATION REQUIREMENTS.
2. MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICK AND GRASS.
4. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
5. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL.
6. DO NOT STRETCH.
7. BLANKET TYPE AND WEIGHT MUST BE CHOSEN BASED ON SITE CONDITIONS, STATE DOT PERFORMANCE FACTORS AND MANUFACTURERS RECOMMENDATIONS.
8. STAPLE LENGTHS SHALL CONFORM TO MANUFACTURERS RECOMMENDATIONS.

| | | |
|---|---|---|
| Westwood | TYPICAL SLOPE STABILIZATION - TEMPORARY EROSION BLANKETS TURF REINFORCEMENT MATS FOR SLOPES | LAST REVISED: 11/24/08 GD21 |



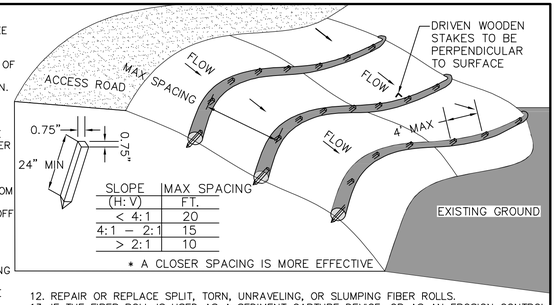

**NOTE:**

1. REFER TO THE PROJECT SWPPP FOR IMPLEMENTATION REQUIREMENTS.
2. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
3. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.
4. MINIMUM OF 3.5 STAPLES/YARD.
5. BLANKET TYPE AND WEIGHT MUST BE CHOSEN BASED ON SITE CONDITIONS AND MANUFACTURERS RECOMMENDATIONS.
6. STAPLE LENGTHS SHALL CONFORM TO MANUFACTURERS RECOMMENDATIONS.
7. EROSION CONTROL BLANKETS SHALL EXTEND TO THE EDGE OF THE DISTURBANCE LIMITS.

| | | |
|---|---|---|
| Westwood | TEMPORARY EROSION BLANKETS TURF REINFORCEMENT MATS FOR CHANNELS | LAST REVISED: 03/03/08 GD22 |

**NOTE:**

1. FIBER ROLLS SHALL BE PREFABRICATED AND MADE FROM WEED FREE RICE STRAW, FLAX, OR A SIMILAR AGRICULTURAL MATERIAL BOUND INTO A TIGHT TUBULAR ROLL BY NETTING.
2. STAKE FIBER ROLLS INTO THE TRENCH. DRIVE STAKES AT THE END OF EACH FIBER ROLL AND SPACED 4 FEET MAXIMUM ON CENTER. USE WOOD STAKES WITH NOMINAL CLASSIFICATION OF 0.75 IN BY 0.75 IN. AND A MINIMUM LENGTH OF 24 IN.
3. PREPARE THE SLOPE BEFORE BEGINNING THE INSTALLATION.
4. DIG SMALL TRENCHES ACROSS THE SLOPE ON THE CONTOUR. THE TRENCH DEPTH SHOULD BE 1/4 TO 1/3 OF THE THICKNESS OF THE ROLL, AND THE WIDTH SHOULD EQUAL THE ROLL DIAMETER, IN ORDER TO PROVIDE AREA TO BACKFILL THE TRENCH.
5. ROLLS SHALL BE INSTALLED PERPENDICULAR TO WATER MOVEMENT, AND PARALLEL TO THE SLOPE CONTOUR.
6. START BUILDING TRENCHES AND INSTALLING ROLLS FROM THE BOTTOM OF THE SLOPE AND WORK UP.
7. TURN THE ENDS OF THE FIBER ROLLS UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL.
8. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED.
9. FIBER ROLLS ENCASED WITH PLASTIC NETTING ARE USED FOR A TEMPORARY APPLICATION ONLY AND SHOULD BE REMOVED FOLLOWING STABILIZATION. FIBER ROLLS USED IN A PERMANENT APPLICATION SHALL BE ENCASED WITH A BIODEGRADABLE MATERIAL AND MAY BE LEFT IN.
10. TEMPORARY INSTALLATIONS SHOULD ONLY BE REMOVED WHEN UP GRADIENT AREAS ARE STABILIZED PER GENERAL PERMIT REQUIREMENTS, AND/OR POLLUTANT SOURCES NO LONGER PRESENT A HAZARD. BUT, THEY SHOULD ALSO BE REMOVED BEFORE VEGETATION BECOMES TOO MATURE SO THAT THE REMOVAL PROCESS DOES NOT DISTURB MORE SOIL AND VEGETATION THAN IS NECESSARY
11. FIBER ROLLS MUST BE INSPECTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS FOR THE ASSOCIATED PROJECT TYPE AND RISK LEVEL. IT IS RECOMMENDED THAT A MINIMUM, THE BMPS BE INSPECTED EVERY 14 DAYS AND/OR WITHIN 24 HOURS FOLLOWING A 0.5" RAIN EVENT.



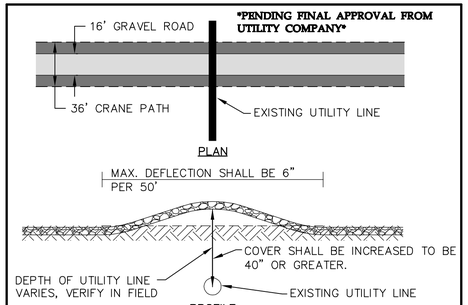

| SLOPE (H:V) | MAX SPACING FT. |
|---|---|
| < 4:1 | 20 |
| 4:1 - 2:1 | 15 |
| > 2:1 | 10 |

* A CLOSER SPACING IS MORE EFFECTIVE

12. REPAIR OR REPLACE SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLLS.
13. IF THE FIBER ROLL IS USED AS A SEDIMENT CAPTURE DEVICE, OR AS AN EROSION CONTROL DEVICE TO MAINTAIN SHEET FLOWS, SEDIMENT THAT ACCUMULATES IN THE BMP SHOULD BE PERIODICALLY REMOVED IN ORDER TO MAINTAIN BMP EFFECTIVENESS. SEDIMENT SHOULD BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES ONE-THIRD THE DESIGNATED SEDIMENT STORAGE DEPTH.
14. IF FIBER ROLLS ARE USED FOR EROSION CONTROL, SEDIMENT REMOVAL SHOULD NOT BE REQUIRED AS LONG AS THE SYSTEM CONTINUES TO CONTROL THE GRADE. SEDIMENT CONTROL BMPS WILL LIKELY BE REQUIRE IN CONJUNCTION WITH THIS TYPE OF APPLICATION.
15. REPAIR ANY RILLS OR GULLIES PROMPTLY.

| | | |
|---|---|---|
| Westwood | TYPICAL FIBER ROLLS | LAST REVISED: 12/13/10 GD40 |

***PENDING FINAL APPROVAL FROM UTILITY COMPANY***



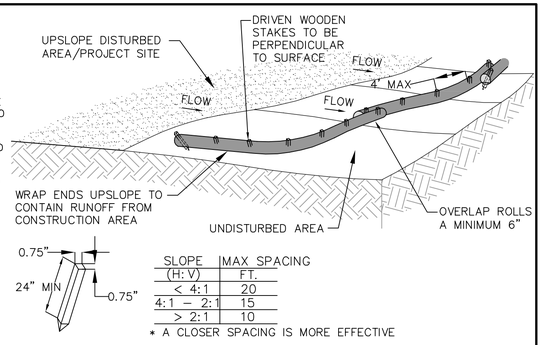

**NOTE:**

1. CROSSING DETAIL FOR INFORMATION ONLY. CROSSING MUST BE APPROVED BY UTILITY COMPANY PRIOR TO CROSSING.
2. LOCATION AND DEPTH OF EXISTING UTILITY SHALL BE FIELD VERIFIED BY EXISTING UTILITY OWNER/OPERATOR.
3. EARTH COVER PROTECTION FOR EXISTING UTILITIES SHALL BE USED WHERE THE COVER OVER THE EXISTING UTILITY IS LESS THAN 40".
4. ACTUAL CROSSING PERMIT REQUIREMENTS SHALL SUPERSEDE THIS DETAIL.

| | | |
|---|---|---|
| Westwood | EARTH COVER PROTECTION FOR UTILITY CROSSING | LAST REVISED: 11/24/08 UT01 |

**NOTES:**

1. FIBER ROLLS SHALL BE INSTALLED PRIOR TO UPSLOPE DISTURBANCE ACTIVITIES COMMENCE.
2. FIBER ROLLS SHALL BE PREFABRICATED AND MADE FROM WEED FREE RICE STRAW, FLAX, OR A SIMILAR AGRICULTURAL MATERIAL BOUND INTO A TIGHT TUBULAR ROLL BY NETTING. USE A 6" OR 12" DIA. ROLL.
3. TRENCHES SHALL BE CREATED ALONG THE SLOPE OF THE PERIMETER. THE TRENCH DEPTH SHOULD BE 1/4 TO 1/3 OF THE THICKNESS OF THE ROLL, AND THE WIDTH SHOULD EQUAL THE ROLL DIAMETER, IN ORDER TO PROVIDE AREA TO BACKFILL THE TRENCH.
4. STAKE FIBER ROLLS INTO THE TRENCH. DRIVE STAKES AT THE END OF EACH FIBER ROLL AND SPACED 4 FEET MAXIMUM ON CENTER. USE WOOD STAKES WITH NOMINAL CLASSIFICATION OF 0.75 IN BY 0.75 IN. AND A MINIMUM LENGTH OF 24 IN.
5. ROLLS SHALL BE INSTALLED PERPENDICULAR TO WATER MOVEMENT, AND PARALLEL TO THE SLOPE CONTOUR.
6. TURN THE ENDS OF THE FIBER ROLLS UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL. THE UPSLOPE POINT SHOULD BE A MINIMUM 6" HIGHER IN ELEVATION THAN THE LOW POINT.
7. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED A MINIMUM OF 6 INCHES, NOT ABUTTED.
8. FIBER ROLLS ENCASED WITH PLASTIC NETTING ARE USED FOR A TEMPORARY APPLICATION ONLY AND SHOULD BE REMOVED FOLLOWING STABILIZATION. FIBER ROLLS USED IN A PERMANENT APPLICATION SHALL BE ENCASED WITH A BIODEGRADABLE MATERIAL AND MAY BE LEFT IN.
9. TEMPORARY INSTALLATIONS SHOULD ONLY BE REMOVED WHEN UP GRADIENT AREAS ARE STABILIZED PER GENERAL PERMIT REQUIREMENTS, AND/OR POLLUTANT SOURCES NO LONGER PRESENT A HAZARD. BUT, THEY SHOULD ALSO BE REMOVED BEFORE VEGETATION BECOMES TOO MATURE SO THAT THE REMOVAL PROCESS DOES NOT DISTURB MORE SOIL AND VEGETATION THAN IS NECESSARY
10. FIBER ROLLS MUST BE INSPECTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS FOR THE ASSOCIATED PROJECT TYPE AND RISK LEVEL. IT IS RECOMMENDED THAT AT A MINIMUM, THE BMPS BE INSPECTED WEEKLY, PRIOR TO FORECASTED RAIN EVENTS, DAILY DURING EXTENDED RAIN EVENTS, AND AFTER THE CONCLUSION OF RAIN EVENTS.

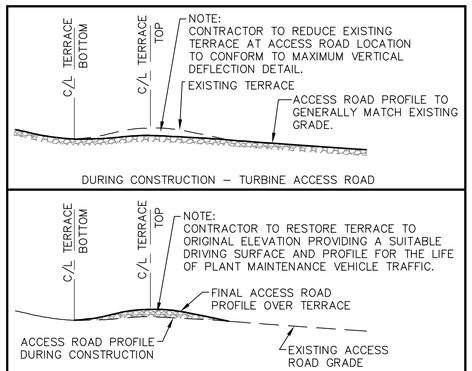



| SLOPE (H:V) | MAX SPACING FT. |
|---|---|
| < 4:1 | 20 |
| 4:1 - 2:1 | 15 |
| > 2:1 | 10 |

* A CLOSER SPACING IS MORE EFFECTIVE

12. REPAIR OR REPLACE SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLLS.
13. SEDIMENT THAT ACCUMULATES UPSLOPE OF THE BMP SHOULD BE PERIODICALLY REMOVED IN ORDER TO MAINTAIN BMP EFFECTIVENESS. SEDIMENT SHOULD BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES ONE-THIRD THE DESIGNATED SEDIMENT STORAGE DEPTH.
14. RILLS OR GULLIES MAY BEGIN TO FORM FOLLOWING MAJOR STORM EVENTS WHERE RUNOFF HAS OVERTOPPED THE FIBER ROLLS. THESE RILLS OR GULLIES SHOULD BE PROMPTLY REPAIRED.

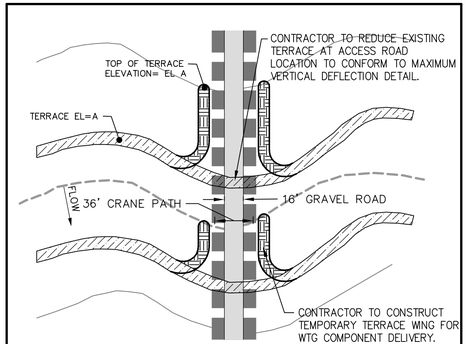
| | | |
|---|---|---|
| Westwood | TYPICAL FIBER ROLLS FOR PERIMETER CONTROL OF CONSTRUCTION AREA LIMIT | LAST REVISED: 09/09/13 GD42 |




**NOTE:**

CONTRACTOR SHALL COORDINATE AND GAIN SIGNOFF ON TERRACE RECONSTRUCTION FROM PROJECT OWNER AND LOCAL LANDOWNER.

| | | |
|---|---|---|
| Westwood | ACCESS ROAD CONSTRUCTION THROUGH MINOR (DRIVE OVER) TERRACE | LAST REVISED: 07/16/10 TR05 |




**NOTE:**

1. CONTRACTOR SHALL COORDINATE AND GAIN SIGNOFF ON TERRACE RECONSTRUCTION FROM PROJECT OWNER AND LOCAL LANDOWNER.
2. TERRACE SHALL BE RESTORE PER DETAIL TR05 UPON COMPLETION OF WTG COMPONENT DELIVERY.

| | | |
|---|---|---|
| Westwood | TEMPORARY TERRACE WINGS | LAST REVISED: 1/21/15 TR06 |

NOTES

1. DETAILS PROVIDED ON SHEETS 11-12 ARE TO BE USED AT CONTRACTOR'S DISCRETION OR AS SPECIFIED IN THE PROJECT SWPPP. IT IS THE CONTRACTOR'S/OPERATOR'S RESPONSIBILITY TO MAINTAIN COMPLIANCE.
2. PERIMETER SEDIMENT CONTROLS OPTIONS SHALL CONSIST OF SILT FENCE, FIBER LOGS (BIOROLLS), WOOD MULCH BERMS, OR TOPSOIL BERMS TO BE UTILIZED AND INSTALLED PER THE CONTRACTOR'S DISCRETION.

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**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Construction Details

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 12 OF 91

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## GENERAL NOTES

1. GROUND SURFACE CONTOURS AND ELEVATIONS ARE BASED ON DATA PROVIDED BY SUNEDISON NOT ACTUAL FIELD SURVEYING. THE TWO FOOT INTERVAL VERTICAL CONTOURS SHOWN ON THE PLANS MEET THE NATIONAL MAP ACCURACY STANDARDS FOR TWO FOOT DIGITAL TERRAIN MODELS (NOT MORE THAN 10% OF THE ELEVATIONS ARE IN ERROR BY MORE THAN ONE FOOT). AS SUCH, THE ACCURACY OF THE ELEVATIONS AND CONTOURS IS NOT AS HIGH AS INFORMATION GATHERED USING CONVENTIONAL FIELD SURVEYING PROCEDURES. THE CONTRACTOR MAY FIND THAT GROUND ELEVATIONS DETERMINED DURING FIELD STAKING VARY FROM THE GROUND ELEVATIONS SHOWN ON THE DRAWINGS. IT IS IMPORTANT THAT THE CONTRACTOR VERIFIES THE ELEVATIONS PRIOR TO ANY CONSTRUCTION OR GRADING ACTIVITIES. WHERE MAJOR DISCREPANCIES ARE FOUND, THE OWNER AND ENGINEER SHALL BE CONTACTED AND NOTIFIED. MODIFICATIONS TO THE GRADING MAY BE REQUIRED. SOME LOCATIONS MAY BE ABLE TO BE ADJUSTED TO MATCH THE ELEVATION CHANGE WHILE OTHERS MAY REQUIRE ADDITIONAL WORK BY THE CONTRACTOR.
2. THERE MAY BE ADDITIONAL EXISTING INFRASTRUCTURE, UTILITIES, AND OBSTACLES WHICH DO NOT APPEAR RECOGNIZABLE ON THE PLANS AND WERE NOT DIGITIZED FOR THIS PLAN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE MINOR ADJUSTMENTS WHILE STAYING WITHIN THE GRADING LIMITS TO AVOID THESE ITEMS IF NEEDED. IF MINOR ADJUSTMENTS ARE NOT SUFFICIENT, THE CONTRACTOR SHALL WORK WITH THE OWNER/ENGINEER TO AVOID THESE ITEMS IN AN ACCEPTABLE MANNER.
3. PROPERTY LINES, ROW LINES, AND EASEMENTS ARE BASED ON ALTA SURVEY PREPARED BY ATWELL.
4. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING DAMAGED PROPERTY MARKERS AND MONUMENTS.
5. THE CONTRACTOR SHALL NOTIFY STATE UTILITY LOCATE SERVICE (ONE CALL–811) AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
6. UTILITY LOCATIONS SHOWN ON THE PLANS ARE BASED ON ALTA SURVEY PREPARED BY ATWELL. ADDITIONAL UTILITIES COULD EXIST BOTH ABOVE GROUND AND BELOW GROUND THAT ARE NOT SHOWN ON THE PLANS OR ARE IN A DIFFERENT LOCATION THAN SHOWN ON THE PLANS. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO CONSTRUCTION. IF UTILITIES ARE DETERMINED TO EXIST THAT ARE NOT SHOWN ON THE PLANS THE ENGINEER SHALL BE CONTACTED IMMEDIATELY. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND RELOCATE AS REQUIRED IN COORDINATION WITH UTILITY AND LANDOWNER. THE CONTRACTOR SHOULD TAKE EXTREME CAUTION WHILE CONSTRUCTING THE PROJECT.
7. THE CONTRACTOR SHALL NOTIFY AND COORDINATE ALL WORK WITH THE UTILITY COMPANIES.
8. UTILITY CROSSING DESIGNS HAVE NOT BEEN COMPLETED FOR THE PROJECT. CONTRACTOR SHALL VERIFY CROSSING DESIGNS WITH ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION.
9. CONTRACTOR TO VERIFY EXISTING CONDITIONS SHOWN ON THE PLANS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
10. ANY FACILITIES REMOVED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, LIGHTING, ETC.) SHALL BE REPLACED BY THE CONTRACTOR IN A CONDITION AS GOOD AS EXISTING UNLESS OTHERWISE DIRECTED BY THE OWNER.
11. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK THE NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. DEPENDING ON FIELD CONDITIONS, ADDITIONAL CULVERTS IN EXCESS OF THOSE ON THE PLANS MAY BE REQUIRED.
12. IF LOCALIZED LOW POINTS ARE ENCOUNTERED DURING TOPSOIL STRIPPING, MASSAGE SURROUNDING AREA TO MAINTAIN POSITIVE DIRECTION OF DRAINAGE TO MINIMIZE PONDING OF STORMWATER DURING RAINFALL EVENTS.
13. THE CONTRACTOR SHALL PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE DISRUPTION OF LANDOWNERS ACCESSING HOMES AND FIELD ACCESS LOCATIONS WHERE FARMERS ARE HARVESTING THEIR FIELDS
14. ROAD MAINTENANCE IS EXPECTED OVER THE LIFE OF THE FACILITY. ROADS SHALL BE MAINTAINED BY THE PROJECT OWNER.
15. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL CLEAN THE LOCATION OF THE WORK AND ALL GROUND IN THE PROJECT AREA OCCUPIED BY THE CONTRACTOR DURING THE PROJECT. THE CONTRACTOR SHALL REMOVE ALL RUBBISH, EXCESS MATERIALS, TEMPORARY STRUCTURES, AND EQUIPMENT, LEAVING THE LOCATION OF THE WORK CLEANED TO THE SATISFACTION OF THE OWNER AND ENGINEER.
16. EXISTING BRIDGES, BOX CULVERTS AND CULVERTS EXIST AROUND THE SITE THAT MAY NOT BE SUITABLE FOR CONSTRUCTION LOADS. SOME OF THESE STRUCTURES ARE SHOWN ON THE PLANS FOR REFERENCE ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO KNOW WHERE THESE STRUCTURES ARE LOCATED AND AVOID THEM. ANY DAMAGE DONE TO BRIDGES, BOX CULVERTS, AND CULVERTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIX.
17. ALL GATES, CATTLE GUARDS AND FENCES SHOWN ON THE PLANS ARE THE FINAL CONFIGURATION AND ASSUME THAT FENCES WILL BE INSTALLED DURING PROJECT RESTORATION. DURING CONSTRUCTION IT MAY BE NECESSARY FOR THE CONTRACTOR TO REMOVE ADDITIONAL FENCE OR INSTALL ADDITIONAL GATES AND FENCE BASED ON CONSTRUCTION SEQUENCING, LANDOWNER REQUESTS, LIVESTOCK AREAS, AND CONSTRUCTION RELATED ITEMS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE DURING CULVERT REPLACEMENT ACTIVITIES AND REVIEW ENVIRONMENTAL REPORTS PRIOR TO WORK IN STREAM/WETLAND AREAS.
19. WHILE BUILDING THE ROADS AND EXCAVATING THE TURBINE FOUNDATIONS, EXCESS SOIL WILL RESULT. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS SOIL IN AN APPROVED MANNER. NO TOPSOIL WILL BE ALLOWED TO LEAVE THE PROPERTY FROM WHICH IT WAS DUG. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT FOR STORM WATER RUNOFF TO DRAIN. THE FINAL SURFACE OF THE DISTURBED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND. DISTURBED AREAS OUTSIDE OF THE FINAL ROADWAY SHALL BE SEEDED AND MULCHED.
20. FINALIZE GRADING AROUND THE BASE OF TURBINES IN ACCORDANCE WITH DETAIL TS03. ELEVATIONS SHOWN ON TURBINE INDEX ARE BASED ON THE TOP OF PEDESTAL BEING 1.5 FT ABOVE THE FINISHED GROUND PER THE FOUNDATION PLAN FROM BARR ENGINEERING. THE FINISHED GROUND ELEVATION IS BASED ON WESTWOOD'S GRADING DESIGN. IF A TURBINE PAD GRADING DESIGN WAS NOT COMPLETED FOR A TURBINE, THE EXISTING GROUND ELEVATION WAS USED.
21. GRADE ALL CRANE PADS AND PROPOSED ROADS ACCORDING TO THE DETAILS PROVIDED IN THE PLANS. VERTICAL ROAD SLOPES GREATER THAN 8% ARE NOT ALLOWED.
22. UNLESS OTHERWISE NOTED, ALL PROPOSED TURBINE SITES, ROADS, TEMPORARY DISTURBANCE AREAS, ETC. SHALL BE CONSTRUCTED AT OR NEAR EXISTING GRADE. CONTRACTOR SHALL FOLLOW GEOTECHNICAL RECOMMENDATIONS AND OVER–EXCAVATE, SCARIFY, MOISTURE CONDITION AND COMPACT THESE AREAS TO A DEPTH OF 12"OR GREATER AS REQUIRED FOR COMPACTION.
23. ALL CONSTRUCTION ACTIVITY SHALL TAKE PLACE WITHIN THE GRADING LIMITS THAT HAVE BEEN PROVIDED. IF THE ENTIRE WIDTH OF THE CORRIDORS IS NOT NEEDED FOR CONSTRUCTION, THE CONTRACTOR SHALL ONLY CLEAR THE ROOM THAT IS NECESSARY. GRADING LIMITS FOR ACCESS ROADS AND CRANE PATHS ARE TYPICALLY CENTERED ON THE ROAD OR CRANE PATH AND ARE 100 FT WIDE, FOR TURBINES ARE CENTERED ON THE TURBINE AND HAVE A RADIUS OF 200 FT, AND FOR CROSS COUNTRY ELECTRICAL LINES EXTEND 25 FT ON EITHER SIDE OF THE LINE. REFER TO THE CONSTRUCTION DOCUMENTS FOR EXACT DIMENSIONS. THE CONTRACTOR SHALL NOT GO OUTSIDE OF CONSTRUCTION CORRIDORS WITHOUT WRITTEN PERMISSION FROM THE OWNER.
24. SOME ACTIVITIES THAT WILL NOT REQUIRE GRADING OR SOIL DISTURBANCE MAY NEED TO GO BEYOND THE DEFINED LIMITS, SPECIFICALLY DURING THE ERECTION OF THE ROTOR. THE CONTRACTOR SHALL RECEIVE WRITTEN PERMISSION FROM THE OWNER PRIOR TO GOING OUTSIDE THE DEFINED LIMITS.
25. TEMPORARY INTERSECTION WIDENINGS SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION ACTIVITIES OR UPON NOTIFICATION TO THE CONTRACTOR BY THE ENGINEER, BE REMOVED UNLESS OTHERWISE NOTIFIED BY THE ENGINEER, CONSTRUCTION MANAGER, OR STATE/COUNTY/LOCAL OFFICIALS. THE DISTURBED AREA FROM THE INTERSECTION WIDENINGS SHALL BE RESTORED TO ITS ORIGINAL LINES AND GRADES WITH THE UPPER FOOT OF RESTORED GROUND BEING TOPSOIL AND THE DISTURBED AREA SHALL BE SEEDED AND MULCHED.
26. CRANE PATHS ARE SHOWN ON THE CONSTRUCTION PLANS. IF THE CONTRACTOR PROPOSES ALTERNATE CRANE PATHS, THEY SHALL MAKE SURE THAT WETLAND AND CULTURAL RESOURCE CORRIDORS ARE NOT DISTURBED. FINAL CRANE PATH ALIGNMENTS SHALL BE DETERMINED BY THE CONTRACTOR BASED UPON FIELD CONDITIONS WITHIN THE WETLAND AND CULTURAL RESOURCE CORRIDORS, SPECIAL LANDOWNER AGREEMENTS AND THE PROJECT BOUNDARY.
27. TURBINE SETBACKS ARE NOT IDENTIFIED ON THE CONSTRUCTION PLANS. IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT ALL TURBINE SETBACKS MEET PROJECT REQUIREMENTS.
28. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL. TRAFFIC CONTROL SHALL MEET THE REQUIREMENTS OF THE COUNTY AND THE STATE DEPARTMENT OF TRANSPORTATION AND ALL RECOMMENDATIONS IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
29. GEOTECHNICAL REPORTS WITH RECOMMENDATIONS HAVE BEEN PREPARED BY BARR ENGINEERING. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORTS AND SHALL REVIEW ALL RECOMMENDATIONS. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT AND RECOMMENDATIONS.
30. ELECTRICAL INFORMATION SHOWN ON THE PLANS IS FOR REFERENCE ONLY AND WAS PROVIDED BY ULTEIG. REFER TO ELECTRICAL PLANS FOR SPECIFIC LOCATIONS, CONSTRUCTION DETAILS AND SPECIFICATIONS FOR THE UNDERGROUND/OVERHEAD POWER COLLECTION SYSTEM, CONTROL BUILDING, SUBSTATION, AND PERMANENT AND TEMPORARY FIBER OPTIC LINES.
31. WIND TURBINE TOWER DOOR ORIENTATION SHALL BE CONFIRMED WITH THE OWNER PRIOR TO CONSTRUCTION.

## ROAD DESIGN PARAMETERS

1. THE ROAD HAS BEEN DESIGNED TO ACCOMMODATE LIGHT DUTY TRUCKS FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS AS WELL AS HEAVY DELIVERY VEHICLES THROUGHOUT THE CONSTRUCTION PERIOD. THE ROAD DESIGN IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY, HIGH VOLUME, CONSTRUCTION LOADS.
2. PLANS ARE INTENDED FOR PRIVATE ACCESS ROAD DESIGN AND NOT INTENDED FOR PUBLIC ROAD IMPROVEMENTS EXCEPT WHERE SHOWN.
3. THE CONTRACTOR SHALL CONFIRM ROAD SECTIONS REQUIRED FOR TURBINE COMPONENT DELIVERY WITH THE FINAL GEOTECHNICAL REPORT.
4. ROAD MAINTENANCE CAN BE EXPECTED DURING CONSTRUCTION AND OVER THE LIFE OF THE PERMANENT FACILITY AND MAY INCLUDE BLADING OF ROAD SURFACES AND REPLACEMENT OF AGGREGATE MATERIAL IN THE ROADS PARTICULARLY DURING AND AFTER RAINFALL EVENTS AND SNOW MELTS. PROPER DRAINAGE SHOULD ALSO BE MAINTAINED ALONG THE ROADWAYS.
5. VERTICAL DESIGN OF ACCESS ROAD USES A MINIMUM K–VALUE OF 16.5 PER VESTAS DELIVERY SPECIFICATIONS.

## STORM WATER DESIGN PARAMETERS

1. CULVERTS HAVE BEEN SIZED BASED UPON A _____ YEAR STORM EVENT. THE MINIMUM TYPICAL CULVERT SIZE IS ___". IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT. ALL CULVERTS SHALL BE INSTALLED PER NORTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR MORTON & STARK COUNTY STANDARD SPECIFICATIONS AND SHALL BE MANUFACTURED OF CORRUGATED METAL PIPE. ALL CULVERTS SHALL BE PLACED AT A MINIMUM 0.5% GRADE. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
2. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY, THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. PROVIDE MINIMUM OF 12'OF COVER OVER CULVERTS. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
3. CONTRACTOR SHALL MINIMIZE DISTURBANCE DURING CULVERT REPLACEMENT ACTIVITIES.
4. UPSIZING OR DOWNSIZING OF PROPOSED CULVERTS DUE TO FIELD CONDITIONS SHALL BE AT THE CONTRACTOR'S DISCRETION. CONTRACTOR SHALL INFORM ENGINEER OF ANY PROPOSED CHANGES. DOWNSIZING A PIPE SIMPLY MEANS CONVERTING FROM ONE LARGE PIPE TO MULTIPLE SMALLER PIPES. PIPES SHALL STILL MEET CONVEYANCE CAPACITY REQUIREMENTS.
5. CONTRACTOR TO MONITOR CROSSINGS AFTER ALL RAIN EVENTS. CONTRACTOR TO REMOVE DEBRIS INHIBITING STREAM/DITCH FLOW. IF THE TEMPORARY CROSSING IS CAUSING LOCALIZED FLOODING THE TEMPORARY CROSSING SHALL BE REMOVED IMMEDIATELY TO ENSURE UPSTREAM DRAINAGE IMPACTS ARE MINIMIZED.
6. LOW WATER CROSSINGS HAVE BEEN DESIGNED TO ALLOW NATURAL DRAINAGE TO OCCUR POST CONSTRUCTION OF THE ACCESS ROADS. IT IS ANTICIPATED THAT DURING "HEAVY" RAIN STORM EVENTS AND DURING THE FREEZE/THAW CYCLE SOME ACCESS ROADS MAY BE DIFFICULT TO TRAVERSE DUE TO THE SEASONAL ENVIRONMENTAL CONDITIONS. MAINTENANCE OF THE ACCESS ROADS MAY BE REQUIRED DUE TO NATURAL DRAINAGE.
7. ANTICIPATED CULVERTS AND LOW WATER CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN. ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO THE CONSTRUCTION ACTIVITIES.
8. TEMPORARY CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
9. CULVERTS FOR TEMPORARY CRANE CROSSINGS ON PRIVATE PROPERTY HAVE BEEN DESIGNED TO ACCOMMODATE THE _____ YEAR STORM EVENT. IT IS ANTICIPATED THAT DURING LARGER RAINFALL EVENTS THE STORM WATER WILL OVERTOP THE CONSTRUCTED CRANE CROSSING.

## PRODUCTS

1. ROAD SUBGRADE SHALL CONSIST OF NATIVE MATERIAL.
2. ROAD AGGREGATE SHALL BE CRUSHED AGGREGATE MEETING NORTH DAKOTA DOT SPECIFICATION 302 & 816 AND THE GRADATION PROVIDED IN TABLE 1, OR AN APPROVED EQUAL.
3. ROAD SHOULDERS, CRANE PATHS AND CRANE PADS SHALL CONSIST OF EXISTING SOILS COMPACTED TO A DEPTH OF 8 INCHES..
4. CULVERTS: SEE PLAN FOR DRAINAGE CULVERT LOCATIONS. ACCESS ROAD CULVERTS SHALL MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE NORTH DAKOTA DEPARTMENT OF TRANSPORTATION AND/OR THE COUNTY. ALL CULVERTS SHALL BE MANUFACTURED OF CORRUGATED METAL PIPE.
5. LAYDOWN YARD/BATCH PLANT AGGREGATE SHALL CONSIST OF CLASS 5 MODIFIED AGGREGATE MATERIAL MEETING NORTH DAKOTA DOT SPECIFICATION 302 & 816 AND THE GRADATION PROVIDED IN TABLE 1, OR AN APPROVED EQUAL.
6. GEOTEXTILE FABRIC FOR ACCESS ROAD/MET TOWER ROAD SHALL BE HP 270 OR APPROVED EQUAL (ALTERNATIVE ROAD SECTION ONLY).

**TABLE 1: CRUSHED BASE COURSE CLASS 5 MODIFIED – GRADATION**

| SIEVE SIZE | PERCENT PASSING |
|---|---|
| 1" | (100) |
| 3/4" | (90–100) |
| #4 | (35–70) |
| #30 | (16–40) |
| #200 | (4.0–10.0) |

MEET FOLLOWING REQUIREMENTS FOR CRUSHED BASE COURSE CLASS 5 MODIFIED:
AT LEAST 50 PERCENT BY WEIGHT OF THE AGGREGATE RETAINED ON THE NO. 4 SIEVE HAS AT LEAST ONE MECHANICALLY FRACTURED FACE FOR CLASS 5.

GRADATION HAS BEEN OBTAINED FROM THE 2008 NORTH DAKOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION BOOK, SECTION 816.02

**TABLE 2: 3" MINUS AGGREGATE GRADATION**

| SIEVE SIZE | PERCENT PASSING |
|---|---|
| 3" | (95–100) |
| 1" | (70–90) |
| ¾" | (40–55) |
| ⅜" | (30–50) |
| #10 | (14–30) |
| #200 | (3–10) |

## EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO GRUB/MULCH ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL SHALL BE STRIPPED FROM ALL ROADWAY AND FOUNDATION AREAS THROUGH THE ROOT ZONE. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL, THAT HAS BEEN STRIPPED, SHALL BE RE–SPREAD OR STOCKPILED WITHIN GRADING AREAS AND/OR USED AS FILL OUTSIDE OF THE DISTURBANCE AREAS, AS DIRECTED BY THE ENGINEER. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM AND NOT IMPEDE NATURAL DRAINAGE FLOW.
3. EMBANKMENT CONSTRUCTION.
   A. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, EMBANKMENTS SHALL HAVE COMPACTED SUPPORT SLOPES OF FOUR FOOT HORIZONTAL TO ONE FOOT VERTICAL, WITH SOME LOCATIONS THROUGHOUT THE PROJECT WITH SLOPES OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR EMBANKMENT CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD/TURBINE EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), ON SITE BORROW, ON SITE/OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8".
   B. SIDE SLOPES GREATER THAN 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
4. ROAD SURFACING
   A. CONSTRUCT FINAL ROAD SURFACE BASED ON DETAIL TS–05 ON SHEET 10.

## SUBGRADE COMPACTION, TEST ROLLING & AGGREGATE BASE COMPACTION

1. FILL MATERIAL
   a. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR TESTS (STANDARD MAXIMUM DRY DENSITY).
   b. FOR PLACED AND COMPACTED FILLS – COMPACTION TESTS – SEE TESTING REQUIREMENTS. INCLUDE THE LOCATION, DRY DENSITY, MOISTURE CONTENT, AND COMPACTION PERCENT BASED ON STANDARD PROCTOR MAXIMUM DRY DENSITY.
   c. IN ROADWAY CUT AREAS, OR WHERE EMBANKMENT CONSTRUCTION REQUIRES LESS THAN 12 INCHES OF FILL PLACEMENT, COMPACT TO A MINIMUM OF 97% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY AND WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT
   d. IF STRUCTURAL FILL IS REQUIRED, GEOTECHNICAL ENGINEER SHALL BE CONSULTED BY CONTRACTOR FOR DETERMINATION OF SUITABILITY. STRUCTURAL FILL SHALL BE PLACED IN LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF _____ INCHES PER THE GEOTECHNICAL REPORT.
2. COMPACTED SUBGRADE
   a. THE SUBGRADE ALONG ACCESS ROADWAYS SHOULD BE SCARIFIED TO A MIMIMUM DEPTH OF 12 INCHES, MOISTURE CONDITIONED TO WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO A MINIMUM OF 97% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
   b. THE ENTIRE SUBGRADE SHALL BE PROOF ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE. IF EXCESS PUMPING IS ENCOUNTERED, PARTIALLY REMOVE UNSUITABLE SOILS AND RECOMPACT AND/OR REPLACE WITH GRANULAR SOILS AND RECOMPACT.
   c. IF PROOF ROLLING DETERMINES THAT THE SUBGRADE STABILIZATION CANNOT BE ACHIEVED, PERFORM 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD SPUR, OR ONE FOR EVERY 1,000 L.F. OF ROAD, WHICHEVER IS GREATER AND CONSULT WITH THE GEOTECHNICAL ENGINEER TO DETERMINE WHICH OF THE FOLLOWING ALTERNATIVES WILL BE IMPLEMENTED:
      • SCARIFY, DRY, AND RECOMPACT SUBGRADE AND PERFORM ADDITIONAL PROOF ROLL.
      • REMOVE UNSUITABLE MATERIAL AND REPLACE WITH 3 INCH MINUS CRUSHED AGGREGATE BASE.
      • INCREASE ROAD BASE THICKNESS. THE SPECIFIED ROAD BASE THICKNESS MAY BE INCREASED IN ACCORDANCE WITH TABLE 3.
      • USE A MIRAFI HP270 GEOTEXTILE FABRIC OR APPROVED EQUAL AND CHANGE THE AGGREGATE BASE TO 3 INCH MINUS MATERIAL.
3. AGGREGATE BASE
   a. AGGREGATE BASE SHALL BE MOISTURE CONDITIONED TO WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO A MINIMUM OF 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
   b. AGGREGATE BASE SHALL BE PROOF ROLLED OVER THE ENTIRE LENGTH.
   c. IF PROOF ROLLING DETERMINES THAT THE ROAD BASE IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   d. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE CONDITION OF THE ROADS DURING CONSTRUCTION AND THE FINAL ACCEPTANCE OF THE ROADWAY WILL BE BASED ON A PROOF ROLL OF THE AGGREGATE SURFACE AT THE END OF THE PROJECT.
   e. ROAD BASE SHALL BE COMPACTED TO ACHIEVE A PENETRATION INDEX VALUE LESS THEN OR EQUAL TO 10 MM/BLOW OR EQUIVALENT TO A CBR VALUE GREATER THAN OR EQUAL TO 25, WHICHEVER IS GREATER.
4. CRANE PATHS/CRANE TRAVEL SHOULDERS
   a. CRANE PATHS/CRANE TRAVEL SHOULDERS SHALL BE PROOF ROLLED OVER THE ENTIRE LENGTH.
   b. WHERE REQUIRED TO SUPPORT CRANE TRAVEL, SCARIFY AND COMPACT EXISTING SOILS TO A DEPTH OF 6 INCHES AND TO A MINIMUM OF 97% STANDARD PROCTOR MAXIMUM DRY DENSITY AT +/– 2% OF OPTIMUM MOISTURE CONTENT.
5. CRANE PADS
   a. CRANE PADS SHALL CONSIST OF EXISTING SOILS COMPACTED TO A DEPTH OF 8 INCHES. PAD SHALL BE GRADED LEVEL.
   b. MOISTURE DENSITY AND DCP TESTING – SEE TESTING REQUIREMENTS. CRANE PADS MUST BE COMPACTED TO A MINIMUM OF 97% STANDARD PROCTOR MAXIMUM DRY DENSITY AT +/– 2% OF OPTIMUM MOISTURE CONTENT.
   c. ALL CRANE PADS SUBGRADE SHALL BE PROOF ROLLED PRIOR TO UTILIZATION.
   d. IF THE CRANE PAD CANNOT ACHIEVE PROOF–ROLL ACCEPTANCE AS DETERMINED BY THE GEOTECHNICAL ENGINEER, DCP TEST MAY BE USED. WHEN UTILIZED, DCP TESTING SHALL BE USED AT MINIMUM RATE OF 2 PER CRANE PAD AND ACHIEVE A MAXIMUM OF 24 MM/BLOW.
   e. AT THE CONTRACTOR'S DISCRETION, CRANE MATS MAY BE UTILIZED TO PROVIDE ADDITIONAL STABILITY.

## TESTING REQUIREMENTS AND SCHEDULE

1. ALL TESTING (DCP, PROOF ROLL, SIEVE, DENSITY, ETC.) IS INCIDENTAL TO THE CONTRACT.
2. TESTING SHALL BE PERFORMED BY A DESIGNATED, INDEPENDENT TESTING AGENCY.
3. SUBMIT TESTING AND INSPECTION RECORDS SPECIFIED TO THE ENGINEER FOR REVIEW. THE ENGINEER WILL REVIEW THE TESTING AND INSPECTION RECORDS TO CHECK CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF CORRECTING DEFECTIVE WORK.
4. PROOF ROLLING SHOULD BE PERFORMED IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS, OR A FULLY LOADED WATER TRUCK, OR A FULLY LOADED BELLY DUMP TRUCK WITH AN EQUIVALENT AXLE LOADING. PROOF ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES AND NO "PUMPING" OF THE SOIL BENEATH/BEHIND THE LOADED TRUCK.
5. SIEVE ANALYSIS:
   a. SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27 OR
   b. SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM C136
6. PROCTOR:
   a. SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99 (STANDARD PROCTOR)
   b. SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR)
   c. SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T180 (MODIFIED PROCTOR)
   d. SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D1557 (MODIFIED PROCTOR)
7. ATTERBERG LIMITS:
   a. SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 & T90
   b. SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D4318
8. MOISTURE DENSITY (NUCLEAR DENSITY):
   a. SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T310
   b. SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D6938
9. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   a. SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM D6951

VESTAS REVIEW

## TESTING SCHEDULE SUMMARY

| LOCATION | TEST | FEQUENCY |
|---|---|---|
| STRUCTURAL FILL | GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, & PROCTOR | 1 PER MAJOR SOIL TYPE |
| | MOISTURE DENSITY TEST (NUCLEAR DENSITY) | 1 PER LAYER OF FILL |
| ROADWAY FILL | GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, & PROCTOR | 1 PER MAJOR SOIL TYPE |
| | MOISTURE DENSITY TEST (NUCLEAR DENSITY) | 1 PER LAYER/1000 LF |
| CONPACTED SUBGRADE | PROOF–ROLL | ENTIRE LENGTH |
| | DCP (NOT REQUIRED UNLESS PROOF–ROLL FAILS) | 1 PER 500 LF OF ROAD |
| | MOISTURE DENSITY TEST (NUCLEAR DENSITY) | 1 PER 500 FT OR MIN. 3 PER ROAD |
| AGGREGATE BASE | PROOF–ROLL | ENTIRE LENGTH |
| | SIEVE ANALYSIS | 1 PER 2500 CY |
| | DCP TEST | 1 PER 500 LF OF ROAD |
| | MOISTURE DENSITY TEST (NUCLEAR DENSITY) | 1 PER 500 LF OF ROAD |
| CRANE PATHS & SHOULDERS | PROOF–ROLL | ENTIRE LENGTH |
| CRANE PADS | PROOF–ROLL SUBGRADE | ENTIRE PAD |
| | DCP TEST | 2 PER PAD |
| | MOISTURE DENSITY TEST (NUCLEAR DENSITY) | 2 PER PAD |
| | PROOF–ROLL AGGREG

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## CEMENT STABILIZED ACCESS ROADS

SPECIFICATIONS BELOW ARE PRELIMINARY, GENERAL RECOMMENDATIONS/GUIDELINES FOR CEMENT STABILIZATION OF PROPOSED SITE ACCESS ROADS WITHIN THE PROJECT. ACTUAL FIELD CONDITIONS MAY ALTER APPLICATION RATE. CONSULT PROJECT ENGINEER FOR FURTHER RECOMMENDATIONS. CONTRACTOR SHALL REFER TO GEOTECHNICAL ENGINEER'S SOIL STABILIZATION TESTING FOR ADDITIONAL RECOMMENDATIONS.

1. CEMENT FOR STABILIZATION SHALL CONSIST OF TYPE 1 OR TYPE 2 PORTLAND CEMENT.
2. STRIP THE TOP 4" INCHES OF TOPSOIL (THROUGH THE ROOT ZONE) FROM THE PROPOSED ROAD SURFACE.
3. A QUALIFIED TECHNICIAN WILL OBTAIN FIELD SOIL SAMPLES TO DETERMINE THE APPROXIMATE ORGANIC CONTENT AND PROCTOR OF THE SOIL TO BE STABILIZED. AREAS WITH HIGH ORGANIC CONTENT MAY REQUIRE ADDITIONAL CEMENT TO STABILIZE THE SOILS PROPERLY. CONSULT THE ENGINEER FOR RECOMMENDATIONS.
4. CEMENT CONTENT SHOULD BE CHOSEN BASED ON THE CLOSEST SOIL SAMPLE TESTED AND THE RESULTS FROM THE TESTING IN THE GEOTECHNICAL REPORT. TYPICAL RATE SHALL BE _____ % BY WEIGHT. RATE MAY NEED TO BE ADJUSTED BASED ON FIELD CONDITIONS.
5. APPLY CEMENT AT A RATE PRESCRIBED BY TABLE 3 BASED ON THE IN-SITU SOIL MOISTURE CONTENT. IF THE IN-SITU SOIL MOISTURE CONTENT IS GREATER THAN 6% ABOVE OPTIMUM, DRY THE EXISTING SOIL TO MEET THE SPECIFICATIONS IN TABLE 10 OR CONSULT THE ENGINEER FOR FURTHER RECOMMENDATIONS. THE CONTRACTOR MAY NEED TO ADJUST THE CEMENT RATE BASED ON THE STABILIZED ROAD TESTING INFORMATION FOR OTHER ACCESS ROADS WITHIN THE PROJECT AREA. CEMENT RATE AND GUIDELINES FOR ADJUSTING BASED ON MOISTURE CONTENT ARE ESTIMATES AND MAY NEED TO BE ADJUSTED THROUGHOUT CONSTRUCTION. CONSULT THE ENGINEER FOR FURTHER RECOMMENDATIONS.
6. CEMENT AND HYDRATED LIME ADDITION RATES SHOULD BE CHOSEN BASED UPON THE MOISTURE CONTENTS SHOWN IN TABLE 20 FOR THE SOIL MOST CLOSELY APPROXIMATING THE SOIL TO BE STABILIZED. DEPENDING ON RESULTS OF THE PROCTOR DENSITY TESTS PERFORMED ON FIELD SAMPLES AND FIELD STRENGTH TESTING (DCP), THE CEMENT CONTENT MAY BE MODIFIED.
7. IN-SITU MOISTURE CONTENT WILL BE CHECKED BY NUCLEAR DENSITY GAUGE OR MICROWAVE OVEN (ASTM D4643) IMMEDIATELY IN FRONT OF THE RECLAIMER PRIOR TO INCORPORATION OF THE CEMENT AND/OR HYDRATED LIME.
8. CONTRACTOR WILL BE ADVISED OF MOISTURE CONTENT AND MOISTURE ADJUSTMENTS SHOULD BE MADE IF IN-SITU MOISTURE IS LESS THAN 90% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY PROCTOR TESTING.
9. CEMENT SHALL BE MIXED UNIFORMLY WITH EXISTING SUBGRADE SOILS TO A DEPTH OF 12 INCHES.
10. THE STABILIZATION ADDITIVE SHALL BE INCORPORATED INTO THE SOIL USING A WIRTGEN WR 2500 RELCAIMER OR EQUIVALENT.
11. IF THE TECHNICIAN DETERMINES HYDRATED LIME IS NEEDED, IT SHOULD BE ADDED IN A SEPARATE RECLAIMING OPERATION FROM THE CEMENT. FOLLOWING INCORPORATION INTO THE SOIL, THE HYDRATED LIME SHOULD BE ALLOWED TO "MELLOW" FOR A 1 – 3 HOUR PERIOD PRIOR TO INCORPORATION OF THE CEMENT.
12. A ROLLING PATTERN SHALL BE ESTABLISHED USING A NUCLEAR DENSITY GAUGE. COMPACTION SHALL BE PERFORMED UNTIL THE STABILIZED MATERIAL "BREAKS". COMPACTION IS TYPICALLY ACHIEVED BY MULTIPLE PASSES OF A PADFOOT ROLLER UNTIL THE ROLLER WALKS OUT OF THE STABILIZED MATERIAL (SPACE IS VISIBLE BETWEEN THE ROLLER DRUM AND THE STABILIZED MATERIAL). THIS SHALL BE FOLLOWED BY BLADING THE HIGH AND LOW POINTS OF THE STABILIZED MATERIAL AND SHAPING THE STABILIZED MATERIAL TO FINAL PROFILE AND CROSS SECTION. SMOOTH DRUM OR RUBBER TIRE ROLLERS ARE THEN USED TO FINISH ROLLING. (THIS IS WHEN DENSITY TESTS SHALL BE PERFORMED) UNTIL THE DENSITY OF THE STABILIZED MATERIAL "BREAKS".
13. THE STABILIZED MATERIAL NEEDS TO BE CONTINUOUSLY WET CURED FOR A MINIMUM OF 24 HOURS (WET CURED IS IDENTIFIED VISUALLY AS SURFACE DAMP). THIS MAY REQUIRE THE APPLICATION OF WATER EVERY 2 – 3 HOURS, INCLUDING AT NIGHT WHEN NO OTHER WORK IS BEING PERFORMED.
14. DENSITY TESTS SHALL BE TAKEN AT THE RATE LISTED IN THE TESTING REQUIREMENTS TO CONFIRM THE DENSITY IS MATCHING THE TARGET DENSITY ESTABLISHED BY THE ROLLING PATTERN.
15. IF A DENSITY FAILURE OCCURS, AND ADDITIONAL APPLICATION OF COMPACTION DOES NOT IMPROVE THE DENSITY, A ONE POINT PROCTOR SHALL BE RUN TO DETERMINE WHETHER THE MATERIAL HAS CHANGED AND A NEW PROCTOR IS NEEDED.
16. ADDITIONAL SUBGRADE STRENGTH TESTING BY DCP SHALL BE DONE AT 2 TO 7 DAYS FROM THE TIME OF FINAL COMPACTION. THE DCP TESTING MUST CONFIRM THAT A CBR OF _____ IS ACHIEVED. IF A CBR OF _____ IS NOT ACHIEVED, ADDITIONAL GRAVEL SURFACING WILL BE REQUIRED AND THE CEMENT CONTENT FOR FUTURE STABILIZATION WILL BE ADJUSTED.
17. THE FOLLOWING DAY (24 HOURS AFTER COMPACTION) SUBGRADE STRENGTH TESTING BY DCP SHALL BE DONE RANDOMLY FOR EVERY 300 LF IN EACH PASS OF THE RECLAIMER. AFTER AT LEAST 2 DAYS OF PRODUCTION, ONCE THE PROCEDURE IS DEEMED SATISFACTORY BY THE ENGINEER, THE TEST SPACING MAY BE INCREASED TO 500 LF. SUBGRADE STRENGTH TESTING SHALL BE DONE AT 24 HOURS (+/– 4 HOURS) FROM THE TIME OF FINAL COMPACTION OF THE SOIL/CEMENT BLEND. A MINIMUM OF 15 CBR IS REQUIRED PRIOR TO PROOF ROLLING BY THE CONTRACTOR. THE RELATIONSHIP CBR = 292/DCP1.12 AS RECOMMENDED BY THE US ARMY CORPS OF ENGINEERS SHOULD BE USED (DCP = DCP PENETRATION IN MM/BLOW). THE RECOMMENDED CORRELATION FOR CBR USES THE EQUATION FOR GRANULAR SOILS BECAUSE AFTER STABILIZATION THE EQUATIONS FOR CLAY ARE NO LONGER APPLICABLE.
18. THE SURFACE AGGREGATE SHALL BE PLACED OVER THE STABILIZED SUBGRADE NO SOONER THAN 24 HOURS AFTER THE COMPLETION OF CEMENT STABILIZATION. PRIOR TO THE PLACEMENT OF THE GRAVEL SURFACE, THE SUBGRADE SHALL BE PROOF ROLLED IN THE PRESENCE OF THE ENGINEER WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK WITH A MINIMUM GROSS WEIGHT OF 25 TONS AND SHALL MEET THE REQUIREMENTS LISTED BELOW. IN LIEU OF A PROOF ROLL, THE BEHAVIOR OF THE STABILIZED MATERIAL CAN BE EVALUATED BY OBSERVING THE LOADED CEMENT TRUCKS PASSING OVER THE COMPACTED MATERIAL.
    a. NO RUTTING GREATER THAN 1.5 INCH.
    b. NO PUMPING OF THE SOIL (PUMPING IS DEFINED AS THE MIXING OF THE UNSTABILIZED SUBGRADE SOILS WITH STABILIZED SUBGRADE.

**TABLE 3: RECOMMENDED CEMENT ADDITIONAL RATES (PERCENT BY WEIGHT) VS. SOIL MOISTURE CONTENT**

| SAMPLE | LOCATION | ASTM/AASHTO | NEAR OPT. | 2–4% ABOVE OPT. | 4–6% ABOVE OPT. |
|---|---|---|---|---|---|
| X | X | X | X% | X% | X% |
| X | X | X | X% | X% | X% |
| X | X | X | X% | X% | X% |
| X | X | X | X% | X% | X% |

## TEMPORARY FEATURE DESIGN PARAMETERS

1. LAYDOWN YARD
    a. GRADING, DRAINAGE AND EROSION CONTROL – SEE EXECUTION, NOTES 1 – 3, AND SUBGRADE COMPACTION, TEST ROLLING AND AGGREGATE BASE COMPACTION, NOTES 1–3.
    b. LAYDOWN YARD AGGREGATE SHALL CONSIST OF CLASS 5 MODIFIED AGGREGATE MATERIAL MEETING NORTH DAKOTA DOT SPEC 302 & 816 AND THE GRADATION PROVIDED IN TABLE 1.
    c. SEE PLAN DETAILS.
2. TEMPORARY INTERSECTION IMPROVEMENTS
    a. GRADING, DRAINGE AND EROSION CONTROL– SEE EXECUTION, NOTES 1 – 3, AND SUBGRADE COMPACTION, TEST ROLLING AND AGGREGATE BASE COMPACTION, NOTES 1–3.
    b. SURFACING – SEE SUBGRADE COMPACTION, TEST ROLLING AND AGGREGATE BASE COMPACTION, NOTE 3.
    c. SEE PLAN DETAILS.
    d. TEMPORARY INTERSECTION WIDENINGS SHALL, UPON COMPLETION OF ALL PROJECT CONSTRUCTION ACTIVITIES OR UPON NOTIFICATION TO THE CONTRACTOR BY THE ENGINEER, BE REMOVED UNLESS OTHERWISE NOTIFIED BY THE ENGINEER, CONSTRUCTION MANAGER, OR STATE/COUNTY/LOCAL OFFICIALS. THE DISTURBED AREA FROM THE INTERSECTION WIDENINGS SHALL BE RESHAPED TO ITS ORIGINAL LINES AND GRADES WITH THE UPPER FOOT OF RESTORED GROUND BEING TOPSOIL AND THE DISTURBED AREA SHALL BE SEEDED AND MULCHED / STABILIZED IN ACCORDANCE WITH THE SWPPP.
3. BATCH PLANTS
    a. GRADING, DRAINAGE AND EROSION CONTROL CONTROL – SEE EXECUTION, NOTES 1 – 3, AND SUBGRADE COMPACTION, TEST ROLLING AND AGGREGATE BASE COMPACTION, NOTES 1–3.
    b. BATCH PLANT YARD AGGREGATE SHALL CONSIST OF CLASS 5 MODIFIED AGGREGATE MATERIAL MEETING NORTH DAKOTA DOT SPEC 302 & 816 AND THE GRADATION PROVIDED IN TABLE 1.
    c. SEE PLAN DETAILS.

## ENVIRONMENTAL

1. WETLAND, STREAMS, AND ENVIRONMENTAL INFORMATION SHOWN ON THE PLANS WAS PROVIDED BY STANTEC. ALL PERMITTING SHALL BE COMPLETED PRIOR TO CONSTRUCTION COMMENCING. THE CONTRACTOR SHALL VERIFY THAT ALL PERMITS HAVE BEEN SUBMITTED AND APPROVED PRIOR TO CONSTRUCTION COMMENCING.
2. BIOLOGICAL REPORTS HAVE BEEN PREPARED BY STANTEC. INFORMATION REQUESTED TO BE SHOWN ON THE PLANS IS SHOWN. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORTS.
3. CULTURAL RESOURCE REPORTS HAVE BEEN PREPARED BY STANTEC. THE LOCATIONS OF THE CULTURAL RESOURCE SITES ARE CONFIDENTIAL AND PROTECTED BY STATE AND FEDERAL LAW. PUBLIC RELEASE OF SPECIFIC INFORMATION REGARDING THESE RESOURCES IS RESTRICTED AND THE SITES ARE NOT SHOWN ON THE CONSTRUCTION PLANS. THE CONTRACTOR SHALL REVIEW THE REPORTS PRIOR TO CONSTRUCTION AND VERIFY THAT THE CONSTRUCTION PLANS AVOID THE CULTURALLY SENSITIVE AREAS.
4. WETLAND DELINEATIONS AND REPORTS HAVE BEEN COMPLETED BY STANTEC. A UNITED STATES ARMY CORPS OF ENGINEERS SITE SPECIFIC PERMIT IS IN THE PROCESS OF BEING APPLIED FOR. WETLAND IMPACTS BEYOND WHAT IS SHOWN ON THE PLANS MUST BE APPROVED BY THE OWNER PRIOR TO PROCEEDING. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REPORTS AND REVIEW ALL PERMITTING REQUIREMENTS PRIOR TO STARTING CONSTRUCTION.
5. THE OWNER HAS PROVIDED NO KNOWN OCCURENCES OF RARE, THREATENED, OR ENDANGERED SPECIES IN OR NEAR THE CONSTRUCTION AREA. CONTRACTOR SHALL COORDINATE WITH OWNER FOR VERIFICATION OF APPLICABLE ENDANGERED SPECIES PROTECTION REQUIREMENTS WITHIN THE PROJECT AREA.

**PROJECT CONTACT INFORMATION**

| TITLE | COMPANY | NAME | PHONE NUMBER |
|---|---|---|---|
| OWNER | SUNEDISION | JED DAILEY | 207–907–9982 |
| OWNER | SUNEDISION | ARON ANDERSON | 612–559–4251 |
| PROJECT MANAGER | WESTWOOD | ROB COPOULS | 952–906–7470 |
| ENGINEER OF RECORD | WESTWOOD | ROB COPOULS | 952–906–7470 |
| CONTRACTOR | MORTENSON CONSTRUCTION | STEVE WESTBY | 763–287–5645 |
| STATE AGENCY | . | . | . |
| COUNTY AGENCY | . | . | . |
| LOCAL AGENCY | . | . | . |
| SWPPP COMPLIANCE | . | . | . |

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Minneapolis, MN 55440

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Boston, MA 02111

# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Construction Notes

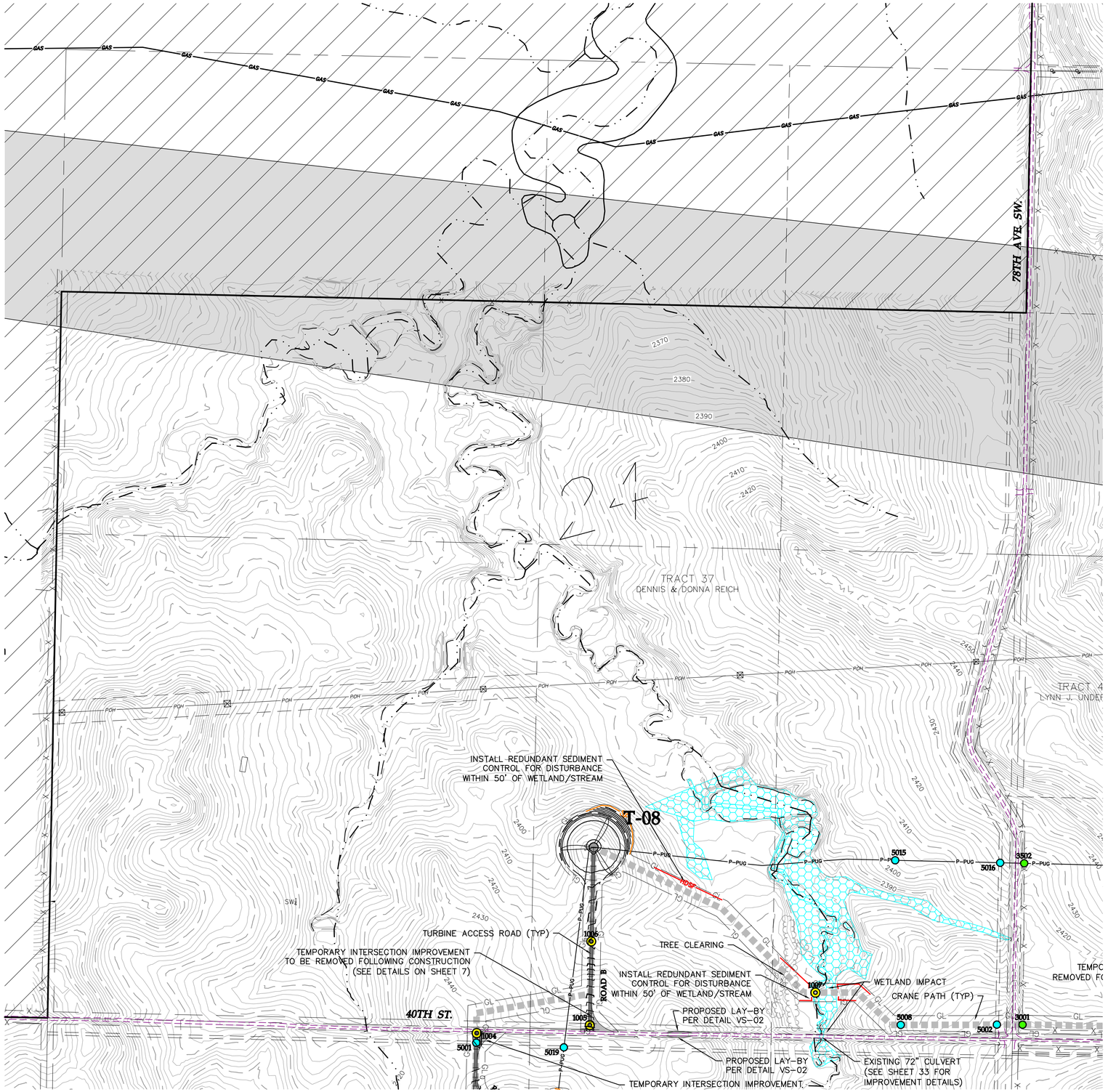
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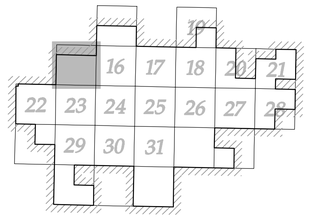



## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
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- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SEDIMENT CONTROL
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0' 300' 600' 900'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S24, T139N, R91W**

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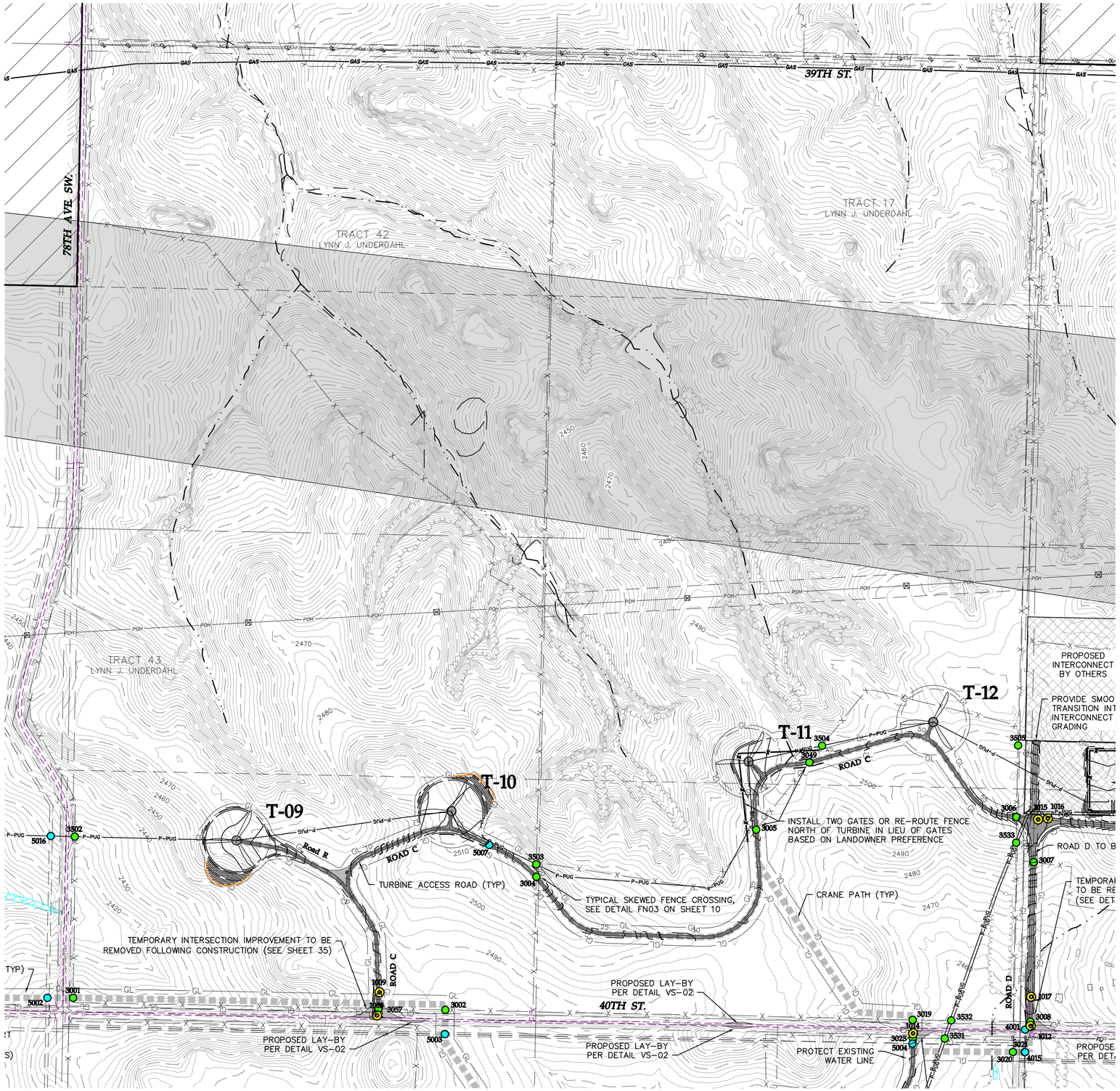
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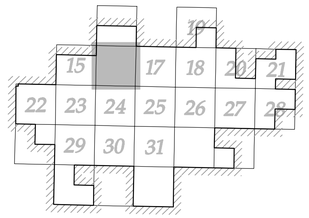



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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S19, T139N, R90W**

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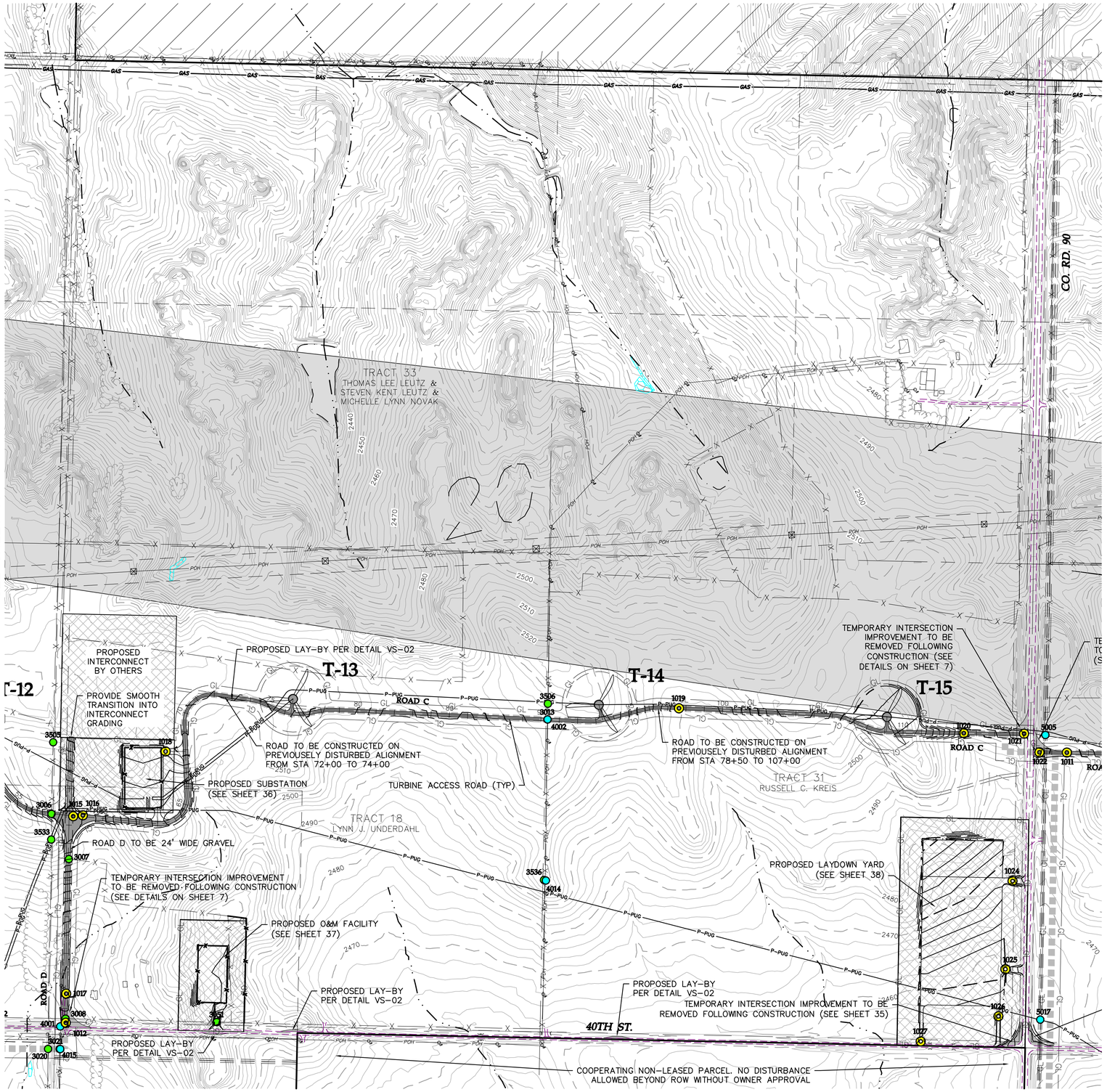
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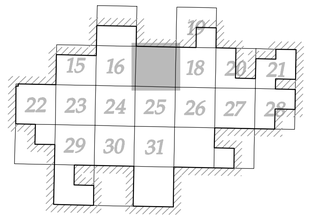



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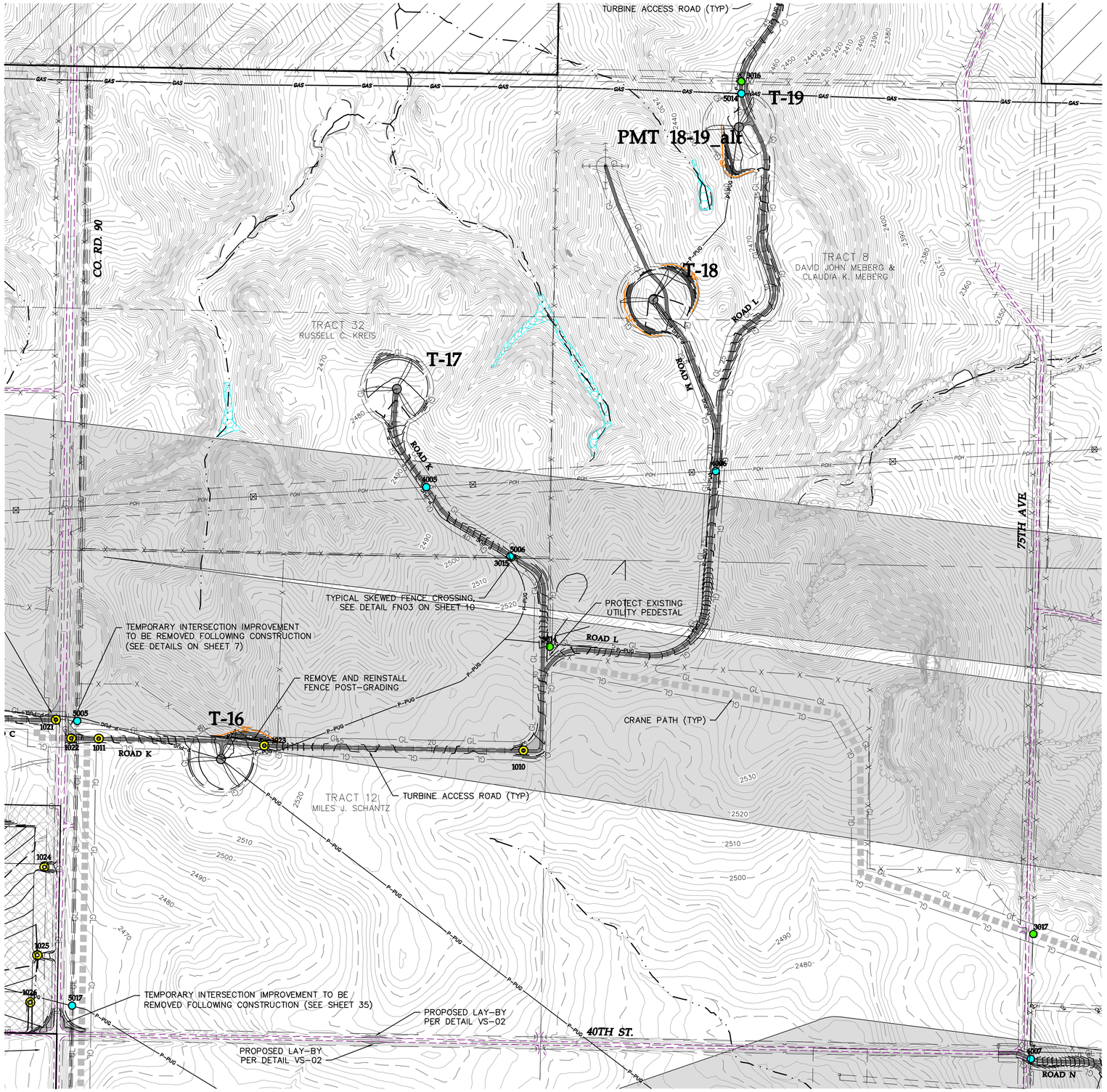
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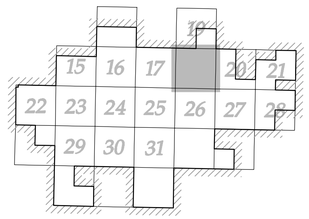

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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SEDIMENT CONTROL
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- X — X — EX. FENCE
- EX. TREELINE
- FOP — EX. FIBER OPTIC LINE
- GAS — EX. GAS PIPELINE
- MICROWAVE BEAM PATH
- POH — EX. OVERHEAD POWER
- TUC — EX. TELEPHONE LINE
- RAT — EX. WATER LINE
- EX. STREAM CHANNEL
- EX. DELINEATED WETLAND/STREAM
- UTILITY CROSSING (SEE SHEET 5)
- FENCE CROSSING (SEE SHEET 5)
- DRAINAGE CROSSING (SEE SHEET 4)

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| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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Minneapolis, MN 55440

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S21, T139N, R90W**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

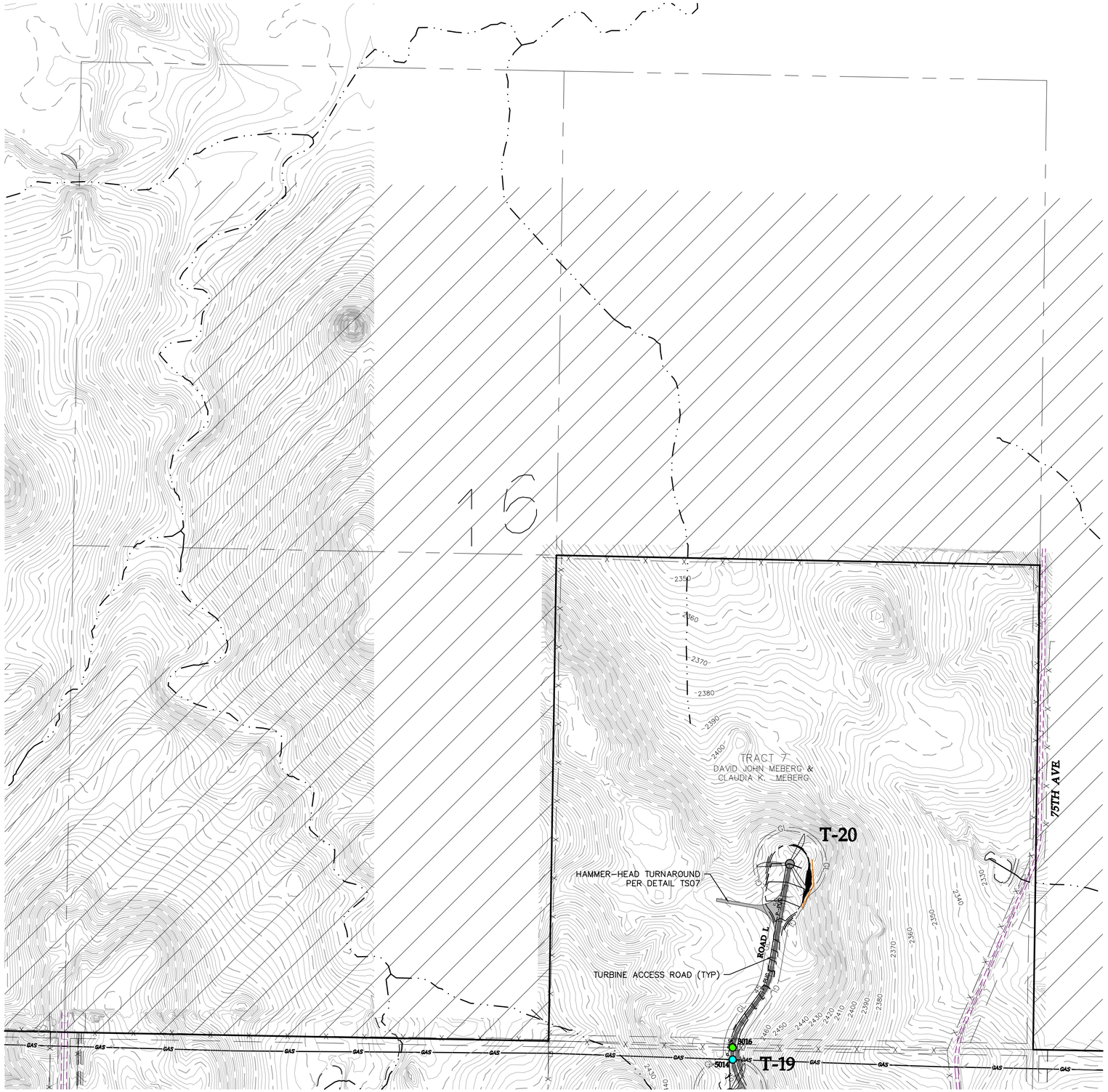
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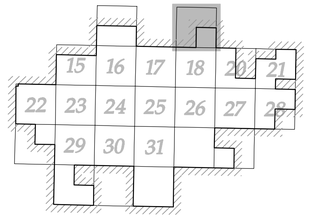

SEE SHEET 18

## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- 16 — SECTION NUMBER
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SEDIMENT CONTROL
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- X — X — EX. FENCE
- EX. TREELINE
- FOP — EX. FIBER OPTIC LINE
- GAS — EX. GAS PIPELINE
- MICROWAVE BEAM PATH
- POH — EX. OVERHEAD POWER
- TUG — EX. TELEPHONE LINE
- WAT — EX. WATER LINE
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- UTILITY CROSSING (SEE SHEET 5)
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S16, T139N, R90W**

**90% Civil Construction Plans**
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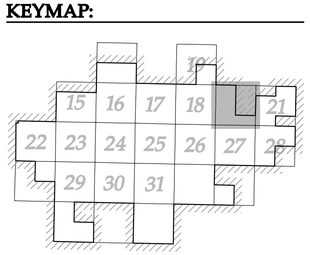



## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON–PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT–OF–WAY LINES
- EASEMENT LINES
- P–PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SEDIMENT CONTROL
- GL — GRADING LIMITS
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- FOP — EX. FIBER OPTIC LINE
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- MICROWAVE BEAM PATH
- POH — EX. OVERHEAD POWER
- TUG — EX. TELEPHONE LINE
- WAT — EX. WATER LINE
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Site Plan - S22, T139N, R90W

**90% Civil Construction Plans**
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**Turbine Array: sunflower_layout_microsited_20150616**

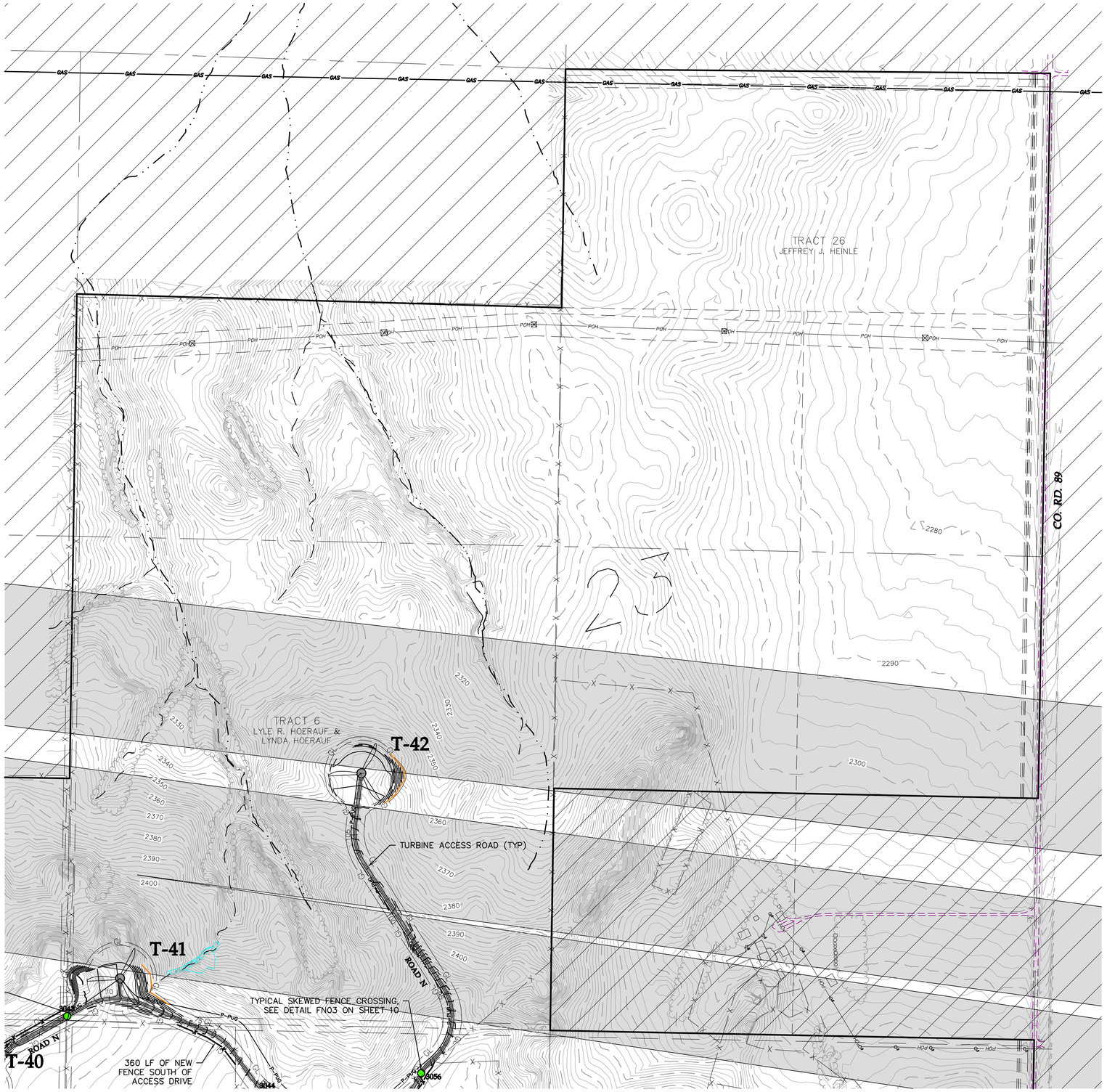
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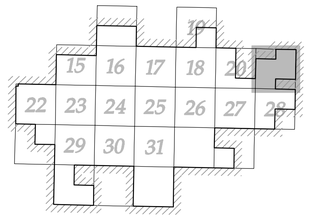



## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON–PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT–OF–WAY LINES
- EASEMENT LINES
- P–PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S23, T139N, R90W**

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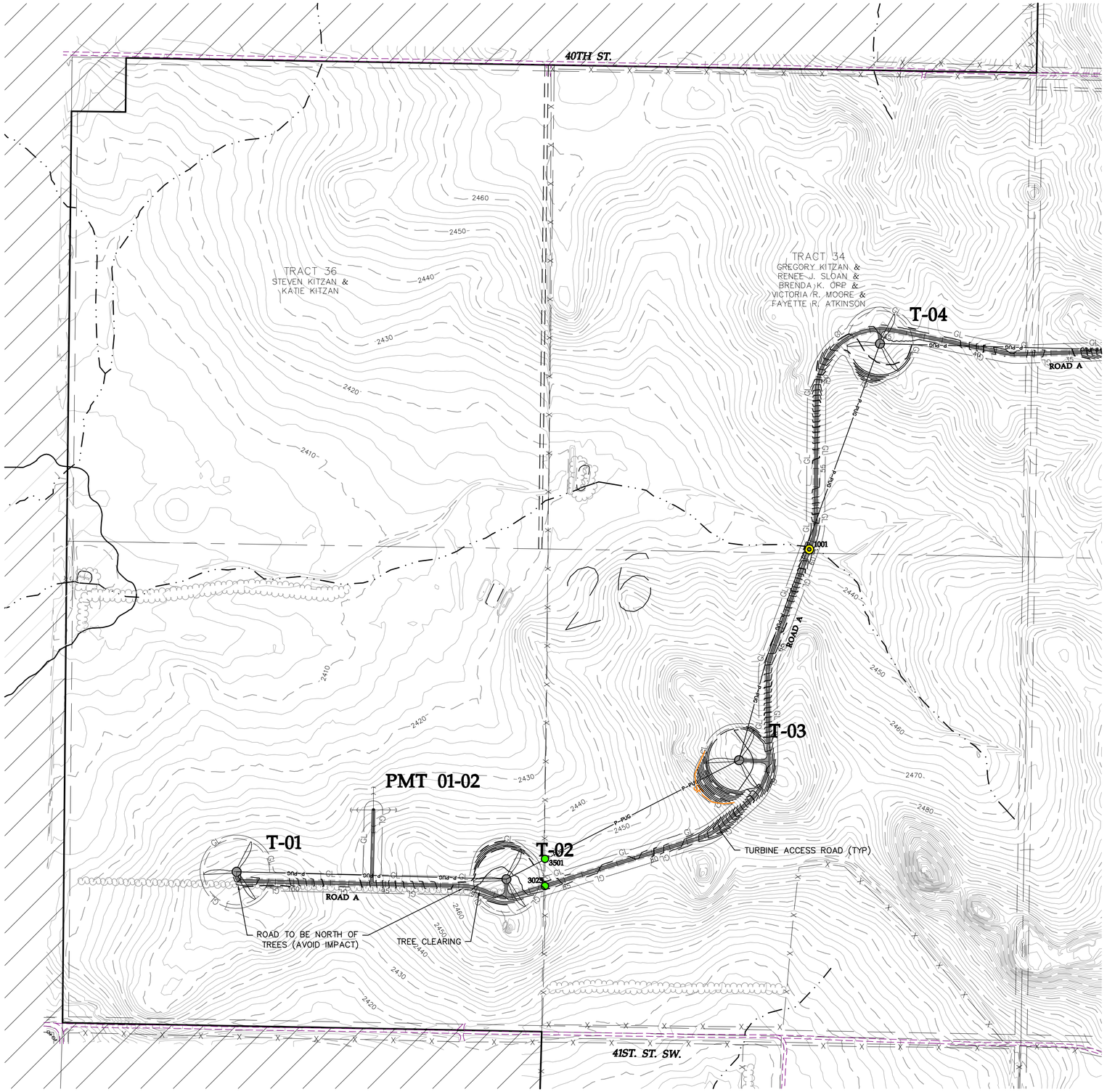
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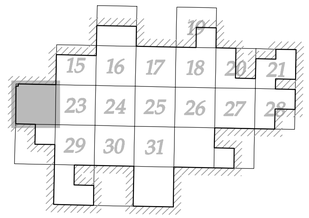



## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON–PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT–OF–WAY LINES
- EASEMENT LINES
- P–PUG — UNDERGROUND COLLECTION*
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- UTILITY CROSSING (SEE SHEET 5)
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| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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0' 300' 600' 900'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

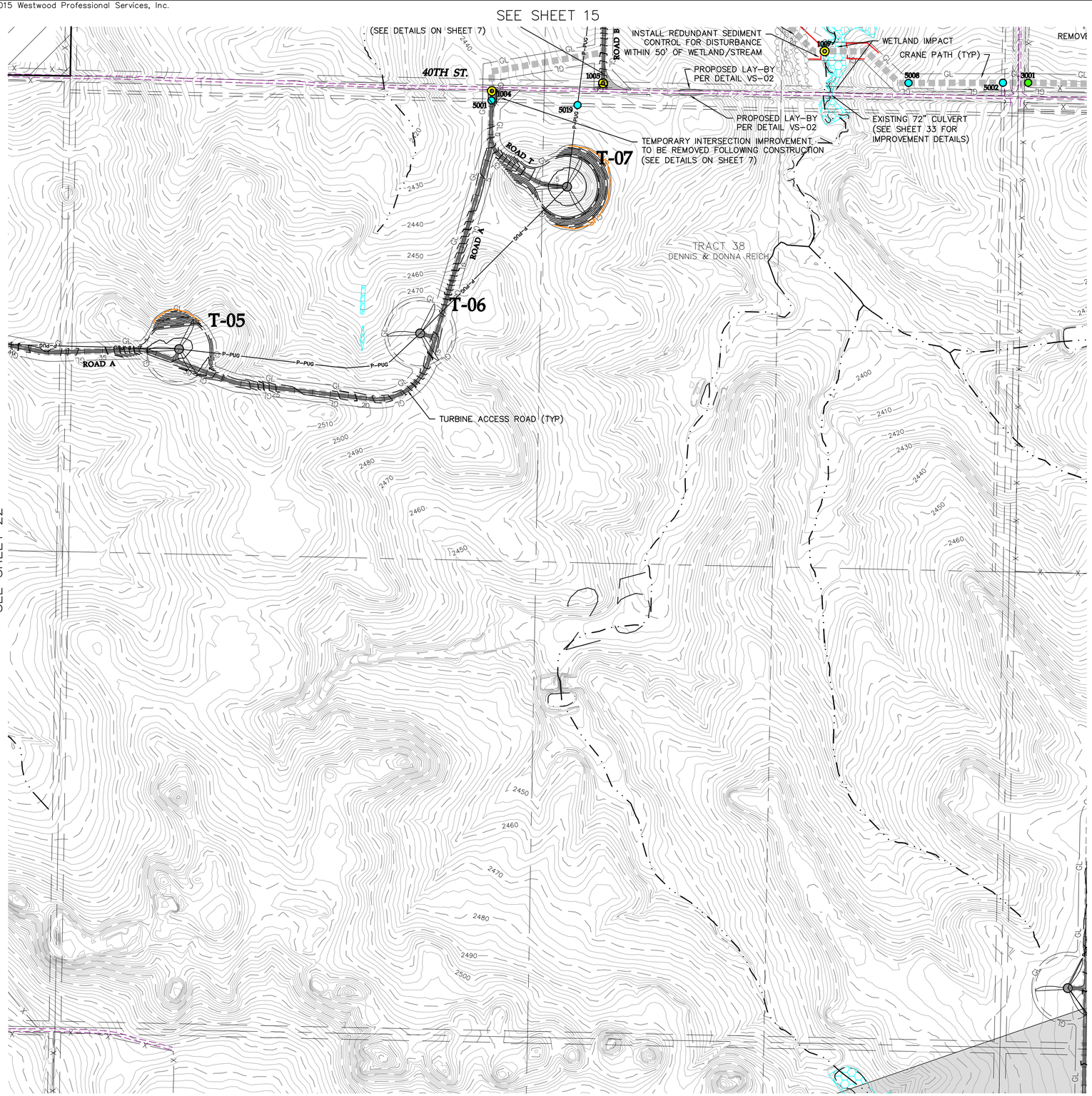
**Site Plan - S26, T139N, R91W**

**90% Civil Construction Plans**
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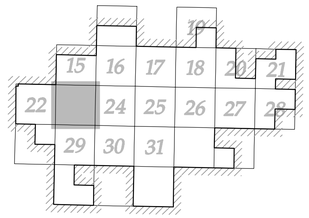

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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION*
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- WAT — EX. WATER LINE
- EX. STREAM CHANNEL
- EX. DELINEATED WETLAND/STREAM
- UTILITY CROSSING (SEE SHEET 5)
- FENCE CROSSING (SEE SHEET 5)
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S25, T139N, R91W**

**90% Civil Construction Plans**
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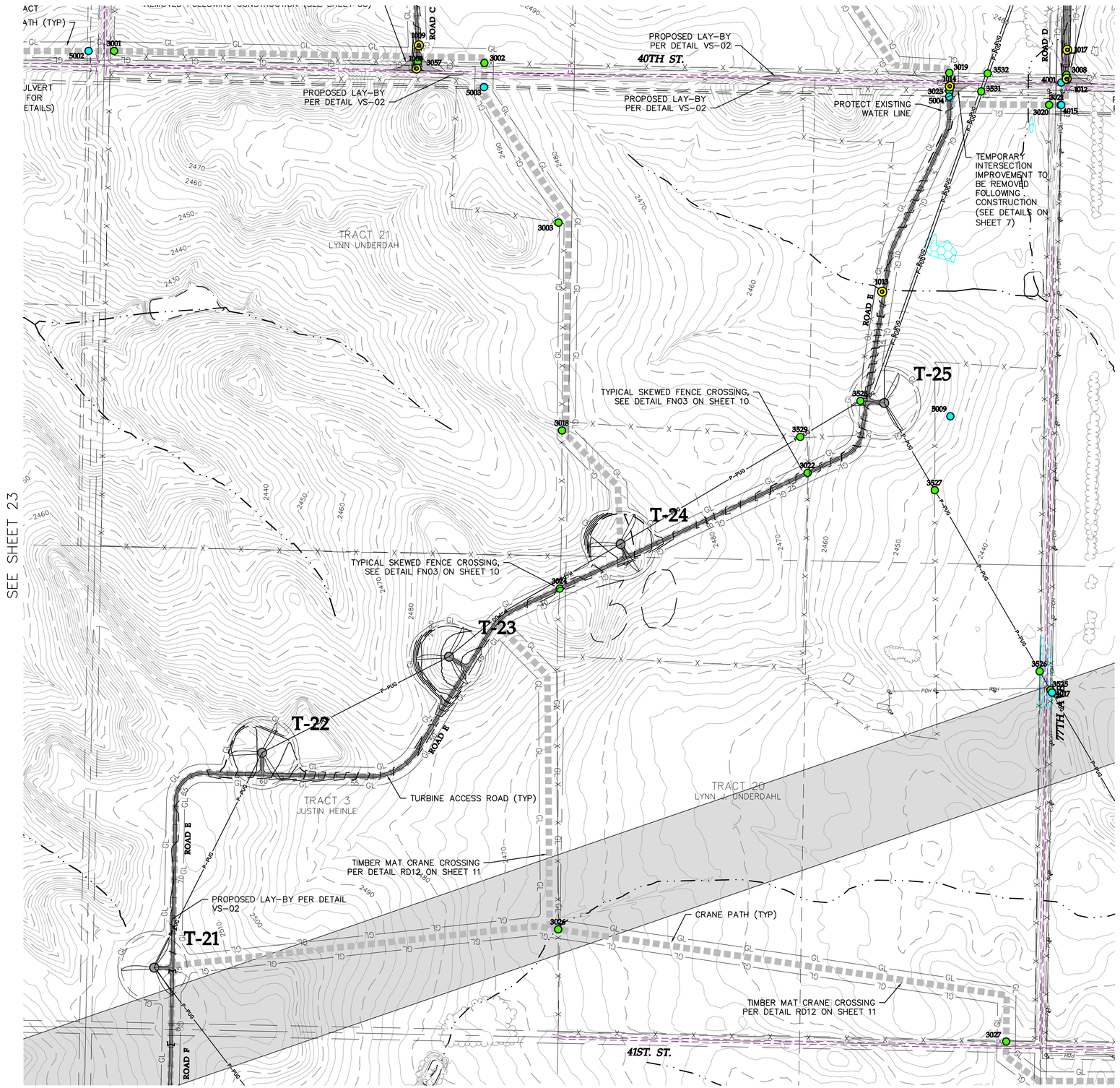
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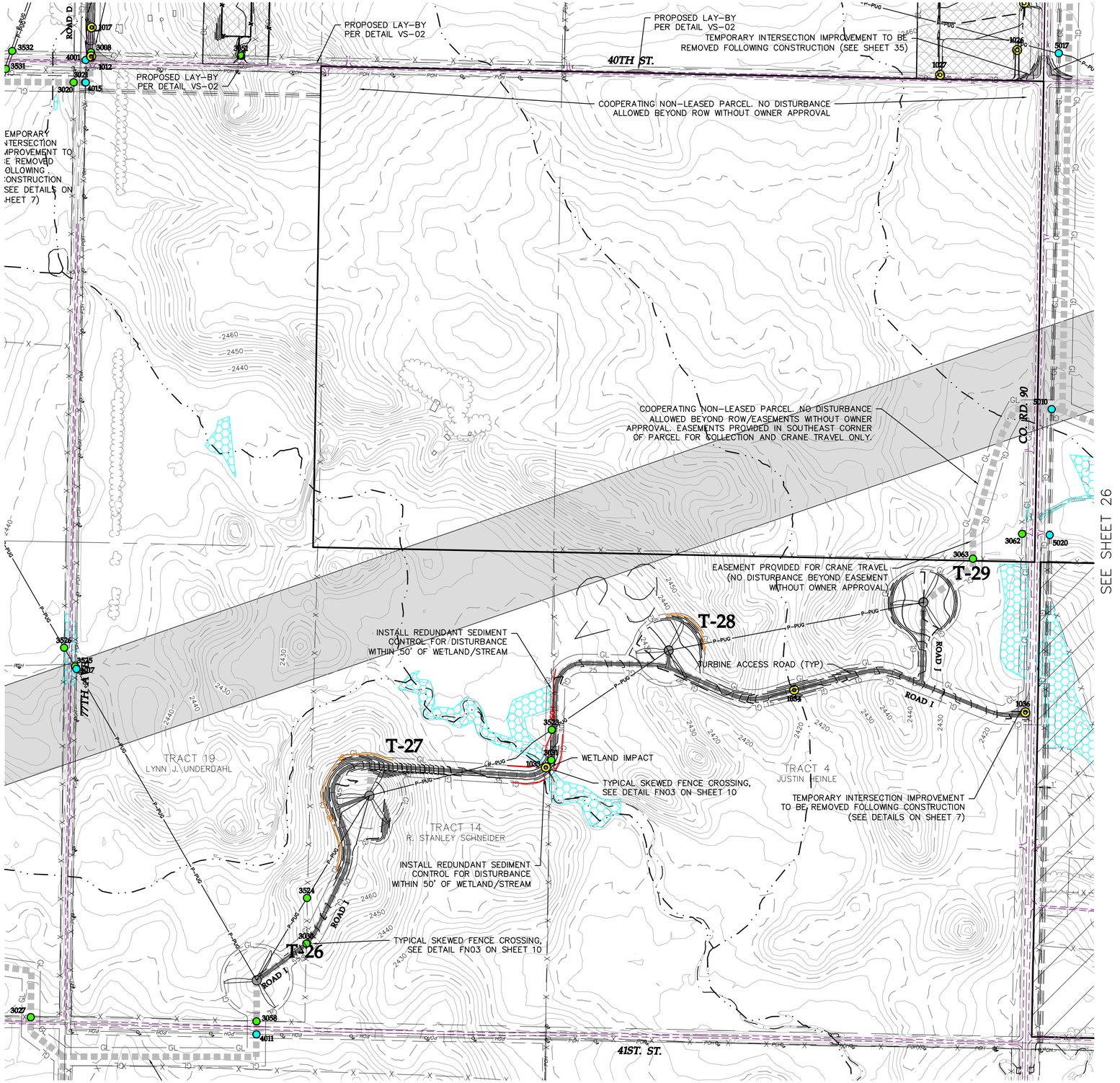
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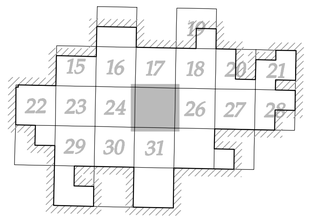



## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S29, T139N, R90W**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

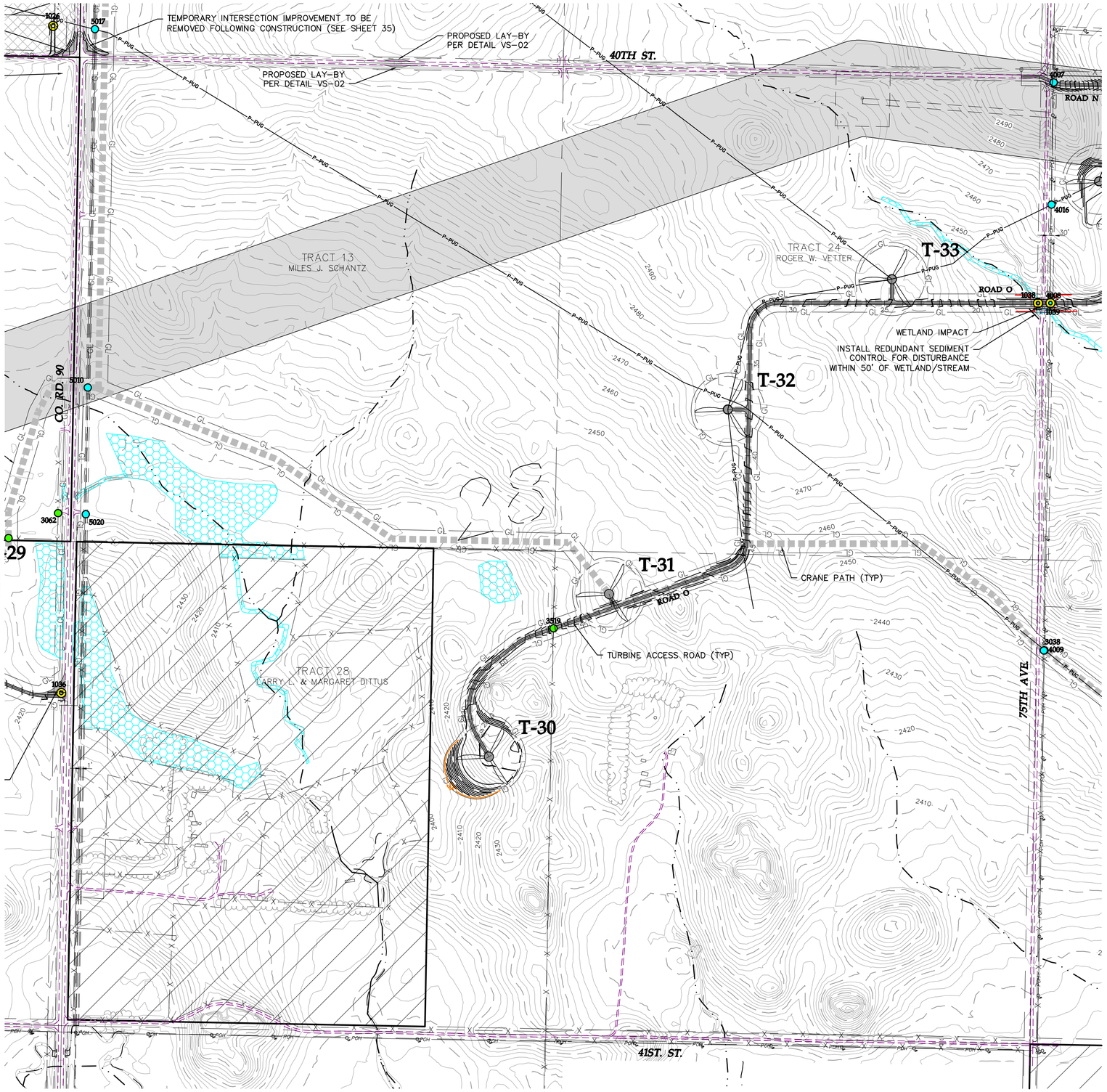
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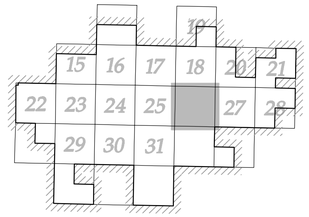

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- FENCE CROSSING (SEE SHEET 5)
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* COLLECTION SYSTEM SHOWN FOR REFERENCE ONLY. REFER TO PLANS BY ULTEIG FOR ELECTRICAL INFORMATION.

## KEYMAP:




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| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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Minneapolis, MN 55440

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0' 300' 600' 900'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S28, T139N, R90W**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

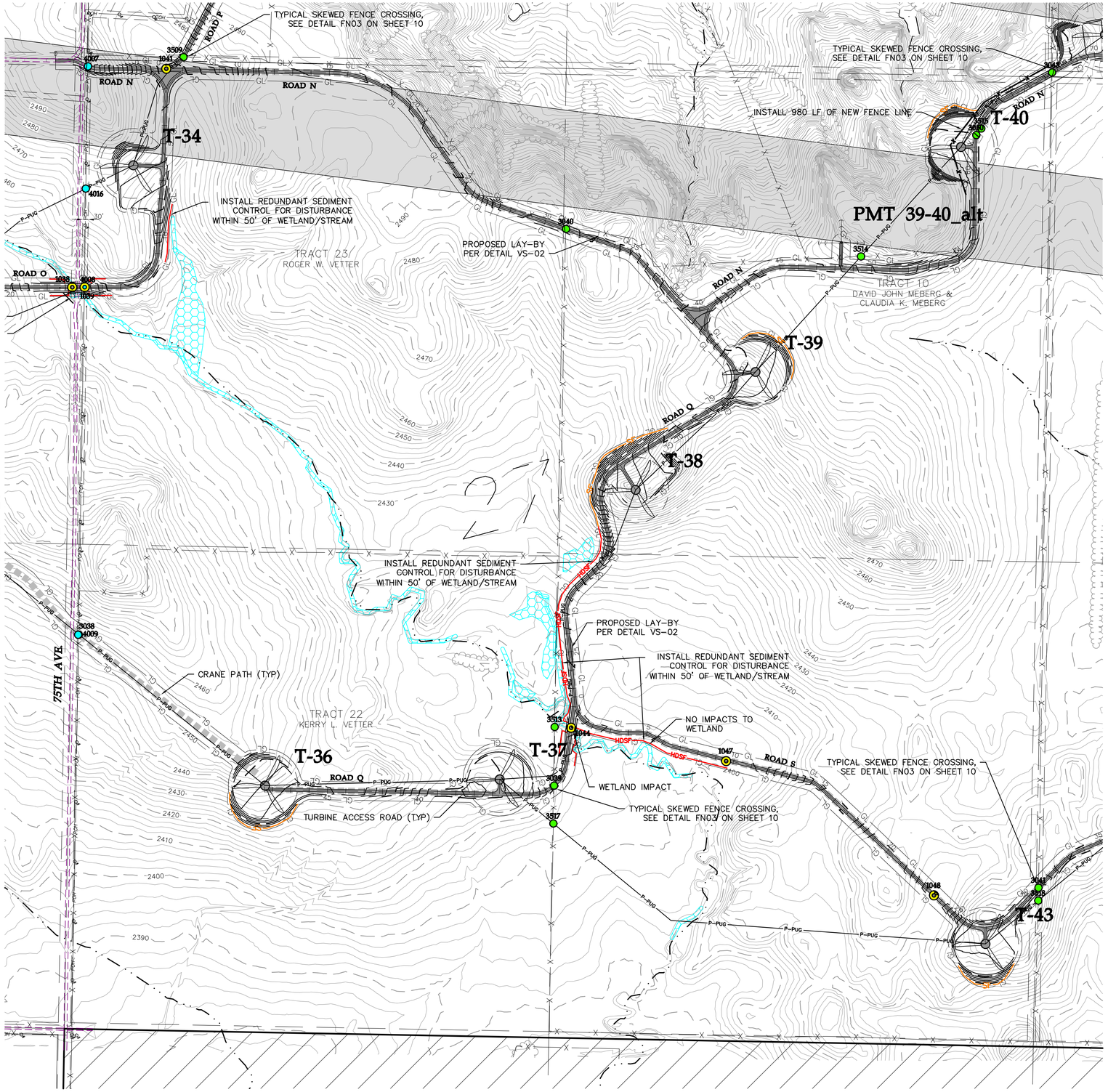
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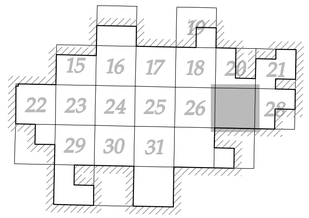

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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- 15 — SECTION NUMBER
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION*
- PROPOSED CULVERT
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SEDIMENT CONTROL
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- X — X — EX. FENCE
- EX. TREELINE
- FOP — EX. FIBER OPTIC LINE
- GAS — EX. GAS PIPELINE
- MICROWAVE BEAM PATH
- POH — EX. OVERHEAD POWER
- TUG — EX. TELEPHONE LINE
- WAT — EX. WATER LINE
- EX. STREAM CHANNEL
- EX. DELINEATED WETLAND/STREAM
- UTILITY CROSSING (SEE SHEET 5)
- FENCE CROSSING (SEE SHEET 5)
- DRAINAGE CROSSING (SEE SHEET 4)

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S27, T139N, R90W**

**90% Civil Construction Plans**
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**Turbine Array: sunflower_layout_microsited_20150616**

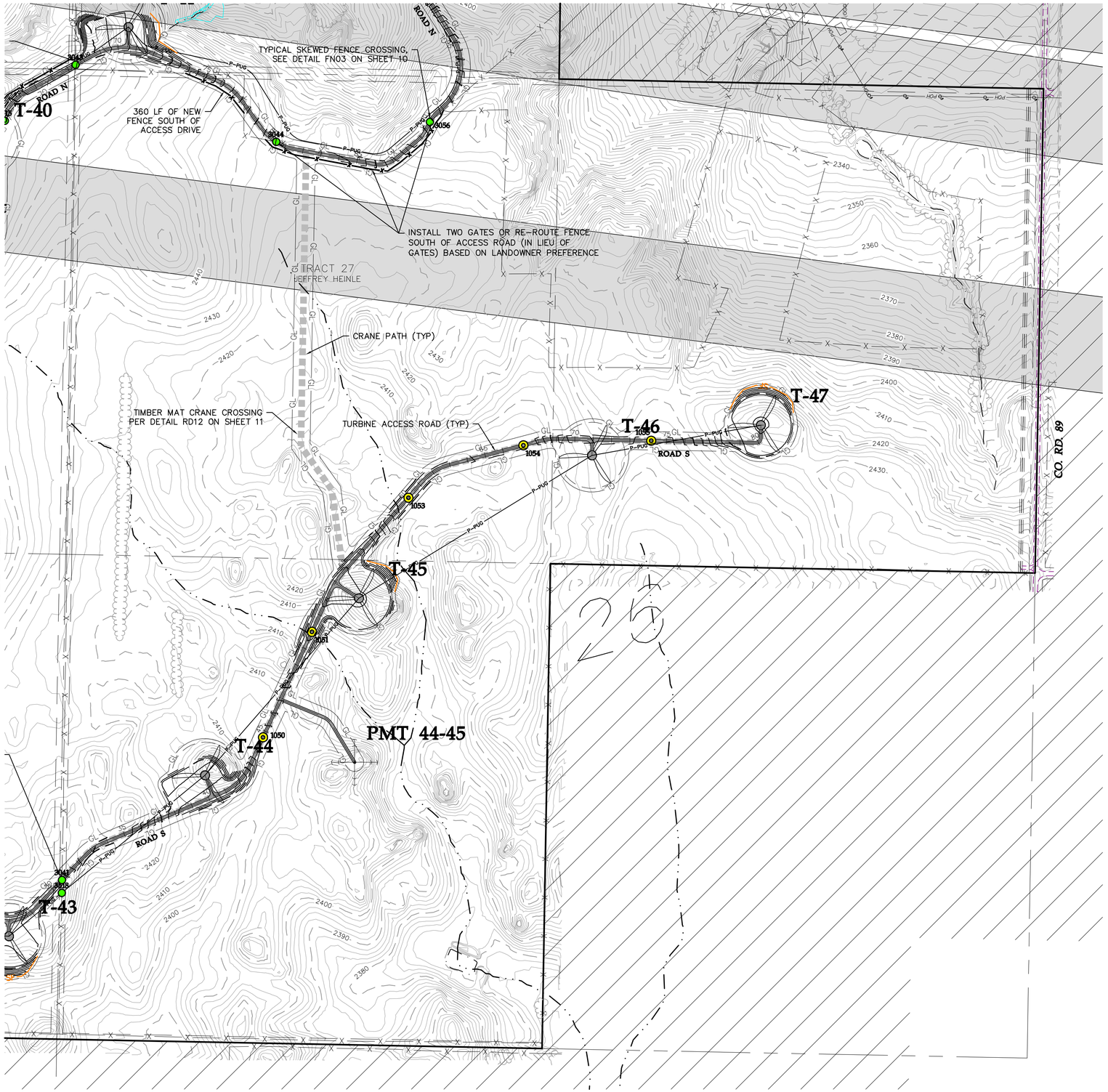
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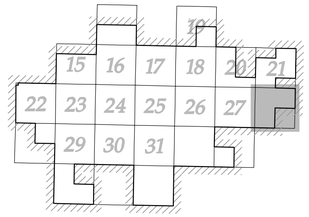

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- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
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- EX. DELINEATED WETLAND/STREAM
- UTILITY CROSSING (SEE SHEET 5)
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S26, T139N, R90W**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

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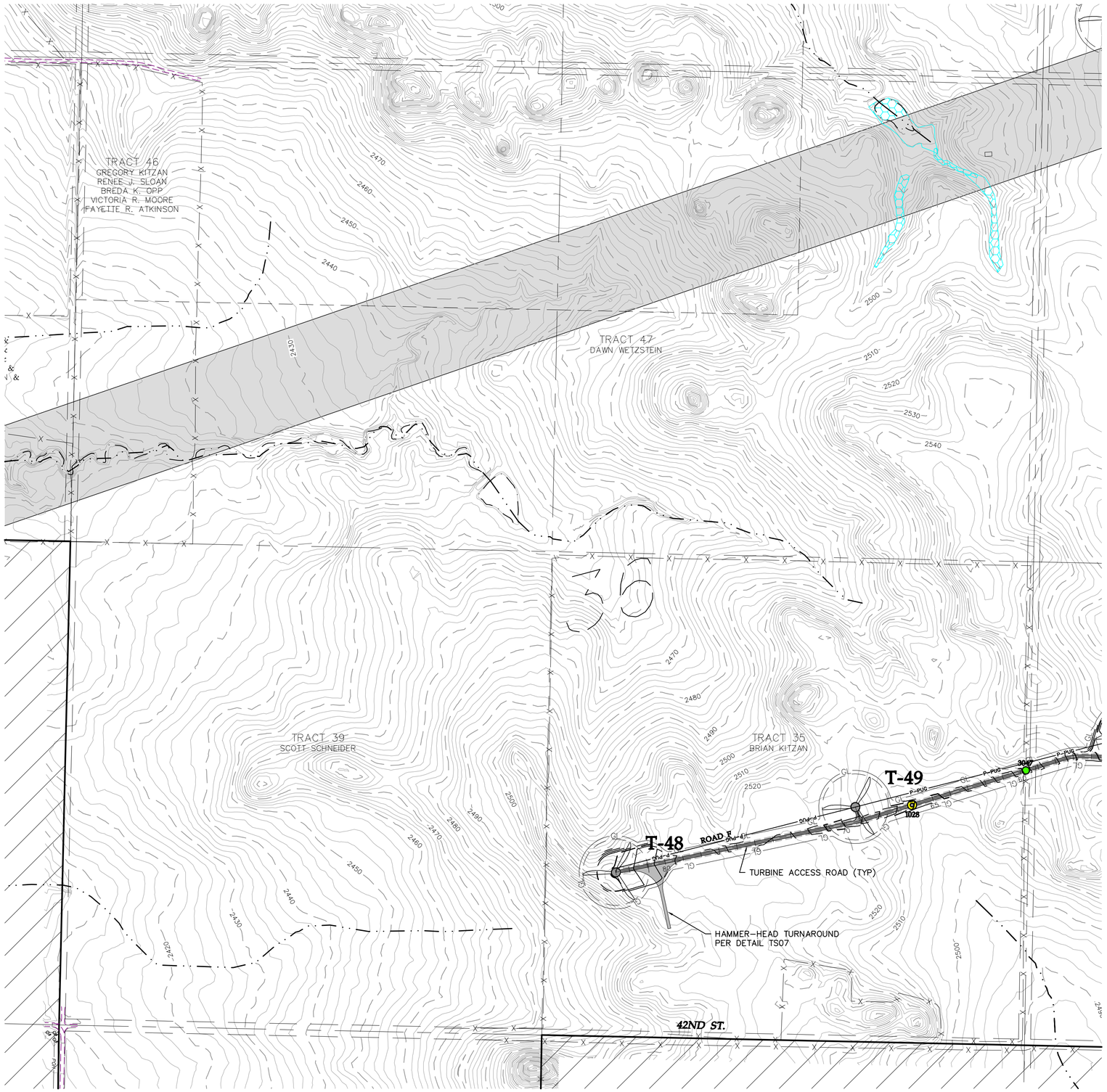
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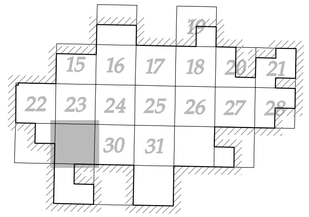

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S36, T139N, R91W**

**90% Civil Construction Plans**
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**Turbine Array: sunflower_layout_microsited_20150616**

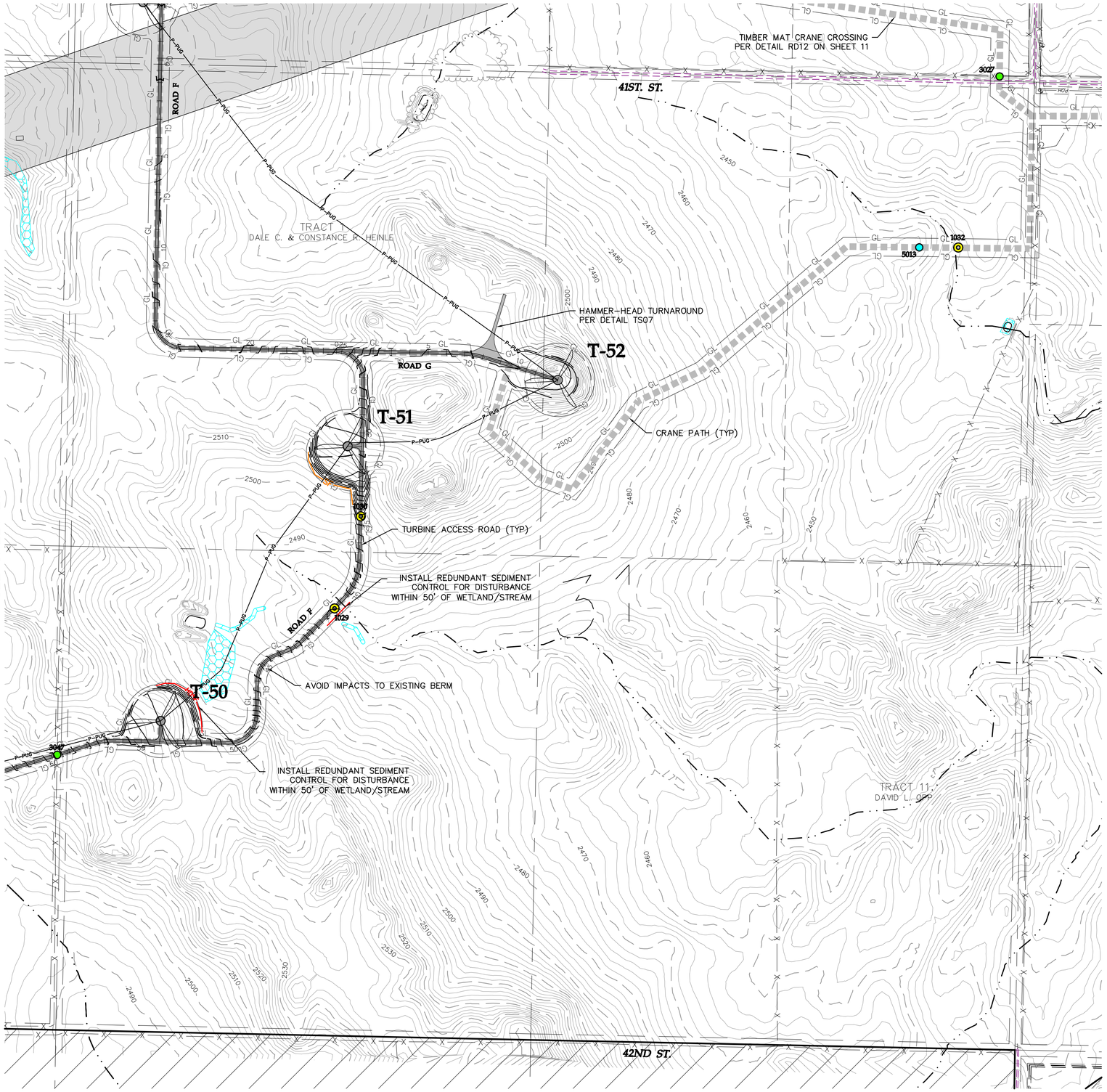
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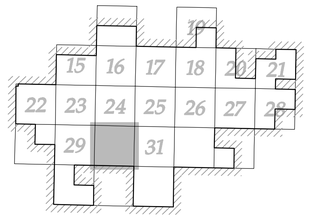

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- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S31, T139N, R90W**

**90% Civil Construction Plans**
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Turbine Array: sunflower_layout_microsited_20150616

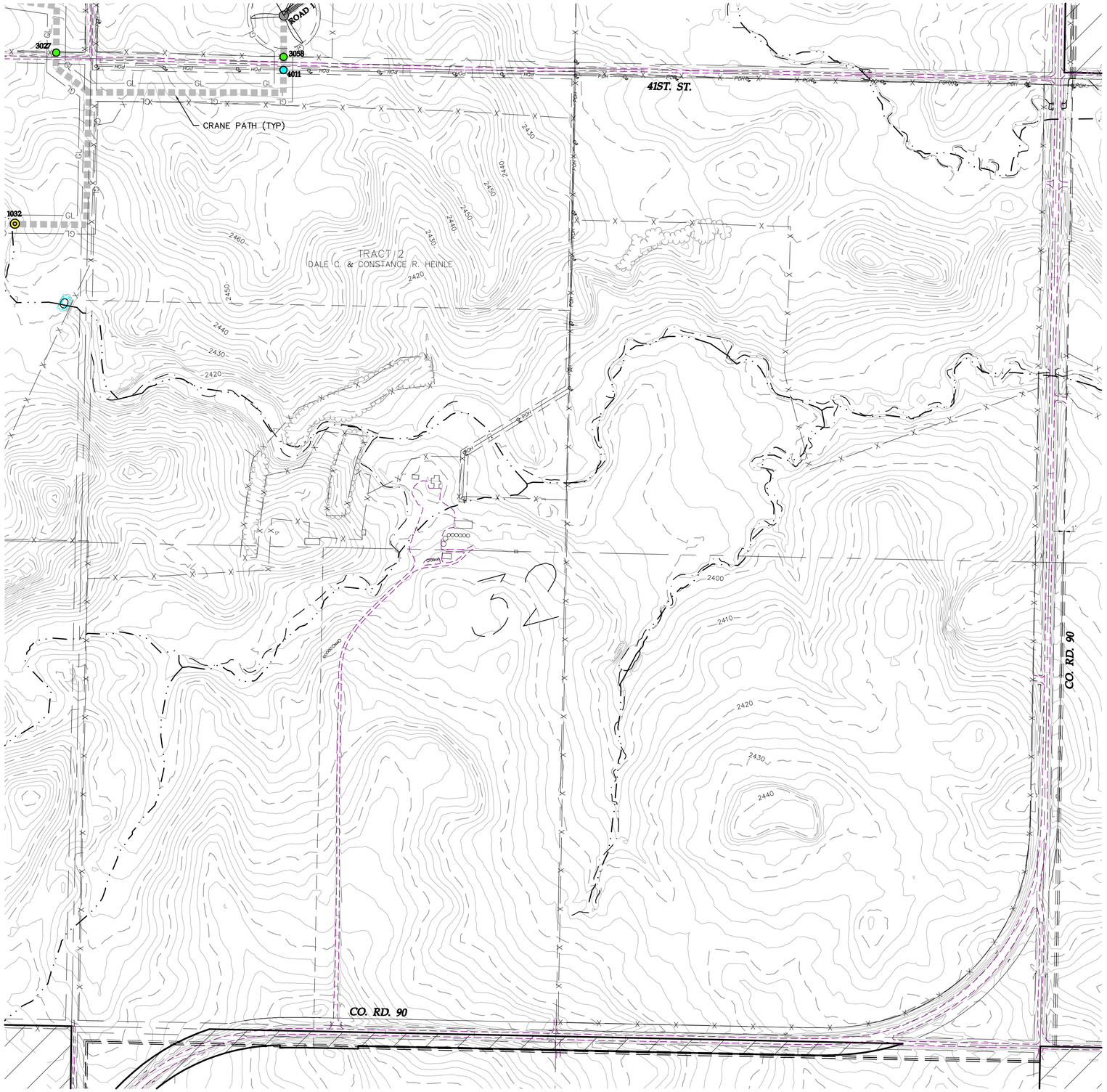
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SEE SHEET 25




SEE SHEET 30

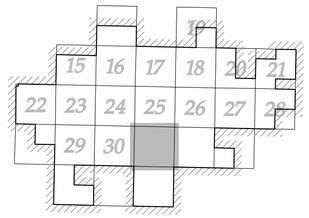
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- PROPOSED CRANE PATH
- ALTERNATE CRANE PATH
- NON–PARTICIPATING LAND
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Site Plan - S32, T139N, R90W**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

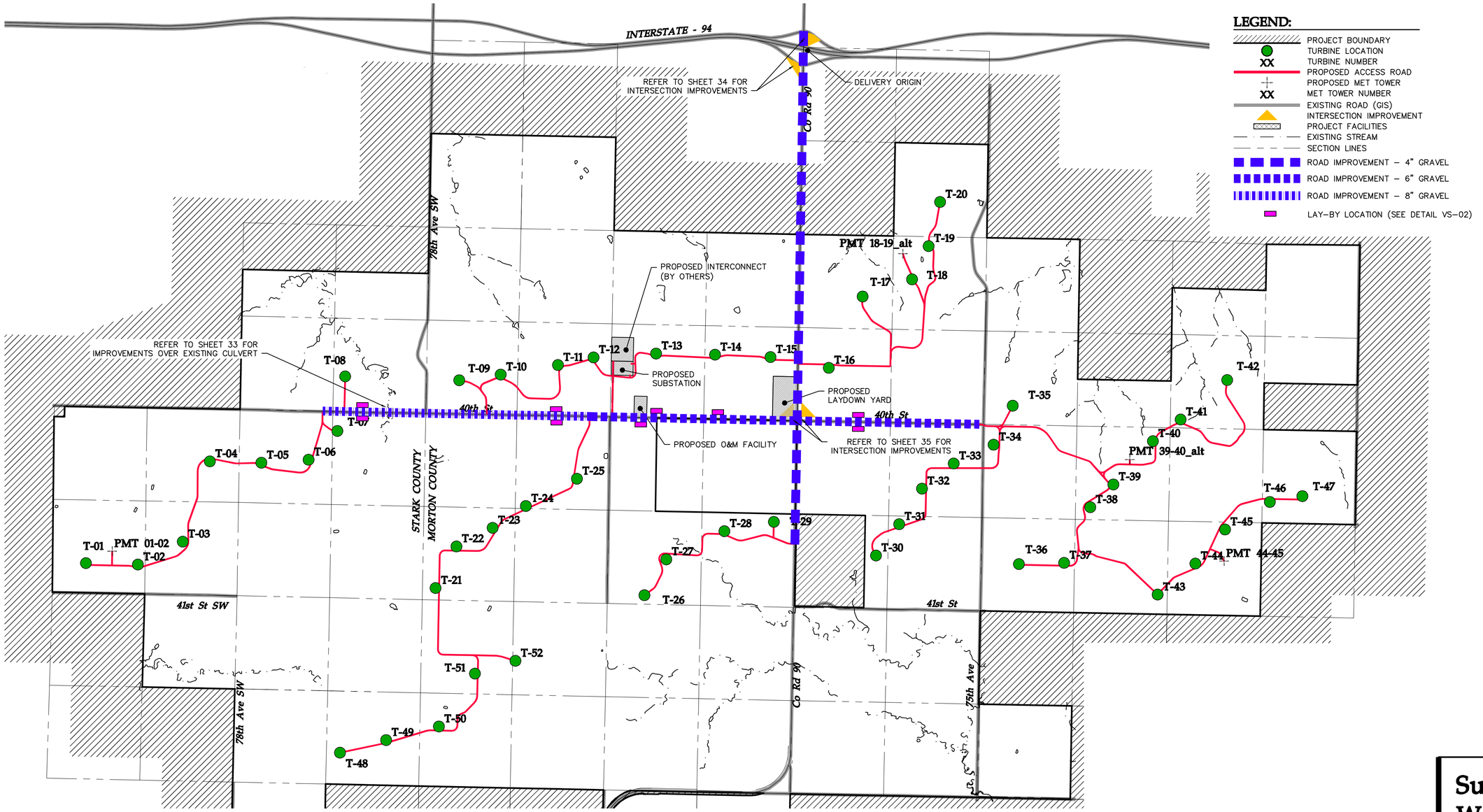
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## LEGEND:

- PROJECT BOUNDARY
- TURBINE LOCATION
- XX TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED MET TOWER
- XX MET TOWER NUMBER
- EXISTING ROAD (GIS)
- INTERSECTION IMPROVEMENT
- PROJECT FACILITIES
- EXISTING STREAM
- SECTION LINES
- ROAD IMPROVEMENT – 4" GRAVEL
- ROAD IMPROVEMENT – 6" GRAVEL
- ROAD IMPROVEMENT – 8" GRAVEL
- LAY-BY LOCATION (SEE DETAIL VS-02)

0' 1500' 3000' 4500'

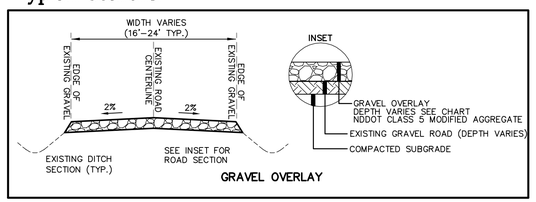
## NOTES:

1. THE RECOMMENDATIONS PROVIDED ARE INTENDED TO PROVIDE SAFE DRIVING CONDITIONS THROUGHOUT THE DURATION OF CONSTRUCTION, MEET TURBINE DELIVERY REQUIREMENTS, AND PROVIDE A ROAD AT THE END OF CONSTRUCTION THAT MEETS OR EXCEEDS THE PRECONSTRUCTION CONDITION.
2. ACCORDING TO THE TURBINE SUPPLIER, THE MAXIMUM CROWN IS 2% OR CROSS SLOPE OF 1%. THE MINIMUM SLOPE IS 0.5%.
3. EXISTING DRAINAGE STRUCTURES SHALL BE MONITORED BY THE GENERAL CONTRACTOR THROUGHOUT CONSTRUCTION. IT MAY BE NECESSARY TO REPLACE OR REPAIR DRAINAGE STRUCTURES IF DAMAGED BY PROJECT DELIVERIES. IF CULVERTS NEED TO BE REPAIRED OR REPLACED THEY SHALL BE DONE PER COUNTY/TOWNSHIP STANDARDS.
4. SPECIFICATION FOR GRAVEL ROAD UPGRADES SHALL FOLLOW PROJECT ROAD SPECIFICATION ON SHEETS 13 & 14.
5. TRAFFIC CONTROL SHALL BE INSTALLED PER NDDOT AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) REQUIREMENTS.
6. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN ROAD IMPROVEMENTS AND EXISTING ROADS, AS WELL AS BETWEEN ROAD IMPROVEMENTS AND EXISTING DRIVEWAYS.
7. ADDITIONAL ROAD IMPROVEMENTS BASED ON FINAL TURBINE SUPPLIER TRANSPORTATION SITE REVIEW MAY BE REQUIRED. THE INFORMATION WAS NOT AVAILABLE PRIOR TO PROVIDING CONSTRUCTION PLAN.
8. GRAVEL IMPROVEMENTS SHOWN ON THE PLANS ARE ESTIMATES BASED ON THE ENGINEER'S AND GENERAL CONTRACTOR'S EXPERIENCE. NO ENGINEERING STUDIES HAVE BEEN COMPLETED. THE AMOUNT OF GRAVEL MAY NEED TO BE ADJUSTED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. THE GRAVEL CAN BE PLACED PRIOR TO CONSTRUCTION, DURING CONSTRUCTION OR AFTER CONSTRUCTION AT THE DIRECTION OF THE CONSTRUCTION MANAGER BASED ON THE FIELD CONDITIONS AND ANTICIPATED TRAFFIC VOLUMES FOR THE PROJECT.

**PUBLIC ROAD IMPROVEMENTS**

| ROAD NAME | FROM | TO | LENGTH | IMPROVEMENT |
|---|---|---|---|---|
| COUNTY ROAD 90 | INTERSTATE 94 | T-29 ACCESS ROAD | 2.1 MILES | 4" GRAVEL OVERLAY |
| 40TH STREET | T-07 ACCESS ROAD | T-12 ACCESS ROAD | 1.5 MILES | 8" GRAVEL OVERLAY |
| 40TH STREET | T-12 ACCESS ROAD | COUNTY ROAD 90 | 1.0 MILES | 6" GRAVEL OVERLAY |
| 40TH STREET | COUNTY ROAD 90 | T-39 ACCESS ROAD | 1.0 MILES | 6" GRAVEL OVERLAY |

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# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Public Improvements Plan

90% Civil Construction Plans
NOT FOR CONSTRUCTION

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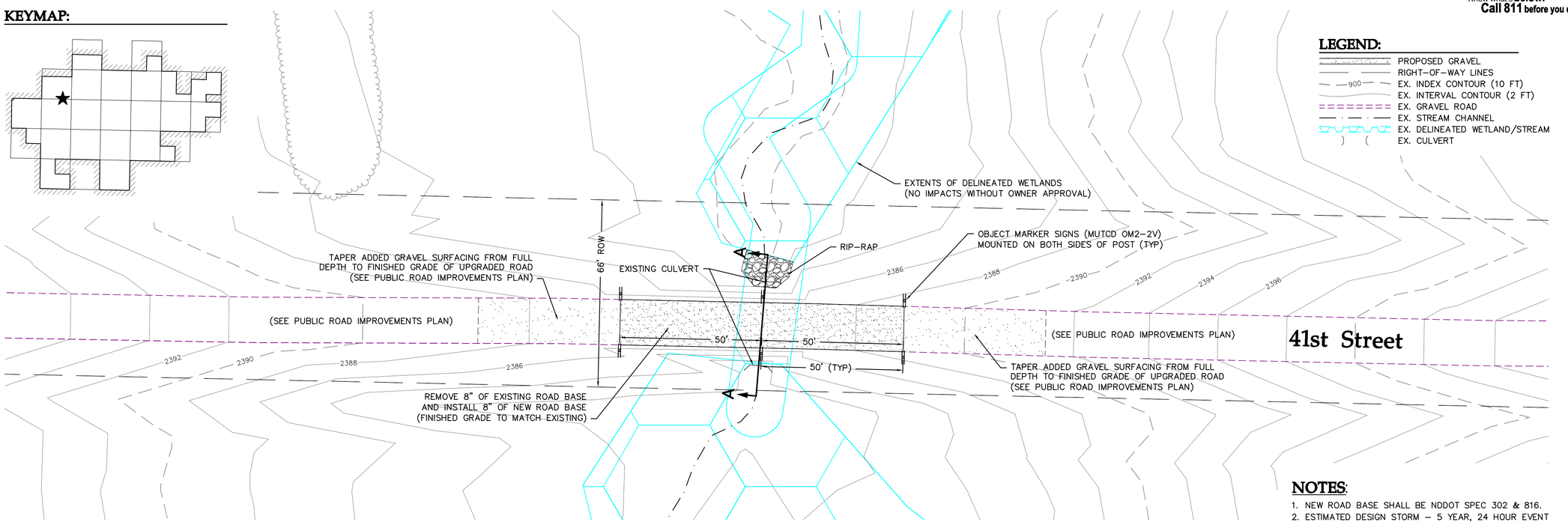
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## KEYMAP:





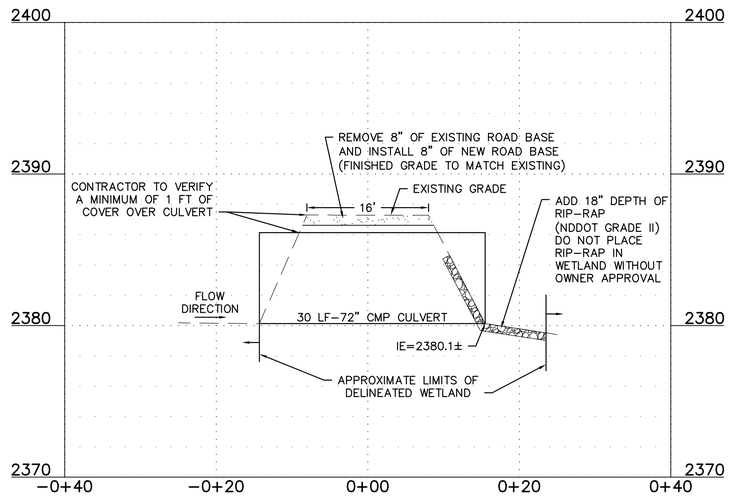

## LEGEND:

- PROPOSED GRAVEL
- RIGHT-OF-WAY LINES
- 900 EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. STREAM CHANNEL
- EX. DELINEATED WETLAND/STREAM
- EX. CULVERT

## NOTES:

1. NEW ROAD BASE SHALL BE NDDOT SPEC 302 & 816.
2. ESTIMATED DESIGN STORM – 5 YEAR, 24 HOUR EVENT

## Culvert A-A




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Boston, MA 02111

0' 20' 40' 60'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Public Improvements - 40th Street Culvert**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

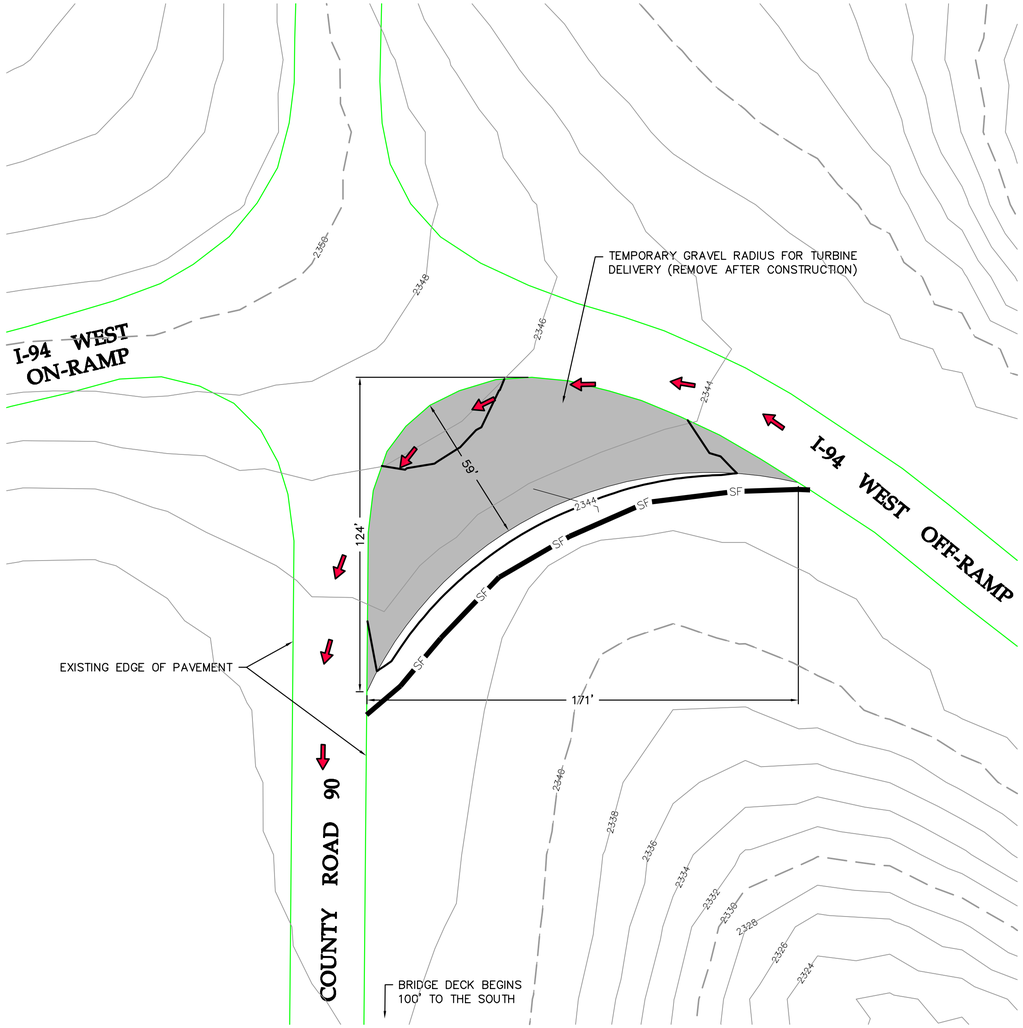
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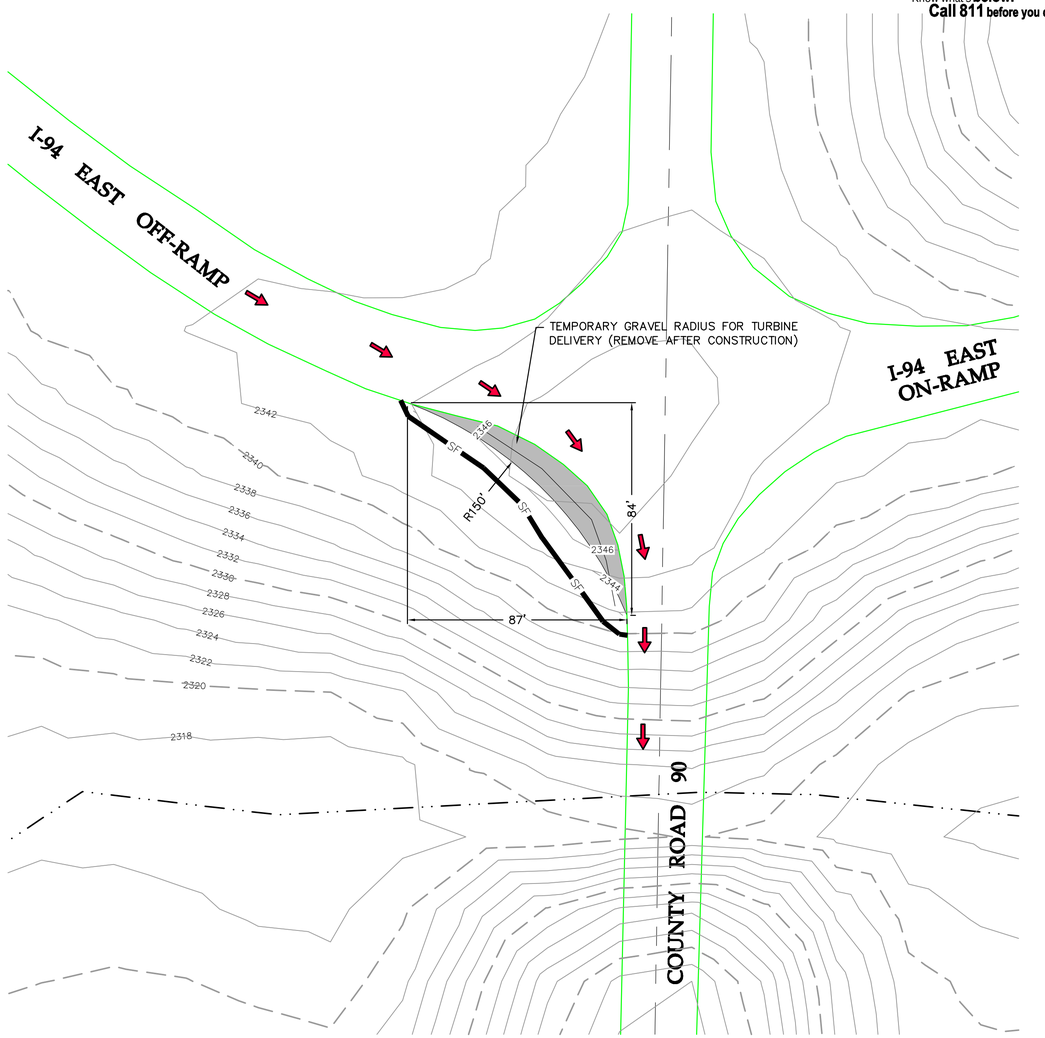
**Sheet:** 33 OF 91

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Know what's **below.**
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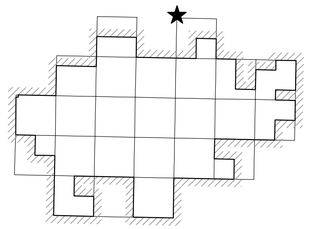

GENERAL NOTES:

1. THE TEMPORARY INTERSECTION IMPROVEMENT SHALL BE REMOVED AT THE COMPLETION OF CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE BLATTNER CONSTRUCTION MANAGER AND RETURNED TO ITS ORIGINAL LINES AND GRADES.
2. ALL CUT AND FILL SLOPES SHALL BE 4:1 OR FLATTER. ALL DISTURBED GROUND NOT COVERED WITH GRAVEL SHALL BE TEMPORARILY STABILIZED PER THE REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLAN.
3. FINAL STABILIZATION REQUIREMENTS SHALL BE BASED ON THE REQUIREMENTS OF THE STORM WATER POLLUTION PREVENTION PLAN.
4. DIRECTION OF TRAFFIC PROVIDED BY BLATTNER ENERGY, INC.
5. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, UTILITIES AND CULVERTS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE PLANS.
6. CONTRACTOR TO PROTECT EXISTING UTILITIES AND MAINTAIN EXISTING DRAINAGE PATTERNS AT ALL TIMES.
7. CONTRACTOR TO VERIFY ROW LIMITS PRIOR TO CONSTRUCTION.
8. ADDITIONAL GRAVEL OUTSIDE OF WHAT IS SHOWN ON THE PLAN MAY BE NECESSARY BASED ON SPECIFIC TURNING MOVEMENTS OF THE ACTUAL DELIVERY TRUCKS UTILIZED FOR DELIVERY.
9. AGGREGATE AND EMBANKMENT COMPACTION AND TESTING SHALL BE DONE PER THE ROAD CONSTRUCTION STANDARDS FROM THE WIND FARM GEOTECHNICAL REPORT.
10. TRAFFIC CONTROL SHALL BE PROVIDED BY THE CONTRACTOR PER COUNTY REQUIREMENTS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
11. EXISTING FEATURES (FENCE, MAILBOX, ETC.) THAT ARE DISTURBED AS PART OF THE TEMPORARY IMPROVEMENT SHALL BE REINSTALLED OR REPLACED IN A CONDITION EQUAL TO OR BETTER THAN THE PRECONSTRUCTION CONDITION.
12. 10-METER USGS CONTOURS ARE SHOWN ON THIS PLAN. MORE ACCURATE TOPO DATA IS NOT AVAILABLE.

**LEGEND:**

- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- NON-PARTICIPATING LAND
- SECTION LINES
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION (FOR REFERENCE ONLY)
- A-PUG — ALT. UNDERGROUND COLLECTION (FOR REFERENCE ONLY)
- PROPOSED CULVERT
- SF — PROPOSED SILT FENCE
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- X — X — EX. FENCE
- POH — EX. OVERHEAD POWER
- DIRECTION OF TRAFFIC FLOW
- 900 — PROPOSED CONTOUR (5')
- 901 — PROPOSED CONTOUR (1')

**KEYMAP:**



**Westwood**
Westwood Professional Services, Inc.
7699 Anagram Drive, Eden Prairie, MN 55344
Phone (952) 937-5150 Toll Free (888) 937-5150
westwoodps.com

| | |
|---|---|
| **Designed:** | DFK |
| **Checked:** | RSC |
| **Drawn:** | TBR |
| **Record Drawing by/date:** | |

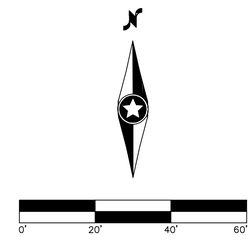
**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111




# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Intersection Improvements I-94 & Co. Rd. 90

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

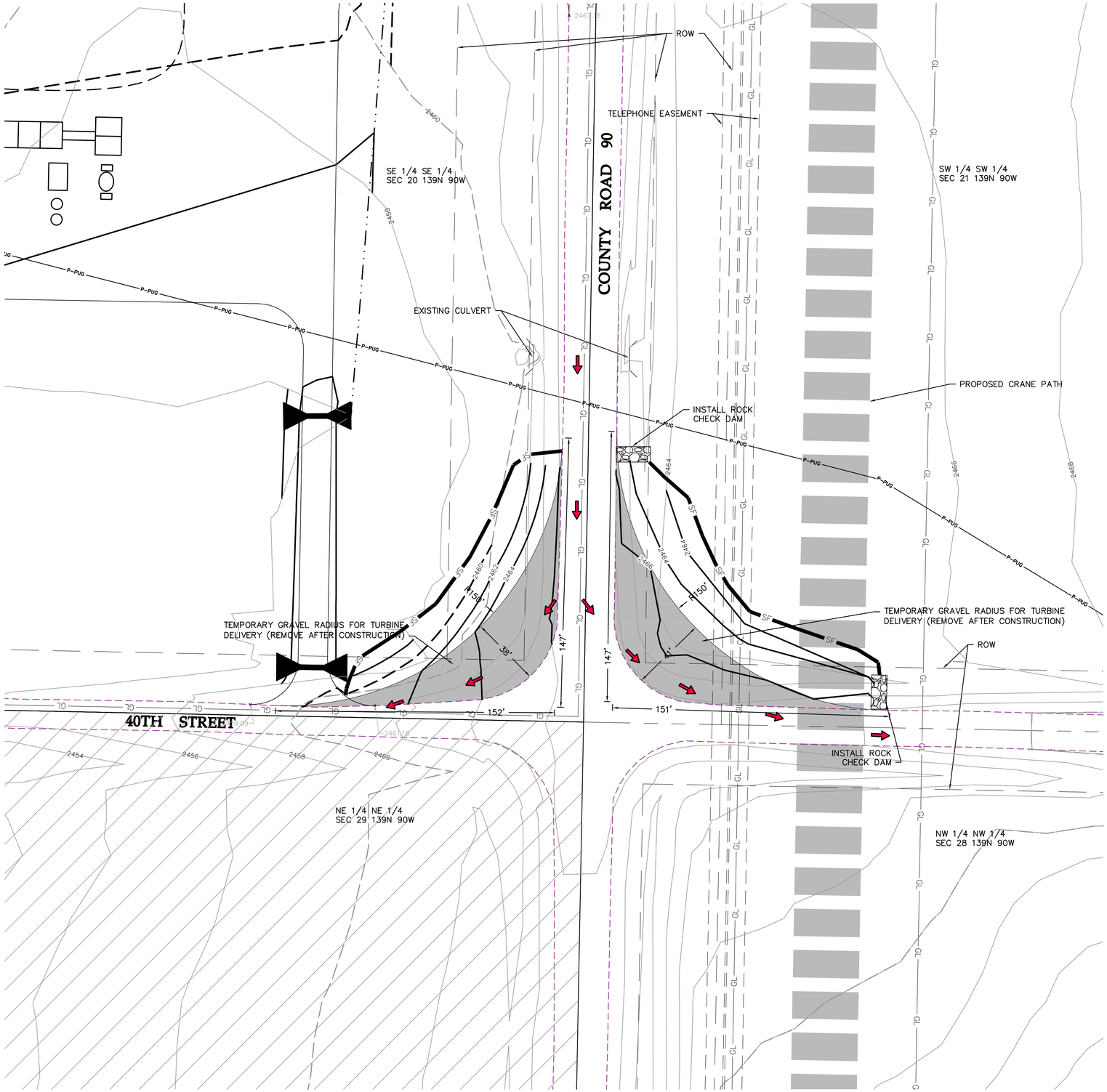
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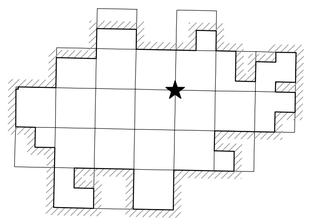
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- SF — PROPOSED SILT FENCE
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- X — EX. FENCE
- POH — EX. OVERHEAD POWER
- DIRECTION OF TRAFFIC FLOW
- 900 — PROPOSED CONTOUR (10')
- 902 — PROPOSED CONTOUR (2')

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## KEYMAP:



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Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

0' 30' 60' 90'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Intersection Improvements 40th St & Co. Rd. 90

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

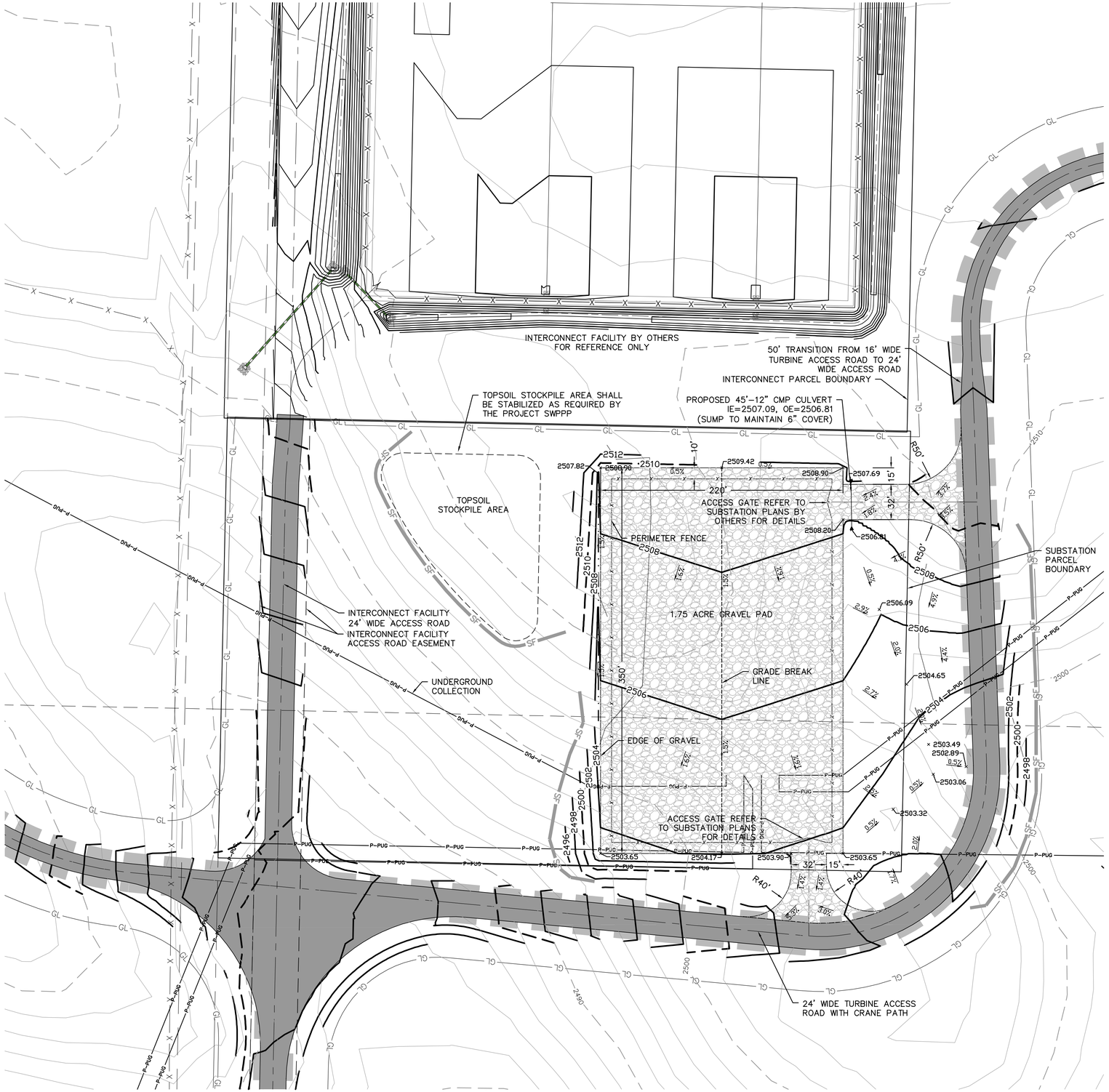
**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 35 OF 91

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## LEGEND:

- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- NON–PARTICIPATING LAND
- SECTION LINES
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- EASEMENT LINES
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- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. FENCE
- POH — EX. OVERHEAD POWER

Know what's **below.** **Call 811** before you dig.

## EARTHWORK

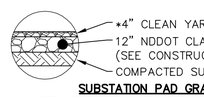
| TOPSOIL STRIPPING (CY) | IMPORT AGGREGATE (CY) | RAW CUT (CY) | RAW FILL (CY) | RAW NET (CY) |
|---|---|---|---|---|
| 2,500 | 3,150 | 6,250 | 4,800 | 800 (CUT) |

THE FOLLOWING WAS ASSUMED FOR EARTHWORK QUANTITIES:

- 6" TOPSOIL STRIP OVER AGGREGATE AREAS.
- 12" HOLD DOWN OVER AGGREGATE AREAS – FOR IMPORTED AGGREGATE BASE.
- EARTHWORK QUANTITIES REFLECT MATERIAL REQUIRED FOR COMPACTED SUBGRADE.
- NO COMPACTION/SHRINKAGE FACTORS TAKEN INTO ACCOUNT.
- TOPSOIL TO BE STOCKPILED IN DESIGNATED AREA AND RE–SPREAD WITHIN PARCEL AFTER CONSTRUCTION IS COMPLETED WITHOUT ADVERSELY AFFECTING THE DRAINAGE PATTERNS OF THE AREA.
- SUBSTATION PAD IS ESTIMATED TO GENERATE EXCESS MATERIAL TO BE USED LOCALLY TO BALANCE ADJACENT ACCESS ROADS.

## NOTES

1. RIGHT–OF–WAY AND EASEMENTS ARE SHOWN PER ALTA SURVEY PREPARED BY ATWELL.
2. REFER TO PLANS BY OTHERS FOR DETAILED SITE INFORMATION FOR THE SUBSTATION SITE. REFER TO SUBSTATION PLANS FOR DETAILED INFORMATION ABOUT SECURITY FENCES AND GATES.
3. ALL CONSTRUCTION SHALL CONFORM TO LOCAL, STATE AND FEDERAL RULES INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. REFER TO THE STORM WATER POLLUTION PREVENTION PLAN PREPARED FOR THE PROJECT FOR DETAILS.
4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
5. THE CONTRACTOR SHALL COMPLETE THE SITE GRADING IN ACCORDANCE WITH THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER. ALL SOIL TESTING SHALL BE COMPLETED BY A THIRD PARTY TESTING LABORATORY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED TESTS AND INSPECTIONS WITH THE TESTING LABORATORY. THE COSTS OF RETESTING (IN CASE OF TESTS NOT MEETING STANDARDS) SHALL BE BORN BY THE CONTRACTOR.
6. PRIOR TO PLACEMENT OF ANY STRUCTURE OR PAVEMENT, A PROOFROLL WILL BE REQUIRED ON THE SUBGRADE. PROOFROLLING SHALL BE ACCOMPLISHED BY MAKING MINIMUM OF 2 COMPLETE PASSES WITH FULLY–LOADED TANDEM–AXEL DUMP TRUCK, OR APPROVED EQUAL, IN EACH OF 2 PERPENDICULAR DIRECTIONS WHILE UNDER SUPERVISION AND DIRECTION OF AN INDEPENDENT TESTING LABORATORY. AREAS OF FAILURE SHALL BE EXCAVATED AND RECOMPACTED AS SPECIFIED HEREIN.
7. ALL SLOPES SHALL BE GRADED TO 4:1 OR FLATTER, UNLESS OTHERWISE INDICATED ON THE PLAN. ALL SLOPES 4:1 OR GREATER AND PROPOSED DITCH BOTTOMS (DRAINAGE SWALES) SHALL BE SEEDED AND STABILIZED WITH FIBER BLANKET.
8. THE CONTRACTOR SHALL UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING, INCLUDING ADJACENT TRANSITION AREAS. PROVIDE A SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCES, WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS, WHERE ELEVATIONS ARE SHOWN, OR BETWEEN SUCH POINTS, AND EXISTING GRADES. AREAS THAT HAVE BEEN FINISH GRADED SHALL BE PROTECTED FROM SUBSEQUENT CONSTRUCTION OPERATIONS.
9. PROVIDE EROSION AND SEDIMENT CONTROL AT THE PERIMETER OF ALL TEMPORARY STOCKPILES.
10. SPOT ELEVATIONS AND PROPOSED CONTOURS INDICATE FINISHED GRADE SURFACE TOP OF AGGREGATE SUB BASE.
11. NO SEDIMENT BASIN IS REQUIRED.
12. EROSION CONTROL BMP'S SHOWN SHALL BE USED AS NEEDED OR AS SPECIFIED IN THE PROJECT SWPPP. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN COMPLIANCE.
13. PROVIDE SECONDARY CONTAINMENT AND BERM AS REQUIRED BY THE SPCC PLAN FOR ALL APPLICABLE MATERIALS WITHIN THE LAYDOWN YARD.
14. AFTER THE SITE GRADING IS COMPLETED, IF EXCESS SOIL MATERIAL EXISTS, THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS SOIL MATERIAL IN A MANNER ACCEPTABLE TO THE OWNER AND THE REGULATING AGENCIES INVOLVED.




**SUBSTATION PAD GRAVEL SECTION**

* REFER TO ELECTRICAL PLANS BY ULTEIG FOR ADDITIONAL GRAVEL REQUIREMENTS

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**Record Drawing by/date:**

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Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

0' 50' 100' 150'

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Substation Grading Plan

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

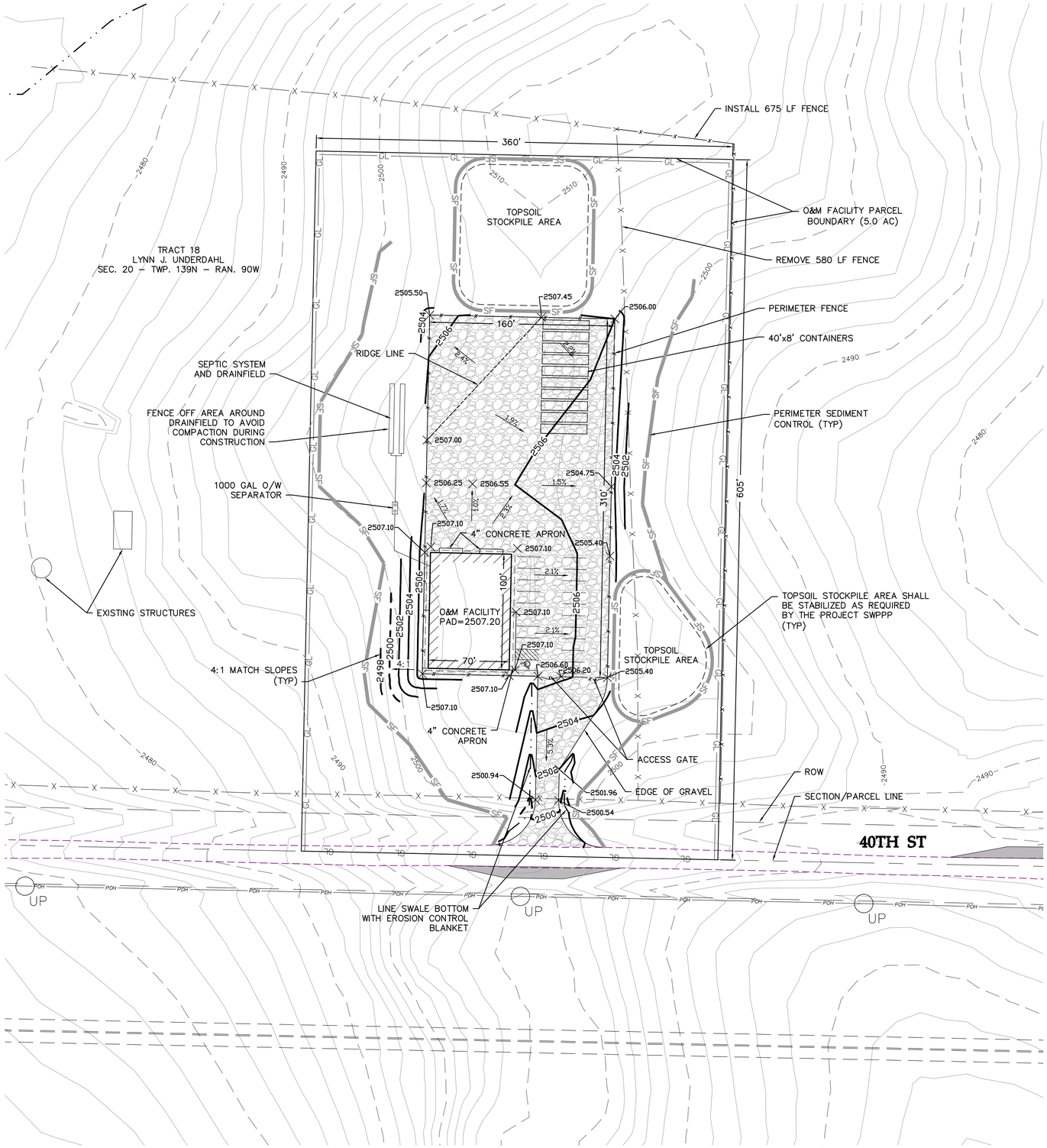
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**Sheet:** 36 OF 91

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## NOTES

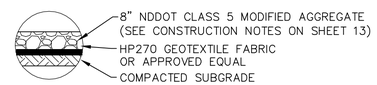
1. RIGHT-OF-WAY AND EASEMENTS ARE SHOWN PER ALTA SURVEY PREPARED BY ATWELL.
2. REFER TO PLANS BY OTHERS FOR DETAILED SITE INFORMATION FOR THE OPERATIONS AND MAINTENANCE SITE. REFER TO ARCHITECTURAL PLANS FOR DETAILED DIMENSIONS FOR BUILDING FOOTPRINT AND EXACT LOCATIONS/DIMENSIONS OF VESTIBULE, SLOPED PAVING RAMPS, TRUCK DOCKS, UTILITY ENTRANCES AND DOWNSPOUT LOCATIONS.
3. ALL CONSTRUCTION SHALL CONFORM TO LOCAL, STATE AND FEDERAL RULES INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. REFER TO THE STORM WATER POLLUTION PREVENTION PLAN PREPARED FOR THE PROJECT FOR DETAILS.
4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
5. THE CONTRACTOR SHALL COMPLETE THE SITE GRADING IN ACCORDANCE WITH THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER. ALL SOIL TESTING SHALL BE COMPLETED BY A THIRD PARTY TESTING LABORATORY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED TESTS AND INSPECTIONS WITH THE TESTING LABORATORY. THE COSTS OF RETESTING (IN CASE OF TESTS NOT MEETING STANDARDS) SHALL BE BORN BY THE CONTRACTOR.
6. PRIOR TO PLACEMENT OF ANY STRUCTURE OR PAVEMENT, A PROOFROLL WILL BE REQUIRED ON THE SUBGRADE. PROOFROLLING SHALL BE ACCOMPLISHED BY MAKING MINIMUM OF 2 COMPLETE PASSES WITH FULLY-LOADED TANDEM-AXEL DUMP TRUCK, OR APPROVED EQUAL, IN EACH OF 2 PERPENDICULAR DIRECTIONS WHILE UNDER SUPERVISION AND DIRECTION OF AN INDEPENDENT TESTING LABORATORY. AREAS OF FAILURE SHALL BE EXCAVATED AND RECOMPACTED AS SPECIFIED HEREIN.
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9. SPOT ELEVATIONS AND PROPOSED CONTOURS INDICATE FINISHED GRADE SURFACE (TOP OF AGGREGATE).
10. AFTER THE SITE GRADING IS COMPLETED, IF EXCESS SOIL MATERIAL EXISTS, THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS SOIL MATERIAL IN A MANNER ACCEPTABLE TO THE OWNER AND THE REGULATING AGENCIES INVOLVED.
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14. ALL DISTURBED AREAS NOT COVERED IN AGGREGATE SHALL BE STABILIZED AND SEEDED PER THE PROJECT SWPPP AFTER COMPLETION OF GROUND DISTURBING ACTIVITIES.

## EARTHWORK

| | TOPSOIL STRIPPING (CY) | IMPORT AGGREGATE (CY) | RAW CUT (CY) | RAW FILL (CY) | RAW NET (CY) |
|---|---|---|---|---|---|
| YARD | 880 | 1,170 | 910 | 770 | 140 |
| GREENSPACE | – | – | 190 | 460* | -270* |
| TOTAL | 880 | 1,170 | 1,100 | 1,230* | -130* |

*USE TOPSOIL FROM STOCKPILE FOR SHORTAGE IN GREENSPACE FILL SLOPES AREA.

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- 6" TOPSOIL STRIP OVER AGGREGATE AREAS.
- 8" HOLD DOWN OVER AGGREGATE AREAS - FOR IMPORTED AGGREGATE BASE.
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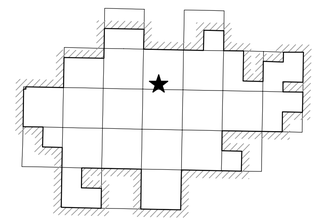



O&M PAD GRAVEL SECTION

## LEGEND:

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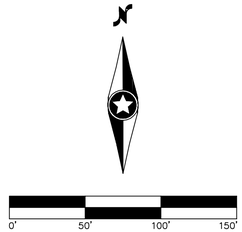
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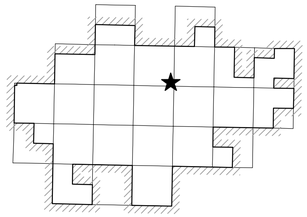
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## KEYMAP:

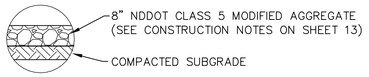


## EARTHWORK

| TOPSOIL STRIPPING (CY) | IMPORT AGGREGATE (CY) | RAW CUT (CY) | RAW FILL (CY) | RAW NET (CY) |
|---|---|---|---|---|
| 7,550 | 7,550 | 8,700 | 8,700 | 0 |

THE FOLLOWING WAS ASSUMED FOR EARTHWORK QUANTITIES:

- 6" TOPSOIL STRIP OVER AGGREGATE AREAS.
- 6" HOLD DOWN OVER AGGREGATE AREAS – FOR IMPORTED AGGREGATE BASE.
- EARTHWORK QUANTITIES REFLECT MATERIAL REQUIRED FOR COMPACTED SUBGRADE.
- NO COMPACTION/SHRINKAGE FACTORS TAKEN INTO ACCOUNT.
- TOPSOIL TO BE STOCKPILED IN DESIGNATED AREA AND RE-SPREAD WITHIN PARCEL AFTER CONSTRUCTION IS COMPLETED WITHOUT ADVERSELY AFFECTING THE DRAINAGE PATTERNS OF THE AREA.



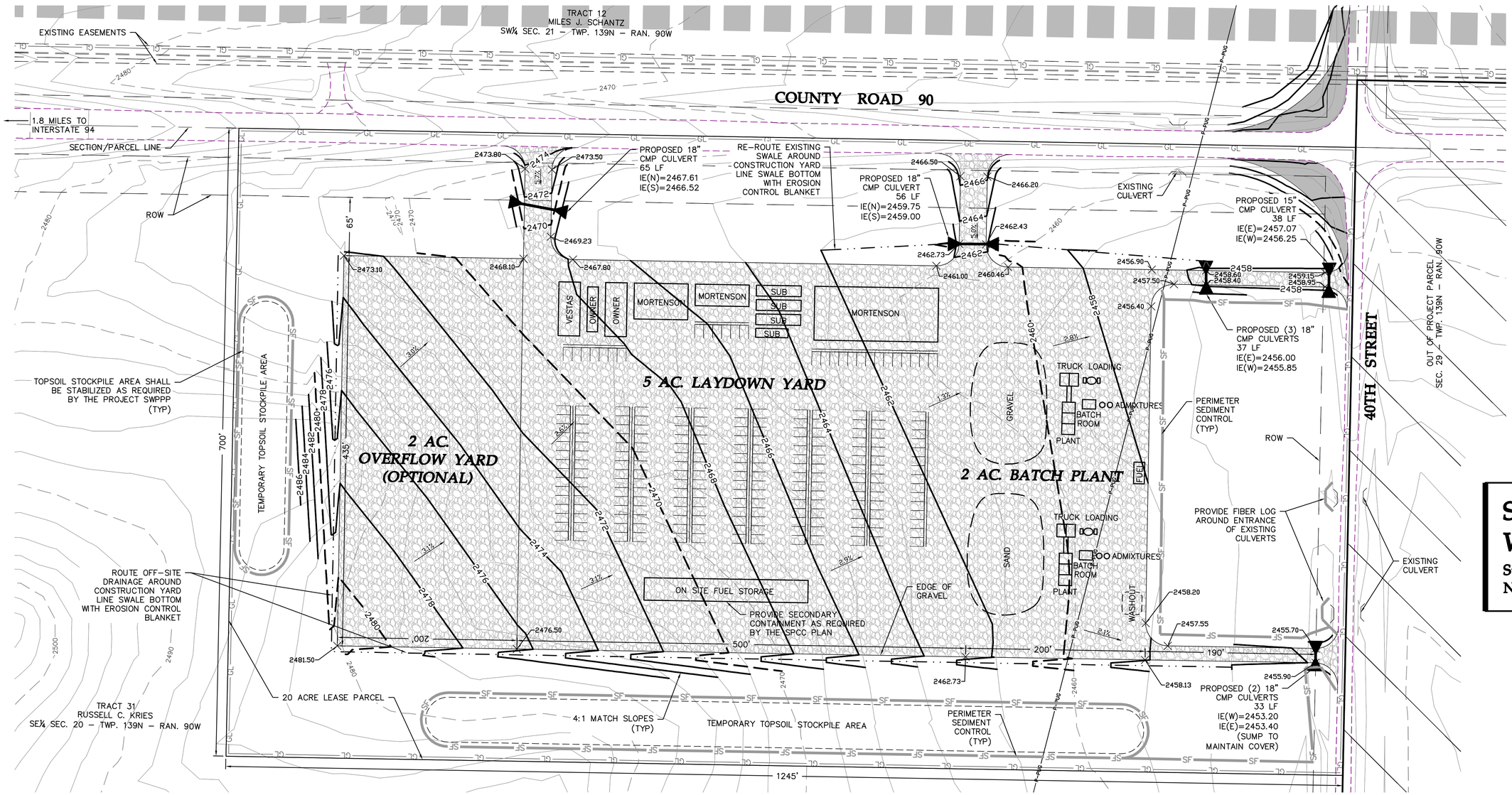

LAYDOWN YARD/BATCH PLANT YARD GRAVEL SECTION

## NOTES

1. RIGHT-OF-WAY AND EASEMENTS ARE SHOWN PER ALTA SURVEY PREPARED BY ATWELL.
2. OVERHEAD DISTRIBUTION LINE IS LOCATED 0.5 MILES TO THE WEST.
3. UNDERGROUND TELEPHONE SERVICE IS ADJACENT TO THE EAST ROW OF COUNTY ROAD 90.
4. ALL CONSTRUCTION SHALL CONFORM TO LOCAL, STATE AND FEDERAL RULES INCLUDING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. REFER TO THE STORM WATER POLLUTION PREVENTION PLAN PREPARED FOR THE PROJECT FOR DETAILS.
5. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
6. ALL SLOPES SHALL BE GRADED TO 4:1 OR FLATTER, UNLESS OTHERWISE INDICATED ON THE PLAN. ALL SLOPES 4:1 OR GREATER SHALL BE SEEDED AND STABILIZED WITH FIBER BLANKET.
7. PROVIDE EROSION AND SEDIMENT CONTROL AT THE PERIMETER OF ALL TEMPORARY STOCKPILES.
8. SPOT ELEVATIONS AND PROPOSED CONTOURS INDICATE FINISHED GRADE SURFACE (TOP OF AGGREGATE).
9. NO SEDIMENT BASIN IS REQUIRED.
10. EROSION CONTROL BMP'S SHOWN SHALL BE USED AS NEEDED OR AS SPECIFIED IN THE PROJECT SWPPP. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN COMPLIANCE.
11. PROVIDE SECONDARY CONTAINMENT AND BERM AS REQUIRED BY THE SPCC PLAN FOR ALL APPLICABLE MATERIALS WITHIN THE LAYDOWN YARD.

## LEGEND:

- NON-PARTICIPATING LAND
- SECTION LINES
- RIGHT-OF-WAY LINES
- EASEMENT LINES
- P-PUG — UNDERGROUND COLLECTION (FOR REFERENCE ONLY)
- PROPOSED CULVERT
- SF — PROPOSED PERIMETER SEDIMENT CONTROL
- GL — GRADING LIMITS
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- x x — EX. FENCE
- POH — EX. OVERHEAD POWER




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| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Laydown Yard Grading Plan

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

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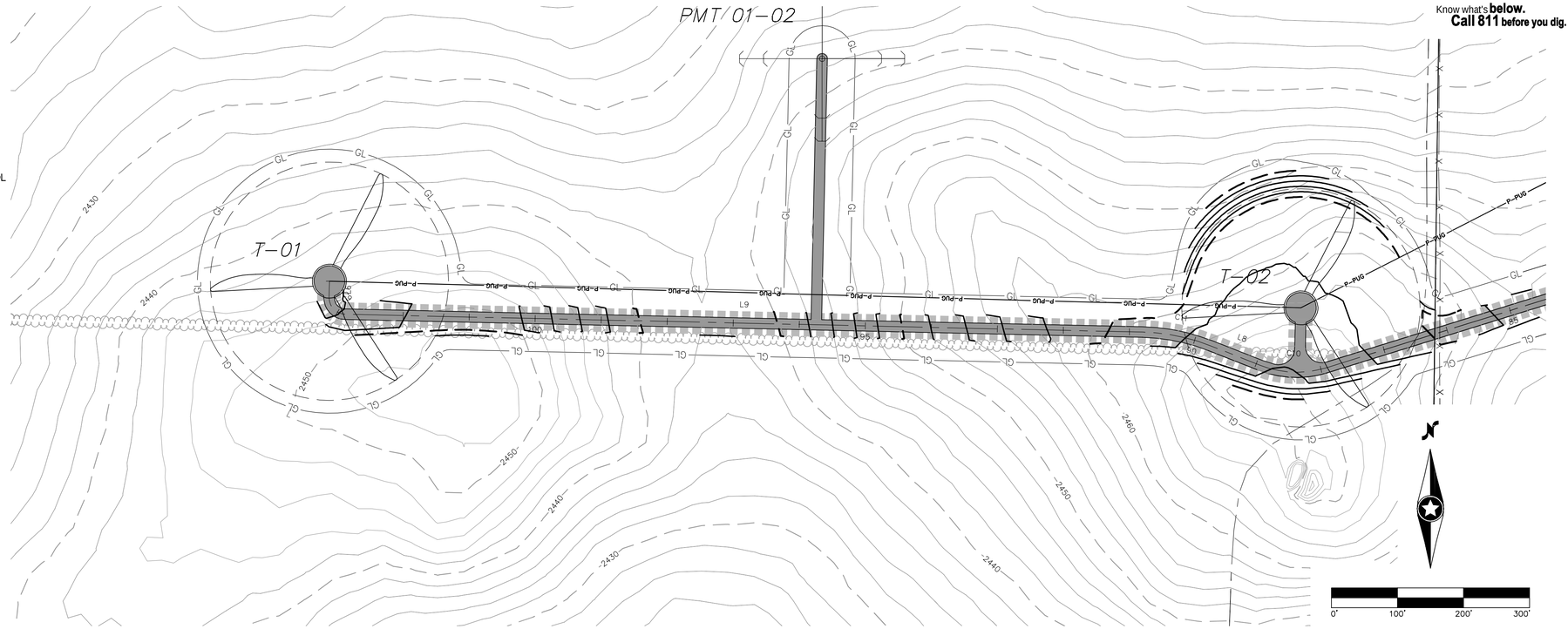
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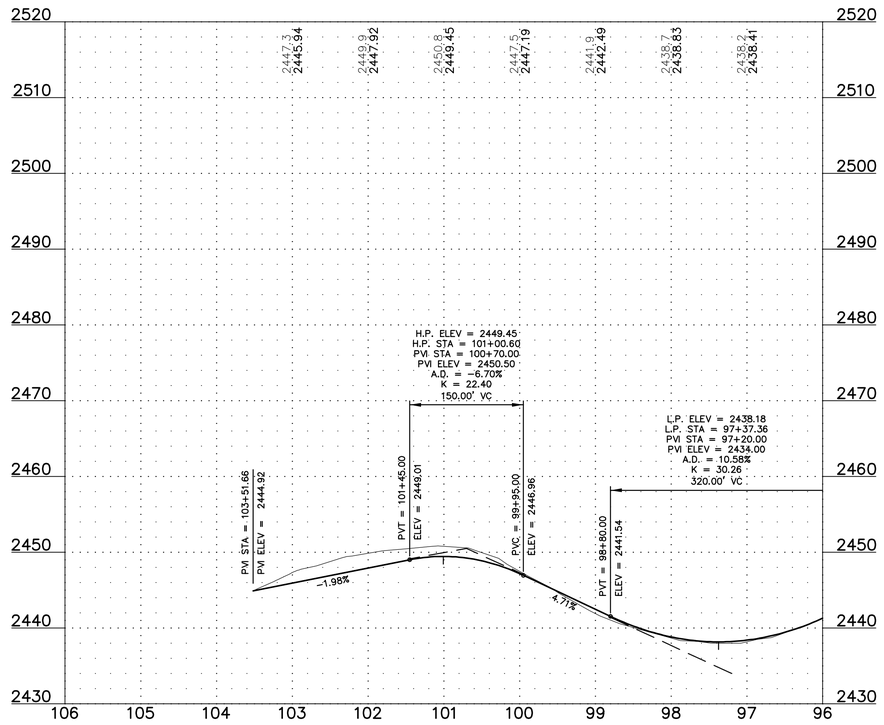
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- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)




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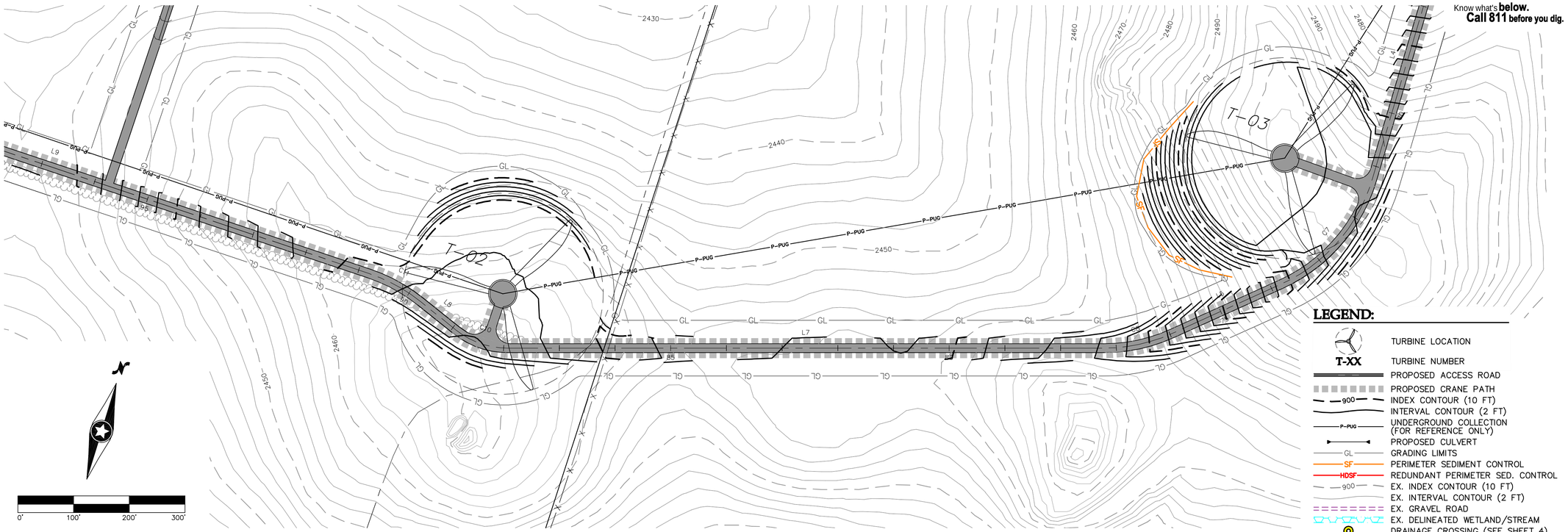
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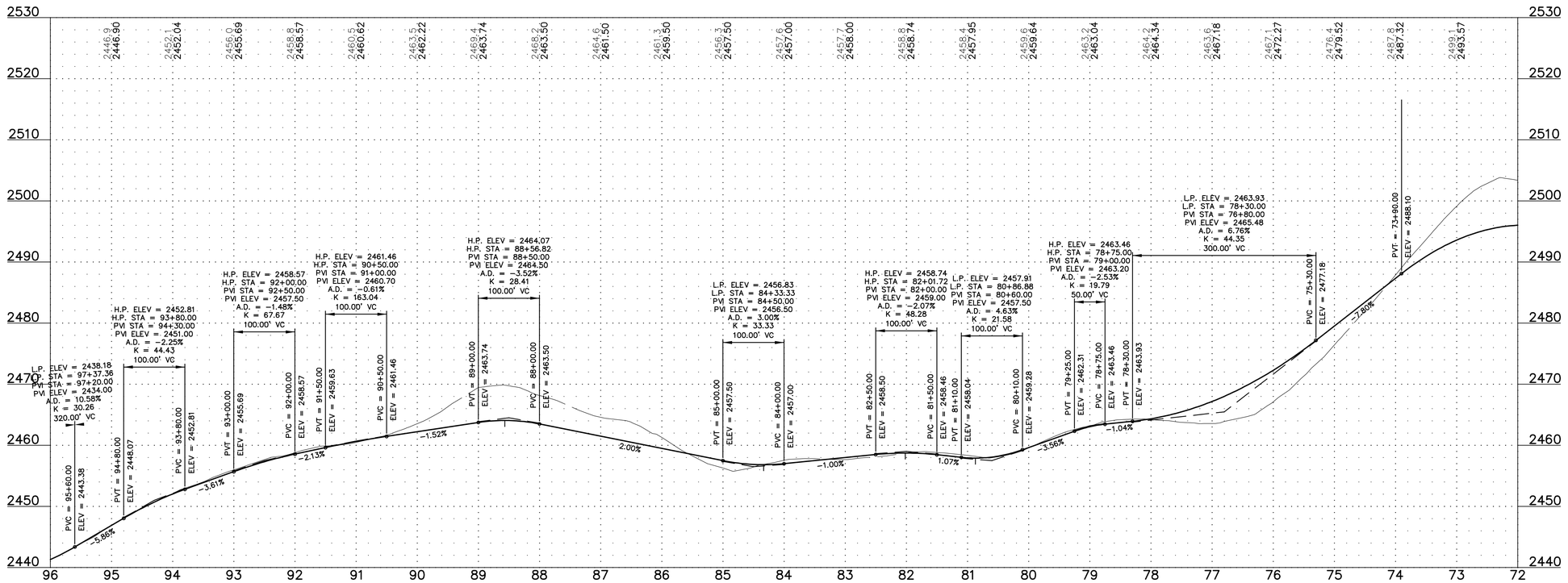



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# Road A - Sta. 96+00 - 72+00




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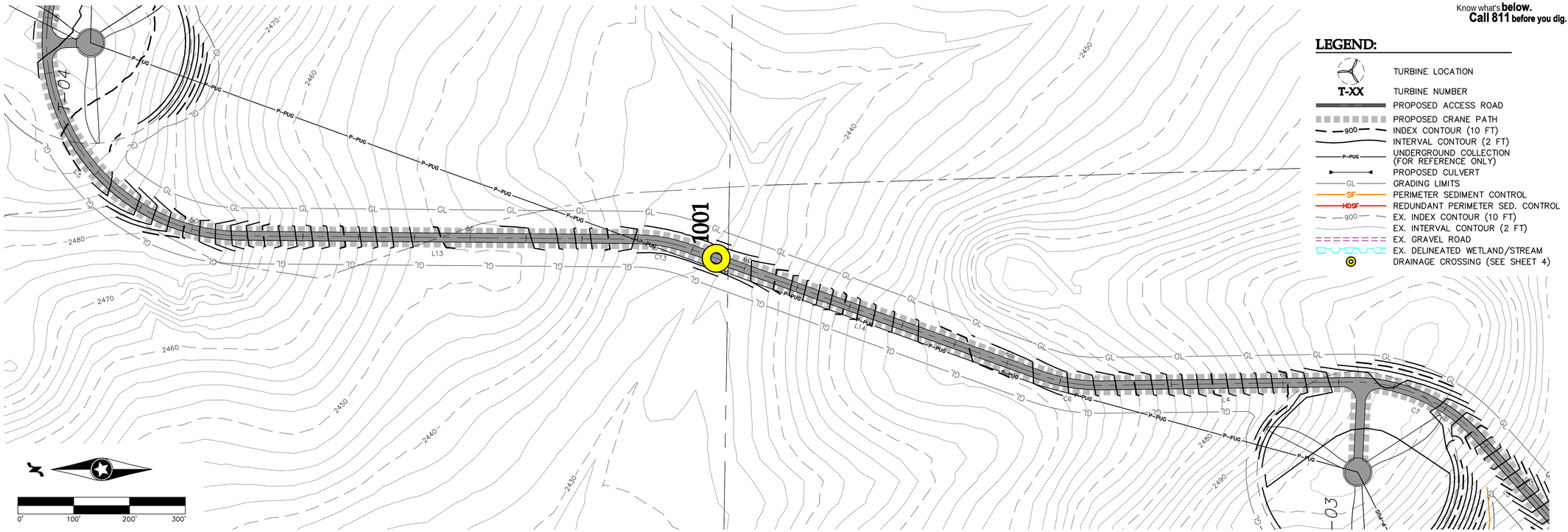
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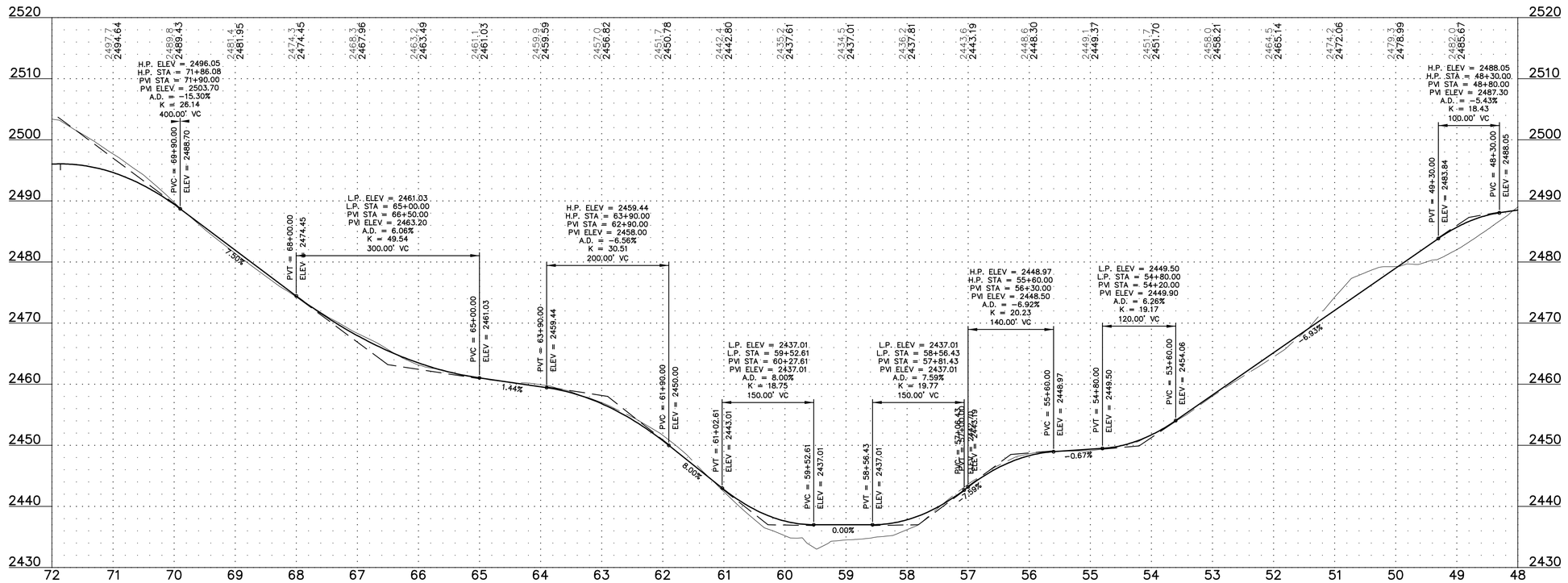



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# Road A - Sta. 72+00 - 48+00




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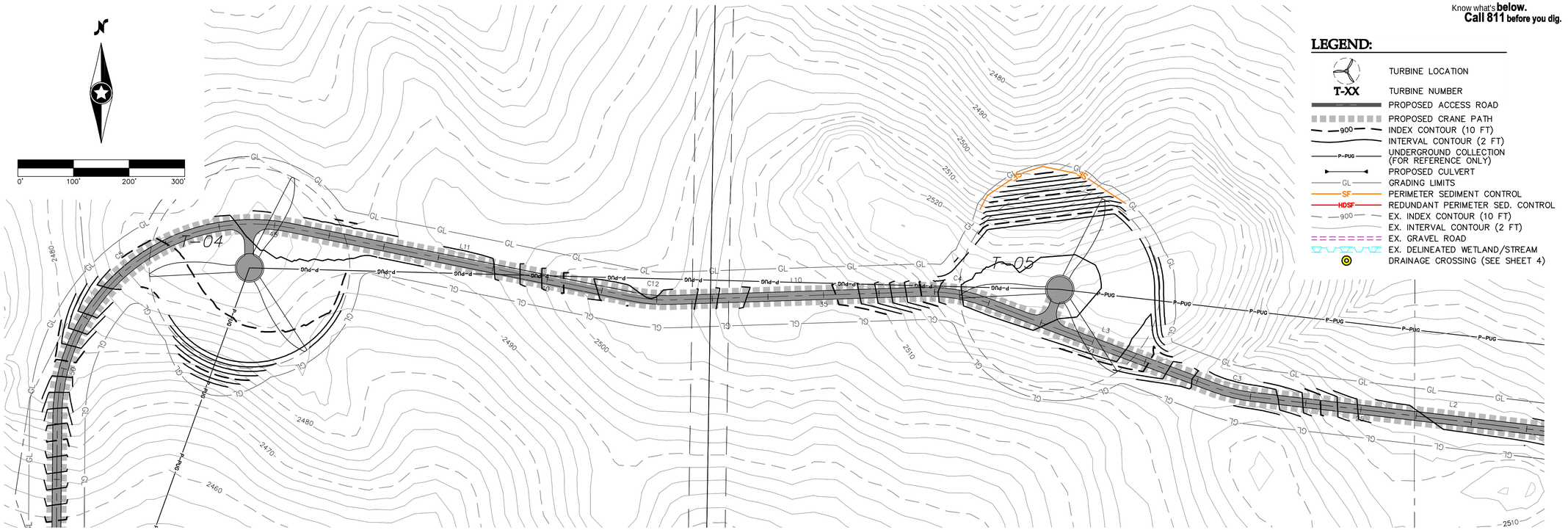
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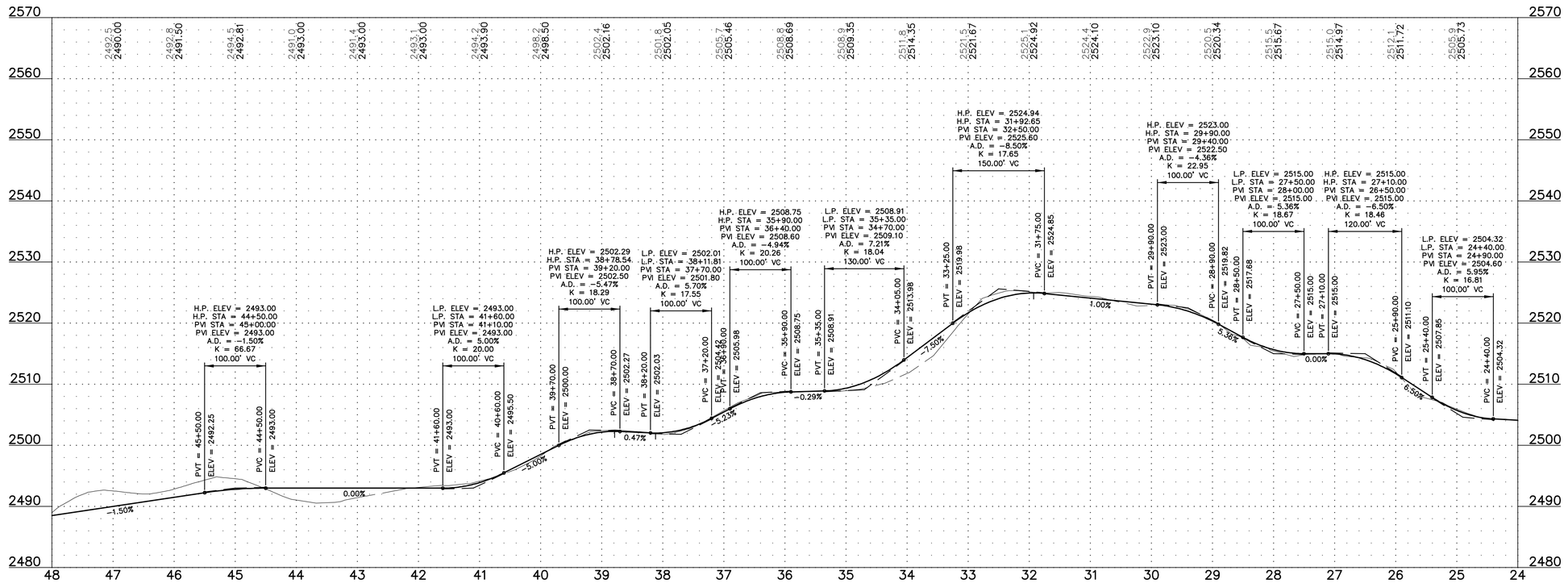



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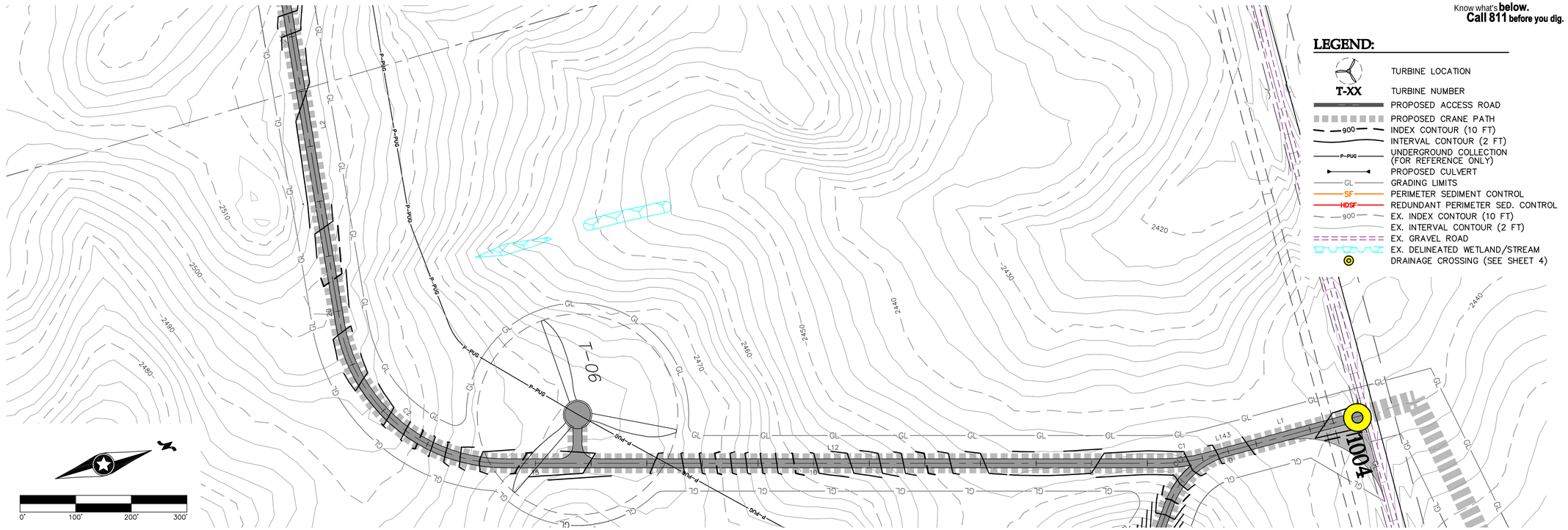
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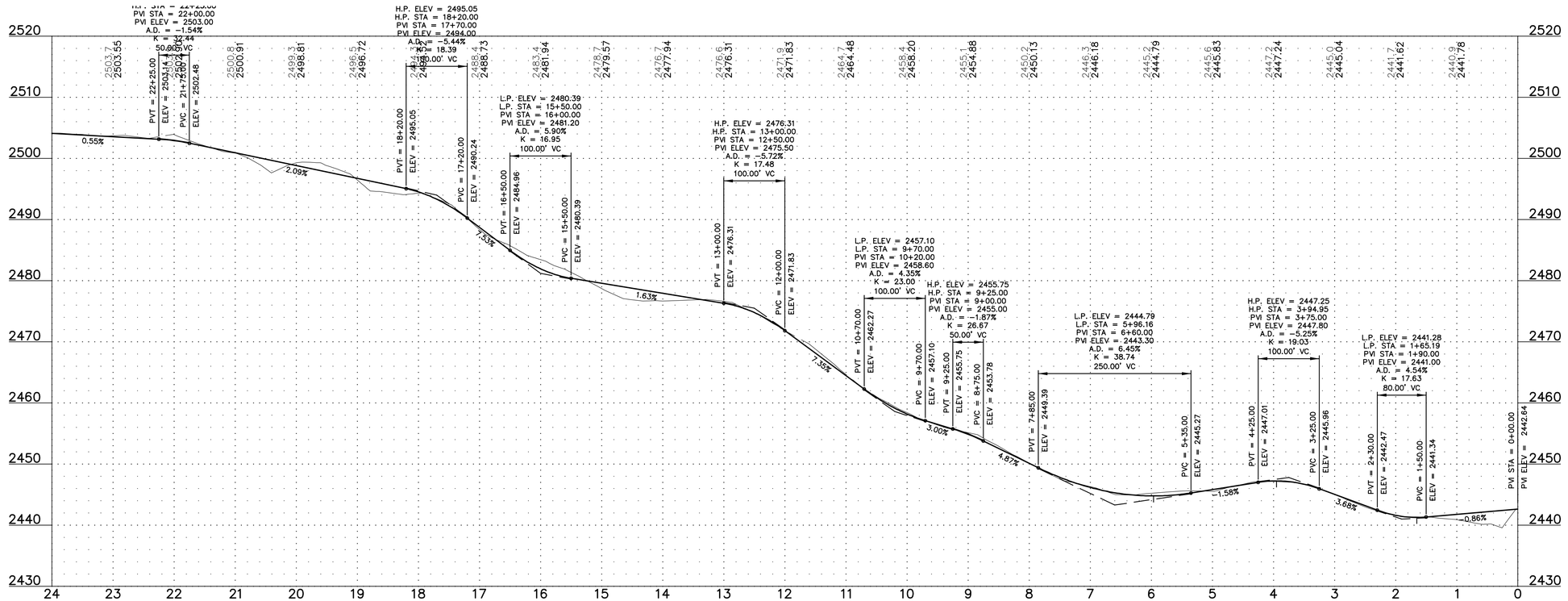
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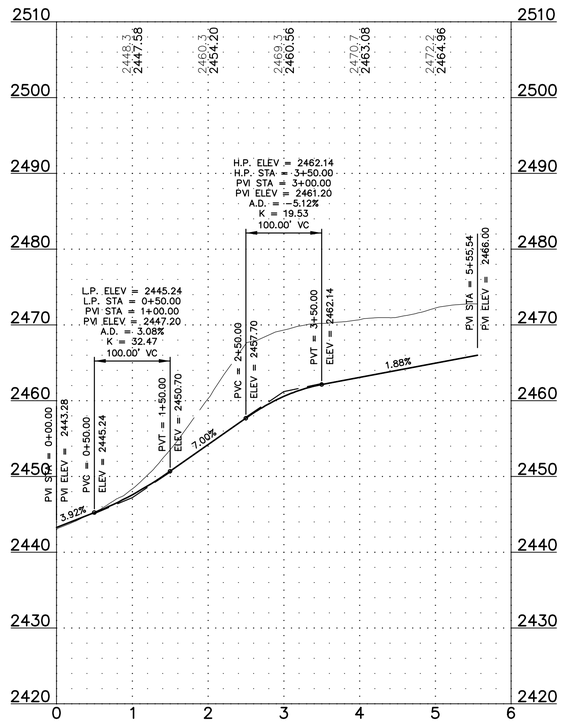



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- DRAINAGE CROSSING (SEE SHEET 4)

# Road T - Sta. 0+00 - 6+00




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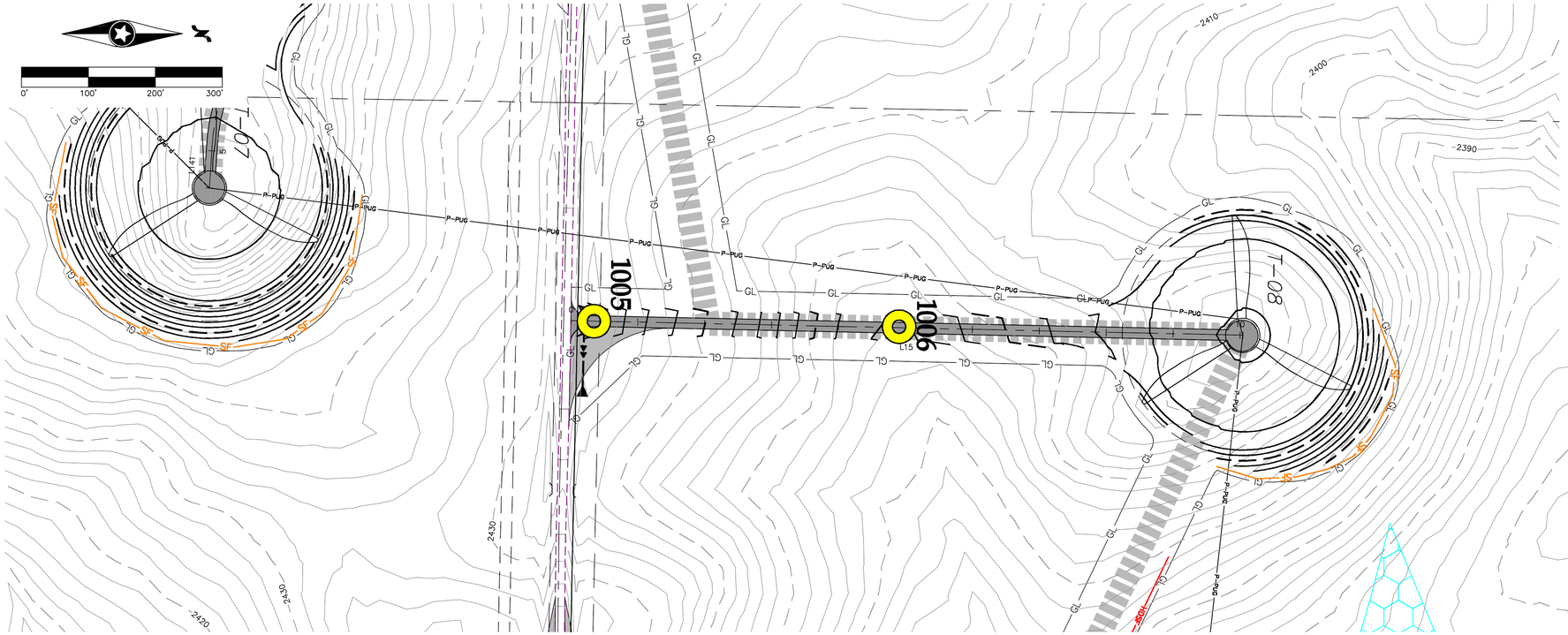
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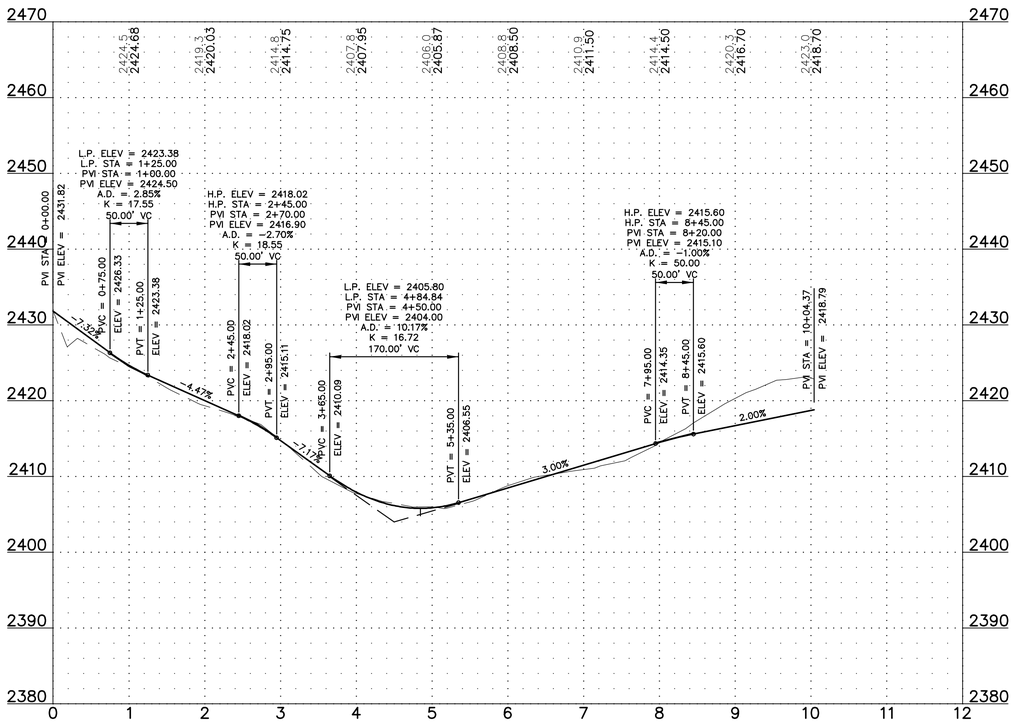



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# Road B - Sta. 0+00 - 11+00




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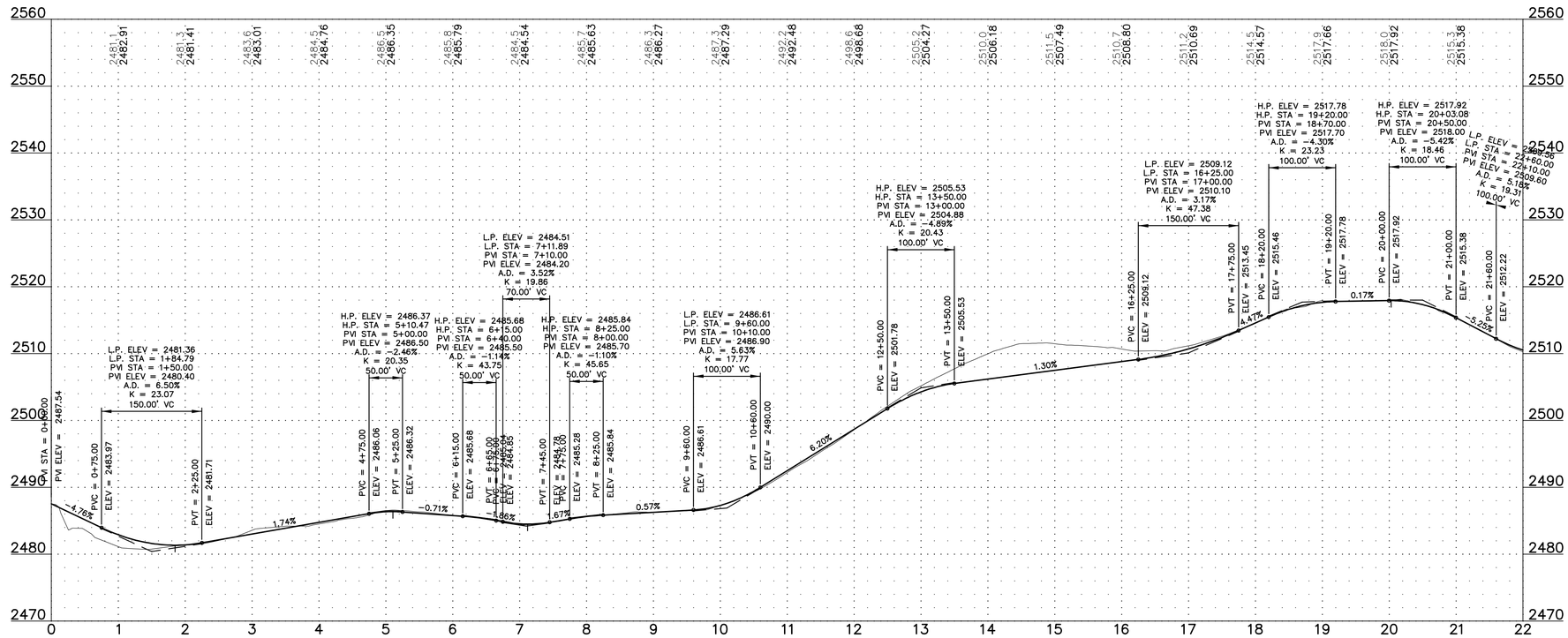



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# Road C - Sta. 0+00 - 22+00




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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Road C - Sta 0+00-22+00**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

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**Date:** 08/03/15

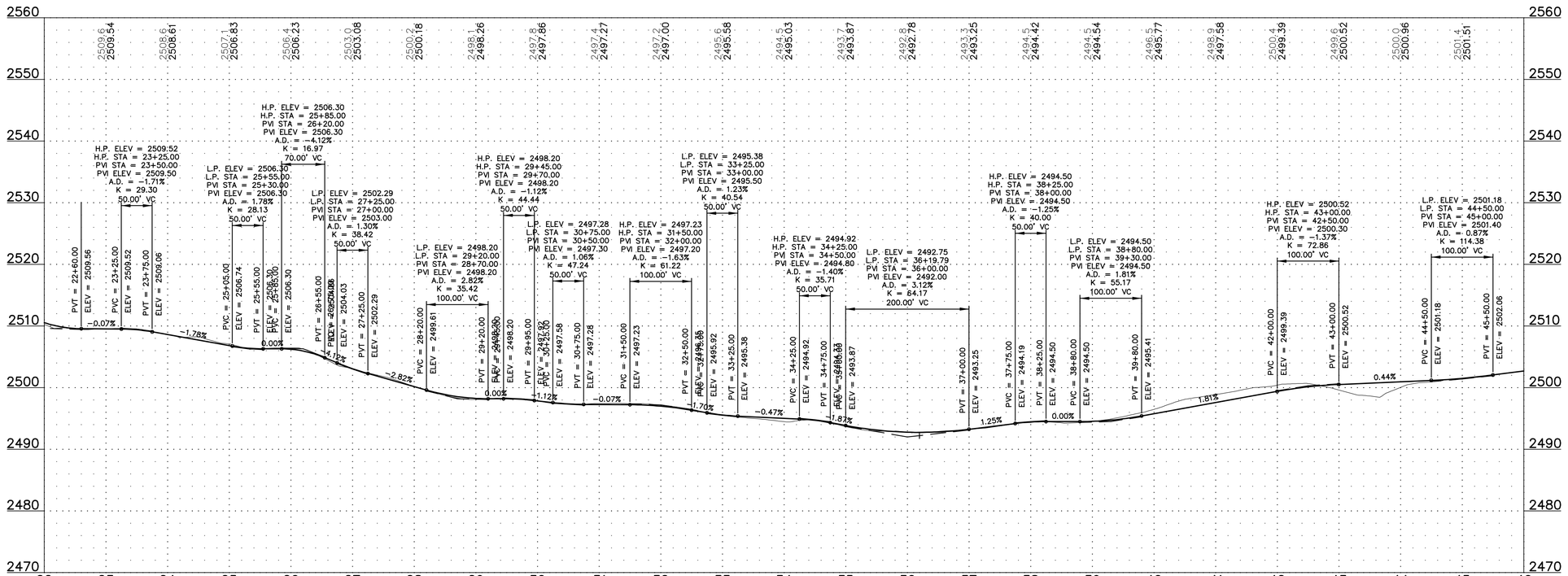
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# Road C - Sta. 22+00 - 46+00




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Revisions:

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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Stark and Morton Counties, North Dakota

Road C - Sta 22+00-46+00

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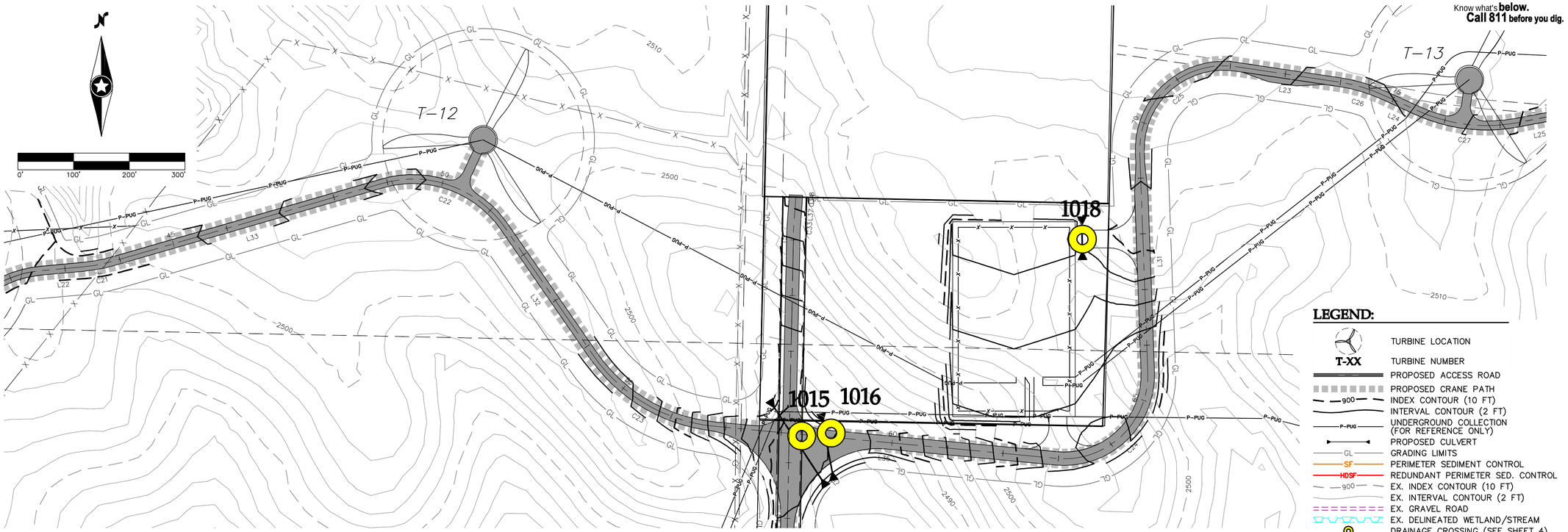
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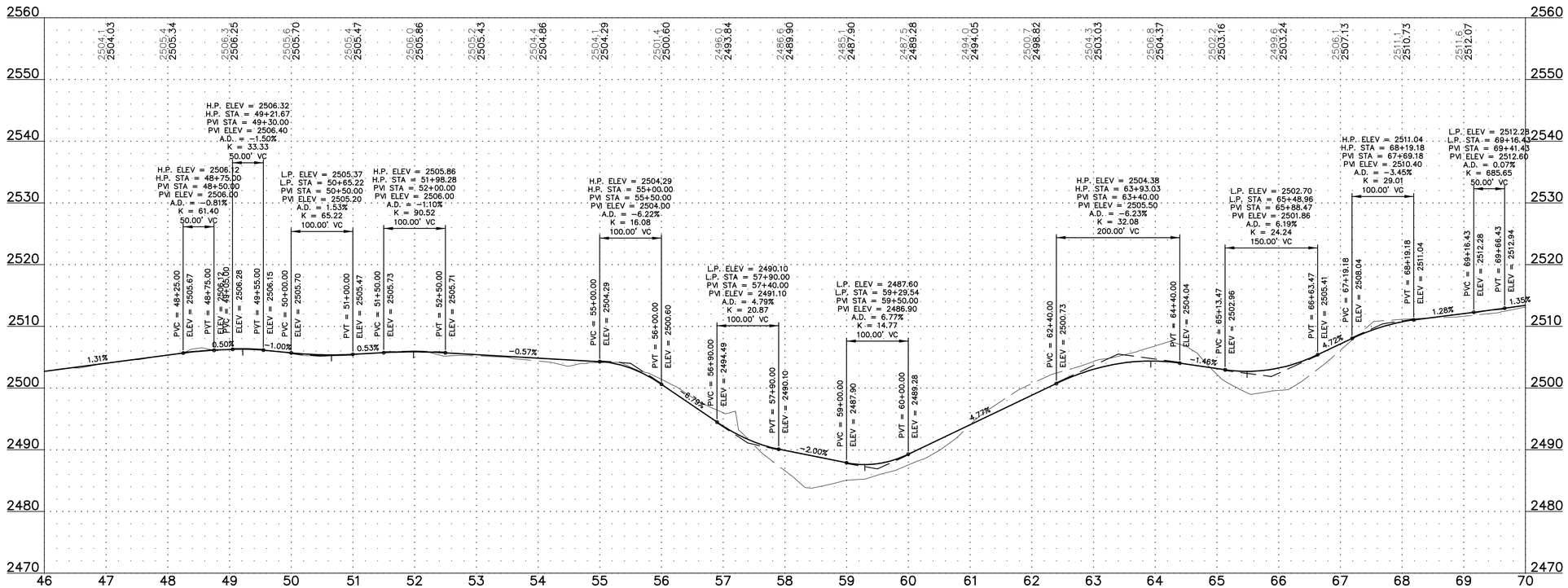
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| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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**Stark and Morton Counties, North Dakota**

**Road C - Sta 46+00-70+00**

**90% Civil Construction Plans**
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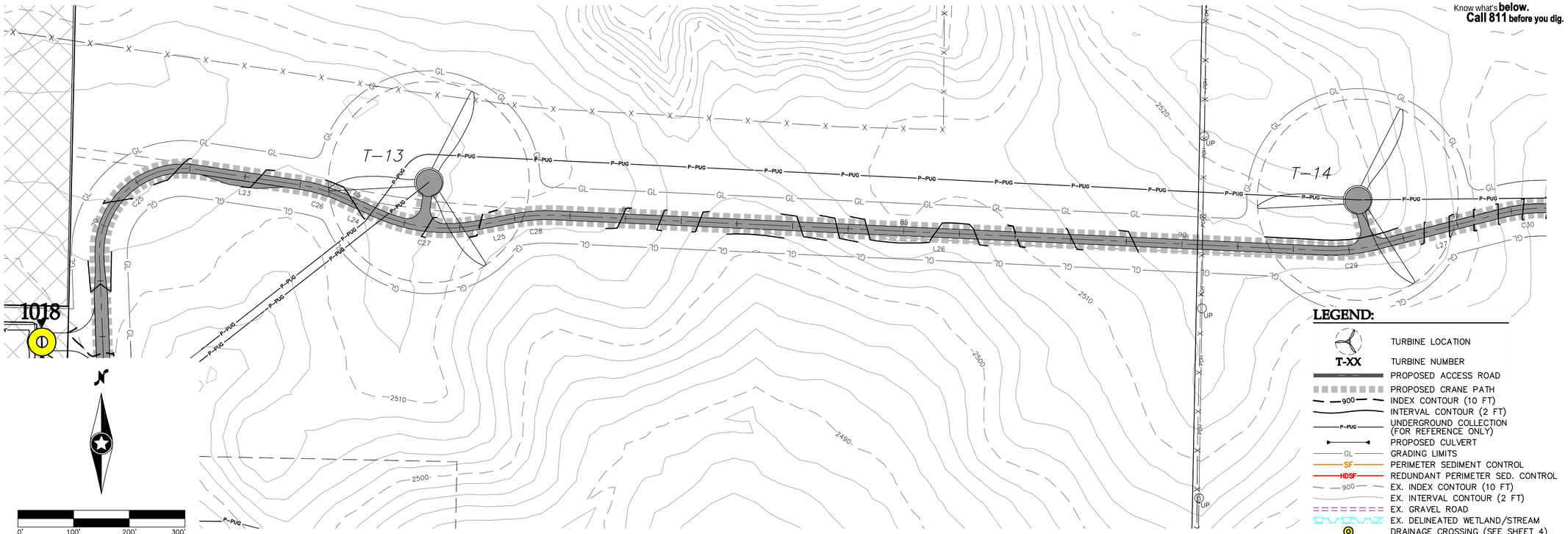
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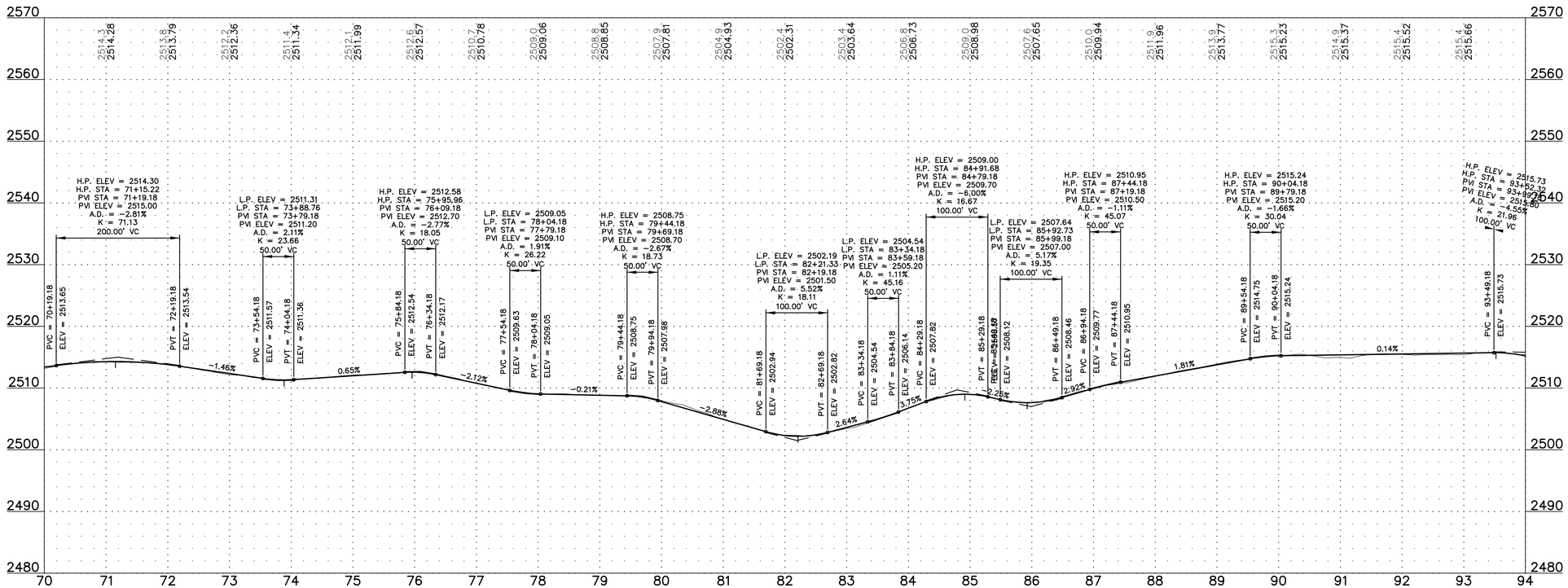
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# Road C - Sta. 70+00 - 94+00




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**Stark and Morton Counties, North Dakota**

**Road C - Sta 70+00-94+00**

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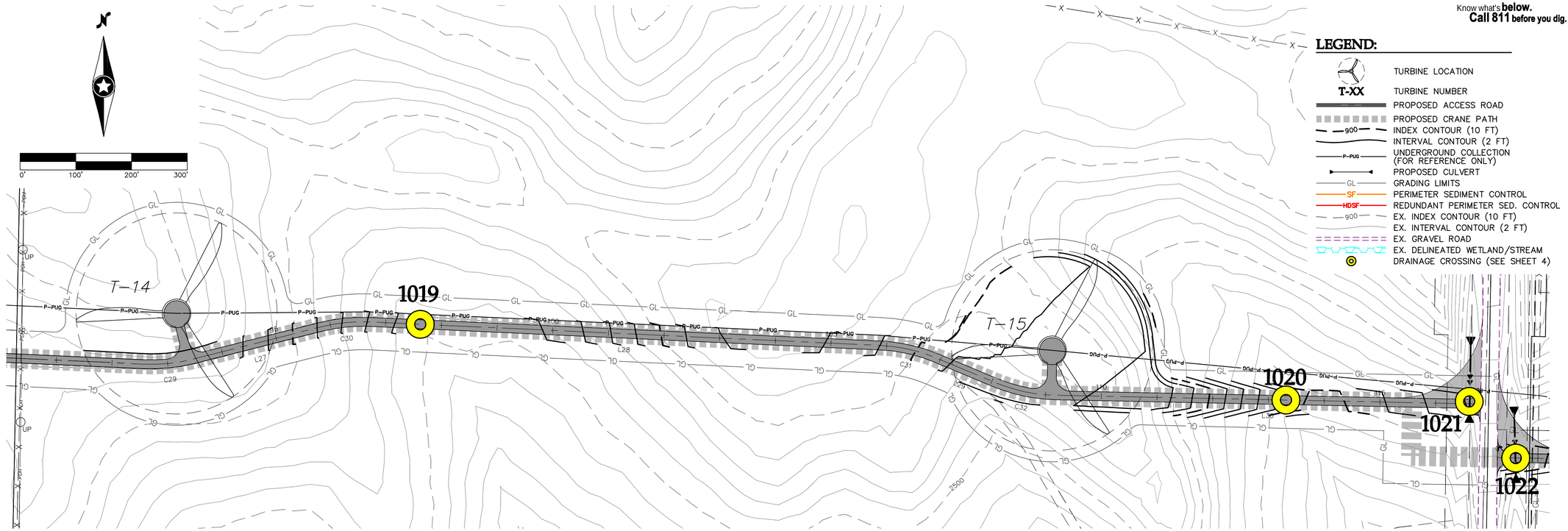
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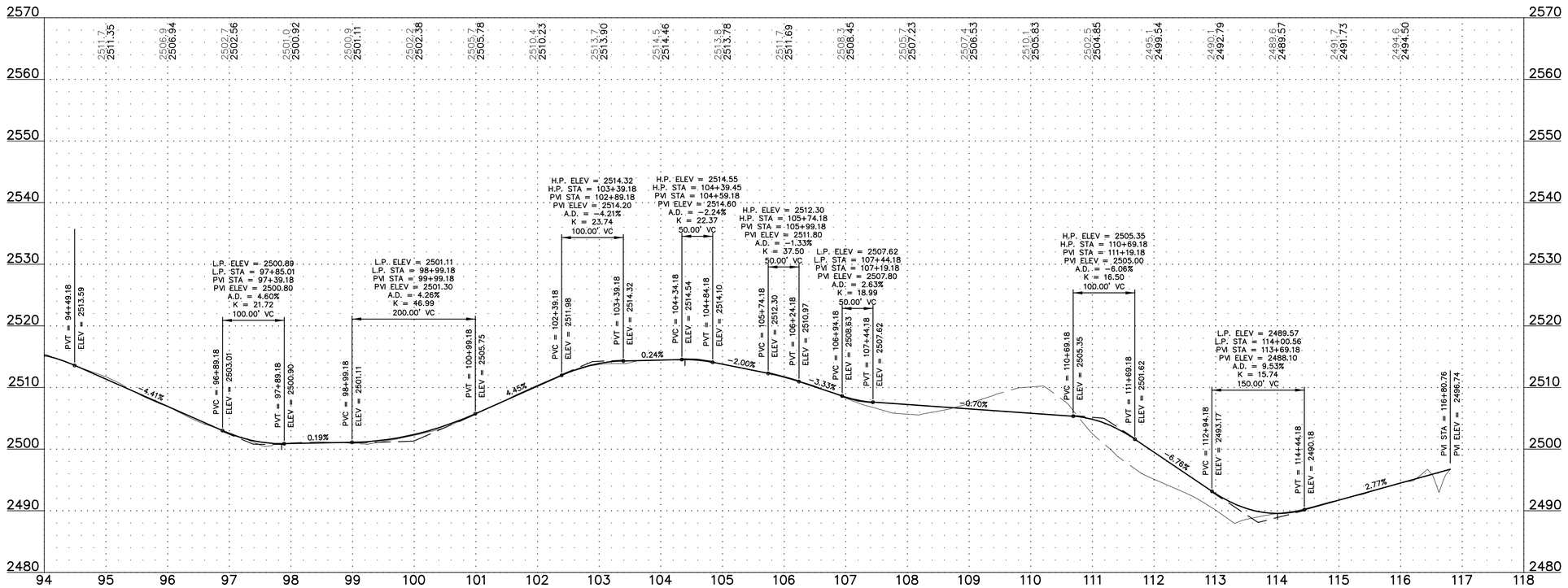



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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- 900 — INDEX CONTOUR (10 FT)
- INTERVAL CONTOUR (2 FT)
- P-PUG — UNDERGROUND COLLECTION (FOR REFERENCE ONLY)
- PROPOSED CULVERT
- GL — GRADING LIMITS
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SED. CONTROL
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road C - Sta. 94+00 - 118+00




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| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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**Road C - Sta 94+00-118+00**

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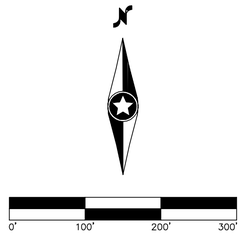
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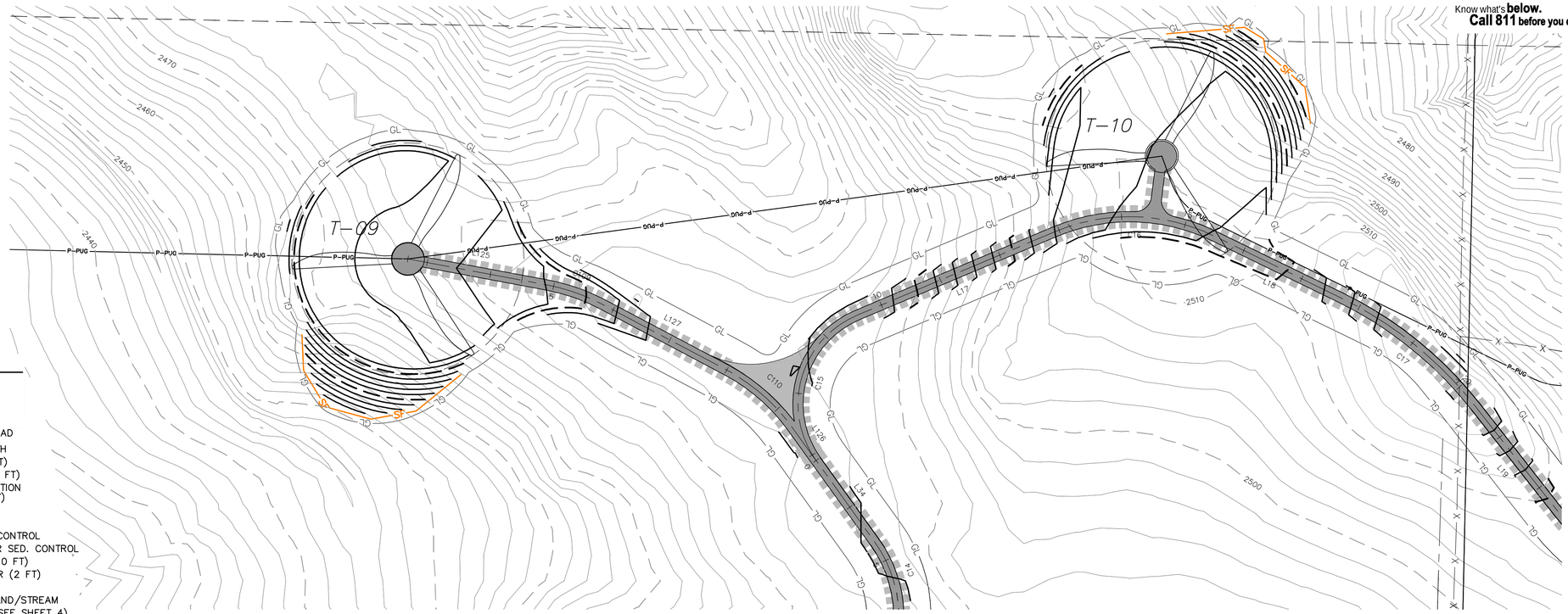
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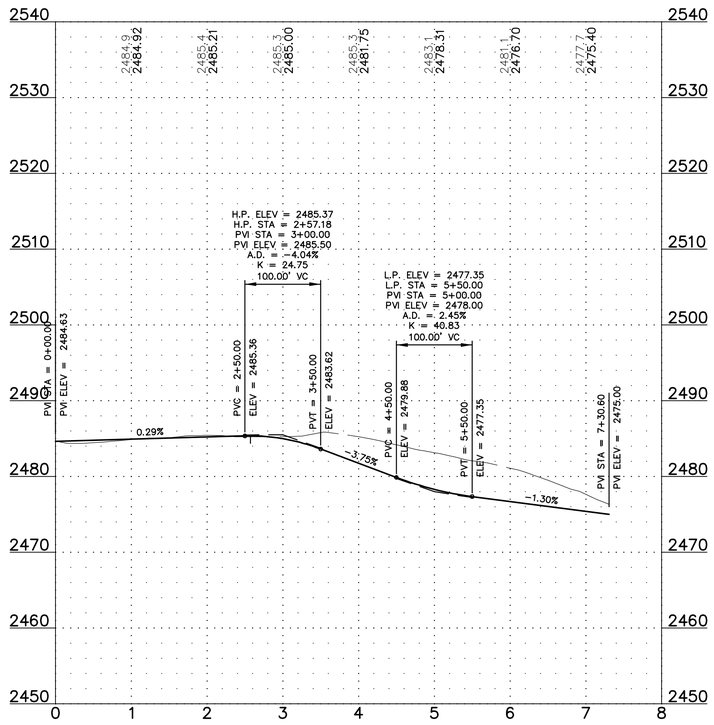




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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- 900 — INDEX CONTOUR (10 FT)
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- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road R - Sta. 0+00 - 8+00




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**Road R - Sta 0+00-8+00**

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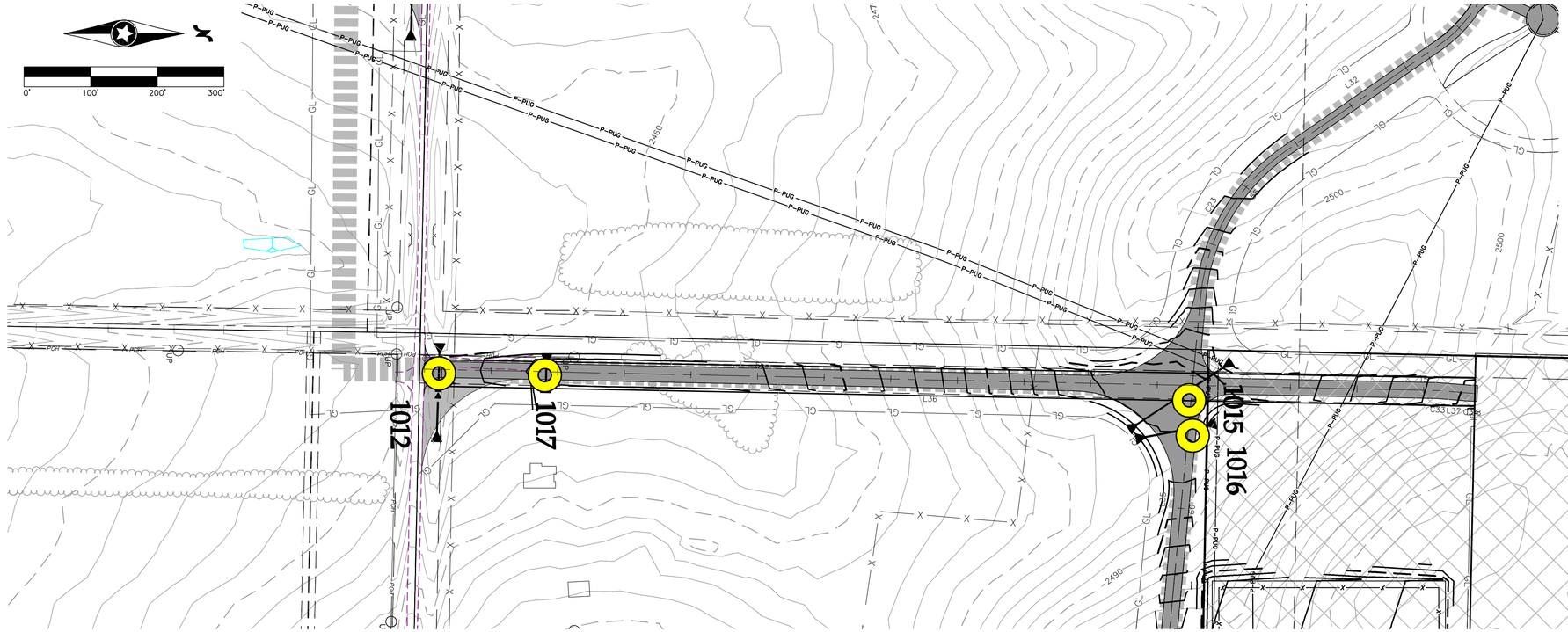
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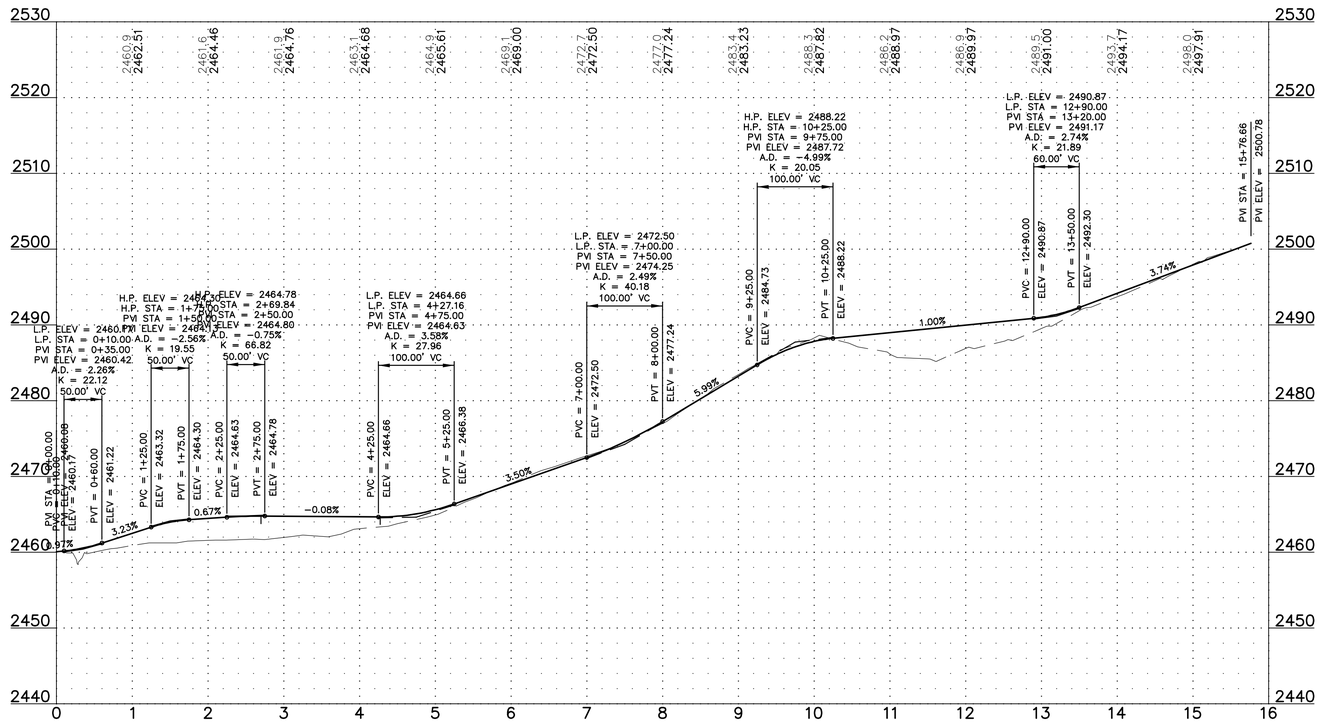
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**Road D - Sta 0+00-16+00**

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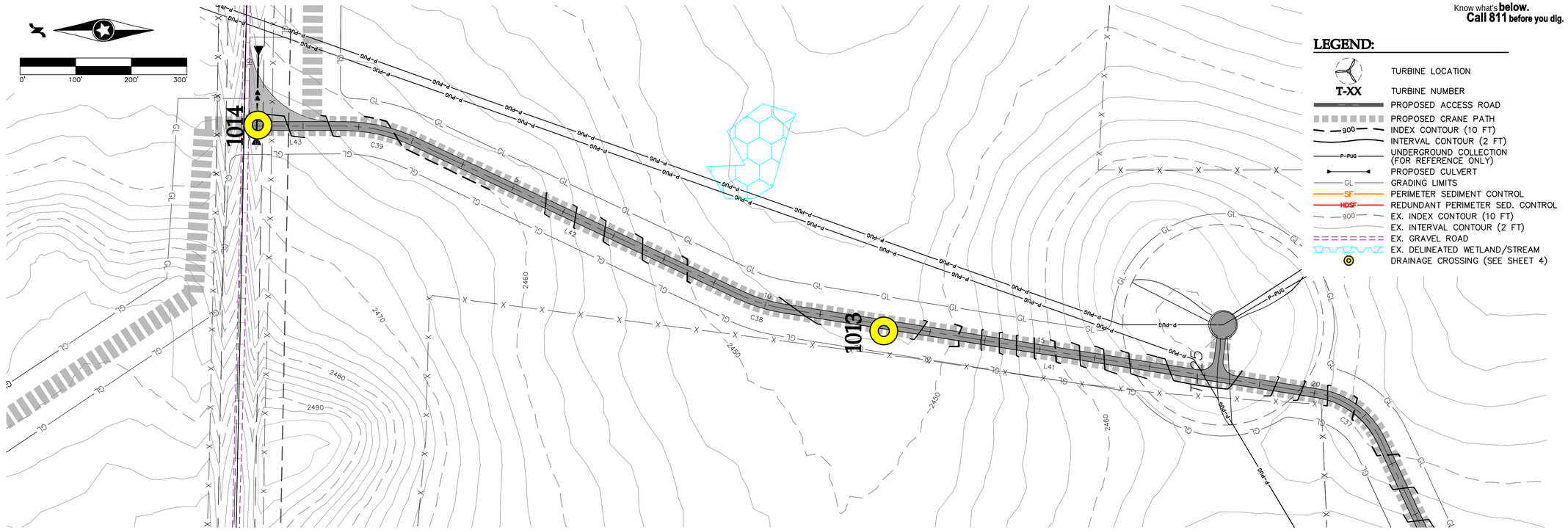
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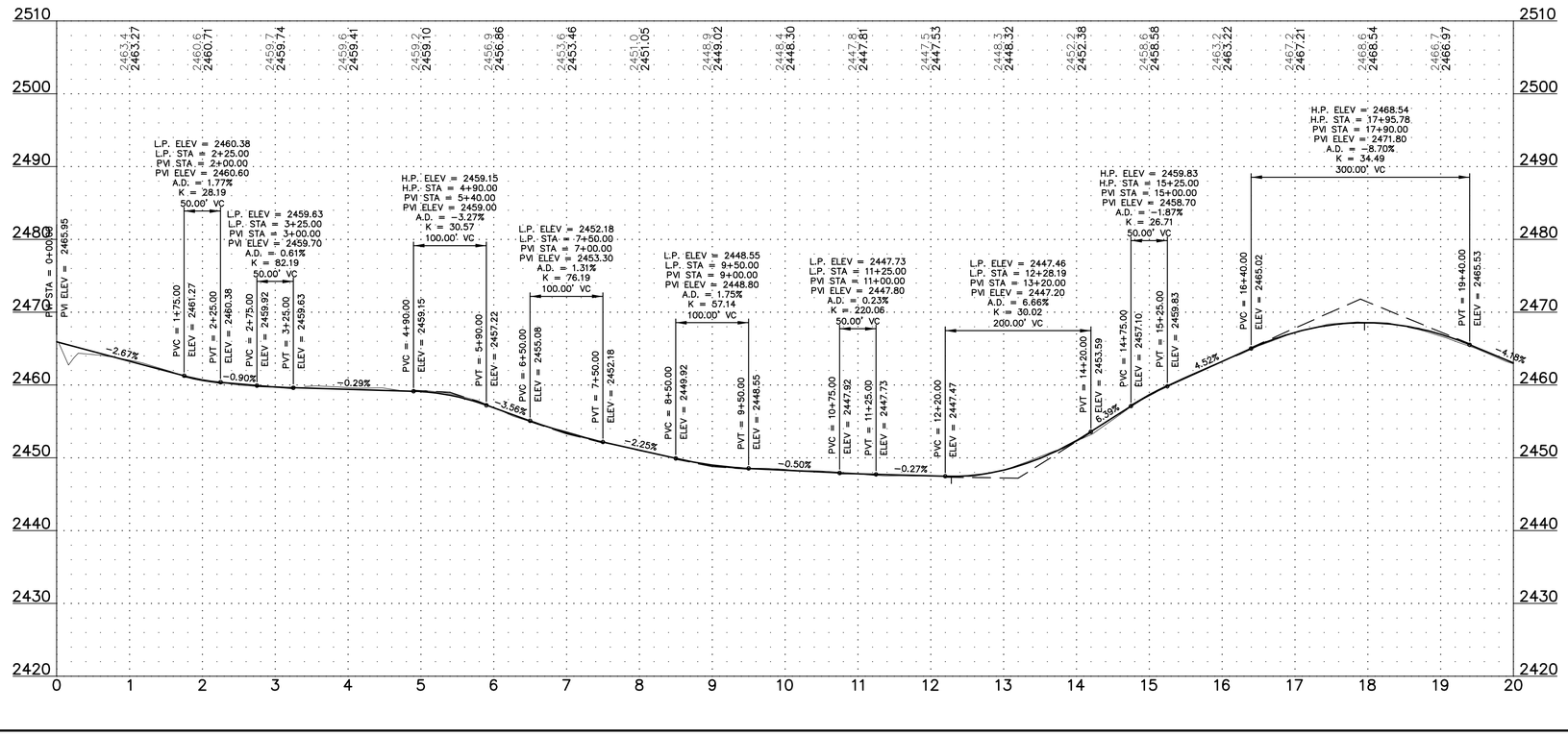



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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- 900 — INDEX CONTOUR (10 FT)
- INTERVAL CONTOUR (2 FT)
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- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road E - Sta. 0+00 - 20+00




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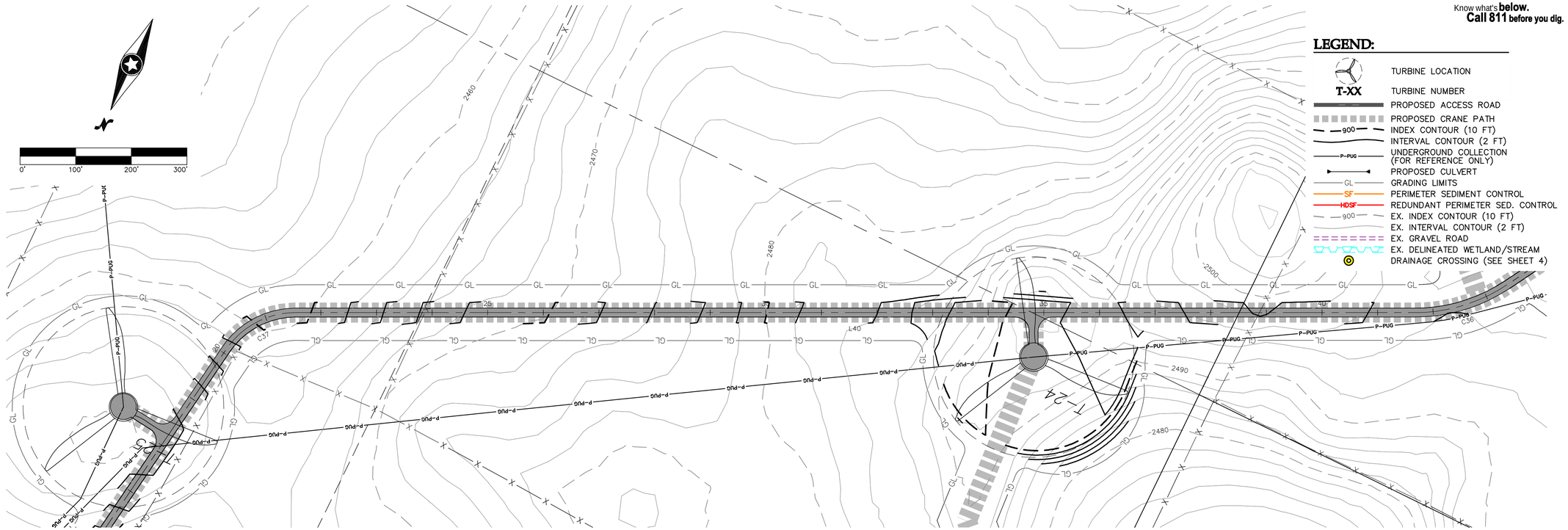
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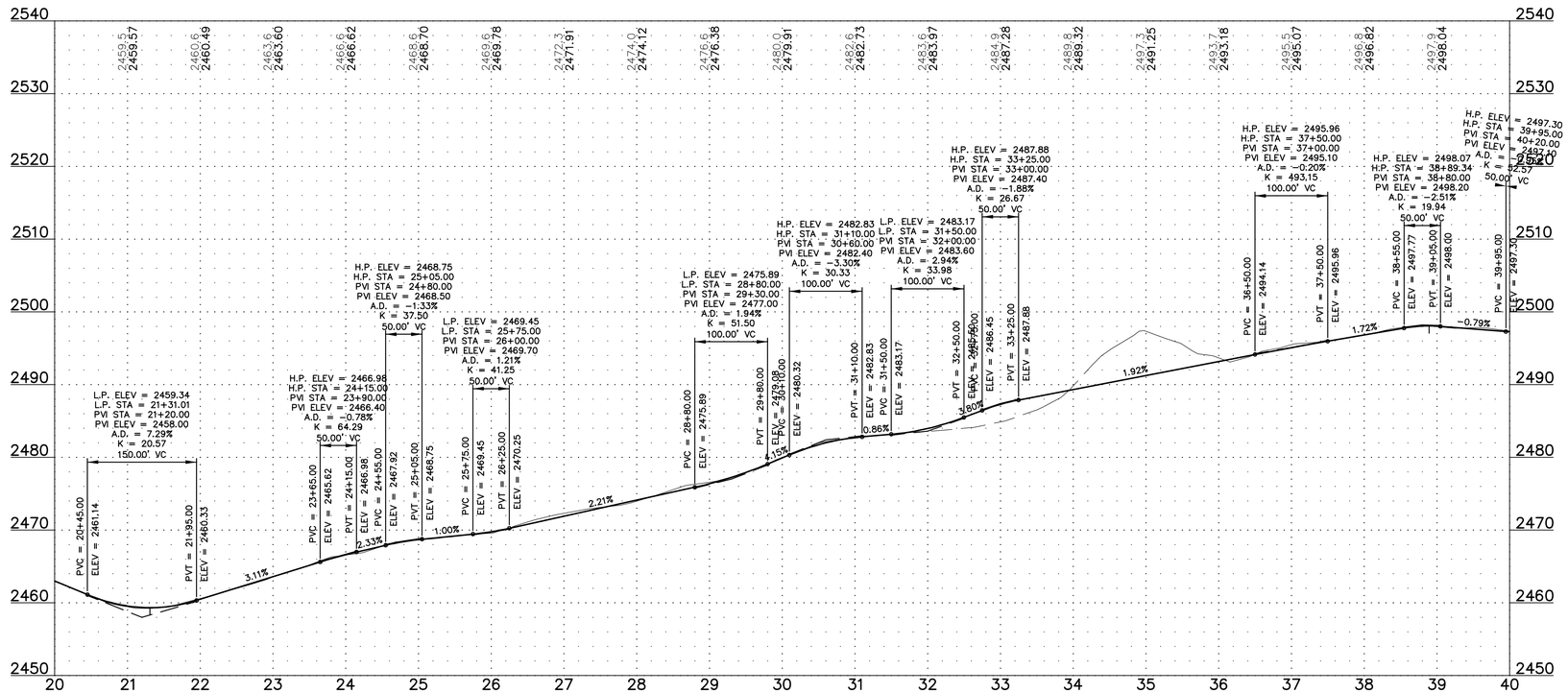
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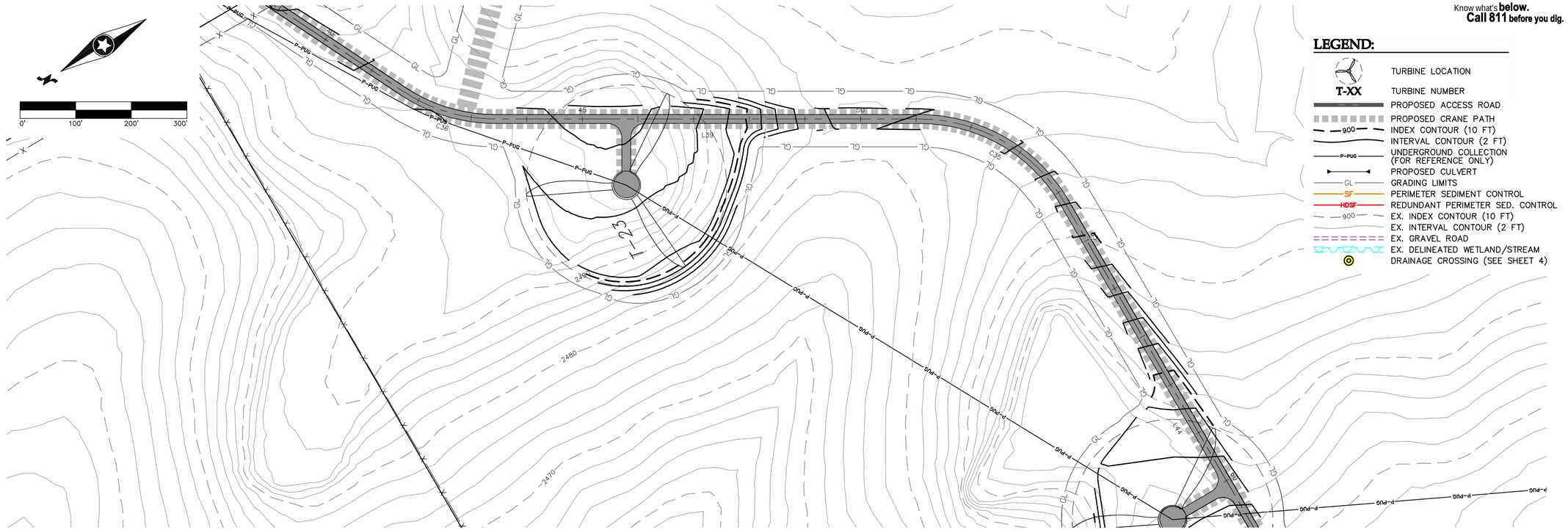
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**Sheet:** 54 OF 91

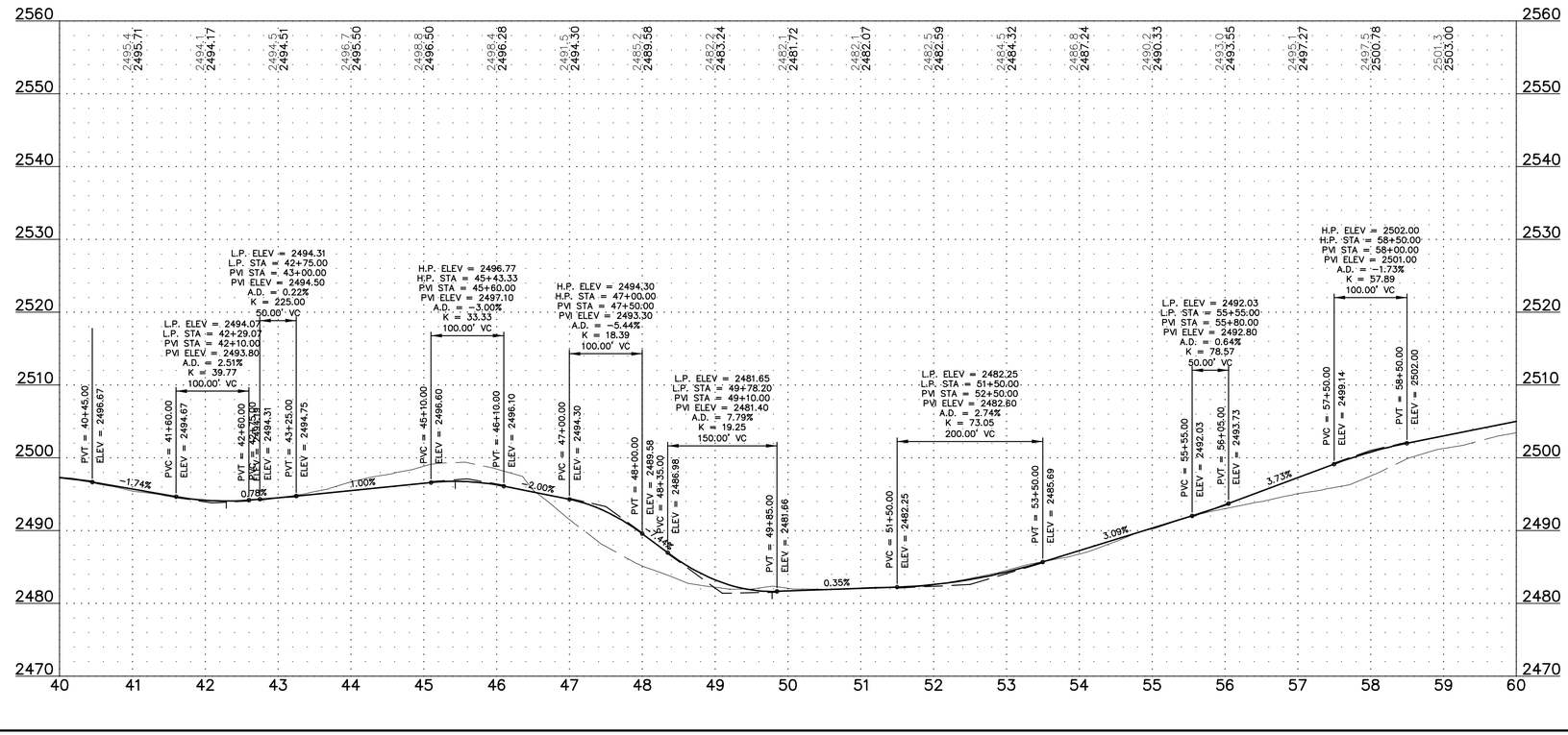
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# Road E - Sta. 40+00 - 60+00




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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

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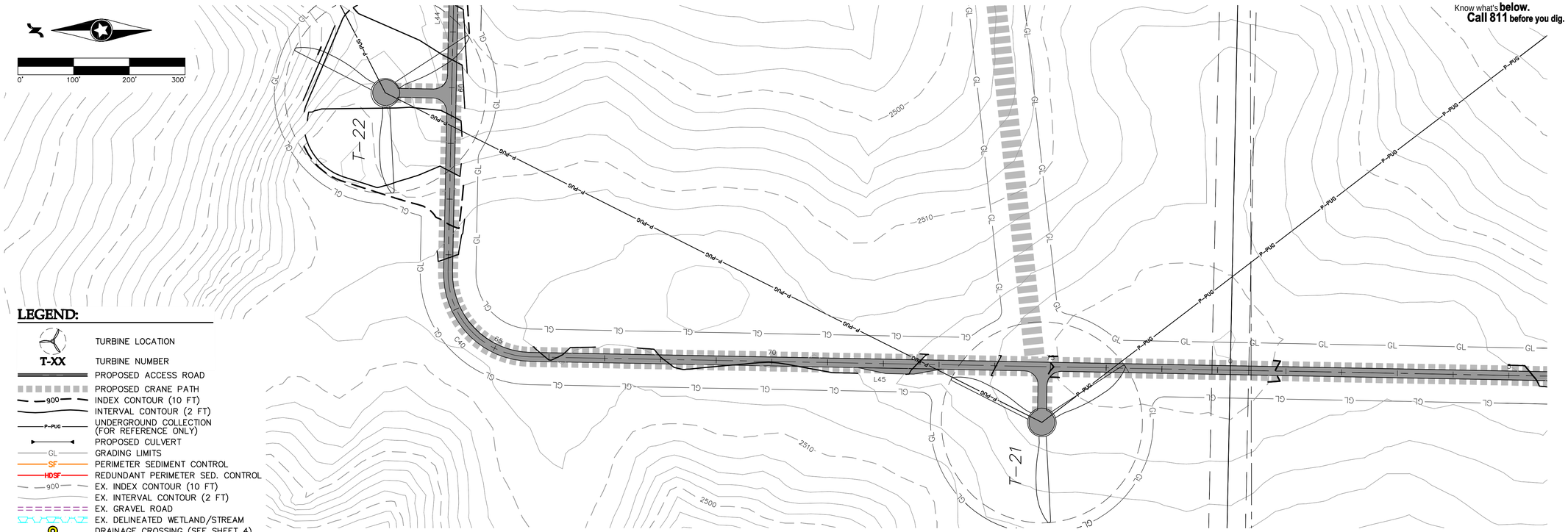
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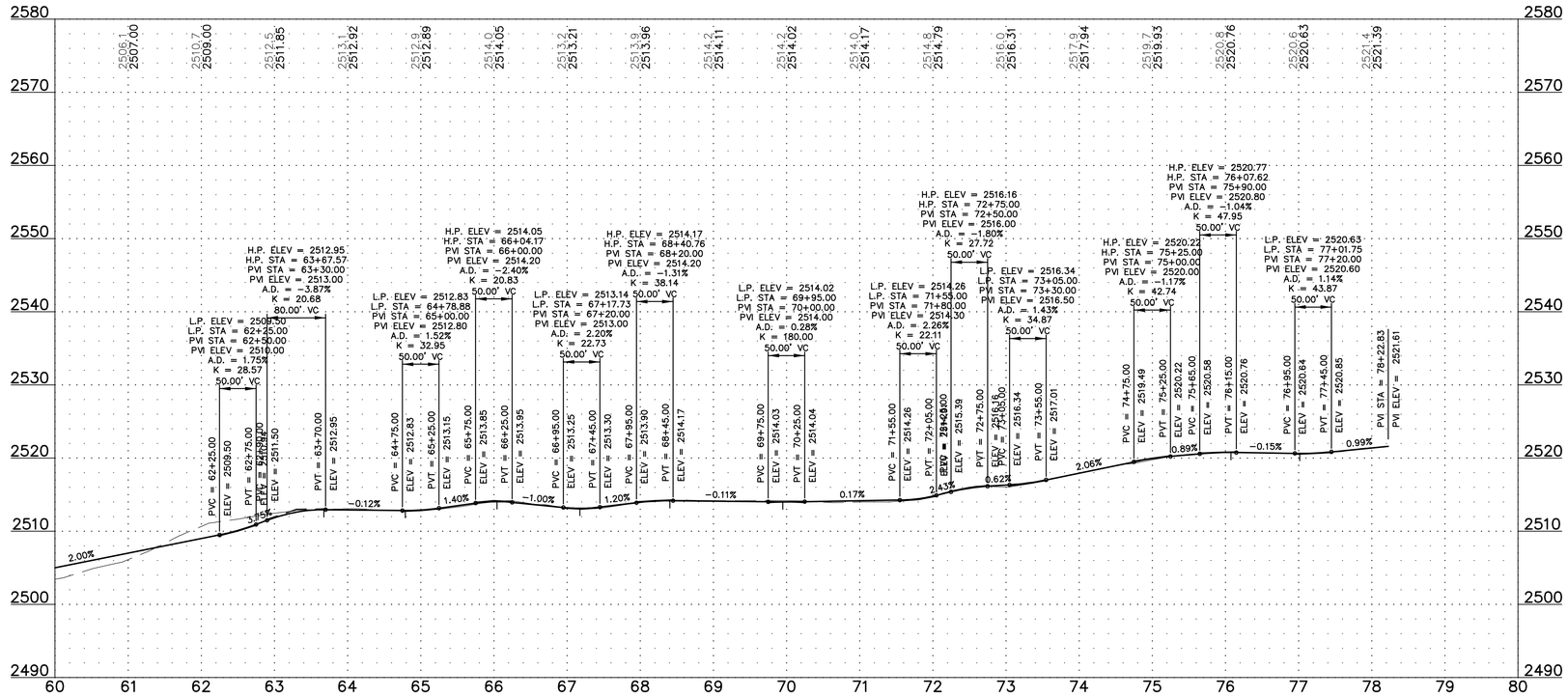
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- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road E - Sta. 60+00 - 80+00




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Stark and Morton Counties, North Dakota

Road E - Sta 60+00-80+00

90% Civil Construction Plans
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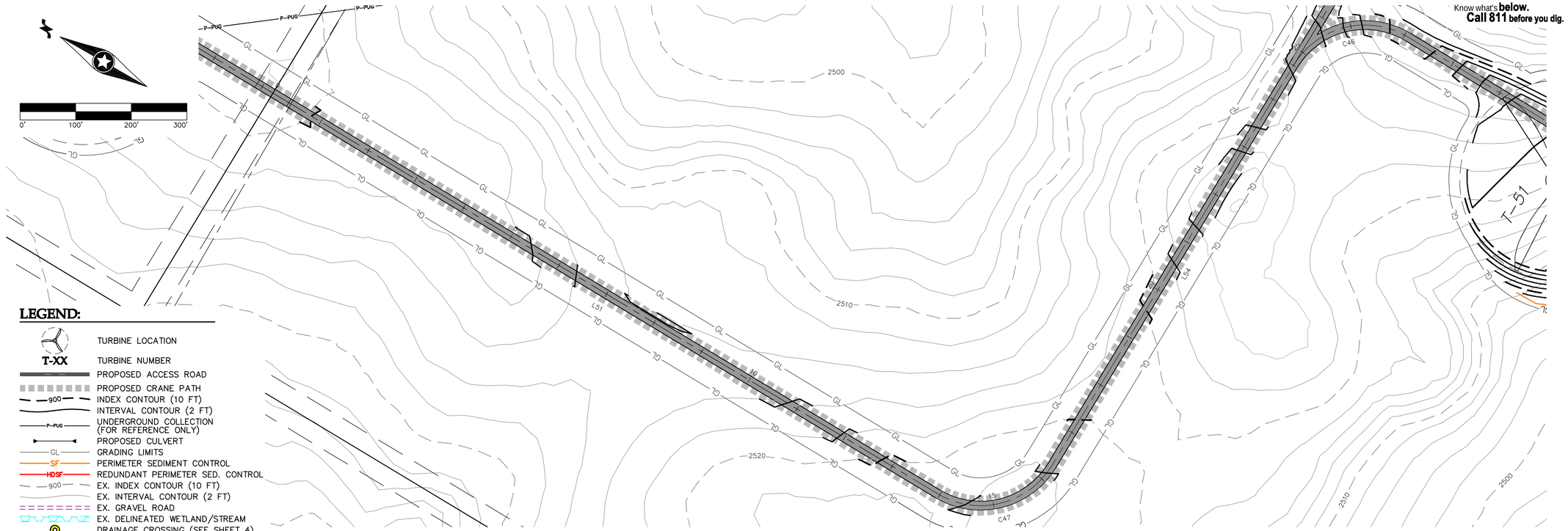
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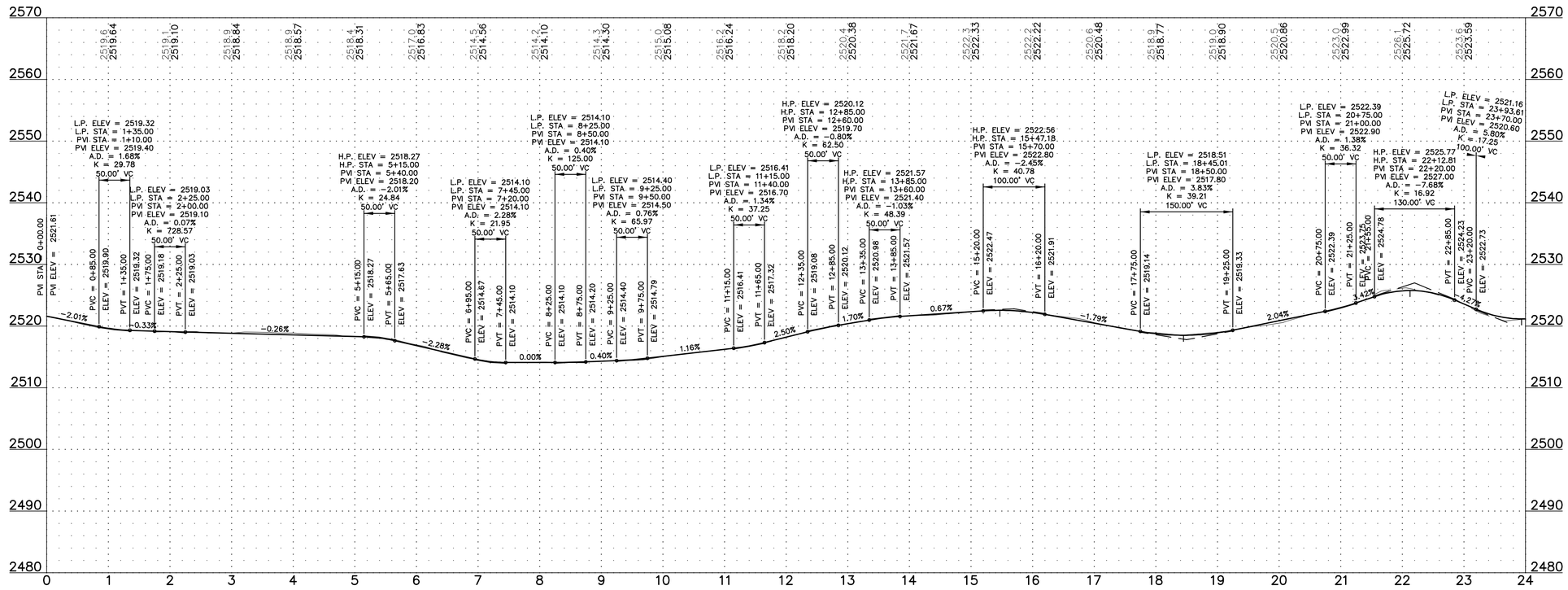
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# Road F - Sta. 0+00 - 24+00




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| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Road F - Sta 0+00-24+00**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

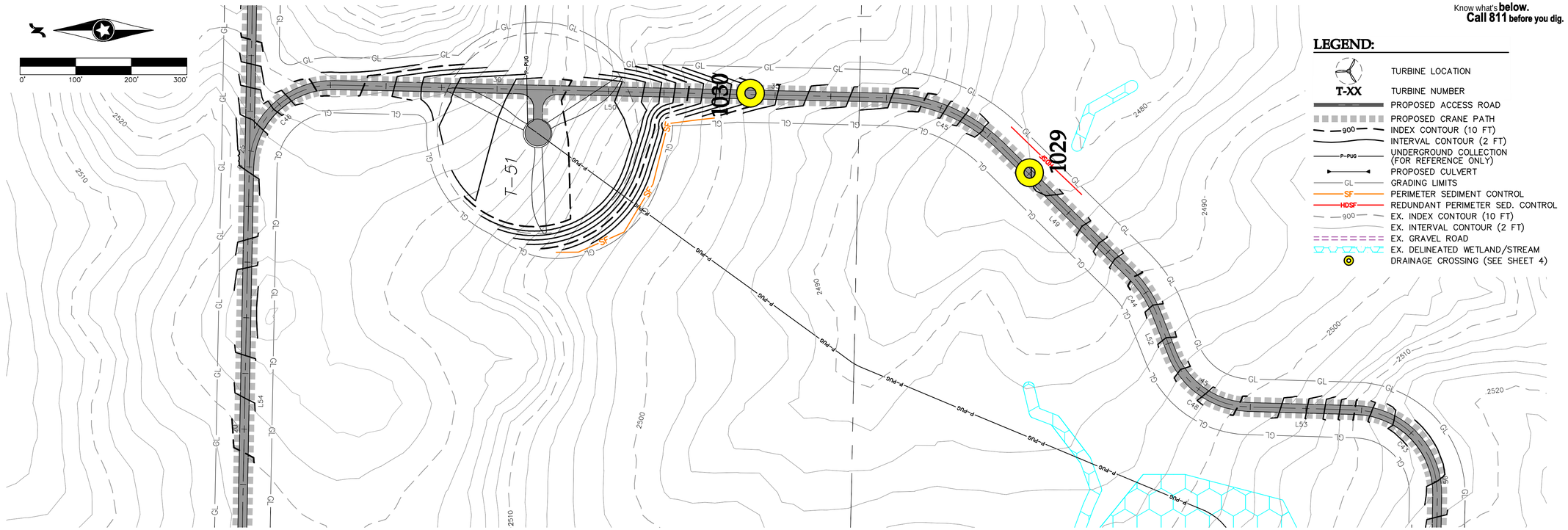
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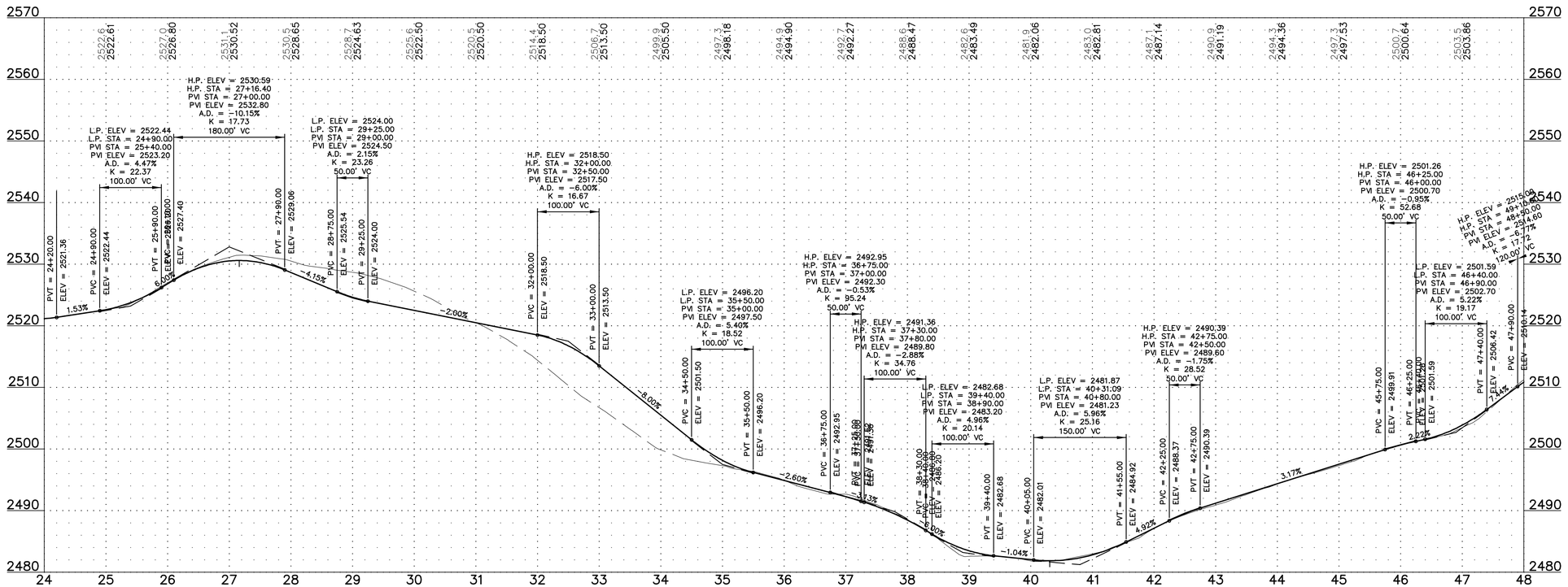
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# Road F - Sta. 24+00 - 48+00




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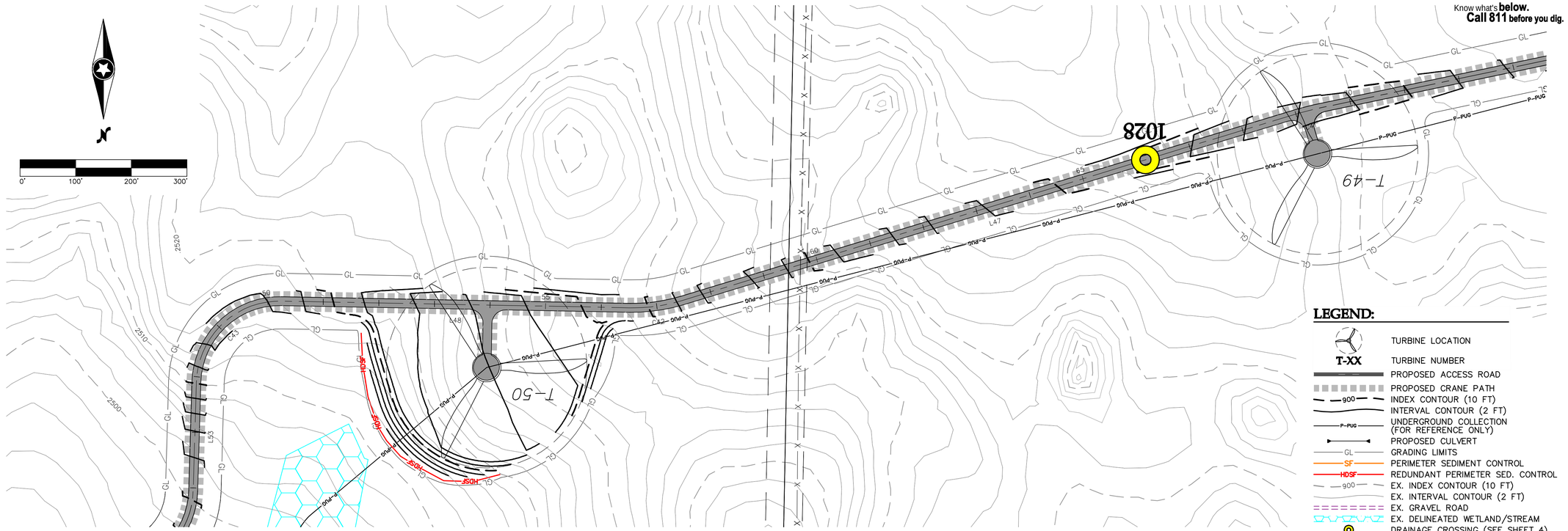
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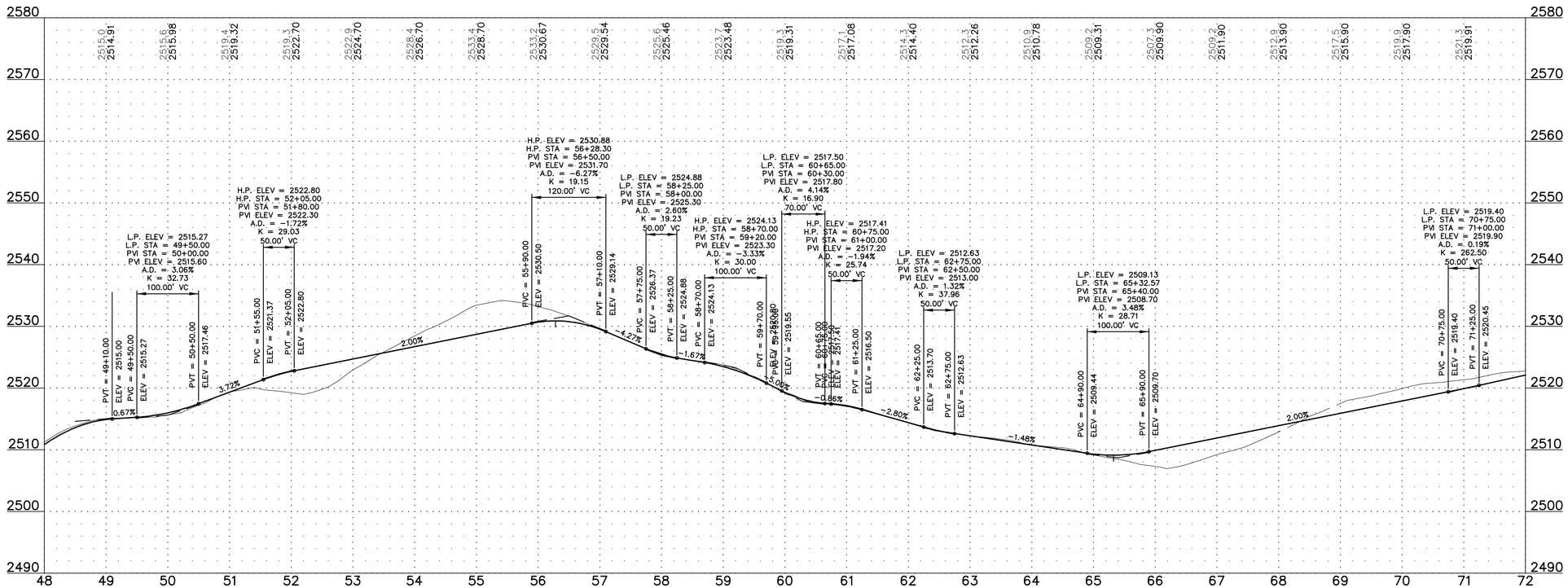
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Stark and Morton Counties, North Dakota

Road F - Sta 48+00-72+00

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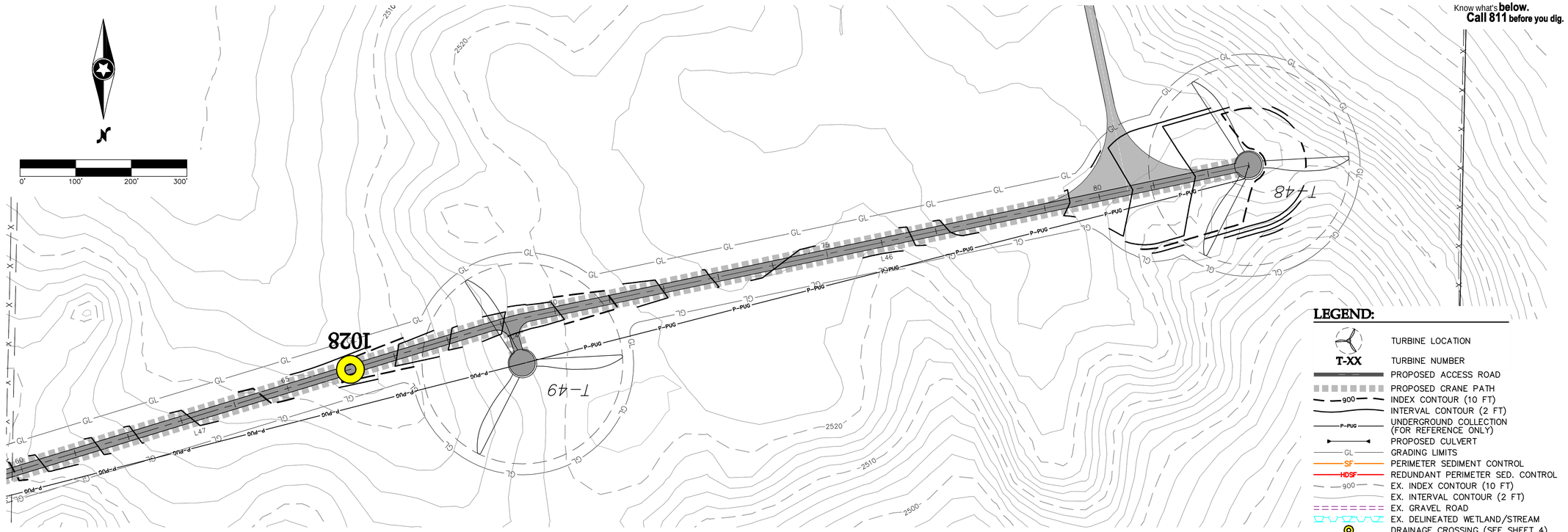
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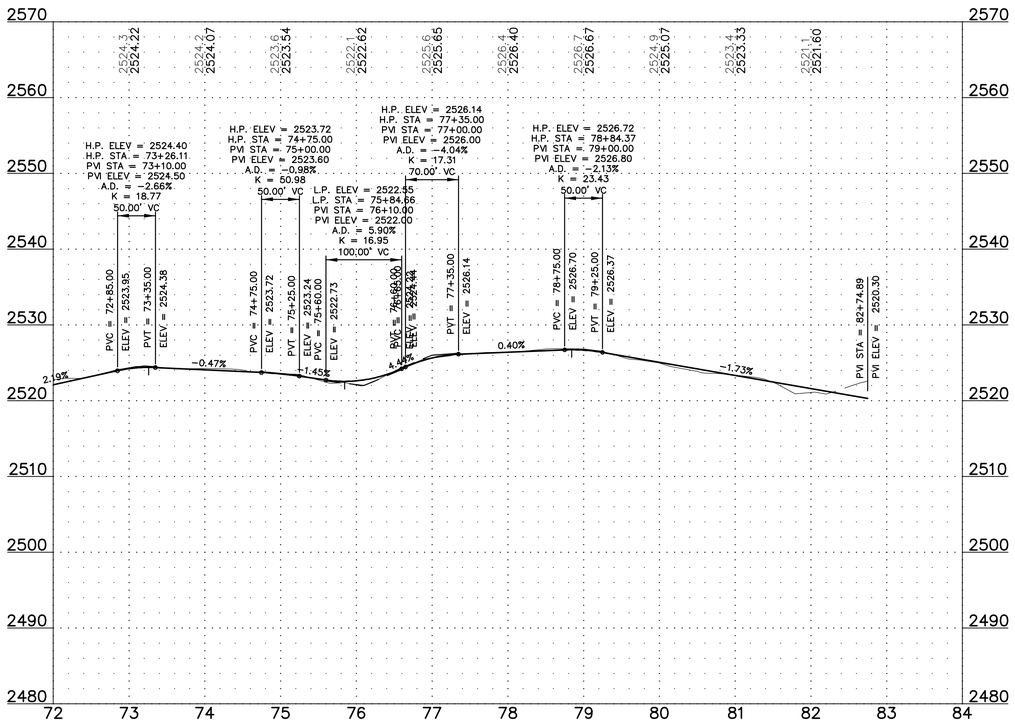



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- PROPOSED ACCESS ROAD
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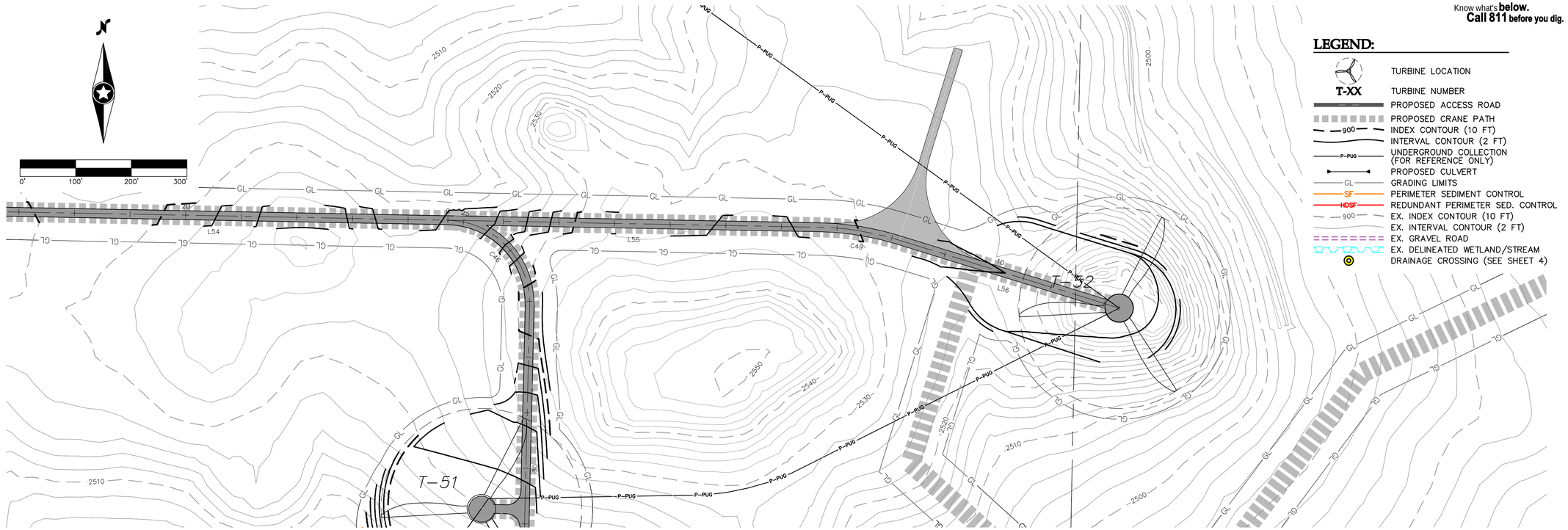
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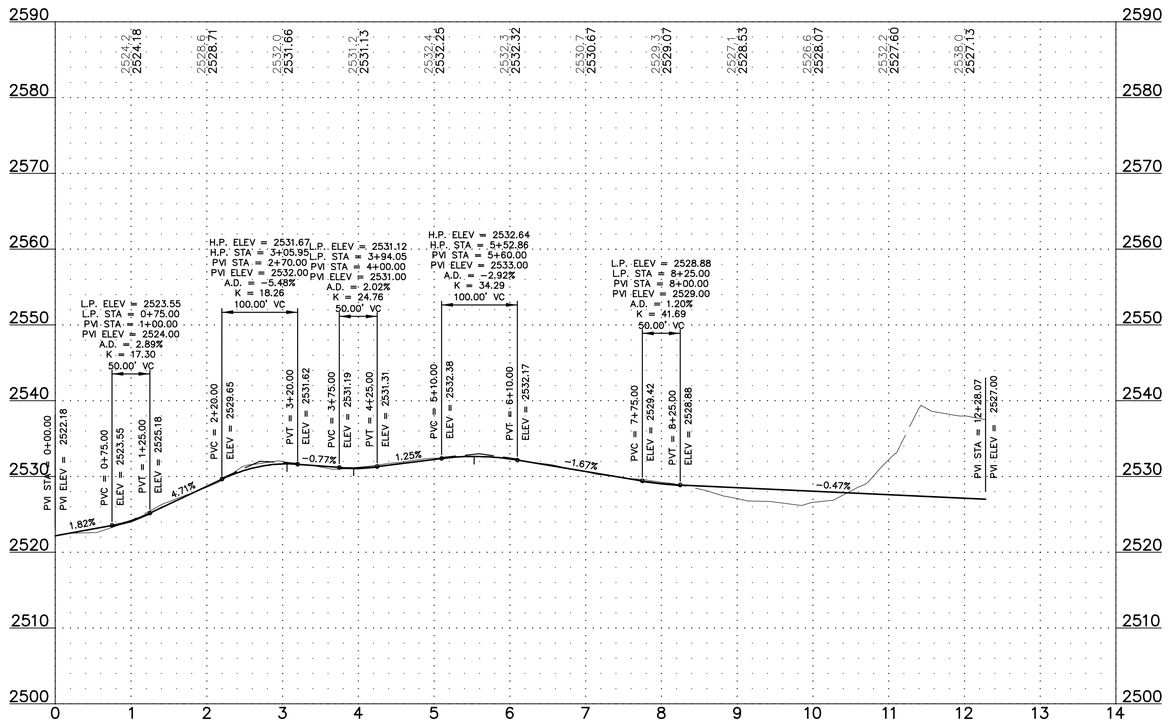



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# Road G - Sta. 0+00 - 13+00




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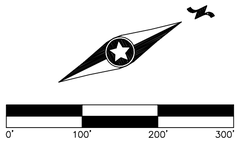
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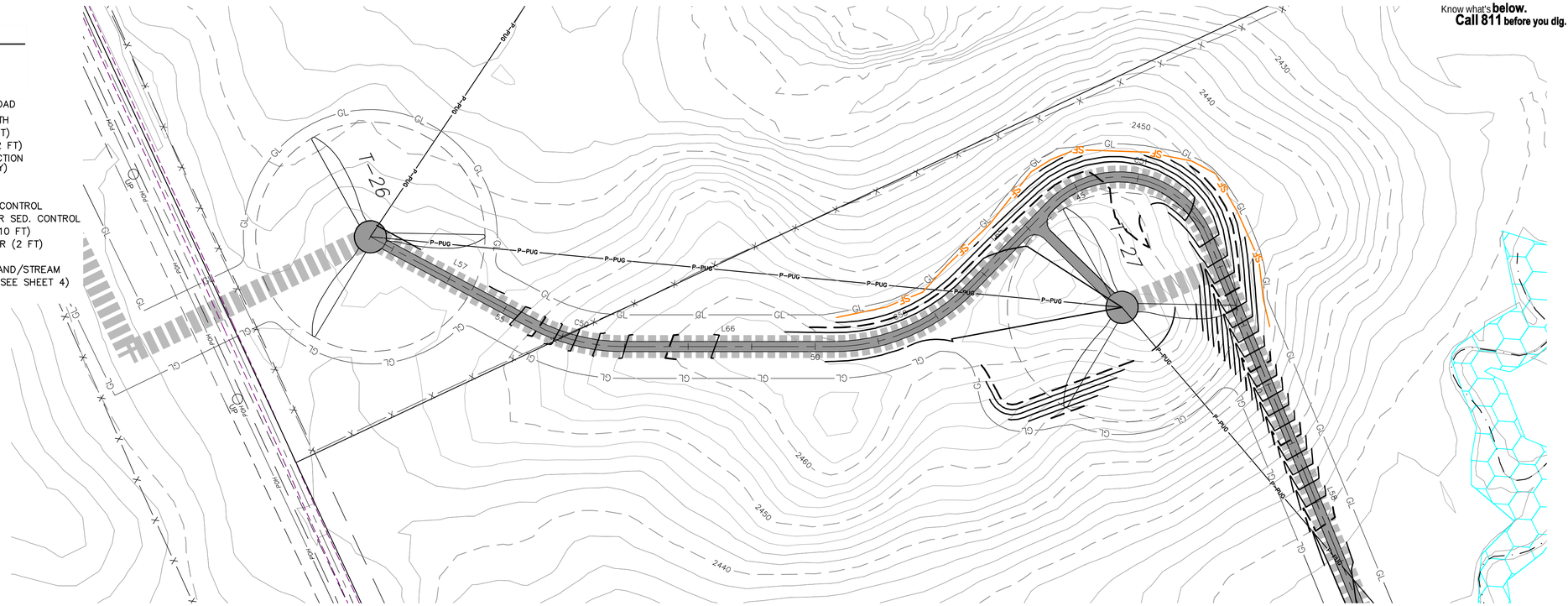
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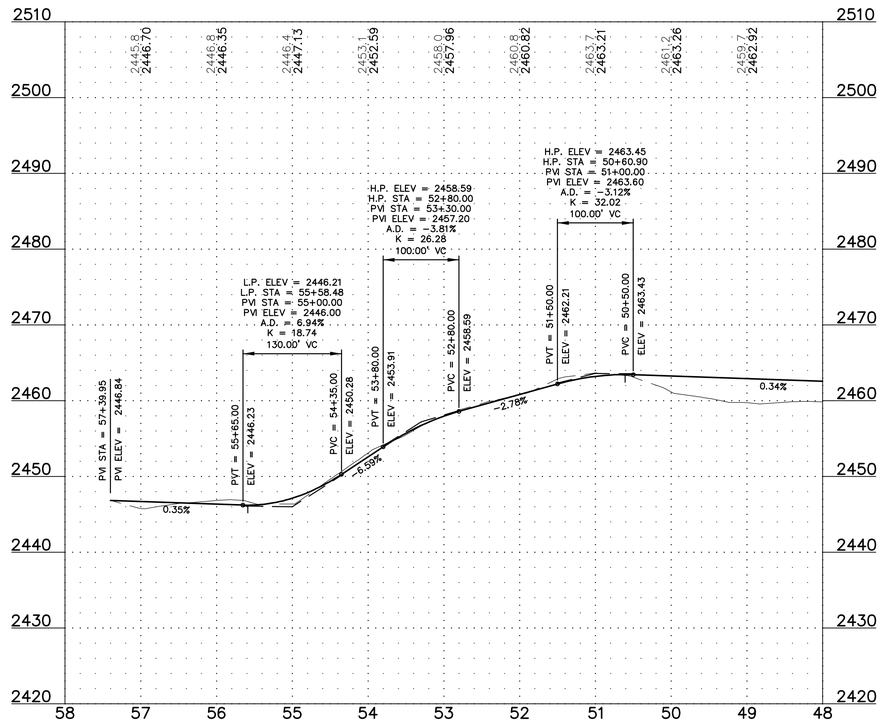
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- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)




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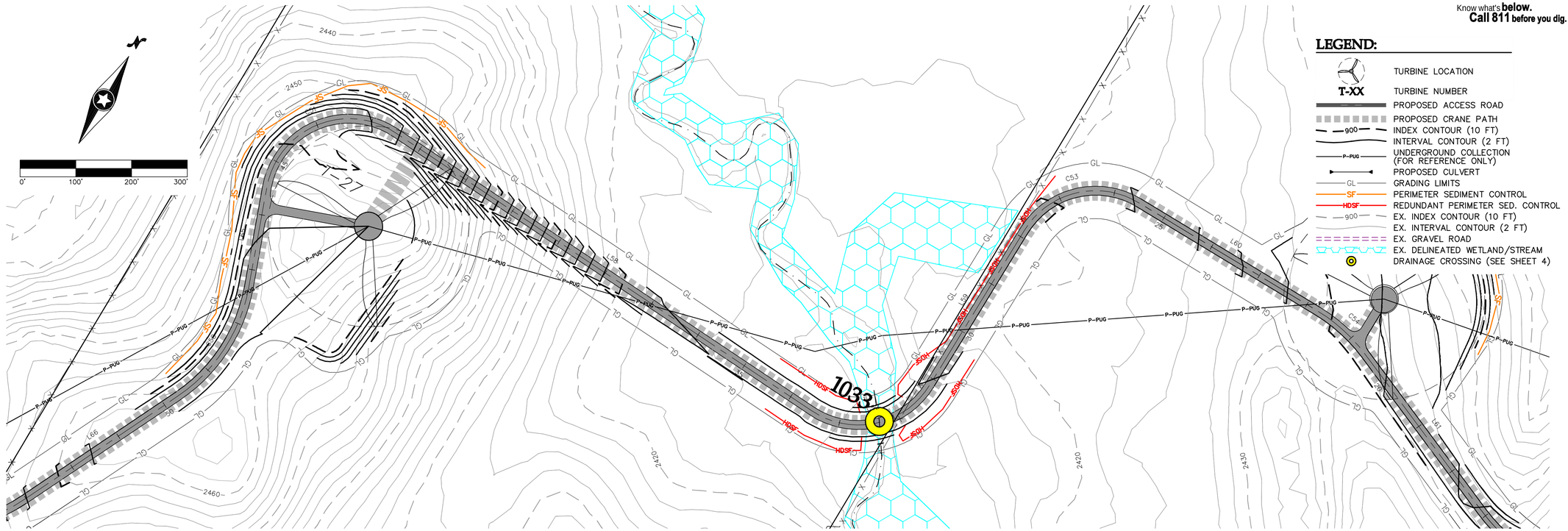
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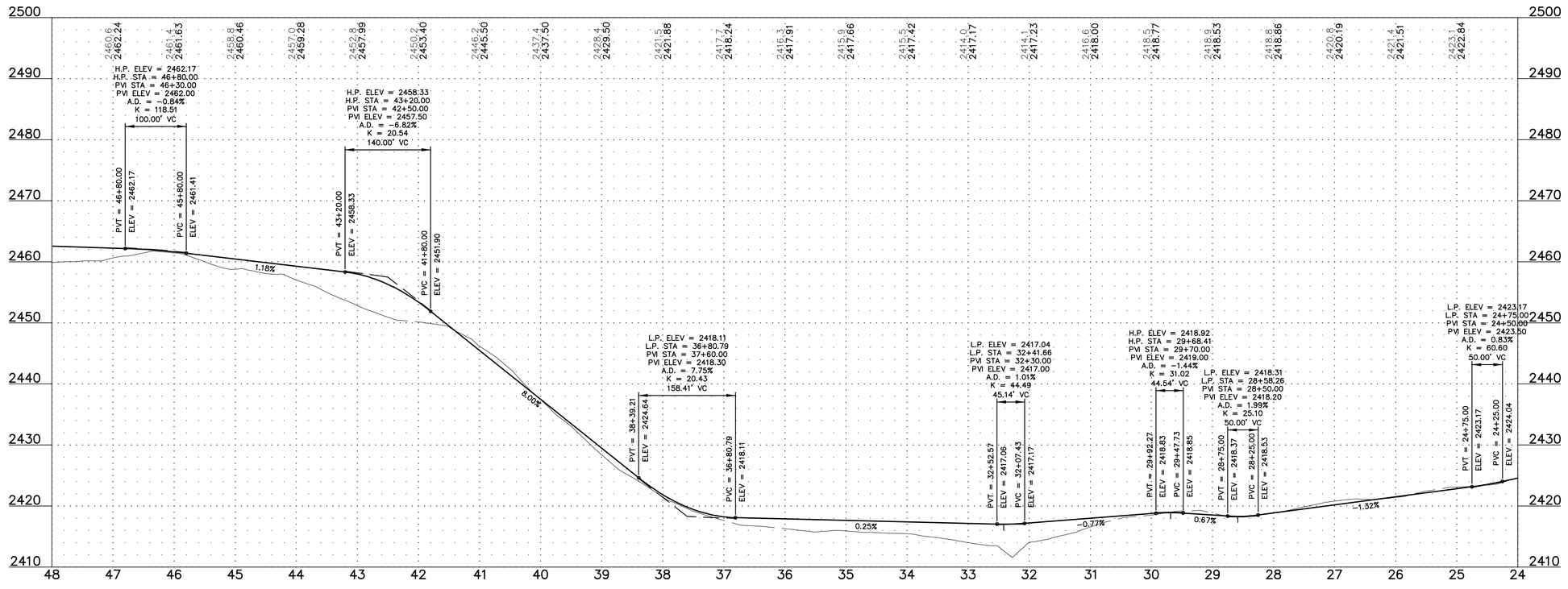



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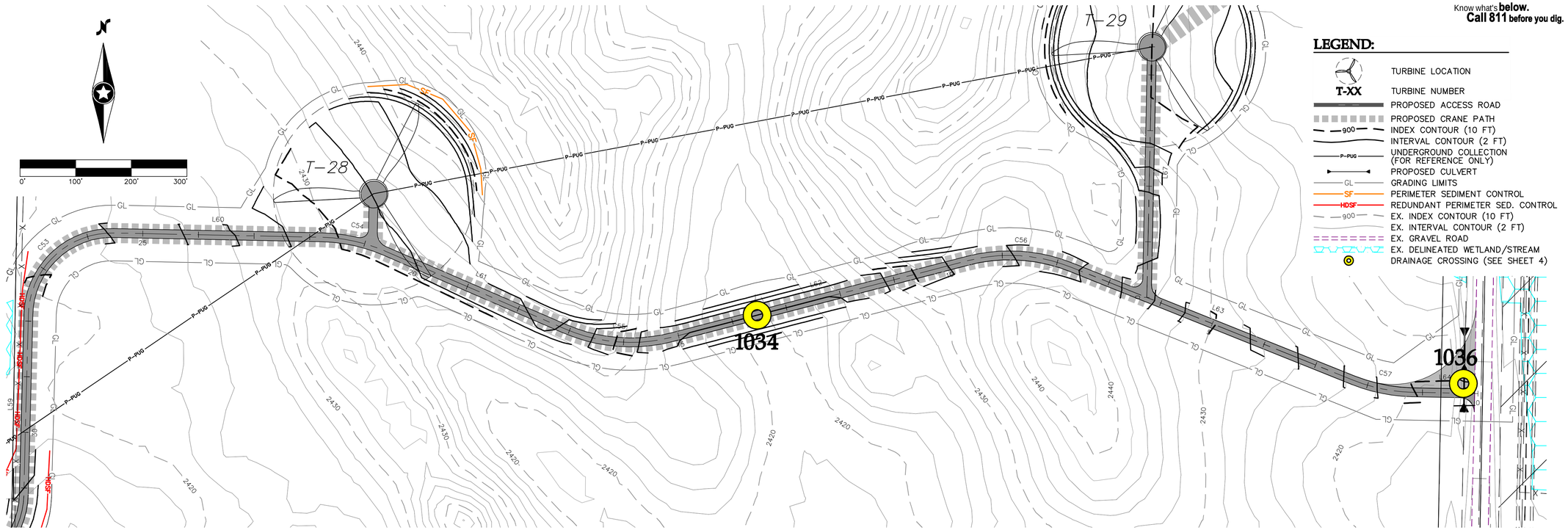
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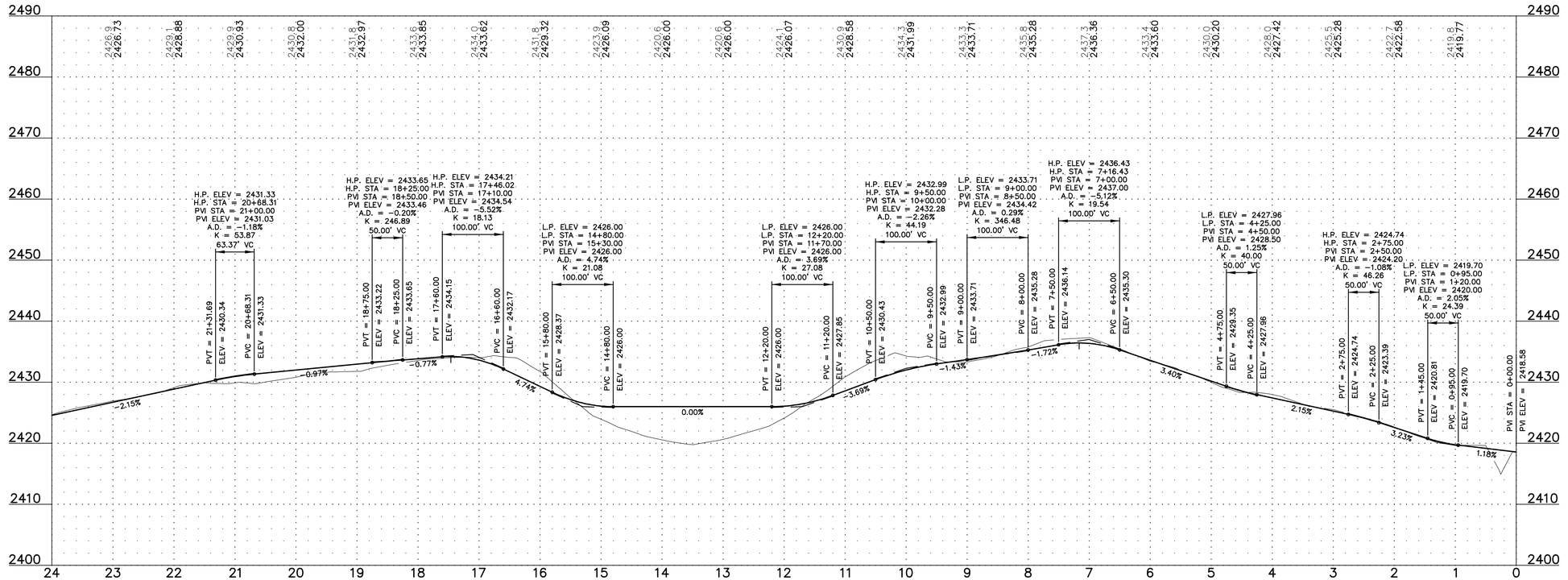



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# Road I - Sta. 24+00 - 0+00




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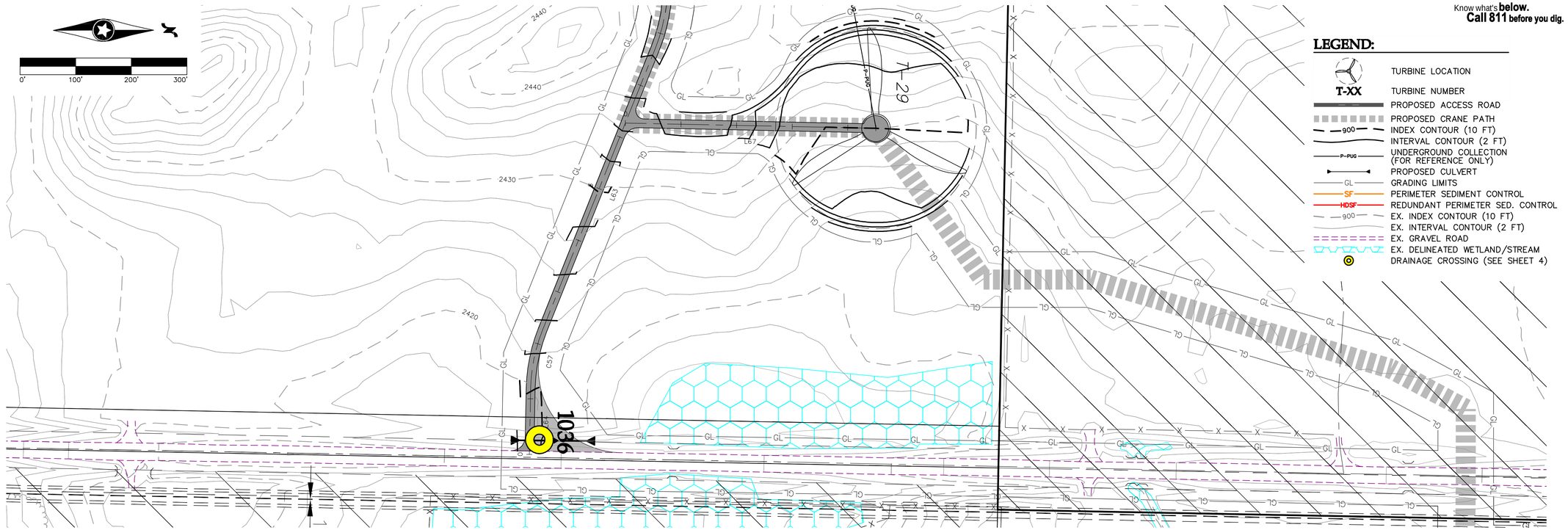
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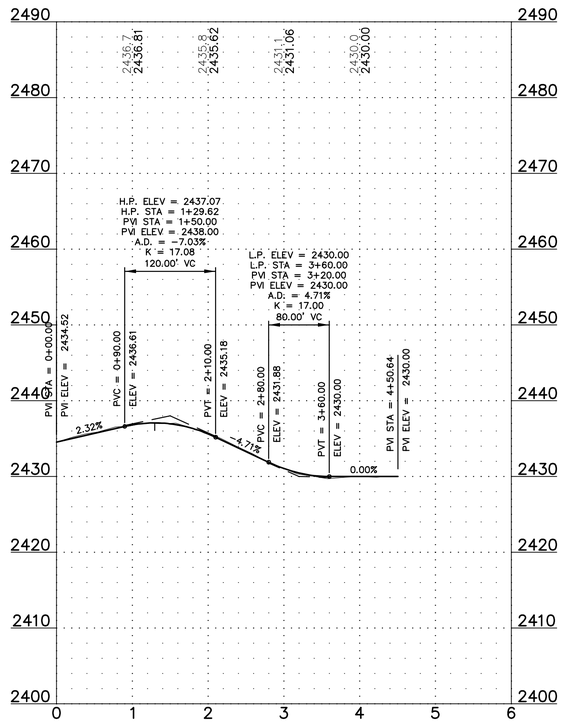



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# Road J - Sta. 0+00 - 6+00




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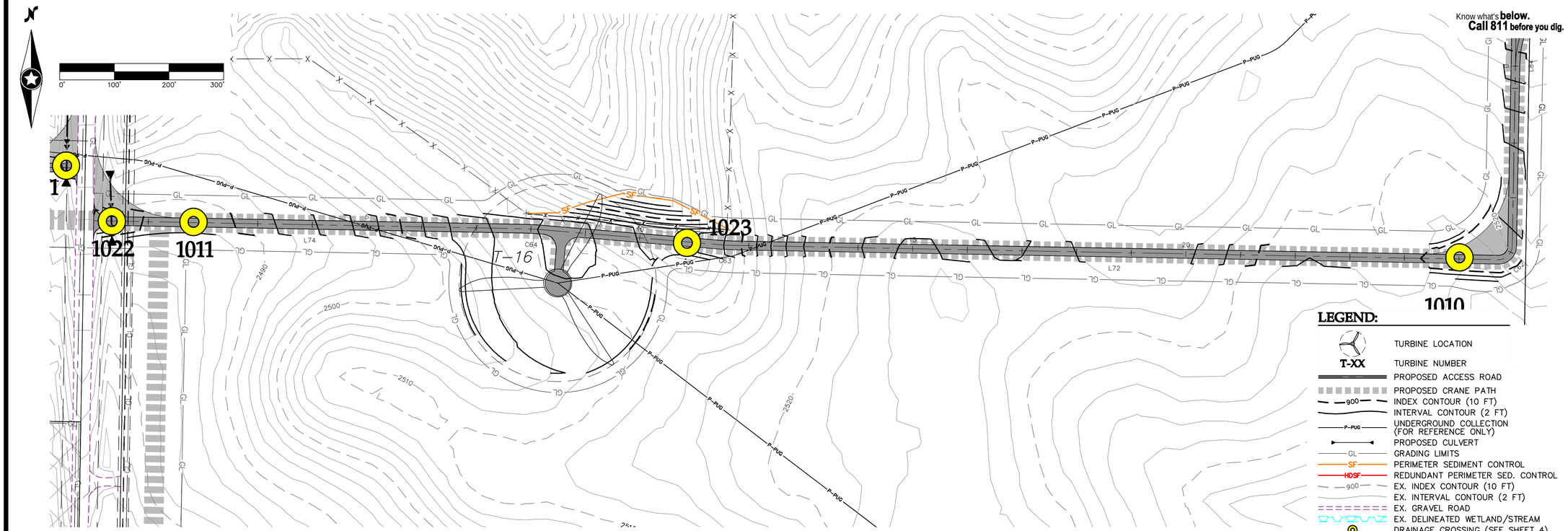
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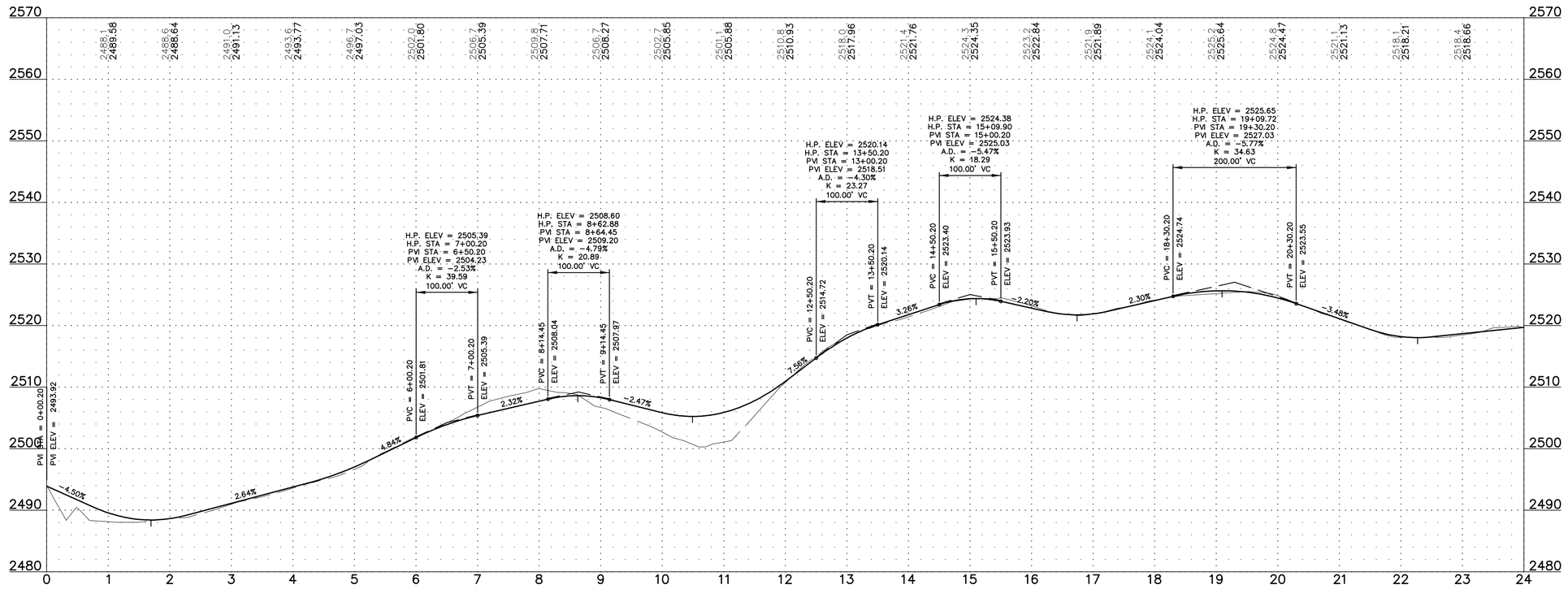



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## Road K - Sta. 0+00 - 26+00




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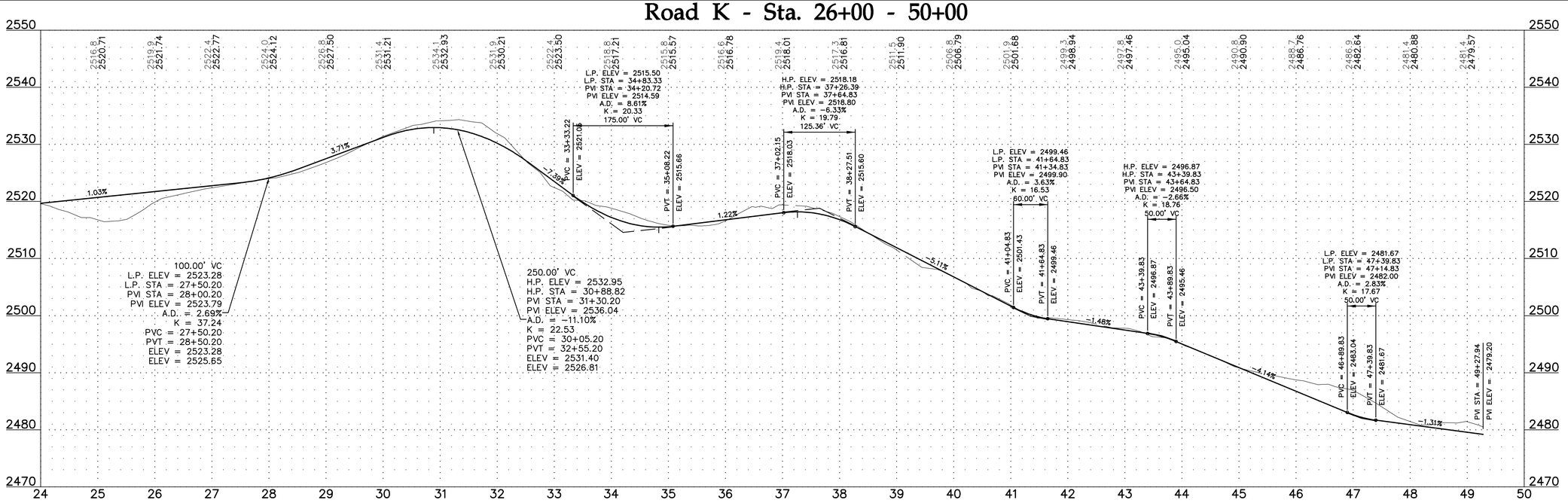
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| **Checked:** | RSC |
| **Drawn:** | TBR |
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**Revisions:**

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| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Road K - Sta 26+00-50+00**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

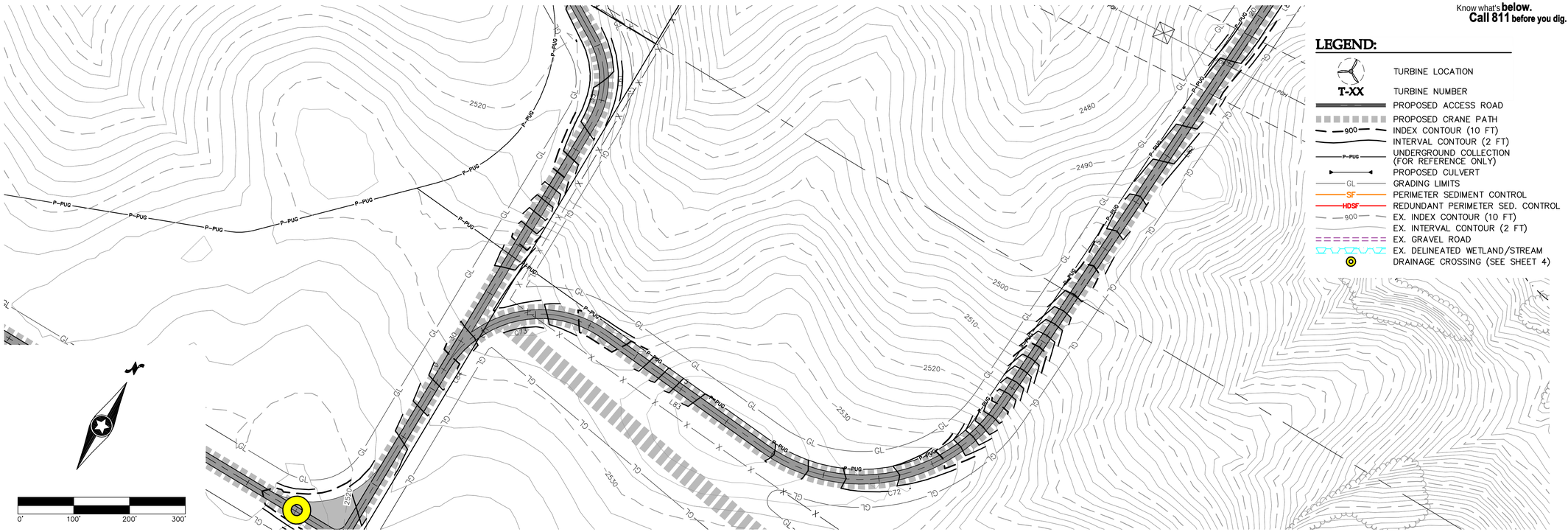
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**Date:** 08/03/15

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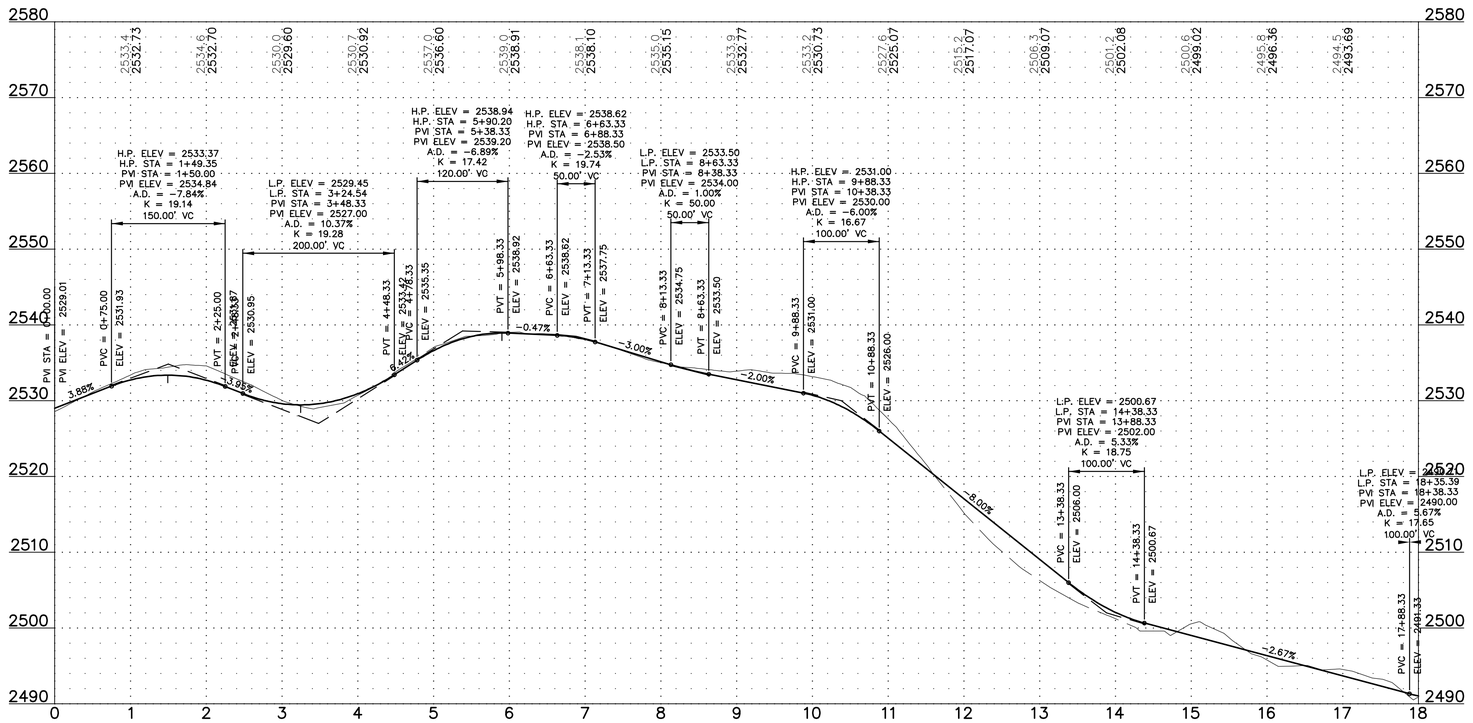



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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
- PROPOSED CRANE PATH
- 900 — INDEX CONTOUR (10 FT)
- INTERVAL CONTOUR (2 FT)
- P-PUG — UNDERGROUND COLLECTION (FOR REFERENCE ONLY)
- PROPOSED CULVERT
- GL — GRADING LIMITS
- SF — PERIMETER SEDIMENT CONTROL
- HDSF — REDUNDANT PERIMETER SED. CONTROL
- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road K - Sta. 24+00 - 46+00




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**Stark and Morton Counties, North Dakota**

**Road L - Sta 0+00-18+00**

**90% Civil Construction Plans**
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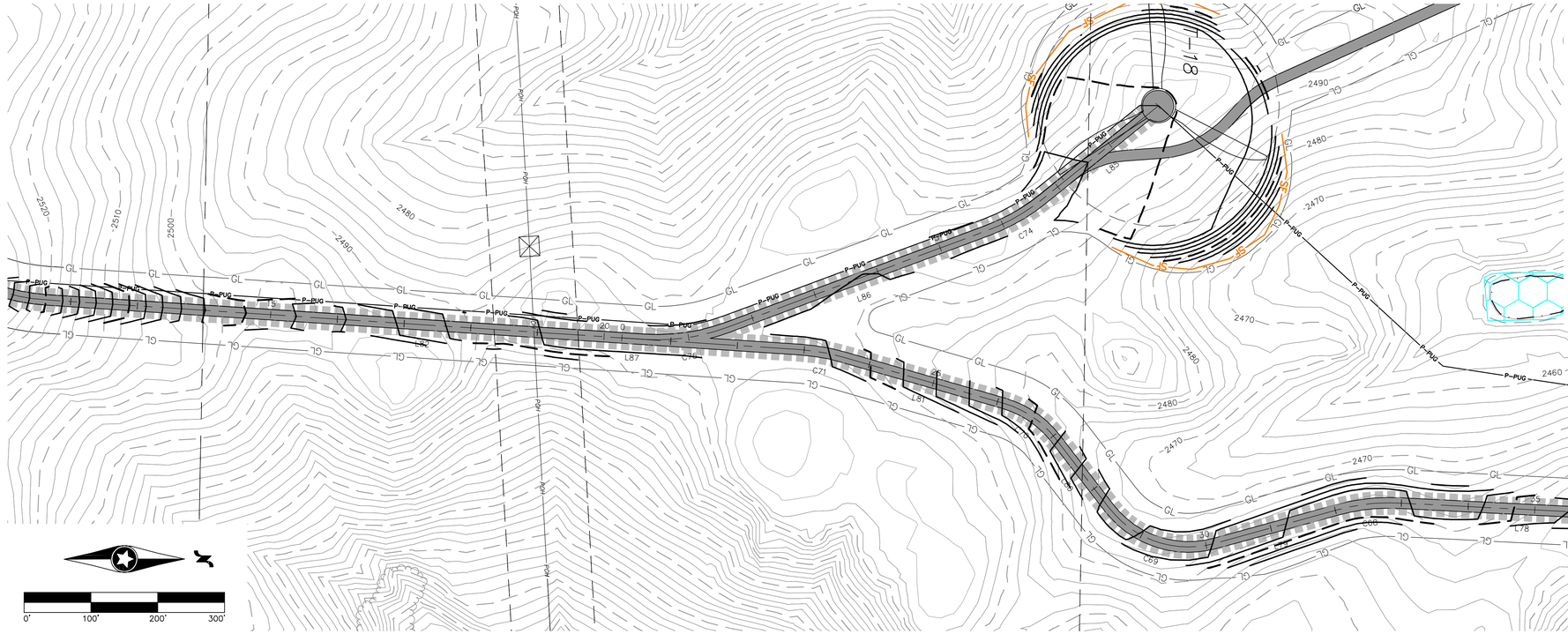
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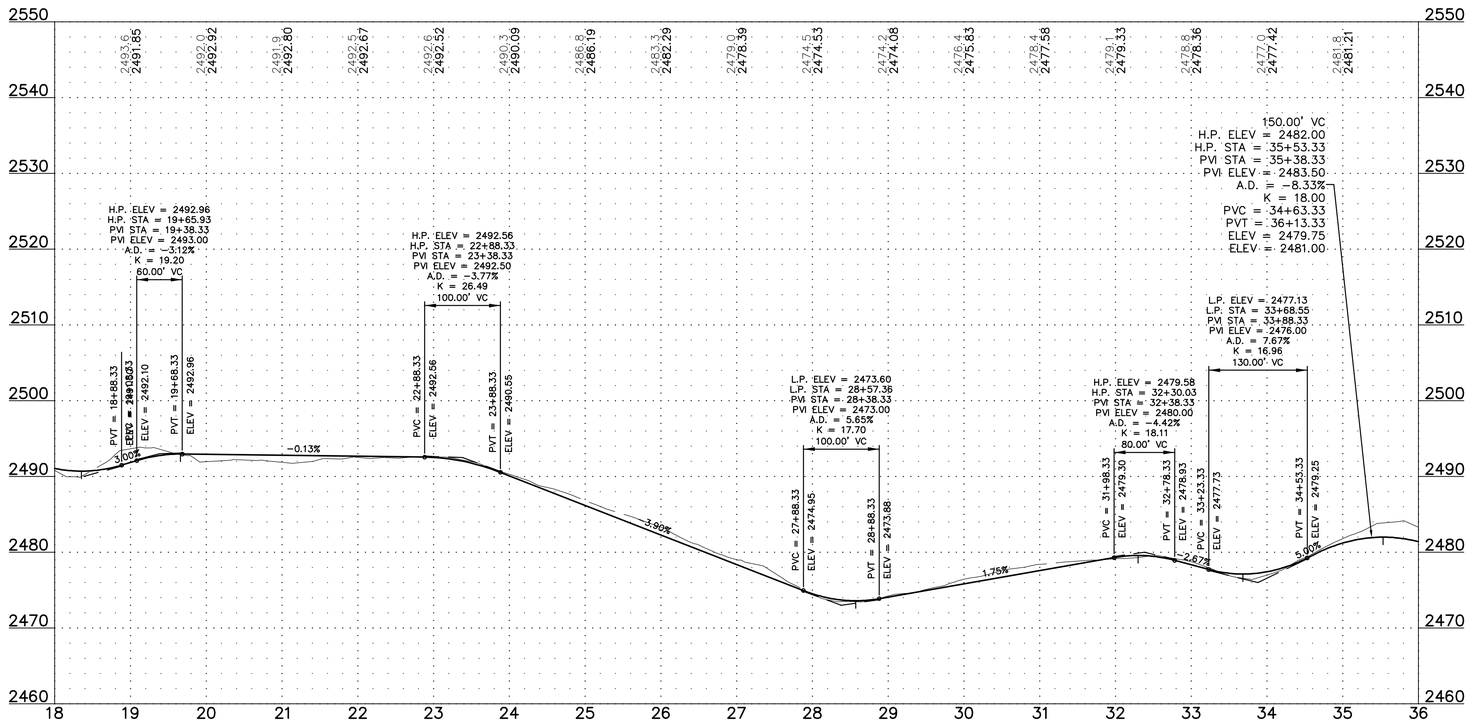
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# Road L - Sta. 18+00 - 36+00




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**Stark and Morton Counties, North Dakota**

**Road L - Sta 18+00-36+00**

**90% Civil Construction Plans**
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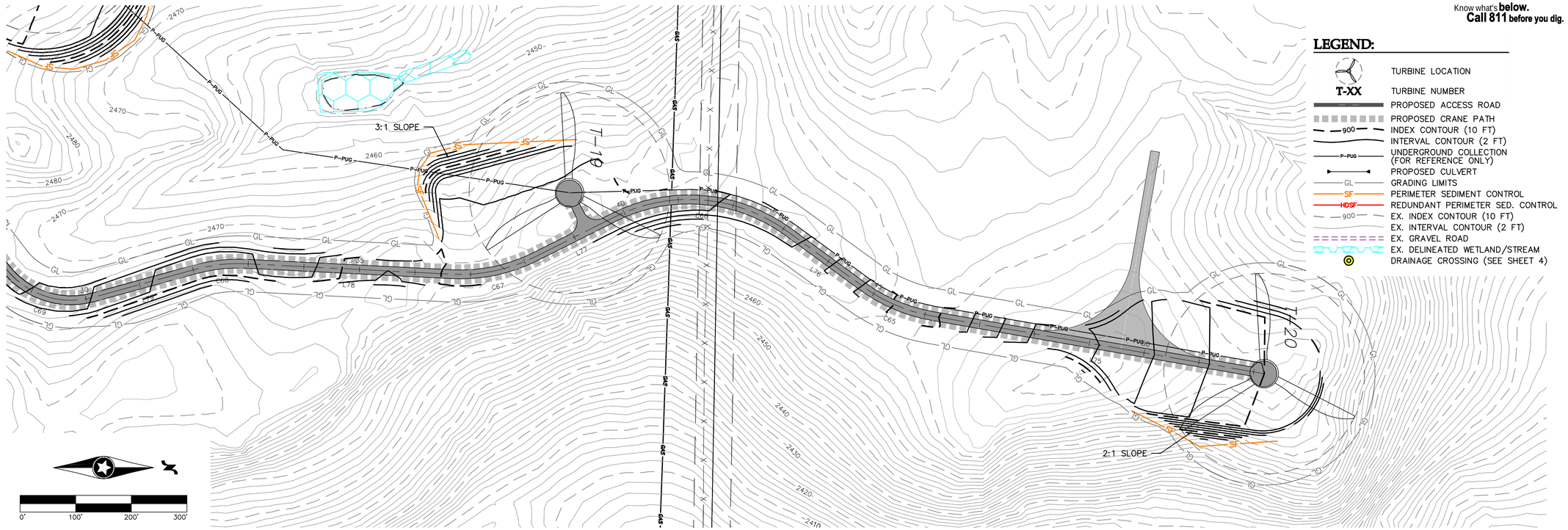
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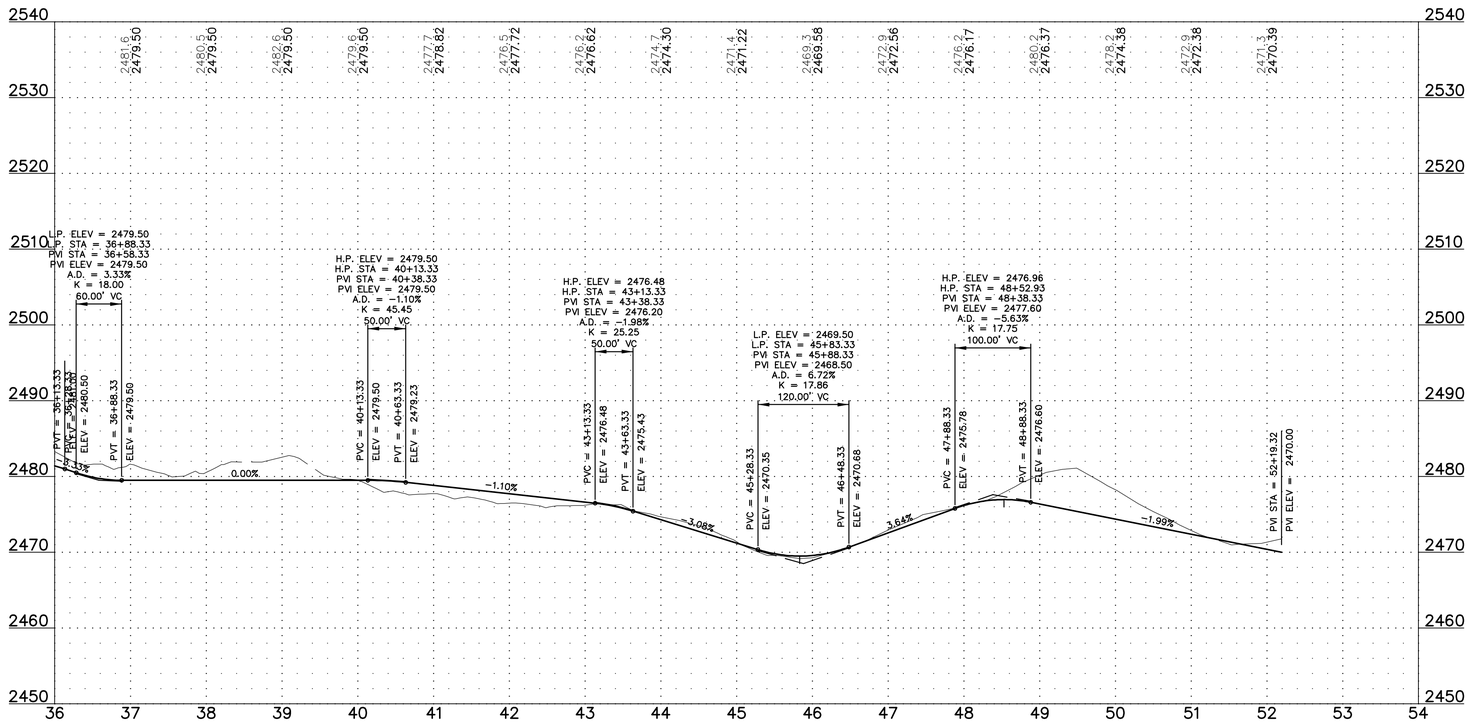



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- DRAINAGE CROSSING (SEE SHEET 4)

# Road L - Sta. 36+00 - 54+00




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**Stark and Morton Counties, North Dakota**

**Road L - Sta 36+00-54+00**

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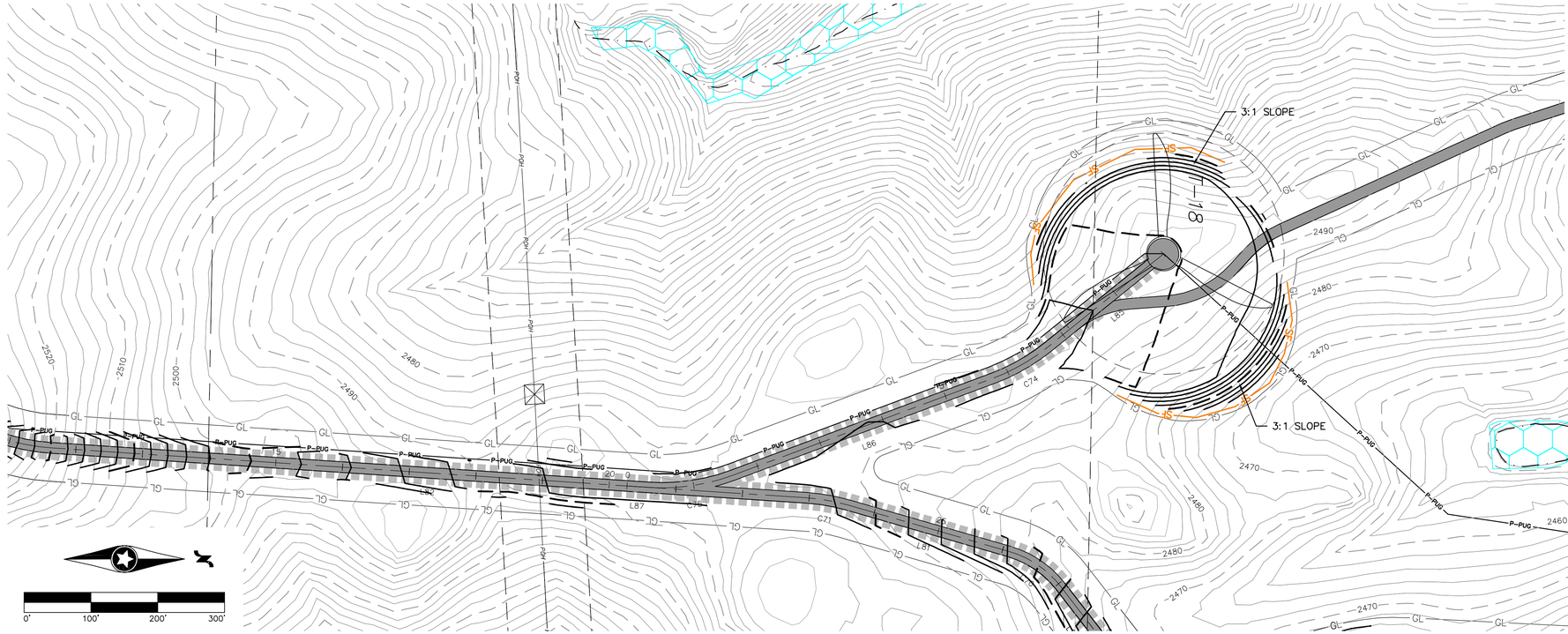
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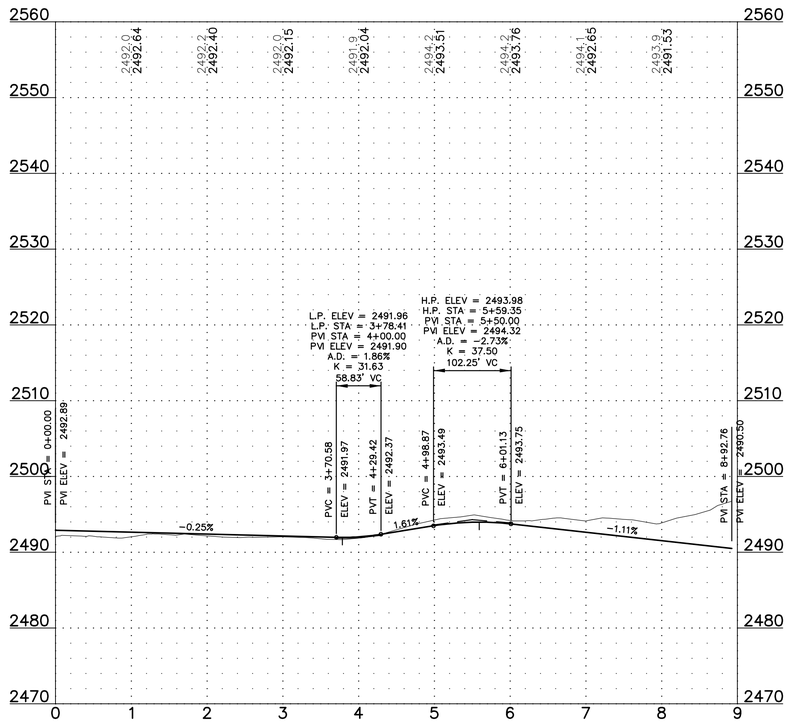



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- DRAINAGE CROSSING (SEE SHEET 4)

# Road M - Sta. 0+00 - 9+00




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**Stark and Morton Counties, North Dakota**

**Road M - Sta 0+00-9+00**

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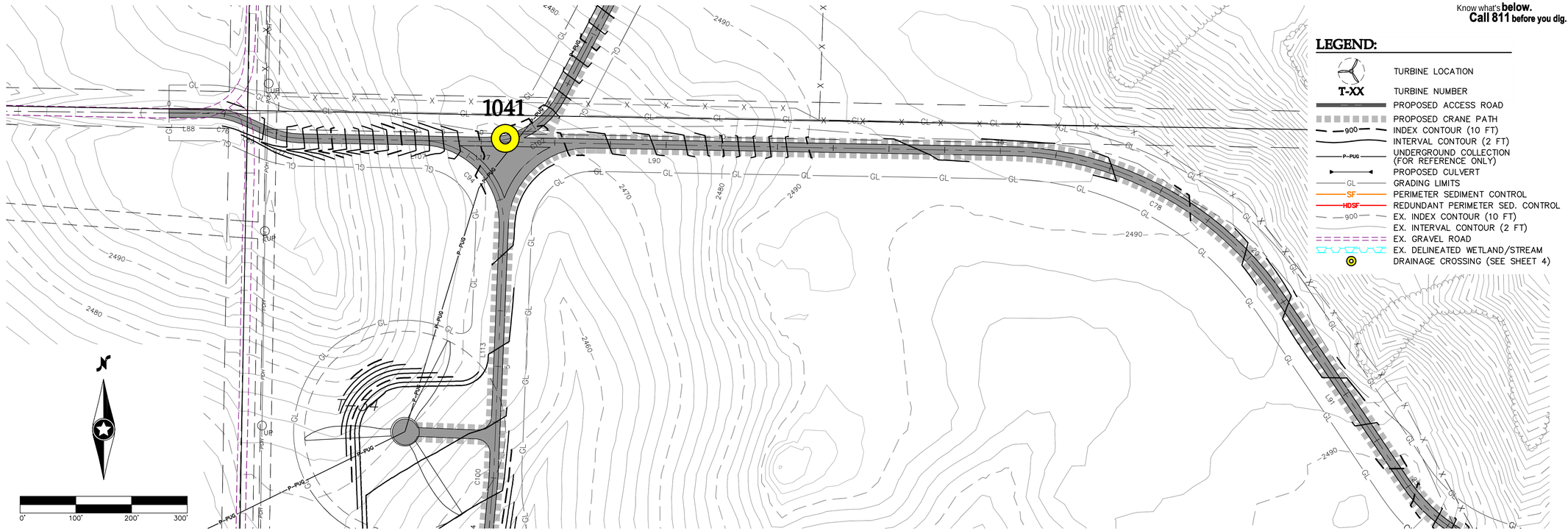
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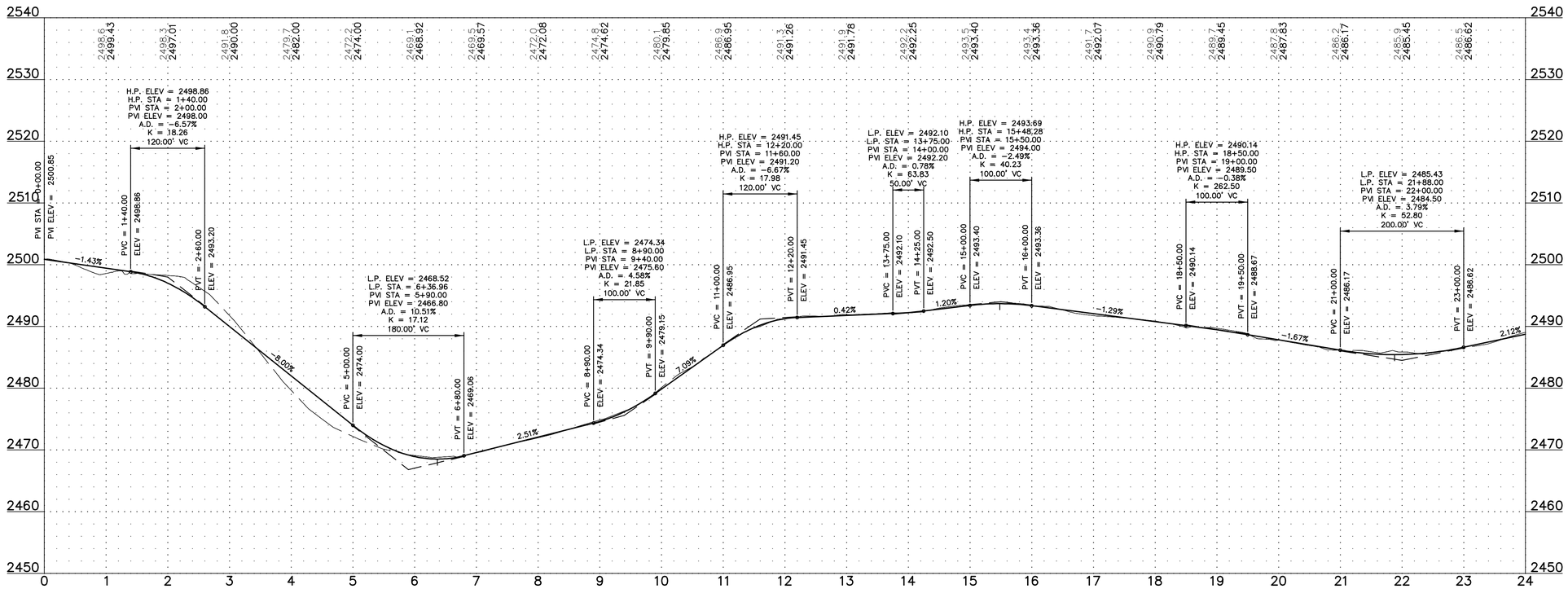
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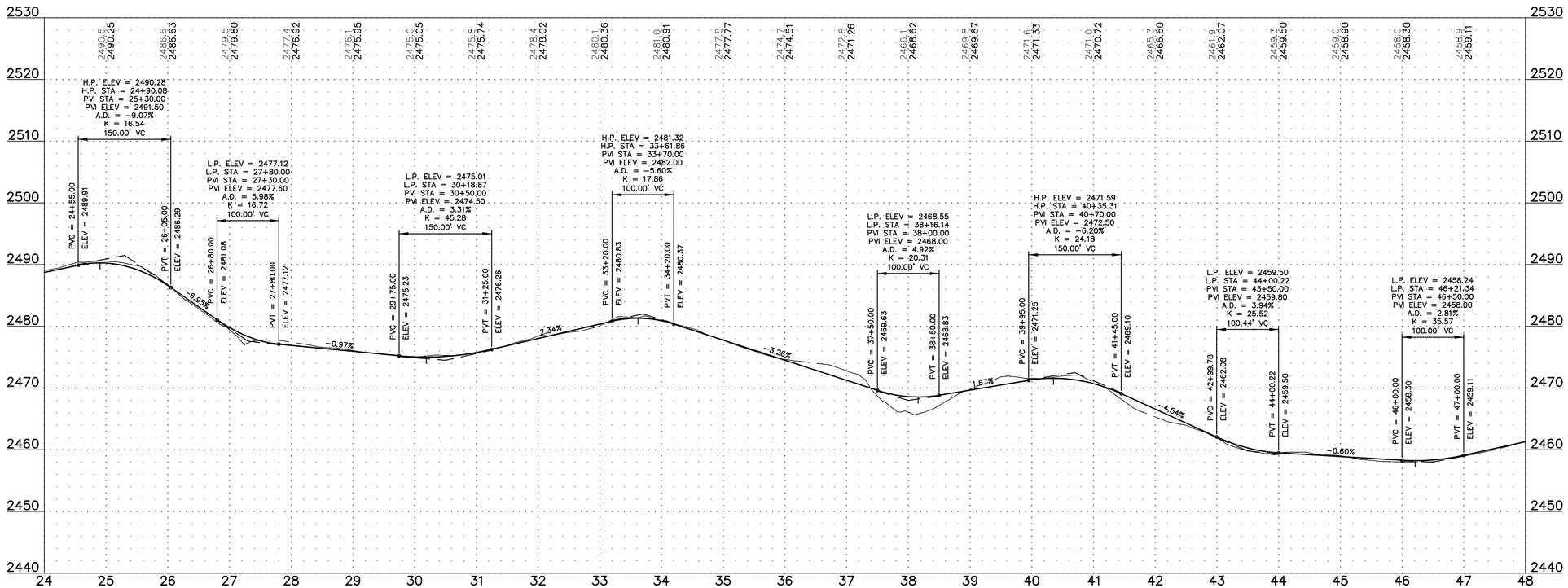
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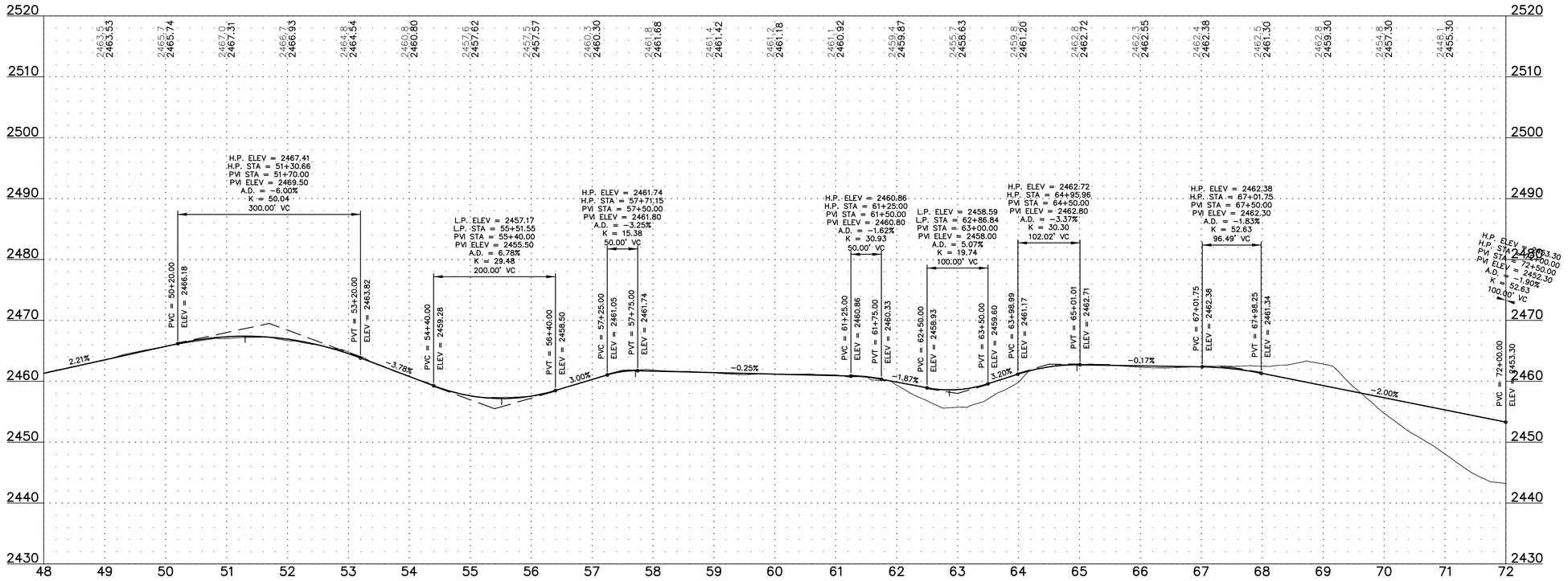



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**LEGEND:**

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- DRAINAGE CROSSING (SEE SHEET 4)

# Road N - Sta. 48+00 - 72+00




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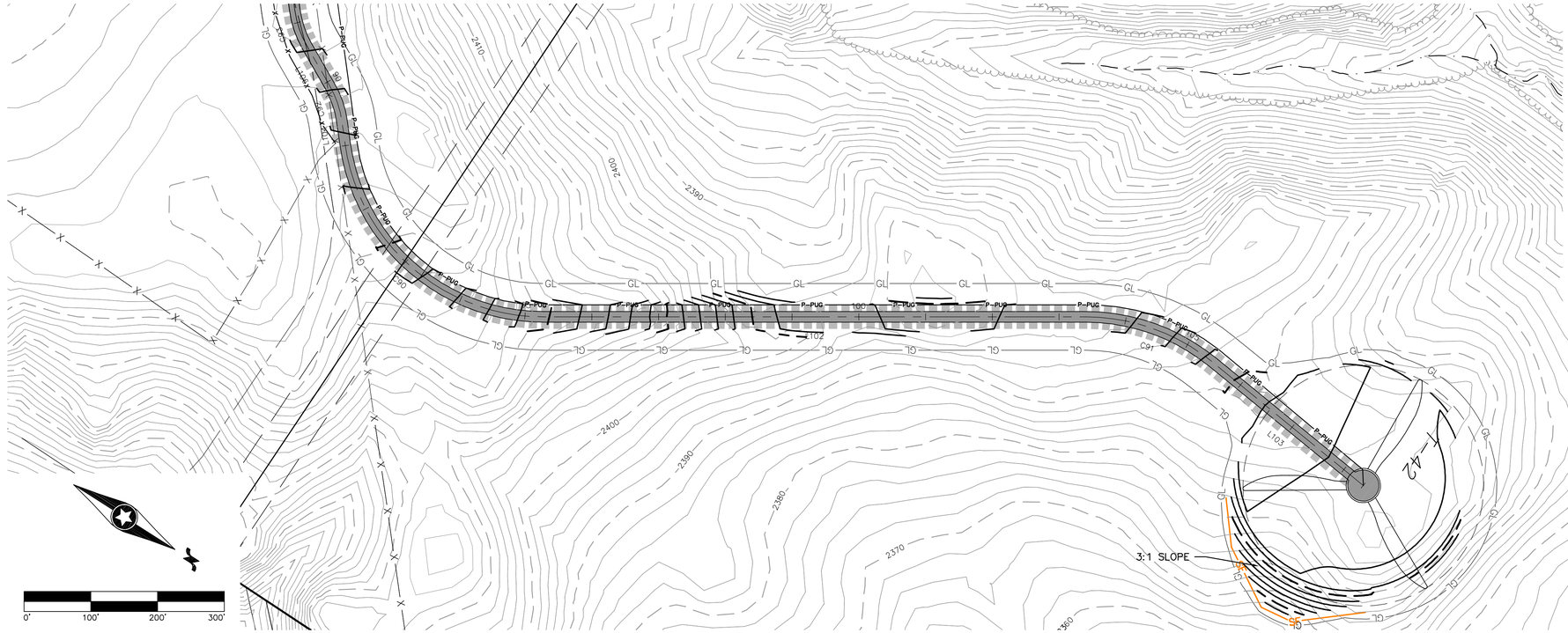
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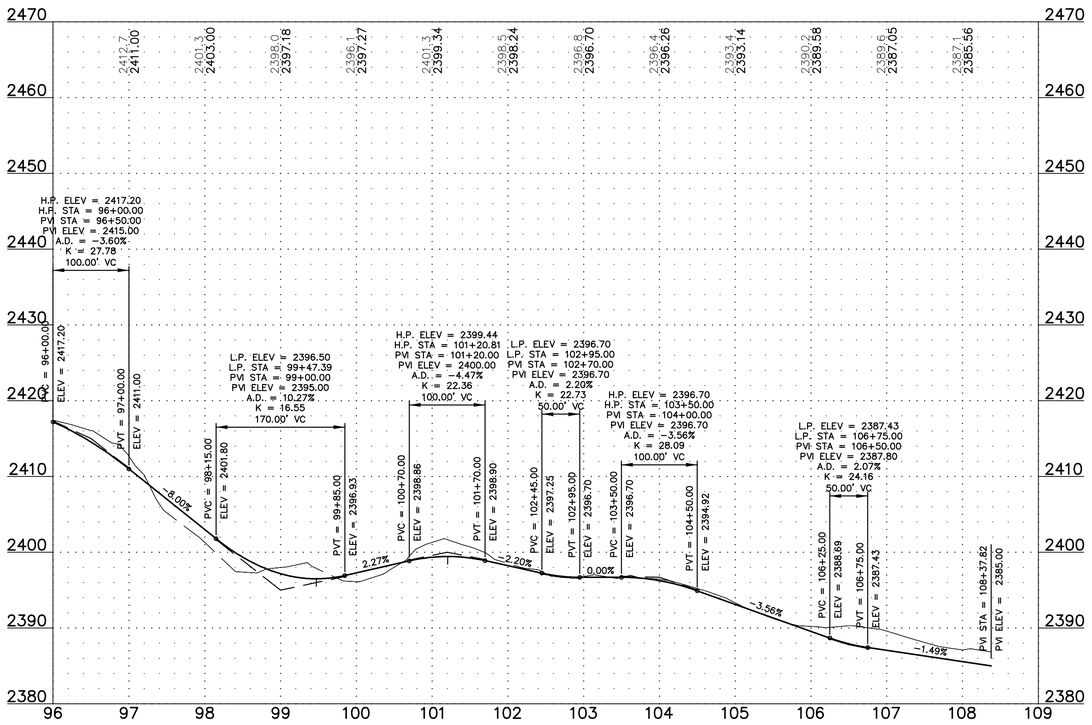



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# Road N - Sta. 96+00 - 109+00




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**Stark and Morton Counties, North Dakota**

**Road N - Sta 96+00-109+00**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

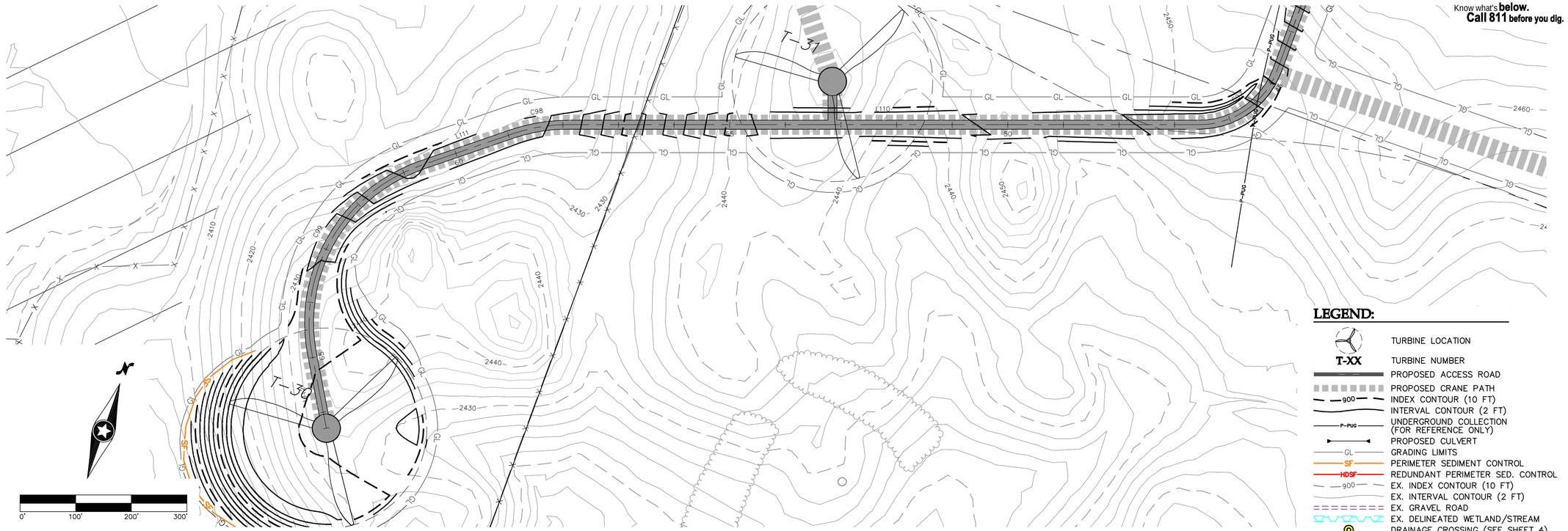
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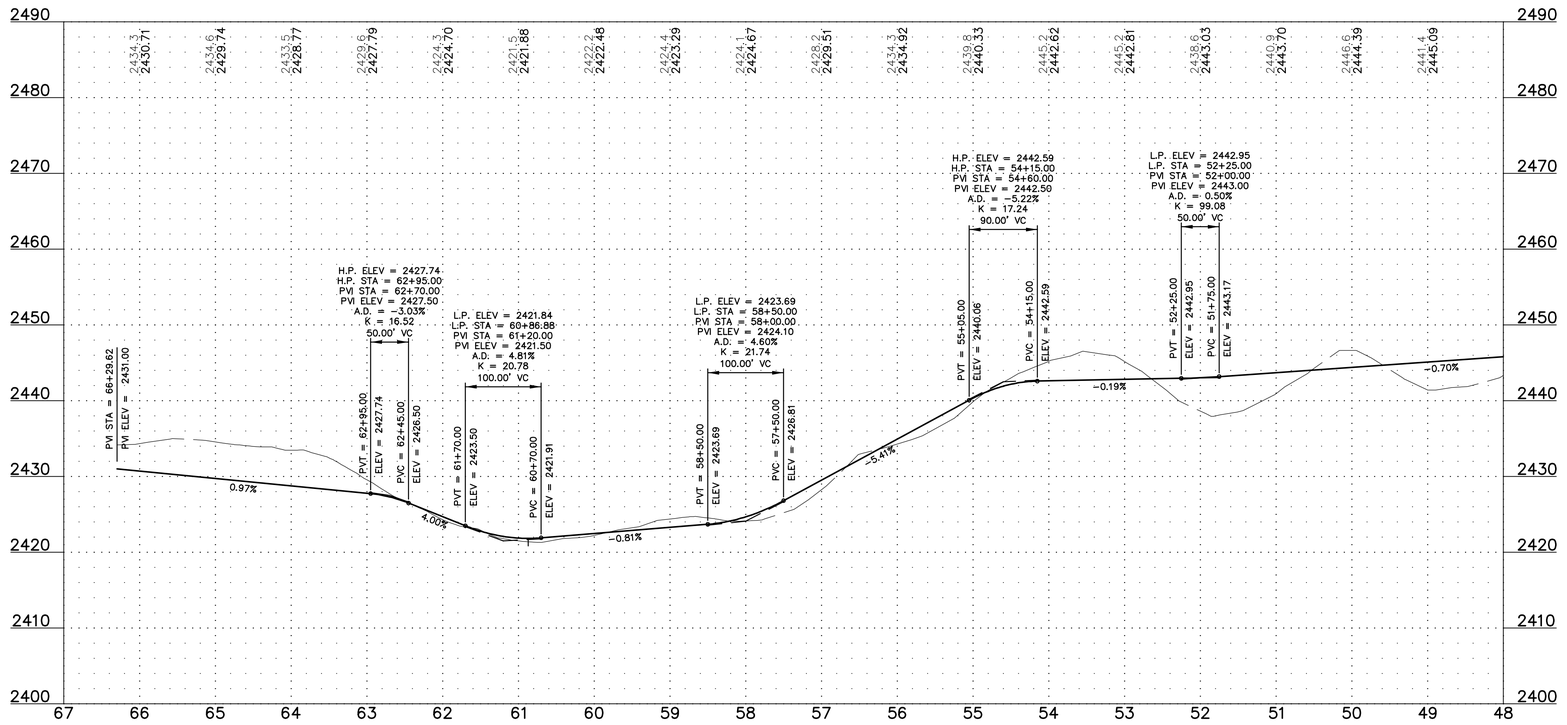
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# Road O - Sta. 64+00 - 48+00




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Revisions:

| # | DATE | DESCRIPTION |
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| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

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# Sunflower Wind Project

Stark and Morton Counties, North Dakota

Road O - Sta 64+00-48+00

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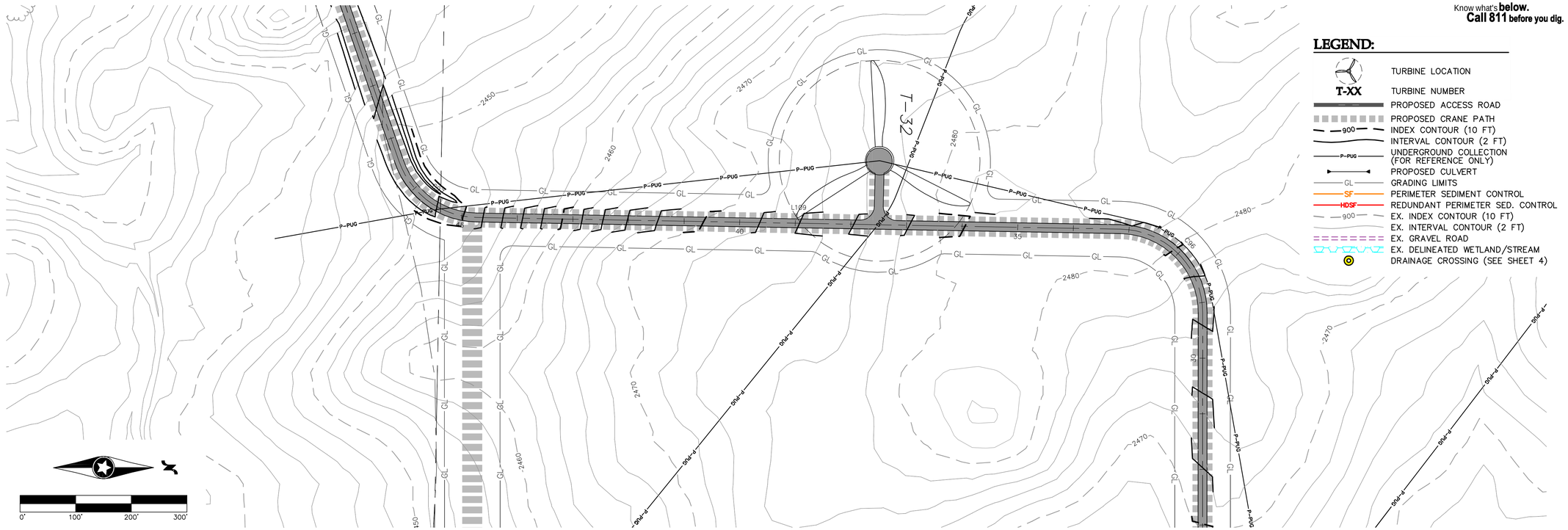
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Date: 08/03/15

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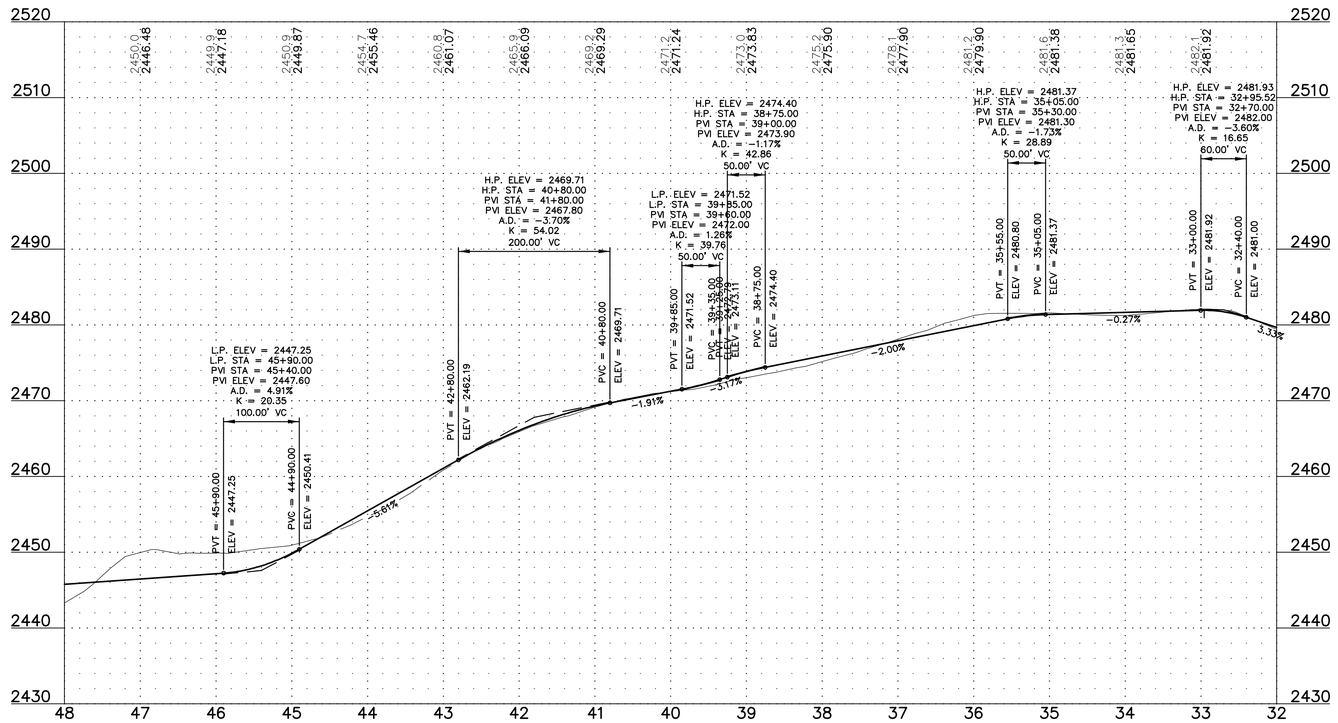



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## LEGEND:

- TURBINE LOCATION
- T-XX — TURBINE NUMBER
- PROPOSED ACCESS ROAD
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- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road O - Sta. 48+00 - 32+00




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**Road O - Sta 48+00-32+00**

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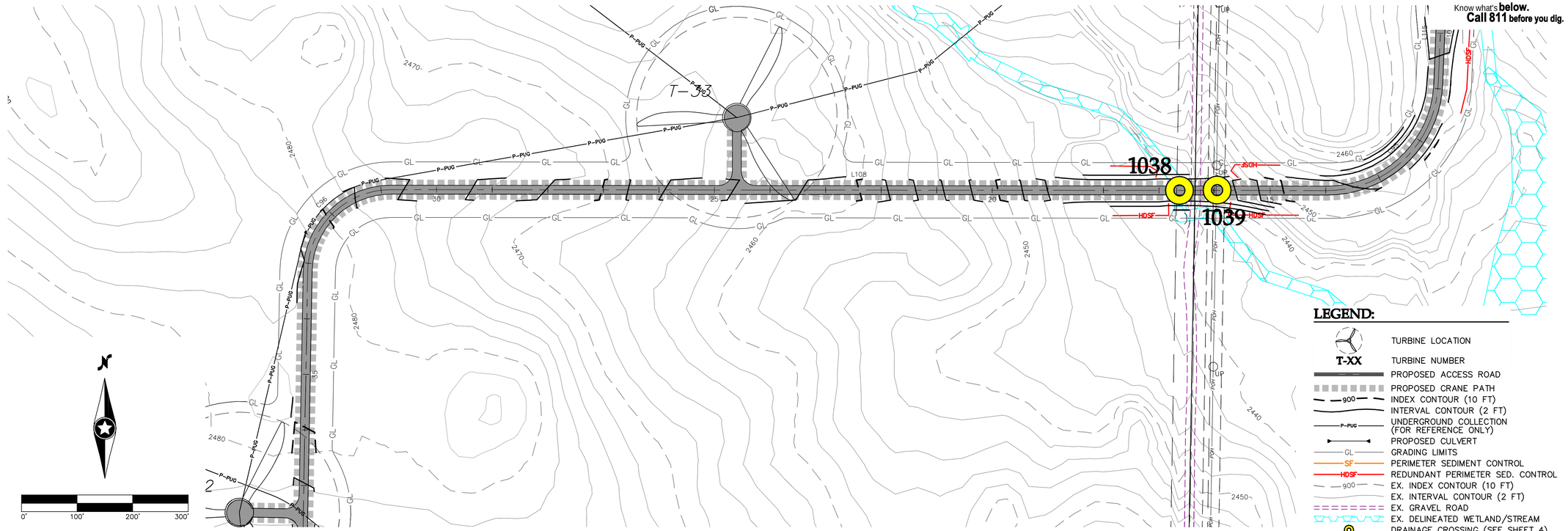
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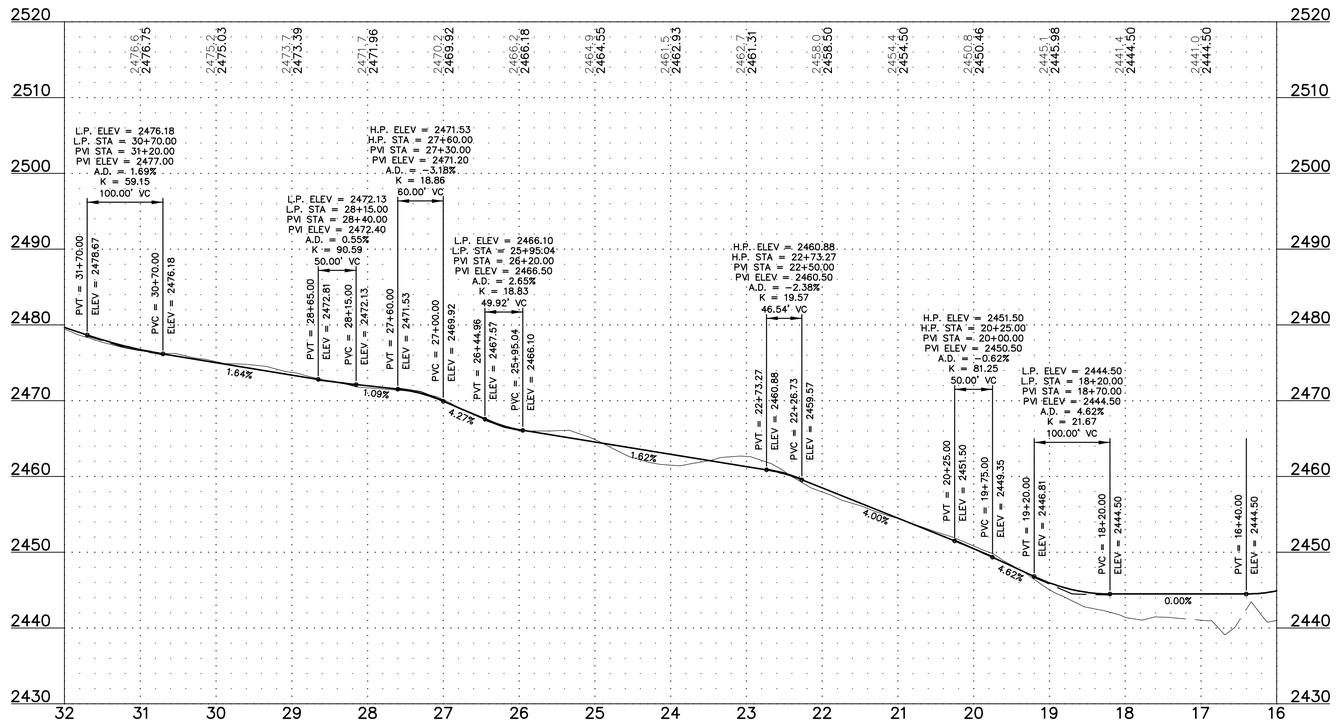
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# Road O - Sta. 32+00 - 16+00




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**Road O - Sta 32+00-16+00**

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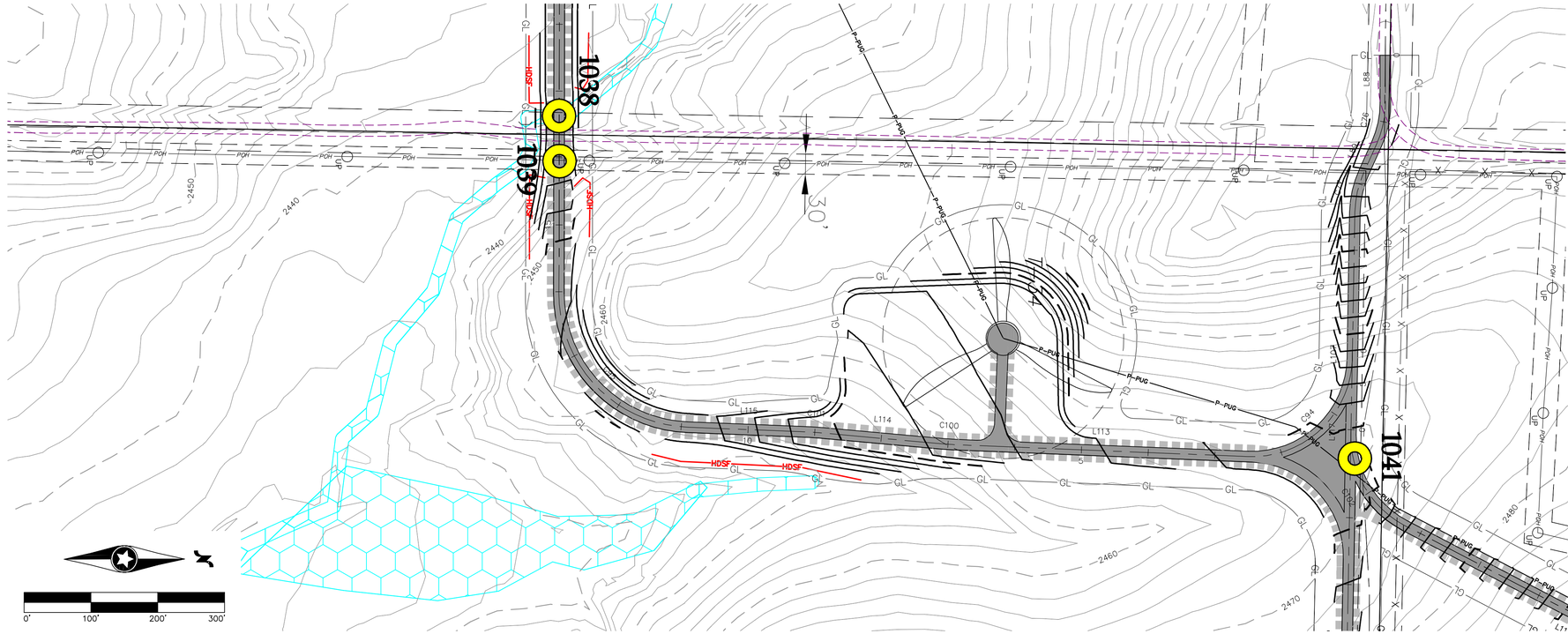
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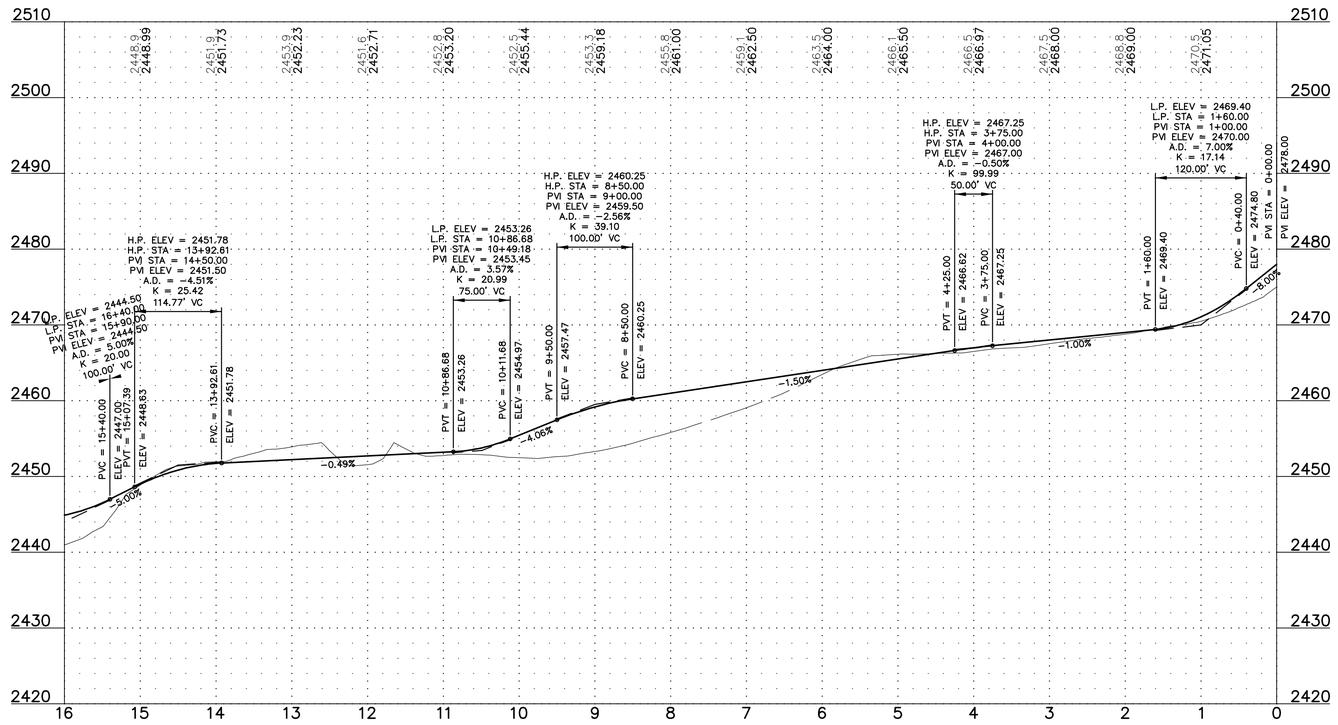



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# Road O - Sta. 16+00 - 0+00




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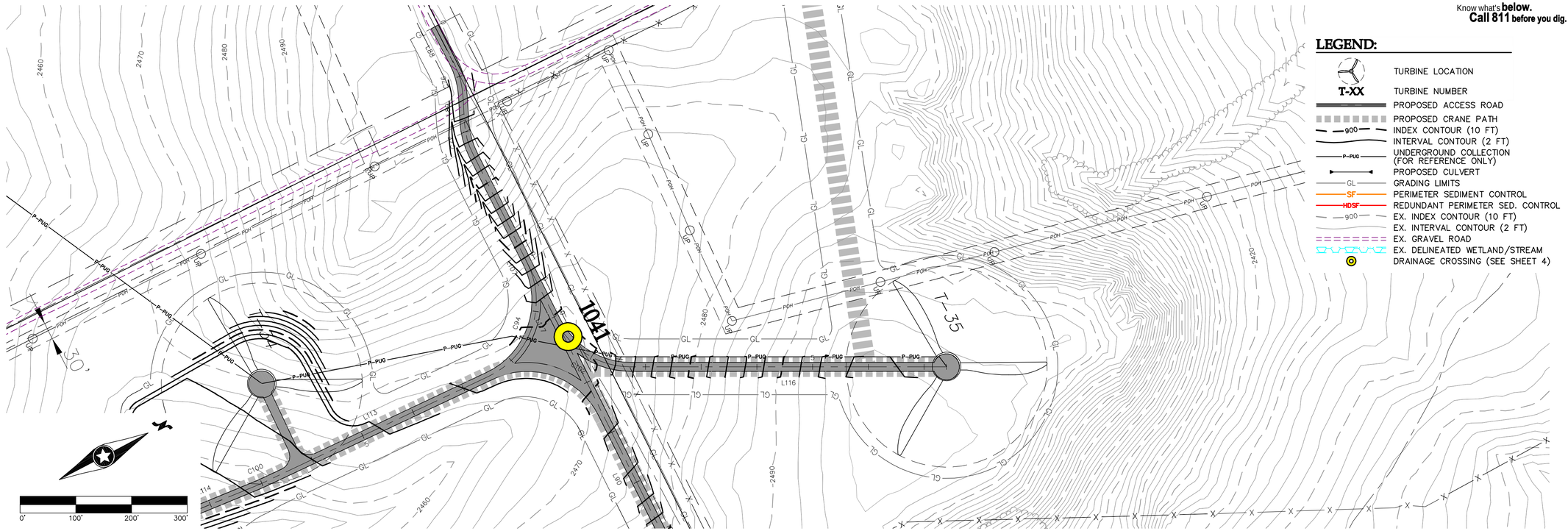
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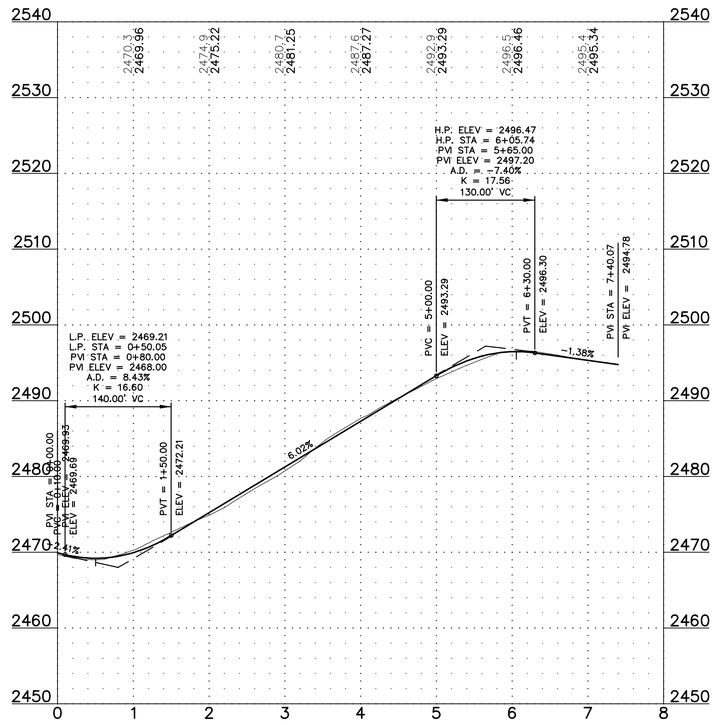



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# Road P - Sta. 0+00 - 8+00




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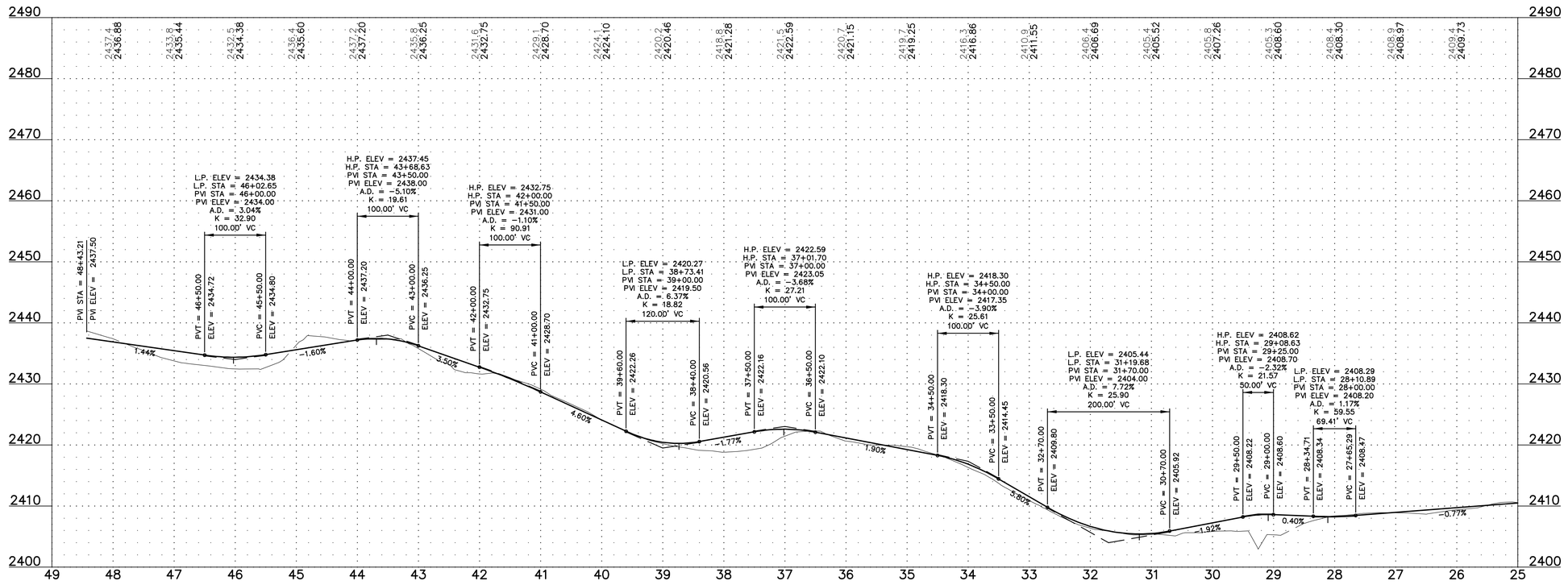



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## Road Q - Sta. 49+00 - 25+00




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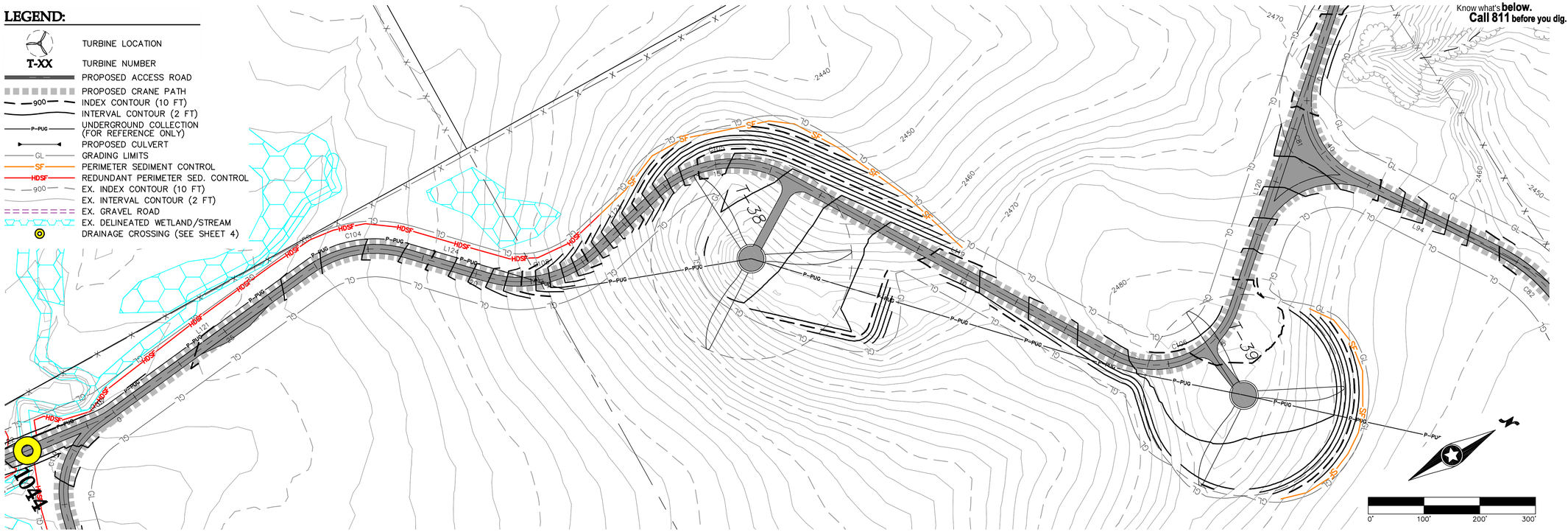
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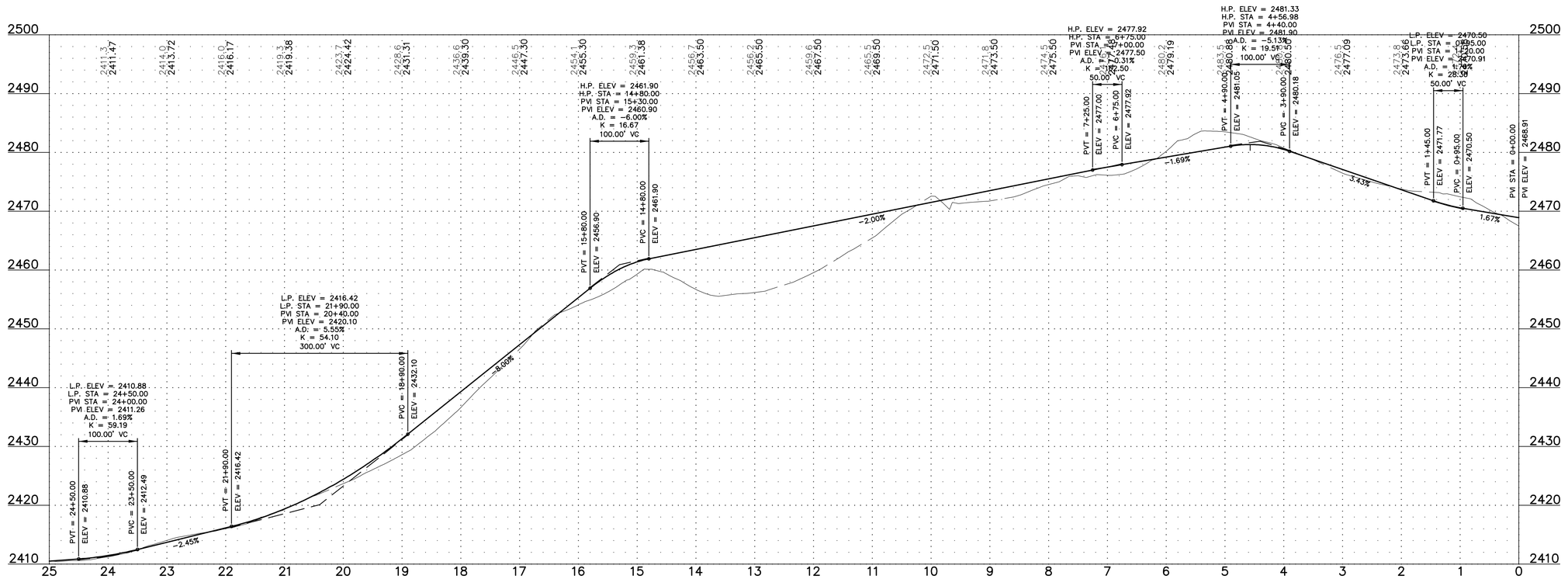
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Stark and Morton Counties, North Dakota

**Road Q - Sta 25+00-0+00**

**90% Civil Construction Plans**
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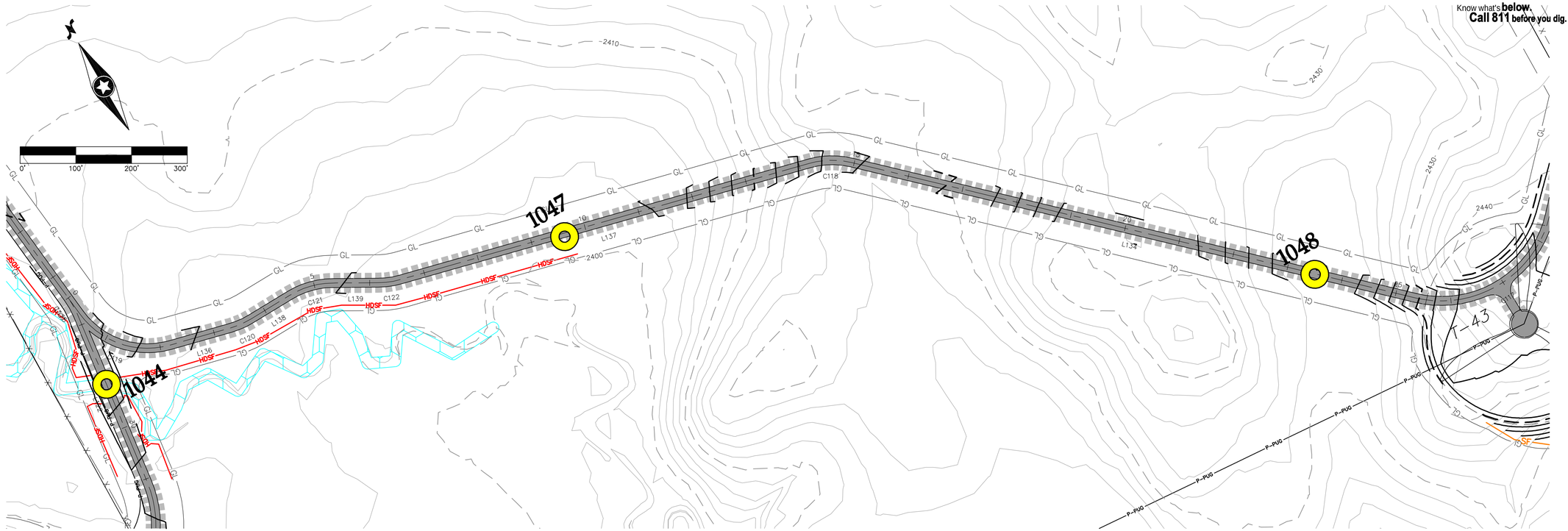
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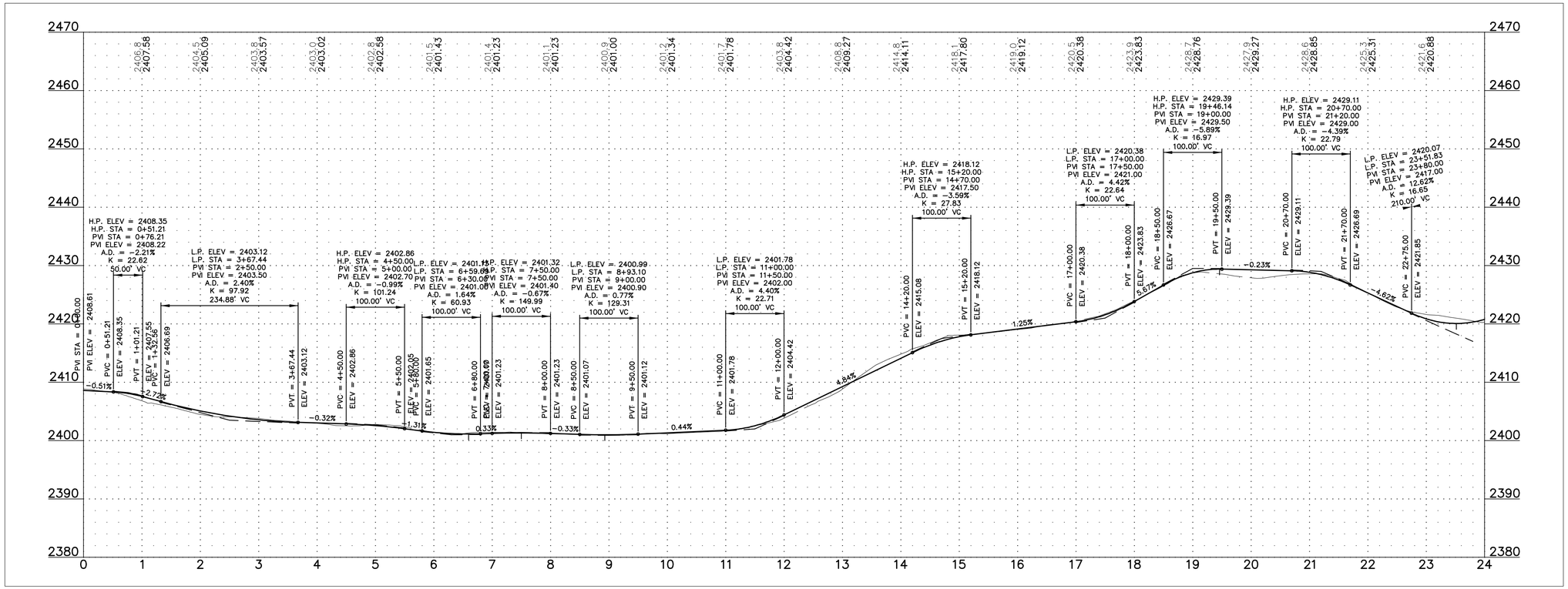


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## Road S - Sta. 0+00 - 24+00




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Stark and Morton Counties, North Dakota

Road S - Sta 0+00-24+00

90% Civil Construction Plans
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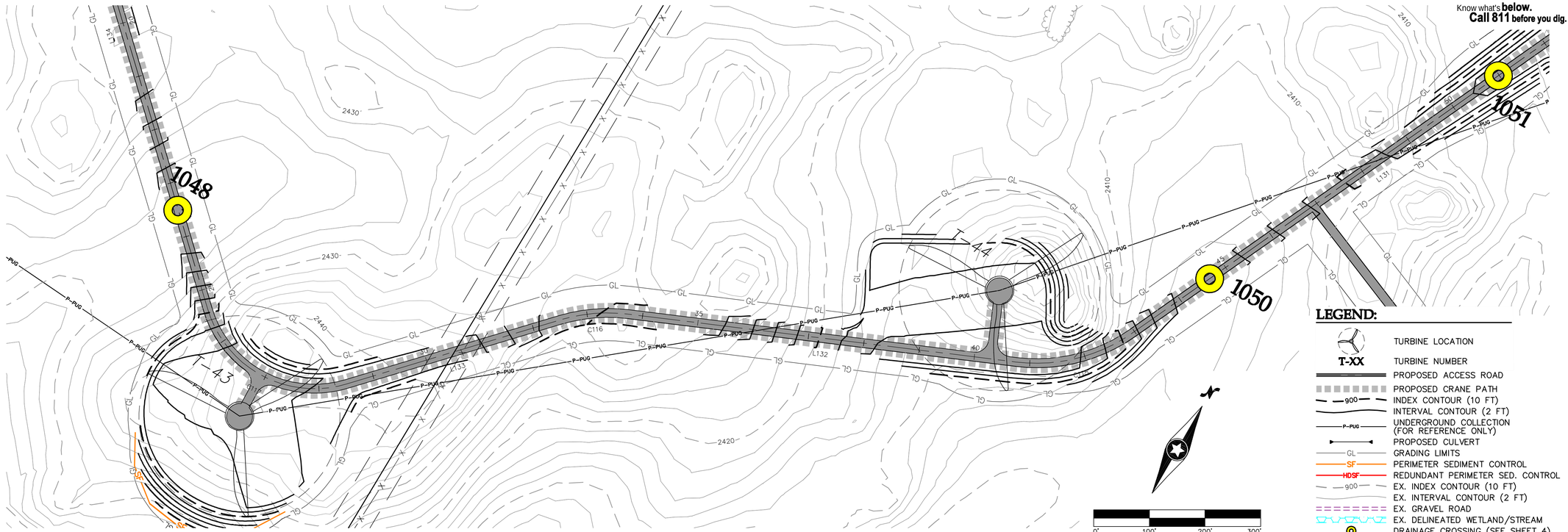
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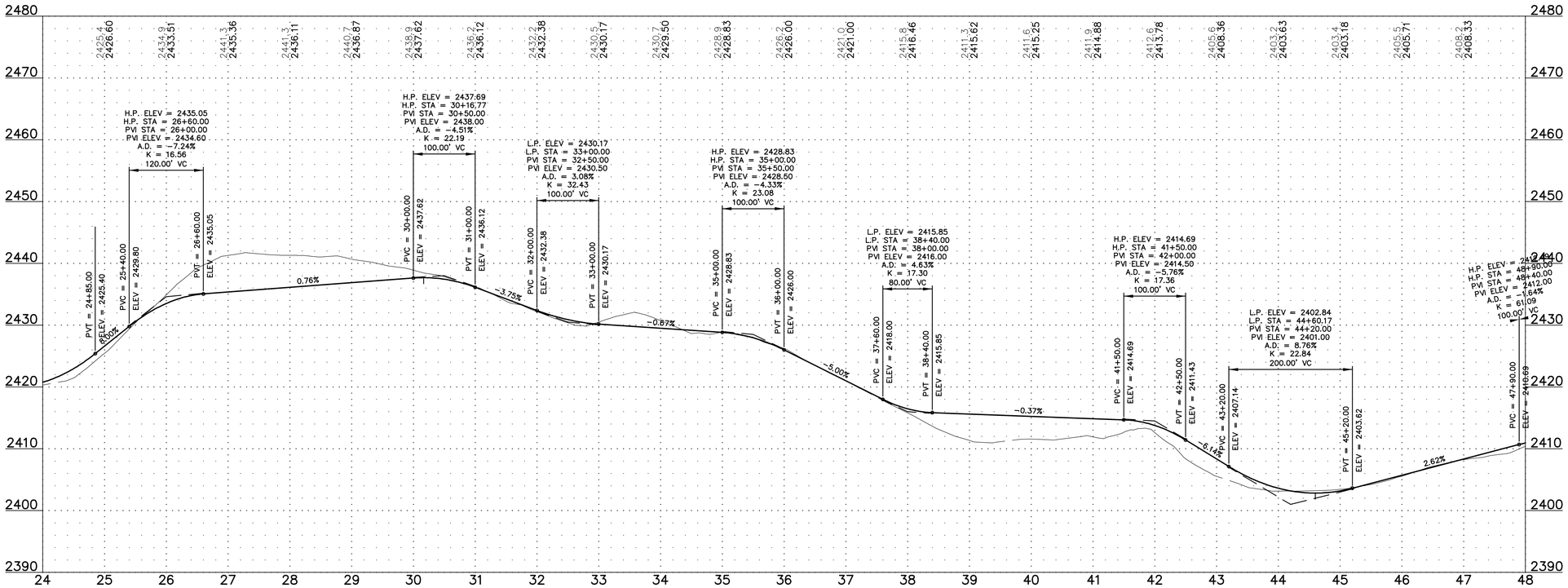



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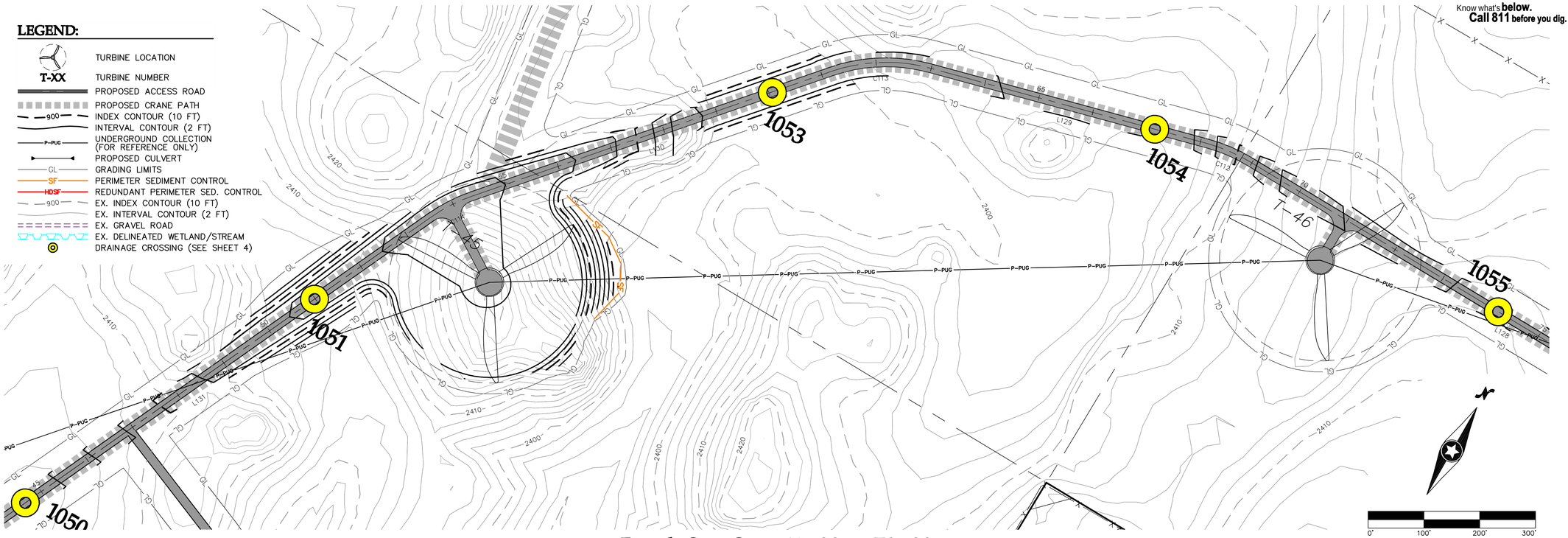
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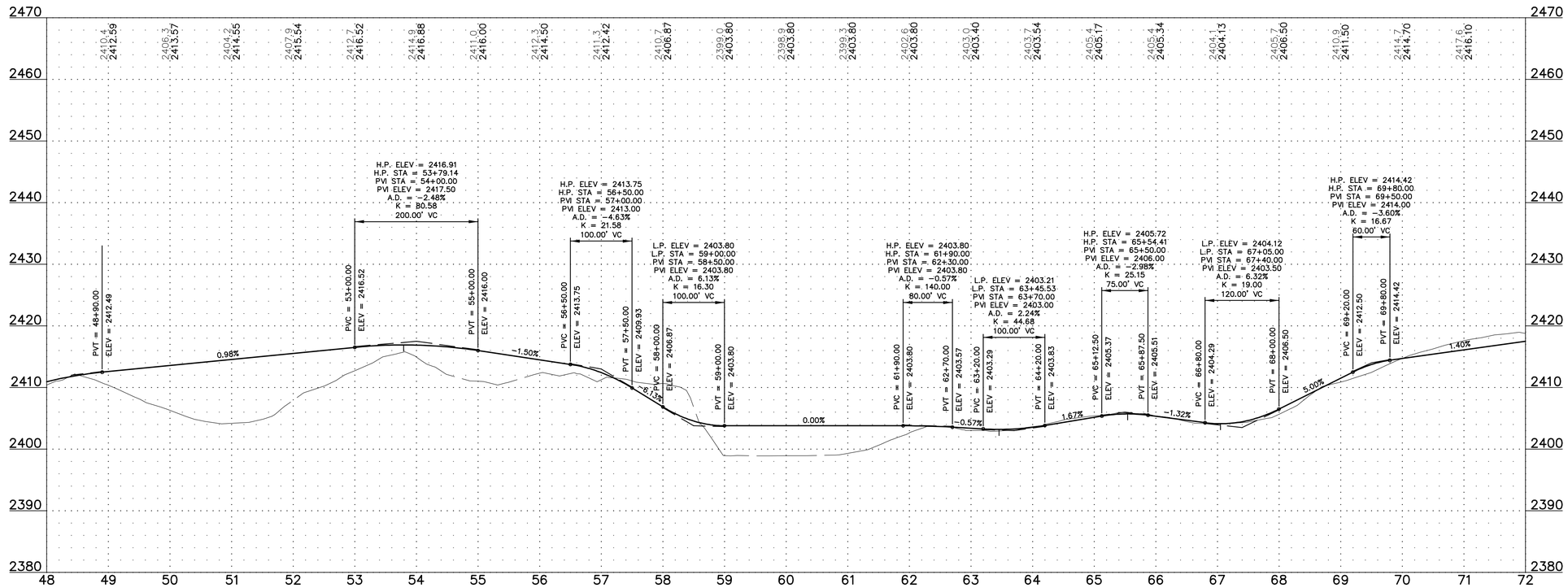
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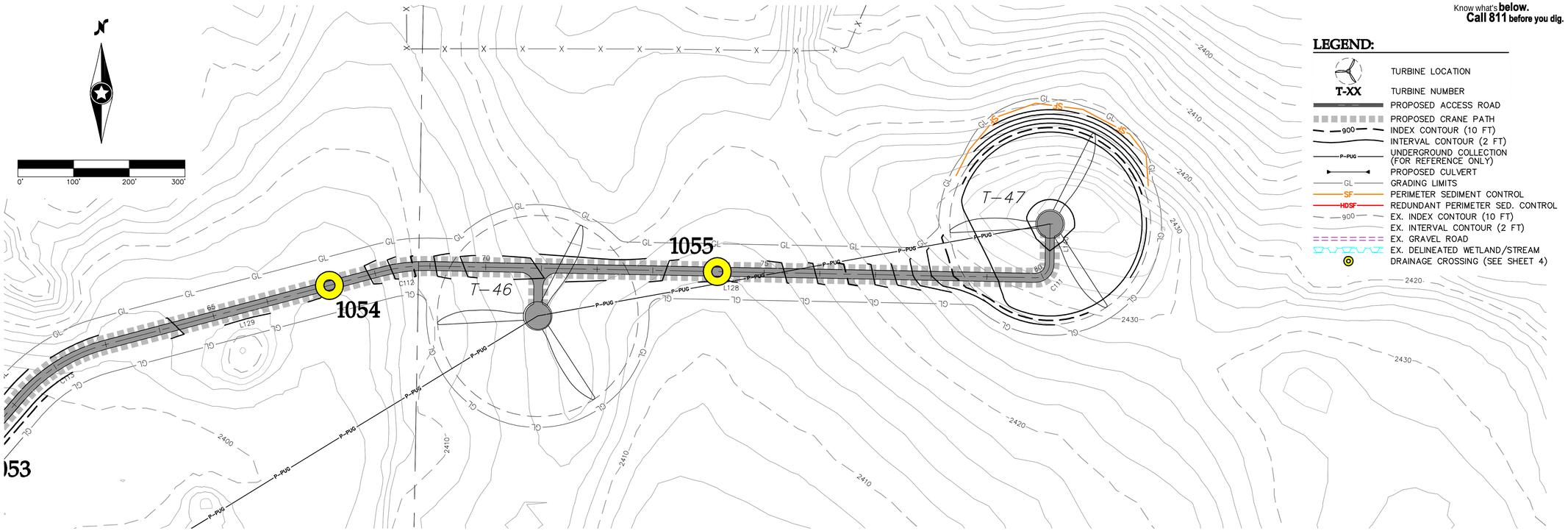
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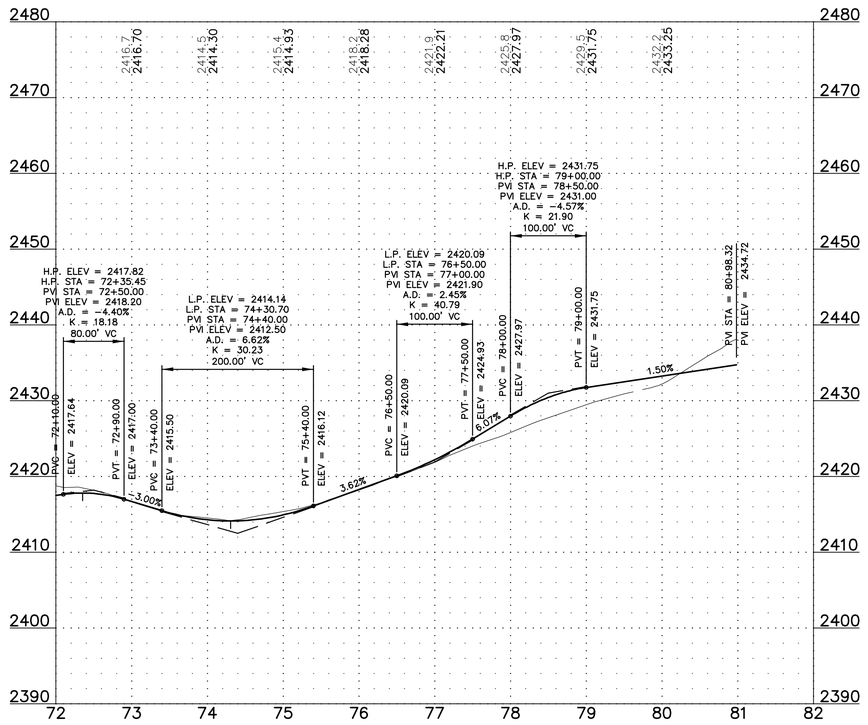



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- SF — PERIMETER SEDIMENT CONTROL
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- 900 — EX. INDEX CONTOUR (10 FT)
- EX. INTERVAL CONTOUR (2 FT)
- EX. GRAVEL ROAD
- EX. DELINEATED WETLAND/STREAM
- DRAINAGE CROSSING (SEE SHEET 4)

# Road S - Sta. 72+00 - 82+00




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| | |
|---|---|
| **Designed:** | DFK |
| **Checked:** | RSC |
| **Drawn:** | TBR |
| **Record Drawing by/date:** | |

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

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179 Lincoln Street, Suite 500
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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

**Road S - Sta 72+00-82+00**

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15

Sheet: 87 OF 91

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| Road A | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L1 | 295.200 | | S1° 14' 41.78"W | 1565965.70,429657.22 | 1565959.28,429362.09 |
| C1 | 78.719 | 300.000 | | 1565959.28,429362.09 | 1565947.33,429284.51 |
| L12 | 1181.272 | | S16° 16' 44.82"W | 1565947.33,429284.51 | 1565616.20,428150.60 |
| C2 | 421.095 | 300.000 | | 1565616.20,428150.60 | 1565293.21,427936.75 |
| L2 | 718.451 | | N83° 17' 51.58"W | 1565293.21,427936.75 | 1564579.67,428020.60 |
| C3 | 72.346 | 300.000 | | 1564579.67,428020.60 | 1564509.53,428037.58 |
| L3 | 436.894 | | N69° 28' 49.82"W | 1564509.53,428037.58 | 1564100.35,428190.72 |
| C4 | 117.149 | 300.000 | | 1564100.35,428190.72 | 1563985.49,428209.60 |
| L10 | 452.923 | | S88° 08' 44.63"W | 1563985.49,428209.60 | 1563532.80,428194.94 |
| C12 | 69.359 | 300.000 | | 1563532.80,428194.94 | 1563463.84,428200.70 |
| L11 | 627.825 | | N78° 36' 27.65"W | 1563463.84,428200.70 | 1562848.38,428324.71 |
| C5 | 616.448 | 350.000 | | 1562848.38,428324.71 | 1562429.26,427984.53 |
| L13 | 708.090 | | S0° 28' 41.98"W | 1562429.26,427984.53 | 1562423.35,427276.46 |
| C13 | 101.280 | 300.000 | | 1562423.35,427276.46 | 1562405.58,427177.24 |
| L14 | 667.695 | | S19° 49' 17.19"W | 1562405.58,427177.24 | 1562179.18,426549.10 |
| C6 | 107.776 | 300.000 | | 1562179.18,426549.10 | 1562161.43,426443.39 |
| L4 | 451.573 | | S0° 45' 44.28"E | 1562161.43,426443.39 | 1562167.44,425991.85 |
| C7 | 257.395 | 300.000 | | 1562167.44,425991.85 | 1562066.65,425763.53 |
| L5 | 213.804 | | S48° 23' 47.33"W | 1562066.65,425763.53 | 1561906.78,425621.57 |
| C8 | 127.522 | 300.000 | | 1561906.78,425621.57 | 1561796.54,425559.39 |

| Road A | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L7 | 1069.116 | | S72° 45' 05.26"W | 1561796.54,425559.39 | 1560775.51,425242.38 |
| C10 | 101.329 | 150.000 | | 1560775.51,425242.38 | 1560676.16,425246.03 |
| L8 | 81.162 | | N68° 32' 36.87"W | 1560676.16,425246.03 | 1560600.62,425275.72 |
| C11 | 105.640 | 300.000 | | 1560600.62,425275.72 | 1560497.59,425296.44 |
| L9 | 1207.783 | | N88° 43' 09.66"W | 1560497.59,425296.44 | 1559290.11,425323.43 |
| C9 | 39.270 | 25.000 | | 1559290.11,425323.43 | 1559265.68,425348.98 |
| L6 | 24.548 | | N1° 16' 50.34"E | 1559265.68,425348.98 | 1559266.22,425373.52 |

| Road B | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L15 | 1004.372 | | N1° 14' 41.77"E | 1566582.21,429654.44 | 1566604.03,430658.57 |

| Road C | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L16 | 414.943 | | N1° 42' 47.04"W | 1570607.83,429584.00 | 1570595.42,429998.75 |
| C14 | 118.702 | 200.000 | | 1570595.42,429998.75 | 1570557.89,430109.54 |
| L34 | 155.921 | | N35° 43' 07.28"W | 1570557.89,430109.54 | 1570466.86,430236.13 |
| C15 | 269.232 | 150.000 | | 1570466.86,430236.13 | 1570530.33,430461.90 |
| L17 | 334.233 | | N67° 07' 13.54"E | 1570530.33,430461.90 | 1570838.27,430591.85 |
| C16 | 255.882 | 300.000 | | 1570838.27,430591.85 | 1571086.37,430585.11 |
| L18 | 219.268 | | S64° 00' 34.97"E | 1571086.37,430585.11 | 1571283.46,430489.02 |
| C17 | 270.766 | 600.000 | | 1571283.46,430489.02 | 1571492.35,430320.36 |
| L19 | 211.883 | | S38° 09' 12.42"E | 1571492.35,430320.36 | 1571623.24,430153.75 |
| C18 | 261.758 | 300.000 | | 1571623.24,430153.75 | 1571849.44,430039.23 |
| L20 | 526.599 | | S88° 08' 44.05"E | 1571849.44,430039.23 | 1572375.77,430022.19 |
| C19 | 501.369 | 300.000 | | 1572375.77,430022.19 | 1572684.78,430342.44 |
| L21 | 406.833 | | N3° 53' 59.76"W | 1572684.78,430342.44 | 1572657.11,430748.33 |
| C20 | 309.400 | 200.000 | | 1572657.11,430748.33 | 1572838.30,430961.09 |
| L22 | 75.894 | | N84° 44' 11.62"E | 1572838.30,430961.09 | 1572913.87,430968.05 |
| C21 | 56.899 | 300.000 | | 1572913.87,430968.05 | 1572969.70,430978.60 |
| L33 | 500.648 | | N73° 52' 10.74"E | 1572969.70,430978.60 | 1573450.64,431117.69 |
| C22 | 249.471 | 200.000 | | 1573450.64,431117.69 | 1573670.71,431039.31 |
| L32 | 279.235 | | S34° 39' 43.91"E | 1573670.71,431039.31 | 1573829.52,430809.64 |
| C23 | 261.750 | 300.000 | | 1573829.52,430809.64 | 1574048.32,430681.56 |

| Road C | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L35 | 615.920 | | S84° 39' 09.94"E | 1574048.32,430681.56 | 1574661.56,430624.16 |
| C24 | 255.033 | 150.000 | | 1574661.56,430624.16 | 1574825.44,430778.92 |
| L31 | 394.933 | | N2° 04' 05.65"W | 1574825.44,430778.92 | 1574811.18,431173.60 |
| C25 | 263.165 | 150.000 | | 1574811.18,431173.60 | 1574983.14,431327.38 |
| L23 | 188.206 | | S81° 32' 47.25"E | 1574983.14,431327.38 | 1575169.30,431299.72 |
| C26 | 84.651 | 300.000 | | 1575169.30,431299.72 | 1575250.18,431275.70 |
| L24 | 64.277 | | S65° 22' 45.78"E | 1575250.18,431275.70 | 1575308.61,431248.92 |
| C27 | 185.341 | 300.000 | | 1575308.61,431248.92 | 1575489.69,431226.94 |
| L25 | 69.664 | | N79° 13' 23.11"E | 1575489.69,431226.94 | 1575558.12,431239.97 |
| C28 | 70.156 | 300.000 | | 1575558.12,431239.97 | 1575627.94,431244.94 |
| L26 | 1385.512 | | S87° 22' 40.92"E | 1575627.94,431244.94 | 1577012.01,431181.56 |
| C29 | 87.931 | 300.000 | | 1577012.01,431181.56 | 1577099.18,431190.38 |
| L27 | 237.555 | | N75° 49' 41.91"E | 1577099.18,431190.38 | 1577329.50,431248.54 |
| C30 | 87.975 | 300.000 | | 1577329.50,431248.54 | 1577416.72,431257.35 |
| L28 | 916.858 | | S87° 22' 10.58"E | 1577416.72,431257.35 | 1578332.61,431215.27 |
| C31 | 105.104 | 300.000 | | 1578332.61,431215.27 | 1578434.63,431192.34 |
| L29 | 112.264 | | S67° 17' 46.58"E | 1578434.63,431192.34 | 1578538.20,431149.01 |
| C32 | 112.666 | 300.000 | | 1578538.20,431149.01 | 1578647.78,431125.83 |
| L30 | 762.867 | | S88° 48' 50.07"E | 1578647.78,431125.83 | 1579410.48,431110.04 |

| Road D – Substation Access | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L36 | 1519.553 | | N1° 12' 49.13"E | 1574157.22,429516.63 | 1574189.40,431035.85 |
| C33 | 5.816 | 100.000 | | 1574189.40,431035.85 | 1574189.70,431041.65 |
| L37 | 44.269 | | N4° 32' 46.27"E | 1574189.70,431041.65 | 1574193.20,431085.78 |
| C34 | 5.816 | 100.000 | | 1574193.20,431085.78 | 1574193.50,431091.59 |
| L38 | 1.205 | | N1° 12' 49.29"E | 1574193.50,431091.59 | 1574193.52,431092.80 |

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Prepared for:

Mortenson construction
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Minneapolis, MN 55440

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# Sunflower Wind Project

Stark and Morton Counties, North Dakota

## Alignment Tables

90% Civil Construction Plans
NOT FOR CONSTRUCTION
Turbine Array: sunflower_layout_microsited_20150616

Date: 08/03/15
Sheet: 88 OF 91

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| Road E | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L43 | 173.594 | | S0° 00' 00.00"E | 1573520.07,429516.38 | 1573520.07,429342.79 |
| C39 | 131.977 | 300.000 | | 1573520.07,429342.79 | 1573491.51,429215.03 |
| L42 | 644.785 | | S25° 12' 20.61"W | 1573491.51,429215.03 | 1573216.92,428631.63 |
| C38 | 84.693 | 300.000 | | 1573216.92,428631.63 | 1573192.07,428550.96 |
| L41 | 972.572 | | S9° 01' 49.96"W | 1573192.07,428550.96 | 1573039.41,427590.45 |
| C37 | 146.520 | 150.000 | | 1573039.41,427590.45 | 1572954.67,427478.05 |
| L40 | 2012.777 | | S64° 59' 49.88"W | 1572954.67,427478.05 | 1571130.52,426627.32 |
| C36 | 176.141 | 300.000 | | 1571130.52,426627.32 | 1571001.13,426511.54 |
| L39 | 763.798 | | S31° 21' 24.38"W | 1571001.13,426511.54 | 1570603.68,425859.30 |
| C35 | 313.122 | 300.000 | | 1570603.68,425859.30 | 1570341.43,425715.48 |
| L44 | 910.184 | | N88° 50' 28.80"W | 1570341.43,425715.48 | 1569431.43,425733.88 |
| C40 | 235.790 | 150.000 | | 1569431.43,425733.88 | 1569278.43,425586.77 |
| L45 | 1256.877 | | S1° 05' 37.10"W | 1569278.43,425586.77 | 1569254.44,424330.13 |

| Road F | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L51 | 1395.386 | | S1° 05' 37.10"W | 1569254.44,424330.13 | 1569227.80,422934.99 |
| C47 | 235.619 | 150.000 | | 1569227.80,422934.99 | 1569374.91,422782.16 |
| L54 | 840.406 | | S88° 54' 22.90"E | 1569374.91,422782.16 | 1570215.17,422766.12 |
| C46 | 236.204 | 150.000 | | 1570215.17,422766.12 | 1570362.26,422612.70 |
| L50 | 993.831 | | S1° 19' 01.57"W | 1570362.26,422612.70 | 1570339.42,421619.13 |
| C45 | 226.724 | 300.000 | | 1570339.42,421619.13 | 1570253.04,421415.31 |
| L49 | 329.596 | | S44° 37' 05.87"W | 1570253.04,421415.31 | 1570021.54,421180.70 |
| C44 | 83.920 | 200.000 | | 1570021.54,421180.70 | 1569951.96,421134.89 |
| L52 | 78.115 | | S68° 39' 34.88"W | 1569951.96,421134.89 | 1569879.20,421106.47 |
| C48 | 175.311 | 150.000 | | 1569879.20,421106.47 | 1569783.85,420971.19 |
| L53 | 195.718 | | S1° 41' 44.91"W | 1569783.85,420971.19 | 1569778.06,420775.56 |
| C43 | 234.043 | 150.000 | | 1569778.06,420775.56 | 1569625.26,420630.02 |
| L48 | 627.124 | | N88° 54' 22.84"W | 1569625.26,420630.02 | 1568998.25,420641.99 |
| C42 | 94.226 | 300.000 | | 1568998.25,420641.99 | 1568905.31,420629.09 |
| L47 | 1160.797 | | S73° 05' 52.41"W | 1568905.31,420629.09 | 1567794.65,420291.60 |
| C41 | 26.254 | 300.000 | | 1567794.65,420291.60 | 1567769.23,420285.08 |
| L46 | 1341.619 | | S78° 06' 43.41"W | 1567769.23,420285.08 | 1566456.39,420008.71 |

| Road G | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L55 | 670.046 | | S88° 54' 22.90"E | 1570215.17,422766.12 | 1570885.09,422753.33 |
| C49 | 139.787 | 500.000 | | 1570885.09,422753.33 | 1571022.67,422731.29 |
| L56 | 418.234 | | S72° 53' 16.47"E | 1571022.67,422731.29 | 1571422.39,422608.22 |

| Road I | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L64 | 118.568 | | N88° 48' 43.89"W | 1579321.09,425918.46 | 1579202.55,425920.92 |
| C57 | 108.018 | 300.000 | | 1579202.55,425920.92 | 1579097.27,425942.34 |
| L63 | 546.201 | | N68° 10' 56.07"W | 1579097.27,425942.34 | 1578590.20,426145.34 |
| C56 | 190.201 | 300.000 | | 1578590.20,426145.34 | 1578403.55,426157.26 |
| L62 | 547.877 | | S75° 29' 30.97"W | 1578403.55,426157.26 | 1577873.14,426020.01 |
| C55 | 198.400 | 300.000 | | 1577873.14,426020.01 | 1577678.92,426035.08 |
| L61 | 351.863 | | N66° 36' 59.36"W | 1577678.92,426035.08 | 1577355.95,426174.73 |
| C54 | 116.216 | 300.000 | | 1577355.95,426174.73 | 1577243.11,426199.31 |
| L60 | 375.259 | | N88° 48' 43.89"W | 1577243.11,426199.31 | 1576867.93,426207.08 |
| C53 | 234.855 | 150.000 | | 1576867.93,426207.08 | 1576714.87,426060.99 |
| L59 | 324.958 | | S1° 28' 47.34"W | 1576714.87,426060.99 | 1576706.48,425736.14 |
| C52 | 241.546 | 150.000 | | 1576706.48,425736.14 | 1576546.73,425590.34 |
| L58 | 898.605 | | N86° 15' 22.51"W | 1576546.73,425590.34 | 1575650.05,425649.01 |
| C51 | 297.133 | 150.000 | | 1575650.05,425649.01 | 1575499.08,425448.63 |
| L65 | 182.105 | | S19° 45' 09.52"E | 1575499.08,425448.63 | 1575560.62,425277.24 |
| C58 | 239.870 | 300.000 | | 1575560.62,425277.24 | 1575547.78,425044.07 |
| L66 | 330.062 | | S26° 03' 33.09"W | 1575547.78,425044.07 | 1575402.78,424747.56 |
| C50 | 147.222 | 300.000 | | 1575402.78,424747.56 | 1575308.87,424636.10 |
| L57 | 290.986 | | S54° 10' 35.18"W | 1575308.87,424636.10 | 1575072.93,424465.79 |

| Road J | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L67 | 450.642 | | N1° 11' 16.11"E | 1578725.62,426091.12 | 1578734.96,426541.67 |

| Road K | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L74 | 792.676 | | S88° 55' 21.27"E | 1579440.50,431014.06 | 1580233.03,430999.16 |
| C64 | 19.486 | 300.000 | | 1580233.03,430999.16 | 1580252.49,430998.16 |
| L73 | 336.366 | | S85° 12' 03.76"E | 1580252.49,430998.16 | 1580587.68,430970.02 |
| C63 | 19.486 | 300.000 | | 1580587.68,430970.02 | 1580607.13,430969.02 |
| L72 | 1403.971 | | S88° 55' 21.27"E | 1580607.13,430969.02 | 1582010.86,430942.62 |
| C62 | 39.303 | 25.000 | | 1582010.86,430942.62 | 1582036.32,430967.18 |
| L71 | 845.656 | | N1° 00' 08.30"E | 1582036.32,430967.18 | 1582051.12,431812.70 |
| C61 | 156.824 | 150.000 | | 1582051.12,431812.70 | 1581978.62,431943.77 |
| L70 | 471.706 | | N58° 54' 00.06"W | 1581978.62,431943.77 | 1581574.71,432187.42 |
| C60 | 130.884 | 300.000 | | 1581574.71,432187.42 | 1581480.68,432276.96 |
| L69 | 348.881 | | N33° 54' 10.98"W | 1581480.68,432276.96 | 1581286.07,432566.53 |
| C59 | 202.940 | 300.000 | | 1581286.07,432566.53 | 1581236.15,432759.26 |
| L68 | 159.560 | | N4° 51' 20.44"E | 1581236.15,432759.26 | 1581249.65,432918.25 |

**Westwood**
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**Designed:** DFK
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**Drawn:** TBR
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**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

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179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Alignment Tables

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 89 OF 91

P:\0006214.00\dwg\Civil\0006214-03DT.dwg

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| Road L | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L84 | 2.879 | | N1° 00' 08.30"E | 1582042.08,431296.45 | 1582042.13,431299.32 |
| C73 | 329.820 | 200.000 | | 1582042.13,431299.32 | 1582261.23,431494.91 |
| L83 | 350.429 | | S84° 30' 40.20"E | 1582261.23,431494.91 | 1582610.06,431461.39 |
| C72 | 480.195 | 300.000 | | 1582610.06,431461.39 | 1582938.10,431740.25 |
| L82 | 1132.060 | | N3° 46' 42.09"E | 1582938.10,431740.25 | 1583012.70,432869.85 |
| C71 | 64.303 | 300.000 | | 1583012.70,432869.85 | 1583023.75,432933.07 |
| L81 | 250.314 | | N16° 03' 33.28"E | 1583023.75,432933.07 | 1583093.00,433173.61 |
| C70 | 94.897 | 150.000 | | 1583093.00,433173.61 | 1583145.43,433250.81 |
| L80 | 131.504 | | N52° 18' 25.93"E | 1583145.43,433250.81 | 1583249.49,433331.22 |
| C69 | 177.133 | 150.000 | | 1583249.49,433331.22 | 1583302.42,433489.63 |
| L79 | 188.719 | | N15° 21' 09.02"W | 1583302.42,433489.63 | 1583252.46,433671.61 |
| C68 | 95.640 | 300.000 | | 1583252.46,433671.61 | 1583242.14,433766.29 |
| L78 | 368.814 | | N2° 54' 48.00"E | 1583242.14,433766.29 | 1583260.89,434134.62 |
| C67 | 154.604 | 300.000 | | 1583260.89,434134.62 | 1583229.49,434284.26 |
| L77 | 159.141 | | N26° 36' 49.97"W | 1583229.49,434284.26 | 1583158.20,434426.54 |
| C66 | 328.545 | 300.000 | | 1583158.20,434426.54 | 1583184.12,434737.84 |
| L76 | 167.226 | | N36° 08' 01.35"E | 1583184.12,434737.84 | 1583282.72,434872.89 |
| C65 | 137.580 | 300.000 | | 1583282.72,434872.89 | 1583336.00,434998.44 |
| L75 | 605.521 | | N9° 51' 28.01"E | 1583336.00,434998.44 | 1583439.67,435595.02 |

| Road M | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L87 | 33.831 | | N3° 46' 42.09"E | 1582995.01,432602.02 | 1582997.24,432635.78 |
| C75 | 126.778 | 300.000 | | 1582997.24,432635.78 | 1582979.01,432760.29 |
| L86 | 414.456 | | N20° 26' 03.95"W | 1582979.01,432760.29 | 1582834.31,433148.66 |
| C74 | 96.514 | 300.000 | | 1582834.31,433148.66 | 1582786.77,433232.18 |
| L85 | 221.183 | | N38° 52' 02.06"W | 1582786.77,433232.18 | 1582647.98,433404.39 |

| Road N | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L88 | 71.343 | | N90° 00' 00.00"E | 1584530.12,429298.25 | 1584601.47,429298.25 |
| C76 | 63.306 | 150.000 | | 1584601.47,429298.25 | 1584662.91,429285.09 |
| L89 | 47.217 | | S65° 49' 08.16"E | 1584662.91,429285.09 | 1584705.98,429265.75 |
| C77 | 60.589 | 150.000 | | 1584705.98,429265.75 | 1584764.71,429252.61 |
| L90 | 1274.623 | | S88° 57' 43.59"E | 1584764.71,429252.61 | 1586039.12,429229.52 |
| C78 | 574.772 | 600.000 | | 1586039.12,429229.52 | 1586525.24,428965.79 |
| L91 | 399.813 | | S34° 04' 31.44"E | 1586525.24,428965.79 | 1586749.24,428634.62 |
| C79 | 193.350 | 300.000 | | 1586749.24,428634.62 | 1586900.08,428519.05 |
| L92 | 782.582 | | S71° 00' 09.04"E | 1586900.08,428519.05 | 1587640.03,428264.30 |
| C80 | 77.046 | 150.000 | | 1587640.03,428264.30 | 1587703.42,428222.00 |
| L93 | 310.229 | | S41° 34' 22.90"E | 1587703.42,428222.00 | 1587909.28,427989.92 |
| C81 | 213.735 | 150.000 | | 1587909.28,427989.92 | 1588103.66,427963.96 |
| L94 | 293.449 | | N56° 47' 10.50"E | 1588103.66,427963.96 | 1588349.17,428124.70 |
| C82 | 182.612 | 300.000 | | 1588349.17,428124.70 | 1588522.20,428173.58 |
| L95 | 622.514 | | S88° 20' 14.61"E | 1588522.20,428173.58 | 1589144.46,428155.52 |
| C83 | 66.179 | 300.000 | | 1589144.46,428155.52 | 1589210.28,428160.88 |
| L96 | 208.425 | | N79° 01' 24.28"E | 1589210.28,428160.88 | 1589414.90,428200.57 |
| C84 | 205.754 | 150.000 | | 1589414.90,428200.57 | 1589536.33,428346.70 |
| L97 | 481.094 | | N0° 25' 52.72"E | 1589536.33,428346.70 | 1589539.95,428827.78 |
| C85 | 320.002 | 300.000 | | 1589539.95,428827.78 | 1589697.01,429089.28 |

| Road N | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L98 | 414.366 | | N61° 32' 49.70"E | 1589697.01,429089.28 | 1590061.33,429286.70 |
| C86 | 314.753 | 350.000 | | 1590061.33,429286.70 | 1590365.24,429300.98 |
| L99 | 403.497 | | S66° 55' 37.62"E | 1590365.24,429300.98 | 1590736.46,429142.85 |
| C87 | 165.331 | 300.000 | | 1590736.46,429142.85 | 1590863.58,429040.42 |
| L100 | 181.370 | | S35° 21' 04.19"E | 1590863.58,429040.42 | 1590968.52,428892.49 |
| C88 | 230.515 | 300.000 | | 1590968.52,428892.49 | 1591157.90,428771.21 |
| L101 | 434.391 | | S79° 22' 34.58"E | 1591157.90,428771.21 | 1591584.84,428691.13 |
| C89 | 132.657 | 150.000 | | 1591584.84,428691.13 | 1591709.01,428723.73 |
| L105 | 154.249 | | N49° 57' 08.22"E | 1591709.01,428723.73 | 1591827.09,428822.98 |
| C93 | 58.904 | 150.000 | | 1591827.09,428822.98 | 1591863.68,428868.65 |
| L106 | 67.414 | | N27° 27' 09.24"E | 1591863.68,428868.65 | 1591894.76,428928.48 |
| C92 | 57.538 | 150.000 | | 1591894.76,428928.48 | 1591930.32,428973.27 |
| L104 | 34.494 | | N49° 25' 50.10"E | 1591930.32,428973.27 | 1591956.52,428995.70 |
| C90 | 429.626 | 300.000 | | 1591956.52,428995.70 | 1592014.08,429385.31 |
| L102 | 812.435 | | N32° 37' 19.23"W | 1592014.08,429385.31 | 1591576.10,430069.58 |
| C91 | 205.779 | 300.000 | | 1591576.10,430069.58 | 1591530.81,430266.20 |
| L103 | 291.864 | | N6° 40' 44.25"E | 1591530.81,430266.20 | 1591564.76,430556.09 |

| Road O | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L107 | 11.422 | | S88° 57' 43.59"E | 1584972.26,429248.85 | 1584983.68,429248.64 |
| C94 | 239.000 | 150.000 | | 1584983.68,429248.64 | 1585130.83,429092.57 |
| L113 | 442.087 | | S2° 19' 45.51"W | 1585130.83,429092.57 | 1585112.87,428650.85 |
| C100 | 14.978 | 300.000 | | 1585112.87,428650.85 | 1585111.88,428635.90 |
| L114 | 185.390 | | S5° 11' 23.90"W | 1585111.88,428635.90 | 1585095.11,428451.27 |
| C101 | 14.978 | 300.000 | | 1585095.11,428451.27 | 1585094.13,428436.33 |
| L115 | 183.304 | | S2° 19' 45.51"W | 1585094.13,428436.33 | 1585086.68,428253.18 |
| C95 | 306.222 | 200.000 | | 1585086.68,428253.18 | 1584886.65,428061.31 |
| L108 | 1684.448 | | N89° 56' 40.64"W | 1584886.65,428061.31 | 1583202.21,428062.93 |
| C96 | 233.029 | 150.000 | | 1583202.21,428062.93 | 1583052.09,427915.67 |
| L109 | 1158.712 | | S1° 02' 41.57"W | 1583052.09,427915.67 | 1583030.96,426757.15 |
| C97 | 182.852 | 150.000 | | 1583030.96,426757.15 | 1582930.09,426618.15 |
| L110 | 1136.401 | | S70° 53' 20.84"W | 1582930.09,426618.15 | 1581856.32,426246.10 |
| C98 | 99.586 | 300.000 | | 1581856.32,426246.10 | 1581769.30,426198.61 |
| L111 | 173.024 | | S51° 52' 10.59"W | 1581769.30,426198.61 | 1581633.20,426091.78 |
| C99 | 429.088 | 300.000 | | 1581633.20,426091.78 | 1581558.84,425705.43 |
| L112 | 135.103 | | S30° 04' 48.35"E | 1581558.84,425705.43 | 1581626.56,425588.53 |

| Road P | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L117 | 7.589 | | S88° 57' 43.59"E | 1585090.63,429246.70 | 1585098.21,429246.57 |
| C102 | 166.150 | 150.000 | | 1585098.21,429246.57 | 1585233.89,429327.11 |
| L116 | 566.330 | | N27° 34' 23.00"E | 1585233.89,429327.11 | 1585496.04,429829.12 |

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Phone (952) 937-5150 Toll Free (888) 937-5150
westwoodps.com

**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

| # | DATE | DESCRIPTION |
|---|---|---|
| A | 5/28/15 | 30% CIVIL CONSTRUCTION PLANS |
| B | 7/2/15 | 60% CIVIL CONSTRUCTION PLANS |
| C | 8/3/15 | 90% CIVIL CONSTRUCTION PLANS |

**Prepared for:**

Mortenson construction
700 Meadow Lane
Minneapolis, MN 55440

SunEdison®
179 Lincoln Street, Suite 500
Boston, MA 02111

# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Alignment Tables

**90% Civil Construction Plans**
**NOT FOR CONSTRUCTION**

**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15

**Sheet:** 90 OF 91

P:\0006214.00\dwg\Civil\0006214-0301.dwg

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| Road Q | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L120 | 437.680 | | S41° 34' 22.90"E | 1587909.28,427989.92 | 1588199.71,427662.49 |
| C106 | 261.859 | 150.000 | | 1588199.71,427662.49 | 1588165.98,427435.12 |
| L119 | 669.800 | | S58° 26' 59.50"W | 1588165.98,427435.12 | 1587595.19,427084.65 |
| C105 | 250.748 | 200.000 | | 1587595.19,427084.65 | 1587505.27,426867.92 |
| L123 | 149.939 | | S13° 23' 03.08"E | 1587505.27,426867.92 | 1587539.98,426722.05 |
| C108 | 208.686 | 200.000 | | 1587539.98,426722.05 | 1587483.34,426530.92 |
| L124 | 151.525 | | S46° 23' 59.82"W | 1587483.34,426530.92 | 1587373.61,426426.43 |
| C104 | 182.735 | 200.000 | | 1587373.61,426426.43 | 1587312.61,426260.86 |
| L121 | 433.135 | | S5° 56' 59.20"E | 1587312.61,426260.86 | 1587357.51,425830.06 |
| C107 | 34.928 | 150.000 | | 1587357.51,425830.06 | 1587357.07,425795.22 |
| L122 | 325.348 | | S7° 23' 30.29"W | 1587357.07,425795.22 | 1587315.21,425472.57 |
| C103 | 292.091 | 200.000 | | 1587315.21,425472.57 | 1587113.14,425298.34 |
| L118 | 1444.740 | | N88° 55' 48.67"W | 1587113.14,425298.34 | 1585668.65,425325.31 |

| Road R | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L126 | 62.901 | | N35° 43' 07.28"W | 1570466.86,430236.13 | 1570430.14,430287.20 |
| C110 | 138.163 | 300.000 | | 1570430.14,430287.20 | 1570326.93,430377.20 |
| L127 | 217.819 | | N62° 06' 21.17"W | 1570326.93,430377.20 | 1570134.42,430479.10 |
| C109 | 90.409 | 300.000 | | 1570134.42,430479.10 | 1570049.39,430508.81 |
| L125 | 221.313 | | N79° 22' 21.50"W | 1570049.39,430508.81 | 1569831.87,430549.63 |

| Road S | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L135 | 35.087 | | S5° 56' 59.19"E | 1587357.51,425830.06 | 1587361.14,425795.16 |
| C119 | 183.038 | 150.000 | | 1587361.14,425795.16 | 1587473.70,425665.25 |
| L136 | 112.439 | | S75° 51' 54.41"E | 1587473.70,425665.25 | 1587582.74,425637.80 |
| C120 | 40.599 | 150.000 | | 1587582.74,425637.80 | 1587622.96,425633.30 |
| L138 | 81.621 | | N88° 37' 38.58"E | 1587622.96,425633.30 | 1587704.56,425635.25 |
| C121 | 81.417 | 150.000 | | 1587704.56,425635.25 | 1587782.53,425615.56 |
| L139 | 80.755 | | S60° 16' 25.44"E | 1587782.53,425615.56 | 1587852.66,425575.51 |
| C122 | 40.818 | 150.000 | | 1587852.66,425575.51 | 1587890.41,425560.32 |
| L137 | 762.382 | | S75° 51' 54.41"E | 1587890.41,425560.32 | 1588629.71,425374.14 |
| C118 | 76.864 | 150.000 | | 1588629.71,425374.14 | 1588696.32,425337.49 |
| L134 | 1040.590 | | S46° 30' 18.37"E | 1588696.32,425337.49 | 1589451.20,424621.27 |
| C117 | 314.896 | 200.000 | | 1589451.20,424621.27 | 1589734.45,424629.23 |
| L133 | 399.833 | | N43° 17' 01.44"E | 1589734.45,424629.23 | 1590008.58,424920.30 |
| C116 | 124.370 | 300.000 | | 1590008.58,424920.30 | 1590109.93,424990.84 |
| L132 | 700.816 | | N67° 02' 12.15"E | 1590109.93,424990.84 | 1590755.21,425264.26 |
| C115 | 220.771 | 300.000 | | 1590755.21,425264.26 | 1590910.34,425414.30 |
| L131 | 1056.787 | | N24° 52' 20.82"E | 1590910.34,425414.30 | 1591354.83,426373.07 |
| C114 | 83.792 | 300.000 | | 1591354.83,426373.07 | 1591400.16,426443.22 |
| L130 | 681.002 | | N40° 52' 31.96"E | 1591400.16,426443.22 | 1591845.82,426958.14 |
| C113 | 179.704 | 300.000 | | 1591845.82,426958.14 | 1591996.01,427051.86 |

| Road S | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L129 | 515.103 | | N75° 11' 47.04"E | 1591996.01,427051.86 | 1592494.01,427183.47 |
| C112 | 83.325 | 300.000 | | 1592494.01,427183.47 | 1592576.48,427193.37 |
| L128 | 1091.059 | | S88° 53' 22.67"E | 1592576.48,427193.37 | 1593667.33,427172.23 |
| C111 | 39.403 | 25.000 | | 1593667.33,427172.23 | 1593692.82,427196.88 |
| L140 | 71.853 | | N0° 48' 22.53"E | 1593692.82,427196.88 | 1593693.83,427268.72 |

| Road T | | | | | |
|---|---|---|---|---|---|
| Number | Length | Radius | Line Direction | Starting Point | Ending Point |
| L143 | 3.823 | | S1° 14' 41.78"W | 1565960.22,429405.22 | 1565960.14,429401.40 |
| C124 | 145.284 | 150.000 | | 1565960.14,429401.40 | 1566022.46,429276.41 |
| L142 | 174.644 | | S54° 14' 57.52"E | 1566022.46,429276.41 | 1566164.20,429174.37 |
| C123 | 168.398 | 300.000 | | 1566164.20,429174.37 | 1566320.70,429118.43 |
| L141 | 63.392 | | S86° 24' 39.81"E | 1566320.70,429118.43 | 1566383.97,429114.46 |

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**Designed:** DFK
**Checked:** RSC
**Drawn:** TBR
**Record Drawing by/date:**

**Revisions:**

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**Prepared for:**

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# Sunflower Wind Project

**Stark and Morton Counties, North Dakota**

## Alignment Tables

90% Civil Construction Plans
NOT FOR CONSTRUCTION

**Turbine Array: sunflower_layout_microsited_20150616**

**Date:** 08/03/15



P:\0006214.00\dwg\Civil\0006214-030T.dwg

# Attachment F

## Training Documentation

# Stormwater Pollution Prevention Training Log

**Project Name:**

**Project Location:**

**Instructor's Name(s):**

**Instructor's Title(s):**

**Course Location:**

**Date of Course:**

**Course Length(hours):**

**Stormwater Training Topic:** ***(check as appropriate)***

- ❑ **Sediment and Erosion Controls**
- ❑ **Stabilization Controls**
- ❑ **Pollution Prevention Measures**
- ❑ **Emergency Procedures**
- ❑ **Inspections/Corrective Actions**
- ❑ **Stormwater Runoff Sampling**

**Specific Training Objective(s):**

_____

_____

_____

_____

**Attendee Roste**r: *(attach additional pages as necessary)*

| No. | Name of Attendee | Company |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

# Attachment G

## Inspection and Maintenance Forms

# Site Inspection Record Template
## Construction
(07-2010)

Project Name: _____

Coverage Number: _____

Inspector: _____ Date: _____ Time: _____

Precipitation Amount: _____ Date: _____

Areas Inspected (Choose Applicable): ☐ Active areas

☐ Stabilized areas with less than 70% cover

☐ Areas that have achieved final stabilization

Is there evidence of, or the potential for, pollutants entering drainage systems or waters of the state from:

- Material Storage Areas ☐ Y ☐ N
- Vehicle Maintenance Areas ☐ Y ☐ N

**Observations / Corrective Actions:**

_____

_____

_____

| | |
|---|---|
| ☐ Y ☐ N | Have all erosion and sediment controls and best management practices identified in the plan been installed or implemented? |
| ☐ Y ☐ N | Are erosion and sediment controls operating correctly and in serviceable condition? |
| ☐ Y ☐ N | Are erosion and sediment controls operating consistently and effectively? |
| ☐ Y ☐ N | Are there any devices similar to silt fence or fiber rolls where sediment has reached more than 1/3 the height of the device? (Removal and repairs must be made within 24 hours.) |
| ☐ Y ☐ N | Are there any sediment basins where collected sediment has reduced the storage capacity by 1/2? (Drainage and removal must be completed within 72 hours.) |
| ☐ Y ☐ N | Is there evidence of sediment deposits in surface waters, drainage ditches or other stormwater conveyance systems? (Removal and stabilization must be completed within 7 days unless prohibited by legal, regulatory or physical access constrains. All reasonable efforts must be made to obtain access. Once permission is granted, removal must take place within 7 days.) |
| ☐ Y ☐ N ☐ NA | Is there evidence of sediment being tracked off-site by vehicles or equipment? (Sediment tracked or deposited on paved surfaces must be removed within 24 hours.) |
| ☐ Y ☐ N | Is there evidence of sediment depositing off-site other than in surface waters, drainage ditches and stormwater conveyance systems? (Sediment must be recovered in a manner and frequency sufficient to minimize off-site impacts – for example, sediment could wash away during the next precipitation event.) |
| ☐ Y ☐ N ☐ NA<br>☐ Y ☐ N ☐ NA<br>☐ Y ☐ N ☐ NA | Is stormwater flow distributed evenly over vegetative buffers?<br>Is sediment accumulating in vegetative buffers?<br>Are rills forming within vegetative buffers?<br>(If vegetative buffers are silted covered, contain rills or are otherwise rendered ineffective, other erosion and sediment controls must be implemented. Eroded areas must be repaired and stabilized.) |
| ☐ Y ☐ N | Are litter, debris, chemicals and parts being managed properly to minimize stormwater pollution? |
| ☐ Y ☐ N | Are liquid or soluble materials like oil, fuel, paint, etc., properly stored to prevent spills, leaks or other discharges? |

| | |
|---|---|
| ☐ Y ☐ N | Is there evidence of concrete wash water discharging to waters of the state, storm sewer systems or onto adjacent properties? |
| ☐ Y ☐ N | Is there evidence of wastewater from processing operations or sanitary facilities (i.e., portable toilets) discharging from the site?<br><br>(These types of discharges are not covered by the construction general permit, NDR10-0000. They must be stopped immediately if they are not covered by another type of permit. The following non-stormwater discharges are allowable if the appropriate prevention measures are in place: fire-fighting, fire hydrant flushing, potable water line flushing, infrequent building and equipment wash down without detergents, uncontaminated foundation drains, springs, lawn watering and air conditioning condensate. Please note that discharges from temporary dewatering activities, such as hydrostatic testing or disinfection of new pipelines may require coverage under the temporary dewatering general permit, NDG07-0000.) |
| ☐ Y ☐ N | Is there evidence of wash water from tools or equipment draining to waters of the state, drainage ditches or storm sewer systems? |
| ☐ Y ☐ N ☐ NA | Are permanent stormwater management measures (e.g., oil-water separators, rain gardens) functioning properly? |

**Corrective Actions and Schedule:**

_____

_____

_____

- Are best management practices effective to minimize the discharge of sediment from the site? ☐ Y ☐ N
- Do best management practices need to be adjusted? ☐ Y ☐ N
- Are additional best management practices needed? ☐ Y ☐ N

**Comments:**

_____

_____

_____

**List all spills, leaks or hose-breaks that have occurred since the last inspection:**

| -Size | -Location | -Was it reportable? | -Was it reported? |
|---|---|---|---|
| _____ | _____ | ☐ Y ☐ N | ☐ Y ☐ N |
| _____ | _____ | ☐ Y ☐ N | ☐ Y ☐ N |
| _____ | _____ | ☐ Y ☐ N | ☐ Y ☐ N |

- Were Spill Prevention Procedures adequate? ☐ Y ☐ N
- What Spill Response Procedures were used?

**Comments**

_____

_____

_____

- Has the SWPP Plan been updated as a result of this inspection? ☐ Y ☐ N
- Has the Site Map been updated as a result of this inspection? ☐ Y ☐ N

# Corrective Action Report

| **Section A – Initial Report**<br>(Complete this section within 24 hours of discovering the condition that triggered corrective action) | | | | | |
|---|---|---|---|---|---|
| **Name of Project** | | **NDPDES Tracking No.** | | **Today's Date** | |
| **Date Problem First Discovered** | | **Time Problem First Discovered** | | | |
| **Name and Contact Information of Individual Completing this Form** | | | | | |

**What site conditions triggered the requirement to conduct corrective action** *(check the box that applies)*:

- ☐ A required stormwater control was never installed, was installed incorrectly, or not in accordance with the permit requirements
- ☐ The stormwater controls that have been installed and maintained are not effective enough for the discharge to meet applicable water quality standards or applicable requirements of the permit
- ☐ Prohibited discharge has occurred or is occurring
- ☐ An agency inspection resulted in identified noncompliant items

**Provide a description of the problem:**

**Deadline for completing corrective action** *(Enter date that is either: (1) no more than 7 calendar days after the date you discovered the problem, or (2) if it is infeasible to complete work within the first 7 days, enter the date that is as soon as practicable following the 7th day)*:

**If your estimated date of completion falls after the 7-day deadline, explain (1) why you believe it is infeasible to complete work within 7 days, and (2) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe:**

**Section B – Corrective Action Progress**
(Complete this section no later than 7 calendar days after discovering the condition that triggered corrective action)

**Section B.1 – Why the Problem Occurred**

| **Cause(s) of Problem**<br>**(Add an additional sheet if necessary)** | **How This Was Determined and the Date You Determined the Cause** |
|---|---|
| **1.** | **1.** |
| **2.** | **2.** |

**Section B.2 – Stormwater Control Modifications to be Implemented to Correct the Problem**

| **List of Stormwater Control Modification(s) Needed to Correct Problem**<br>**(Add an additional sheet if necessary)** | **Date of Completion** | **SWPPP Update Necessary?** | **Notes** |
|---|---|---|---|
| **1.** | | ☐Yes ☐No<br>If yes, provide date SWPPP modified: | |
| **2.** | | ☐Yes ☐No<br>If yes, provide date SWPPP modified: | |

# Corrective Action Report

| Section C – Certification and Signature |
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| **Section C.1 – Certification and Signature by Inspector, Contractor or Subcontractor** |
| "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."<br><br>**Signature of Site Representative:** _____ **Date:** _____<br><br>**Printed Name and Affiliation:** _____ |