# Vanguard Renewables Waupaca AD1

## Brooks Farms Dairy LLC
## Waupaca County, WI
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Project No. 21720000

# Vanguard Renewables Waupaca AD1
# Brooks Farms Dairy LLC

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# EXECUTIVE SUMMARY

Brooks Farms Dairy is working with Vanguard Renewables who is proposing to add two anaerobic digesters to the operation prior to sending their manure to long term storage. Part of this plan includes adding sand separation and the needed manure transfer systems, nutrient concentration systems, solids storage, feed storage runoff collection, an additional long-term waste storage facility, and a permanent manure pipeline running to the south. The following report discusses these improvements. While the digesters will be managed by a third party, all waste will be managed under the Farm's WPDES CAFO permit. Animal numbers are not proposed to increase and the digester will be processing food waste which will be managed under the Farm's WPDES permit.

This design will impact days of storage by adding offsite waste, adding an additional long-term storage, adding feed storage leachate and runoff, and removing sand bedding from the waste stream.

A permit modification is required for the additional facilities and sample points as well as the addition of waste and will follow the submittal of the design plans.

The Waupaca AD1 facility is a proposed renewable natural gas production facility located at N1757 County Road A, Waupaca, WI which will produce renewable natural gas from the anaerobic digestion of manure and food waste.

Liquid food waste materials will be brought to the facility by truck and may be unloaded directly into one of the hydrolysis tanks. Food waste materials in packaging containers may also be brought onsite by truck and unloaded within an enclosed organics receiving area (ORA) building. Within the ORA, packaged food waste will be separated from the packaging materials and the food waste will be directed to one of the hydrolysis tanks. The hydrolysis tanks will screen for inorganic material which will then be collected and sent offsite for waste disposal. The packaging materials will be compacted and sent offsite for waste disposal or recycled if possible.

The daily amount of food waste received is anticipated to be approximately 225 tons per day. Onsite storage time for the food waste materials will be minimal because the anaerobic digester will require food waste materials to be fed continuously while the digester is in operation. Less than half of the material fed to the anaerobic digester will be comprised of manure from the adjacent Brooks Farms Dairy and more than half will be comprised of food waste materials.

For the purposes of this Report, the terminology "food waste" and "organics" may be used interchangeably and are intended to have the same meaning.

# CHAPTER 1 – PROJECT DESCRIPTION

## 1.1 INTRODUCTION

This design report has been prepared to outline the design work for construction of a sand separation facility, anaerobic digester facility, solids separation and nutrient concentration system (VSEP), and associated transfer tanks and piping. The Farm is an existing dairy operation that operates under Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. 0066885. The Farm has entered into an agreement with Vanguard Renewables. (hereafter Vanguard) to allow Vanguard to process the dairy manure and food waste to produce pipeline-quality renewable natural gas (RNG). The Farm is located at N1757 County Road A, Waupaca, Town of Lind, Waupaca County, Wisconsin. The Farm is owned and operated by the Brooks family.

## 1.2 DESIGN OBJECTIVE

The purpose of the proposed project is to utilize food waste otherwise destined for a landfill, create a byproduct with more plant available nutrients than raw manure, and generate pipeline-quality renewable natural gas (RNG) through the anaerobic digestion of dairy manure and food waste. The components of the project are a waste transfer system with tanks and pipelines, a sand separation system, food waste receiving structures, two in ground digesters, a solids separation system, a nutrient concentration system (VSEP), biogas upgrading equipment and associated equipment enclosures, and a utility interconnect. The project does not include new or expanded facilities for livestock or expand the herd size. The proposed project consists of the following:

- Feed storage runoff collection and transfer to permeate tank
- Manure transfer from existing barns to sand separation system
- Sand separation building with tanks and process equipment
- Organics receiving area for offsite wastes (non-reviewable)
- Three hydrolysis tanks before the digesters
- Two below ground, 1,780,000-gallon anaerobic digester (AD) tanks
- Solids separation system
- VSEP nutrient concentration system with buffer tank
- Permeate tank (proposed long term waste storage facility)
- Concentrate transfer system to existing waste storage facility
- Associated transfer piping
- H2S removal
- Utility Interconnect
- Access roads
- Stormwater Improvements
- Permanent manure pipeline to southern fields

The purpose of this design report and associated construction drawings is to provide sufficient detail to construct the following components:

- Construction of two belowground, 1,780,000-gallon anaerobic digester (AD) tanks compliant with NRCS 313 and 522, designed to ACI 350.
- Construction of three reception tanks called hydrolysis tanks, compliant with NRCS 634, designed to ACI 350.

- Construction of leachate and runoff transfer systems (gravity and forcemain) compliant with NRCS 634 and NRCS 561.
- Construction of a long-term waste storage facility tank (Permeate Tank) compliant with NRCS 313 and 522, designed to ACI 318.
- Construction of a sand separation system compliant with NRCS 634.
- Construction of all associated transfer systems compliant with NRCS 634.
- Construction of manure solids storage to NRCS 313.

## 1.3 PROJECT RESPONSIBILITIES

This project involves multiple firms, with each firm responsible for design and certification of the items as outlined in the following table.

**Table 1. Project Responsibilities**

| DESCRIPTION | DESIGN RESPONSIBILITY | VENDOR |
|---|---|---|
| Manure Transfer from Existing Barns to Sand Separation | MSA | Komro |
| Manure Sand Separation Civil and Structural Design | MSA | Komro |
| Permanent Manure Pipeline from Farm Design | MSA | |
| Feed Storage Runoff Collection and Piping to Permeate Tank | MSA | |
| Hydrolysis Tanks Structural Design | PlanET/MPE | PlanET |
| Receiving Pumps Technical Container Structural | PlanET/MPE | PlanET |
| Anerobic Digester Structural Design | PlanET/MPE | PlanET |
| Digester Facility Site Civil | USM/MSA | |
| Overall Site Layout | Ross Engineering/Purpose Engineering | |
| Raw Gas Piping Design | Ross Engineering/Purpose Engineering | |
| H2S Removal and Upgrading Structural and Building Design | PlanET/MPE | PlanET |
| Biogas Piping Design to Utility Interconnect | Ross Engineering/Purpose Engineering | |
| Digestate Piping Design to Solids Separation | Ross Engineering/Purpose Engineering | |
| SWECO Feed Tank Structural Design | MSA | |
| Solids Separation Building and Structural Design | Ross Engineering/Purpose Engineering | |
| VSEP Building and Structural Design | Ross Engineering/Purpose Engineering | |
| VSEP System Design | Ross Engineering/Purpose | New Logic Research |

| | |
|---|---|
| | Engineering<br>Ross<br>Engineering/Purpose |
| Permeate Piping Design to Organics Receiving Area | Engineering<br>Ross<br>Engineering/Purpose |
| Permeate Piping Design to Permeate Tank | Engineering<br>Ross<br>Engineering/Purpose |
| Concentrate Piping Design to Concentrate Lagoon | Engineering |
| Permeate Tank Civil and Structural Design | MSA |

## 1.4 CONSTRUCTION TIMELINE

- Start of Construction/Site Mobilization: April 3, 2023
- Anerobic Digester Tank (Start Excavation): May 1, 2023
- Sand Separation (Start Excavation): May 1, 2023
- Nutrient Recovery System (Start Excavation): June 26, 2023

# CHAPTER 2 – SITE ASSESSMENT

## 2.1 TOPOGRAPHY

The existing topography was determined using survey of the site provided by MSA Professional Services and Westwood in 2022. The result of the topographic survey is included in the construction drawings in **Appendix A**.

## 2.2 SOILS INVESTIGATION

In 2022, four iterations of soils investigations were completed at the Farm. Preliminary geotech soil borings (ST1 through ST5) were completed by Braun Intertec on April 27. Braun Intertec did additional soil borings (ST6 through ST19) on November 9. On November 17, Geosyntec Consultants completed soil borings B-1 through B-12. Dale Mitte of MSA completed test pits with a tracked backhoe on November 8; due to a staking issue, these are numbered oddly, as 2022-2, 3, 5, 8, 10, 16, 17, and 18. There are no additional or missing test pits. The controlling elevations are all based off of water observed in soils investigations. For the Permeate Tank, that water was in ST13, at elevation 821.7. For the Digesters, the controlling elevation is 820.07 in ST4, and for the hydrolysis tanks, the controlling elevation is 820.0 in B6.

Geosyntec borings B7 and B12 showed unusually high water that was only visible in these two borings, and none of the surrounding borings. The following is a discussion on these borings and why these water levels are not used as the limiting water elevations, from Dale Mitte, soil scientist and Andrew Skwor, PE.

> "In B7, the log notes that in the yellowish, red sandy silty clay there was trace interspersed fine gravel mixed in the material. Mostly likely when drilled they encountered a somewhat gravelly-sand pocket in the CL till. These gravelly-sand pockets with their open void spaces sometimes hold free water in them and when punctured will have water drain out freely. This water cannot readily migrate downward in the SP sand layer as the CL till material around it is less permeable by a significant amount. The water in B7 is shown at elevation 824.5'. ST6 is right next to it and is typical of most of the pits and logs right beside B7 and it does not have water in the CL till, but like almost all other borings the water is down in the sand layer below.
>
> ST6 has no water above elevation 818.0', it has water under elevation 818.0' or 12.5' deep not 5 ft deep. The sand in B7 is at elevation 818.2' or 11.3' deep with water seeping out above it but would have been difficult to tell actual water levels in the SP sand below.
>
> Also note B6, B7, and ST6, ST7 are all close together and B6, B7, and ST6 are very similar with topsoil over CL glacial till over SP sand with the water listed in the sand. The CL till layer is 8.5' to 11.3' deep. Overall, in the logs and also what was observed in the excavated test pits is that the CL red glacial till does contain some sandy pockets. The sand pockets in the CL till of the excavated test pits did not have observed water per the logs which is a majority of noted logs by both drilling firms.
>
> B12 and ST 13 are located in the waterway/drainageway from the wetland location to the northwest. Observed no water initially drilling in B12 until 16' (elevation 812.0) when they encountered the SW sand. After 24 hrs the water observation was at 16'. The CL till above

notes silty clay with trace of coarse sand. This boring,ST13, and ST10 have the CL glacial till layer as thicker in the area running 16' plus of CL glacial till, whereas most of the other borings and test pits, the CL glacial till is 9' to 12' thick on average.

To summarize B12 and ST13 have a thicker till layer, thus more weight pushing down on the SP layer with water. Once the layer is punctured by drilling the pressure of the extra weight is relieved and pushes water upwards.

In ST13, at the start of the boring no water was observed, but after 30-minutes water was at 6.5'. This log is the only one listingtopsoil over SC till to 7.5' and the CH fill to 16.5' plus. No water was observed at the start and no SP sand was found at least to 16.5'. But after 30-minutes they had water at 6.5'. An assumption is the SC till which is sandier than the CH fill may had a small seep or wet lenses which after a few minutes found its way over to the newly drilled boring and filled it. The sand pockets in the tills may contain water but can be emptied and also the site can be assisted by drain tile with proper drain fill. The tile and drain fill will take away those upper perched lenses andpockets and also relieve that upper weight pressure which would stabilize over time

ST10 does somewhat the same, no sand for 6.5' and no water until auger was removed, the water was recorded to 12.5'.

Please note in B8 the water was recorded at 13.5' at the start which was the top of the SP sand, then in 15 hrs later it was 8.4'. In 24 hrs it was back down to 11 ft. In my professional opinion, the pressure pushes the water below in the SP sand layer up slowly but then once it stabilizes the water would go back down to the SP layer. This was recognized in the test pits where the water was originally observed around 16.5' to 18' in SB8 and SB10, but upon checking later on during the same day the water came up to around 13', but stayed in the SP layer depth. For almost all of the borings of both geotechnical firms, the logs noted the water in the SP layer mostly and not much in the CL till layer.

In my professional opinion, the actual water table is in the SP sand layer and at the top of the SP sand layer or somewhat below it by 1-3'. Everything about the SP sand layer is perched or happened by temporarily relieving the pressure by borings. Notes most of the observed water is down in the SP sand layer and is between 812 to 820 elevation. This also fits the noted geotechnical firms logs and Natural History Tech Report 007.

Also, the two well logs including one from 2020 shows water being stable in depth of 10'-18' down but back both are just in the SP sand layer, not above into the clay layer

Observed/recorded water at 3.7'. There is no note about overnight weather or any site conditions that would be contributed to the water level change. Also, this hole was drilled on 11/16/22. It was one of the first holes, would have been nice if left open for a few more days to recheck as they drilled from 11/16 to 11/19 on Saturday according to the logs. So now there were more borings done over the area which would assist in relieving the pressure. IE why the water in B8 on 11/17/22 came up to 8.4' but was already going back down to 11' in 24 hours."

## 2.3 WELLS

The Farm has four wells onsite. Contamination from surface runoff and risk from traffic damage is minimal, due to the proximity of the wells to the facilities and motor vehicle traffic. The locations of the wells can be seen in **Appendix A**. The wells are all outside of 250' of the proposed infrastructure. Three wells (Unique well IDs UN280, ZG695, and NP653) are within 245', 165', and 115' of the existing feed storage (FSA) respectively, and 185', 230', and 200' of the Small Pit, respectively, which will be collecting runoff from the FSA. These distances are greater than the distances required by NR812. The proposed piping for the feed storage collection is not within 250' of the wells. In addition, there are no community wells located within 1,000' of the proposed waste storage facilities.

## 2.4 SUSCEPTIBLE AREAS

The site was evaluated for susceptible features such as karst features, surface water features, and drain tiles. A delineated wetland is located directly north of the proposed digester facilities. Wetland indicator soils are present, though the delineation let to only the northern wetland being identified in the immediate parcel. The county requires a 25' setback to the wetland boundary. No bedrock was discovered in any of the soil investigations, though groundwater was present in several (see section 2.2 for a more in depth discussion). There are no existing field tile drains in the area of the proposed improvements. There are no floodplains within 1,000 ft of the proposed improvements, per WI DNR SWDV. No wetlands or water bodies have been or will be filled as a result of construction activities or digester facility operations. The Farm is pursuing a clean water discharge permit which is not included in this submittal.

# CHAPTER 3 – IMPROVEMENT DESCRIPTIONS

## 3.1 HYDROLYSIS TANKS

Three hydrolysis tanks are proposed to feed the digesters. The purpose of the hydrolysis tanks is to take the manure after sand has been removed and to take food waste from the Organics Receiving Area (ORA) and combine them prior to addition to the digester. These tanks will also serve as a final step for removing any material that would be detrimental to the digester that did not get removed at the ORA or in the sand separation system. Hydrolysis Tank 1 (#HT1) will hold high organics liquids (FOG), while Hydrolysis Tanks 2 and 3 (#HT2 and #HT3, respectively) will hold manure and clean organics.

#HT1 receives high organics liquids from trucks unloading clean liquids through the Technical Container #1 (#TC1). #HT2 and #HT3 can receive clean organics from the ORA, through underground piping, or from unloading trucks, through the #TC1. They receive manure through underground piping from the proposed sand separation building. While #HT2 or #HT3 is being filled, it is recirculated through the hydrocyclone in the Technical Container #2 (#TC2). While this is happening, the other tank (#HT2 or #HT3, the one that has already been filled before), is feeding the digesters. The content in #HT1 will be fed into the digesters together with #HT2 and #HT3 at a lower rate, varying accordingly to the required organic load. In case it is required, there will be available piping for by-passing the hydrolysis tanks, sending manure from the sand separation building, or organics from the ORA or the trucks' unloading bay straight to the digesters. Also, liquid organics can be sent from #HT1 to the ORA in order to dilute high solids organics while diminishing the use of water.

The tanks all have interior diameters of 45'-11" and 12" thick walls. Tank 1 has a wall height of 14'-10" with a maximum liquid depth of 8'-9". Tanks 2 and 3 have wall heights of 26'-3" with maximum liquid depths of 25'. The volume of Hydrolysis Tank 1 is 108,000 gallons, while the volumes of Hydrolysis Tanks 2 and 3 are 309,000 gallons each. The slabs of each of the hydrolysis tanks is set at 824.0, and the proposed grade outside of the tanks ranges from 829.0 to 831.0. The hydrolysis tanks are designed to NRCS 634 Waste Transfer (11/2022), with concrete designed to ACI 350. This design requires a minimum of 2' to subsurface saturation, and the hydrolysis tanks have 4.0' of separation, with water at 820.0' in soils investigation B6. Bedrock was not encountered in any of the soils investigations; the required 2' of separation is met.

## 3.2 DIGESTERS AND GAS UPGRADING SYSTEM

Two anaerobic digesters are proposed as part of the project. The waste stream will be pump from the hydrolysis tanks to the digester. From the digesters, the digestate will move to the solids separation and V-SEP building before going to long-term waste storage in the existing waste storage (Concentrate Storage) and the proposed waste storage (Permeate Tank). The digesters are mesophilic in configuration with a required operation temperature of 100.4 degrees F. Heat is supplied by hot water recirculation, external heat exchangers and a fuel gas fired hot water boiler. There are three side mounted agitators and two submerged mixers in each digester. Over/under pressure relief valves are to be installed on the digesters.

The gas upgrading system consists of the following steps:

1. Gas conditioning: The gas is collected into a raw gas buffer tank of 2,642 gallons. Then it is cooled through two cold water chillers and the liquid faction is separated.

2. Filtration: The gas is filtered through a PSA system (6 PSA Adsorber vessels), plus 2 $H_2S$ carbon filters and 1 VOC carbon filter.
3. Gas compression: The biomethane is collected in a Biomethane Buffer tank and then sent through one of the two in-parallel blowers to the interface with the customer.

The digesters each have an interior diameter of 111.6' with 16" thick walls, with a concrete wall height of 26'-5" and a roof height on top of the wall of 18'-1/2", for a total height of 44'-5 ½". The maximum liquid depth in the digesters is 24'-4", which correlates to a maximum volume of 1,780,000 gallons in each digester. The digester slab is proposed to be at elevation 824.5, sloping at 2% to the middle to an elevation of 823.38, sitting 10' below proposed grade. The digesters are designed to ACI 350 liquid tight concrete with waterstop, Table 3, Column A of NRCS 522 Pond Sealing and Lining (06/2021). Due to the ACI 350 design, the digesters do not require a subliner. This design requires a minimum of 2' to subsurface saturation, and the digesters have 3.3' of separation, with water at 820.1' in soils investigation ST4. Bedrock was not encountered in any of the soils investigations; the required 1.5' of separation is met.

## 3.3 Feed Storage Runoff Controls

The Farm's existing feed storage system does not have runoff controls. The majority of runoff flows to the south, though the apron on the north side of the bunkers flows north. Any apron runoff from the eastern two bunkers flows to the Small Pit. A collection system is proposed for the south side of the bunkers at the low spot where runoff leaves the existing feed pad apron, with a gravity pipe running to the west, to circle around to the north of the bunkers and penetrate the Small Pit. The proposed catch basin is a 4' x 4' square manhole x 5' deep with a Neenah R-4482A grate (34" x 34"), with a 24" corrugated HDPE pipe at 0.16% slope. From the Small Pit, the runoff will be pumped with a Wilo submersible pump through 10" DR17 HDPE to the new waste storage facility (Permeate Tank).

## 3.4 Waste Storage Facility – Permeate Tank

A new waste storage facility is proposed south of the existing waste storage facility. The existing waste storage is proposed to be used for housing the "concentrate" portion of the waste stream (the portion of waste from the V-SEP that has the majority of the nutrients in it, and the proposed Permeate Tank will hold the permeate or tea water portion, which will be a diluted, low nutrient concentration waste stream. The proposed storage is a rectangular vertical walled concrete tank measuring 230' x 470' inside dimensions x 16' deep, with a bottom elevation at 825.0. The storage facility will be constructed of Reduced Seepage Concrete with Waterstop (NRCS 522 Table 2, Column A) and a 1.5' thick subliner with soils meeting P200>20% and PI>7 (NRCS 522 Table 2A, Column A). The storage will be holding process wastewater and is proposed to meet WI Admin. Code NR 213 through NR 213.06 Alternative Designs, as the storage is designed to NRCS standards more stringent than Chapter NR 213. The storage is sized for 10.7 million gallons of MOL volume; between all storages onsite, the Farm will have nearly 18.5 million gallons of storage or 222 days of storage at their existing animal numbers. In depth storage calculations are available in **Appendix F**. This design requires a minimum of 2.5' to subsurface saturation, and the Permeate Tank has 3.3' of separation, with water at 821.7' in soils investigation ST13. Bedrock was not encountered in any of the soils investigations; the required 1.5' of separation is met. The eastern wall of the storage is designed for

## 3.5 SAND SEPARATION SYSTEM AND ASSOCIATED TRANSFERS

The following description is to aid in understanding how sand laden manure is processed and is transferred through the system before the digester system. The various plansets in **Appendix A** should be referenced for specific pipe sizes and materials as well as pump models.

The current manure transfer in the Freestall Barn is an auger channel that runs to the north to a two cell reception tank before being pumped to the Big Pit. This will be modified as part of the sand separation system. The auger will be reversed, and a 5' deep, 11.33' wide by 30' long flush tank is proposed at the southern end of the channel. A 24" ADS gravity flume is proposed to move sand laden manure from the tank to the sand building. A 12" DR17 HPDE flush line will loop back to the tank. The existing reception tank in the freestall barn will be left in place with the option of pumping directly to the manure storage if the sand building is ever not operational.

Heifers are also bedded on sand at the Farm in the Heifer Barn directly south of the Freestall Barn; their manure is currently scraped to the west end of the barn and then to the south directly into the big pit. A flush flume is proposed on the west end just outside of the existing barn to run to the north, joining the freestall barn flume; the barn will be extended over the proposed flume (by others). A 12" DR17 HDPE flush line will come from the sand building to the 24" ADS gravity flume. The scrape alley will remain in place, though concrete will need to be replaced and an overhead door is required on the south end of the barn extension.

The sand separation system is provided by Komro Sales and Services, Inc. When manure enters the sand separation system it will go through a cross auger and sand settling lanes. The sand will be washed and stored within the sand building. Manure and the water used to wash the sand will then be discharged to the hydrolysis tanks after passing through a piping manifold in Technical Container 1.

The sand separation system will also have the option of discharging directly to the manure storage without going through digestion. The first bypass line is proposed to tie into the existing freestall transfer line. A second bypass line is proposed around the western side of the manure storage to discharge over the top.

## 3.6 VSEP AND SOLIDS BUILDING

The following description is to aid in understanding how digested manure is processed and is transferred through the system before long term storage. The various plansets in **Appendix A** should be referenced for specific pipe sizes and materials as well as pump models. A watertight concrete building (plans available in **Appendix A**) is proposed to the south of the existing lagoon and between the digesters and the proposed permeate waste storage tank. This building will have a solids separation and stacking area on the west side, with a pressate feed tank (TK7005 SWECO Feed Tank) measuring 11.33' x 47' x 12' deep to the north of the stacking building. The solids separation and stacking area of the building is roofed with a 6' wall and open to the air. The SWECO feed tank is north of the 6' wall, though still roofed. The solids stacking area is proposed to be concrete with waterstop, though it is also proposed to have 1.5' of P200>30% and PI > 5 liner soils beneath to meet NRCS CPS 313 Table 5, Roofed Working Surface Stacking Area. Digested manure is fed through an above ground insulated and heat traced Line 32 and pumped into the solids separator screw press (Boerger RC40) located in a mezzanine above, which drops solids to the floor below. Pressate liquid is routed through a gravity line to the SWECO feed tank; there is

also a floor drain from the mezzanine that ties into this gravity line (these lines will be insulated and heat traced). There is a floor drain in the south end of the solids stacking area that leads to a 6' deep x 4' diameter manhole TK-7071, which then pumps to the drain manifold in the VSEP portion of the building. From the SWECO feed tank, the pressate is pumped into the SWECOs which are located in the VSEP building. The SWECOs are another layer of solids separation, the solid fraction of which ends up back in the solids stacking area. The VSEP side of the building is not open to the exterior and is also concrete with waterstop. Within the VSEP building, the liquid from the SWECOs goes through the VSEP to be divided into two waste streams: concentrate and permeate. As their names suggest, this is a nutrient concentration system to help with better nutrient management. The VSEP discharges permeate through Line 50 to TK-7062, another 4' diameter x 6' deep manhole. This is pumped via surface mounted pump through above ground piping, splitting to Line 42 (heading back to the ORA) and Line 43, which goes to the proposed permeate waste storage facility. Line 42 has a tee to Line 53, which is stubbed for future use. The VSEP also discharges CIP permeate through Line 51 to TK-7073, and CIP concentrate through Line 51 to TK-7074 (both TK structures are 4' diameter x 6' deep manholes). Both manholes use submersible pumps to pump to the drain manifold. The drain manifold pumps permeate through Line 44 to the proposed permeate storage tank and concentrate through Line 45 to the existing waste storage facility. The floor of the VSEP has floor drains which lead to TK-7072 (4' diameter x 6' deep manhole), which pumps to the drain manifold; a drain from the VSEP itself (Line 41) also enters these drains.

## 3.7 STORMWATER CONSIDERATIONS

To prevent issues with stormwater flow and to keep the site drained, the site has been graded to drain away from structures and to the wetland. Several surface inlets and culverts are proposed. Any pipes crossing under a stormwater pipe within 3' will be insulated in the area of the crossing.

## 3.8 SAFETY FEATURES

Safety considerations have been made for each of the structures onsite. The manhole outside of the freestall will be covered to prevent entry. The proposed waste storage facility will have a fence with warning signs installed at any point the top of wall is less than 5' above grade. The feed storage inlet will have a grate over the top, and the Small Pit will have gates installed across the ramp. The digesters and hydrolysis tanks are completely covered and will have confined space warning signs at any access points.

The facility will have appropriate road marking and floor signage/painting (using appropriate wear resistant colors) to designate segregation, process, safety, hazard, and storage areas. Facility floors will be pitched toward drains but be level enough for safe forklift operation. Floor surfaces will have appropriate texture to prevent slipping, spinning wheels of equipment such as forklifts. Air curtains will be installed to control fugitive odor release when doors are open only on the two bunker unloading doors. Gully/Drains covered by grating on the inside of the door threshold to prevent liquid from escaping the building. The HVAC/odor control system will include air circulation to all areas/pits and sumps to prevent hazardous gas/condensation/odor pockets forming to the pit, or free-standing fans to reduce mold growth.

Alarms will be installed to warn Operations before an overflow event, as well as a transparent access window, with the ability to be in-situ cleaned (i.e., mounted squidgy), for visual awareness of Tank levels. Emergency overflow will be included. Over/under pressure relief valves are to be installed on the digesters.

## 3.9 FAILURE ANALYSES

Failure of the waste storage (permeate) tank is unlikely due to its entire construction of reinforced concrete. The most logical scenario in which waste would leave structure would be improper operation and maintenance causing the storage to overtop. If it were to overtop, waste would flow 130' until reaching a classified wetland, and additional 430' until reaching an unnamed intermittent stream (WBIC 5021201). This stream is an eventual tributary of Walla Walla Creek (WBIC 254000) after 7,200'. At the point of discovering a storage has overtopped, the owner shall gather big square or round bales and place in front of waste flow, if possible, to create a dam. Additionally, a soil dam could be created to stem the flow of contaminated water. Once the waste flow is stopped, the Farm would notify the DNR and proper authorities, and begin the cleanup process.

In the digester design, worst-case conditions were run separately in addition to the conditions associated with the use of the Environmental Endurance Factor 'Sd' in ACI350, which all provides a high degree of safety and confidence against catastrophic failure. In addition to the water-tight design, there will also be an interior liner to completely enclose the fluid within, providing a high degree of confidence that no leaks will occur.

In the event the digester is offline, the farm has two backup lines to transfer from the sand separation into the existing waste storage facility, as well as the option to pump sand laden manure directly to the waste storage facility from the freestall barn and scrape heifer manure directly to the waste storage if the sand separation system is offline.

## 3.10 NRCS 634 VARIANCE REQUEST

On behalf of Brooks Farms (Permittee) and Vanguard Renewables, we are requesting a variance to Wisconsin NRCS Conservation Practice Standard Code 634 Waste Transfer, November 2022. This consideration is for piping systems beyond or downstream of Technical Container #1 (TC#1). TC#1 is the point at which yard piping (true waste transfer systems) transitions to process piping. The variance is being requested because some of the process piping does not meet the required 3 feet per second velocity within in the standard. Additionally, the plant designer, PlanET Biogas, uses a volume-based operation philosophy and feeding schedule which would need to change; maintaining 3 fps would result in pipe size changes which would result in flowrate changes. Because of their experience, number of plants developed as well as plant successes, it was determined their recommendations on pipe size and pumps needed to be followed as closely as possible.
The minimal pipeline velocity within the standard is to minimize solid settlement and control various piping and pump issues long-term. In the case of this project several features have been added to reduce solid size thus making them less prone to settling and staying within the flow. Some of those features include:

- Bar screen placed at the influent to the sand separation system.
- Cross gutter and settling lanes within the sand separation building which create settlement and carry organic solids out of the waste stream as well as create pockets of floating debris which can get skimmed off.
- The discharge tank within the sand separation system pumps to TC#1 uses a pump and maceration system to reduce size of solids to the digestion process. The pump and macerater are used in conjunction with the agitator in the tank to allow recirculation which homogenizes the waste and reduces the chance of passing large solids.

- Once comingled with food waste, a hydrocyclone is utilized as the initial process to catch remaining sand particles and debris before being pushed into the digestion process.

Finally, management of the process is another key part to making sure the system stays operational. Vanguard Renewables has a management program to staff the facility 6 days per week with on-call staff during off hours. The system also has various controls including flow meters, amperage monitoring, and pressure sensors throughout the system to note when there may be a pipe restriction or blockage. Maintenance is completed using pipeline management Standard Operation Procedures (SOP) which may include backflushing, jetting, vacuuming, or section replacement. The system design also has strategic redundancy which allows pipelines to be taken offline for maintenance to minimize disruption of the process.
Andrew Skwor, PE had a phone discussion with Mr. Bernie Michaud, on February 16th, 2023 at approximately 10:15am regarding pipeline and flow velocity for the process system. Mr. Michaud was very supportive of the conversation, but also provided concerns that we feel we address within our request. Based on that conversation is how we deemed a variance request to the standard was an appropriate action.
For reasoning stated we feel the variance request is justified and appreciate the consideration to grant the variance for this project.

# CHAPTER 4 – MANAGEMENT ASSESSMENT

## 4.1 WASTE GENERATION

The manure on the dairy is currently all directed towards the Big Pit, which will be converted to use as a Concentrate Storage. Cows, heifers, and calves are housed in various buildings onsite; the main freestall barn is the one in question for this design. Cows are bedded on sand, which is currently being directed to the manure storage. The Farm will start separating sand out of the manure and recycling it as part of the proposed improvements. The proposed improvements tie into the existing waste handling system. The proposed changes add additional waste to the waste stream, as well as adding storage volume. The proposed improvements have been designed assuming 285 tons per day of offsite waste being imported onto the farm (19,079,468 gallons), though the operation point of the system is 225 tons per day of offsite waste, which correlates to approximately 15,000,000 gallons annually of offsite waste.

The farm will have 222 days of storage when the improvements are complete if the digester is bringing in the full capacity of off-site waste, with 9,274,741 gallons annually of manure and process wastewater, and a maximum design of 19,079,468 gallons annually of off-site waste. Approximately 953,973 gallons of volume is to be removed through the solids separation screw press prior to the V-SEP. It is estimated that 5% of the volume of the waste will be removed as solids, and this estimated volume is based solely on the maximum offsite waste volume. The total storage volumes on the farm will be 18,495,540 gallons between the current “Big Pit” waste storage facility and the proposed permeate waste storage facility. It should be noted that these volumes and the days of storage are the maximum capacity of the digester system, not the proposed operating point of the digester.

## 4.2 WASTE MANAGEMENT

The Farm is responsible for all facilities, equipment, and piping to the final tank in the sand separation building and from the long term waste storages (Big Pit/Concentrate Storage and Permeate Tank) to the nutrient’s end use or when it is sold. Farm personnel are required to operate, manage, and maintain all facilities of this transfer system including the sand separation system.

Vanguard staff will be responsible for the facility and equipment downstream of the final tank in the sand separation building. Vanguard personnel are required to operate, manage, and maintain all facilities of the transfer system, anerobic digesters, and digester recirculation.

The sand separation system, once optimized, will remove a minimum of 97% of the sand from the waste stream and require only daily maintenance per the vendor’s operation and maintenance plan and schedule.

The entire system is minimally influenced by weather as all critical equipment is housed and capable of being heated. This will allow weather influences to be greatly reduced on component wear and maintenance to reduce risk and create better longevity.

The Farm is aware that the nutrients brought into their permit will exceed what their acreage can currently have applied. The farm is discussing options, including but not limited to selling the additional nutrients that Vanguard is bringing into the digesters. To do so the Farm would be

required to have a commercial fertilizer license from DATCP. The agreement between Vanguard and the Farm states that the Farm's nutrient management plan will not be exceeded.

## 4.3 DIGESTER MANAGEMENT

The proposed project site is adjacent to the dairy facility and set back from the nearest road. The majority of piping is underground. This proposed project should not change the overall aesthetics of the Farm. The surrounding area is a rural farming community, with several rural residences scattered in the area. There should be no negative impact to aesthetics of the area with the proposed project.

The digester will be operated to ensure liquid level is maintained in the operating band, manure temperature is kept at approximately 100.4 degrees F, and gas pressure is maintained within the design specifications for the tank. All components of the digester will be maintained in accordance with manufacturer's recommendations.

## 4.4 SAND SEPARATION MANAGEMENT

While the Farm will be responsible for the operation of the sand separation, the digester developer will be operating the transfer of manure into the hydrolysis tanks and therefore into the digesters. The digester operation and mass balance has been sized such that the digester system will always be available to take manure. In the event the digester is offline, the farm has two backup lines to transfer into the existing waste storage facility, as well as the option to pump sand laden manure directly to the waste storage facility from the freestall barn and scrape heifer manure directly to the waste storage.

# CHAPTER 5 – DESIGN STANDARDS AND SPECIFICATIONS

## 5.1 NRCS CONSERVATION PRACTICE STANDARDS

The following NRCS Conservation Practices standards are the applicable standards used in this design:

- Wisconsin USDA-NRCS Conservation Practice Standard (CPS) 313 – Waste Storage Facility (10/2017R)
- Wisconsin USDA NRCS CPS 366 – Anaerobic Digester (01/2018)
- Wisconsin USDA-NRCS CPS 522 – Pond Sealing & Lining – Concrete (06/2021)
- Wisconsin USDA-NRCS CPS 533 – Pumping Plant (08/2021)
- Wisconsin USDA-NRCS CPS 561 – Heavy Use Area Protection (11/2022)
- Wisconsin USDA-NRCS CPS 634 – Waste Transfer (11/2022)

## 5.2 ADDITIONAL DESIGN REQUIREMENTS

- Wisconsin Administrative Code NR 243
- Wisconsin Administrative Code NR 213
- American Concrete Institute (ACI) Code 350-20: Code Requirements for Environmental Engineering Concrete Structures (for Digesters)
- ACI Code 318-19: Building Code Requirements for Structural Concrete (for all other structural concrete)

## 5.3 CONSTRUCTION SPECIFICATIONS

The following construction specifications shall be used for the completion of this work:

- USDA-NRCS Wisconsin – 2. Excavation (5/18)
- USDA NRCS Wisconsin – 3. Earthfill (5/22)
- USDA-NRCS Wisconsin – 4. Concrete (11/22)
- USDA-NRCS Wisconsin – 004. WS Embedded or Expansive Waterstop (11/22)
- USDA-NRCS Wisconsin – 204. Earthfill for Waste Storage Facilities (9/18)
- USDA-NRCS Wisconsin – 300. Clay Liner (4/18)
- USDA-NRCS Wisconsin – 634. Waste Transfer Pipe (11/22)
- WDNR CPS 1053 – Channel Erosion Matt (11/2018)
- WDNR CPS 1056 – Silt Fence (3/2006)
- WDNR CPS 1057 – Trackout Control Practices (7/2018)
- WDNR CPS 1058 – Mulching for Construction Sites (6/2003)
- WDNR CPS 1059 – Seeding for Construction Site Erosion Control (11/2003)
- WDNR CPS 1060 – Storm Drain Inlet Protection for Construction Sites (6/2016)
- WDNR CPS 1061 – Dewatering Practices for Sediment Control (4/2020)
- WDNR CPS 1062 – Ditch Check (3/2018)
- WDNR CPS 1067 – Temporary Grading Practices for Erosion Control (3/2004)
- WDNR CPS 1068 – Dust Control (11/2017)

# CHAPTER 6 – AUTHORITY

To the best of my professional knowledge, judgement, and belief, this design meets applicable standards as listen in Chapter 5 of this report.

All of which is respectfully submitted,
MSA Professional Services

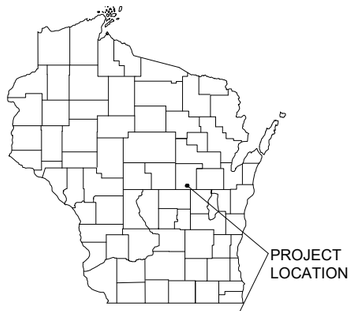
Jenise Anderson
Wisconsin P.E. No. 47342-6
(Expiration 07/31/2024)

# APPENDIX A

# Construction Plans

# 2022 EQIP FSA RUNOFF COLLECTION AND WASTE STORAGE FACILITY

## BROOKS FARMS DAIRY, LLC
## WAUPACA COUNTY, WI




**LOCATION MAP**
NOT TO SCALE


OWNER
RON BROOKS
N1757 COUNTY ROAD A
WAUPACA, WI 54981
PHONE: (920) 636-8991

ENGINEER
MSA PROFESSIONAL SERVICES, INC.
JENISE ANDERSON, PE
OFFICE: (608) 355-8885
CELL: (701) 370-9821

COUNTY
WAUPACA COUNTY LAND AND WATER CONSERVATION DEPARTMENT
BRIAN HAASE
811 HARDING ST,
WAUPACA, WI 54981
PHONE: (715) 258-6482


## SHEET INDEX



## LEGEND

| | |
|---|---|
| W | EXISTING WATER MAIN |
| W | EXISTING WATER MAIN, VALVE & HYDRANT |
| W | EXISTING WATER SERVICE & CURB STOP |
| W | PROPOSED WATER MAIN, VALVE, & HYDRANT |
| W | PROPOSED WATER SERVICE & CURB STOP |
| SAN | EXISTING SANITARY SEWER & MANHOLE |
| SAN | PROPOSED SANITARY SEWER & MANHOLE |
| FM | EXISTING FORCEMAIN |
| SS | EXISTING STORM SEWER & INLET |
| SS | PROPOSED STORM SEWER & INLET |
| SS | PROPOSED STORM SEWER & MANHOLE |
| E | BURIED ELECTRIC |
| G | BURIED GAS & VALVE |
| TV | BURIED CABLE TELEVISION |
| T | BURIED TELEPHONE |
| FO | BURIED FIBER OPTICS |
| OH | OVERHEAD UTILITY |
| | RAILROAD TRACKS |
| | EXISTING CURB & GUTTER |
| | PROPOSED CURB & GUTTER |
| | EXISTING SIDEWALK |
| | PROPOSED SIDEWALK |
| CP | EXISTING CULVERT PIPE |
| | PROPOSED CULVERT PIPE |
| | FENCE LINE |
| | DRAINAGE ARROW |
| | SILT FENCE |
| | RIGHT-OF-WAY |
| | BASELINE |
| | PROPERTY LINE |
| | TREE LINE |
| | BENCHMARK |
| | IRON PIPE |
| | IRON ROD |
| | CONTROL POINT |
| | UTILITY POLE & GUY |
| 1000.00 | SOIL BORING |
| | LIGHT POLE |
| | PEDESTAL |
| | STREET SIGN |
| | MAILBOX |
| | FLAGPOLE |
| | TREE - DECIDUOUS |
| | TREE - CONIFEROUS |
| | TREE TO BE REMOVED |

WISCONSIN
JENISE R ANDERSON
47342-6
BARABOO, WI
PROFESSIONAL ENGINEER
2/24/2023
CIVIL SITE

**JENISE ANDERSON, PE**
**MSA PROFESSIONAL SERVICES, INC.**

**TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, JUDGEMENT, AND BELIEF, THESE PLANS MEET WISCONSIN ADMINISTRATIVE CODES NR243 AND NR213 AND THE FOLLOWING STANDARDS:**

**NRCS STANDARD 313 (10/17) - WASTE STORAGE FACILITY**
**NRCS STANDARD 522 (10/17) - POND SEALING OR LINING - CONCRETE**
**NRCS STANDARD 533 (08/21) - PUMPING PLANT**
**NRCS STANDARD 634 (01/14) - WASTE TRANSFER**
**NRCS STANDARD 561 (11/22) - HEAVY USE AREA PROTECTION**

WISCONSIN
KEITH M SCHINKOETH
E-44539
CHAMPAIGN IL
PROFESSIONAL ENGINEER
02/15/2023
STRUCTURAL

DIGGERS HOTLINE
Dial 811 or (800) 242-8511
www.DiggersHotline.com

NOTE:
UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

| | | NO. | DATE | REVISION | BY |
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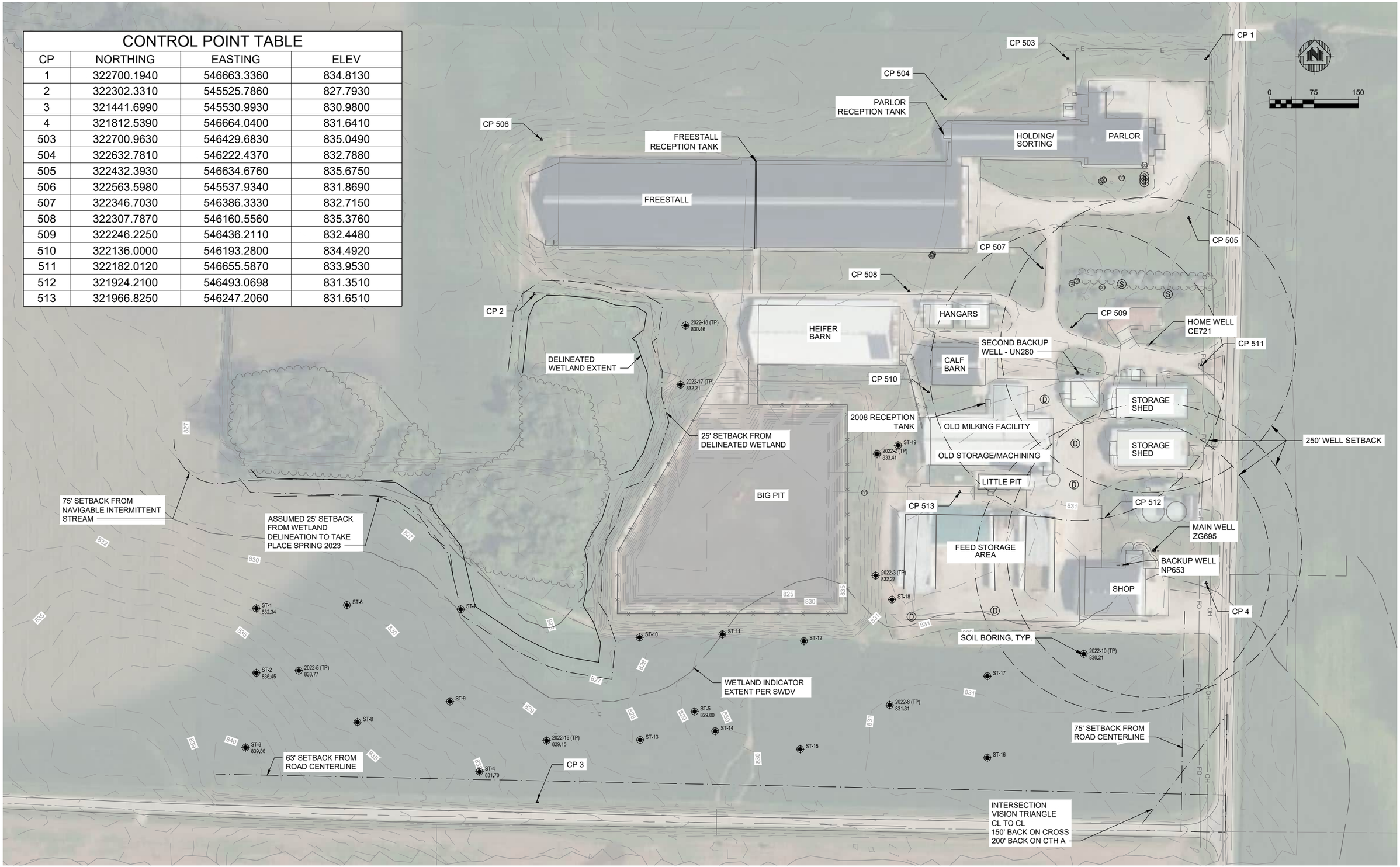
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

TITLE SHEET - CAFO SUBMITTAL

PROJECT NO. 21752002
SHEET G000

| CONTROL POINT TABLE | | | |
|---|---|---|---|
| CP | NORTHING | EASTING | ELEV |
| 1 | 322700.1940 | 546663.3360 | 834.8130 |
| 2 | 322302.3310 | 545525.7860 | 827.7930 |
| 3 | 321441.6990 | 545530.9930 | 830.9800 |
| 4 | 321812.5390 | 546664.0400 | 831.6410 |
| 503 | 322700.9630 | 546429.6830 | 835.0490 |
| 504 | 322632.7810 | 546222.4370 | 832.7880 |
| 505 | 322432.3930 | 546634.6760 | 835.6750 |
| 506 | 322563.5980 | 545537.9340 | 831.8690 |
| 507 | 322346.7030 | 546386.3330 | 832.7150 |
| 508 | 322307.7870 | 546160.5560 | 835.3760 |
| 509 | 322246.2250 | 546436.2110 | 832.4480 |
| 510 | 322136.0000 | 546193.2800 | 834.4920 |
| 511 | 322182.0120 | 546655.5870 | 833.9530 |
| 512 | 321924.2100 | 546493.0698 | 831.3510 |
| 513 | 321966.8250 | 546247.2060 | 831.6510 |

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2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

EXISTING OVERVIEW

PROJECT NO. 21752002
SHEET G001

NOTES:

1. SEE ROSSGROUP PLANS FOR PIPING PLAN VIEWS AND VESP STRUCTURAL PLANS

2. SEE MPE-PLANET SHEETS FOR DIGESTER AND HYDROLYSIS TANK SHEETS AND CIVIL GRADING

FREESTALL

HEIFER BARN FLUME TO BE LOCATED OUTSIDE OF EXISTING BARN. BARN TO BE EXTENDED BY OTHERS.

HEIFER BARN

HANGARS

CALF BARN

STORAGE SHED

STORAGE SHED

OLD MILKING FACILITY

OLD STORAGE

EXISTING FSA AND IMPROVEMENTS SEE SHEET CS103

PLANNED FOR FUTURE FSA

2022-18 (TP) 830.46

0+00

SAND SEPARATION SEE SHEET CS104

ROSSGROUP LINE 1 - 650 LF - PROPOSED 6" DR 17 (ASTM F 714) PE PIPE FROM SAND SEPARATION BUILDING TO TECHNICAL CONTAINER #1 MANIFOLD. TO BE HORIZONTALLY DRILLED UNDER WETLAND SEE SHEET CS307

2022-17 (TP) 832.21

15" STORMWATER PIPE
INLET I.E. - 827.25
OUTLET I.E. - 826.00
SLOPE - 0.74%

25' SETBACK FROM DELINEATED WETLAND

1+00

2+00

3+00

4+00

5+00

6+23.36

75' SETBACK FROM NAVIGABLE INTERMITTENT STREAM

TC #1

HT #3

HT #2

HT #1

TC #2

TC #3

TC #4

DIGESTER #1

DIGESTER #2

ORA

BUP

SOLIDS STORAGE

V-SEP

GRID INJECTION

BIG PIT

6" NON-PERFORATED DRAIN TILE
OUTLET ELEV. = 824.50
CONTRACTOR TO VERIFY

DELINEATED WETLAND EXTENT

WETLAND INDICATOR EXTENT PER SWDV

PROPOSED WASTE STORAGE SEE SHEET CS102

230'

470'

2022-3 (TP) 832.27

2022-10 (TP)

250' WELL SETBACK (TYP.)

2022-5 (TP) 833.77

2022-8 (TP) 831.31

2022-16 (TP) 829.15

ST-4 831.70

ST-5 829.00

ST-6

ST-7

ST-8

ST-9

ST-10

ST-11

ST-12

ST-13

ST-14

ST-15

ST-16

ST-18

ST-19

2022-2 (TP) 833.41

SOIL BORING, TYP.

6" PERFORATED DRAIN TILE
ELEV. = 825.00
ON FOOTING

SETBACKS FROM ROAD AND INTERSECTION VISION TRIANGLE

0 50 100

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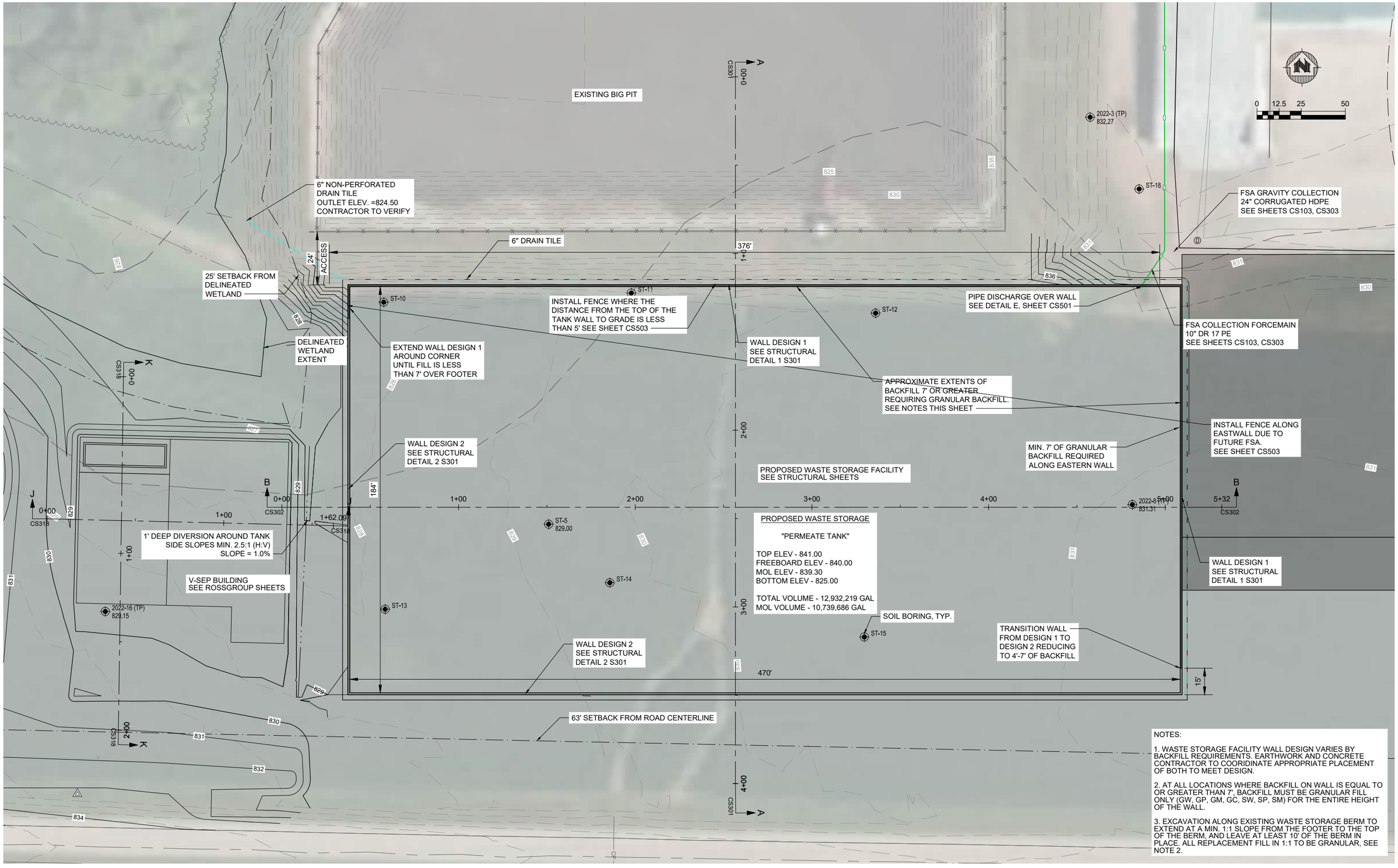
# 2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

## PROPOSED OVERVIEW

PROJECT NO. 21752002

SHEET CS101

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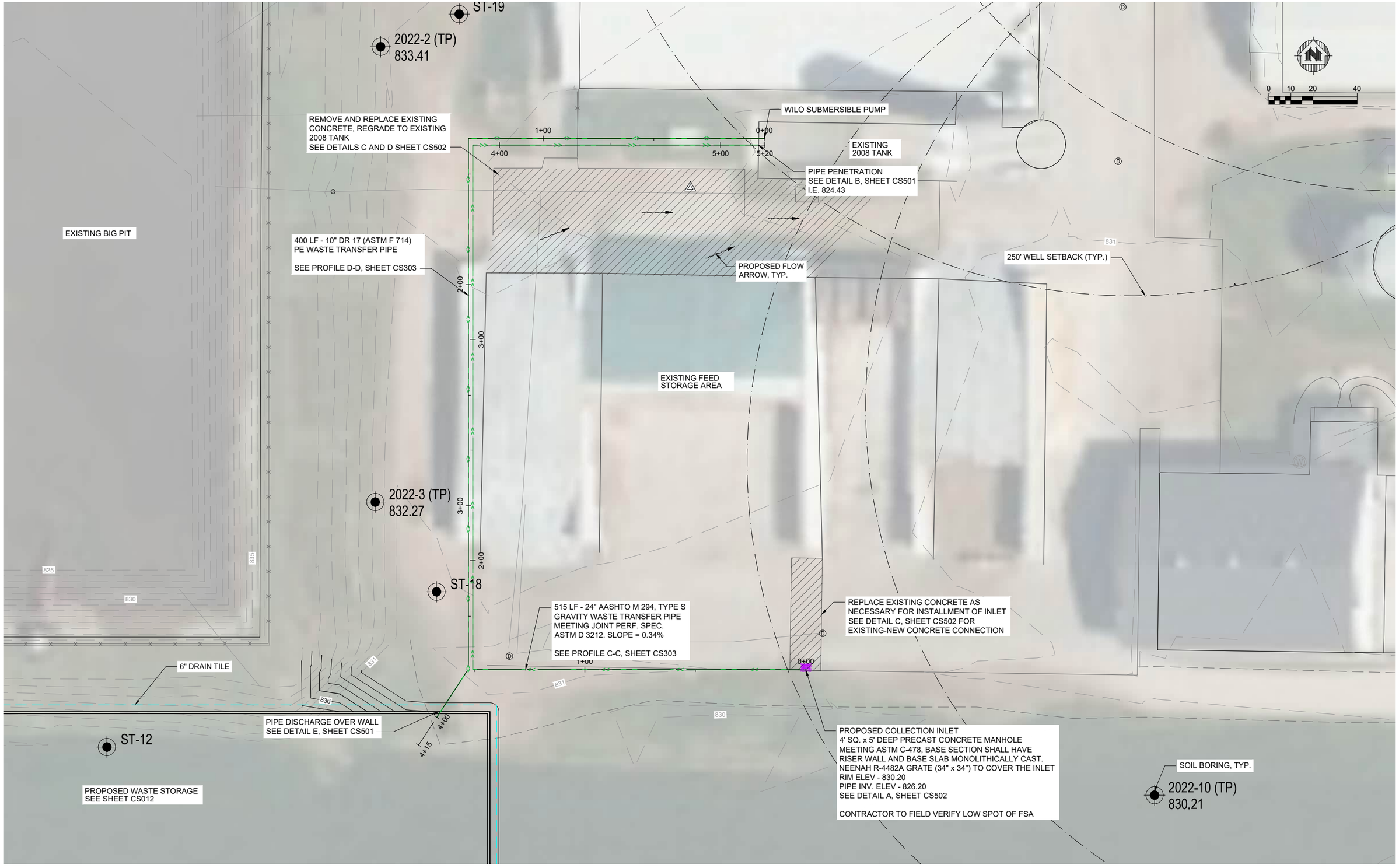
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

PROPOSED WASTE STORAGE PLAN

PROJECT NO. 21752002
SHEET CS102

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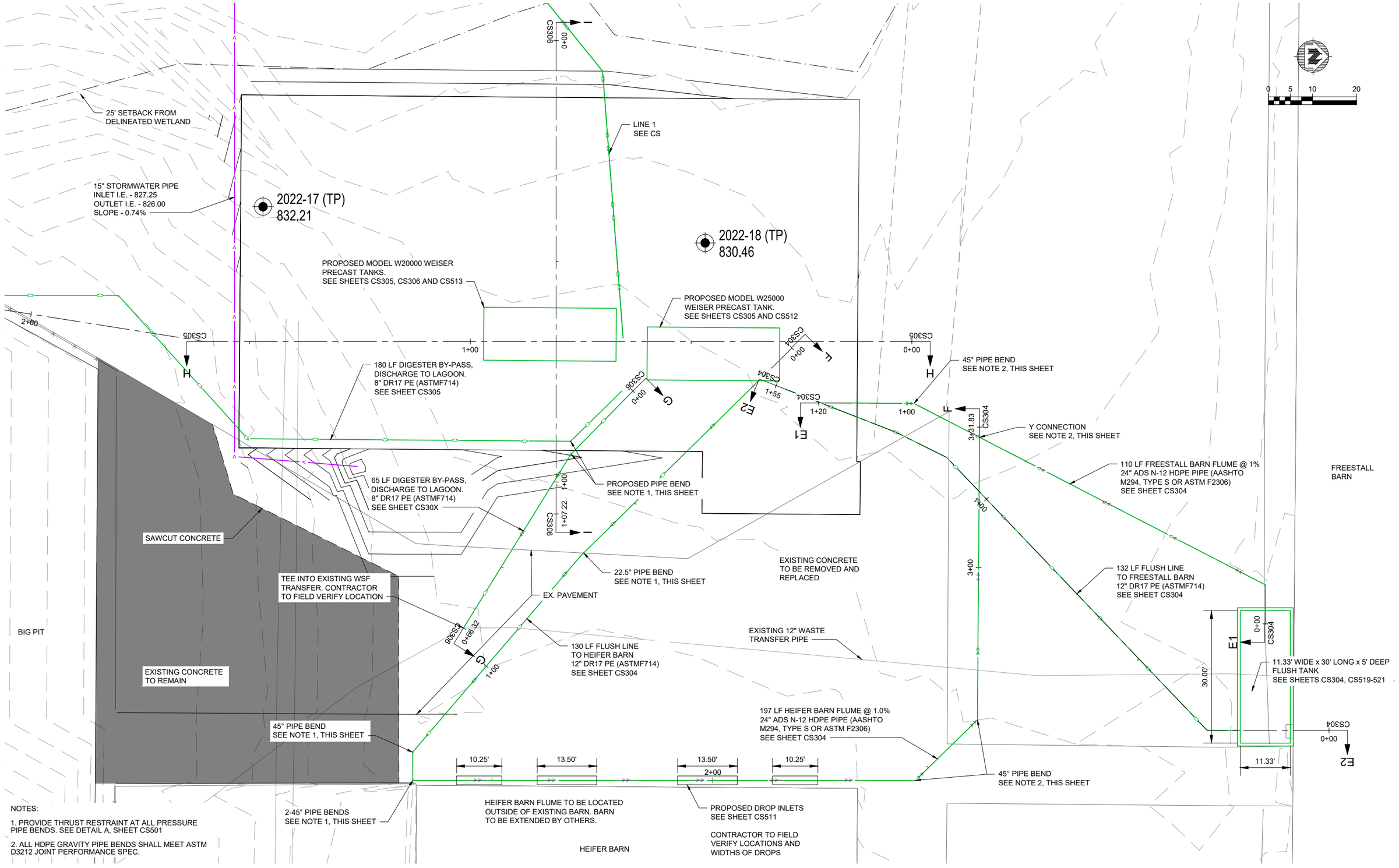
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

PROPOSED FEED STORAGE PLAN

PROJECT NO. 21752002
SHEET CS103




NOTES:

1. PROVIDE THRUST RESTRAINT AT ALL PRESSURE PIPE BENDS. SEE DETAIL A, SHEET CS501
2. ALL HDPE GRAVITY PIPE BENDS SHALL MEET ASTM D3212 JOINT PERFORMANCE SPEC.

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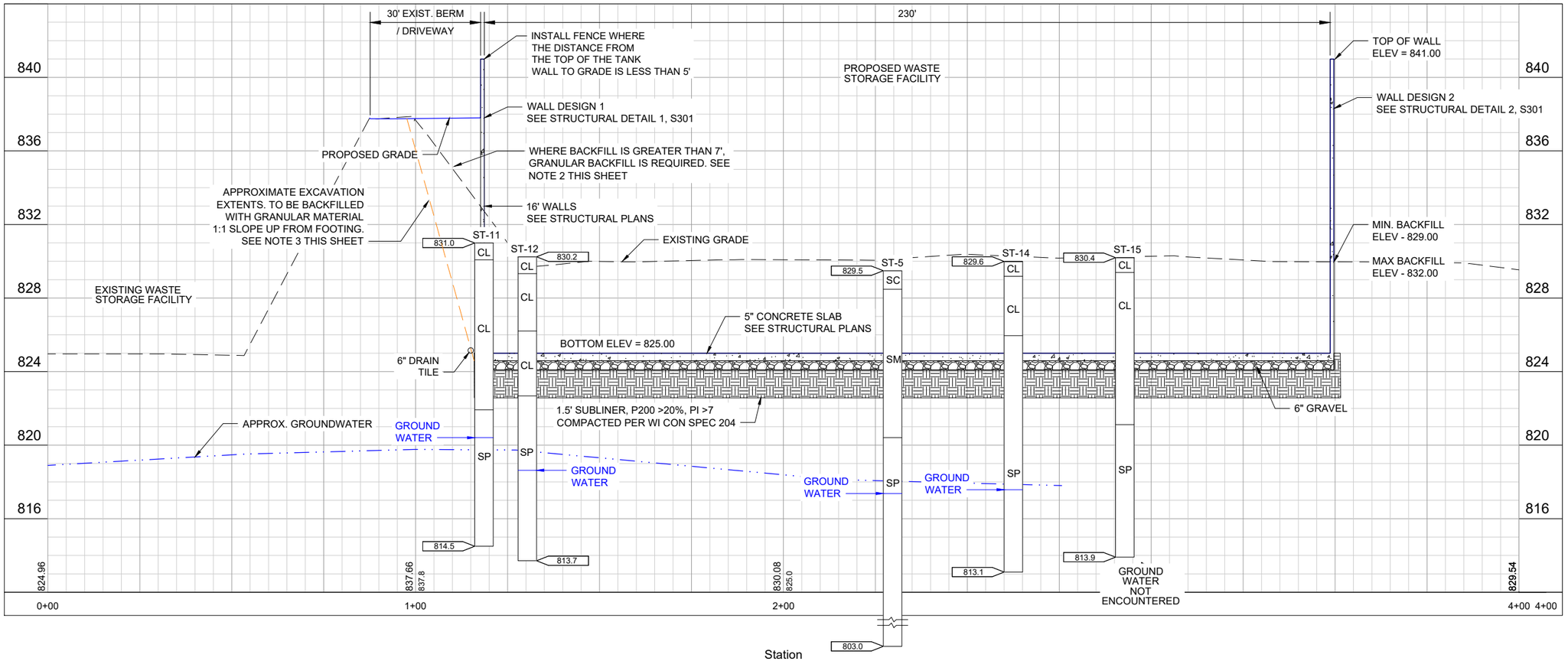
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

SAND SEPARATION OVERVIEW

PROJECT NO. 21752002
SHEET CS104

# A-A WSF NORTH SOUTH PROFILE




NOTES:
1. WASTE STORAGE FACILITY WALL DESIGN VARIES BY BACKFILL REQUIREMENTS. EARTHWORK AND CONCRETE CONTRACTOR TO COORDINATE APPROPRIATE PLACEMENT OF BOTH TO MEET DESIGN.
2. AT ALL LOCATIONS WHERE BACKFILL ON WALL EXCEEDS 7' AND ON EAST SIDE, BACKFILL MUST BE GRANULAR FILL ONLY (GW, GP, GM,GC,SW, SP,SM) FOR ENTIRE HEIGHT OF WALL.
3. EXCAVATION ALONG EXISTING WASTE STORAGE BERM TO EXTEND AT A MIN. 1:1 SLOPE FROM THE FOOTER TO THE TOP OF THE BERM, AND LEAVE AT LEAST 10' OF THE BERM IN PLACE

| | | NO. | DATE | REVISION | BY |
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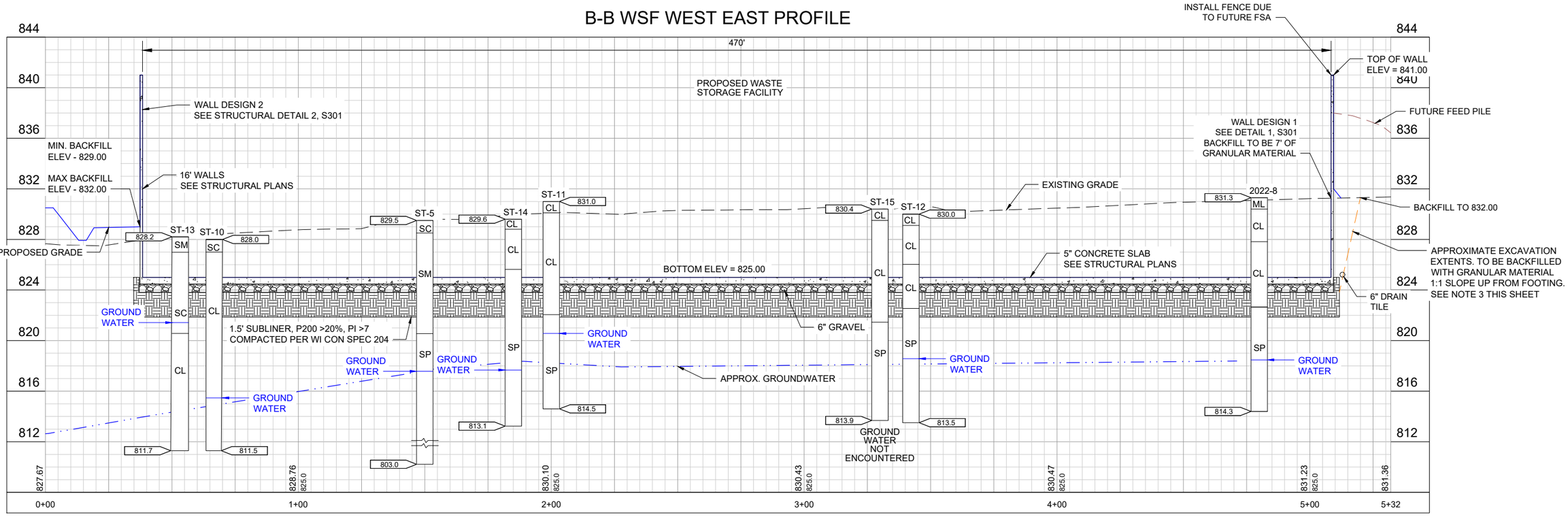
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

WSF PROFILE - NORTH SOUTH

PROJECT NO. 21752002
SHEET CS301

# B-B WSF WEST EAST PROFILE




Station

NOTES:
1. WASTE STORAGE FACILITY WALL DESIGN VARIES BY BACKFILL REQUIREMENTS. EARTHWORK AND CONCRETE CONTRACTOR TO COORDINATE APPROPRIATE PLACEMENT OF BOTH TO MEET DESIGN.
2. AT ALL LOCATIONS WHERE BACKFILL ON WALL EXCEEDS 7' AND ON EAST SIDE, BACKFILL MUST BE GRANULAR FILL ONLY (GW, GP, GM, GC, SW, SP , SM) FOR ENTIRE HEIGHT OF WALL.

| | | NO. | DATE | REVISION | BY |
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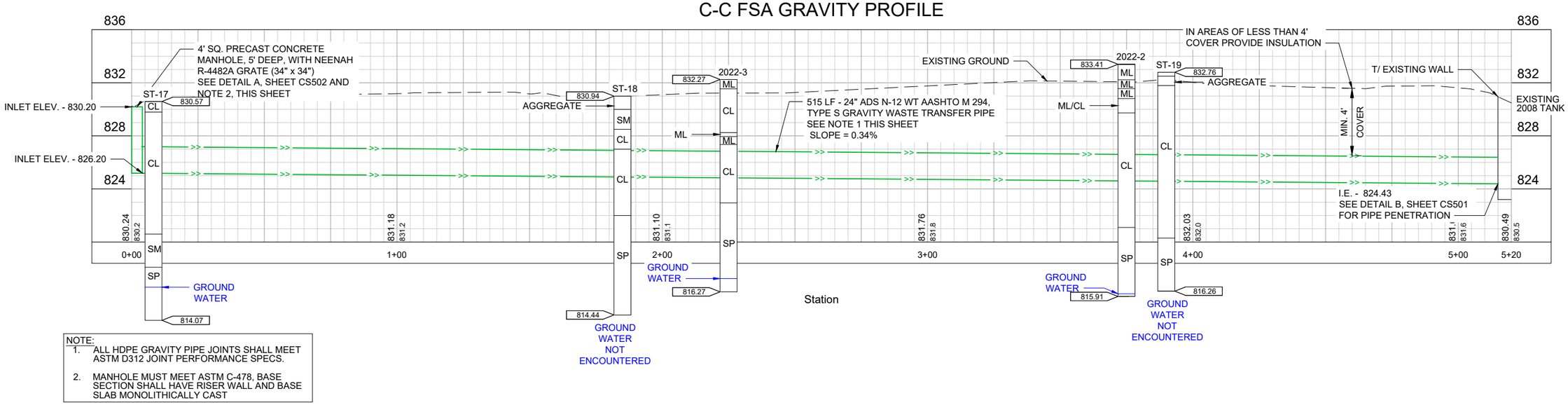
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

WSF PROFILE - WEST EAST

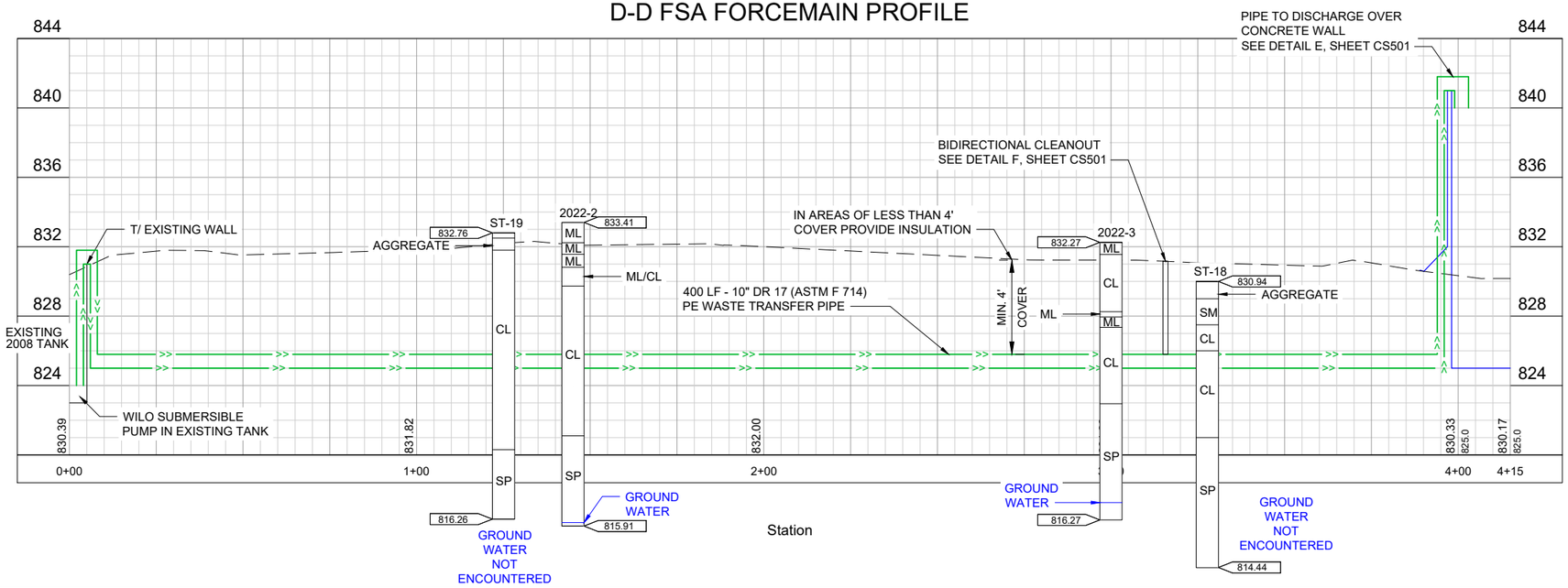
PROJECT NO. 21752002
SHEET CS302

# C-C FSA GRAVITY PROFILE




NOTE:
1. ALL HDPE GRAVITY PIPE JOINTS SHALL MEET ASTM D312 JOINT PERFORMANCE SPECS.
2. MANHOLE MUST MEET ASTM C-478, BASE SECTION SHALL HAVE RISER WALL AND BASE SLAB MONOLITHICALLY CAST

# D-D FSA FORCEMAIN PROFILE




PIPE NOTES:
PROVIDE THRUST BLOCKING AT ALL BENDS AND CLEANOUTS SEE DETAIL A, SHEET CS501

| | | NO. | DATE | REVISION | BY |
|---|---|---|---|---|---|
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| | DESIGNED BY: Init | . | . | . | . |
| | CHECKED BY: Init | . | . | . | . |

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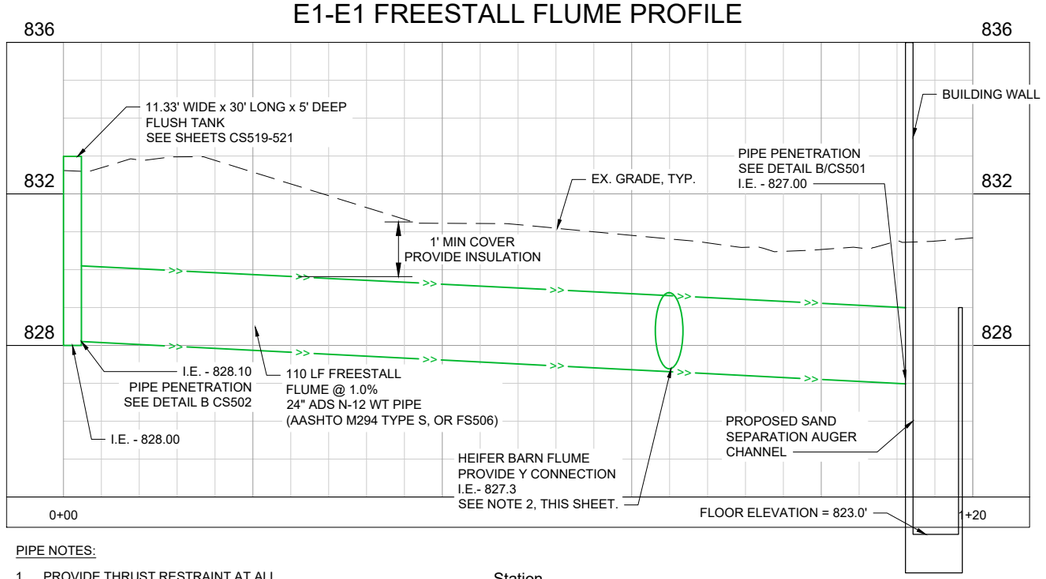
WAUPACA COUNTY, WI

FSA WASTE TRANSFER PROFILE

PROJECT NO. 21752002
SHEET CS303

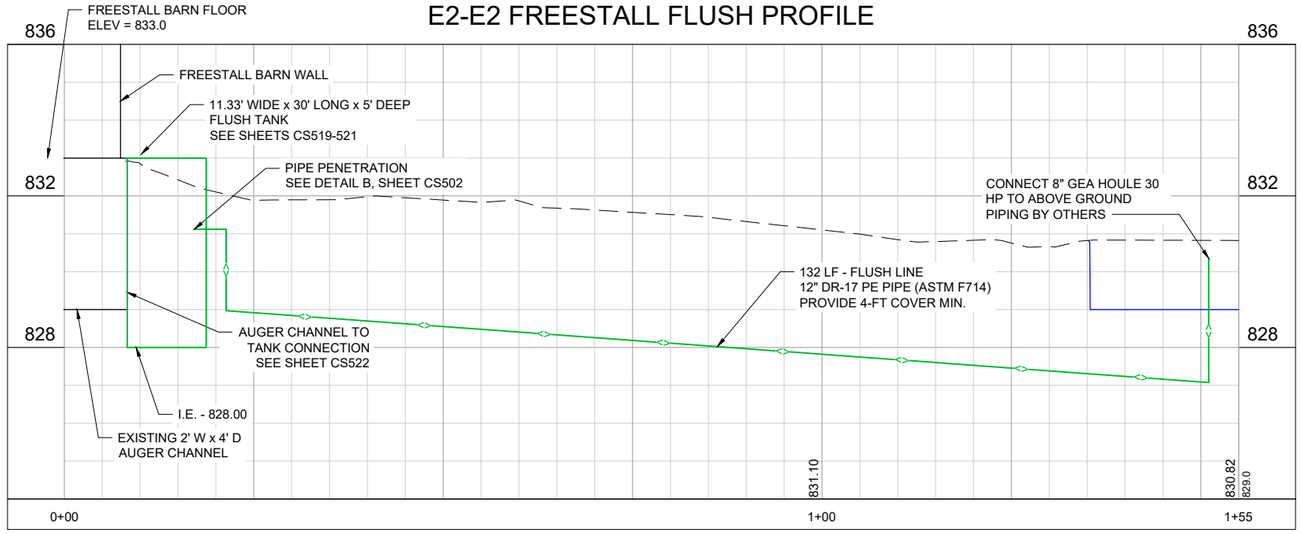
## E1-E1 FREESTALL FLUME PROFILE



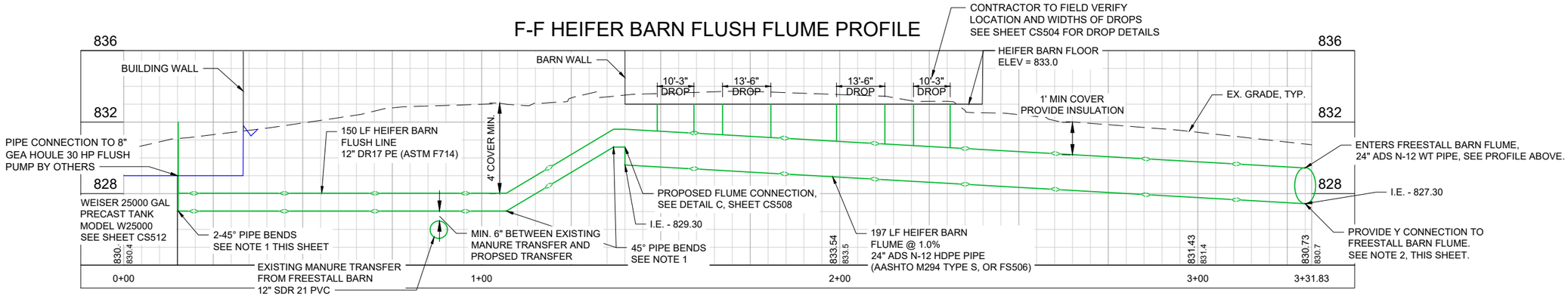

PIPE NOTES:

1. PROVIDE THRUST RESTRAINT AT ALL PRESSURE PIPE BENDS. SEE DETAIL A, SHEET CS501.
2. ALL HDPE GRAVITY PIPE JOINTS SHALL MEET ASTM D3212 JOINT PERFORMANCE SPECS.

## E2-E2 FREESTALL FLUSH PROFILE




## F-F HEIFER BARN FLUSH FLUME PROFILE




PIPE NOTES:

1. PROVIDE THRUST RESTRAINT AT ALL PRESSURE PIPE BENDS. SEE DETAIL A, SHEET CS501.
2. ALL HDPE GRAVITY PIPE JOINTS SHALL MEET ASTM D3212 JOINT PERFORMANCE SPECS.
3. MANHOLE MUST MEET ASTM C-478, BASE SECTION SHALL HAVE RISER WALL AND BASE SLAB MONOLITHICALLY CAST.

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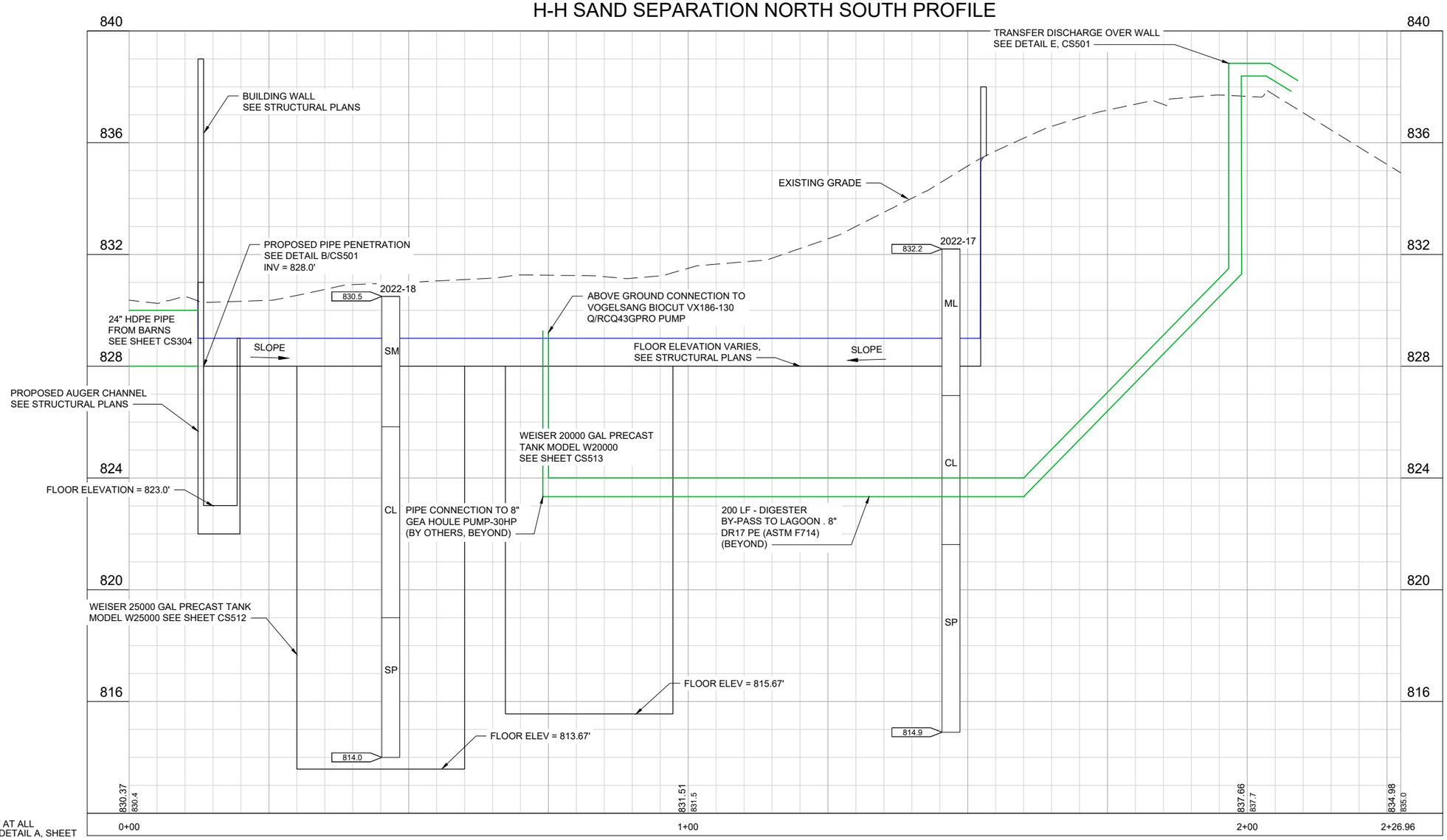
FLUSH FLUME PROFILES

PROJECT NO. 21752002

SHEET CS304

# H-H SAND SEPARATION NORTH SOUTH PROFILE




PIPE NOTES:

1. PROVIDE THRUST RESTRAINT AT ALL PRESSURE PIPE BENDS. SEE DETAIL A, SHEET CS501.
2. ALL HDPE GRAVITY PIPE JOINTS SHALL MEET ASTM D3212 JOINT PERFORMANCE SPECS.
3. MANHOLE MUST MEET ASTM C-478, BASE SECTION SHALL HAVE RISER WALL AND BASE SLAB MONOLITHICALLY CAST.

| | | NO. | DATE | REVISION |
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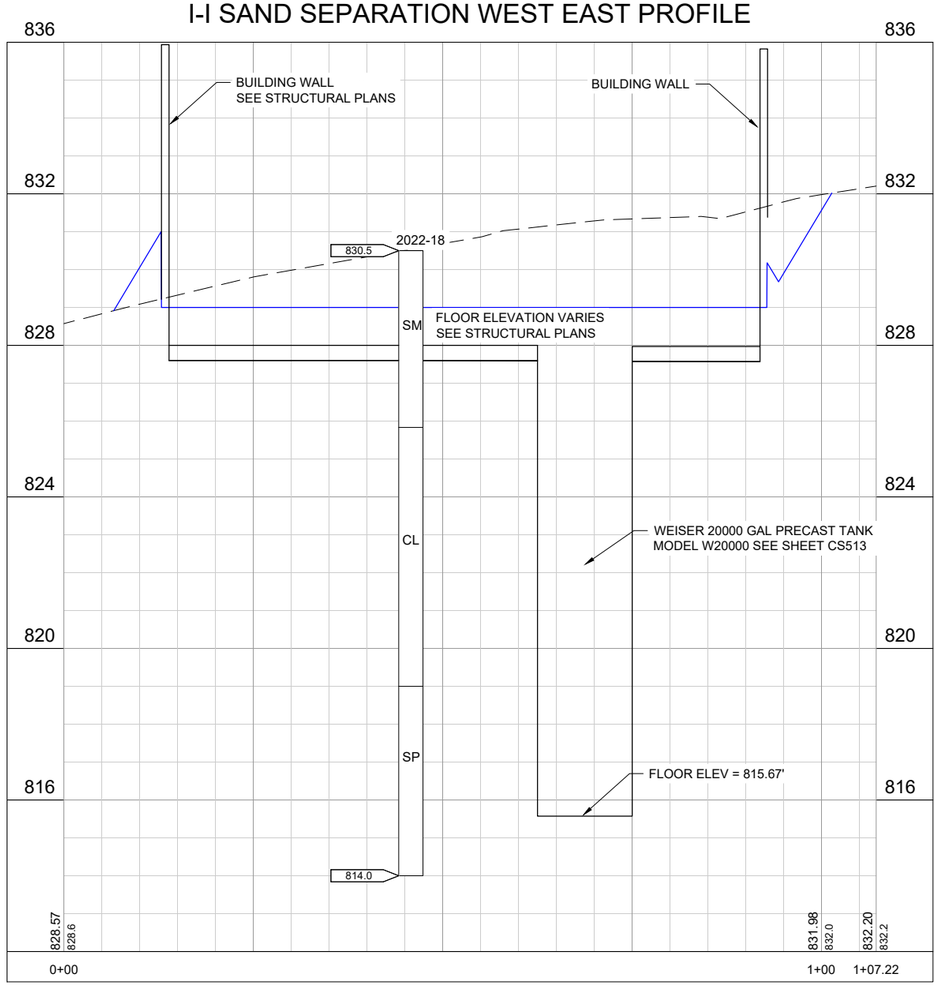
SAND SEPARATION PROFILES

PROJECT NO. 21752002
SHEET CS305

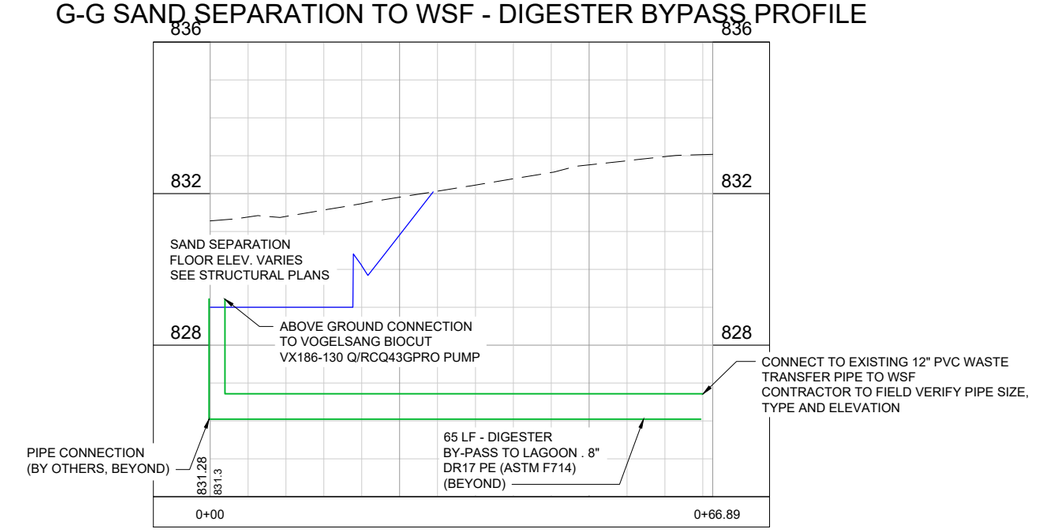
## I-I SAND SEPARATION WEST EAST PROFILE




Station

SEE STRUCTURAL PLANS OF SAND SEPARATION FACILITY FOR DETAILS (BY OTHERS)

## G-G SAND SEPARATION TO WSF - DIGESTER BYPASS PROFILE




Station

PIPE NOTES:

1. PROVIDE THRUST RESTRAINT AT ALL PRESSURE PIPE BENDS. SEE DETAIL A, SHEET CS501.
2. ALL HDPE GRAVITY PIPE JOINTS SHALL MEET ASTM D3212 JOINT PERFORMANCE SPECS.

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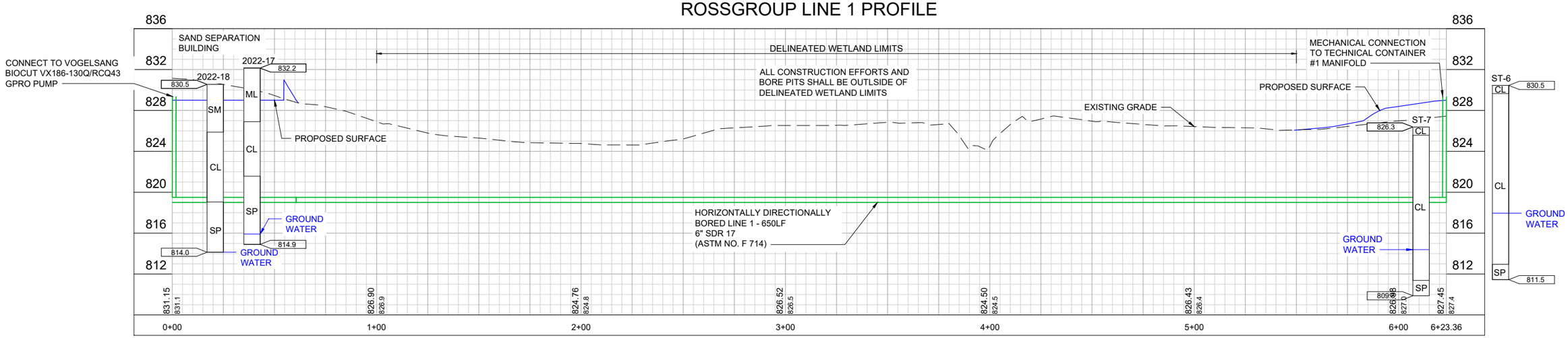
SAND SEPARATION PROFILES

PROJECT NO. 21752002
SHEET CS306

# ROSSGROUP LINE 1 PROFILE

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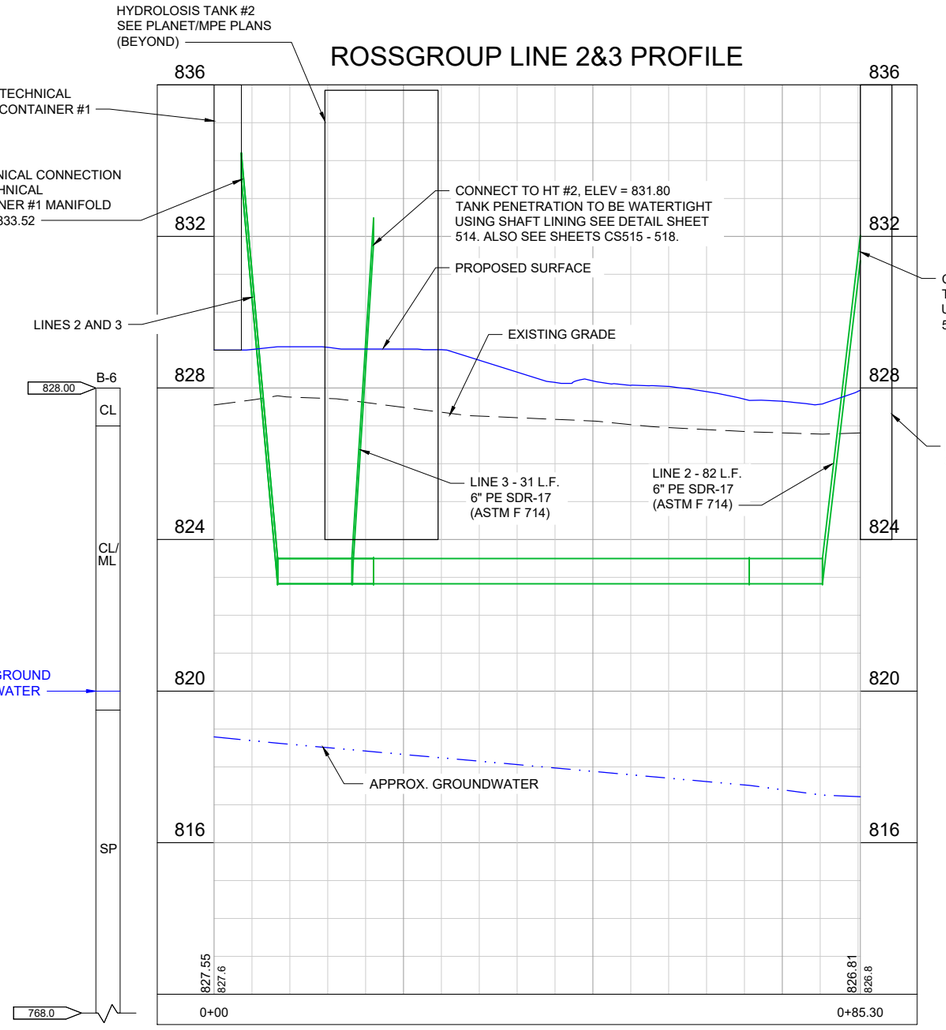
ROSSGROUP LINE 1 PROFILE

PROJECT NO. 21752002

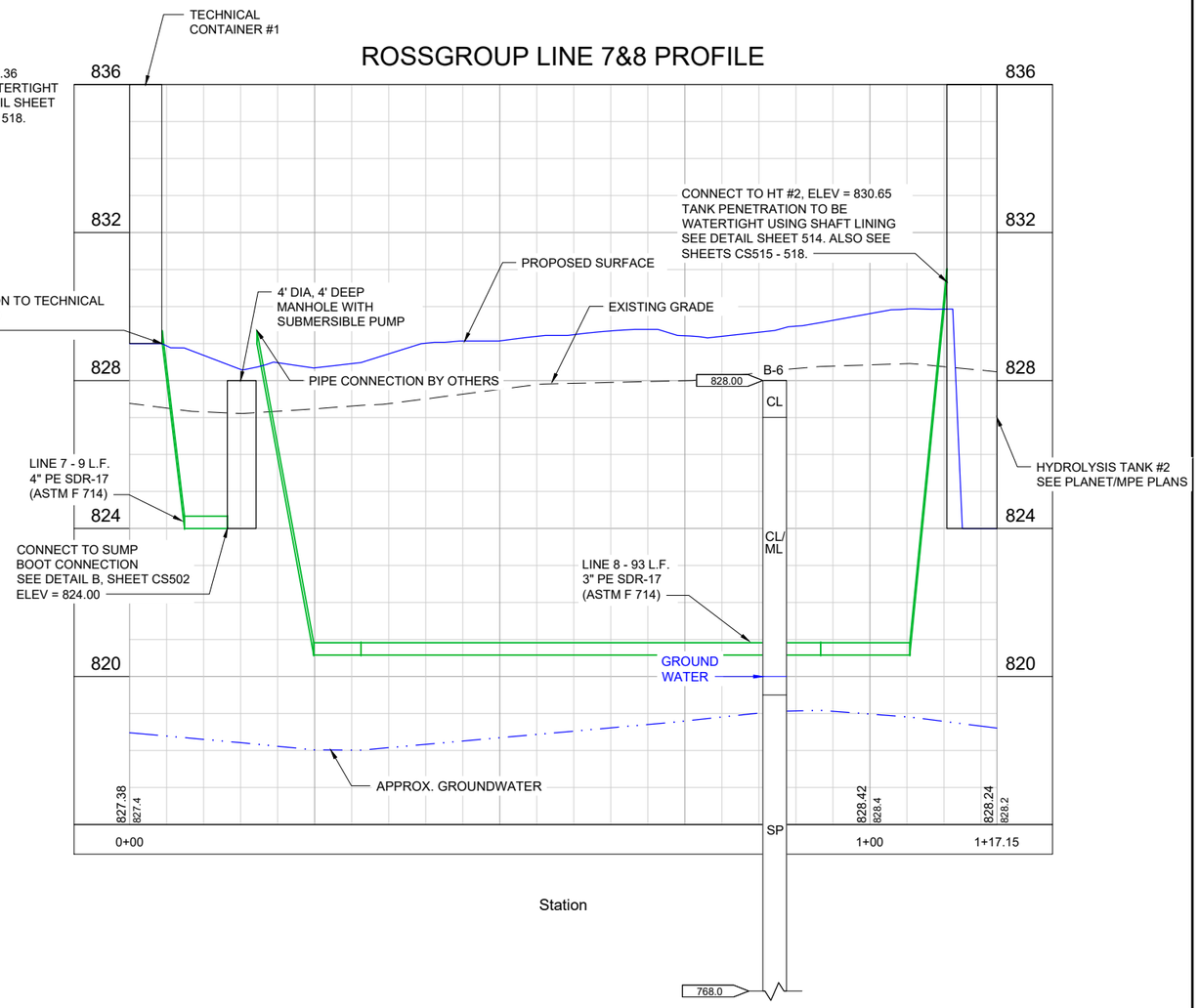
SHEET CS307

## ROSSGROUP LINE 2&3 PROFILE

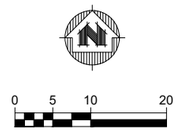



Station

## ROSSGROUP LINE 7&8 PROFILE




Station

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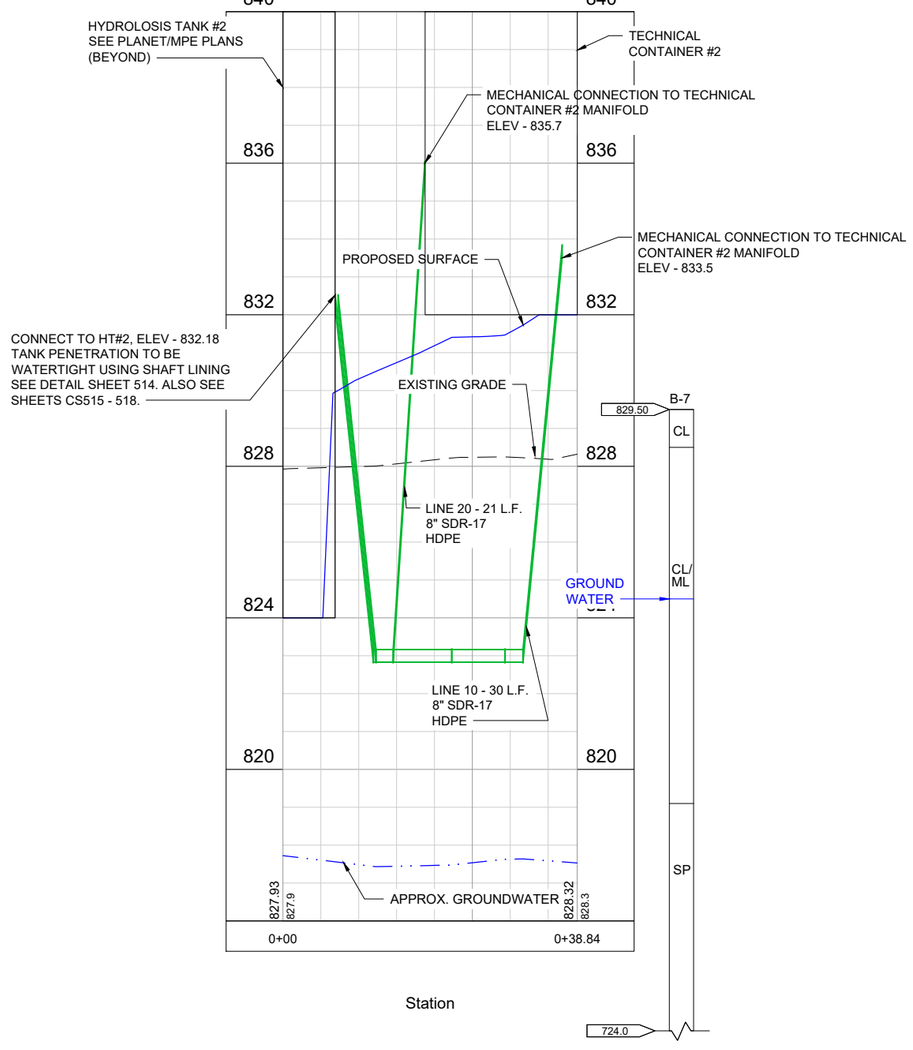
ROSSGROUP LINES 2-3,7-8 PROFILES

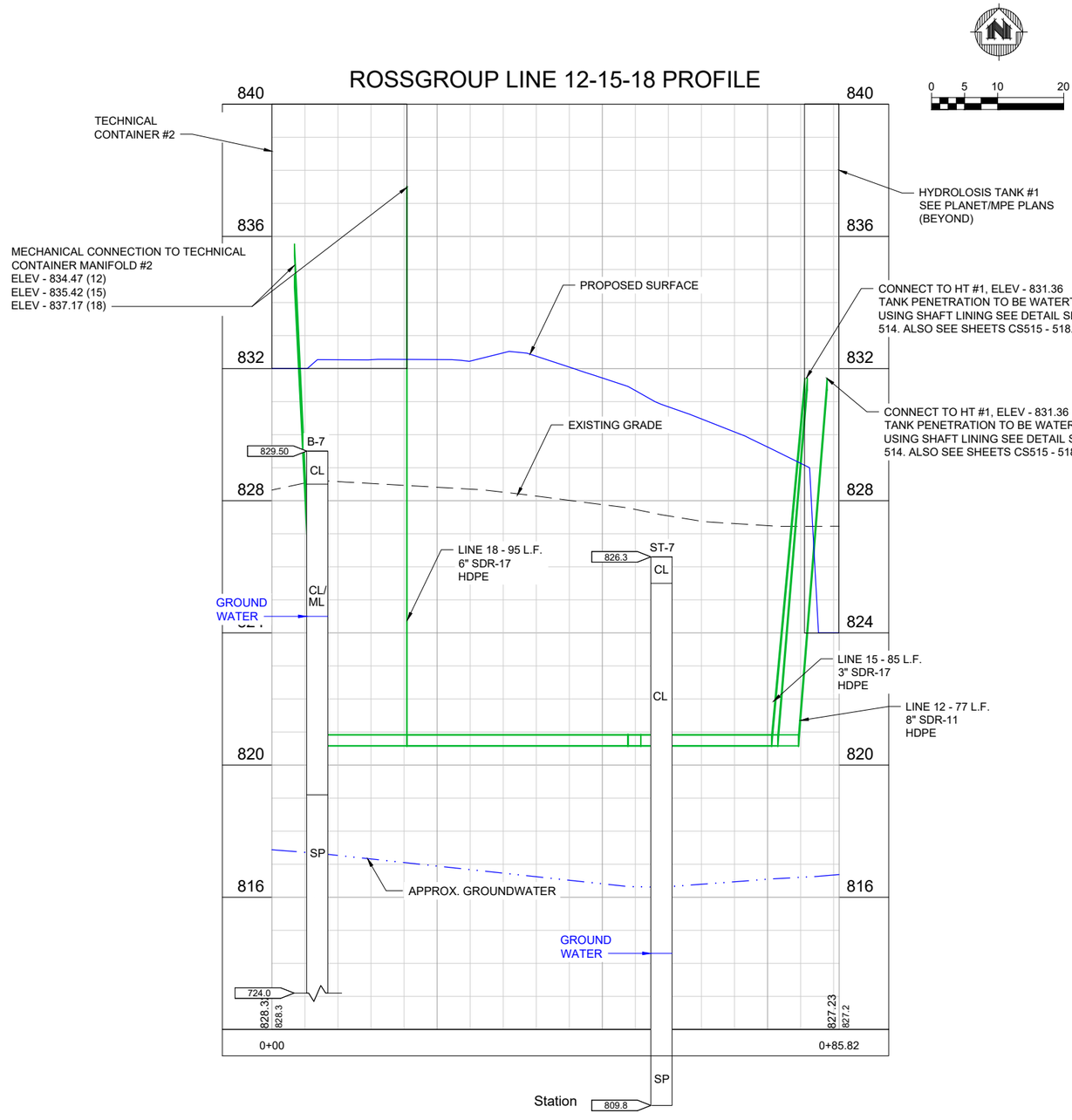
PROJECT NO. 21752002

SHEET CS308

# ROSSGROUP LINE 10 & 20 PROFILE




# ROSSGROUP LINE 12-15-18 PROFILE




| | | NO. | DATE | REVISION | BY |
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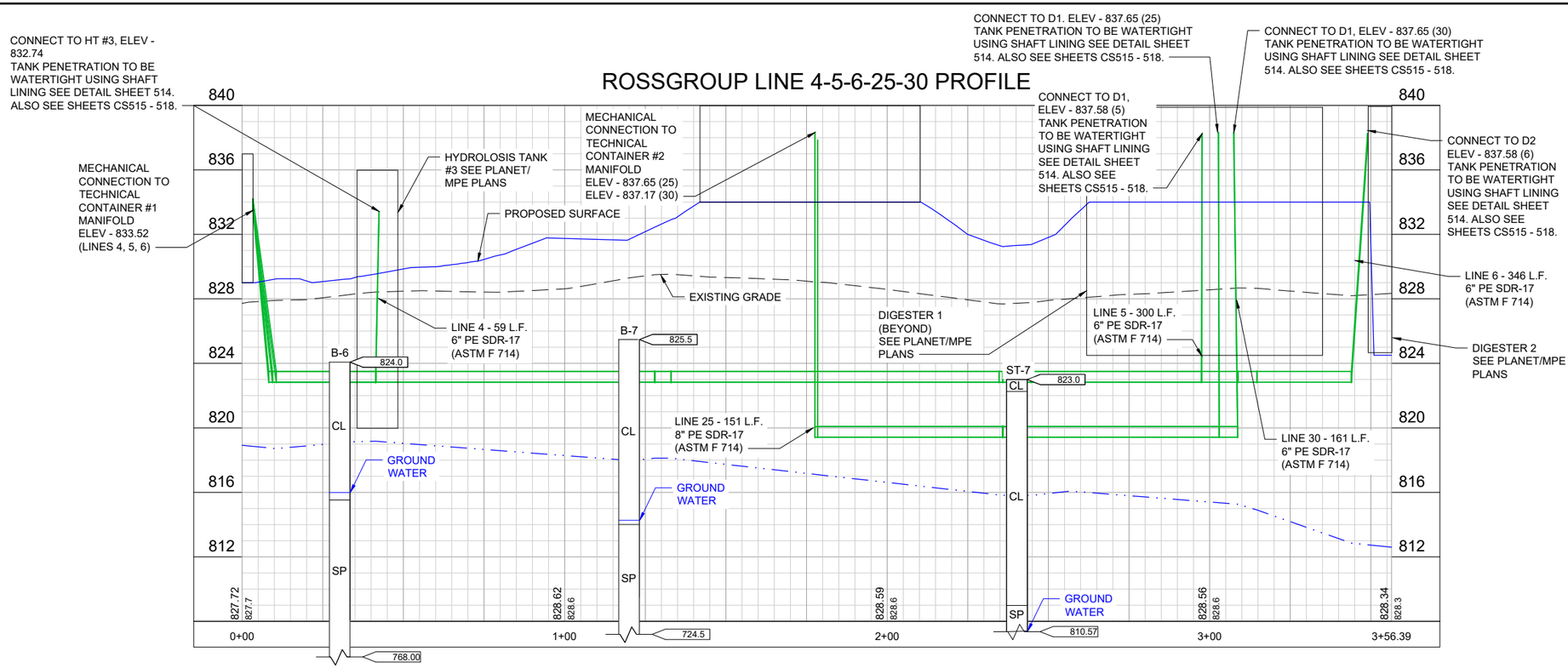
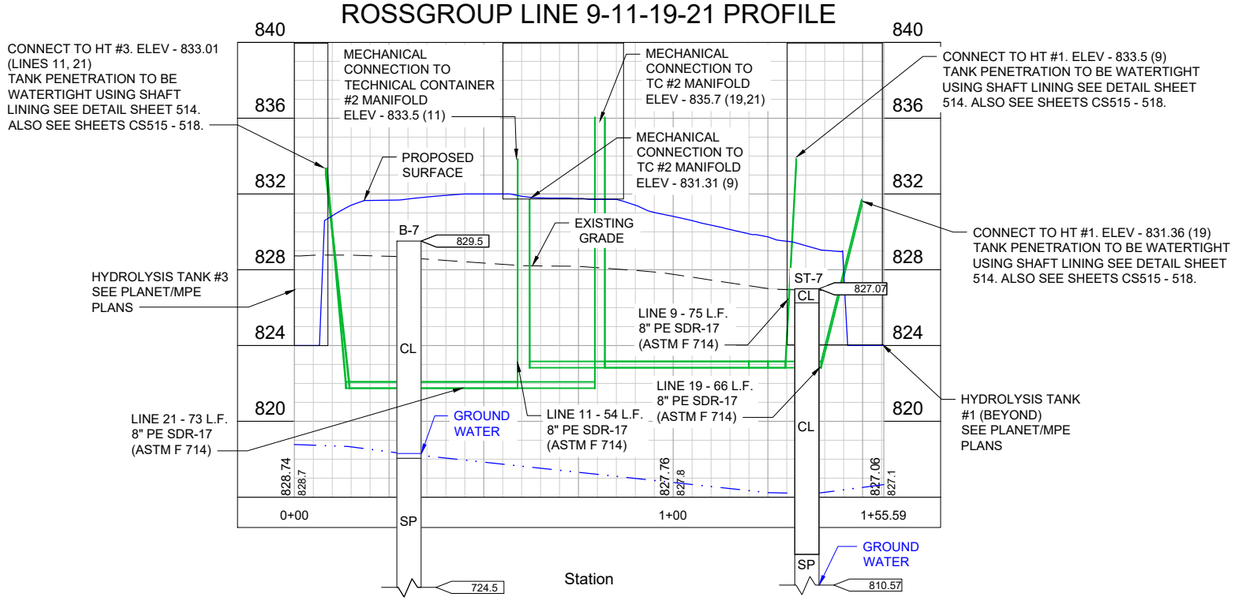
ROSSGROUP LINES 10,12,15,18,20 PROFILES

PROJECT NO. 21752002
SHEET CS309

## ROSSGROUP LINE 4-5-6-25-30 PROFILE




## ROSSGROUP LINE 9-11-19-21 PROFILE




| | | NO. | DATE | REVISION | BY |
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| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
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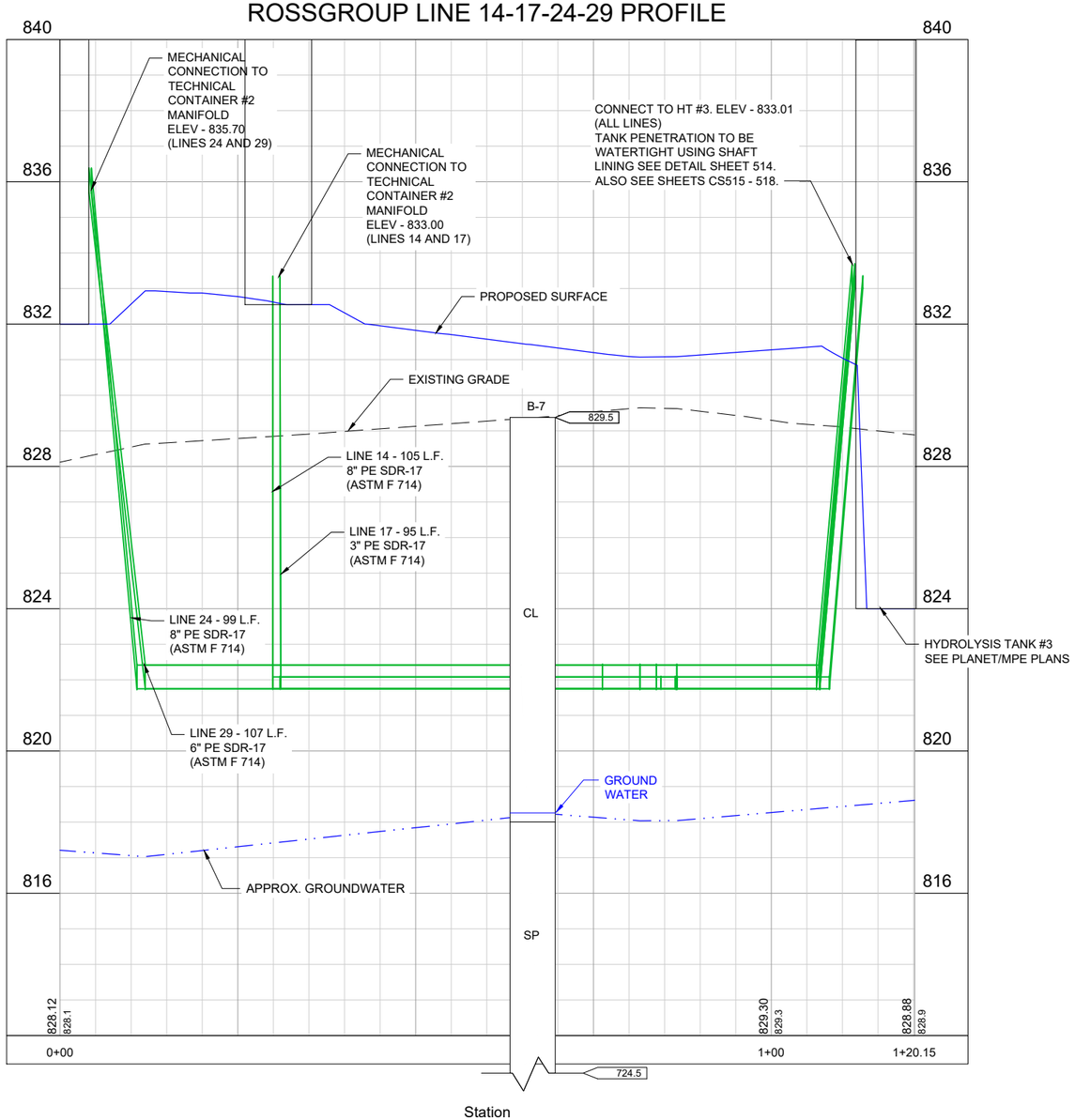
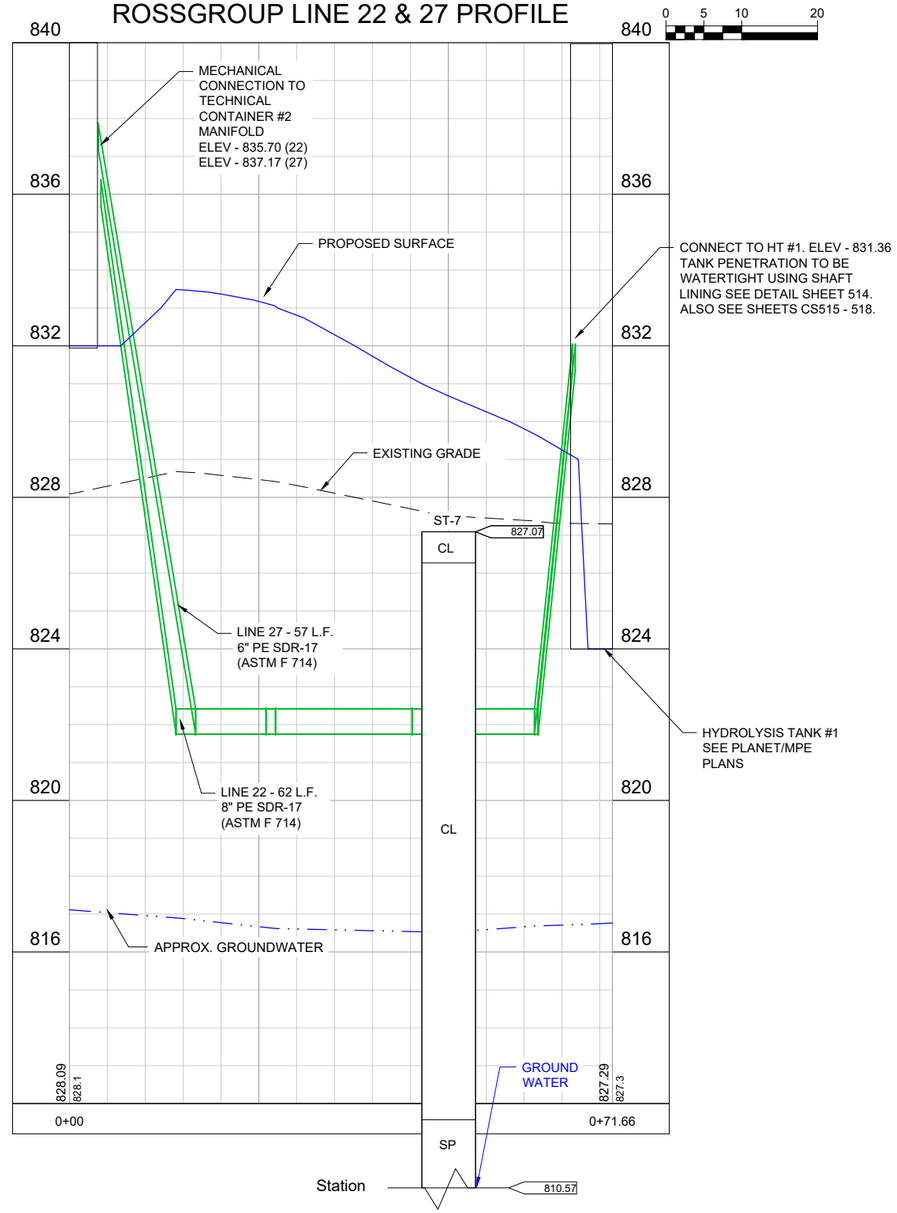
ROSSGROUP LINES 4-6,9,11,19,21,25,30 PROFILES

PROJECT NO. 21752002
SHEET CS310

## ROSSGROUP LINE 14-17-24-29 PROFILE




## ROSSGROUP LINE 22 & 27 PROFILE

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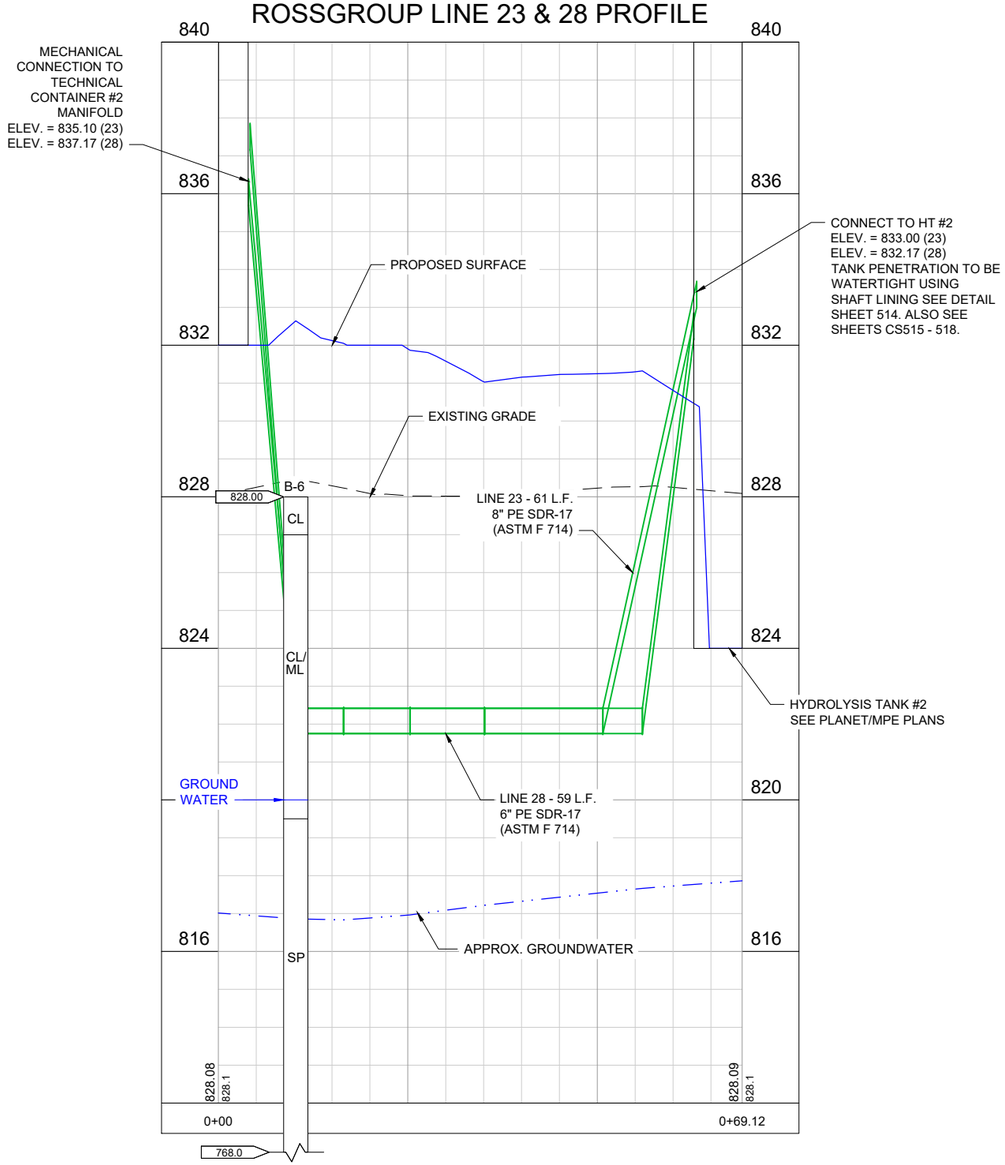
ROSSGROUP LINES 14,17,22,24,27,29 PROFILES

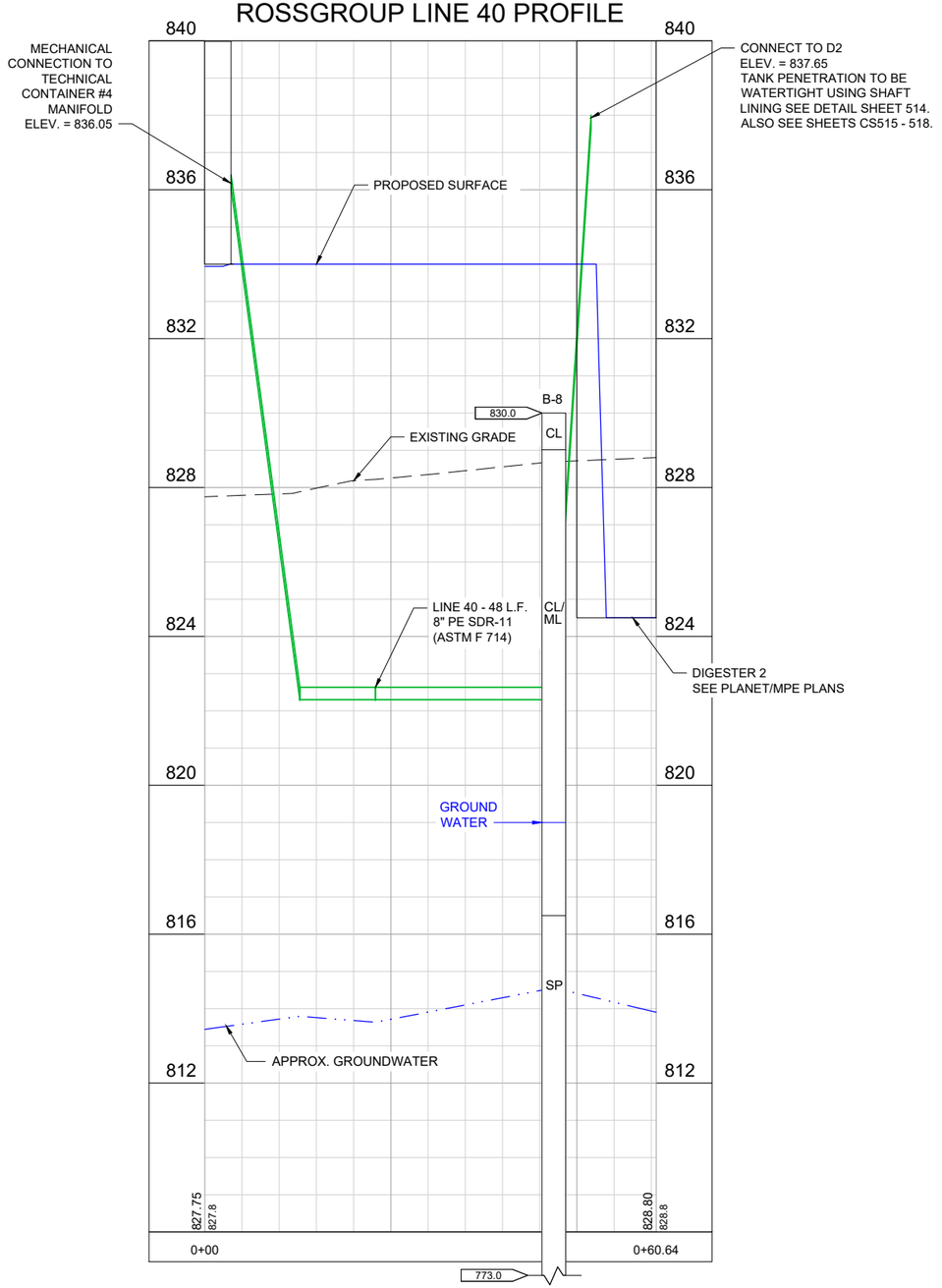
PROJECT NO. 21752002
SHEET CS 311

## ROSSGROUP LINE 23 & 28 PROFILE




Station

## ROSSGROUP LINE 40 PROFILE




Station

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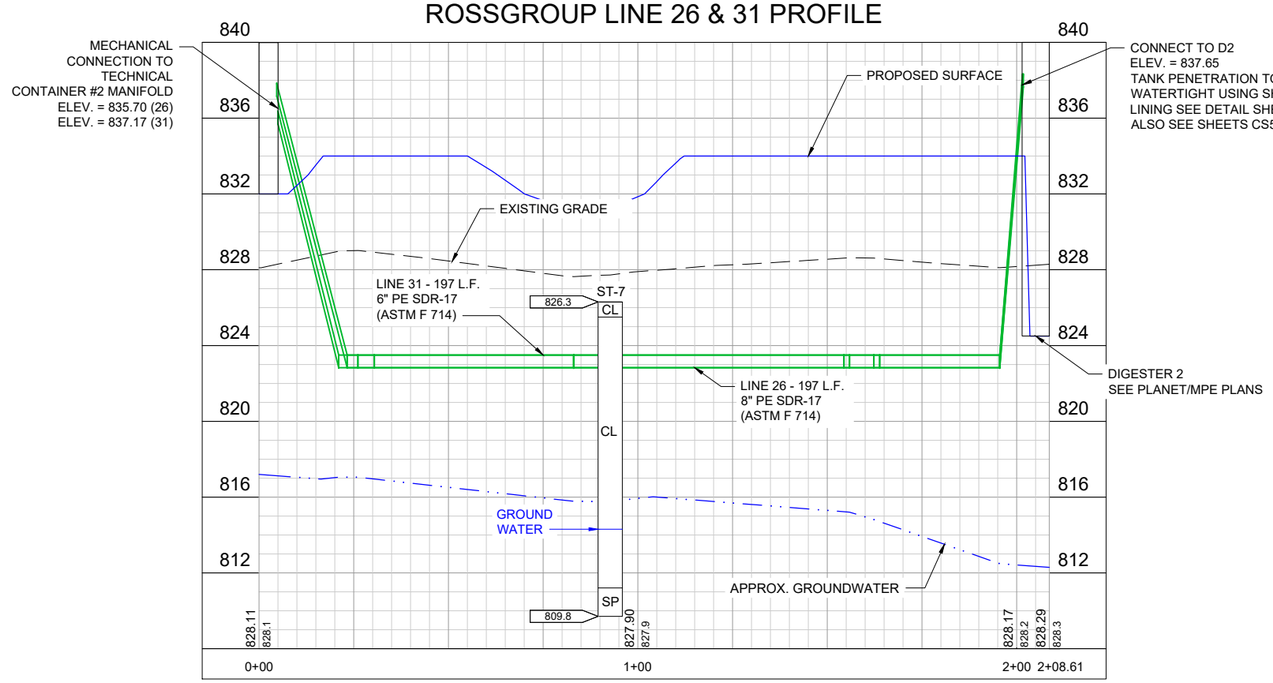
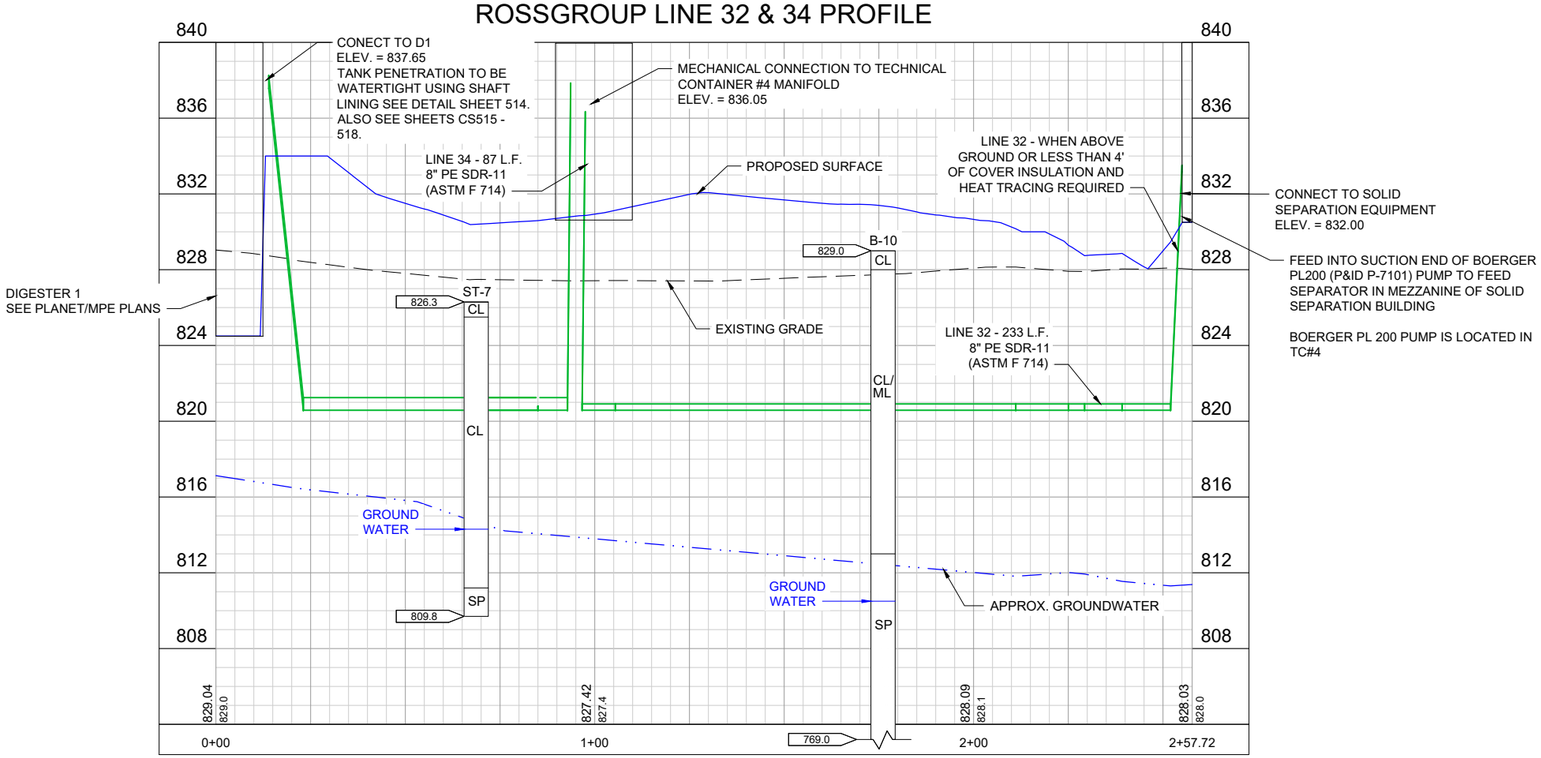
ROSSGROUP LINES 23,28,40 PROFILES

PROJECT NO. 21752002
SHEET CS312

## ROSSGROUP LINE 26 & 31 PROFILE




## ROSSGROUP LINE 32 & 34 PROFILE

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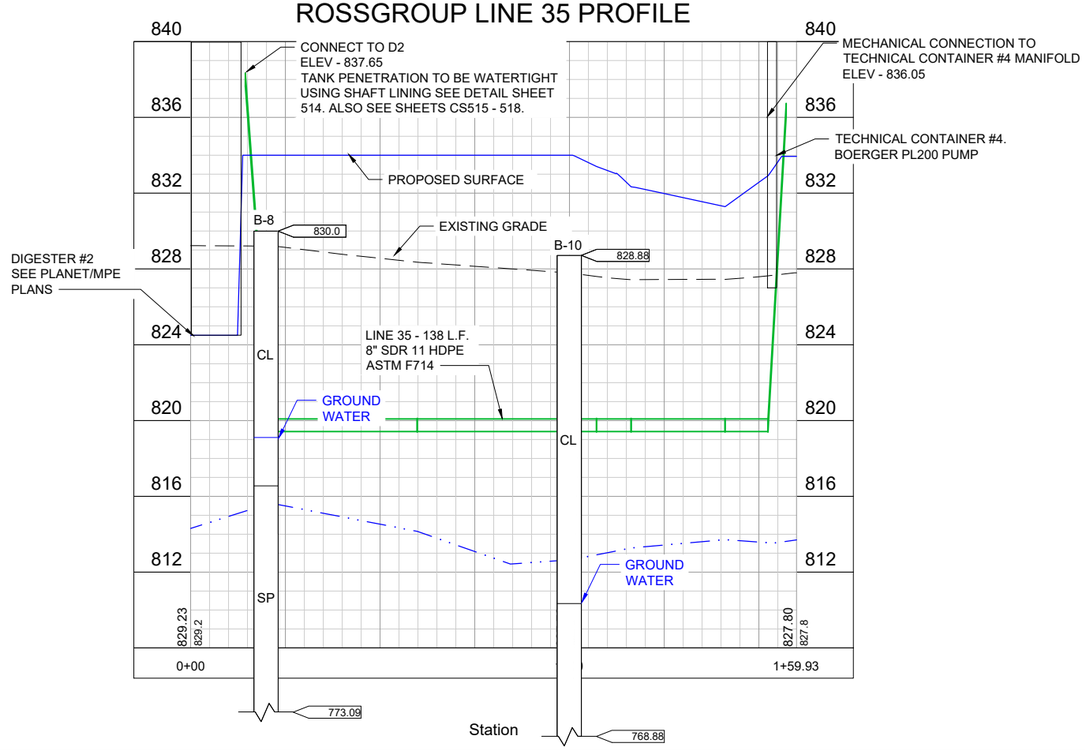
ROSSGROUP LINES 26,31,32,34 PROFILES

PROJECT NO. 21752002
SHEET CS313

# ROSSGROUP LINE 35 PROFILE

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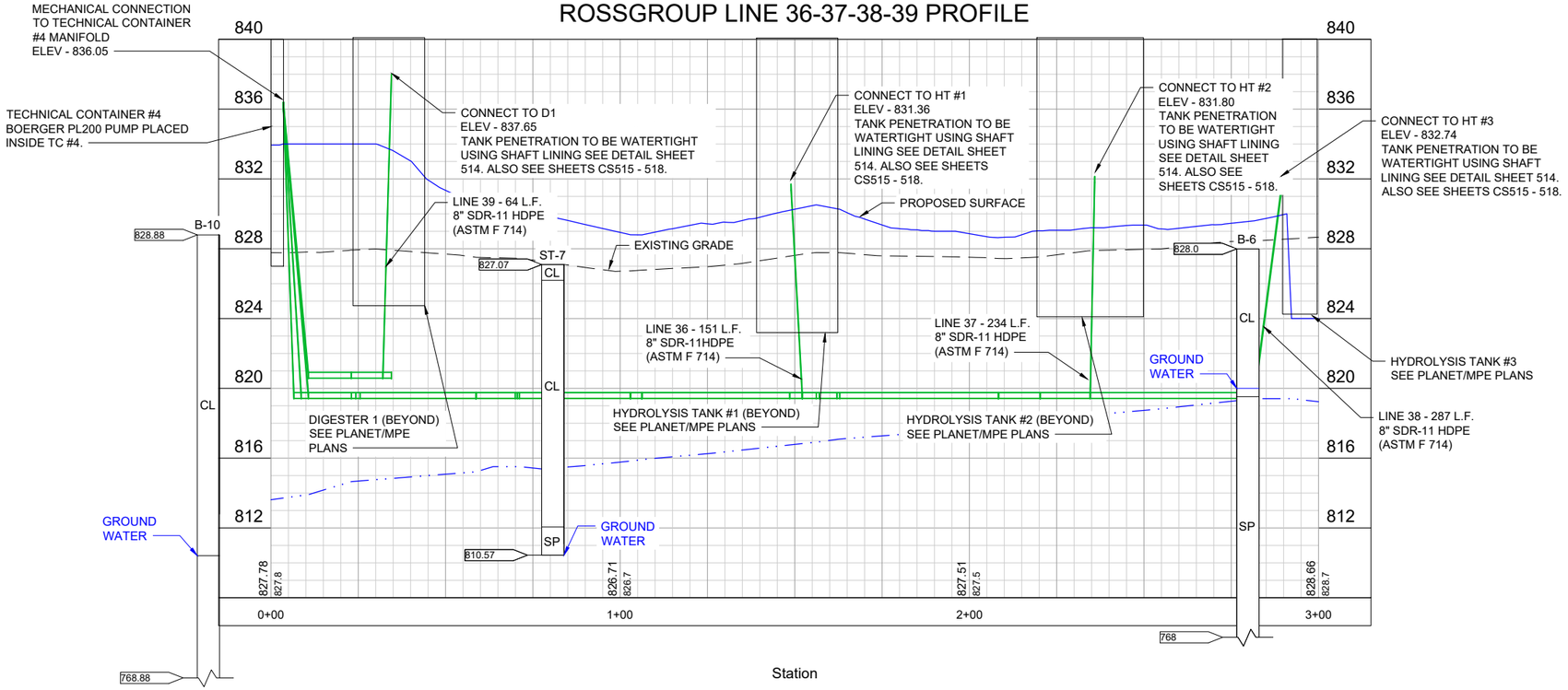
ROSSGROUP LINE 35 PROFILE

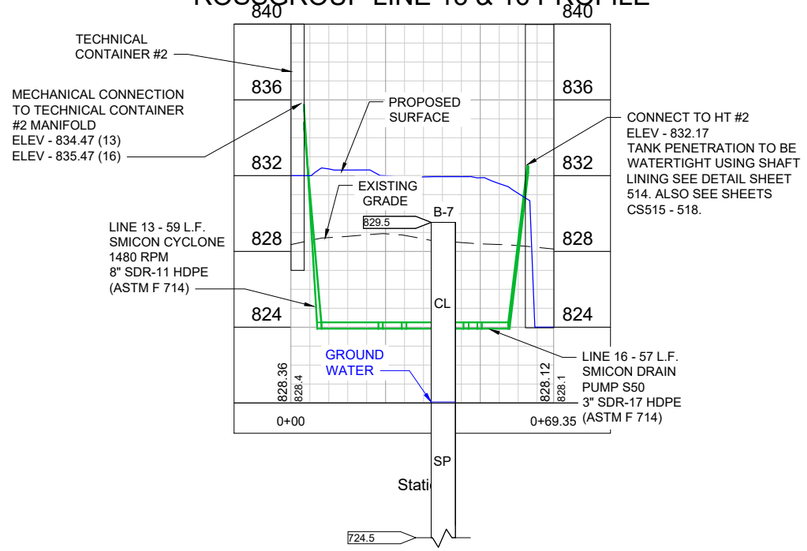
PROJECT NO. 21752002

SHEET CS314

# ROSSGROUP LINE 36-37-38-39 PROFILE




# ROSSGROUP LINE 13 & 16 PROFILE

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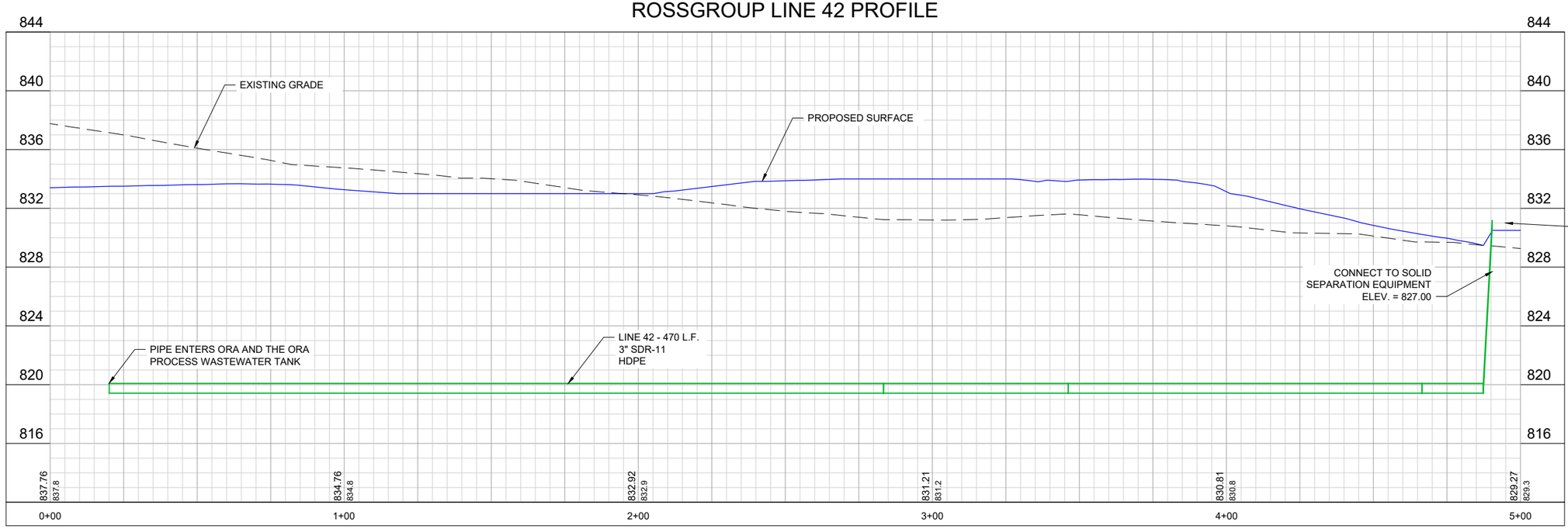
WAUPACA COUNTY, WI

ROSSGROUP LINES 13,16,36-39 PROFILES

PROJECT NO. 21752002
SHEET CS315

0 10 20 40

# ROSSGROUP LINE 42 PROFILE




Station

NOTE:
LINE 42 COMES FROM GD-MP FLOMAX 5 1.5X1.5 PUMP OF MANHOLE TK-7062 IN THE VSEP BUILDING, WHICH EXTENDS PIPING ABOVE GROUND UNTIL DROPPING BELOW GROUND IN THE SOUTHWEST CORNER OF THE VSEP BUILDING

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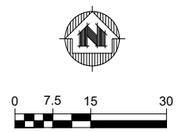
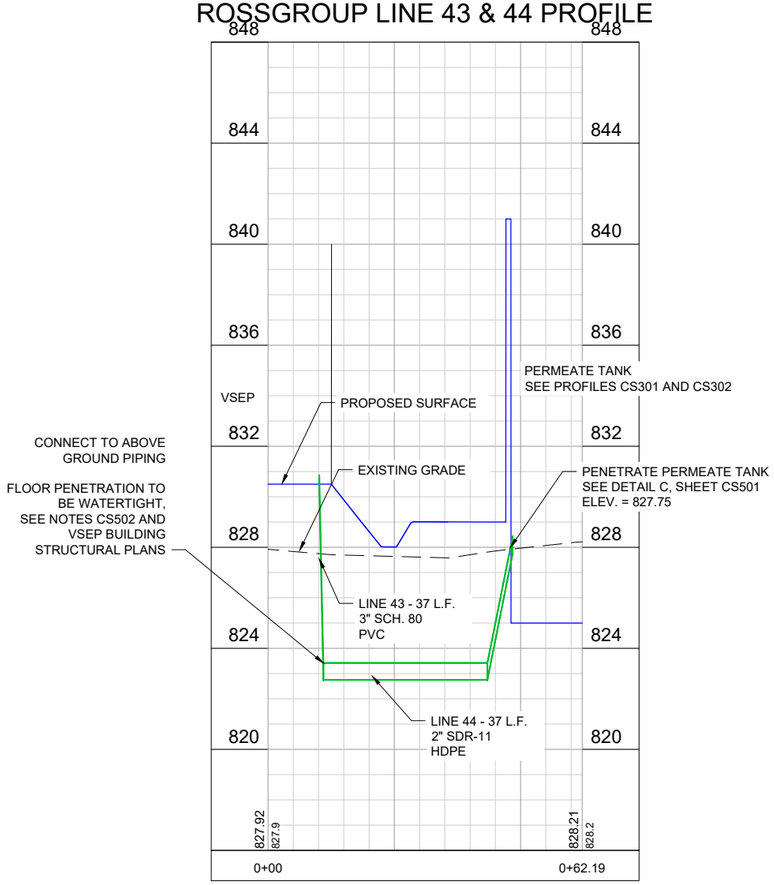
ROSSGROUP LINE 42 PROFILE

PROJECT NO. 21752002
SHEET CS316

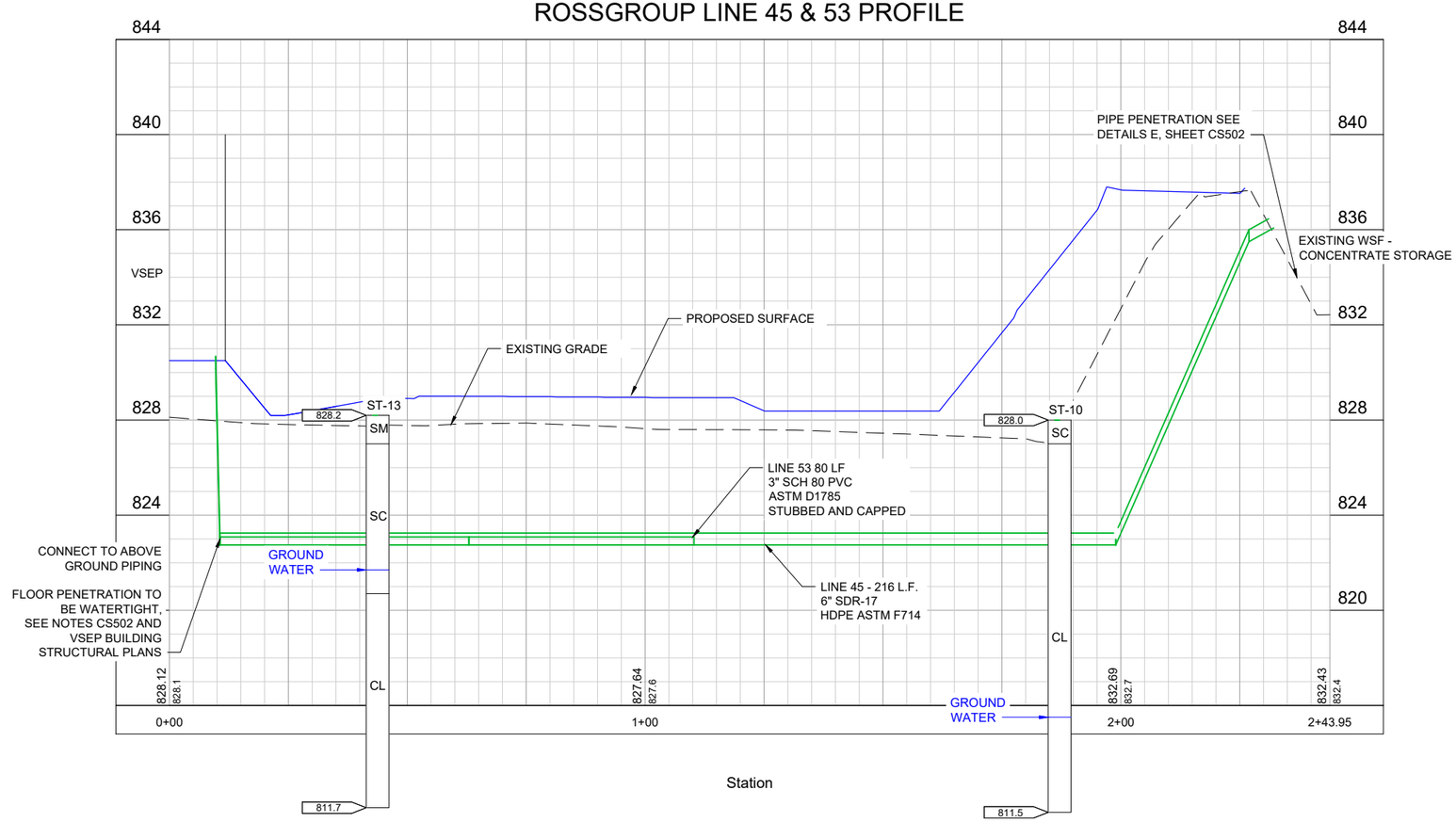



## ROSSGROUP LINE 43 & 44 PROFILE




Station

## ROSSGROUP LINE 45 & 53 PROFILE




Station

NOTE:
LINE 43 AND 53 COME FROM GD-MP-FLOWMAX 5 1.5X1.5 SP CENTRIFUGAL PUMP OF MANHOLE TK-7062 IN THE VSEP BUILDING, WHICH EXTENDS PIPING ABOVE GROUND UNTIL DROPPING BELOW GROUND TO EXIT THE BUILDING AND DISCHARGE TO THE PERMEATE STORAGE.

LINE 44 COMES FROM THE DRAIN MANIFOLD AND RUNS ABOVE GROUND BEFORE DROPPING BELOW GROUND TO EXIT THE BUILDING AND DISCHARGE TO THE PERMEATE STORAGE.

LINE 45 COMES FROM THE DRAIN MANIFOLD AND RUNS ABOVE GROUND BEFORE DROPPING BELOW GROUND TO EXIT THE BUILDING AND DISCHARGE TO THE CONCENTRATE STORAGE (THE EXISTING WSF).

| | | NO. | DATE | REVISION | BY |
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| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
| | DESIGNED BY: Init | . | . | . | . |
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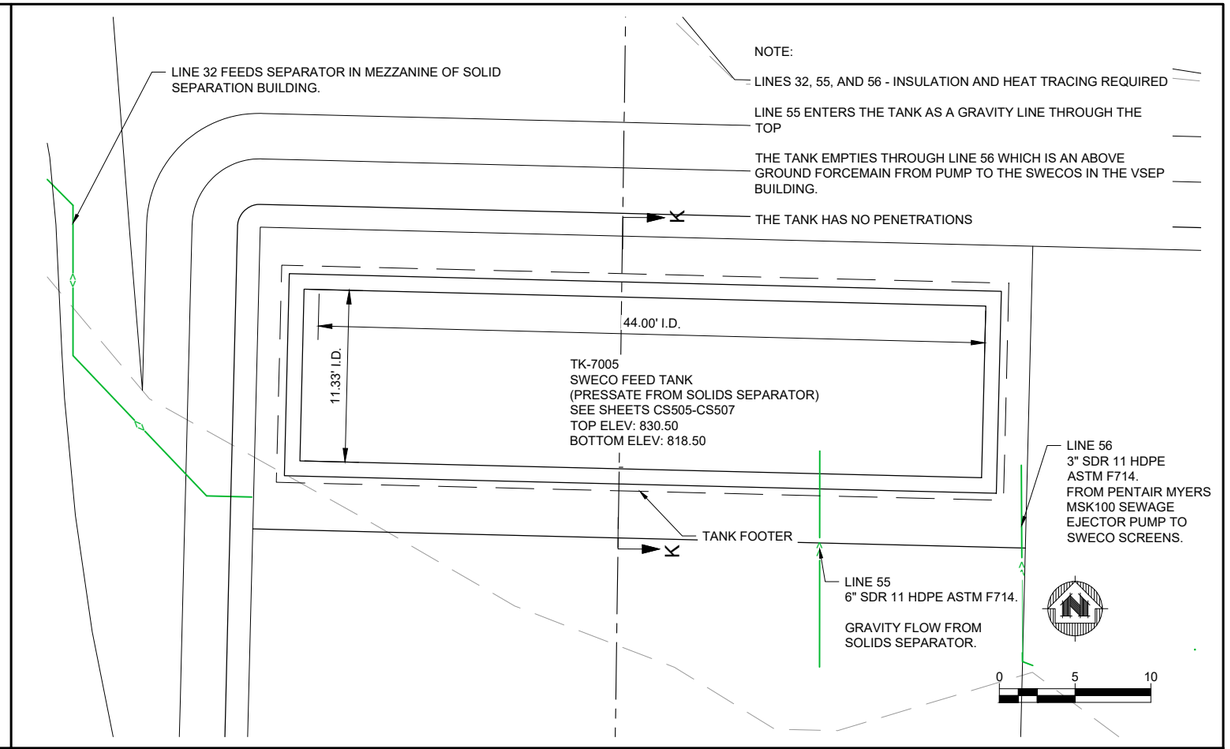
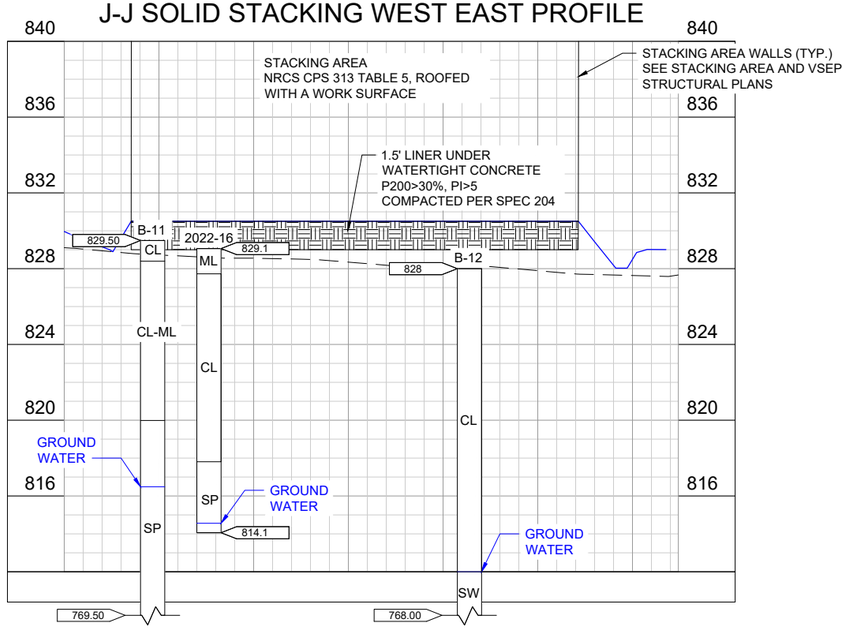
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

ROSSGROUP LINES 43-45 PROFILES

PROJECT NO. 21752002
SHEET CS317

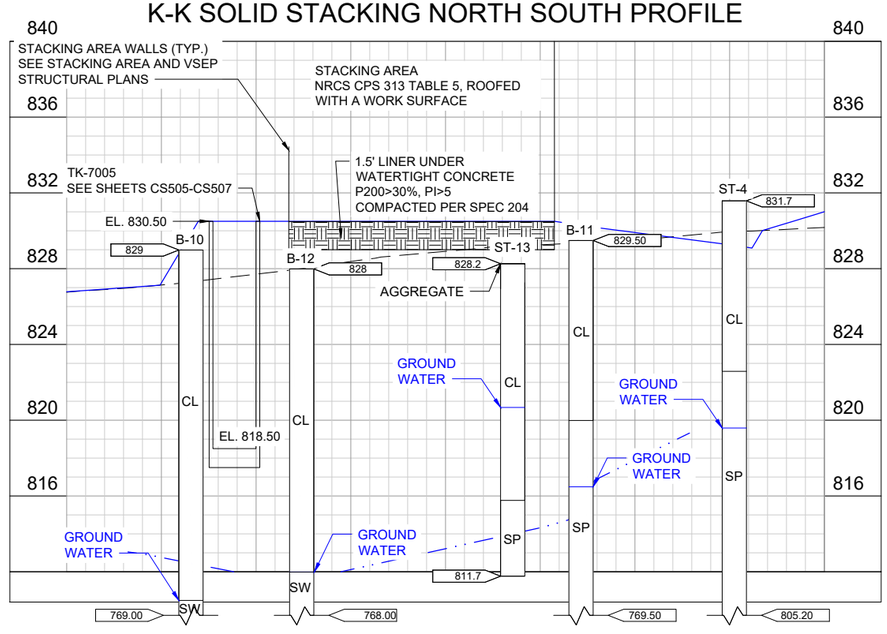



## J-J SOLID STACKING WEST EAST PROFILE




Station

## K-K SOLID STACKING NORTH SOUTH PROFILE

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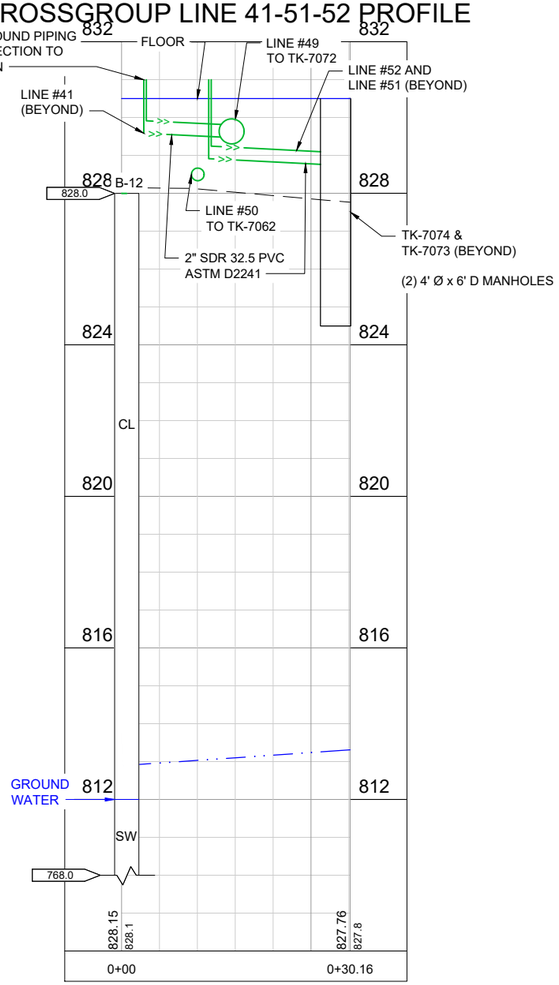
WAUPACA COUNTY, WI

STACKING AREA PROFILES

PROJECT NO. 21752002
SHEET CS318

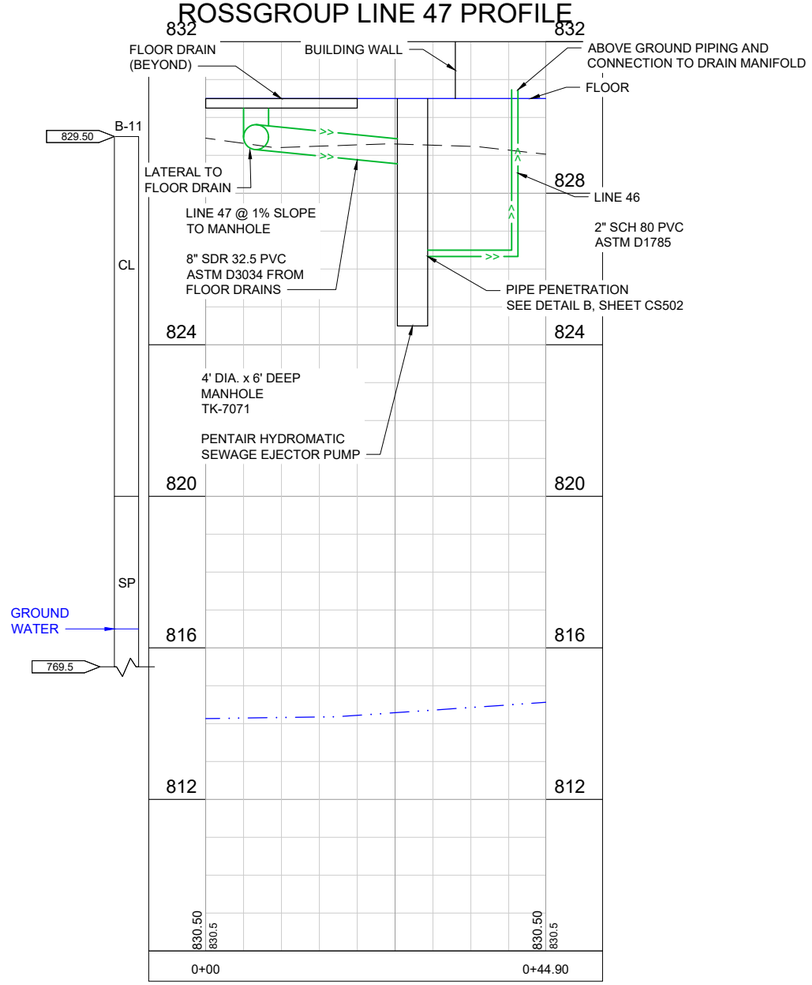
NOTES:
1. ALL FLOOR PENETRATIONS TO BE WATERTIGHT WITH HYDROPHILIC CAULK, SEE NOTES ON SHEET CS502.
2. MANHOLE MUST MEET ASTM C-478, BASE SECTION SHALL HAVE RISER WALL AND BASE SLAB MONOLITHICALLY CAST

## ROSSGROUP LINE 41-51-52 PROFILE




Station

## ROSSGROUP LINE 47 PROFILE

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| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
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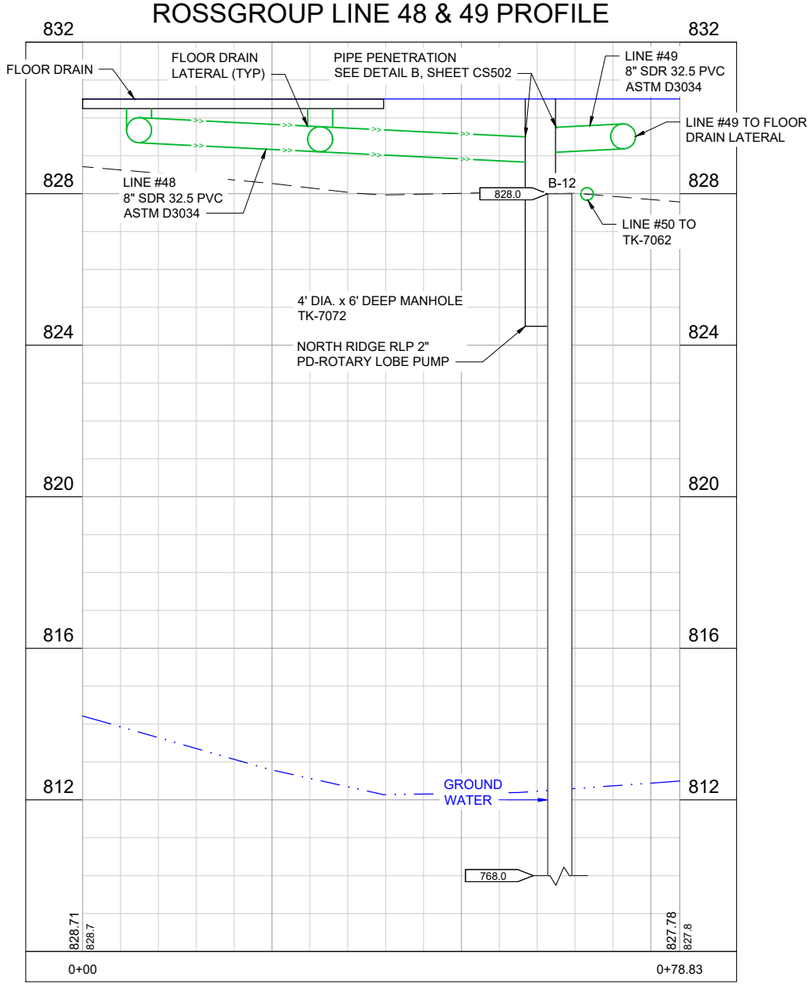
WAUPACA COUNTY, WI

ROSSGROUP LINES 41,47,51,52 PROFILES

PROJECT NO. 21752002
SHEET CS319

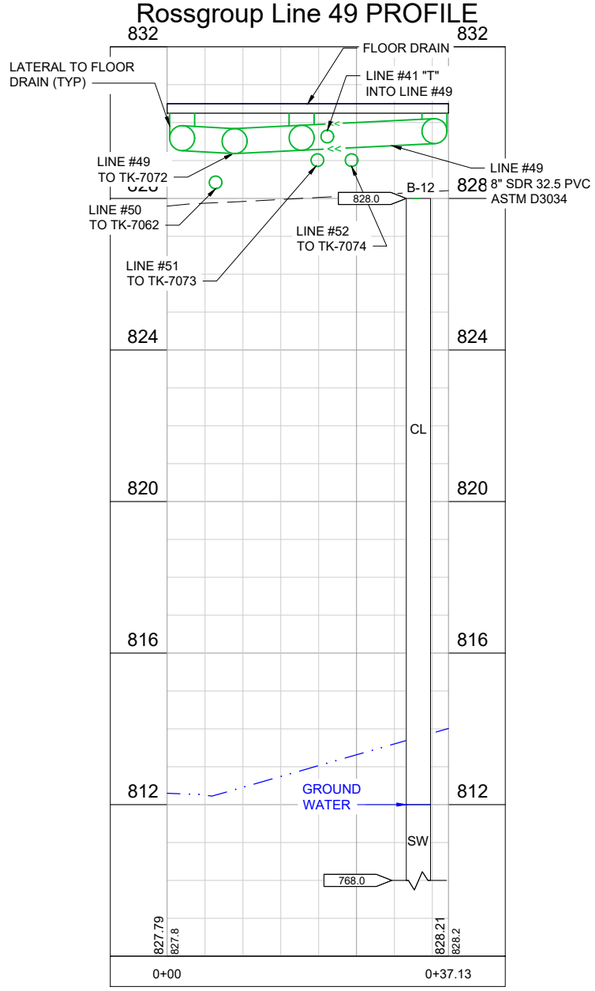
NOTES:
1. ALL FLOOR PENETRATIONS TO BE WATERTIGHT WITH HYDROPHILIC CAULK, SEE NOTES ON SHEET CS502.
2. MANHOLE MUST MEET ASTM C-478, BASE SECTION SHALL HAVE RISER WALL AND BASE SLAB MONOLITHICALLY CAST

## ROSSGROUP LINE 48 & 49 PROFILE



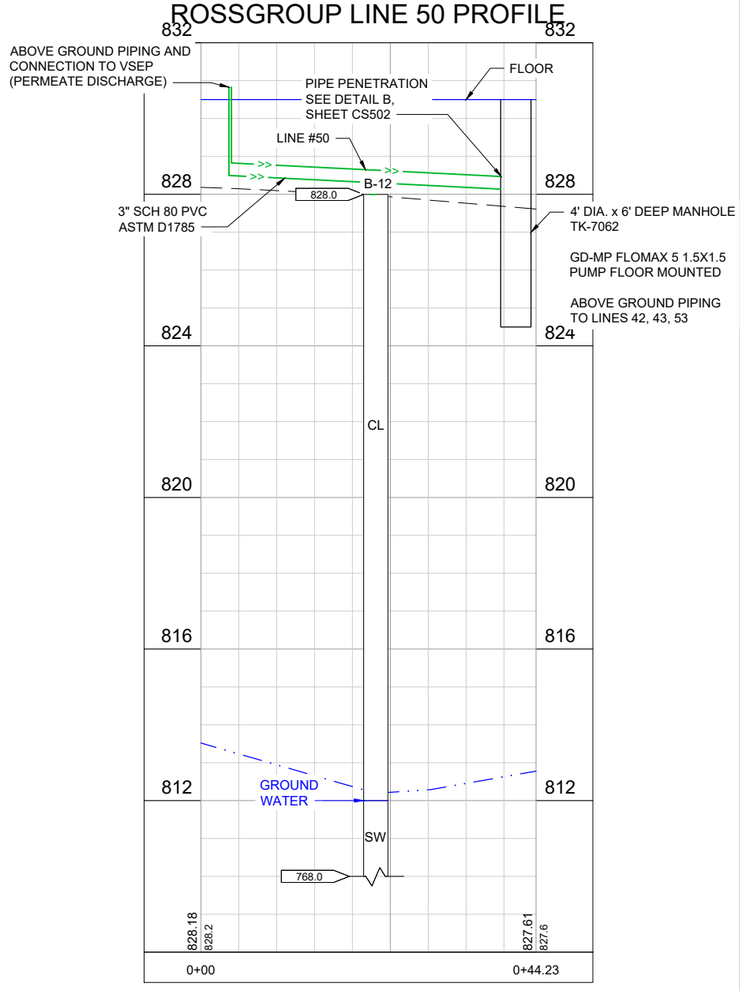

Station

## Rossgroup Line 49 PROFILE




Station

## ROSSGROUP LINE 50 PROFILE

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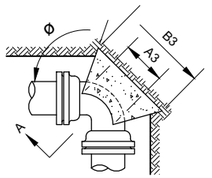
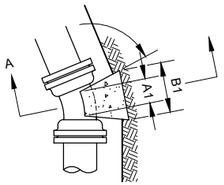
ROSSGROUP LINES 48-50 PROFILES

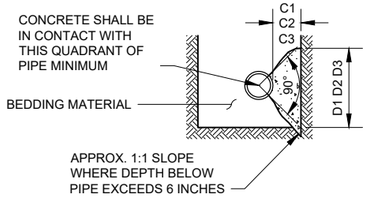
PROJECT NO. 21752002
SHEET CS320



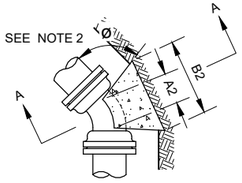

PLAN - 90° BEND




PLAN - 22 ½° BEND




SECTION A-A

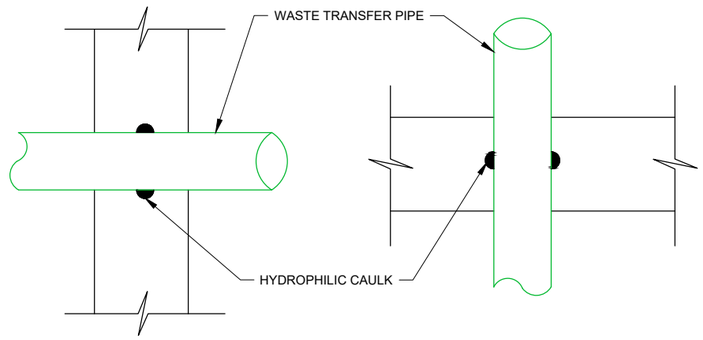



PLAN - 45° BEND

1. DIMENSIONS IN TABLE ARE BASED ON A WATER PRESSURE OF 150 P.S.I. AND AN EARTH RESISTANCE OF 2 TONS PER SQ. FT. INFORM THE ENGINEER IF PRESSURES EXCEED 150 PSI, OR ON-SITE SOIL DOES NOT MEET THIS CONDITION.
2. DIMENSION C1 C2 C3 SHOULD BE LARGE ENOUGH TO MAKE ANGLE Ø EQUAL TO OR LARGER THAN 45°.
3. RESTRAINT TO BE POURED AGAINST FIRM UNDISTURBED SOIL, OR DISTURBED SOIL COMPACTED TO 95% OF MODIFIED PROCTOR DENSITY, ASTM D1557.
4. CONCRETE SHALL HAVE A MINIMUM 7-DAY COMPRESSIVE STRENGTH OF 2000 PSI.

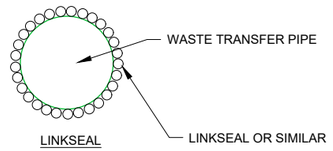
| BUTTRESS DIMENSIONS | | | | | | |
|---|---|---|---|---|---|---|
| PIPE SIZE | 22 ½° BENDS | | 45° BENDS | | 90° BENDS | |
| | B1 | D1 | B2 | D2 | B3 | D3 |
| 6" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-4" | 1'-2" |
| 8" | 1'-0" | 1'-0" | 1'-4" | 1'-2" | 1'-10" | 1'-6" |
| 10" | 1'-2" | 1'-2" | 1'-7" | 1'-7" | 2'-3" | 1'-10" |
| 12" | 1'-4" | 1'-4" | 1'-10" | 1'-10" | 2'-8" | 2'-3" |
| 16" | 1'-10" | 1'-8" | 2'-6" | 2'-4" | 3'-10" | 2'-10" |
| 20" | 2'-4" | 2'-0" | 3'-3" | 2'-10" | 5'-0" | 3'-4" |
| 24" | 2'-10" | 2'-4" | 4'-0" | 3'-3" | 6'-4" | 3'-10" |

A THRUST RESTRAINT DETAILS
CS501 SCALE: NTS




HYDROPHILIC CAULK - POURED IN PLACE

SEE STRUCTURAL PLAN FOR PIPE PENETRATION STEEL REINFORCEMENT DETAILS




B PIPE PENETRATION DETAILS
CS501 SCALE: NTS

NOTES:
1. CUT CONCRETE REINFORCING STEEL AROUND WASTE TRANSFER PIPE. SEE STRUCTURAL PLAN FOR PIPE PENETRATION STEEL REINFORCEMENT DETAILS.
2. SUPPORT PIPE WITH PRECAST CONCRETE BRICKS.
3. VERIFY LAYOUT OF WASTE TRANSFER PIPE WITH FIELD ENGINEER BEFORE CONCRETE PLACEMENT.
4. WATERSTOP DIMENSIONS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS FOR MINIMUM COVER.
5. THE WATERSTOP SHALL BE APPLIED TO EVEN SURFACES, FREE OF DIRT, OIL, OR LATANCE.
6. THE WATER STOP MUST BE BONDED TO THE CONCRETE AND/OR PIPE PRIOR TO PLACEMENT OF ADJOINING CONCRETE.
7. PIPE JOINTS SHALL NOT BE CLOSER THAN 10 FEET FROM THE INSIDE SURFACE OF THE WASTE STORAGE FACILITY; ANY JOINT WITHIN 25 FEET OF THE INSIDE SURFACE OF THE WASTE STORAGE FACILITY SHALL BE SUPPORTED WITH A CAST-IN-PLACE CONCRETE RESTRAINT, 1' MIN WIDTH SURROUNDING PIPE.

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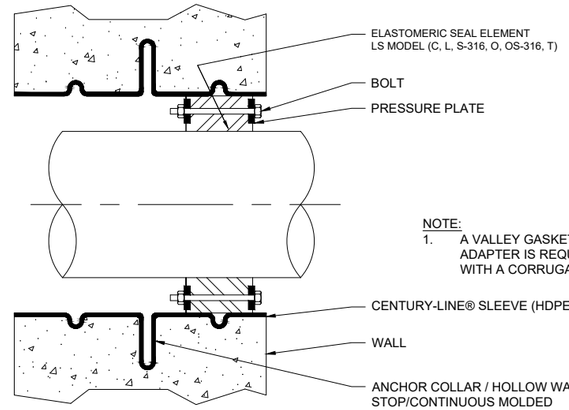
MANUFACTURED BY PIPELINE SEAL & INSULATOR, INC.
HOUSTON, TEXAS, U.S.A. TEL: 800-423-2410 E-MAIL: INFO@PSIPSI.COM



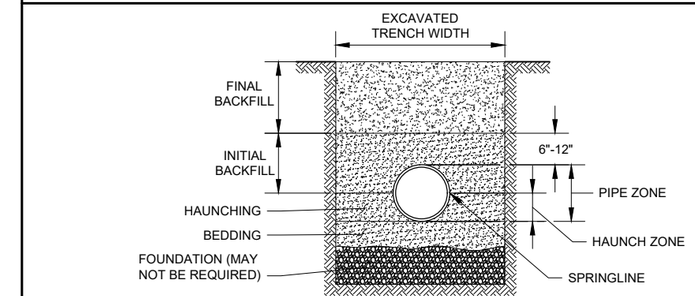

NOTE:
1. A VALLEY GASKET OR MANHOLE ADAPTER IS REQUIRED ON PIPE WITH A CORRUGATED EXTERIOR.

| LINK-SEAL® SCHEDULE | | | |
|---|---|---|---|
| LS MODEL | SEAL ELEMENT | BOLTS/NUTS | PRESSURE PLATE |
| C | EPDM (BLACK) | ZINC DICHROMATE/ORGANIC COATED CARBON STEEL BOLT | REINFORCED NYLON POLYMER |
| L | EPDM (BLUE) | ZINC DICHROMATE/ORGANIC COATED CARBON STEEL BOLT | REINFORCED NYLON POLYMER |
| O | NITRILE | ZINC DICHROMATE/ORGANIC COATED CARBON STEEL BOLT | REINFORCED NYLON POLYMER |
| T | SILICONE | ZINC DICHROMATE/ORGANIC COATED CARBON STEEL BOLT | STEEL ZINC DICHROMATE |
| (C,L,O)+S-316 | SEE MODEL OPTIONS | 316 STAINLESS STEEL | REINFORCED NYLON POLYMER |

| LINK-SEAL® SLEEVES | | |
|---|---|---|
| SLEEVE MODEL | DESCRIPTION | MATERIAL |
| CS | CENTRY-LINE SLEEVE | HDPE |
| WS | STEEL WALL SLEEVE | STEEL |

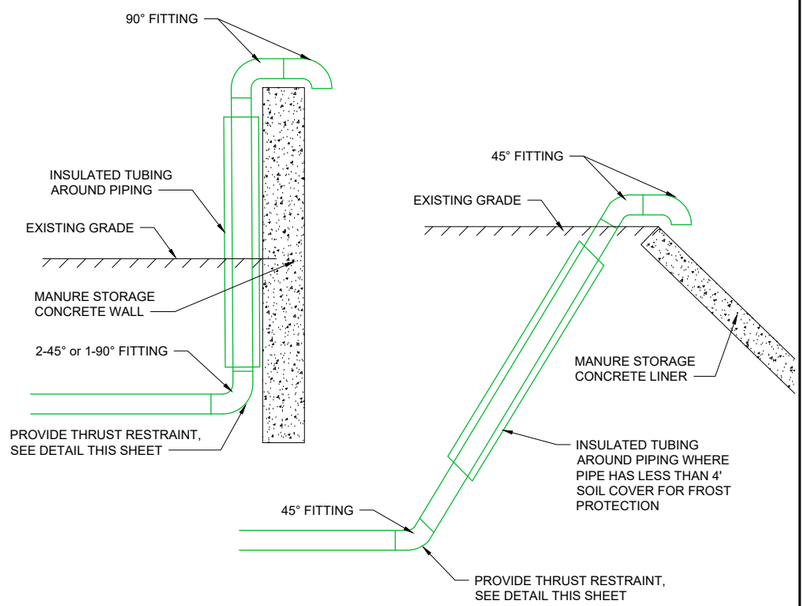
For more Material Property Information, see literature at www.linkseal.com

C MANHOLE CONNECTION - LINK-SEAL DETAIL
CS501 SCALE: NTS

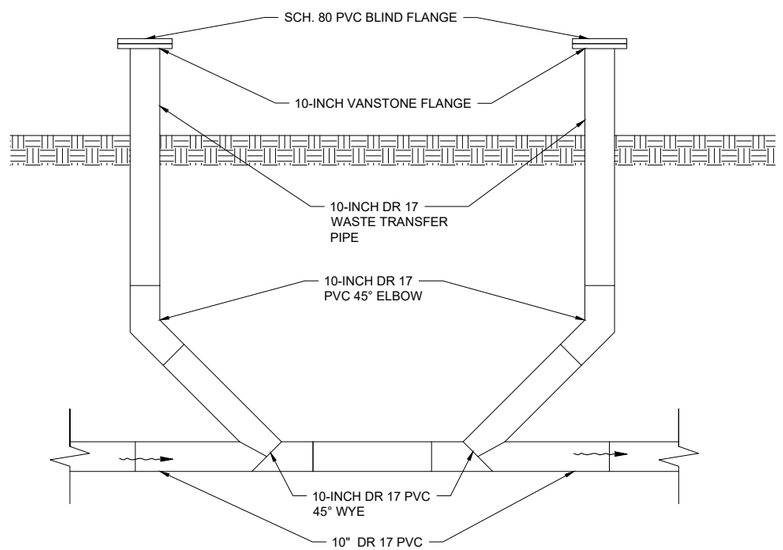



GENERAL NOTES:
1. DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO ASTM D2321.
2. CLASS 1 EMBEDMENT MATERIAL SHALL BE CLEAN, OPEN GRADED CRUSHED STONE, ROCK OR GRAVEL.
3. NO PARTICLES LARGER THAN 1 1/2 -INCHES SHALL BE USED IN THE PIPE EMBEDMENT.
4. DO NOT USE CLASS 1A MATERIAL WHERE CONDITIONS MAY CAUSE MIGRATION OF FINES FROM ADJACENT SOIL AND LOSS OF PIPE SUPPORT.
5. CLASS 1 MATERIAL IS SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM. INSTALL AND COMPACT IN 6-INCH MAXIMUM LAYERS.
6. INSTALL BEDDING IN 6-INCH MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 INCH (6 INCH IN ROCK CUTS).
7. INSTALL AND COMPACT HAUNCHING IN 6-INCH MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
8. INSTALL AND COMPACT INITIAL BACKFILL TO A MINIMUM OF 6 INCH ABOVE PIPE CROWN
9. EMBEDMENT COMPACTION:
   CLASS 1: PLACE AND WORK BY HAND TO INSURE ALL EXCAVATED VOIDS AND HAUNCH AREAS ARE FILLED. FOR HIGH DENSITIES USE VIBRATORY COMPACTORS.
10. EMBEDMENT INCLUDES BEDDING, HAUNCHING, AND INITIAL BACKFILL

D CLASS I - FLEXIBLE PIPE EMBEDMENT DETAIL
CS501 NO SCALE




E TRANSFER DISCHARGE OVER WALL
CS501 SCALE: NTS




F BI-DIRECTIONAL CLEANOUT DETAIL
CS501

NOTE: IF PUSH GASKETED FITTINGS ARE USED IN LIEU OF GLUED JOINTS, MECHANICAL JOINT RESTRAINTS SHALL BE INSTALLED ON ALL JOINTS AT CLEANOUT

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2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

PIPING DETAILS

PROJECT NO. 21752002
SHEET CS501

USE OF EXPANSIVE WATERSTOP MATERIALS IN WASTE MANAGEMENT PRACTICES

MATERIAL

EXPANSIVE WATERSTOPS SHALL CONSIST OF PREFORMED STRIPS OR MASTIC (CAULK) MADE OF HYDROPHILIC MATERIALS THAT EXPAND WHEN SUBJECTED TO MOISTURE OR THE MATERIAL BEING STORED. THEY SHALL NOT CONTAIN BENTONITE. ENGINEER RECOMMEND LEAKMASTER LV-Z. USE SHALL BE LIMITED TO NON-MOVEMENT JOINTS.

THE CONTRACTOR SHALL PROVIDE THE SPECIFICATIONS FOR THE MATERIAL TO BE USED FOR APPROVAL SEVEN (7) DAYS PRIOR TO USE. THE SPECIFICATIONS SHALL INCLUDE THE APPLICABILITY OF THE MATERIAL FOR THE USE INTENDED.

CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL PROVIDE A COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS/SPECIFICATIONS FOR APPROVAL SEVEN (7) DAYS PRIOR TO USE.

2. EXPANSIVE WATERSTOP SHALL BE PLACED AT THE LOCATIONS SHOWN ON THE DRAWINGS.

3. THE EXPANSIVE WATERSTOP SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS, INCLUDING BUT NOT LIMITED TO:

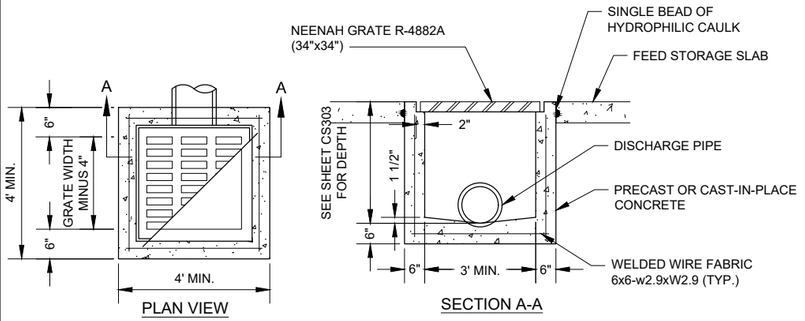
   A. CLEANING OF SURFACES
   B. SURFACE PREPARATION
   C. APPLICATION OF ADHESIVES (AND CURING) OR MECHANICAL FASTENING
   D. APPLICATION OF EXPANSIVE WATERSTOP
   E. CURING OF EXPANSIVE WATERSTOP

4. REQUIRED ADHESIVE OR OTHER FORMS OF MECHANICAL FASTENING TO EXISTING CONCRETE SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS.

5. ADHESIVE FOR PREFORMED EXPANSIVE WATERSTOP AND THE MASTIC FOR CAULK TYPE EXPANSIVE WATERSTOP SHALL BE ALLOWED TO CURE FOR THE DURATION AS INDICATED BY THE MANUFACTURER PRIOR TO PLACING CONCRETE OVER THE WATERSTOP. THE REQUIRED CURING TIME WILL BE TEMPERATURE DEPENDENT.

6. MASTIC (CAULK) SHALL BE PLACED TO THE BEAD SIZE AS RECOMMENDED BY THE MANUFACTURER BASED ON THE AMOUNT OF CONCRETE COVER PROVIDED.

7. THE EXPANSIVE WATERSTOP SHALL NOT BE ALLOWED TO BECOME WET PRIOR TO PLACING CONCRETE OVER THE WATERSTOP. MATERIAL THAT HAS EXPANDED PRIOR TO CONCRETE PLACEMENT SHALL BE REMOVED AND REPLACED FOLLOWING ALL OF THE INITIAL INSTALLATION REQUIREMENTS.

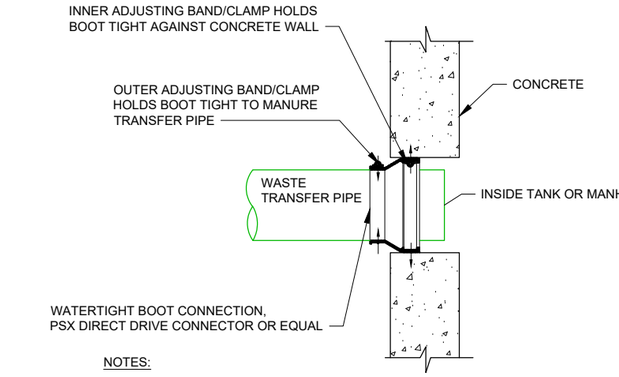



PLAN VIEW

SECTION A-A

GENERAL NOTES:
1. SEE PLANS FOR SIZE, NUMBER, AND LOCATION OF PIPES.
2. DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.
3. DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.
4. ALL PRECAST INLET UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M 199.
5. PRECAST REINFORCED BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS FOR GRANULAR BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.
6. ALL BAR STEEL AND WELDED WIRE FABRIC REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

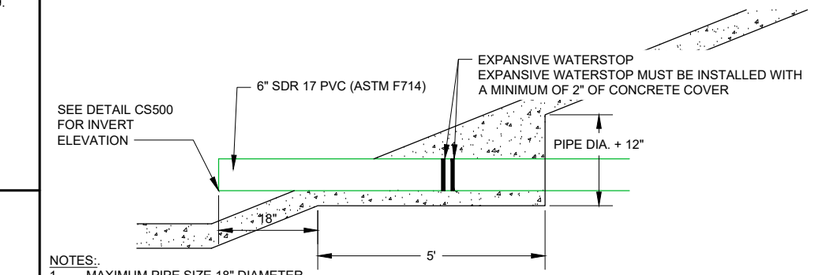
A CS502 AREA DRAIN INLET DETAIL
NO SCALE



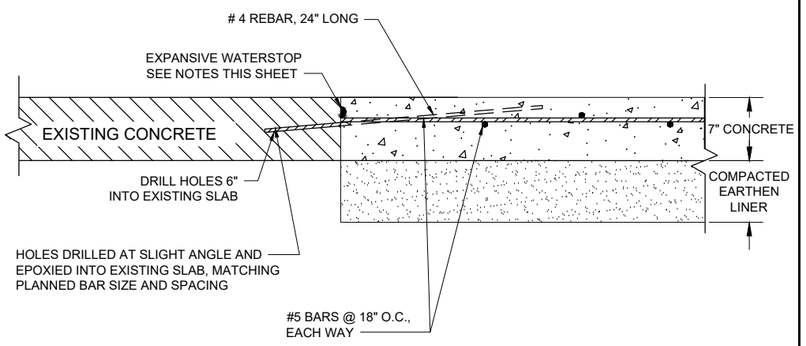

NOTES:

- IN THE SITUATION WHERE THE TRANSFER PIPE IS CORRUGATED DOUBLE WALL HDPE, A SMOOTH PIPE ADAPTER SHALL BE INSTALLED ON THE CORRUGATED DOUBLE WALL HDPE TO CREATE A WATERTIGHT FLEXIBLE CONNECTION.

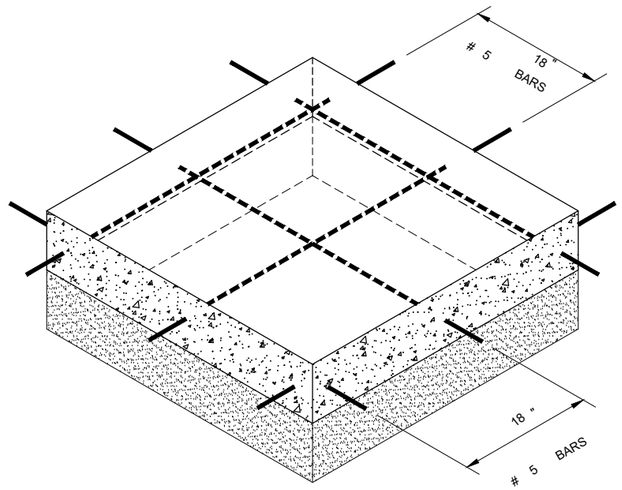
B CS502 PIPE PENETRATION - BOOT DETAIL
NO SCALE



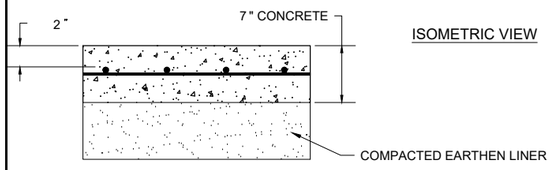

NOTES:.
1. MAXIMUM PIPE SIZE 18" DIAMETER
2. VERIFY LAYOUT OF WASTE TRANSFER PIPE WITH FIELD ENGINEER BEFORE CONCRETE PLACEMENT.
3. WATERSTOP DIMENSIONS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS FOR MINIMUM COVER.
4. THE WATERSTOP SHALL BE APPLIED TO EVEN SURFACES, FREE OF DIRT, OIL, OR LATANCE.
5. THE WATERSTOP MUST BE BONDED TO THE EXISTING CONCRETE AND PIPE PRIOR TO PLACEMENT OF CONCRETE.
6. IF NECESSARY, CONCRETE MAY BE MOUNDED OVER THE TOP OF THE TRANSFER PIPE TO ACHIEVE THE REQUIRED 2" OF COVER.
7. PIPE JOINTS SHALL NOT BE CLOSER THAN 10 FEET FROM THE INSIDE SURFACE OF THE WASTE STORAGE FACILITY; ANY JOINT WITHIN 25 FEET OF THE INSIDE SURFACE OF THE WASTE STORAGE FACILITY SHALL BE SUPPORTED WITH A CAST-IN-PLACE CONCRETE RESTRAINT.




C CS502 EXISTING - NEW CONCRETE CONNECTION
SCALE: NTS
FEED STORAGE SLAB




ISOMETRIC VIEW

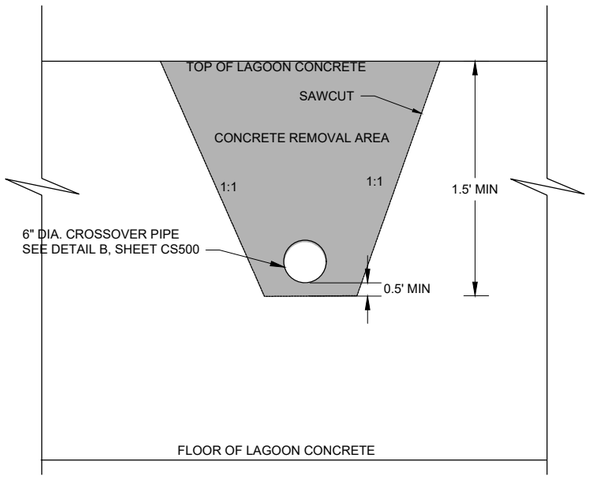



SECTION

NOTES:

1. Fc = 4,000 PSI
2. Fy = 60,000 PSI
4. REQUIRED SPLICE LENGTH= 24"

D CS502 CONCRETE SLAB REINFORCEMENT DETAIL




E CS502 LAGOON LINER PIPE PENETRATION DETAIL

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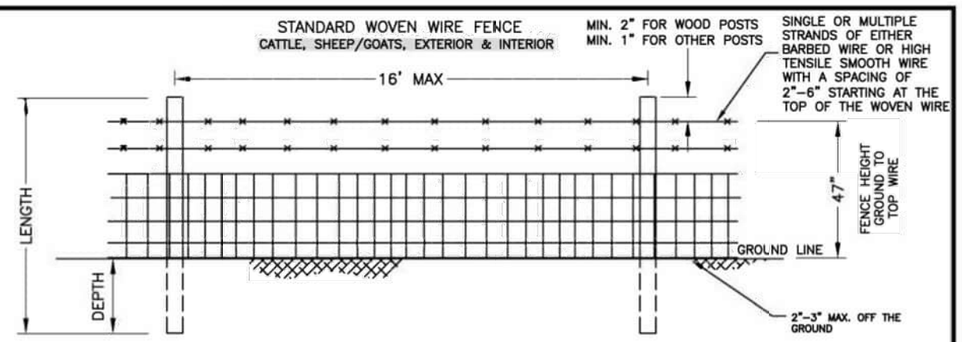
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

DETAILS

PROJECT NO. 21752002
SHEET CS502

## STANDARD WOVEN WIRE FENCE

CATTLE, SHEEP/GOATS, EXTERIOR & INTERIOR




### LINE POSTS

WOOD:

DIA. = 4" MIN
DEPTH = 2' MIN
MIN. LENGTH= FENCE HEIGHT + POST DEPTH + 2"

ALL WOOD SPECIES EXCEPT RED CEDAR, WHITE CEDAR, TAMARACK, OSAGE ORANGE, BLACK LOCUST, AND WHITE OAK SHALL BE TREATED BY A METHOD LISTED IN WI CONSTRUCTION SPEC. #10–FENCES.

STEEL:

STANDARD "T" POST MIN 1.25 LBS/FT, 1–3/8" X 1–3/8" X 1/8"
DEPTH= 1.5' MIN
MIN. LENGTH= FENCE HEIGHT + POST DEPTH + 1"

ALL STEEL POSTS WILL HAVE AN ANCHOR PLATE AND BE STUDDED

ALL STEEL POSTS WILL BE PAINTED WITH A WEATHER RESISTANT PAINT FOR STEEL, ENAMELED AND BAKED, OR HOT DIP GALVANIZED

ALL STEEL POSTS WILL BE ROLLED FROM HIGH CARBON STEEL

### WIRE

10–GAUGE OR HEAVIER FOR TOP AND BOTTOM STRANDS OF WOVEN WIRE

14.5–GAUGE OR HEAVIER FOR INTERMEDIATE AND STAY WIRES, SPACED MAX. 12" APART

WOVEN WIRE TO MEET ASTM A116

TOP WIRES:
BARBED WIRE MEETING PART I OF WCS #10–FENCES OR HIGH TENSILE WIRE MEETING PART II OF WCS #10–FENCES

### FASTENERS

ALL WIRES SHALL BE ATTACHED TO EACH LINE POST

STAPLES SHALL BE 9–GAUGE, GALVANIZED STEEL OR HEAVIER.

RECOMMENDED LENGTH: 1.75" MIN. FOR SOFTWOODS
1" MIN. FOR HARDWOODS

USE BARBED STAPLES FOR WOOD POSTS

MANUFACTURER'S CLIPS OR 14–GAUGE WIRE MAY BE USED TO FASTEN WIRES TO NON–WOOD POSTS

### NOTES

BRACES ARE REQUIRED AT ALL CORNERS, GATES, PULL AND END ASSEMBLIES. SEE BRACE DETAILS.

A CORNER OR BEND ASSEMBLY SHALL BE USED WHEN THE HORIZONTAL ALIGNMENT CHANGES MORE THAN 15 DEGREES AND A PULL ASSEMBLY SHALL BE USED WHEN VERTICAL ALIGNMENT CHANGES MORE THAN 15 DEGREES. A CORNER OR BEND ASSEMBLY WILL BE USED ONLY WHEN IT WILL NOT AFFECT THE INTEGRITY OF THE FENCE.

PULL ASSEMBLIES SHALL BE INSTALLED AT INTERVALS NOT TO EXCEED 660 FEET. THE CONTINUITY OF THE WIRE SHALL BE INTERRUPTED AT THE PULL ASSEMBLY.

H–BRACING IS REQUIRED AT ALL PULL ASSEMBLIES AND MUST BE INSTALLED EVERY 660' MAX. SEE BRACE DETAILS.

TENSION OF FENCE SHOULD BE SET SUCH THAT THE SAG BETWEEN POSTS IS 1 INCH OR LESS

### GROUNDING

IT IS RECOMMENDED THAT FENCES WITHOUT STEEL POSTS BE GROUNDED FOR LIGHTNING PROTECTION AT LEAST EVERY QUARTER MILE. ALL LINE WIRES MUST BE GROUNDED. USE 12.5 GAUGE WIRE FOR LEAD–OUT WIRE.

–GROUND RODS
MIN 4 FEET INTO GROUND
0.5" MIN DIAMETER, GALVANIZED STEEL

NOTE
- OWNER MAY CONSTRUCT ANY OF THE NRCS 701 FENCES, OR ALTERNATIVE APPROVED BY ENGINEER

REFER TO WI CONSTRUCTION SPEC #10–FENCES FOR MORE SPECIFIC INFORMATION

Fence Length = _____ FT.

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | STANDARD WOVEN WIRE FENCE<br>CATTLE, SHEEP/GOATS, EXTERIOR & INTERIOR<br>CLIENT: BROOKS DAIRY<br>COUNTY: WAUPACA | MSA Date<br>Designed _____<br>Drawn _____<br>Checked _____<br>Approved _____ | Drawing Name 701–4A<br>Date 7/19<br>Sheet of |

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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

WSF DETAILS

PROJECT NO. 21752002
SHEET CS503


THIS IS ONLY AN EXAMPLE OF THE TYPE OF SIGN THAT MUST BE POSTED AROUND THE FACILITY. OTHER COMMERCIALLY AVAILABLE SIGNS MAY BE USED.

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | MANURE STORAGE PIT WARNING SIGNS<br>CLIENT: BROOKS DAIRY<br>COUNTY: WAUPACA | Designed MSA<br>Drawn<br>Checked<br>Approved | Date<br>File Name WI-596A<br>Date 07/14<br>Sheet of |


THESE ARE ONLY EXAMPLES OF THE TYPES OF SIGNS THAT MUST BE POSTED AROUND THE FACILITY. OTHER COMMERCIALLY AVAILABLE SIGNS MAY BE USED.

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | MANURE STORAGE PIT WARNING SIGNS<br>CLIENT: BROOKS DAIRY<br>COUNTY: WAUPACA | Designed MSA<br>Drawn<br>Checked<br>Approved | Date<br>File Name WI-596B<br>Date 07/14<br>Sheet of |

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WAUPACA COUNTY, WI

WSF DETAILS

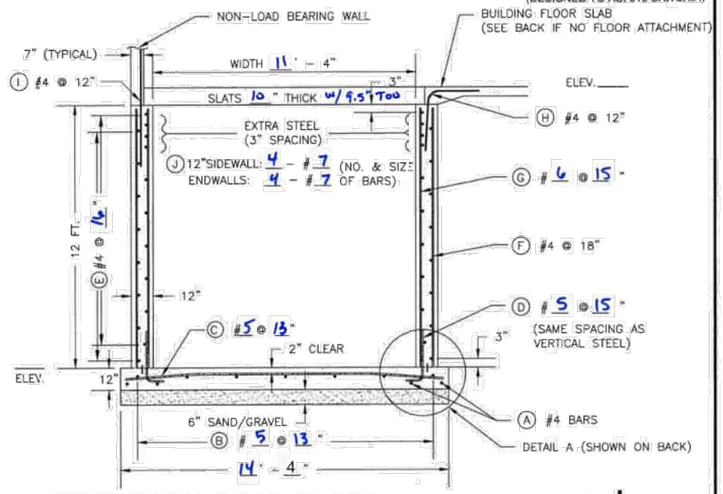
PROJECT NO. 21752002
SHEET CS504

NOT TO SCALE

NOTE: SHORE THE WALLS ON THE INSIDE, AT THE TOP, UNTIL THE SLATS AND BUILDING FLOOR ARE IN PLACE.

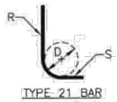
LID DESIGN LOADING (CIRCLE ONE)
I LIVESTOCK
II SKID-STEER LOADER
III TRACTOR

CONDITIONS OF USE
CONCRETE 4000 psi
BACKFILL TO TOP
SURCHARGE ( Y or N )
SOIL EFP = 60
(DESIGNED TO ACI 318 CRITERIA)

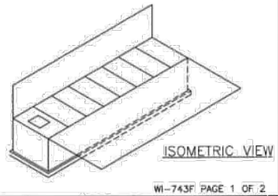



STEEL SCHEDULE (GRADE 40 OR 60) (CIRCLE ONE)

| MARK | SIZE | TYPE | R | S | LENGTH |
|---|---|---|---|---|---|
| A | 4 | STR | -- | -- | 47'6" |
| B | 5 | STR | -- | -- | 47'6" |
| C | 5 | STR | -- | -- | 14' |
| D | 5 | 21 | 28 | 10 | 41' |
| E | 4 | STR | -- | -- | 46'6" |
| F | 4 | STR | -- | -- | 11'9" |
| G | 6 | STR | -- | -- | 11'9" |
| H | 4 | 21 | 2'-0" | 2'-0" | 4'-0" |
| I | 4 | STR | -- | -- | 4'-0" |
| J | 7 | STR | -- | -- | 46'6" |




TYPE 21 BAR



ISOMETRIC VIEW

NOTE: VERTICAL WALL STEEL AND ENDS OF REINFORCEMENT REQUIRE 2" CLEAR COVER.

SEE WI-745 FOR CORNER STEEL DETAIL.

WI-743F PAGE 1 OF 2

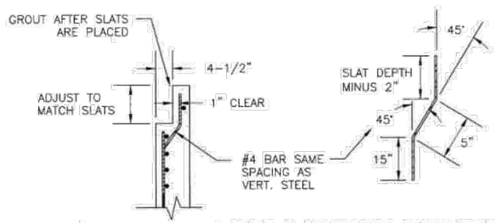
| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | SLATS ACROSS TOP OF TANK AT END OF BUILDING<br>12 FOOT WALL<br>CLIENT: BROOKS FARMS<br>COUNTY: WAUPACA | Designed MSA Date<br>Drawn<br>Checked<br>Approved | File Name WI-743F<br>Date 03/2019<br>Sheet of |

NOT TO SCALE

STEEL DETAILS

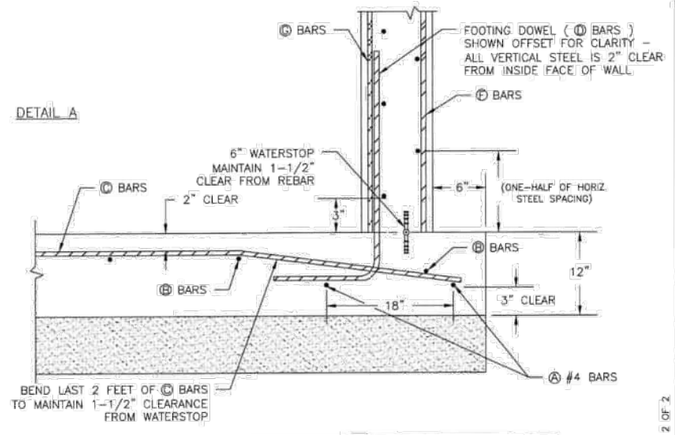
| BAR SIZE | BEND DIAMETER (C) INCHES | SPLICE LENGTH INCHES (MIN.) |
|---|---|---|
| #3 | 2-1/4 | 12 |
| #4 - HORIZ. WALL | 3 | 19 |
| #4 - ALL OTHER | 3 | 15 |
| #5 - HORIZ. WALL | 3-3/4 | 24 |
| #5 - ALL OTHER | 3-3/4 | 19 |
| #6 - HORIZ. WALL | 4-1/2 | 29 |
| #6 - ALL OTHER | 4-1/2 | 22 |
| #7 - HORIZ. WALL | 5-1/4 | 42 |
| #8 - HORIZ. WALL | 6 | 48 |

NOTE: HORIZONTAL STEEL IN WALLS REQUIRES A LONGER SPLICE THAN HORIZONTAL STEEL WITH 12" OR LESS OF FRESH CONCRETE CAST BELOW THE SPLICE.




CONFIGURATION OF WALL IF THERE IS NO BUILDING FLOOR ATTACHED

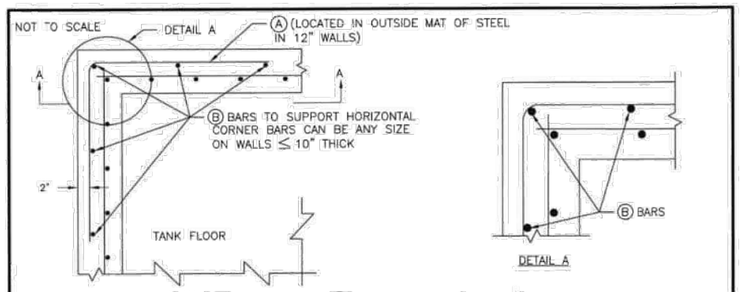
DETAIL A




THIS STANDARDIZED DESIGN MUST BE ADAPTED TO THE SPECIFIC SITE. THIS DRAWING WAS PREPARED AT THE NRCS STATE OFFICE, 8030 EXCELSIOR DRIVE, SUITE 200 MADISON, WI 53717-2906

WI-743F PAGE 2 OF 2

NOT TO SCALE




STEEL SCHEDULE (GRADE 40 OR 60) (CIRCLE ONE)

| MARK | SIZE | QUANTITY | TYPE | LENGTH | R* | S* | TOTAL LENGTH |
|---|---|---|---|---|---|---|---|
| A | 5 | 64 | 21 | 12'3" | 6' | 6' | 784' |
| B | | N/A | STR | | -- | -- | |

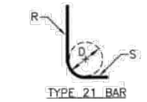
* R AND S ARE THE SAME LENGTH

S = 6' FOR 12' WALLS
S = 5' FOR 10' WALLS
S = 4' FOR ≤ 8' WALLS

ONE DIMENSION OF (A) BARS CAN BE SHORTENED ON ENDWALL TO MEET THE REQUIRED SPLICE LENGTH.

STEEL DETAILS

| BAR SIZE | BEND DIAMETER (D) INCHES | SPLICE LENGTH INCHES (MIN.) |
|---|---|---|
| #4 - HORIZ. WALL | 3 | 19 |
| #5 - HORIZ. WALL | 3-3/4 | 24 |
| #6 - HORIZ. WALL | 4-1/2 | 29 |




TYPE 21 BAR

(DESIGNED TO ACI 318 CRITERIA)

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | CORNER STEEL DETAILS<br>6 - 12 FOOT TANK WALLS<br>CLIENT: BROOKS FARMS<br>COUNTY: WAUPACA | Designed MSA Date<br>Drawn<br>Checked<br>Approved | File Name WI-745<br>Date 03/2019<br>Sheet of |

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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

TK-7005 SWECO FEED TANK DETAILS

PROJECT NO. 21752002
SHEET CS505

## RECEPTION TANK DESIGN
(DESIGNED TO ACI 318 CRITERIA)

1. VERTICAL WALL STEEL

| WALL HEIGHT | WALL THICKNESS | LOADING | | | |
|---|---|---|---|---|---|
| | | NO TRACTOR ADJACENT | | TRACTOR ADJACENT | |
| | | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 7 FT. or less | 8" | #4 @ 12" | #4 @ 18" | #4 @ 10" | #4 @ 16" |
| 8 FT. | 8" | #4 @ 12" | #4 @ 18" | #4 @ 7" | #5 @ 18" |
| 8 FT. | 12" | #4 @ 18" | #4 @ 18" | #4 @ 12" | #4 @ 18" |
| 10 FT. | 8" | #5 @ 9" | #5 @ 12" | #6 @ 9" | #6 @ 12" |
| 10 FT. | 10" | #5 @ 12" | #4 @ 12" | #5 @ 9" | #5 @ 12" |
| 10 FT. | 12" | #4 @ 9" | #4 @ 15" | #4 @ 7" | #4 @ 10" |
| 12 FT. | 12" | #5 @ 9" | #5 @ 12" | #6 @ 9" | #6 @ 15" |

2. HORIZONTAL WALL STEEL
(DESIGNED TO ACI 318 CRITERIA)

| WALL THICKNESS | GRADE 40 | GRADE 60 |
|---|---|---|
| 8" | #4 @ 10" | #4 @ 12" |
| 10" | #4 @ 8" | #4 @ 10" |
| 12" (steel for each face) | #4 @ 12" | #4 @ 16" |

3. LID STEEL (8" THICK POURED IN PLACE LID)
(DESIGNED TO ACI 318 CRITERIA)
LOADING – 1. LIVESTOCK (125 psf)
2. SKID-STEER LOADER (150 psf)
3. TRACTOR (2-5000LB. LOADS – 4FT. O.C.)

| WIDTH | LOADING (GRADE 40) | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 6 FT. | #4 @ 12" | #4 @ 10" | #4 @ 4" or #5 @ 6" |
| 8 FT. | #4 @ 12" | #4 @ 11" | #5 @ 4" or #6 @ 6" |
| 10 FT. | #4 @ 7" | #4 @ 7" | #6 @ 4" or #7 @ 5" |
| 12 FT. | #6 @ 11" | #6 @ 10" | #7 @ 4" or #8 @ 4" |

| WIDTH | LOADING (GRADE 60) | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 6 FT. | #4 @ 12" | #4 @ 12" | #3 @ 4" or #4 @ 6" |
| 8 FT. | #4 @ 12" | #4 @ 12" | #4 @ 4" or #5 @ 6" |
| 10 FT. | #4 @ 11" | #4 @ 10" | #5 @ 4" or #6 @ 6" |
| 12 FT. | #5 @ 12" | #5 @ 11" | #5 @ 3" or #6 @ 4" |

USDA United States Department of Agriculture
Natural Resources Conservation Service

RECEPTION TANK DESIGN
CLIENT: BROOKS FARMS
COUNTY: WAUPACA

Designed MSA Date
Drawn
Checked
Approved

File Name: WI-741A
Date: 03/2019
Sheet of

4. EXTRA STEEL (GRADE 40) (GRADE 60)
LOCATED IN TOP OF WALL FOR SLAT OR BEAM & SLAT TANK
(DESIGNED TO ACI 318 CRITERIA)

WALL HEIGHT – 8 FT.

| WALL THICKNESS | SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 3 – #6 | 3 – #5 | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #7 |
| | 4 – #5 | 2 – #6 | 4 – #6 | 3 – #6 | | |
| 10" | 3 – #5 | 3 – #4 | 3 – #6 | 4 – #4 | 3 – #7 | 4 – #5 |
| | 4 – #4 | 2 – #5 | 4 – #5 | 3 – #5 | 4 – #6 | 3 – #6 |
| 12" | 3 – #4 | 2 – #4 | 3 – #5 | 2 – #5 | 3 – #6 | 2 – #6 |

WALL HEIGHT – 10 FT.

| WALL THICKNESS | SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 4 – #6 | 4 – #5 | 4 – #8 | 4 – #6 | THICKEN WALL | THICKEN WALL |
| | | 3 – #6 | | | | |
| 10" | 3 – #6 | 3 – #5 | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #6 |
| | 4 – #5 | 2 – #6 | 4 – #6 | 3 – #6 | | |
| 12" | 2 – #6 | 2 – #5 | 2 – #8 | 2 – #6 | 3 – #8 | 3 – #6 |
| | 3 – #5 | | 3 – #6 | | 4 – #7 | |

WALL HEIGHT – 12 FT.

| WALL THICKNESS | SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 4 – #7 | 4 – #6 | THICKEN WALL | THICKEN WALL | THICKEN WALL | THICKEN WALL |
| | | | | | | |
| 10" | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #6 | THICKEN WALL | THICKEN WALL |
| | 4 – #6 | 3 – #6 | | | | |
| 12" | 2 – #7 | 2 – #6 | 3 – #8 | 3 – #6 | 4 – #8 | 4 – #7 |
| | 3 – #6 | | | | | |

CONSTRUCTION NOTES FOR SLAT AND BEAM & SLAT TANKS:

1. EXTRA STEEL IS ALWAYS REQUIRED AT ENDWALLS.
2. EXTRA STEEL IS ALWAYS REQUIRED ON SIDEWALLS WHEN THERE IS NO BUILDING FLOOR SLAB ATTACHED TO THE TOP OF THE WALL.
3. "SPAN ALONG TOP OF WALL" SHOWN ABOVE REFERS TO THE BEAM SPACING ALONG THE SIDEWALLS; AND THE TANK WIDTH FOR THE ENDWALLS.
4. FOR A SLAT TANK WITH NO BEAMS, USE THE 12 FT "SPAN ALONG TOP OF WALL" COLUMN ABOVE AND ADD A STATEMENT IN THE O&M PLAN: "NEVER REMOVE MORE THAN 3 ADJACENT SLATS AT ONE TIME FOR ANY REASON."

USDA United States Department of Agriculture
Natural Resources Conservation Service

RECEPTION TANK DESIGN
CLIENT: BROOKS FARMS
COUNTY: WAUPACA

Designed MSA Date
Drawn
Checked
Approved

File Name: WI-741B
Date: 03/2019
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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

TK-7005 SWECO FEED TANK DETAILS

PROJECT NO. 21752002
SHEET CS506

5. HORIZONTAL REINFORCEMENT FOR WALL CORNERS (Ⓐ BARS ON DRAWING WI-745 )
(DESIGNED TO ACI 318 CRITERIA)

| WALL HEIGHT \ THICKNESS | NO SURCHARGE | | | | | |
|---|---|---|---|---|---|---|
| | GRADE 40 | | | GRADE 60 | | |
| | 8" | 10" | 12" | 8" | 10" | 12" |
| 7' | #4 @ 12" | NA | NA | #4 @ 18" | NA | NA |
| 8' | #4 @ 10" | #4 @ 14" | TS | #4 @ 16" | #4 @ 18" | TS |
| 10' | #5 @ 8" | #5 @ 10" | TS | #5 @ 12" | #4 @ 10" | TS |
| 12' | #6 @ 6" | #5 @ 6" | #5 @ 8" | #5 @ 6" | #5 @ 10" | #5 @ 12" |

| WALL HEIGHT \ THICKNESS | WITH SURCHARGE | | | | | |
|---|---|---|---|---|---|---|
| | GRADE 40 | | | GRADE 60 | | |
| | 8" | 10" | 12" | 8" | 10" | 12" |
| 7' | #4 @ 10" | NA | NA | #4 @ 12" | NA | NA |
| 8' | #4 @ 6" | #4 @ 10" | TS | #4 @ 10" | #4 @ 15" | TS |
| 10' | #5 @ 6" | #5 @ 8" | #5 @ 10" | #4 @ 6" | #4 @ 8" | #4 @ 10" |
| 12' | NA | NA | #5 @ 6" | NA | NA | #5 @ 9" |

TS = NO ADDITIONAL STEEL NEEDED
NA = NOT APPLICABLE COMBINATION OF THICKNESS AND HEIG-IT

6. TYPICAL PRECAST LID THICKNESSES

SLATS FOR LIVESTOCK – 6"
SLATS FOR EQUIPMENT – 9 1/2"
DRIVE THROUGH PANEL – 9 1/2"

*ANY PRECAST COMPONENTS SHALL BE DESIGNED FOR THE MAXIMUM LOADING CONDITIONS ANTICIPATED.

7. TANK BOTTOM SLAB REINFORCEMENT (DESIGNED TO ACI 318 CRITERIA)

TANK BOTTOM SLAB SHALL HAVE REINFORCEMENT EQUAL TO OR GREATER THAN THE FOLLOWING:

| REINFORCING STEEL FOR SLABS IN THE "LONG" DIRECTION | | | |
|---|---|---|---|
| SLAB THICKNESS (INCHES) | REBAR SIZE (GR 60) AND SPACING | | |
| | SLAB LENGTH* | | |
| | <100' | <150' | <175' |
| 10 | #4 @ 10" | #4 @ 7" | #4 @ 6" |
| | #5 @ 16" | #5 @ 11" | #5 @ 9" |
| 12 | #4 @ 8" | #4 @ 5" | #4 @ 5" |
| | #5 @ 13" | #5 @ 9" | #5 @ 7.5" |

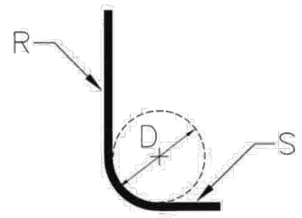
*SLAB LENGTH OR DISTANCE BETWEEN WATERSTOP JOINTS IN SLAB.

| REINFORCING STEEL FOR TANK SLABS IN THE "SHORT" DIRECTION (TANKS 12' OR LESS IN WIDTH) | |
|---|---|
| SLAB THICKNESS (INCHES) | REBAR SIZE (GR 60) AND SPACING |
| 10 | #4 @ 10" |
| | #5 @ 16" |
| 12 | #4 @ 8" |
| | #5 @ 13" |

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | RECEPTION TANK DESIGN<br>CLIENT: BROOKS FARMS<br>COUNTY: WAUPACA | Designed MSA Date<br>Drawn<br>Checked<br>Approved | File Name: WI-741C<br>Date: 03/2019<br>Sheet of |

8. FOOTING/WALL HOOK BARS
(DESIGNED TO ACI 318 CRITERIA)

| WALL HEIGHT (FEET) | WALL THICKNESS (INCHES) | LOADING | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NO TRACTOR ADJACENT | | | | | | TRACTOR ADJACENT | | | | | |
| | | GRADE 40 | | | GRADE 60 | | | GRADE 40 | | | GRADE 60 | | |
| | | HOOK BAR SIZE | R (in) | S (in) | HOOK BAR SIZE | R (in) | S (in) | HOCK BAR SIZE | R (in) | S (in) | HOOK BAR SIZE | R (in) | S (in) |
| 7 OR LESS | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 8 | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 8 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 4 | 21 | 8 | 4 | 24 | 8 |
| 10 | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 24 | 8 |
| 10 | 10 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 10 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 4 | 21 | 8 | 4 | 24 | 8 |
| 12 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 5 | 22 | 10 | 5 | 28 | 10 |




TYPE 21 BAR

| | | | |
|---|---|---|---|
| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | RECEPTION TANK DESIGN<br>CLIENT: BROOKS FARMS<br>COUNTY: WAUPACA | Designed MSA Date<br>Drawn<br>Checked<br>Approved | File Name: WI-741D<br>Date: 03/2019<br>Sheet of |

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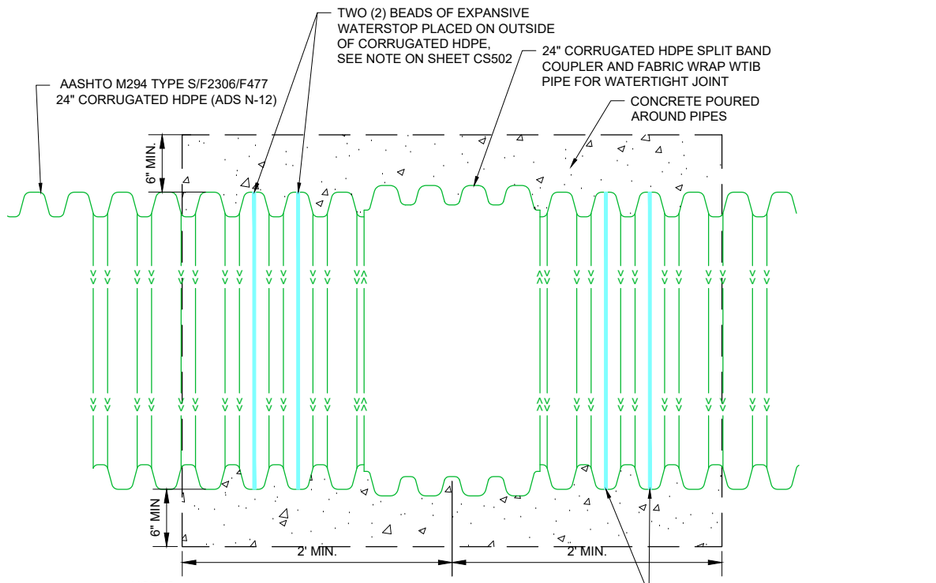
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

TK-7005 SWECO FEED TANK DETAILS

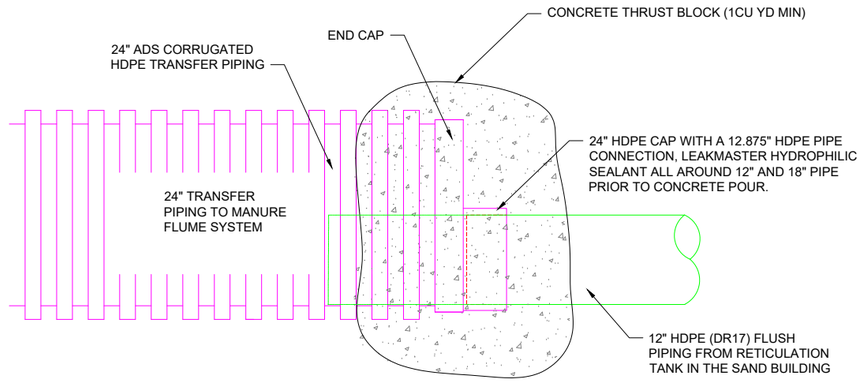
PROJECT NO. 21752002
SHEET CS507




NOTES:

- EXTRA PRECAUTION MUST BE TAKEN TO ENSURE THAT CONCRETE IS SUFFICIENTLY CONSOLIDATED AROUND ENTIRE PIPE PERIMETER.
- MAINTAIN A MINIMUM OF 6" OF CONCRETE AROUND ALL PIPES
- IF MATERIAL IS USED TO KEEP CONCRETE OUT OF TRANSFER PIPE, MATERIAL MUST BE REMOVED BEFORE OPERATION OF SYSTEM.

A CONCRETE JOINT RESTRAINT
CS5XX




C CHARGE LINE ENTRY
CS5XX

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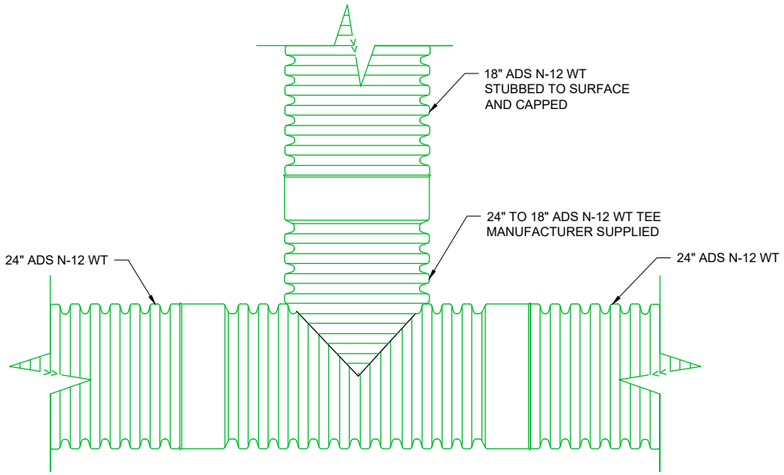
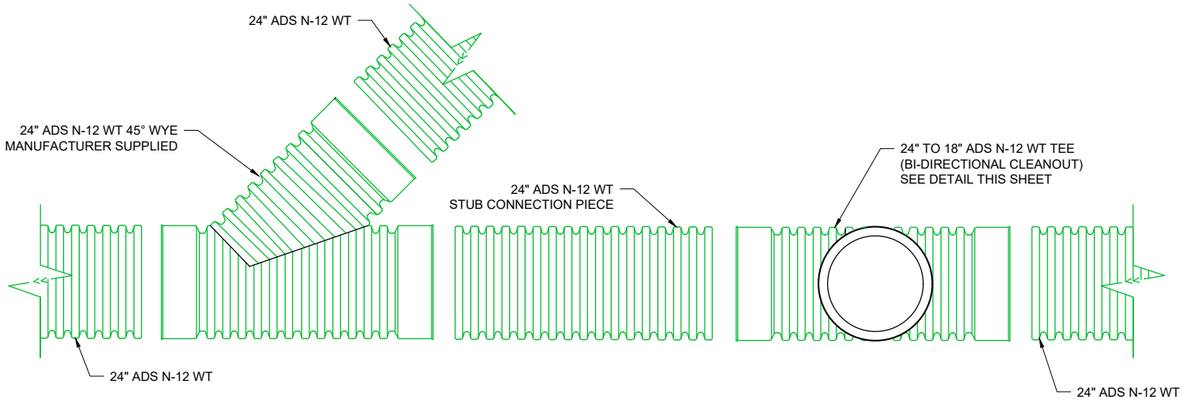
**MANURE TRANSFER DETAILS**

PROJECT NO. 21752002
SHEET CS508




B CS509 18" BI-DIRECTIONAL CLEANOUT DETAIL




C CS509 WYE CONNECTION DETAIL

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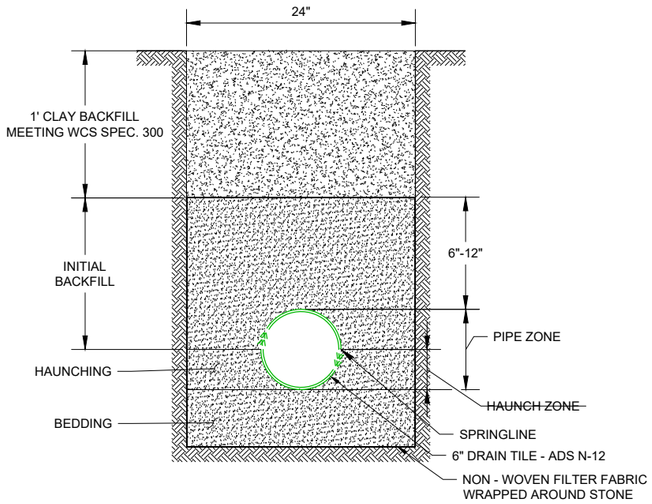
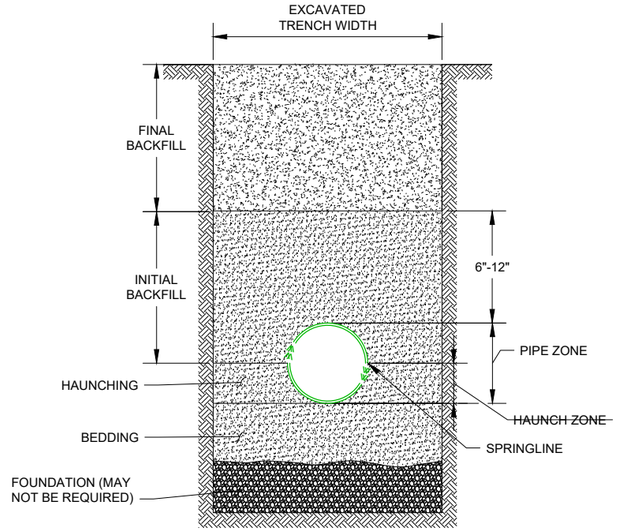



GENERAL NOTES:

1. DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO ASTM D2321.
2. CLASS 1A EMBEDMENT MATERIAL SHALL BE CLEAN, OPEN GRADED CRUSHED STONE, ROCK OR GRAVEL.
3. NO PARTICLES LARGER THAN 1 INCH SHALL BE USED IN THE PIPE EMBEDMENT.
4. CLASS 1 MATERIAL IS SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM. INSTALL AND COMPACT IN 6-INCH MAXIMUM LAYERS.
5. INSTALL BEDDING IN 6-INCH MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 INCH (6 INCH IN ROCK CUTS).
6. INSTALL AND COMPACT HAUNCHING IN 6-INCH MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
7. INSTALL AND COMPACT INITIAL BACKFILL TO A MINIMUM OF 6 INCH ABOVE PIPE CROWN.
8. EMBEDMENT COMPACTION:

   CLASS 1A: PLACE AND WORK BY HAND TO INSURE ALL EXCAVATED VOIDS AND HAUNCH AREAS ARE FILLED. FOR HIGH DENSITIES USE VIBRATORY COMPACTORS.

A CS510 **CLASS I - FLEXIBLE PIPE EMBEDMENT DETAIL FOR DRAIN TILE**
UNDER THE WASTE STORAGE FACILITY




GENERAL NOTES:

1. DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO ASTM D2321.
2. CLASS III EMBEDMENT MATERIAL SHALL BE COURSE-GRAINED SOILS WITH FINES. NO PARTICLES LARGER THAN 1 INCH SHALL BE USED IN THE PIPE EMBEDMENT.
3. DO NOT USE WHERE WATER CONDITIONS IN TRENCH MAY CAUSE INSTABILITY.
4. CLASS III MATERIAL IS SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED TRENCH BOTTOM. DO NOT USE IN THICKNESS GREATER THAN 12 INCH TOTAL. INSTALL AND COMPACT IN 6-INCH MAXIMUM LAYERS.
5. INSTALL AND COMPACT BEDDING IN 6-INCH MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 INCHES (6 INCH IN ROCK CUTS).
6. INSTALL AND COMPACT HAUNCHING IN 6-INCH MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
7. INSTALL AND COMPACT INITIAL BACKFILL TO A MINIMUM OF 6 INCHES ABOVE PIPE CROWN.
8. EMBEDMENT COMPACTION:

   MINIMUM DENSITY 90% STANDARD PROCTOR. USE HAND TAMPERS OR VIBRATORY COMPACTORS. MAINTAIN MOISTURE CONTENT NEAR OPTIMUM TO MINIMIZE COMPACTIVE EFFORT.

B CS510 **CLASS III - FLEXIBLE PIPE EMBEDMENT DETAIL FOR TRANSFER PIPE**
24" FLUME TRANSFER PIPE

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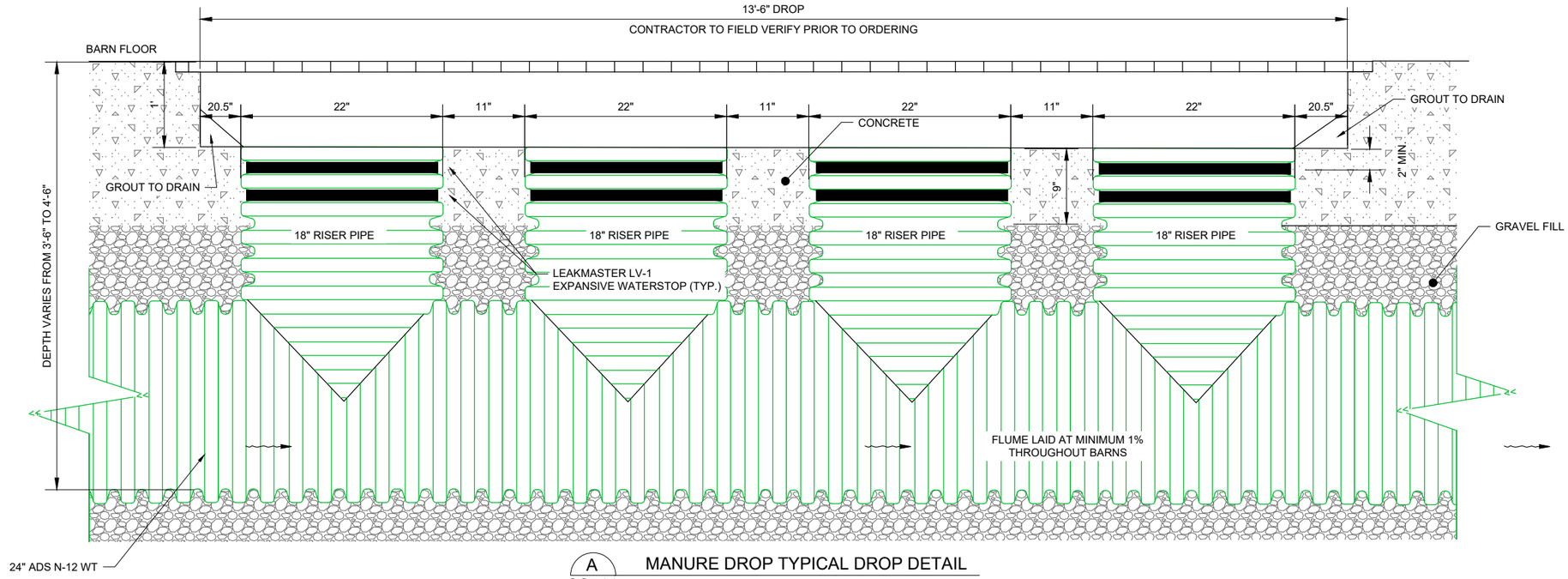
**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

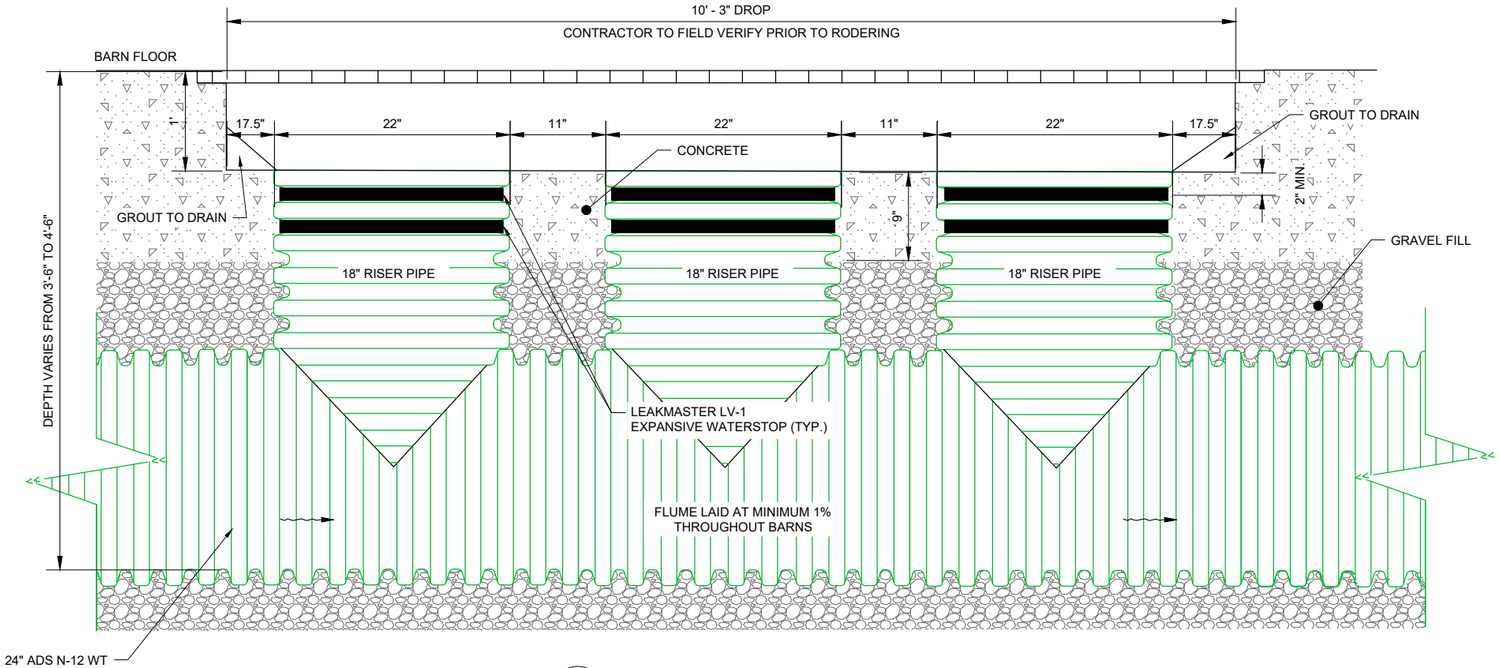
**MANURE TRANSFER DETAILS**

PROJECT NO. 21752002
SHEET CS510

NOTES:
- LEAKMASTER LV-1 OR EQUAL NON-BENTONITE CAULK SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- MANIFOLD SYSTEM SHALL BE FACTORY FABRICATED.
- IF ADDITIONAL PIPES ARE NEEDED TO EXTEND RISERS, PIPES SHALL BE CONNECTED TO MANIFOLD WITH WATERTIGHT GASKETS.

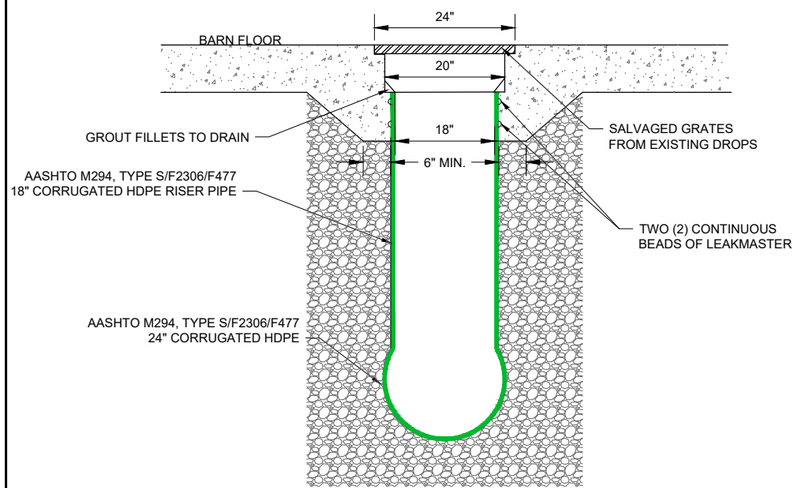



A CS511 MANURE DROP TYPICAL DROP DETAIL




B CS511 MANURE DROP TYPICAL DROP DETAIL

NOTES:
- LEAKMASTER LV-1 OR EQUAL NON-BENTONITE CAULK SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- MANIFOLD SYSTEM SHALL BE FACTORY FABRICATED.
- IF ADDITIONAL PIPES ARE NEEDED TO EXTEND RISERS, PIPES SHALL BE CONNECTED TO MANIFOLD WITH WATERTIGHT GASKETS.




C CS511 MANURE DROP TYPICAL DROP DETAIL

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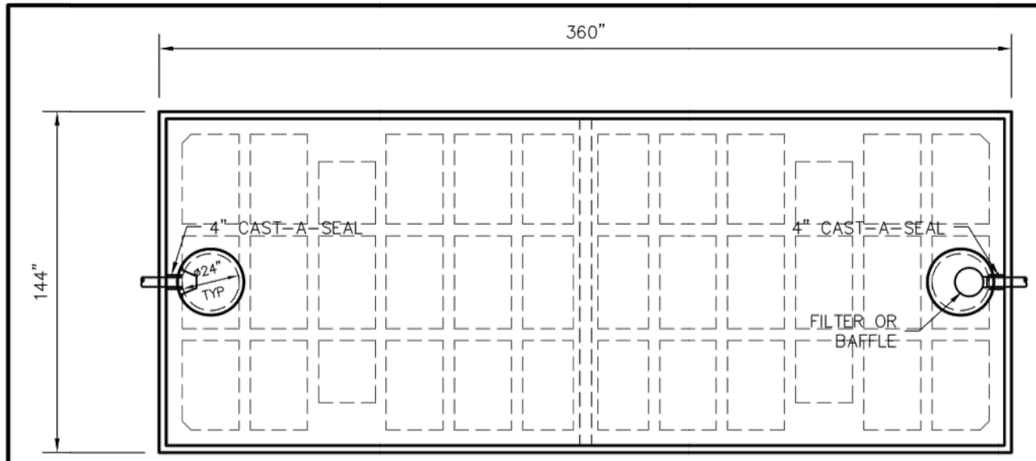
PROJECT NO. 21752002
SHEET CS511




TOP VIEW




SIDE VIEW

TANKS ARE MANUFACTURED TO MEET OR EXCEED ASTM C-1227 REQUIREMENTS

# W25000
## TANK SPECIFICATIONS

DIMENSIONS:
- WALL: 6" RIBBED
- BOTTOM: 9" RIBBED
- COVER: 9" RIBBED
- MANHOLE: 24" I.D. PRECAST RISER
- HEIGHT: 160" O.D.
- LENGTH: 360" O.D.
- WIDTH: 144" O.D.
- BELOW INLET: 138" O.D.
- LIQUID LEVEL 132.5"
- WEIGHT: 42,000 LBS
  PER TOP OR BOTTOM SECTION
  25,200 FOR MIDDLE SECTION

INLET AND OUTLET:
4" CAST-A-SEAL BOOT OR EQUAL

INLET AND OUTLET BAFFLE AND FILTER:
WISCONSIN, SEE DETAIL #10
(OTHER STATES SEE CHART)

LIQUID CAPACITY: 194.63 GAL/IN

HOLDING TANK:
OUTLET HOLE PLUGGED
ACTUAL CAPACITY: 26,178 GALLONS

LOADING DESIGN: 8'-0" UNSATURATED SOIL

TANK CAN BE USED AS:
SEPTIC / HOLDING / PUMP OR SIPHON

TANK: MIX DESIGN #9 (SMALL FIBER)

CUSTOMIZED TANKS:
FOR CUSTOM TANKS CONTACT
WIESER CONCRETE

**DRAWINGS SUBMITTED FOR APPROVAL**

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

SCALE: 3/16"=1'-0" | PRE-POUR:
REV. | POST-POUR:
DATE:
DRAWN BY: WCP
DATE: 00/00/00
FILE: W25000

**WIESER CONCRETE**
W3716 US HWY 10 MAIDEN ROCK, WI 54750
800-325-8456

W25000 SEPTIC MANUAL

SHEET NO. 1 OF 1

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| | CHECKED BY: Init | . | . | . | . |

PLOT DATE: 2/24/2023 10:44 PM, G:\21\21752\21752001\CADD\Construction Documents\CS512 PRECAST TANK - WEISER W25000.dwg

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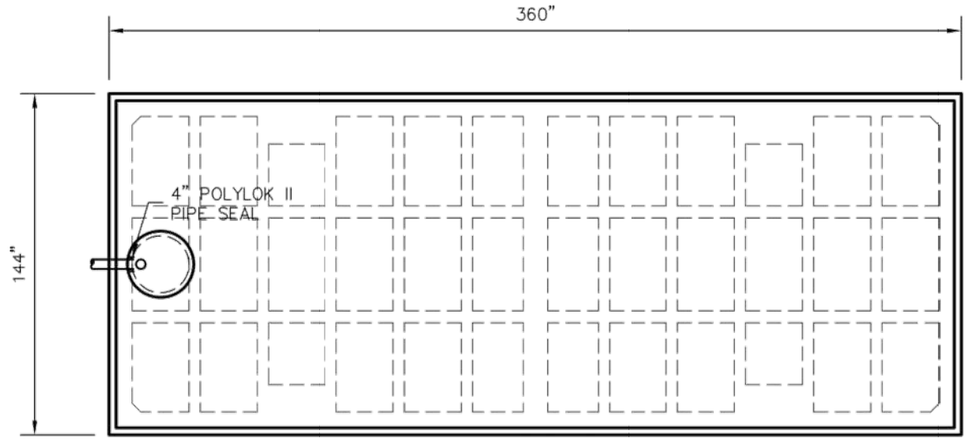
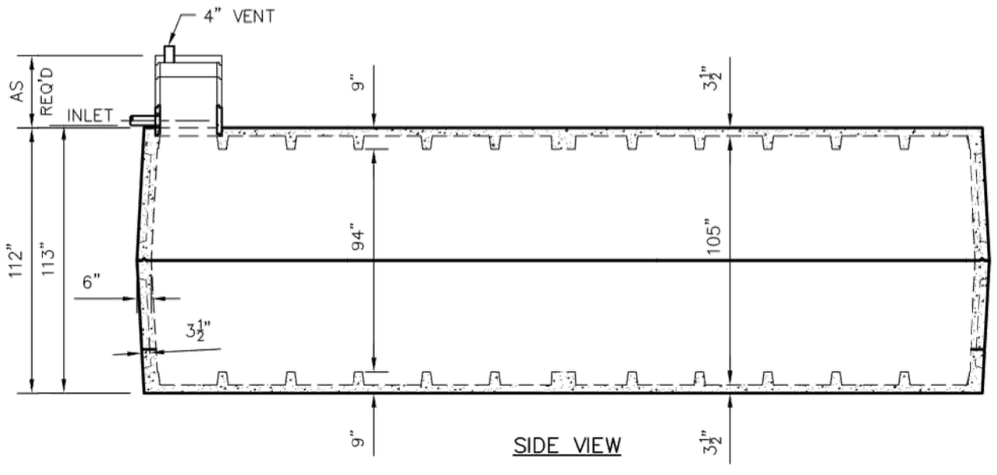
WAUPACA COUNTY, WI

W25000 PRECAST TANK

PROJECT NO. 21752002
SHEET CS512




TOP VIEW




SIDE VIEW

# W20000 HOLDING TANK SPECIFICATIONS

DIMENSIONS:
- WALL: 6" RIBBED
- BOTTOM: 9" RIBBED
- COVER: 9" RIBBED
- MANHOLE: 24" I.D. PRECAST RISER
- HEIGHT: 112" O.D.
- LENGTH: 360" O.D.
- WIDTH: 144" O.D.
- BELOW INLET: 113" O.D.
- LIQUID LEVEL 105"
- WEIGHT: 42,000 LBS PER SECTION

INLET AND OUTLET:
- 4" POLYLOK II PIPE SEAL OR EQUAL

HOLDING TANK:
- NO OUTLET HOLE
- ACTUAL CAPACITY: 20,000 GALLONS

LIQUID CAPACITY: 192.65 GAL/IN

LOADING DESIGN: 8'-0" UNSATURATED SOIL

TANK CAN BE USED AS:
- HOLDING TANK

TANK: MIX DESIGN #9 (SMALL FIBER)

CUSTOMIZED TANKS:
- FOR CUSTOM TANKS CONTACT WIESER CONCRETE

W20000 SEPTIC TANK; SEPTIC TANK HAS ADDITIONAL 24" RING BETWEEN TOP AND BOTTOM

TANKS ARE MANUFACTURED TO MEET OR EXCEED ASTM C-1227 REQUIREMENTS

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

SCALE: 3/16"=1'-0" | PRE-POUR:
REV. | POST-POUR:
DATE:
DRAWN BY: WCP
DATE: 00/00/00
FILE: W20000 HOLDING

WIESER CONCRETE
W3716 US HWY 10 MAIDEN ROCK, WI 54750
800-325-8456

W20000 HOLDING SEPTIC MANUAL

SHEET NO. 1 OF 1

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PLOT DATE: 2/24/2023 10:44 PM, G:\21\21752\217520011\CADD\Construction Documents\CS513 PRECAST TANK - WEISER W20000.dwg

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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

W20000 PRECAST TANK

PROJECT NO. 21752002
SHEET CS513

## SHAFT CONNECTORS FOR PVC-KG DRAINAGE PIPES

**KGF-S/B shaft connector for PVC-KG pipe connection**

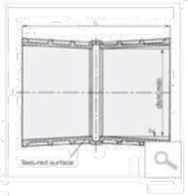
Very good waterproof adhesion to the surrounding concrete due to the profiling and textured surface. Easy introduction of the pipe guaranteed (angle ±3°). High impact resistance and low weight. The seals approved, for KG pipes are used.

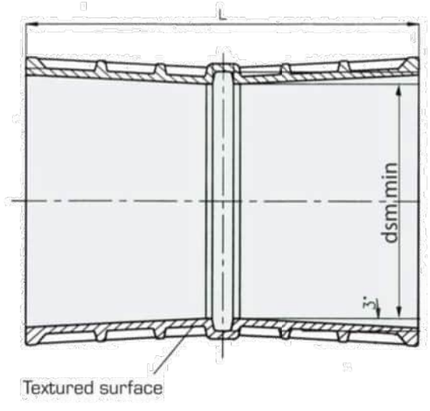
**Suitable for PVC drainage pipes to DIN EN 1401-1.**

Information on the availability of special lengths of KGF-S/B shaft connector is available on request..

**KGF-S/B SHAFT CONNECTOR**

| DN/OD | $dsm_{min}$ | L |
|---|---|---|
| mm | mm | mm |
| 110 | 110,4 | 80 / 110 / 240 |
| 125 | 125,4 | 80 / 110 / 240 |
| 160 | 160,5 | 65 / 80 / 90 / 110 / 240 |
| 200 | 200,6 | 80 / 110 / 240 |
| 250 | 250,8 | 80 / 110 / 240 |
| 315 | 316,0 | 80 / 110 / 240 |
| 400 | 401,2 | 80 / 110 / 240 |
| 500 | 501,5 | 80 / 110 / 240 |



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| | CHECKED BY: Init | . | . | . | . |

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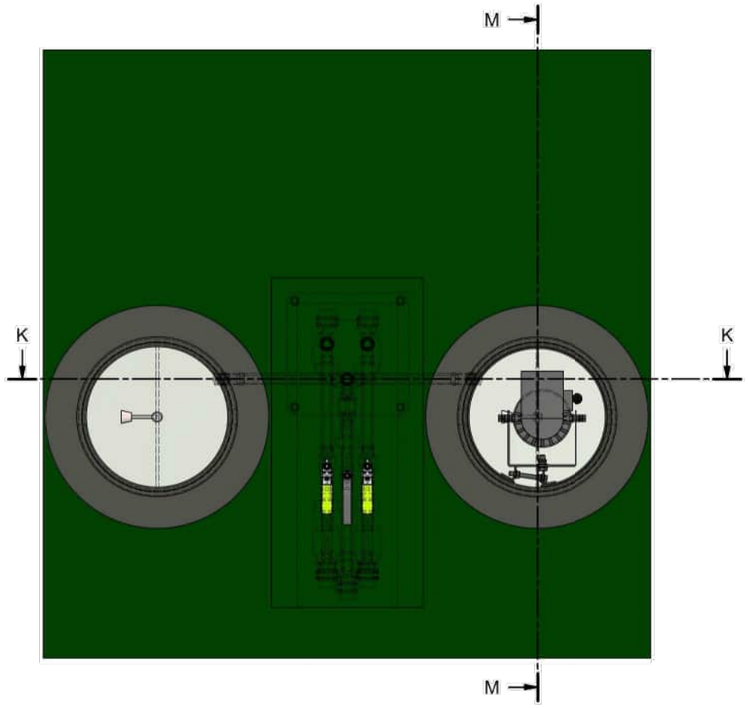
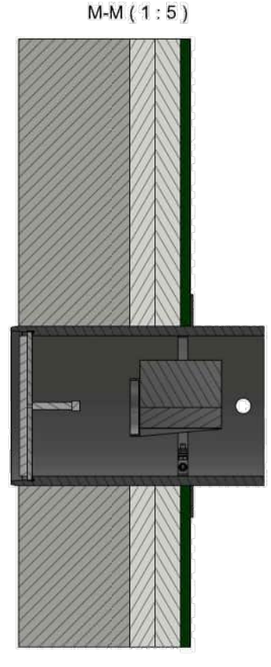
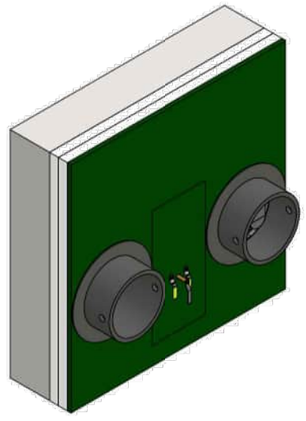
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

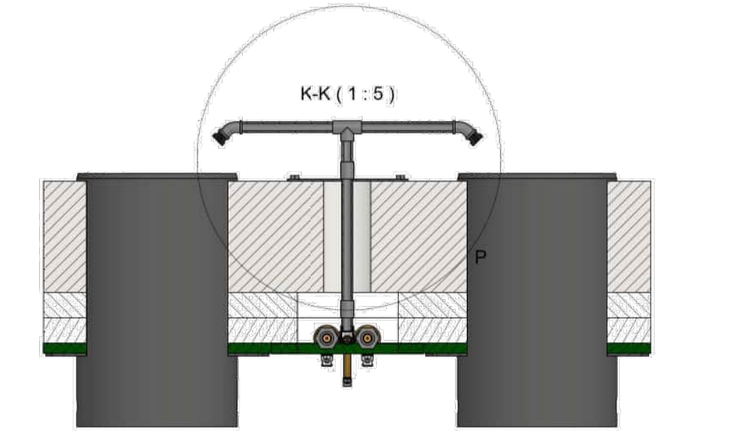
SHAFT CONNECTOR DETAIL

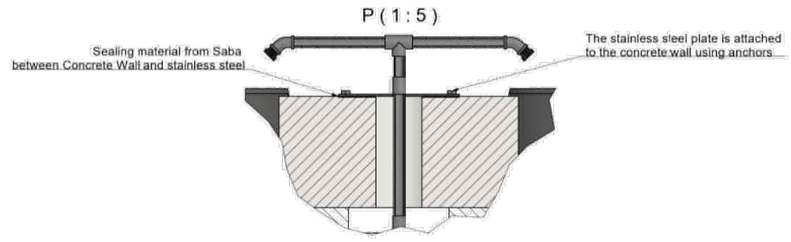
PROJECT NO. 21752002
SHEET CS514

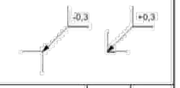





| | | | | | | |
|---|---|---|---|---|---|---|
| | | NO. | DATE | REVISION | | BY |
| PROJECT DATE: . | DRAWN BY: Init | . | . | . | | . |
| | DESIGNED BY: Init | . | . | . | | . |
| | CHECKED BY: Init | . | . | . | | . |

PLOT DATE: 2/24/2023 10:44 PM, G:\21\21752\21752001\CADD\Construction Documents\21752001 - PlanET Details.dwg

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2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

DETAILS - PENETRATION

PROJECT NO. 21752002
SHEET CS515

| No. | Change: | Changed by: | Date: |
|---|---|---|---|
| | | | |

Project:
Principal:

PlanET Biogastechnik GmbH
Schlesierpromenade 1b
D – 48712 Gescher
T: +49 (0) 2542 / 993561
F: +49 (0) 2542 / 909561-88

Norm: DIN EN ISO 13920-BF
Weight: 465,426 kg
Material:

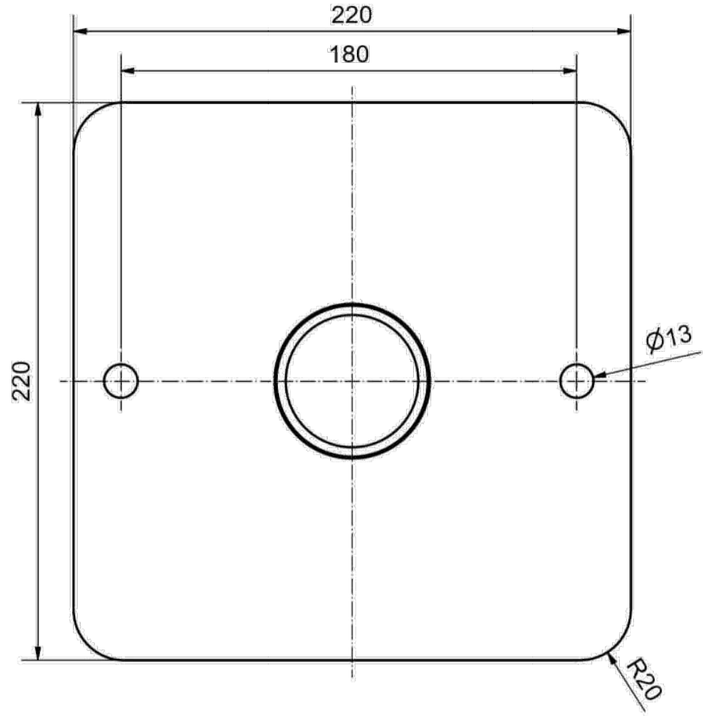
| | Date | Name |
|---|---|---|
| Created | 16.12.2022 | Jens Schepplins-Roers |
| Checked | | |
| Layout | DIN A1 | |
| Scale | 1 : 5 | |

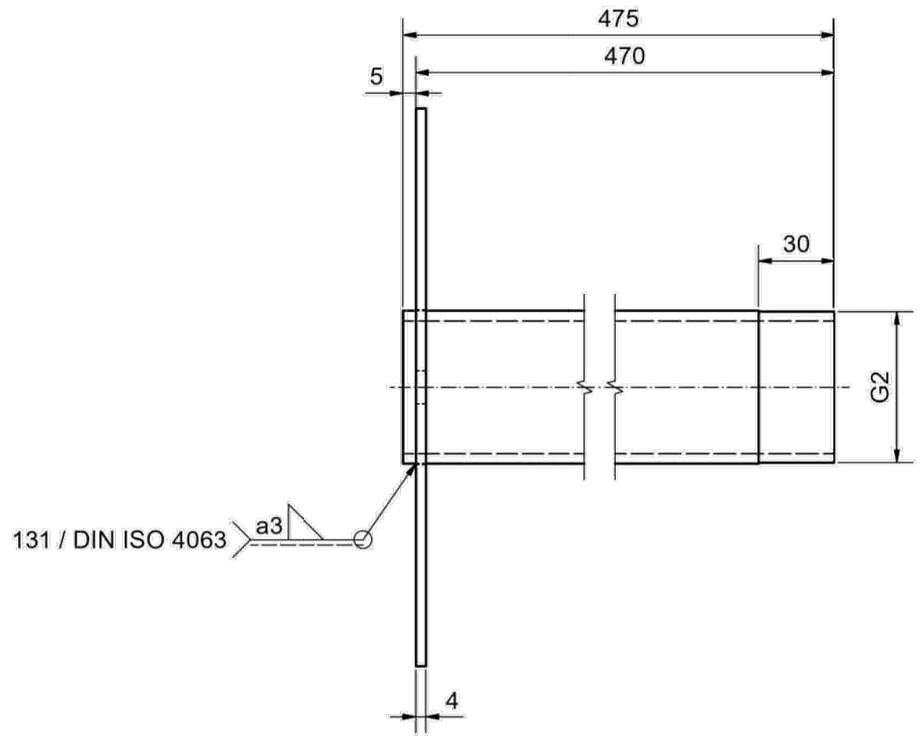
Tank section
Operation and monitoring
Inst. situation desulphurisat.

Behälterschnitte
Bedienung u. Überwachung
Einbausituation Entschwefelung

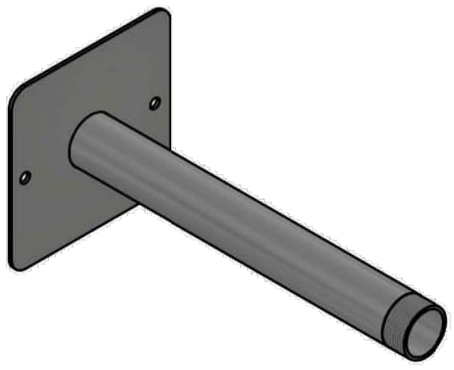


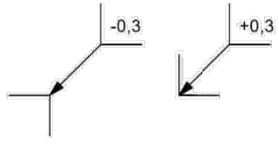
Drawing number: 012066
Part number: C01994
ERP Item number: M10000124
Revision: –
Project number:
Sheet: 1 of 1




ISO ( 1 : 5 )






| Rev. | Änderung | Geändert von | Datum |
|---|---|---|---|
| | | | |

Projekt:

Bauherr:

PlanET Biogastechnik GmbH
Schildarpstraße 75
D – 48712 Gescher
T: +49 (0) 2542 / 869550
F: +49 (0) 2542 / 869568 88

Norm: DIN EN ISO 13920-BF
Gewicht: 4,124 kg
Material:

| | Datum | Name |
|---|---|---|
| Erstellt | 18.10.2022 | Robert Banse |
| Geprüft | | |
| Format | DIN A3 | |
| Maßstab | 1 : 2 | |

Einzelteilzeichnung — Component drawing
Sicherheitseinrichtung — Safety devices
Probeentnahme Durchführung — Sampling Procedure



| Zeichnungsnummer: | Bauteilnummer: | Revision: | Projektnummer: | Blatt: |
|---|---|---|---|---|
| 010338 | 002590 | - | | 1 von 1 |
| | ERP Artikelnummer: 10002118 | | | |

| | | NO. | DATE | REVISION | BY |
|---|---|---|---|---|---|
| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
| | DESIGNED BY: Init | . | . | . | . |
| | CHECKED BY: Init | . | . | . | . |

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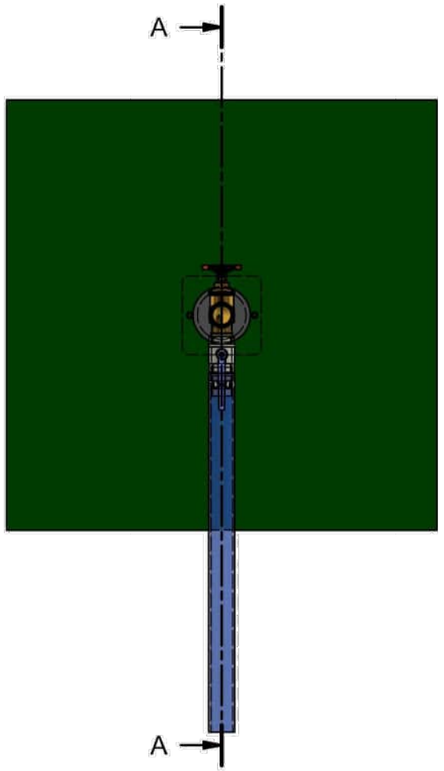
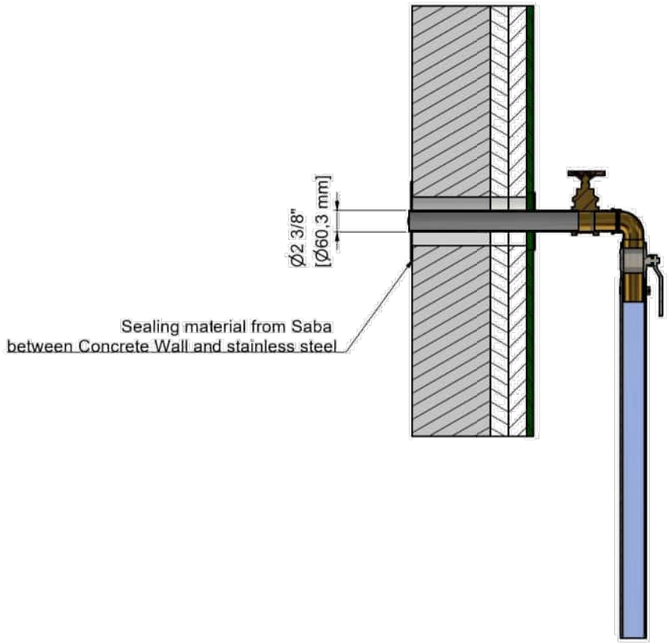
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

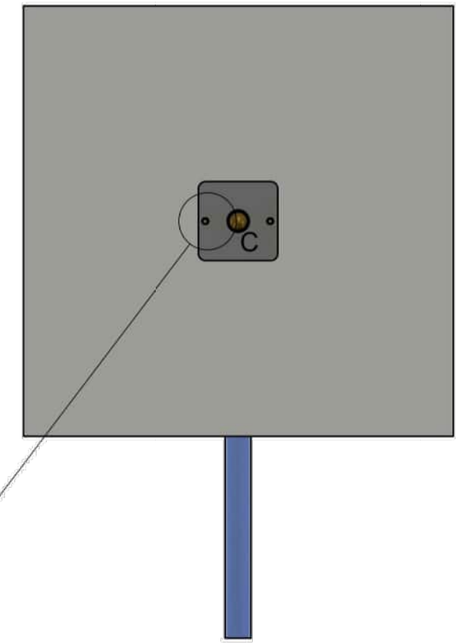
DETAILS - PENETRATION

PROJECT NO. 21752002
SHEET CS515

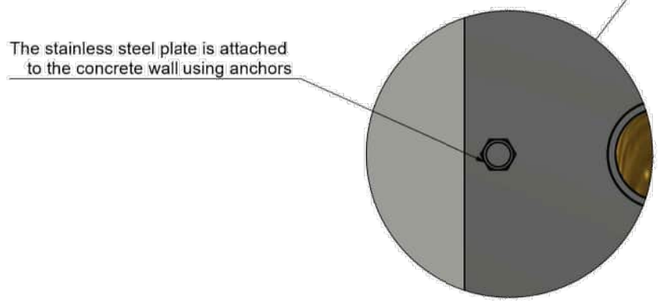


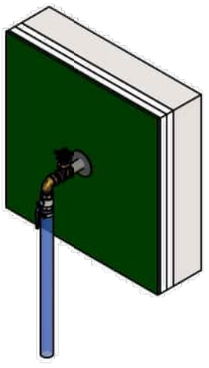

A-A ( 1 : 10 )

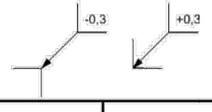



C ( 1 : 2 )






| | | | |
|---|---|---|---|
| A | Pos. 5 replaced | Walter Munio | 14.02.2022 |
| Rev. | Änderung | Geändert von | Datum |

Projekt:

Bauherr:

PlanET Biogastechnik GmbH
Schilderpstraße 75
D - 48712 Gescher
T: +49 (0) 2542 / 869560
F: +49 (0) 2542 / 869568 88

Norm: DIN EN ISO 13920-BF
Gewicht: 495,804 kg
Material:

| | Datum | Name |
|---|---|---|
| Erstellt: | 09.02.2022 | Walter Munio |
| Geprüft: | | |
| Format: | DIN A2 | |
| Maßstab: | 1 : 20 | |

Baugruppenzeichnung
Probeentnahme
Einbausituation Probeentnahme



Zeichnungsnummer: 005682
Bauteilnummer: 005832
ERP Artikelnummer:
Revision: B
Projektnummer:
Blatt: 1 von 1

| | | NO. | DATE | REVISION | BY |
|---|---|---|---|---|---|
| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
| | DESIGNED BY: Init | . | . | . | . |
| | CHECKED BY: Init | . | . | . | . |

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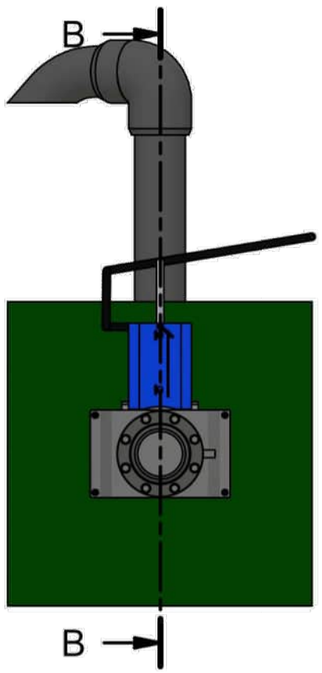
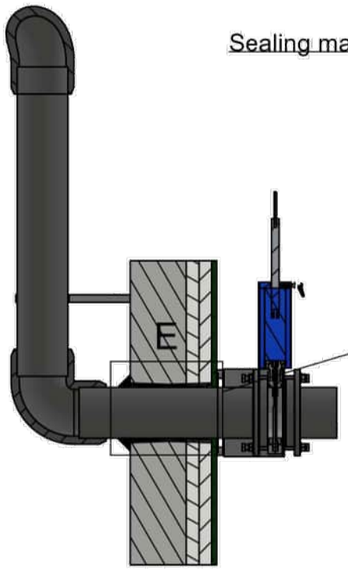
2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

DETAILS - PENETRATION

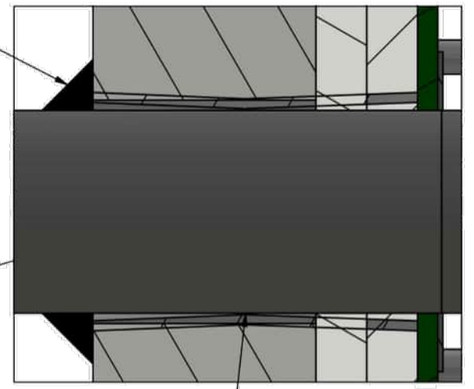
PROJECT NO. 21752002
SHEET CS516




B-B ( 1 : 20 )




E ( 1 : 5 )




shaft lining with sealing lip cast into the concrete wall

-0,3

+0,3

| Rev. | Change | Changed by | Date |
|---|---|---|---|
| | | | |

Project:

Principal:

PlanET Biogastechnik GmbH
Schildarpstraße 75
D - 48712 Gescher
T: +49 (0) 2542 / 869560
F: +49 (0) 2542 / 869568 88

Norm: DIN EN ISO 13920-BF
Weight: 584,471 kg
Material:

| | Date | Name |
|---|---|---|
| Created | 16.12.2022 | CIDEON Admin |
| Checked | | |
| Layout | DIN A3 | |
| Scale | 1 : 20 | |

Tank section
Substrate filling connection
Filling line1 DA200 6-8m

Behälterschnitte
Substratbefüllanschluss
Befüllle tung1 DA200 6-8m



Drawing number: 012076
Part number: 011903
ERP Item number:
Revision: -
Project number:
Sheet: 1 of 1

| | | NO. | DATE | REVISION | BY |
|---|---|---|---|---|---|
| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
| | DESIGNED BY: Init | . | . | . | . |
| | CHECKED BY: Init | . | . | . | . |

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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

DETAILS - PENETRATION

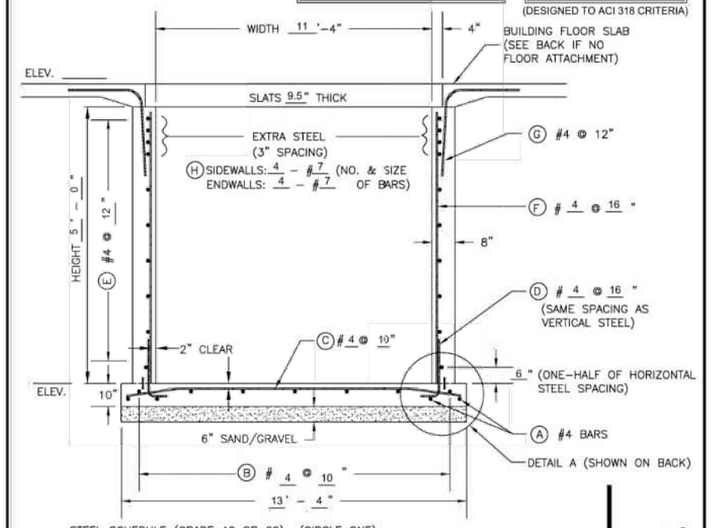
PROJECT NO. 21752002
SHEET CS517

NOT TO SCALE

NOTE: SHORE THE WALLS ON THE INSIDE, AT THE TOP, UNTIL THE SLATS AND BUILDING FLOOR ARE IN PLACE.

LID DESIGN LOADING (CIRCLE ONE)
I LIVESTOCK
II SKID-STEER LOADER
III TRACTOR

CONDITIONS OF USE
CONCRETE 4000 psi
BACKFILL TO TOP
SURCHARGE ( Y or N )
SOIL EFP = 60
(DESIGNED TO ACI 318 CRITERIA)



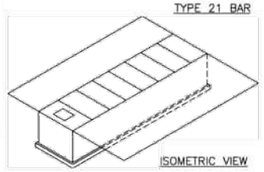

STEEL SCHEDULE (GRADE 40 OR 60) (CIRCLE ONE)

| MARK | SIZE | TYPE | R | S | LENGTH |
|---|---|---|---|---|---|
| A | 4 | STR | -- | -- | |
| B | 4 | STR | -- | -- | |
| C | 4 | STR | -- | -- | |
| D | 4 | 21 | 22 | 8 | |
| E | 4 | STR | -- | -- | |
| F | 4 | STR | -- | -- | |
| G | 4 | 21 | 2'-0" | 2'-0" | 4'-0" |
| H | 7 | STR | -- | -- | |

NOTE: VERTICAL WALL STEEL AND ENDS OF REINFORCEMENT REQUIRE 2" CLEAR COVER.
SEE WI-745 FOR CORNER STEEL DETAIL.



TYPE 21 BAR


ISOMETRIC VIEW

WI-743A PAGE 1 OF 2

USDA United States Department of Agriculture
Natural Resources Conservation Service

SLATS ACROSS TOP OF TANK
IN INTERIOR OF BUILDING
6 - 8 FOOT WALLS
CLIENT: Brooks Farms
COUNTY: Waupaca

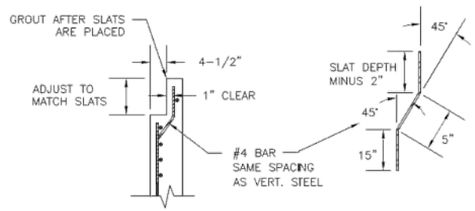
| | Date | File Name |
|---|---|---|
| Designed | MSA | WI-743A |
| Drawn | | Date 03/2019 |
| Checked | | |
| Approved | | Sheet of |

NOT TO SCALE

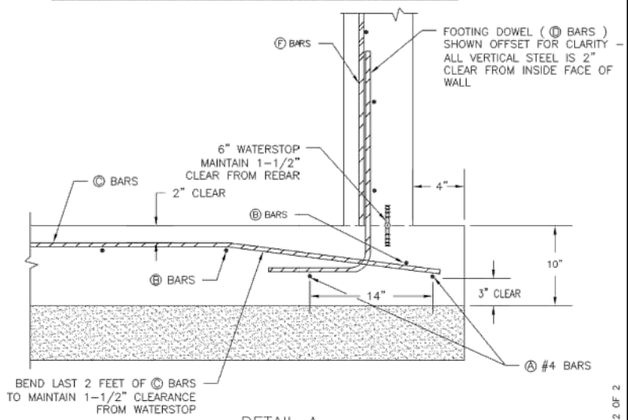
STEEL DETAILS

| BAR SIZE | BEND DIAMETER (D) INCHES | SPLICE LENGTH INCHES (MIN.) |
|---|---|---|
| #3 | 2-1/4 | 12 |
| #4 - HORIZ. WALL | 3 | 19 |
| #4 - ALL OTHER | 3 | 15 |
| #5 - HORIZ. WALL | 3-3/4 | 24 |
| #5 - ALL OTHER | 3-3/4 | 19 |
| #6 - HORIZ. WALL | 4-1/2 | 29 |
| #6 - ALL OTHER | 4-1/2 | 22 |
| #7 - HORIZ. WALL | 5-1/4 | 42 |
| #8 - HORIZ WALL | 6 | 48 |

NOTE: HORIZONTAL STEEL IN WALLS REQUIRES A LONGER SPLICE THAN HORIZONTAL STEEL WITH 12" OR LESS OF FRESH CONCRETE CAST BELOW THE SPLICE.




CONFIGURATION OF WALL IF THERE IS NO BUILDING FLOOR ATTACHED

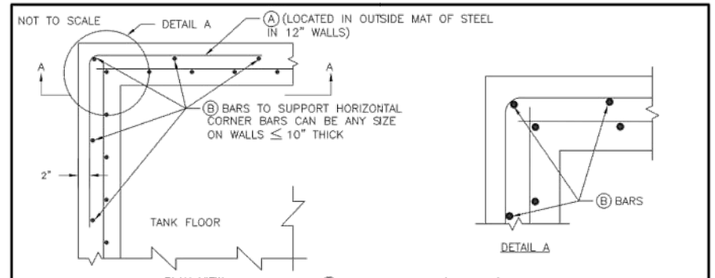


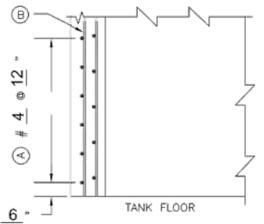

DETAIL A

THIS STANDARDIZED DESIGN MUST BE ADAPTED TO THE SPECIFIC SITE.
THIS DRAWING WAS PREPARED AT THE NRCS STATE OFFICE,
8030 EXCELSIOR DRIVE, SUITE 200 MADISON, WI 53717-2906

WI-743A PAGE 2 OF 2

NOT TO SCALE




STEEL SCHEDULE (GRADE 40 OR 60) (CIRCLE ONE)

| MARK | SIZE | QUANTITY | TYPE | LENGTH | R* | S* | TOTAL LENGTH |
|---|---|---|---|---|---|---|---|
| A | | | 21 | | | | |
| B | | | STR | | -- | -- | |

* R AND S ARE THE SAME LENGTH

S = 6' FOR 12' WALLS
S = 5' FOR 10' WALLS
S = 4' FOR ≤ 8' WALLS

ONE DIMENSION OF (A) BARS CAN BE SHORTENED ON ENDWALL TO MEET THE REQUIRED SPLICE LENGTH.

STEEL DETAILS

| BAR SIZE | BEND DIAMETER (D) INCHES | SPLICE LENGTH INCHES (MIN.) |
|---|---|---|
| #4 - HORIZ. WALL | 3 | 19 |
| #5 - HORIZ. WALL | 3-3/4 | 24 |
| #6 - HORIZ. WALL | 4-1/2 | 29 |

TYPE 21 BAR

(DESIGNED TO ACI 318 CRITERIA)

USDA United States Department of Agriculture
Natural Resources Conservation Service

CORNER STEEL DETAILS
6 - 12 FOOT TANK WALLS
CLIENT: Brooks Farms
COUNTY: Waupaca

| | Date | File Name |
|---|---|---|
| Designed | MSA | WI-745 |
| Drawn | | Date 03/2019 |
| Checked | | |
| Approved | | Sheet of |

| | | NO. | DATE | REVISION | BY |
|---|---|---|---|---|---|
| PROJECT DATE: . | DRAWN BY: Init | . | . | . | . |
| | DESIGNED BY: Init | . | . | . | . |
| | CHECKED BY: Init | . | . | . | . |

PLOT DATE: 2/24/2023 10:44 PM, G:\21\21752\21752001\CADD\Construction Documents\CS518 FLUSH TANK - WALL DETAIL.dwg

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2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

FLUSH TANK - WALL DETAIL

PROJECT NO. 21752002
SHEET CS519

5. HORIZONTAL REINFORCEMENT FOR WALL CORNERS ( Ⓐ BARS ON DRAWING WI-745 )
(DESIGNED TO ACI 318 CRITERIA)

| WALL HEIGHT \ THICKNESS | NO SURCHARGE | | | | | |
|---|---|---|---|---|---|---|
| | GRADE 40 | | | GRADE 60 | | |
| | 8" | 10" | 12" | 8" | 10" | 12" |
| 7' | #4 @ 12" | NA | NA | #4 @ 18" | NA | NA |
| 8' | #4 @ 10" | #4 @ 14" | TS | #4 @ 16" | #4 @ 18" | TS |
| 10' | #5 @ 8" | #5 @ 10" | TS | #5 @ 12" | #4 @ 10" | TS |
| 12' | #6 @ 6" | #5 @ 6" | #5 @ 8" | #5 @ 6" | #5 @ 10" | #5 @ 12" |

| WALL HEIGHT \ THICKNESS | WITH SURCHARGE | | | | | |
|---|---|---|---|---|---|---|
| | GRADE 40 | | | GRADE 60 | | |
| | 8" | 10" | 12" | 8" | 10" | 12" |
| 7' | #4 @ 10" | NA | NA | #4 @ 12" | NA | NA |
| 8' | #4 @ 6" | #4 @ 10" | TS | #4 @ 10" | #4 @ 15" | TS |
| 10' | #5 @ 6" | #5 @ 8" | #5 @ 10" | #4 @ 6" | #4 @ 8" | #4 @ 10" |
| 12' | NA | NA | #5 @ 6" | NA | NA | #5 @ 9" |

TS – NO ADDITIONAL STEEL NEEDED
NA – NOT APPLICABLE COMBINATION OF THICKNESS AND HEIGHT

6. TYPICAL PRECAST LID THICKNESSES

SLATS FOR LIVESTOCK – 6"
SLATS FOR EQUIPMENT – 9 1/2"
DRIVE THROUGH PANEL – 9 1/2"

*ANY PRECAST COMPONENTS SHALL BE DESIGNED FOR THE MAXIMUM LOADING CONDITIONS ANTICIPATED.

7. TANK BOTTOM SLAB REINFORCEMENT (DESIGNED TO ACI 318 CRITERIA)

TANK BOTTOM SLAB SHALL HAVE REINFORCEMENT EQUAL TO OR GREATER THAN THE FOLLOWING:

| REINFORCING STEEL FOR SLABS IN THE "LONG" DIRECTION | | | |
|---|---|---|---|
| SLAB THICKNESS (INCHES) | REBAR SIZE (GR 60) AND SPACING SLAB LENGTH* | | |
| | <100' | <150' | <175' |
| 10 | #4 @ 10" | #4 @ 7" | #4 @ 6" |
| | #5 @ 16" | #5 @ 11" | #5 @ 9" |
| 12 | #4 @ 8" | #4 @ 5" | #4 @ 5" |
| | #5 @ 13" | #5 @ 9" | #5 @ 7.5" |

*SLAB LENGTH OR DISTANCE BETWEEN WATERSTOP JOINTS IN SLAB.

| REINFORCING STEEL FOR TANK SLABS IN THE "SHORT" DIRECTION (TANKS 12' OR LESS IN WIDTH) | |
|---|---|
| SLAB THICKNESS (INCHES) | REBAR SIZE (GR 60) AND SPACING |
| 10 | #4 @ 10" |
| | #5 @ 16" |
| 12 | #4 @ 8" |
| | #5 @ 13" |

USDA United States Department of Agriculture
Natural Resources Conservation Service

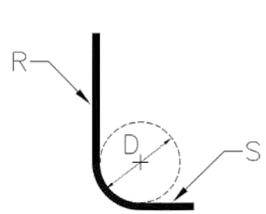
RECEPTION TANK DESIGN
CLIENT: Brooks Farms
COUNTY: Waupaca

Designed MSA Date
Drawn
Checked
Approved

File Name: WI-741C
Date: 03/2019
Sheet of

8. FOOTING/WALL HOOK BARS
(DESIGNED TO ACI 318 CRITERIA)

| WALL HEIGHT (FEET) | WALL THICKNESS (INCHES) | LOADING | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NO TRACTOR ADJACENT | | | | | | TRACTOR ADJACENT | | | | | |
| | | GRADE 40 | | | GRADE 60 | | | GRADE 40 | | | GRADE 60 | | |
| | | HOOK BAR SIZE | R (in) | S (in) | HOOK BAR SIZE | R (in) | S (in) | HOOK BAR SIZE | R (in) | S (in) | HOOK BAR SIZE | R (in) | S (in) |
| 7 OR LESS | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 8 | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 8 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 4 | 21 | 8 | 4 | 24 | 8 |
| 10 | 8 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 24 | 8 |
| 10 | 10 | 4 | 19 | 8 | 4 | 22 | 8 | 4 | 19 | 8 | 4 | 22 | 8 |
| 10 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 4 | 21 | 8 | 4 | 24 | 8 |
| 12 | 12 | 4 | 21 | 8 | 4 | 24 | 8 | 5 | 22 | 10 | 5 | 28 | 10 |




TYPE 21 BAR

USDA United States Department of Agriculture
Natural Resources Conservation Service

RECEPTION TANK DESIGN
CLIENT: Brooks Farms
COUNTY: Waupaca

Designed MSA Date
Drawn
Checked
Approved

File Name: WI-741D
Date: 03/2019
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2022 EQIP WASTE STORAGE FACILITY
BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

FLUSH TANK DETAILS

PROJECT NO. 21752002
SHEET CS520

## RECEPTION TANK DESIGN
(DESIGNED TO ACI 318 CRITERIA)

1. VERTICAL WALL STEEL

| WALL HEIGHT | WALL THICKNESS | LOADING | | | |
|---|---|---|---|---|---|
| | | NO TRACTOR ADJACENT | | TRACTOR ADJACENT | |
| | | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 7 FT. or less | 8" | #4 @ 12" | #4 @ 18" | #4 @ 10" | #4 @ 16" |
| 8 FT. | 8" | #4 @ 12" | #4 @ 18" | #4 @ 7" | #5 @ 18" |
| 8 FT. | 12" | #4 @ 18" | #4 @ 18" | #4 @ 12" | #4 @ 18" |
| 10 FT. | 8" | #5 @ 9" | #5 @ 12" | #6 @ 9" | #6 @ 12" |
| 10 FT. | 10" | #5 @ 12" | #4 @ 12" | #5 @ 9" | #5 @ 12" |
| 10 FT. | 12" | #4 @ 9" | #4 @ 15" | #4 @ 7" | #4 @ 10" |
| 12 FT. | 12" | #5 @ 9" | #5 @ 12" | #6 @ 9" | #6 @ 15" |

2. HORIZONTAL WALL STEEL
(DESIGNED TO ACI 318 CRITERIA)

| WALL THICKNESS | GRADE 40 | GRADE 60 |
|---|---|---|
| 8" | #4 @ 10" | #4 @ 12" |
| 10" | #4 @ 8" | #4 @ 10" |
| 12" (steel for each face) | #4 @ 12" | #4 @ 16" |

3. LID STEEL (8" THICK POURED IN PLACE LID)
(DESIGNED TO ACI 318 CRITERIA)
LOADING – 1. LIVESTOCK (125 psf)
2. SKID-STEER LOADER (150 psf)
3. TRACTOR (2-5000LB. LOADS – 4FT. O.C.)

| WIDTH | LOADING (GRADE 40) | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 6 FT. | #4 @ 12" | #4 @ 10" | #4 @ 4" or #5 @ 6" |
| 8 FT. | #4 @ 12" | #4 @ 11" | #5 @ 4" or #6 @ 6" |
| 10 FT. | #4 @ 7" | #4 @ 7" | #6 @ 4" or #7 @ 5" |
| 12 FT. | #6 @ 11" | #6 @ 10" | #7 @ 4" or #8 @ 4" |

| WIDTH | LOADING (GRADE 60) | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 6 FT. | #4 @ 12" | #4 @ 12" | #3 @ 4" or #4 @ 6" |
| 8 FT. | #4 @ 12" | #4 @ 12" | #4 @ 4" or #5 @ 6" |
| 10 FT. | #4 @ 11" | #4 @ 10" | #5 @ 4" or #6 @ 6" |
| 12 FT. | #5 @ 12" | #5 @ 11" | #5 @ 3" or #6 @ 4" |

USDA United States Department of Agriculture
Natural Resources Conservation Service

RECEPTION TANK DESIGN
CLIENT: Brooks Farms
COUNTY: Waupaca

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Date: 03/2019
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4. EXTRA STEEL (GRADE 40) (GRADE 60)
LOCATED IN TOP OF WALL FOR SLAT OR BEAM & SLAT TANK
(DESIGNED TO ACI 318 CRITERIA)

| WALL THICKNESS | WALL HEIGHT – 8 FT. SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 3 – #6 | 3 – #5 | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #7 |
| | 4 – #5 | 2 – #6 | 4 – #6 | 3 – #6 | | |
| 10" | 3 – #5 | 3 – #4 | 3 – #6 | 4 – #4 | 3 – #7 | 4 – #5 |
| | 4 – #4 | 2 – #5 | 4 – #5 | 3 – #5 | 4 – #6 | 3 – #6 |
| 12" | 3 – #4 | 2 – #4 | 3 – #5 | 2 – #5 | 3 – #6 | 2 – #6 |

| WALL THICKNESS | WALL HEIGHT – 10 FT. SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 4 – #6 | 4 – #5 | 4 – #8 | 4 – #6 | THICKEN WALL | THICKEN WALL |
| | | 3 – #6 | | | | |
| 10" | 3 – #6 | 3 – #5 | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #6 |
| | 4 – #5 | 2 – #6 | 4 – #6 | 3 – #6 | | |
| 12" | 2 – #6 | 2 – #5 | 2 – #8 | 2 – #6 | 3 – #8 | 3 – #6 |
| | 3 – #5 | | 3 – #6 | | 4 – #7 | |

| WALL THICKNESS | WALL HEIGHT – 12 FT. SPAN ALONG TOP OF WALL | | | | | |
|---|---|---|---|---|---|---|
| | 8 FT. | | 10 FT. | | 12 FT. | |
| | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 | GRADE 40 | GRADE 60 |
| 8" | 4 – #7 | 4 – #6 | THICKEN WALL | THICKEN WALL | THICKEN WALL | THICKEN WALL |
| | | | | | | |
| 10" | 3 – #7 | 4 – #5 | 4 – #8 | 4 – #6 | THICKEN WALL | THICKEN WALL |
| | 4 – #6 | 3 – #6 | | | | |
| 12" | 2 – #7 | 2 – #6 | 3 – #8 | 3 – #6 | 4 – #8 | 4 – #7 |
| | 3 – #6 | | | | | |

CONSTRUCTION NOTES FOR SLAT AND BEAM & SLAT TANKS:

1. EXTRA STEEL IS ALWAYS REQUIRED AT ENDWALLS.
2. EXTRA STEEL IS ALWAYS REQUIRED ON SIDEWALLS WHEN THERE IS NO BUILDING FLOOR SLAB ATTACHED TO THE TOP OF THE WALL.
3. "SPAN ALONG TOP OF WALL" SHOWN ABOVE REFERS TO THE BEAM SPACING ALONG THE SIDEWALLS; AND THE TANK WIDTH FOR THE ENDWALLS.
4. FOR A SLAT TANK WITH NO BEAMS, USE THE 12 FT "SPAN ALONG TOP OF WALL" COLUMN ABOVE AND ADD A STATEMENT IN THE O&M PLAN: "NEVER REMOVE MORE THAN 3 ADJACENT SLATS AT ONE TIME FOR ANY REASON."

USDA United States Department of Agriculture
Natural Resources Conservation Service

RECEPTION TANK DESIGN
CLIENT: Brooks Farms
COUNTY: Waupaca

Designed MSA Date
Drawn
Checked
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File Name: WI-741B
Date: 03/2019
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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

FLUSH TANK DETAILS

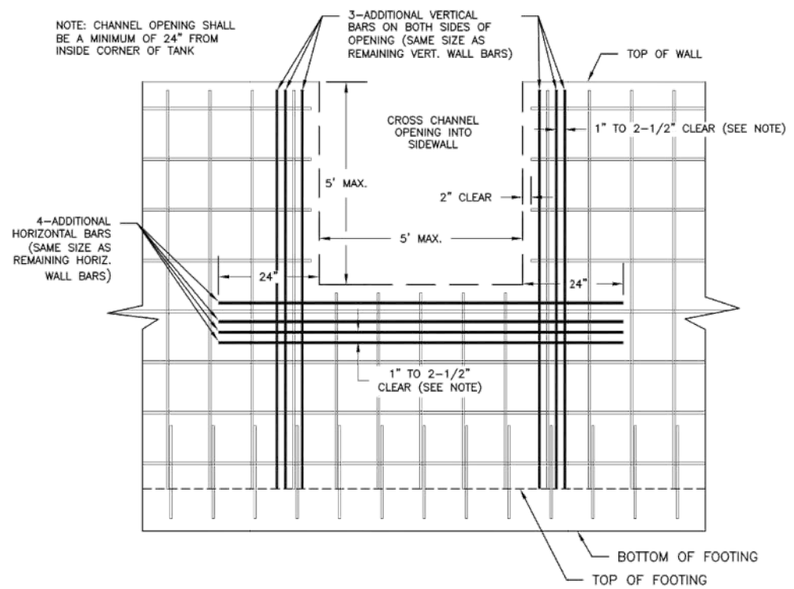
PROJECT NO. 21752002
SHEET CS521

# CROSS CHANNEL PENETRATION DETAIL

## MAXIMUM OPENING SIZE OF 5' x 5'

CONSTRUCTION NOTES:

1. THIS DETAIL IS DESIGNED FOR THE OPENING TO BE CAST IN THE WALL AT THE TIME OF CONSTRUCTION. THIS DETAIL SHALL BE USED FOR ALL CROSS CHANNEL OPENINGS IN WALLS, INCLUDING CANTILEVERED TEE WALLS AND TANK WALLS (WALLS SUPPORTED AT BOTH THE TOP AND THE BOTTOM).
2. PROVIDE 2" CLEAR FROM THE END OF ALL CUT BARS AND OPENING.
3. REBAR CLEARANCE: MINIMUM 2" CLEAR FROM OPENING AND 1" TO 2-½" CLEAR BETWEEN BARS.
4. ADDITIONAL BARS SHALL BE IN SAME PLANE AS REMAINING WALL STEEL. IF WALL HAS 2 CURTAINS OF STEEL, EXTRA STEEL APPLIES TO BOTH CURTAINS.
5. IF THE CROSS-CHANNEL IS OF PRECAST CONCRETE, CONSULT PRECAST SUPPLIER FOR REQUIRED DIMENSIONS OF OPENING.
6. CHANNEL OPENING SHALL NOT BE LOCATED WITHIN 24" OF TANK CORNER.
7. WALL TO CHANNEL JOINT (BOTH CAST-IN-PLACE AND PRECAST CHANNELS) – DO NOT STRUCTURALLY TIE CHANNEL TO CANTILEVERED TEE WALL. TANKS WHICH ARE DESIGNED TO BE SUPPORTED AT BOTH TOP AND BOTTOM (such as the 740 series drawings), MAY HAVE THE CHANNEL STRUCTURALLY TIED TO THE WALL. PROVIDE AN EXPANSIVE WATERSTOP AROUND THE OPENING AT THE CENTER OF THE WALL PRIOR TO PLACING CHANNEL. AFTER THE CHANNEL IS INSTALLED, PROVIDE ELASTOMERIC SEALANT ON THE INSIDE OF THE TANK WHERE THE CHANNEL MEETS THE WALL. ELASTOMERIC SEALANT SHALL MEET ASTM C920 TYPE M OR S, GRADE NS, CLASS 25 OR 50, WITH AN "M" USE DESIGNATION.
8. PRE-CAST CHANNEL – PRECAST CHANNEL REQUIRES A LAYER OF LOW PERMEABILITY SOILS AROUND BOTH THE SIDES AND BOTTOM IN ACCORDANCE WITH THE MANUFACTURER'S PRE-APPROVED SUBMITTAL (REFER TO AWMFH CHAPTER 10 WISCONSIN SUPPLEMENTS).

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| USDA United States Department of Agriculture<br>Natural Resources Conservation Service | CROSS CHANNEL WALL PENETRATION DETAIL<br>CLIENT: _____<br>COUNTY: _____ | Date<br>Designed _____<br>Drawn _____<br>Checked _____<br>Approved _____ | Drawing Name<br>WI-589<br>Date<br>05/2017<br>Sheet of |

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BROOKS FARMS DAIRY, LLC
WAUPACA COUNTY, WI

FLUSH TANK DETAILS

PROJECT NO. 21752002
SHEET CS522

## GENERAL REINFORCING/CONCRETE NOTES

1. ALL LAPS SHALL BE CLASS-'B' PER ACI 318, UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS, AND THE DETAILER TAKES SPECIAL CARE TO PROVIDE STAGGERED LAPS. USE TOP BAR LAP LENGTHS FOR ALL HORIZONTAL BARS AND FOR BARS IN SLABS WITH MORE THAN 12" OF CONCRETE BELOW. SEE DETAIL 6/S303 FOR REINFORCING SPLICE.
2. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON PLACING DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.
3. BAR PLACEMENT TOLERANCES SHALL BE AS SPECIFIED IN THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) MANUAL OF STANDARD PRACTICE, CURRENT EDITION.
4. ALL REINFORCING BARS DIMENSIONS ARE FROM OUT-TO-OUT BAR. ALL BEND ANGLES ARE AT 45 DEGREES AND 90 DEGREES, UNLESS NOTED OTHERWISE.
5. ALL JOINTS IN LIQUID RETAINING STRUCTURES SHALL CONTAIN WATERSTOPS AT SLAB/WALL JOINT AND AT ALL CONSTRUCTION AND CONTRACTION JOINTS. SEE DETAILS 1, 2, & 4/S303
6. THE READY MIX CONCRETE SUPPLIER SHALL PROVIDE A MIX DESIGN THAT MINIMIZES SHRINKAGE. THIS MIX DESIGN SHALL MINIMIZE THE AMOUNT OF WATER TO 0.45 W/C RATIO, MINIMIZE CONCRETE PASTE, AND USE AGGREGATES OF APPROPRIATE TYPE, SIZE AND GRADATION PER ACI 360 FOR SLABS-ON-GRADE AND ACI 318 FOR WALLS & FOOTINGS.
7. WHEN APPLICABLE, GROUT USED TO SEAL AROUND PIPE PENETRATION SHALL BE NON-SHRINK, NON-METALLIC GROUT WITH A COMPRESSIVE STRENGTH EQUAL TO OR GREATER THAN THE COMPRESSIVE STRENGTH OF THE SURROUNDING CONCRETE MEMBER.
8. ALL CONCRETE SUBJECT TO EXTERIOR EXPOSURE SHALL BE AIR ENTRAINED, TOTAL AIR CONTENT OF 6% +/- 1%.
9. UNLESS THE MIX DESIGN INCLUDES THE USE OF SUPERPLASTICIZERS, CONCRETE WITH A SLUMP GREATER THAN 5" SHALL BE REFUSED. CONCRETE WITH APPROVED SUPERPLASTICIZERS SHALL NOT HAVE A SLUMP OF GREATER THAN 8".
10. CALCIUM CHLORIDE AND/OR ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED.
11. SOME FINE LINE RANDOM SHRINKAGE CRACKING MAY DEVELOP. HOWEVER PER NRCS 313, ACI 318 & PCA, WITH THE USE OF STEEL AS SHOWN THESE CRACKS ARE EXPECTED TO PERFORM AT A WATERTIGHT LEVEL. LARGER WALL AND FLOOR CRACKS DUE TO IMPROPER CURING METHODS, WEATHER PROTECTION, SUBSTITUTION, DELETION OR MISPLACEMENT OF REINFORCEMENT OR IMPROPER MIX DESIGN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
12. PROVIDE ADDITIONAL DIAGONAL REINFORCING AROUND ALL OPENINGS AND PENETRATIONS THROUGH WALLS AND SLABS - SEE DETAIL 5/S303

## GENERAL STRUCTURAL/FOUNDATION NOTES

1. CONTRACTOR TO COORDINATE STRUCTURAL AND CIVIL PLANS FOR DETAILS, DIMENSIONS, ELEVATIONS, OPENINGS, ETC. NOTIFY ENGINEER OF ANY VARIANCE BEFORE COMMENCING CONSTRUCTION.
2. IN NO CASE SHALL STRUCTURAL ALTERATIONS OR WORK AFFECTING STRUCTURAL MEMBERS BE MADE, UNLESS APPROVED BY ENGINEER.
3. SIMILAR PORTIONS OF THE STRUCTURE SHALL HAVE SIMILAR DETAILING, UNLESS NOTED OTHERWISE.
4. ALL WALL FORM TIES SHALL BE KNOCKED OFF FLUSH w/ THE FACE OF THE WALL AT INTERIOR AND EXTERIOR FACE OF WALLS. AT TIES BELOW THE FINISHED FLOOR AND/OR FINISHED GRADE PROVIDE A LAYER OF DAMPPROOFING PRODUCT OVER THE REMOVED TIE AREA, TYP.
5. ALL FOOTINGS SHALL BEAR ON COMPACTED SOIL HAVING A MINIMUM BEARING CAPACITY EQUAL TO THE NET ALLOWABLE BEARING CAPACITY PER GEOTECHNICAL REPORT.
6. THE ENGINEER SHALL BE NOTIFIED IF ACTUAL FIELD CONDITIONS DO NOT MEET BEARING REQUIREMENTS, OR IF QUESTIONABLE SOIL CONDITIONS ARE DISCOVERED INCLUDING BUT NOT LIMITED TO PEAT AND OTHER HIGH ORGANIC SOILS OR EXPANSIVE CLAY.
7. DO NOT USE EXCESSIVE COMPACTION EFFORTS ADJACENT TO TANK WALLS. SUCCESSIVE PASSES OF A COMPACTOR CAN RESULT IN WALL PRESSURE BUILD UP BEYOND THE DESIGN INTENT.
8. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ENGINEER BEFORE CONTINUING WITH CONSTRUCTION.
9. REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS AND RECOMMENDATIONS FOR REMOVAL OF UNDESIRABLE SOILS, SITE SOIL, SUBGRADE PREPARATION, EXISTING SOIL INFORMATION, EXPECTED GROUNDWATER CONTROLS, AND BACKFILL RECOMMENDATIONS. STRUCTURAL BACKFILL, EXISTING SOIL BASE AND COMPACTION OF GRANULAR FILL LAYERS SHALL BE MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER.
10. PROVIDE MINIMUM 12" COMPACTED GRANULAR FILL LAYER BELOW ALL FOUNDATIONS, EXTEND 12" BEYOND SLAB. PROVIDE FILL DIRECTLY UNDER STRUCTURES AND WITHIN A 1H:1V ZONE OF INFLUENCE, UP TO, AROUND, AND ABOVE PLANNED FOUNDATION GRADES. SEE GEOTECHNICAL REPORT FOR MORE INFORMATION. ADDITIONAL COMPACTED GRANULAR FILL MAY BE REQUIRED IN AREAS OF UNSUITABLE OR SOFT SOILS BELOW STRUCTURAL FOUNDATIONS OR FOOTINGS.

## DESIGN STRESSES

| | |
|---|---|
| CAST-IN-PLACE CONCRETE | |
| WALLS AND FOOTINGS | f'c = 5000 PSI |
| SLAB-ON-GRADE | f'c = 5000 PSI |
| STEEL | |
| REINFORCING | fy = 60 KSI<br>ASTM A615, GRADE 60 |
| ANCHORS | |
| ANCHOR BOLTS | F1554, GRADE 36 |
| EXPANSION ANCHORS | WEDGE TYPE |
| GEOTECHNICAL INFORMATION | |
| MAX NET ALLOWABLE SOIL BEARING PRESSURE | q = 3000 PSF |
| GEOTECHNICAL REPORT PREPARED BY: | BRAUN INTERTEC CORPORATION |
| DATED: | JUNE 30, 2022 |

## CONCRETE MIX DESIGN

| | |
|---|---|
| 28 DAY COMPRESSIVE STRESS | LISTED ABOVE |
| WATER/CEMENT RATIO | 0.45 |
| AIR CONTENT % (MIN-MAX) | 6 +/- 1 |
| SLUMP, INCHES | 5 |
| AGGREGATE, GRAVEL | 3/4" OR 1 1/2" |

## STEEL REINFORCING

| | |
|---|---|
| MIN CLEAR COVER, UNO | |
| WALLS & SLABS | |
| TOP & SIDES | 2" |
| BOTTOM | 3" |



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**2022 EQIP WASTE STORAGE FACILITY**
**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

**STRUCTURAL GENERAL NOTES & DESIGN STRESSES**

PROJECT NO. 21720000
SHEET S101

CONSTRUCTION INSPECTION PLAN

PRIOR TO ANY SITEWORK, A PRECONSTRUCTION MEETING SHALL BE CONDUCTED BETWEEN THE OWNER, EXCAVATION CONTRACTOR, TANK CONTRACTOR, CONSTRUCTION INSPECTOR/ENGINEER OF RECORD, SITE ENGINEER, AND THE NRCS/COUNTY LAND CONSERVATION DEPARTMENT.

CONCRETE SUPPLIER TO PROVIDE ENGINEER WALL AND FLOOR MIX DESIGNS FOR APPROVAL, CONSISTENT WITH ACI 318 PRIOR TO POURING SLAB.

NRCS WISCONSIN CONSTRUCTION SPECIFICATION #4 - CONCRETE, SHALL BE USED FOR ALL PLACEMENT OF CONCRETE.

NRCS WISCONSIN CONSTRUCTION SPECIFICATION #004 - WS - EMBEDDED OR EXPANSIVE WATERSTOP SHALL BE USED FOR ALL WATERSTOP INSTALLATION.

CONSTRUCTION INSPECTOR MUST BE COMPETENT IN INTERPRETING CONSTRUCTION DOCUMENTS, FAMILIAR WITH TYPE OF CONSTRUCTION, INDEPENDENT, AND NOT A DIRECT EMPLOYEE OF CONTRACTOR.

CONSTRUCTION INSPECTOR WILL BE RESPONSIBLE FOR AS-BUILT DOCUMENTATION, CONSTRUCTION INSPECTION LOG, AND PHOTOGRAPHS.

CONSTRUCTION INSPECTOR TO INSPECT REBAR SIZE, LOCATION, SPACING, AND WATERSTOP LOCATIONS IN BASE SLAB PRIOR TO CONCRETE POUR. SLAB IS TO BE POURED AS INDICATED ON PLAN TO COMPLETE THE TANK. INSPECTED ITEMS SHALL BE AS FOLLOWS:

- PROVIDE CONTINUOUS INSPECTION OF CONCRETE PLACEMENT AROUND THE WATERSTOP TO ENSURE CONSOLIDATION.
- NUMBER AND SPACING OF BASE SLAB REINFORCING
- SPACING OF WALL DOWELS
- BASE SLAB WATERSTOP JOINT
- BASE SLAB WATERSTOPS, IF REQUIRED

CONSTRUCTION INSPECTOR TO INSPECT REBAR SIZE, LOCATION, SPACING, AND WATERSTOP LOCATION IN EACH WALL SECTION PRIOR TO CONCRETE POUR. WALL IS TO BE POURED IN 100 FOOT LONG MAXIMUM SECTIONS TO COMPLETE THE TANK. INSPECTED ITEMS SHALL BE AS FOLLOWS:

- CONCRETE PLACEMENT ADJACENT TO ALL WATERSTOP
- SPACING OF WALL VERTICAL AND HORIZONTAL REINFORCING
- WALL WATERSTOP AT JOINT AFTER WELDING TO FOOTING WATERSTOP
- FORM TIE HOLE PLUGS AT INSIDE FACE OF WALL
- GROUTED FORM TIE HOLES AT OUTSIDE FACE OF WALL

TESTING FOR CONCRETE GREATER THAN 4,000 PSI:

ALL CONCRETE WITH REQUIRED COMPRESSIVE STRENGTH ABOVE 4,000 PSI MUST BE TESTED. CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO SAMPLE MATERIALS, PERFORM TESTS, AND SUBMIT TEST REPORTS DURING CONCRETE PLACEMENT. CAST AND LABORATORY CURE ONE SET OF FOUR STANDARD CYLINDERS FOR EACH COMPOSITE SAMPLE FOR EACH DAY'S POUR OF EACH CONCRETE MIX. PROVIDE FOUR CYLINDERS FOR EACH 200 CU. YD. OR FRACTION THEREOF. PERFORM TESTS ACCORDING TO ACI 318 - INSPECTION AND TESTING. TEST ONE SPECIMEN AT 7 DAYS AND TWO SPECIMENS AT 28 DAYS.

SITEWORK SPECIFICATION

SITE ENGINEER TO VERIFY SUBGRADE WITH COMPACTED SUBBASE IS CAPABLE OF SUPPORTING A BEARING PRESSURE OF 3000 PSF & A SUBGRADE MODULUS OF 200 PCI. COMPACTED GRANULAR SUBBASE SHALL BE MINIMUM 6" THICK OF CLEAN SAND OR 3/4" CRUSHED STONE WITH FINES. PROVIDE ADDITIONAL COMPACTED GRANULAR SUBBASE UP TO 10" THICK SHOULD SUBGRADE MODULUS RANGE BETWEEN 100 TO 200 PCI.

BACKFILLING

ONCE THE CONCRETE IS PROPERLY CURED, BACKFILL CAN BE PLACED AROUND THE TANK. AVOID BACKFILL CONTAINING LARGE ROCKS, HARD OR FROZEN SOIL LUMPS, OR CONSTRUCTION DEBRIS.

BACKFILL MATERIAL MUST BE PLACED FROM THE HEEL OF THE FOOTING AT A 45° ANGLE AWAY FROM THE WALL UNTIL SURFACE ELEVATION IS ENCOUNTERED. BACKFILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT MAXIMUM DRY DENSITY PER MODIFIED PROCTOR

GRANULAR BACKFILL MATERIAL INCLUDES GW, GP, GM, GC, SW, SP, AND SM SOILS. CLAY/SILT BACKFILL MATERIAL INCLUDES SM-SC, SC, ML, CL-ML, AND CL SOILS. MH AND CH SOILS ARE NOT PERMITTED TO BE USED AS BACKFILL MATERIAL. IF PROPOSED TO BE USED AS BACKFILL A SPECIAL DESIGN MUST BE USED.

ADJACENT TO TANK:
WITHIN 2 FEET OF TANK, EARTHFILL SHALL BE PLACED IN 4-INCH LIFTS (PRIOR TO COMPACTION) IN A MANNER ADEQUATE TO PREVENT DAMAGE TO THE STRUCTURE AND TO ALLOW THE STRUCTURE OR PIPE TO GRADUALLY AND UNIFORMLY ASSUME THE BACKFILL LOADS. COMPACTION SHALL BE ACCOMPLISHED BY MEANS OF MANUALLY DIRECTED POWER TAMPERS OR PLATE VIBRATORS OR HAND TAMPING UNLESS OTHERWISE SPECIFIED. HEAVY EQUIPMENT SHALL NOT BE OPERATED WITHIN 2 FEET OF TANK. COMPACTION BY MEANS OF DROP WEIGHTS OPERATING FROM A CRANE OR HOIST OF ANY TYPE WILL NOT BE PERMITTED.

THE TANK SITE SHALL BE GRADED TO PROVIDE DRAINAGE ACCORDING TO SITE ENGINEER'S GRADING PLAN.

SOIL BORING REQUIREMENT

THE OWNER SHALL HIRE GEOTECHNICAL FIRM TO CONDUCT SUBSURFACE INVESTIGATION WHEN:

- BUILDING MORE THAN 20% OF THE TANK FLOOR AREA ON FILL DUE TO TANK BEING LOCATED ON SIDE OF HILL
- SITE SOILS ARE INCAPABLE OF PROVIDING THE REQUIRED MINIMUM ALLOWABLE BEARING PRESSURE

BORINGS SHALL BE TAKEN TO ESTABLISH AMOUNT OF ANTICIPATED DIFFERENTIAL SETTLEMENT THAT MAY OCCUR BETWEEN THE FILL AND NON-FILL AREAS OF THE STRUCTURE. IF DIFFERENTIAL SETTLEMENT IS AN ISSUE, PRE-LOADING OF FILL AREA WITH APPROPRIATE OVERBURDEN MAY BE REQUIRED TO MINIMIZE THE FUTURE MOVEMENT. GEOTECHNICAL INVESTIGATION SHALL ALSO ESTABLISH AN ALLOWABLE SOIL BEARING PRESSURE FOR WALL FOUNDATIONS.

- BORINGS ARE NOT REQUIRED WHEN ENTIRE TANK FOOTPRINT IS BEING UNIFORMLY RAISED ON FILL TO CREATE NECESSARY SEPARATION FROM GROUNDWATER OR BEDROCK, AND WHEN EXISTING SITE SOILS ARE CAPABLE OF PROVIDING THE REQUIRED MINIMUM ALLOWABLE BEARING PRESSURE.

CONSTRUCTION INSPECTION PLAN, CONT'D

ESTABLISHING AND MAINTAINING VEGETATION

NRCS CODE 342-CRITICAL AREA PLANTING SHALL BE DONE BY OTHERS UNDER DIRECTION OF SITE ENGINEER.

NRCS WISCONSIN CONSTRUCTION SPECIFICATION #4 - CONCRETE, SHALL BE USED FOR ALL PLACEMENT OF CONCRETE.

NRCS WISCONSIN CONSTRUCTION SPECIFICATION #004 - WS - EMBEDDED OR EXPANSIVE WATERSTOP SHALL BE USED FOR ALL WATERSTOP INSTALLATION.

OPERATION AND MAINTENANCE PLAN

FENCING, GUARDRAILS, AND OTHER SAFETY FEATURES SHOWN ON CONSTRUCTION DOCUMENTS SHALL BE INSPECTED & MAINTAINED TO ENSURE SAFE OPERATION OF WASTE STORAGE FACILITY AND PREVENT ACCESS BY HUMANS OR LIVESTOCK.

SLAB DESIGN ALLOWS FOR A 23,200 LBS MAXIMUM VEHICLE AXLE LOAD FOR 5" SLAB.

OTHER REQUIREMENTS:

- FOLLOWING EMPTYING OF THE FACILITY, INSPECT THE CONCRETE WALLS AND SLAB FOR SEPARATION OR CRACKING AND REPAIR THEM AS NEEDED.
- INSPECT PUMPS, PIPES, AND VALVES TWICE YEARLY TO ENSURE THEY ARE FUNCTIONAL AND NOT A SAFETY HAZARD.

CONTINGENCY PLAN

BEGIN PLANNED CONTINGENCY UTILIZATION OF MANURE BY APPLYING ON FIELDS AT RATES ACCORDING TO 590 NUTRIENT MANAGEMENT PLAN.

EMERGENCY RESPONSE PLAN

HAVE NAME AND PHONE NUMBER OF A LICENSED SEPTIC WASTE HAULER READILY AVAILABLE TO FARM PERSONNEL.

CALL LICENSED SEPTIC TANK WASTE HAULER TO VACUUM SPILLED MANURE INTO VACUUM TANK AND DEPOSIT BACK INTO WASTE STORAGE TANK OR APPLY TO LAND ACCORDING TO 590 NUTRIENT MANAGEMENT PLAN.

ASSESS THE EXTENT OF THE SPILL AND NOTIFY THE DNR.

PROVIDE TEMPORARY EARTHEN BARRIERS TO CONTAIN LIQUID AND TO STOP LIQUID FROM ENTERING NEARBY WATERWAYS OR STORMWATER SYSTEM. RETURN SPILLED MANURE TO WASTE STORAGE TANK OR APPLY TO LAND ACCORDING TO 590 NUTRIENT MANAGEMENT PLAN.

DO REGULAR INSPECTIONS OF PIPES, PUMPS, AND VALVES TO ENSURE PROPER OPERATION AT POTENTIAL SPILL

CONFINED SPACE ENTRY INTO MANURE TRANSFER SYSTEM

CONFINED SPACES WHERE HUMAN ENTRY MAY OCCUR SHALL BE DESIGNED AND OPERATED IN COMPLIANCE WITH THE PROVISIONS CONTAINED IN ASABE EP470, MANURE STORAGE SAFETY.

POST WARNING SIGNS ON OR NEXT TO ALL CONFINED SPACES. THE SIGNS SHOULD BE STURDY, WEATHERPROOF, AND DISPLAY SUCH WORDING AS, "DANGER! CONFINED SPACE, DO NOT ENTER". REGULARLY INSPECT ALL WARNING SIGNS TO MAKE SURE THEY ARE CLEAN, READABLE, AND HAVE NOT BEEN TAMPERED WITH.

BE SURE THAT ALL OPENINGS TO CONFINED SPACES ARE APPROPRIATELY COVERED OR BLOCKED OFF. OPENINGS SHOULD BE COVERED WITH SUBSTANTIAL METAL GRILL COVERS. THESE PROVIDE NATURAL VENTILATION, AND HELP PREVENT ACCIDENTAL FALLS OR UNAUTHORIZED ENTRY.

IF EMPLOYEES ARE NOT REQUIRED TO ENTER A CONFINED SPACE, LOCK THE OPENING TO PREVENT ENTRY.

OBEY ALL WARNING SIGNS ON AND AROUND CONFINED SPACES

AVOID GOING NEAR CONFINED SPACES WHILE SMOKING OR USING ELECTRICAL EQUIPMENT.

NOTIFY SOMEONE WHO HAS BEEN TRAINED IN CONFINED RESCUE OPERATIONS IF THEY SPOT ANYONE IN TROUBLE IN A CONFINED SPACE.

CONFINED SPACES CAN BE DEADLY. IF THE AIR IN THE SPACE IS NOT TESTED BEFORE ENTRY, YOU COULD BE OVERCOME BY FUMES AND PASS OUT OR DIE DUE TO LACK OF OXYGEN, TOXIC GASES, OR AN INABILITY TO ESCAPE QUICKLY ENOUGH. MULTIPLE DEATHS OFTEN OCCUR WHEN ONE PERSON ENTERS THE SPACE, IS OVERCOME, AND OTHERS TRY UNSUCCESSFULLY TO SAVE THE FIRST PERSON.

FOLLOWING ARE THE BASIC GUIDELINES FOR CONFINED SPACE ENTRY:

- TEST THE ATMOSPHERE FOR OXYGEN, AND FOR LEVELS OF TOXIC AND EXPLOSIVE GASES.
- IF A DANGEROUS ATMOSPHERE EXISTS, YOU MUST WEAR A SELF-CONTAINED BREATHING APPARATUS. VENTILATE THE AREA AS THOROUGHLY AS POSSIBLE.
- ALL MECHANICAL AND ELECTRICAL EQUIPMENT MUST BE LOCKED OUT.
- USE THE "BUDDY SYSTEM" AND WEAR A LIFELINE. SUFFICIENT EQUIPMENT AND MANPOWER MUST BE AVAILABLE. A THIRD PERSON SHOULD BE ON HAND TO SUMMON ASSISTANCE IF NEEDED.
- ESTABLISH HOW YOU WILL BE COMMUNICATING BEFORE ENTERING THE CONFINED SPACE. THE MEANING OF VERBAL SIGNALS, HAND GESTURES, OR TUGGING LINE SIGNALS MUST BE UNDERSTOOD BY THE PEOPLE ON THE OUTSIDE.
- NEVER RE-ENTER A CONFINED SPACE WITHOUT RE-TESTING AND VENTING THE AREA.

EMERGENCY SLAB CRACK REPAIR PLAN

IN THE EVENT UN-INTENTIONAL FLOOR CRACKING OR CRACK MIGRATIONS OCCUR REPAIR THE CRACKS WITH A SIMPSON ETI-LV EPOXY ADHESIVE. THE REPAIR INVOLVES INJECTING LOW-VISCOSITY EPOXY INTO THE CRACKS TO MAKE THEM WATERPROOF. USE "GRAVITY-FEED APPLICATION" WHICH MEANS DISPENSING THE OIL-LIKE VISCOSITY EPOXY ALONG THE CRACK TO FILL IT WITHOUT PRESSURE. IN THE EVENT OF NARROW CRACKS, SIMPSON RECOMMENDS USING TWO BEADS OF CAULK ALONG EACH SIDE OF THE CRACK APPROXIMATELY 1/8" FROM THE EDGE OF THE CRACK TO WORK AS A RESERVOIR FOR THE EPOXY. ALTERNATIVELY, THE INSTALLER MAY ROUT THE CRACK TO FORM A V-GROOVE. WITH ROUTING, IT IS REQUIRED TO CLEAN THE CRACK WITH COMPRESSED AIR AFTERWARDS AS ROUTING CAN IMPACT DUST AND DEBRIS INTO THE CRACK AND PREVENT PROPER FLOW OF THE EPOXY.

OWNER AGREEMENT TO O/M PLAN

SIGNED: _____ DATE: _____

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**2022 EQIP WASTE STORAGE FACILITY**
**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

**STRUCTURAL CONSTRUCTION NOTES**

PROJECT NO. 21720000
SHEET S102

CD CODES AND DOCUMENTS

CD-1 ALL CONSTRUCTION SHALL BE PERFORMED IN CONFORMANCE WITH THE BUILDING AND DESIGN CODES REFERENCED WITHIN THESE DOCUMENTS. THE PROJECT DOCUMENTS REFER TO THE FOLLOWING CODES AND STANDARDS, UNLESS OTHERWISE NOTED:

BUILDING CODE:
INTERNATIONAL BUILDING CODE 2015
ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

STRUCTURAL CONCRETE:
NRCS CODE 313 "WASTE STORAGE FACILITY" OCTOBER 2017R
NRCS CODE 522 "POND SEALING OR LINING, CONCRETE" JUNE 2021
NRCS CODE 634 "WASTE TRANSFER" AUGUST 2016
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-14
GUIDE TO DESIGN OF SLABS-ON-GRADE, ACI 360R
PCA CONCRETE FLOORS ON GROUND (2ND EDITION)
CRSI MANUAL OF STANDARD PRACTICE
NRCS CODE #4 "CONCRETE" DECEMBER 2017
NRCS CODE #004 - WS "EMBEDDED OR EXPANSIVE WATERSTOP" MAY 2018

CD-2 "DRAWINGS" MEANS THE LATEST STRUCTURAL DESIGN DRAWINGS, UNLESS OTHERWISE NOTED. "SPECIFICATIONS" MEANS THE LATEST PROJECT SPECIFICATIONS, UNLESS OTHERWISE NOTED

CD-3 THE SPECIFICATIONS ARE AN INTEGRAL PART OF THE CONTRACT DOCUMENTS AND SHALL BE USED IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS. IN CASES, IF ANY, WHERE REQUIREMENTS INDICATED ON THE STRUCTURAL DRAWINGS DIFFER FROM THE SPECIFICATIONS, NOTIFY THE STRUCTURAL ENGINEER FOR RESOLUTION.

CD-4 ALL DETAILS, SECTIONS AND NOTES ON THE DRAWINGS ARE INTENDED TO BE TYPICAL WHERE CONDITIONS ARE SIMILAR TO THOSE INDICATED BY DETAIL OR DETAIL TITLE OR NOTE.

CD-5 ASSUME EQUAL SPACING IF NOT INDICATED ON DRAWINGS.

CD-6 USE ONLY DIMENSIONS INDICATED ON THE DRAWINGS. DO NOT SCALE DRAWINGS OR USE ANY DIMENSIONS TAKEN FROM ELECTRONIC DRAWING FILES.

CC CONTRACTOR RESPONSIBILITIES AND COORDINATION

CC-1 THE CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS FOR SUCCESSFUL COMPLETION OF THIS PROJECT.

CC-2 THE STRUCTURAL DRAWINGS AND NOTES REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION, UNLESS OTHERWISE NOTED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS, METHOD, TECHNIQUES, SEQUENCES, AND OPERATION OF CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO.

CC-3 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF ALL TEMPORARY BRACING AND CONSTRUCTION SUPPORTS, FOR NEW AND EXISTING STRUCTURES, AS NECESSARY TO COMPLETE THE PROJECT. NO PORTION OF THE PROJECT, WHILE UNDER CONSTRUCTION, IS INTENDED TO BE STABLE IN THE ABSENCE OF THE CONTRACTOR'S TEMPORARY BRACES AND SUPPORTS. CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WISCONSIN TO DESIGN ALL TEMPORARY BRACING AND CONSTRUCTION SUPPORTS.

CC-4 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS, NEW AND EXISTING, BY MEASUREMENTS AND SURVEYS AT THE JOB SITE, PRIOR TO SUBMITTAL OF SHOP DRAWINGS. THE CONTRACTOR SHALL TAKE ANY AND ALL OTHER MEASUREMENTS NECESSARY TO VERIFY CONFORMANCE WITH THE DRAWINGS AND TO PERFORM THE WORK PROPERLY. THE CONTRACTOR SHALL VISIT SITE TO TAKE INTO ACCOUNT ALL EXISTING CONDITIONS AS THEY MAY AFFECT THE WORK, AND INCLUDE IN THE BID WORK THAT IS REQUIRED TO COMPLETE THE WORK.

CC-5 IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE STRUCTURAL WORK WITH THE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, AS WELL AS ANY OTHER APPLICABLE TRADES. IN CASE OF CONFLICT BETWEEN THE STRUCTURAL WORK AND DRAWINGS RELATED TO OTHER TRADES, THE CONTRACTOR SHALL MAKE ALLOWANCES IN HIS BID FOR THE MORE SEVERE REQUIREMENT. CONFLICTS BETWEEN THE STRUCTURAL WORK AND THE DRAWINGS OF OTHER TRADES SHALL NOT BE REASON FOR ANY EXTRA COST OR DELAY IN THE EXECUTION OF THE WORK.

CC-6 ALL FIELD WORK SHALL BE COORDINATED AND CONTINUOUSLY SUPERVISED BY THE CONTRACTOR.

CC-7 MATERIALS AND EQUIPMENT SHALL BE STORED AND TRANSPORTED IN A MANNER SO AS NOT TO EXCEED THE ALLOWABLE LOADING INDICATED IN THE DRAWINGS.

CC-8 THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCIES BETWEEN THE STRUCTURAL DRAWINGS AND SPECIFICATIONS AND ANY OTHER DOCUMENTS OR EXISTING CONDITIONS FOR RESOLUTION PRIOR TO PROCEEDING WITH THE WORK. DO NOT ASSUME THAT EITHER THE DRAWINGS OR SPECIFICATIONS TAKE PRECEDENCE.

CC-9 THE CONTRACTOR SHALL VERIFY WITH THE GEOTECHNICAL ENGINEER THAT THE PROPOSED CONSTRUCTION PROCEDURES AND SEQUENCES FOLLOW THE RECOMMENDATIONS WITHIN THE GEOTECHNICAL REPORT AND SOIL BORINGS.

CC-10 THE CONTRACTOR SHALL MAKE NO DEVIATION FROM THE DESIGN DRAWINGS WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.

CC-11 SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION RELATING TO THE COORDINATION OF STRUCTURAL COMPONENTS INCLUDING, BUT NOT LIMITED TO:
CIVIL:
SITE PREPARATION
BACK-FILLING MATERIALS AND REQUIREMENTS
PAVING AND SITE ELEMENTS OUTSIDE OF STRUCTURAL ENVELOPE

CC-12 PRINCIPAL OPENING SIZES AND LOCATIONS ARE INDICATED ON THE DRAWINGS. ADDITIONAL OPENINGS, BLOCK OUTS, AND SLEEVES MAY BE REQUIRED BY OTHER DISCIPLINES AND SHALL BE CONSTRUCTED USING THE CRITERIA INDICATED IN THE STRUCTURAL DOCUMENTS. CONTRACTOR TO SUBMIT PROPOSED OPENING LOCATIONS AND METHOD OF CONSTRUCTION FOR OPENINGS NOT SHOWN ON STRUCTURAL DOCUMENTS TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

CC-13 BY SUBMITTING A BID, THE BIDDER AGREES AND WARRANTS THAT THE DRAWINGS HAVE BEEN EXAMINED AND FOUND THAT THEY ARE ADEQUATE FOR PROPER COMPLETION OF THE PROJECT.

SU SUBMITTALS

SU-1 THE CONTRACTOR IS TO REVIEW EACH SUBMITTAL PRIOR TO FORWARDING TO STRUCTURAL ENGINEER. THE CONTRACTOR IS TO STAMP EACH SUBMITTAL VERIFYING THAT THE FOLLOWING IS ADDRESSED:
1.THE SHOP DRAWING IS REQUESTED.
2.THE SHOP DRAWING IS BASED ON THE LATEST DESIGN.
3.THE STRUCTURAL ENGINEER'S COMMENTS FROM ANY PREVIOUS SUBMITTALS ARE ADDRESSED.
4.THE WORK IS COORDINATED AMONG ALL CONSTRUCTION TRADES.
5.REVISIONS FROM PREVIOUS SUBMITTALS ARE CLEARLY MARKED BY CIRCLING OR CLOUDING.
6.FIELD DIMENSIONS THAT DIFFER FROM THE DRAWINGS ARE NOTED.
7.SUBMITTAL IS COMPLETE.

THE STRUCTURAL ENGINEER MAY RETURN, WITHOUT COMMENT, SUBMITTALS THAT THE CONTRACTOR HAS NOT STAMPED OR WHICH DO NOT MEET THE ABOVE REQUIREMENTS. THE STRUCTURAL ENGINEER'S REVIEW OF SUBMITTALS SHALL BE FOR GENERAL CONFORMANCE WITH THE DESIGN INTENT. NO WORK SHALL BE STARTED WITHOUT SUCH REVIEW.

SU-2 FOR COMPONENTS THAT REQUIRE ENGINEERING BY THE SUPPLIER, PROVIDE A NOTE ON EACH SHOP DRAWING, WRITTEN AND SIGNED BY THE SUPPLIER'S ENGINEER, INDICATING THAT THE SHOP DRAWING IS IN CONFORMANCE WITH THE CALCULATIONS OF THE SUPPLIER'S ENGINEER.

SU-3 THE FOLLOWING ITEMS REQUIRE SUBMITTALS FOR STRUCTURAL REVIEW :
S CONCRETE REINFORCING LAYOUT
S CONCRETE MIX DESIGNS
S CONCRETE CONSTRUCTION JOINT LAYOUT
S CONCRETE FORMWORK

S = SHOP DRAWINGS RECOMMENDED

TI TESTING AND INSPECTION

TI-1 THE FOLLOWING STRUCTURAL ITEMS REQUIRE TESTING AND/OR INSPECTIONS AS REQUIRED BY THE GOVERNING BUILDING CODES LIST IN CODES AND DOCUMENTS AND AS OUTLINED IN THE SPECIFICATIONS:
- CONCRETE REINFORCEMENT
- EXPANSION AND ADHESIVE ANCHORS
- FOUNDATIONS
- CAST IN PLACE CONCRETE

TI -2 SEE SHEET S102 FOR ADDITIONAL TESTING AND INSPECTION INFORMATION

FO FOUNDATIONS

FO-1 THE OWNER SHALL RETAIN THE SERVICES OF A QUALIFIED GEOTECHNICAL ENGINEERING FIRM FOR TESTING AND OBSERVATION DURING EXCAVATION, BACKFILL, AND FOUNDATION CONSTRUCTION PHASES OF THIS PROJECT TO VERIFY THAT DESIGN REQUIREMENTS ARE MET.

FO-2 THE FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL INVESTIGATION REPORT BY BRAUN INTERTEC CORPORATION, DATED: JUNE 30, 2022.

FO-3 THE CONTRACTOR SHALL VERIFY WITH THE GEOTECHNICAL ENGINEER THAT THE FOLLOWING IS IN CONFORMANCE WITH THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT:
A. THE BEARING STRATUM AT EACH FOUNDATION IS AS ASSUMED IN THE REPORT.
B. THE ALLOWABLE BEARING CAPACITIES MEET OR EXCEED THE RECOMMENDED VALUES.
C. THE ENGINEERED FILL IS INSTALLED PER THE RECOMMENDATIONS.
D. THE INSTALLATION OF THE FOUNDATIONS IS AS ASSUMED IN THE REPORT.

FO-4 PLACE FOOTINGS AND SLAB ON GRADE ON UNDISTURBED, NATURAL SUBGRADE, AS VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER RETAINED FOR THE PROJECT. IF SUBGRADE IS DEEMED UNSUITABLE, EXTEND EXCAVATION TO SUITABLE, UNDISTURBED NATURAL SUBGRADE AND RAISE GRADE USING COMPACTED ENGINEERED FILL OR PLAIN CONCRETE, AS DETERMINED AND INSPECTED BY THE QUALIFIED GEOTECHNICAL ENGINEER.
A. FILL OR BACKFILL MATERIAL CAN CONSIST OF WELL-GRADED GRANULAR FILL APPROVED BY A SOILS ENGINEER. COHESIVE SOIL AND SILTY/CLAYEY GRANULAR MATERIAL MAY BE ACCEPTABLE ABOVE SUBGRADES THAT HAVE BEEN STABILIZED WITH GRANULAR MATERIALS. FILL MUST BE FREE OF UNSUITABLE SOIL, FROZEN MATERIAL, RUBBLE, ORGANICS, DEGRADABLE MATERIAL, CHEMICAL CONTAMINANTS AND STONES THAT WOULD INTERFERE WITH COMPACTION OR COMPACTION TESTING. COMPACT FILL TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D696.

FO-5 THE CONTRACTOR SHALL USE CARE IN GRADING AND EXCAVATION NOT TO DAMAGE EXISTING ITEMS TO REMAIN. DAMAGE TO THE EXISTING ITEMS BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

FO-6 EXCAVATE, BRACE, AND BACKFILL SLAB AT GRADE PITS FOLLOWING RECOMMENDATIONS FROM GEOTECHNICAL REPORT, PRIOR TO CONSTRUCTION OF NEW FOOTINGS.

FO-7 SLABS ON GRADE HAVE NOT BEEN DESIGNED FOR UPLIFT.

RE REINFORCEMENT

RE-1 REINFORCEMENT SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES:
DEFORMED BARS: ASTM A615 GRADE 60

RE-2 DETAIL REINFORCEMENT BASED ON THE PROJECT REQUIREMENTS, ACI-318, ACI-315, ACI-117, AND CRSI MANUAL OF STANDARD PRACTICE.

RE-3 ALL LAP SPLICES ARE TO BE ACI STANDARD CLASS B TENSION LAP SPLICES. WHERE BARS OF DIFFERENT SIZES LAP, PROVIDE LAP SPLICE LENGTH FOR LARGER BAR.

RE-4 WHERE A 90° HOOK IS GRAPHICALLY INDICATED, PROVIDE ACI STANDARD 90° HOOK. WHERE A 135° HOOK IS GRAPHICALLY INDICATED, PROVIDE ACI STANDARD 135° HOOK. WHERE A 180° HOOK IS GRAPHICALLY INDICATED, PROVIDE ACI STANDARD 180° HOOK.

RE-5 PROVIDE ACI STANDARD FULL TENSION WELDED WIRE LAP SPLICE FOR WELDED WIRE FABRIC.

RE-6 FOR BARS INDICATED IN GROUPS, PROVIDE BARS OF EACH GROUP AT EQUAL SPACING, UNLESS OTHERWISE NOTED.

RE-7 WHERE DOWELS ARE INDICATED BUT NOT SIZED, PROVIDE DOWELS THAT MATCH SIZE AND LOCATION OF MAIN REINFORCEMENT AND LAP SPLICE WITH THE MAIN REINFORCEMENT.

RE-8 WHERE CONCRETE ELEMENTS INTERSECT WALLS, PROVIDE DOWELS TO EXTEND CONTINUOUS WALL REINFORCEMENT. AT THE INTERSECTION OF CONCRETE FOOTINGS OR WALLS, PROVIDE CORNER BARS THE SAME SIZE AND SPACING AS CONTINOUS OR HORIZONTAL REINFORCING, RESPECTIVELY, UNLESS NOTED OTHERWISE.

RE-9 REINFORCEMENT SHALL HAVE THE FOLLOWING CONCRETE PROTECTION (CLEAR COVER), UNLESS OTHERWISE NOTED:
UNFORMED SURFACES IN CONTACT WITH SOIL OR WATER, OR EXPOSED TO WEATHER: 3"
FORMED SURFACES IN CONTACT WITH SOIL OR WATER, OR EXPOSED TO WEATHER: 2"

RE-10 NO CONSTRUCTION SHALL BE MADE WITHOUT REINFORCEMENT.

RE-12 FOR CONCRETE THAT IS FIELD CUT, EXPOSED REINFORCING SHALL BE COATED WITH AN ANTI-CORROSIVE ZINC RICH PRIMER.

RE-13 STORE MATERIAL IN ACCORDANCE WITH ACI 304R.



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**2022 EQIP WASTE STORAGE FACILITY**
**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

**STRUCTURAL SPECIFICATION SHEET**

PROJECT NO. 21720000
SHEET S103

CM CONCRETE MATERIAL PROPERTIES

CM-1 PREPARE DESIGN MIXES FOR EACH TYPE AND STRENGTH OF CONCRETE BY EITHER LABORATORY TRIAL BATCH OR FIELD EXPERIENCE METHODS AS SPECIFIED IN ACI 301.

A. SLUMP SHALL BE 4" MAXIMUM, 2" MINIMUM FOR WALLS AND FOOTINGS AND 5" MAXIMUM, 3" MINIMUM FOR SLABS-ON-GRADE.
B. LIMIT THE USE OF FLY ASH TO 15% OF THE CEMENT CONTENT. (PERCENTAGE COULD BE INCREASED TO 20% FOR TYPE C. FLY ASH LOWERS THE HEAT OF HYDRATION SO USE CAUTION IN WINTER MONTHS.)
C. CONTRACTOR SHALL EXERCISE CARE IN SELECTION OF MIX DESIGN AND CURING METHODS TO MINIMIZE THE DIFFERENTIAL MOISTURE LOSSES THAT MAY RESULT IN CURLING OF CONCRETE SLABS PLACED OVER POLYETHYLENE.
D. COMPRESSIVE STRENGTH: STRENGTH REQUIREMENTS AT 28 DAYS AND THE LOCATIONS OF EACH TYPE OF CONCRETE REQUIRED FOR THIS PROJECT SHALL BE AS NOTED IN DESIGN DATA.

CM-2 PROVIDE NORMAL WEIGHT CONCRETE WITH MINIMUM CURED DENSITY OF 145 PCF, AND AGGREGATE CONFORMING TO ASTM C33, UNLESS OTHERWISE NOTED.

CM-3 THE USE OF CALCIUM CHLORIDE AND OTHER CHLORIDE-CONTAINING AGENTS IS PROHIBITED. THE USE OF RECYCLED CONCRETE IS PROHIBITED. PLACEMENT WITHIN AND CONTACT BETWEEN ALUMINUM ITEMS, INCLUDING ALUMINUM CONDUIT, AND CONCRETE IS PROHIBITED.

CM-4 CONCRETE EXPOSED TO WEATHER SHALL BE AIR-ENTRAINED, RESULTING IN A TOTAL AIR CONTENT OF 6% +/- 1%, A MAXIMUM SLUMP OF 4 INCHES, WITH A W/C RATIO OF 0.45.

CP CAST IN PLACE CONCRETE

CP-1 CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301, LATEST EDITION, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, EXCEPT AS MODIFIED BY SUPPLEMENTAL REQUIREMENTS CONTAINED IN THE FOLLOWING NOTES.

CP-2 UNLESS OTHERWISE DETAILED OR NOTED, REINFORCING SHALL BE IN ACCORDANCE WITH "THE ACI DETAILING MANUAL, SP-66."

CP-3 ALL CONCRETE TESTING SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF A QUALIFIED ENGINEER WHO IS LICENSED TO PRACTICE IN THE STATE OF WISCONSIN. THE TESTING AGENCY SHALL MEET REQUIREMENTS CONTAINED IN ASTM E329.

CP-4 DESIGN, ERECT, SUPPORT, BRACE AND MAINTAIN FORMWORK TO SUPPORT VERTICAL AND LATERAL LOADS THAT WILL BE IMPOSED BY CONCRETE AND CONSTRUCTION ACTIVITIES. CONSTRUCT FORMWORK SO CONCRETE MEMBERS AND STRUCTURES ARE OF CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATIONS AND POSITION.

CP-5 PROVIDE SUPPORTS FOR REINFORCING, INCLUDING BOLSTERS, CHAIRS, SPACERS AND OTHER DEVICES FOR SPACING, SUPPORTING AND FASTENING REINFORCING BARS AND WELDED WIRE FABRIC IN PLACE. USE WIRE BAR TYPE SUPPORTS COMPLYING WITH CONCRETE REINFORCING STEEL INSTITUTE (CRSI) RECOMMENDATIONS, UNLESS OTHERWISE APPROVED.

CP-6 COLD WEATHER PLACING: PROTECT CONCRETE WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH, WHICH COULD BE CAUSED BY FROST, FREEZING ACTIONS OR LOW TEMPERATURES, IN COMPLIANCE WITH ACI 306. DO NOT USE CALCIUM CHLORIDE, SALT AND OTHER MATERIALS CONTAINING ANTIFREEZE AGENTS.

CP-7 HOT WEATHER PLACING: WHEN HOT WEATHER CONDITIONS EXIST THAT WOULD SERIOUSLY IMPAIR QUALITY AND STRENGTH OF CONCRETE, PLACE CONCRETE IN COMPLIANCE WITH ACI 305.

CP-8 PROVIDE CONCRETE MIX DESIGNS AND DELIVER CONCRETE IN ACCORDANCE WITH ASTM C94.

CP-9 PROVIDE CONCRETE SLAB FINISHES THAT CONFORM TO THE ARCHITECTURAL REQUIREMENTS OF THE PROJECT. FOLLOW PROCEDURE CONTAINED IN PARAGRAPH 5.3.4 OF ACI 301.

JW JOINTS AND WATERPROOFING

JW-1 PROVIDE CONTINUOUS WATERSTOPS, AT EACH CONSTRUCTION JOINT OF ANY CONCRETE ELEMENT EXPOSED TO SOIL OR WATER. AT ALL JOINTS CONTAINING WATERSTOPS, INTENTIONALLY ROUGHEN CONCRETE TO 1/4" AMPLITUDE SEE CIVIL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

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**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

**STRUCTURAL SPECIFICATION SHEET**

PROJECT NO. 21720000
SHEET S104

## GENERAL NOTES

A. VERIFY SUBGRADE WITH COMPACTED SUBBASE IS CAPABLE OF SUPPORTING A BEARING PRESSURE OF 3000 PSF & A SUBGRADE MODULUS OF 200 PCI. COMPACTED GRANULAR SUBBASE SHALL BE MINIMUM 6" THICK OF CLEAN SAND OR 3/4" CRUSHED STONE WITH FINES. PROVIDE ADDITIONAL COMPACTED GRANULAR SUBBASE UP TO 10" THICK SHOULD SUBGRADE MODULUS RANGE BETWEEN 100 TO 200 PCI.
B. ALL JOINTS TO CONTAIN 6" PVC WATERSTOP, UNLESS OTHERWISE NOTED.
C. CONTRACTOR SHALL ENSURE THE WATER-TIGHTNESS OF THE STRUCTURE JOINTS BY PROPER INSTALLATION AND DETAILING OF WATERSTOPS.
D. CONCRETE SHALL REACH 28-DAY COMPRESSIVE STRENGTH PRIOR TO BACKFILL.
E. FIELD VERIFY ALL PIPE LOCATIONS WITH OWNER PRIOR TO CONSTRUCTION.
F. PLACE PIPE PENETRATION IN WALLS AND SLABS BETWEEN TYPICAL REINFORCEMENT, WHERE POSSIBLE. PROVIDE ADDITIONAL DIAGONAL REINFORCING AROUND ALL OPENINGS AND PENETRATIONS THROUGH WALLS AND SLABS - SEE OPENING DETAIL 5/S303

## GENERAL DESIGN LOADS AND ASSUMPTIONS

TANK TYPE: RECTANGULAR

DESIGN STATEMENT
- DESIGN (ACI 318 COMPLIANT) DOES NOT MEET THE REQUIREMENTS OF "LIQUID TIGHT" CRITERIA, WHICH REQUIRES ADDITIONAL LEVELS OF PROTECTION FOR GEOLOGIC CONCERNS, GROUNDWATER RESOURCES, AND RISK FACTORS AS DESCRIBED IN AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK (AWMFH), CHAPTER 10

DESIGN CONDITIONS
- WALLS DESIGNED FOR VARIED HEIGHT UNSATURATED BACKFILL WITH EMPTY TANK, FULL LIQUID WITH NO BACKFILL, AND STACKED FEED STORAGE & IMPACT LOAD WITH EMPTY TANK.
- CORNER WALLS ARE DESIGNED AS PLATES WITH CORNER & BOTTOM EDGE FIXED AND TOP & JOINT EDGE FREE. ALL OTHER WALLS ARE DESIGNED AS STRAIGHT CANTILEVERED WALLS.
- ALL WALLS ARE DESIGNED WITH AT-REST LOADING CONDITIONS.
- WALLS AND SLABS ARE NOT DESIGNED FOR HYDROSTATIC PRESSURES OR BUOYANCY. MAINTAIN GROUNDWATER TABLE BELOW THE TOP OF THE BASE SLAB.
- ALLOWABLE SOIL BEARING PRESSURE: 3,000 PSF.

LOAD CONDITIONS
- EXTERNAL PRESSURE FROM BACKFILL: 115 PCF UNIT WEIGHT + 230 PSF SURCHARGE
- INTERNAL PRESSURE FROM LIQUID (PER NRCS CODE 313): 65 PSF/FT, NON-SAND-LADEN
- EXTERNAL PRESSURE FROM FEED: 65 PCF UNIT WEIGHT
- IMPACT LOAD: 10 K (ASSUMED FRONT-END LOADER)

RETAINING WALLS WITH RETAINED SOIL HEIGHT GREATER THAN 7'-0" & ALL CORNER WALLS
LOADING CONDITION 1: 60 PSF/FT EFP SOIL LOAD + 120 PSF/FT EFP SURCHARGE
(HEIGHT OF SOIL 13'-0", ASSUMING UNSATURATED SAND BACKFILL)

LOADING CONDITION 2: 65 PSF/FT EFP MANURE LOAD
(HEIGHT OF MANURE 16'-0")

REINFORCING DESIGNS PER SECTION 1/S301 & ELEVATION 1/S302 SHALL BE USED

REMAINING RETAINING WALLS & CORNER WALLS WITH RETAINED SOIL HEIGHT LESS THAN 7'-0"
LOADING CONDITION 1: 100 PSF/FT EFP SOIL LOAD + 200 PSF/FT EFP SURCHARGE
(HEIGHT OF SOIL 7'-0", ASSUMING UNSATURATED CLAY/SILT BACKFILL)

LOADING CONDITION 2: 65 PSF/FT EFP MANURE LOAD
(HEIGHT OF MANURE 16'-0")

REINFORCING DESIGNS PER SECTION 2/S301 SHALL BE USED

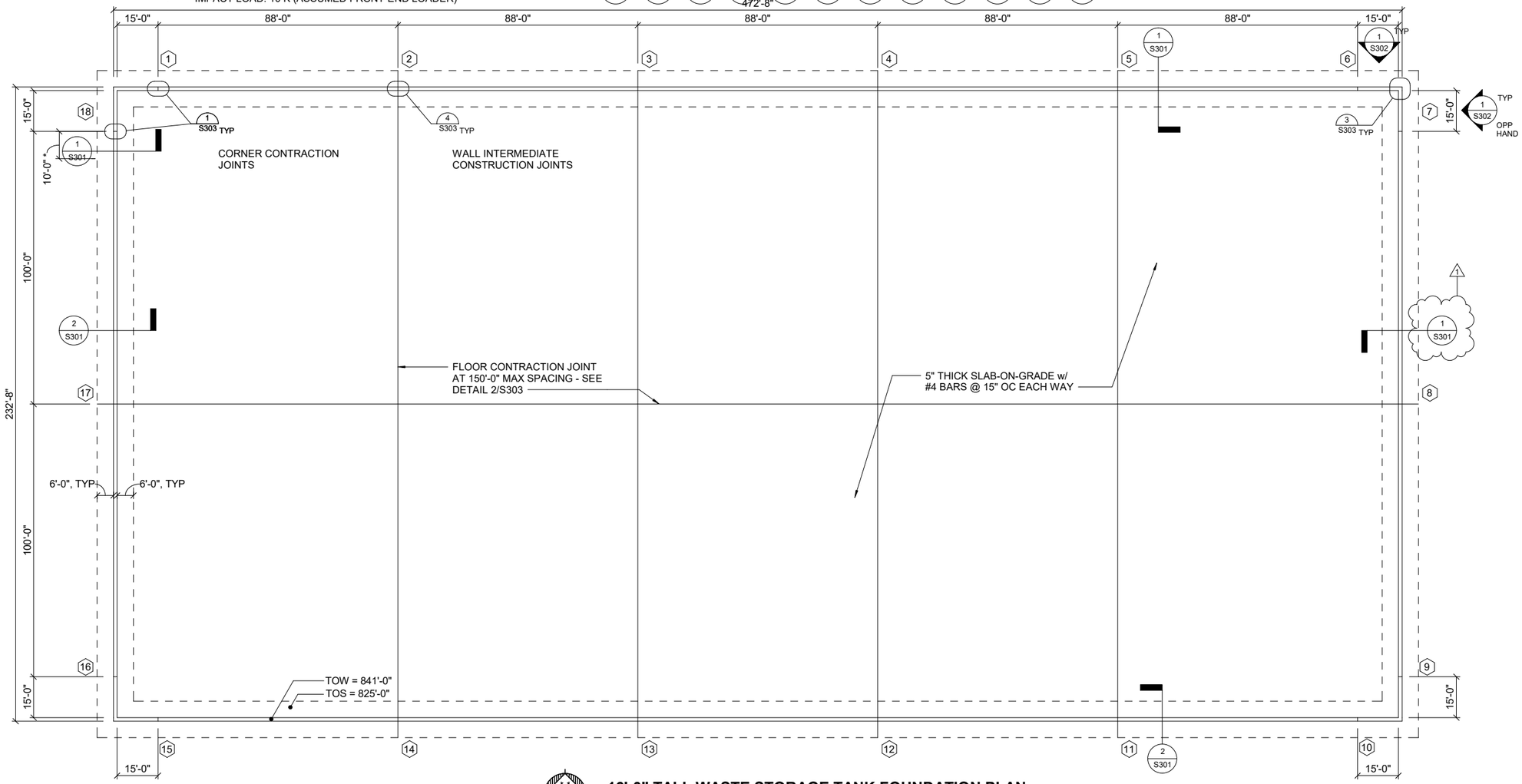
RETAINING WALLS WITH RETAINED FEED STORAGE & IMPACT LOAD
LOADING CONDITION 1: 60 PSF/FT EFP SOIL LOAD +120 PSF/FT EFP SURCHARGE +10K IMPACT LOAD
(HEIGHT OF SOIL 7'-0", ASSUMING OF UNSATURATED SAND BACKFILL)
(IMPACT LOAD AT 11'-6" ABOVE TOF, ACROSS 5'-9" OF WALL WIDTH)

LOADING CONDITION 2: 60 PSF/FT EFP SOIL LOAD +40.33 PSF/FT EFP FEED LOAD
(HEIGHT OF SOIL 7'-0", ASSUMING OF UNSATURATED SAND BACKFILL)
(HEIGHT OF FEED 9'-0", PLACED ON TOP OF SAND BACKFILL)

REINFORCING DESIGNS PER SECTION 1/S301 SHALL BE USED

(#) DENOTES MINIMUM NUMBER OF WALL JOINTS

*REINFORCING DESIGN PER SECTION 1/S301 APPLIES FOR 10'-0" FROM NORTH CORNER JOINT ON WEST WALL. VERIFY RETAINED SOIL HEIGHT WITH SITE PLAN




## 16'-0" TALL WASTE STORAGE TANK FOUNDATION PLAN

3/64" = 1'-0" (11"x17")
3/128" = 1'-0" (22"x34")

| No | DATE | REVISIONS | BY |
|---|---|---|---|
| 1 | 02/13/2023 | REVISION 1 | MLB |

PROJECT DATE: 1/11/2023
DRAWN BY: BLS
DESIGNED BY: MLB
CHECKED BY: SHG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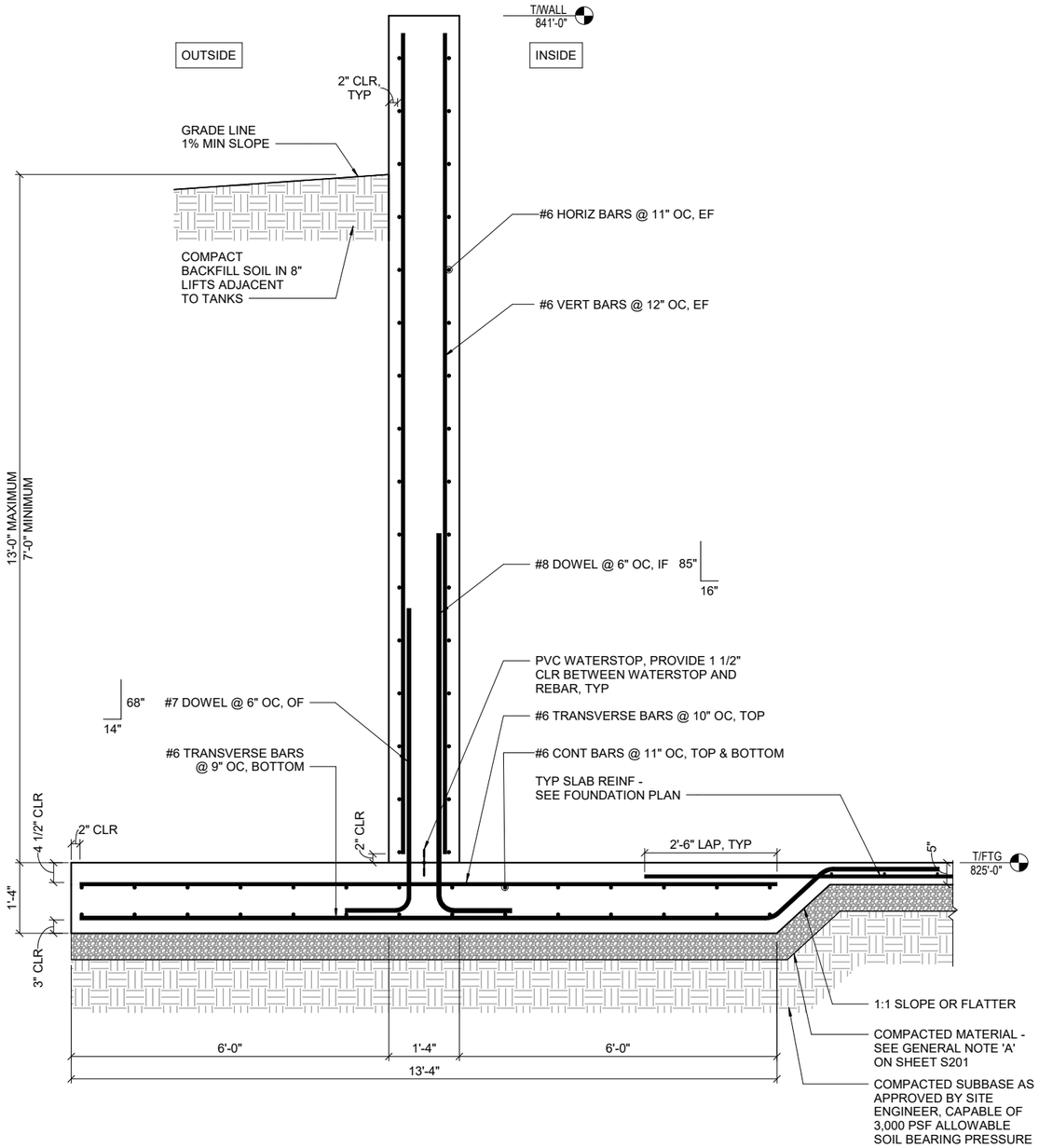
**2022 EQIP WASTE STORAGE FACILITY**
**BROOKS FARMS DAIRY, LLC**
**WAUPACA COUNTY, WI**

**WASTE STORAGE TANK FOUNDATION PLAN**

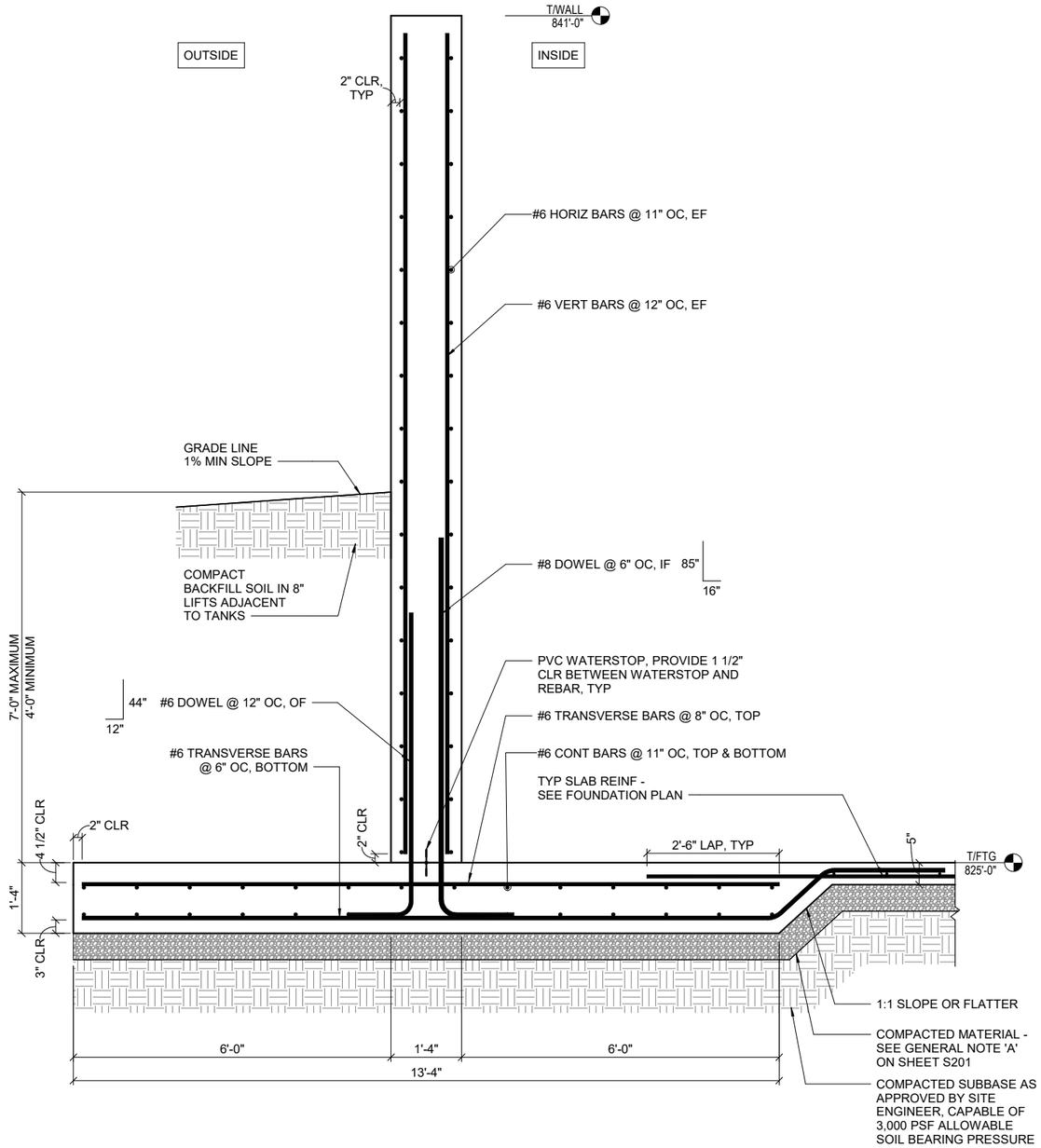
PROJECT NO. 21720000
SHEET S201

PLOT DATE: 2/13/2023 11:55:17 - J:\Autodesk Docs\21720000 - Vanguard Renewables Brooks Dairy ENG Dgnsets\21720000 - Vanguard Renewables Brooks Dairy - STRUCT.rvt




## 1 TANK WALL SECTION w/ RETAINED SOIL HEIGHT BETWEEN 13' & 7'

S301 3/4" = 1'-0" (11"x17")
3/8" = 1'-0" (22"x34")
0 6" 1' 2' 3'




## 2 TANK WALL SECTION w/ RETAINED SOIL HEIGHT BETWEEN 4' & 7'

S301 3/4" = 1'-0" (11"x17")
3/8" = 1'-0" (22"x34")
0 6" 1' 2' 3'

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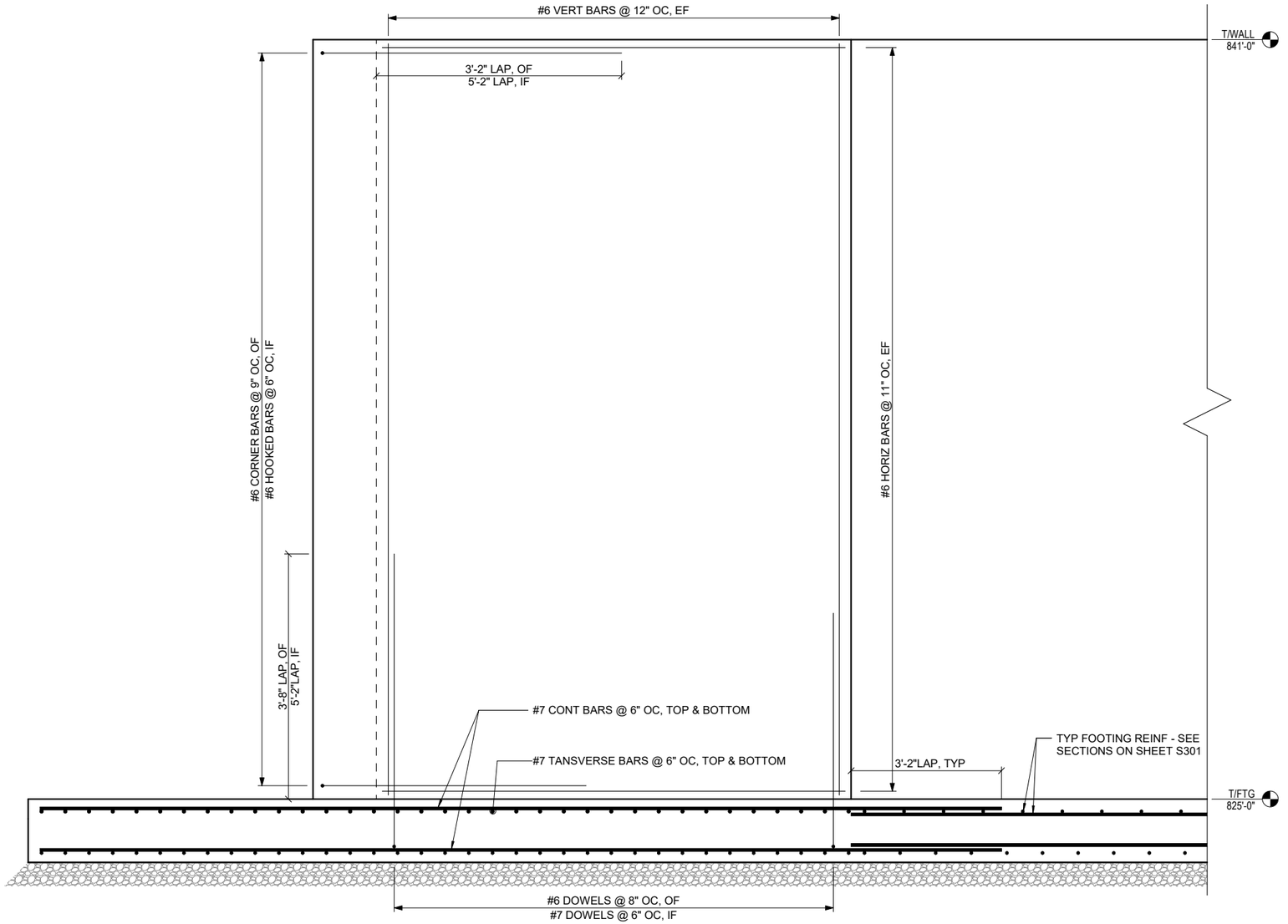
**WAUPACA COUNTY, WI**

**WASTE STORAGE TANK SECTIONS**

PROJECT NO. 21720000
SHEET S301




## 1 TYPICAL CORNER ELEVATION
S302

3/4" = 1'-0" (11"x17")
3/8" = 1'-0" (22"x34")

0 6" 1' 2' 3'

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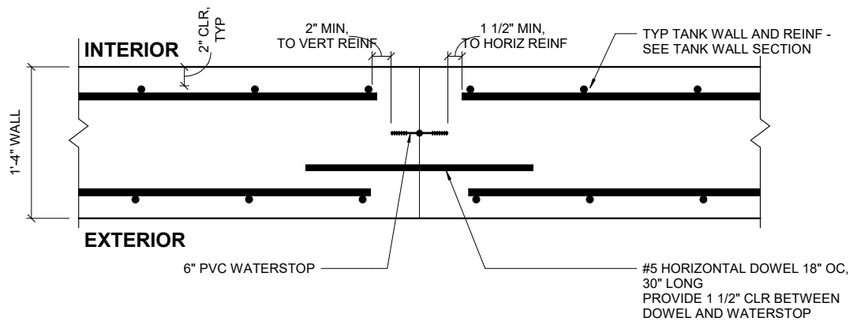
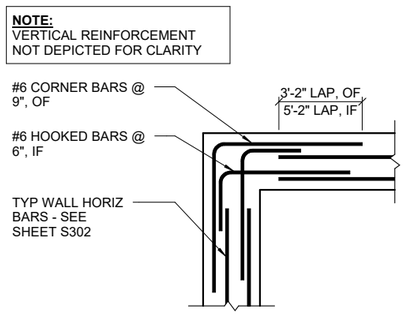
**WASTE STORAGE TANK ELEVATIONS**

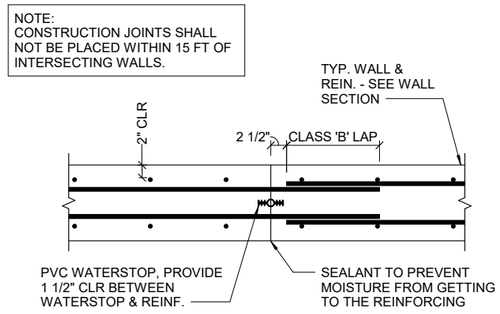
PROJECT NO. 21720000
SHEET S302




## 1 WALL CONTRACTION JOINT

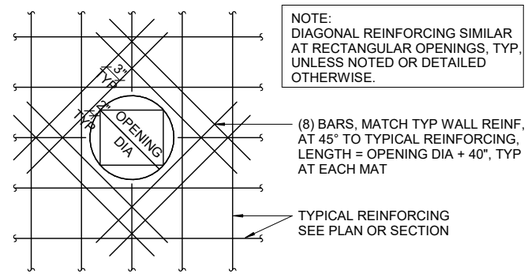
S303 1 1/2" = 1'-0" (11"x17")
3/4" = 1'-0" (22"x34")
0 3" 6" 12" 18"

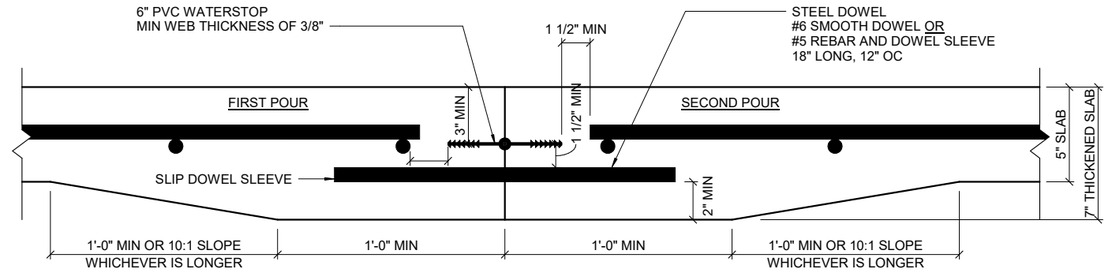



## 2 FLOOR CONTRACTION JOINT

S303 3" = 1'-0" (11"x17")
1 1/2" = 1'-0" (22"x34")
0 3" 6" 12" 18"




## 3 CORNER REINFORCING DETAIL

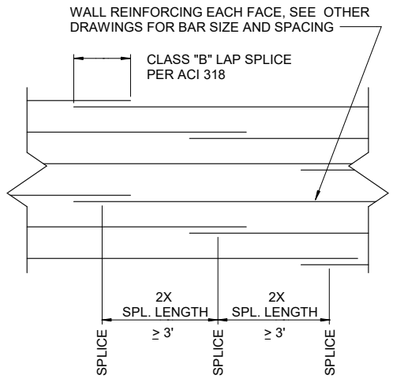
S303 NONE

## 4 WALL CONSTRUCTION JOINT

S303 NONE

## 5 DIAGONAL REINFORCING AT CONCRETE WALL AND SLAB OPENINGS

S303 NONE




**BAR SPLICE SCHEDULE**

| BAR SIZE | SPLICE LENGTH |
|---|---|
| #4Ø | 18" |
| #5Ø | 23" |
| #6Ø | 26" |
| #7Ø | 38" |
| #8Ø | 45" |

*LAP STAGGER TO BE GREATER OF 36" & SPLICE LENGTH - SEE SCHEDULE ABOVE.

## 6 TYPICAL WALL REINFORCING SPLICE DETAIL

S303 NONE

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**WASTE STORAGE TANK STRUCTURAL DETAILS**

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