HUDDLESTON McBRIDE
LAND DRAINAGE SERVICES
ROCHELLE, ILLINOIS

• 116 W. Main St., No. 208, St. Charles, Il., 60174
• **9504 East Fowler Rd., Rochelle, Il., 61068**
Phone 815-562-6007 Fax 815-562-6557
T. Huddleston mobile 815-757-6007
Email: huddmac@aol.com

Patrick Brown, Director of Development
BayWa r.e.Solar Projects LLC
17901 Von Karman Avenue, Suite 1050
Irvine, CA 92614

Re: Introduction letter for proposed Prairie Solar LLC, Champaign County, IL.

To whom it may concern,

The objective of this letter is to give notice that Huddleston McBride Land Drainage Co., has been retained by BayWa r.e. Solar Projects, LLC for the purpose of maintaining local and regional agricultural drainage systems within and related to the proposed Prairie Solar LLC, Champaign County Solar project.

Huddleston – McBride Land Drainage Co., (Hudmac) has been actively involved in providing subsurface agricultural drainage mapping, evaluation, construction and consulting services for over 42 years. Hudmac also owns and operates Cooprider Drainage Co., *(established November 1930)* and Countryside Drainage, *(established May 2005)* which exclusively designs, installs and maintains agricultural drain tile systems.

Hudmac provides complete design, and construction services for agriculture, solar, pipeline, roadway, environmental restoration, commercial and municipal underdrain projects. We also have developed methodology for the location and evaluation of existing subsurface drainage tile systems including hydrologic benefit and efficiency. Our research projects include evaluation and testing in efforts to improve solutions for water table management, hydrology restoration, soil permeability, water quality, drainage system abandonment and construction procedures.

Hudmac owns and operates a complete construction equipment group and support.
Our construction crews maintain and install subsurface drainage systems on over 350 farms annually. Existing agri drainage tile investigation and evaluation services include over 240 individual parcels ranging from 10 to 7,000 acres in size and totaling over 20,000 acres annually.

It shall be our intent to work with the BayWa professional design team to identify, locate, map and recommend drainage improvements for the Prairie Solar project.

Thank you for the opportunity to introduce our company we look forward to working on this project.

Sincerely,

Thomas L. Huddleston III,
Huddleston McBride Land Drayage Co.,

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Agricultural Drainage Considerations
Including modifications and maintenance recommendations for ground mounted solar projects within existing agricultural land use areas

Tom Huddleston, Huddleston McBride Land Drainage, October 8, 2018
Huddleston McBride Doc no. 18231

This brief has been prepared for proposed solar projects and is intended to clarify the basics of subsurface agricultural drainage tile systems including onsite evaluation and recommendations for maintenance, modification and repair.

1. Agricultural Drainage History and Basics

Agricultural drainage is used throughout the farm belt to improve crop production by removing excess surface (flooding) and subsurface (root zone) water from agricultural fields.

It was over 300 years ago that the first discovery was made that wet land could produce greater crops when excessive water was removed by tile drain systems. It is also known that tile drains have been installed in the northern Illinois agricultural areas since the early 1890's and many of these systems still operate today. Since that time, additional newer drain tile systems have modified and replaced existing systems and are included in practically all agricultural regions. These systems have made possible increase acreage and yield of crops from previously unproductive areas.

Crop production on certain soil types and landscapes are significantly enhanced by subsurface drainage. This includes areas with low permeability soils, isolated low depressions and lands with low slope gradients. Only water draining freely from the soil profile by gravity is removed by drain tiles. Tile drains are intended to function at atmospheric pressure as gravity flow systems. Flow occurs as a result of differences in the water surface elevation (e.g., the water table and tile elevations), thus making a positive (free flowing or pumped) outlet critical to their operation. The initial flow collector in the tile drain system is the perforated lateral. The depth to which tile laterals will lower the water table and water removal rate are a function of drain depth, spacing, and soil permeability. Drain depth typically ranges from 3 to 6 ft and spacing from 30 to 100 ft. Laterals drain to mains and submains where the flow rate is governed by inside pipe roughness, pipe size and slope. Mains and submains must be sized to convey the flow from all upstream laterals. Tile drain systems eventually discharge into a surface water conveyance systems or ditch. These ditches are part of a mutual legal public drainage system or jurisdictional drainage district system, both administered and governed by Illinois Drainage Code, (farmdoc.illinois.edu/legal/pdfs/drainage_law1.pdf) local drainage districts and local County Stormwater Ordinances.

Existing agricultural drain tile systems have improved drainage within naturally wet soil types which completely changes the native hydraulic soil characteristic and creates stable aeriated conditions for improved crop performance. After many years of subsurface drainage, these regional soils have developed dependence on artificial drainage which is essential to productive farming. Disturbance or malfunction of these systems will cause immediate failure to the local water table and produce saturated lands.

2. Agricultural Drainage Evaluation and Mapping

During the planning phases of any land use change within agricultural areas, it is essential to understand drainage characteristics within the proposed local site and adjoining watershed. Agri drainage systems are generally considered to be regional designs that improve drainage efficiencies within an area wide or watershed basis.

Therefore drainage management within a single land tract must take in consideration the consequences and effects to the lands of others as indicated and required by Illinois Drainage Code and local ordinances.

Onsite drainage investigations and evaluations are critical to comprehend on site conditions and significance to other land tracts. Drainage investigation map reports should include procedures and applications as follows:

Listed on page 3 are sample plans of Existing Agricultural Drainage Plans in accordance with typical County Ordinances and standard practices.

Field reconnaissance and record research work should be completed in efforts to identify all areas which are typical to installation of existing drain tile. Existing features such as soils, watertable, topographical elevations, surface channels, depressions, wetlands and natural drainage ingress and egress locations are considered.

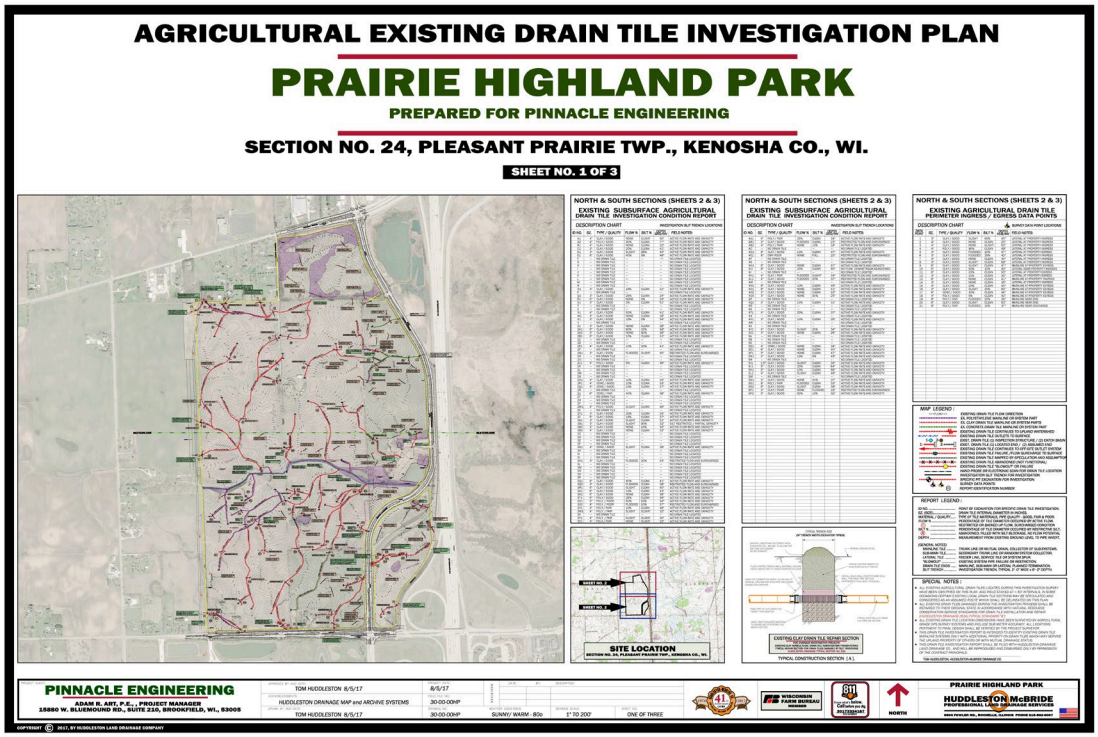
Following field review, investigation areas are staked and slit trenched to verify existence of drain tile. All existing drain tiles encountered during the investigation procedure are logged on field mapping and repaired to their original state according to U.S.D.A., Natural Resource Conservation Service construction repair practices. Following specific point locations, drain tile routes are located by surface probing or electronic detection and field staked at <20' intervals including cut stakes for invert elevations where requested. Any existing drain tile not encountered during slit trenching procedures will remain unknown.

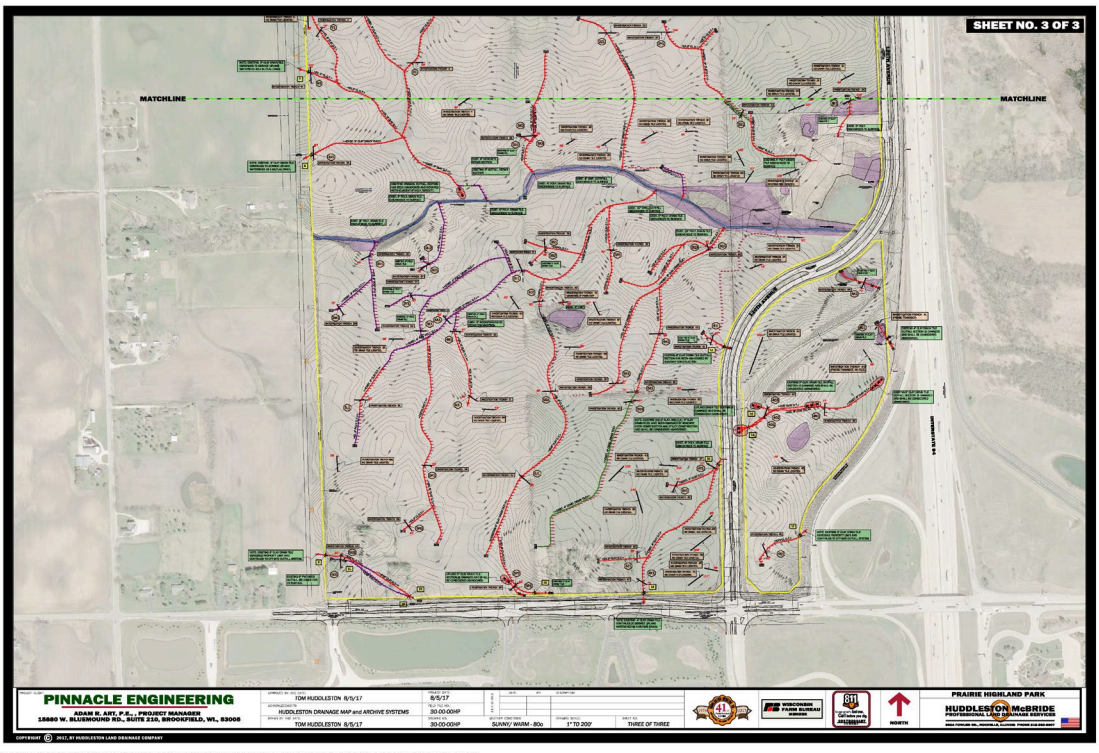
Record mapping shall be completed according to typical civil engineering mapping standards. The developer or project engineer should furnish base map computer data files of the investigation area including mapped topography, easements, right-of-ways, wetland delineation areas and project boundary limits.

All existing found drain tile routes will be located in the field by GPS location systems *(<1m., Illinois State Plane)* and recorded on final plans. The field staking process should include pipe invert cut stakes at all perimeter locations, strategic interior locations and <20' interval pin flagging along tile routes for electronic survey location by the project engineer or surveyor if deemed necessary. It is critical that mutual drainage tiles and surface flow systems that benefit the lands of others are carefully identified and protected.

Final drain tile mapping shall be computer drafted on a base map including recent color digital aerial photography, topography and project limits. Mapped information will include the location of all existing drain tile routes and applicable drainage findings encountered during the field investigation process. A field report shall be attached to the plan containing evaluation information including size, flow, system effectiveness, restrictive siltation, pipe invert to ground surface depth, pipe type / quality, system classification and specific field notes.

3. Agricultural Drain Tile Investigation Plan Samples





4. Agricultural Drainage Modification Recommendations for Ground Mounted Solar Projects.

Depending on the project site and existing drainage conditions, it will be mandatory to maintain existing agricultural mutual drainage system which are necessary to maintain drainage rights of the lands of others. It will be recommended to maintain local (onsite) drainage systems which will assure stable watertable and preserve the ability for continued farming after the duration of the project. It shall also be noted that poorly maintained local drainage systems during the solar project existence may cause jurisdictional wetland conditions which will alter future farm practices and the ability for correction or improvement.

It is our professional opinion, there are two basic methods of farm drainage preservation within the solar project lifespan which include:

- ***A. Complete Avoidance and Protection,***
- ***B. Existing System Replacement By "like kind" Procedures.***

A. Complete Avoidance and Protection

Many of the drain tile system which have been identified in recent drainage investigations are original clay systems which were part of early farm development and date from 1920 to 1970. Some random polyethylene drain tile systems were located as supplement to the original clay systems and installed from 1970 to present.

Since the clay drain tile systems where installed at an early date there are no manufactural material specifications and standards, therefore it is not possible to professionally evaluate the quality or lifespan of these system. Many early clay drain tiles are cracked and held in place only by consolidated ground compression.

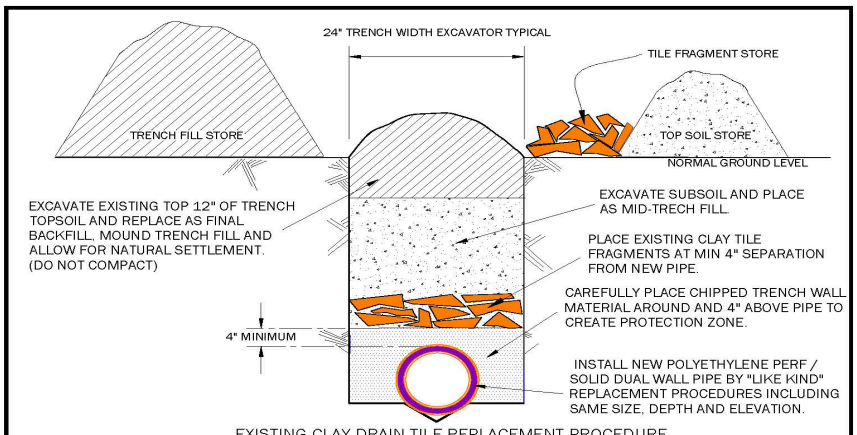
The "Avoidance and Protection" method would require that all existing drainage system would be carefully evaluated for obvious failures and repair splices would be implemented. Existing drain tiles which conflict with specific solar support column locations would need to be rerouted by "warp section" repair. These tile systems would also need to be "lined out" by surface chalk marking and protected from heavy intense surface traffic, wide track low compaction construction equipment would be mandatory during construction.

The clay drain tile structural pipe integrity is unknown and section failure could occur during the solar project life span, therefore it will be necessary to create contingency plans for access and drain tile repair if needed during solar operation.

B. Existing System Replacement By "like kind" Procedures.

Existing drain tile systems installed many years ago have an unpredictable lifecycle and may not be dependable for the duration of the solar projects. The "like kind" replacement procedure will assure reliable performance and protection for the project duration and ready for future farm operations.
Replacement By "like kind" Procedures are more construction intensive than the avoidance and protection method and will require as follows.

1. **All existing agricultural drain tile systems are field staked and delineated in accordance with the Drainage Investigation Plan.**
2. **All existing clay drain tile systems are removed by "like kind" procedures which include the removal and replacement of all original systems including the same size, depth, grade and location. (in accordance with attached typical no. 20a, below on this page)**
3. **Existing drain tile "like kind" replacement which conflict with specific solar support column locations will need to be rerouted by "warp route" installation and would maintain a lateral separation from the support column of ≥4ft.**
4. **All existing drain tiles that egress or ingress the solar site would include a 6" online riser pipe located on or within 2ft (+-) of the project boundary.*(or as otherwise indicated by project owner)* This riser pipe will serve as an observation port for flow verification, system identification and pipeline ventilation. (in accordance with attached typical no. 27D, page 6)**
5. **All additional existing drain tile feeder laterals encountered during the "like kind" replacement process and not listed on investigation plans shall be evaluated and considered for replacement by this same procedure.**
6. **All existing replacement systems shall be located by gps at state plane coordinates and drafted on record plans.**



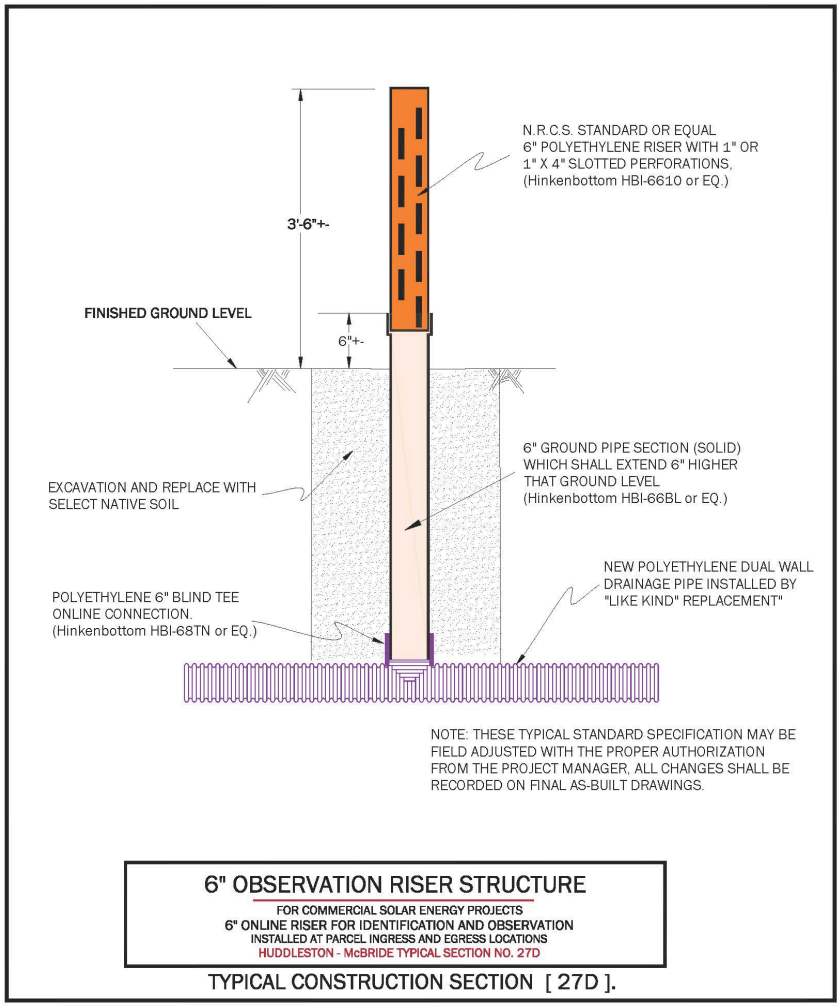
EXISTING CLAY DRAIN TILE REPLACEMENT PROCEDURE

1. EXCAVATE 12" (+-) TOPSOIL, STORE SEPARATE AND SAVE FOR FINAL BACKFILL.
2. EXCAVATE SUBSOIL TO TOP OF EXISTING TILE, STORE SEPARATE AND SAVE FOR MID-TRENCH FILL.
3. EXCAVATE CLAY PIPE, STORE FRAGMENTS SEPARATE AND SAVE FOR BURY FILL.
   (REMOVE POLYETHYLENE DRAINAGE PIPE FROM SITE)
4. CAREFULLY PRESERVE ORIGINAL DRAIN TILE PILOT GROOVE, CLEAN WITH HAND SHOVEL AND INSTALL NEW POLYETHYLENE SOLID or PERFORATED DUAL WALL PIPE WITH IN EXISTING PILOT GROVE POSITION, (ADS N-12 OR EQUAL) [A.S.T.M. F-405 OR F--677, A.A.S.H.T.O.M.-252 OR M-294], INSTALLATION BY "LIKE KIND PROCEDURES INCLUDING SAME PIPE SIZE AT SAME LOCATION AND ELEVATION.
   (PIPE SIZE MY BE MODIFIED IF APPROVED BY RESIDENT ENGINEER OR PROJECT OWNER)
5. PLACE "SPADE CHIPPED" CLEAN TRENCH WALL MATERIAL AROUND AND 4" ABOVE NEW PIPE TO CREATE BEDDING SUPPORT AND PIPE PROTECTION.
6. BACKFILL EXCAVATION TRENCH IN FOLLOWING SEQUENCE.
   (1) -EXISTING CLAY FRAGMENTS OVER BEDDING SOIL.
   (2) - BACKFILL TRENCH SUBSOIL
   (3) - BACKFILL FINAL LIFT WITH SAVED TOPSOIL.
7. FINAL RECORD MAPPING SHALL BE PREPARED INCLUDING GPS SURVEY LOCATION.

NOTE: ALL EXISTING UNKNOWN LATERAL DRAIN TILES ENCOUNTERED DURING "LIKE KIND" REPLACMENT PROCESS SHALL BE REPLACED BY SAME PROCEDURE

EXISTING DRAIN TILE REPLACEMENT SECTION
FOR COMMERCIAL SOLAR ENERGY PROJECTS
EXISTING AGRICULTURAL DRAIN TILE "LIKE KIND" REPLACEMENT
TRENCH REPLACEMENT INCLUDING EXISTING LATERALS BY MID SIZE EXCAVATOR
HUDDLESTON - McBRIDE TYPICAL SECTION NO. 20A

TYPICAL CONSTRUCTION SECTION [20A].



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Huddleston McBride Doc no. 18232
October 8, 2018, END