

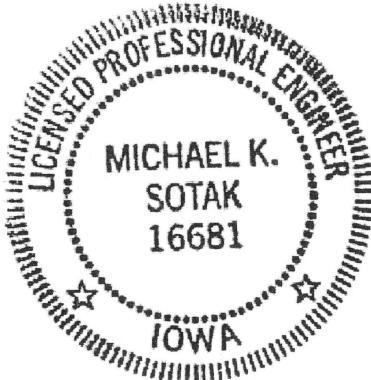
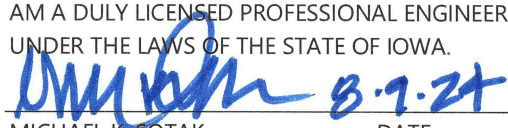
SPECIFICATIONS  
AND  
TECHNICAL DOCUMENTS  
FOR

Sundown Lake Rural Improvement Zone

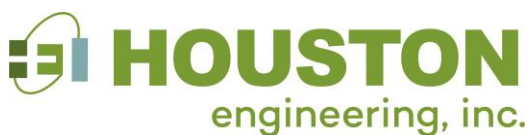
**Sundown Lake SW Basin**

Moravia, Iowa

August 9<sup>th</sup>, 2024

	I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
	 8.7.24
	MICHAEL K. SOTAK DATE
	LICENSE NO: 16681
	MY LICENSE RENEWAL DATE IS: 12.31.24
	PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS

PREPARED BY:



Houston Engineering Inc.  
100 Court Avenue, Suite 202  
Des Moines, IA 50309  
Phone: 515.444.5393  
[houstoneng.com](http://houstoneng.com)

## INVITATION TO BID

The Sundown Lake Rural Improvement Zone Board of Trustees invites contractors to submit bids for:

### **SUNDOWN LAKE SW BASIN APPANOOSE COUNTY, IOWA**

**The Project consists of constructing three earthen dams totaling approximately 120,000 cubic yards of earth fill with related rock riprap, reinforced concrete work, channel grading, and other incidental items necessary.**

Sealed bids will be received through Quest VirtuBid (vBid) until **11:00 a.m. Central Time, Thursday, September 26th, 2024**, at which time they will be opened and read aloud via the follow:

Join the bid opening on your computer or mobile app

[Join the meeting now](#)

Or Visit:

<https://bit.ly/SundownSWBasin>

#### **Or call in (audio only)**

Number: +1 701-404-1699

Conference ID: 801097147#

It is the intent to provide a recommendation of award to the Sundown Lake RIZ on **October 2nd, 2024**, for its selection and award of contract.

No bid shall be withdrawn after opening bids without consent of the Sundown Lake Rural Improvement Zone Board of Trustees for a period of 45 days after the scheduled time for closing bids. Sundown Lake Rural Improvement Zone Board of Trustees reserves the right to reject any or all bids and to waive any informalities in the bidding.

The contract documents are available at [www.QuestCDN.com](http://www.QuestCDN.com), project #**9256146** for a fee of \$42.00. Bids will ONLY be received and accepted via the online electronic bid services through QuestCDN.com. Bids must be accompanied by a bidder's bond equal to at least five percent (5%) of the total amount of the bid.

Questions regarding the project may be directed to Mark Jacobs, Houston Engineering, Inc., at 515.444.5396 or [mjacobs@houstoneng.com](mailto:mjacobs@houstoneng.com). The deadline for questions is **September 19<sup>th</sup>, 2024**.

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**SECTION 00200**  
**INSTRUCTIONS TO BIDDERS**

**RECEIPT OF BIDS:**

Sealed Bids will be received through Quest VirtuBid (vBid) until **11:00 a.m.** Central time, on **Thursday, September 26th, 2024** for the **Sundown Lake SW Basin**.

Join the bid opening on your computer or mobile app

[Join the meeting now](#)

Or Visit:

<https://bit.ly/SundownSWBasin>

**Or call in (audio only)**

Number: +1 701-404-1699

Conference ID: 801097147#

No Bids will be considered which have not been received by the deadline set forth above, as determined by the Owner. The Owner is not responsible for delays.

**TAXES AND PERMITS:**

OWNER is exempt from State and local sales and use taxes on materials to be permanently incorporated into the Project. Said taxes shall not be included in the Contract Price.

All applicable sales and use taxes (including State collected taxes) on any items other than construction and building materials physically incorporated into the Project are to be paid by CONTRACTOR and are to be included in appropriate Bid items.

**EXAMINATION OF SITE:**

Before submitting its Bid, each prospective Bidder shall become familiar with the Work, the Site where the Work is to be performed, local labor conditions, and all laws, local weather conditions, regulations, and other factors affecting performance of the Work. Bidder shall carefully correlate its observations with requirements of the Bidding Documents and be satisfied with the expense and difficulties attending performance of the Work. The submission of a Bid shall constitute a representation of compliance by Bidder. There shall be no subsequent financial adjustment for lack of such familiarization.

Each Bidder may visit the Site of the Work to become further informed relative to construction and procedures, availability of property required for the Work; the character and quantity of surface and subsurface materials, and utilities to be found; the arrangement and condition of existing structures

and facilities; the procedures necessary for maintenance of uninterrupted operation of existing facilities; the character of construction equipment and facilities needed for performance of the Work; and facilities needed for transportation, handling, and storage of materials and equipment. All such factors shall be properly investigated and considered in the preparation of the Bid. Bidders may contact Jeff Sampson at Sundown Lake RIZ Board of Trustees at 402.216.8890 if a site visit is desired.

Before submitting a Bid, each Bidder may, at Bidder's own expense and with OWNER'S prior approval, make or obtain any examinations, investigations, explorations, geotechnical studies, and any additional information and data which pertain to the physical conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance, or furnishing the Work in accordance with the time, price, or other terms and conditions of the Bidding Documents.

Each Bidder shall be required to submit a written plan for review and approval by OWNER detailing any exploration program it proposes to perform during the Bidding period. The exploration program shall not be initiated without prior written approval by OWNER. Bidder shall fill all holes and clean up and restore the Site to its former condition to the satisfaction of OWNER upon completing its exploration.

#### **INTERPRETATIONS OF DRAWINGS AND DOCUMENTS:**

Each Bidder shall examine the Bidding Documents carefully and, not later than seven (7) days prior to the date for receipt of Bids, make written request to ENGINEER for interpretation or corrections of any ambiguity, inconsistency, or error therein which Bidder may discover. Any interpretation or correction will be issued as an Addendum to the Bidding Documents. Only a written interpretation or correction by Addendum shall be binding. Oral and other interpretations or clarifications shall be without legal effect. Questions shall be addressed in writing to:

Mr. Mark Jacobs, P.E., CFM  
Houston Engineering, Inc.  
100 Court Ave, Suite 202  
Des Moines, IA 50309

Or via email to: [mjacobs@houstoneng.com](mailto:mjacobs@houstoneng.com)

#### **MATERIALS, EQUIPMENT, SUPPLIERS, AND SUBCONTRACTORS:**

Application procedures for consideration of substitute or "or equal" items are set forth in the General Conditions. Notwithstanding these contract provisions, Bidder shall predicate its Bid on the materials and equipment expressly cited in the Bidding Documents and shall not adjust or alter its Bid price in anticipation of a substitution being accepted.

Each Bidder shall submit with their Bid, or provide immediately if low bidder, a "List of Subcontractors and/or Vendors" for acceptance by OWNER. Upon award of the Contract, OWNER-accepted subcontractors and vendors shall be utilized. Substitutions shall only be allowed in the event that the named subcontractor and/or vendor is dilatory in complying with the requirements of the Bidding Documents or in the case of vendors, cannot meet the required delivery schedule. All substitutions

must be approved by OWNER and confirmed by written change order. No increase in Contract Price shall be allowed for substitutions of subcontractors.

Acceptance of the Bid and award of the Work shall in no way relieve CONTRACTOR of its obligation to supply equipment or perform Work in conformance with the requirements of the Bidding Documents.

### **CONTRACT TIME:**

The Project completion date is an essential part of the Agreement, and it shall be necessary for each Bidder to satisfy OWNER of its ability to complete the Work by the completion date set forth in the Bidding Documents. Therefore, Bidders shall also submit with their bid a proposed project schedule that assumes that Award of Bid will be made by **04 October 2024**, and that Notice to Proceed will be issued within one week of receiving all contract documents from CONTRACTOR.

### **BID FORMS:**

The Bid Form is included with the Bidding Documents for reference only. Bids will ONLY be received and accepted via the online electronic bid service through QuestCDN.com.

The Unit Prices Form and Alternates Form (if applicable) are for reference only. The Unit Prices shall be submitted through the QuestCDN.com "Bid Worksheet" and must be filled in correctly for each and every item for which a quantity is given, and the Bidder shall clearly indicate prices for which the Bidder proposed to do each item of Work contemplated.

Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

Acknowledgment of receipt of all Addenda shall be documented within QuestCDN.

The address and telephone number for communications regarding the Bid must be shown.

Applicable portions of the Corporate Acknowledgement shall be completed and submitted with the Bid. Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal shall be affixed and attested by its secretary or assistant secretary. The state of incorporation shall be shown below the corporate name. Bids by partnerships must be executed in the partnership name and signed by a partner; title and the official address of the partnership must be shown below the signature. Bids by joint ventures shall be signed by each participant in the joint venture or by an authorized agent of each participant.

The Sundown Lake RIZ intends to act as quickly as possible to issue the Notice to Proceed. Because of

the unique nature of the proposed work, the Sundown Lake RIZ also intends to award the work to a Contractor with recent and relevant experience in this type of work. Therefore, all bids shall be accompanied, or provided immediately if low bidder, with the following:

1. List of proposed suppliers
2. List of proposed subcontractors
3. Statement of experience for general contractor or subcontractors if appropriate, for dam construction and/or dam rehabilitation
4. List and contact information for references related to work described in 3. Above
5. Proposed schedule for the work to be performed

### **SUBMISSION OF BIDS**

Bids shall be submitted as set forth in the Agreement as follows:

Bid proposals must be submitted via the online electronic bid services through QuestCDN. Bidding information can be downloaded at [www.questCDN.com](http://www.questCDN.com). Reference Quest CDN project #**9256146** for a non-refundable charge of \$42. Contact QuestCDN Customer Support at 952-233-1632 or [info@questcdn.com](mailto:info@questcdn.com) for assistance in membership registration, downloading digital project information and vBid online bid submittal. Project bid documents must be downloaded from QuestCDN, which will add your company to the Planholder List and allow access to vBid online bidding for the submittal of your bid.

It is the sole responsibility of the Bidder to see that the submitted bid proposal is received in proper time. Any proposal received after the scheduled closing time for receipt of the proposals will be rejected.

Discrepancies in the multiplication of units of Work with unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

### **WITHDRAWAL OR REVISION OF BIDS:**

A Bidder may, without prejudice to himself, withdraw a Bid after it has been deposited with OWNER, provided the request for such withdrawal is in writing signed by Bidder and is received by OWNER before the time set for opening Bids. Telephonic and facsimile communications will not be accepted.

### **BID SECURITY:**

Each Bid must be accompanied by a Bid Bond on the Bid Bond Form in an amount not less than five percent (5%) of the total Bid. The Bid Bond shall be issued by a surety company licensed to conduct business in the State of Iowa and acceptable to OWNER.

Said Bid Security is given as a guarantee that Bidder will enter into a contract if awarded the Work and, in the case of refusal or failure to so enter into said contract, the security shall be declared forfeited to OWNER. Such security shall be returned to all but the three (3) lowest responsible Bidders within seven

(7) days after the opening of Bids and the remaining security will be returned within forty-eight (48) hours after OWNER and the successful Bidder have executed the Agreement.

Bidder's Bid Bond shall be accompanied by a written guarantee by a surety company which is named on the most current U.S. Department of Treasury Circular 570 list and is licensed to do business in Iowa and is acceptable to OWNER, that in the event a contract is awarded to Bidder, said surety will furnish the required Performance, Labor, and Material Payment and Guarantee Bonds, as required herein.

The Successful Bidder, upon his failure or refusal to execute the Agreement after he has received notice of the acceptance of its Bid, shall forfeit to OWNER the security deposited with its Bid, as liquidated damages for such failure or refusal.

**BIDS TO REMAIN OPEN:**

All Bids shall remain subject to acceptance for forty-five (45) calendar days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

**AWARD OF CONTRACT:**

OWNER reserves to itself the right to reject any and all Bids, to waive any and all informalities not involving price, time, or changes in the Work, to negotiate contract terms with the successful Bidder, and to disregard all nonconforming, non-responsive, unbalanced, or conditional Bids. Also, OWNER reserves the right to reject the Bid of any Bidder if OWNER believes that Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Bidding Documents.

Discrepancies in the multiplication of units of Work and unit prices shall be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof shall be resolved in favor of the correct sum. Discrepancies between words and figures or tables shall be resolved in favor of words.

In evaluating Bids, OWNER shall consider the qualifications of Bidders, whether or not the Bids comply with the prescribed requirements and such alternates, unit prices, and other data as may be requested in the Bid Form or prior to the Notice of Award. Thoroughness and completeness of Bidder's Construction Plan submitted with the Bid shall also be included in OWNER'S evaluation. Submittal of a construction schedule which OWNER considers, in its sole discretion, to be of an unrealistic duration for completing the Work shall be valid basis for rejecting the Bid.

OWNER will consider the qualifications and experience of those Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in these Instructions to Bidders. OWNER also may consider the operating costs, maintenance requirements, performance data, and guarantees of major items of materials and equipment proposed for incorporation in the Work, when such data is required to be submitted prior to the Notice of Award.

OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders and proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Bidding Documents to OWNER'S satisfaction within the prescribed time.

A pre-award meeting may be held with the selected Bidder to discuss Bidder's proposed construction plan and to clarify any questions that OWNER may have relating to the Bid.

If the Work is to be awarded, it will be awarded to the lowest responsible Bidder whose evaluation by OWNER indicates that the award will be in the best interests of OWNER and the Work.

**SIGNING OF AGREEMENT:**

When OWNER gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned copies of the Agreement with all other written Contract Documents attached. Within ten (10) days thereafter CONTRACTOR shall sign and deliver the required number of copies of the Agreement and attached Contract Documents to OWNER with the required Bonds, power of attorney, and insurance certificates.

**SECTION 00410  
BID FORM**

**Project:** Sundown Lake SW Basin

**Place:** Moravia, Iowa

**Date:** \_\_\_\_\_

1. In compliance with your REQUEST FOR PROPOSALS dated \_\_\_\_\_, and subject to all conditions thereof, the undersigned \_\_\_\_\_, a Corporation incorporated in the State of \_\_\_\_\_, hereby proposes to furnish and do everything required by the Contract Documents to which this refers at the lump sum or unit prices shown for each bid item on the following Bid Schedule. (The Bid Schedule lists the various divisions of construction contemplated in the Contract Documents, together with an estimate of the units of each for unit price items. With these units as the basis for unit cost items, the bidder will extend each item, using the cost he inserts in the unit column. Any total cost found inconsistent with the unit cost when the bids are examined will be deemed in error and corrected to agree with the unit cost which shall be considered correct.)
2. The undersigned bidder does hereby declare and stipulate that this proposal is made in good faith, without collusion or connection with any other person or persons bidding for the same Work, and that it is made in pursuance of and subject to all the terms and conditions of the Invitation to Bid and Instructions to Bidders, the Agreement, the Contract Drawings, and the Specifications pertaining to the Work to be done, all of which have been examined by the undersigned.
3. The undersigned has examined the location of the proposed Work, the Drawings, Specifications, and other Contract Documents and is familiar with the local conditions at the place where the Work is to be performed.
4. The undersigned bidder agrees to execute the Agreement and a Performance Bond and a Payment Bond for the amount of the total of this Bid within ten (10) calendar days from the date when the written Notice of the Award of the Agreement is delivered to him at the address given on this Bid. The name and address of the corporate surety with which the Bidder proposes to furnish the specified Performance and Payment Bonds is as follows:  
  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. All the various phases of Work enumerated in the Contract Documents with their individual jobs and overhead, whether specifically mentioned, included by implication or appurtenant thereto, are to be performed by the Contractor under one of the items listed in the Bid Schedule, irrespective of whether it is named in said list.

6. Payment for Work performed will be in accordance with the Bid Schedule subject to changes as provided in the Contract Documents.
7. The undersigned Bidder hereby acknowledges Addenda No. \_\_\_\_ through \_\_\_\_.

**PRICES:**

The foregoing prices shall include all labor, materials, equipment, transportation, shoring, removal, dewatering, overhead, profit, insurance, permits, taxes, etc., to cover the completed Work in place of the several kinds called for.

BIDDER acknowledges that the Owner has the right to delete items in the Bid or change quantities at his sole discretion without affecting the Agreement or prices of any item so long as the deletion or change does not exceed twenty-five percent (25%) of the total Contract Amount.

**QUANTITIES:**

The approximate quantities of Work to be completed in place under the Agreement at unit prices are identified in the "Bid Schedule" and are for the purpose of comparing bids. These quantities have been estimated from the Contract Documents. The quantities used are for the general information of the bidder and represent the major items of the work to be done. Minor items and minor details are not listed but shall be part of the complete Agreement.

**SCHEDULE:**

Contractor to provide proposed schedule of services including anticipated start and completion dates and any significant times work will not be performed in between start and completion. See Contract Agreement for Substantial and Final Completion dates.



**BID TABULATIONS:**  
**FOR REFERENCE – VIRTUAL BIDS ONLY**

SUMMARY OF QUANTITIES				
GENERAL BID ITEM DESCRIPTION:	QUANTITY	UNIT	UNIT PRICE	EXTENSION
<b>SUNDOWN SW BASIN</b>				
MOBILIZATION	1	LS		
CLEARING AND GRUBBING	1	LS		
HANDLING OF WATER	1	LS		
EROSION CONTROL (SWPPP)	1	LS		
SURVEY & STAKING	1	LS		
EARTH EMBANKMENT	120387	CY		
STRIP, STOCKPILE, AND REPLACE 9" TOPSOIL	3491	CY		
EXCAVATION - LOCAL SPOIL	9735	CY		
SEEDING - GRASS SEED MIX	6.4	AC		
SEEDING - FLOODPLAIN SEED MIX	3.2	AC		
EROSION CONTROL MATTING	37600	SY		
FORMED CONCRETE FOR RISER	8	CY		
STEEL REINFORCING BARS FOR RISER	1082	LBS		
ANGLE IRON TRASH RACK AND APPURTUNANCES	1	LS		
24" HDPE PIPE	87	LF		
24" SMP PLACEMENT	18	LF		
CLASS 'E' ROCK RIPRAP	1,750	TN		
GRAVEL	14	CY		
TOTAL BID				

**RESPECTFULLY SUBMITTED:**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
License Number (if applicable)

(SEAL - IF BID is by a corporation)

Attest \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone: \_\_\_\_\_

**SECTION 00430**  
**BID BOND**

Bond No. \_\_\_\_\_  
Amount: \$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS that

\_\_\_\_\_, as  
PRINCIPAL, and \_\_\_\_\_, as SURETY,  
are held and firmly bound unto the **Sundown Lake RIZ Board of Trustees**, hereinafter called the  
OBLIGEE, in the penal sum of

\_\_\_\_\_ DOLLARS(\$)  
lawful money of the United States of America, for the payment of which we bind ourselves, our heirs,  
executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

WHEREAS, the PRINCIPAL has submitted the accompanying Bid dated, \_\_\_\_\_ 202\_\_,  
for the **Sundown Lake SW Basin** as set out in the accompanying Bid; and WHEREAS, the OBLIGEE  
has required as a condition for receiving said Bid that the PRINCIPAL deposit with the OBLIGEE a Bid  
Bond for said amount conditioned that, in the event of failure to execute the proposed contract for  
such construction and the required Performance and Payment Bonds if the contract is awarded to it,  
that said sum be paid immediately to the OBLIGEE as liquidated damages and not as a penalty for  
the PRINCIPAL'S failure to perform.

NOW, THEREFORE, if the PRINCIPAL shall, within the period specified:

A. On the attached prescribed forms presented to it for signature, enter into a written contract with  
the OBLIGEE in accordance with its Bid as accepted and give Performance and Payment Bonds with  
good and sufficient surety or sureties as may be required upon the forms prescribed in the contract  
documents for the faithful performance and the proper fulfillment of said contract; or

B. Pay to the OBLIGEE the penal sum of this bond as liquidated damages and not as a penalty;

Then this obligation shall be void and of no effect, otherwise to remain in full force and effect.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 202\_\_.

\_\_\_\_\_  
PRINCIPAL

By: \_\_\_\_\_

\_\_\_\_\_  
SURETY

By: \_\_\_\_\_  
Attorney-In-Fact

*(A certified copy of the agent's power-of-attorney must be attached hereto.)*

**SECTION 00520  
CONTRACT AGREEMENT**

THIS AGREEMENT, with an effective date of the \_\_\_ day of \_\_\_\_\_, 202\_\_\_. is made and entered into between the **Sundown Lake Rural Improvement Zone Board of Trustees**, (hereinafter called "Owner"), and \_\_\_\_\_, a corporation with a principal place of business at \_\_\_\_\_, (hereinafter called the "Contractor"), (Owner and Contractor may be collectively referred to herein as "Parties", or individually as "Party").

**Recitals**

**Whereas**, the Owner desires to obtain professional construction services for a project ("Project") as hereinafter provided;

**Whereas**, Contractor represents that it has the requisite skill, experience and personnel and is qualified to perform construction services for the Owner in connection with constructing the Project as specified in this Agreement;

**NOW, THEREFORE**, in consideration of the promises and mutual covenants and obligations set forth herein, the parties mutually agree as follows:

**PART 1 WORK**

**1.1 CONTRACTOR SHALL COMPLETE ALL WORK AS SPECIFIED OR INDICATED IN THE CONTRACT DOCUMENTS AND GENERALLY DESCRIBED AS FOLLOWS:**

**The Project consists of constructing three earthen dams totaling approximately 120,000 cubic yards of earth fill with related rock riprap, reinforced concrete work, channel grading, and other incidental items necessary.**

**The project is located in Appanoose County, Iowa.**

**PART 2 THE PROJECT**

**2.1** The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as the **Sundown Lake SW Basin**. As described herein, the Project shall mean the Work called for in this Agreement.

**PART 3 ENGINEER**

**3.1** The Project has been designed by Houston Engineering ("Engineer"), who will assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

## **PART 4 CONTRACT TIME**

### **4.1 TIME OF THE ESSENCE**

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Agreement.

### **4.2 DATES FOR SUBSTANTIAL COMPLETION FOR THE WORK AND FINAL ACCEPTANCE ARE AS FOLLOWS:**

A. Substantial Completion Date – The Work will be completed on or before **31 May, 2025** in accordance with the terms and conditions of this Agreement. The Dates are based on an anticipated Notice of Award (NOA) prior to **04 October, 2024**.

B. Substantial Completion is defined as that degree of completion of the Project's operating facilities or systems sufficient to provide Owner beneficial operation of the Work. The substantial completion includes all grading to be performed by machines.

C. Final Acceptance Date - Shall be no later than **30 June, 2025** in accordance with the terms and conditions of this Agreement.

D. Final Acceptance is defined as all of the work being complete. It is anticipated that final acceptance shall only be related to any non-machine related grading and seeding.

E. Contractor to provide schedule for anticipated work efforts which includes working continuously at the site to reduce the Owner's responsibility to provide construction oversight by Engineer.

### **4.3 MILESTONES**

A. Not Used

### **4.4 LIQUIDATED DAMAGES**

A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.2 (A) above, plus any extensions thereof allowed in accordance with the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner five hundred dollars (\$500) for each calendar day that expires after the time specified in Paragraph 4.2 (A) and or 4.2 (C) above until the completion dates are satisfied. Owner and Contractor agree that liquidated damages are in lieu of any special, incidental, or consequential damages.

### **4.5 LIABILITIES**

A. Neither party shall be liable to the other for any special, incidental, or consequential damages arising out of its performance or non-performance of obligations hereunder, whether such liability is based in contract, tort (including negligence), or otherwise.

## **PART 5 PRICE**

**5.1** Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents.

**5.2 Not Used**

**5.3** Nothing in this Agreement is a pledge of the Owner's credit, or a payment guarantee by the Owner to Contractor. Any obligation of the Owner to make payments hereunder shall constitute a currently budgeted expense of the Owner, and nothing contained herein shall constitute a mandatory liability, charge, or requirement of or against the Owner in any ensuing fiscal year beyond the then current fiscal year. This Agreement shall never constitute a general obligation or other indebtedness of the Owner, or a multiple fiscal year direct or indirect debt or other financial obligation whatsoever of the Owner within the meaning of the Constitution and laws of the State of Iowa. In the event of a default by the Owner of any of its obligations under this Agreement, the Contractor shall have no recourse against any revenues of the Owner.

## **PART 6 PAYMENT PROCEDURES**

### **6.1 GENERAL**

A. Unless otherwise expressly provided, the prices shown in the Contractor's Bid shall include the cost of all labor, materials, equipment, tools, forms, services, utilities, royalties, fees and any other items or expenses necessary to complete the Project. Work not shown in the Contract Documents, but which is necessary to construct the Project, shall be considered a part of the Project whether specified or not and no separate payment shall be made for these items.

B. Unless otherwise expressly provided in the Contract Documents, the amount to be paid for the work shall include all labor, materials, forms, tools, scaffolding, plant, equipment, services, utilities, royalties, fees, and everything, whether temporary or permanent, necessary to complete the Project.

### **6.2 DETERMINATION OF AMOUNTS AND QUANTITIES**

A. The Owner shall verify amounts and quantities of work performed. To assist the Owner, the Contractor shall make available for inspection any records required by the Owner.

### **6.3 VARIATIONS IN ESTIMATED QUANTITIES**

A. When a pay item in this Agreement is an estimated quantity and when the actual quantity of such pay item varies more than twenty five percent (25%) above or below the estimated quantity stated in this Agreement, an equitable adjustment in the Unit Price shall be negotiated upon demand of either the Owner or Contractor. The Unit Price adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred and twenty five percent (125%) or below seventy-five (75%) of the estimated quantity.

B. If the quantity variation is such as to cause a change in the time necessary for completion of the Project, the Owner may make an appropriate adjustment in the completion date of the Project.

### **6.4 PARTIAL PAYMENTS TO THE CONTRACTOR**

A. The Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about forty-five (45) days after the submission by the Contractor to the Owner of a proper application for payment, which has been reviewed and approved by the Engineer. All such payments will be measured by the schedule of values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided by the Supplementary Conditions:

B. Periodic progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with the General Conditions:

1. 90% percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Owner, and if the character and progress of the Work have been satisfactory to Owner, Owner may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

2. 90% percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

C. Partial payments made by the Owner shall not be considered as an acceptance on the part of the Owner of any part of the Project or of material furnished, but simply as payments on account. Failure of Contractor to provide a schedule, either required or requested by the Owner, may result in the withholding of any payments due the Contractor.

D. The Owner reserves the right to set off any unpaid observation, testing or surveying fees, or other Owner charges from partial payments due the Contractor.

### **6.5 RETAINAGE**

A. The Owner shall withhold no more than 10% of all partial payments until the work required by



the Contract has been performed. Thereafter, the Owner shall not withhold any further amounts as retainage from the monthly payments, provided satisfactory progress is being made in the opinion of the Owner.

## **6.6 OWNER'S RIGHT TO ACCEPT PORTION OF THE PROJECT**

A. The Owner reserves the right to make use of any completed portion of the Project without invalidating the Contract or obligating the Owner to accept the remainder of the Project.

## **6.7 FINAL PAYMENT**

A. Upon final completion and acceptance of the Work in accordance with 01770 – Contract Closeout, Owner shall pay the remainder of the Contract Price as recommended by Engineer.

## **PART 7 CONTRACTOR'S REPRESENTATIONS**

### **7.1 IN ORDER TO INDUCE OWNER TO ENTER INTO THIS AGREEMENT, CONTRACTOR MAKES THE FOLLOWING REPRESENTATIONS:**

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Contract Documents.

E. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.

F. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Time, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

I. Contractor has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by the Owner is acceptable to Contractor.

J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## **PART 8 CONTRACT DOCUMENTS**

### **8.1 CONTENTS**

A. The Contract Documents consist of the following:

1. This Agreement
2. Specifications as listed in the table of contents of the Project Manual
3. Drawings listed on the sheet index bound in the drawings
4. Addenda and Field Orders
5. Exhibits to this Agreement (enumerated as follows):
  - a. Contractor's Bid;
  - b. Documentation submitted by Contractor prior to Notice of Award
6. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
  - a. Notice to Proceed;
  - b. Work Change Directives;
  - c. Change Order(s).

B. The documents listed in Paragraph 8.1 are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 8.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

## **8.2 ORDER OF PRECEDENCE**

A. It is the intent of the parties that the Contract Documents shall be read as calling for a complete, operable and maintainable project. The Contract Documents are intended to be read as complementary, one with another. Any Work called for on any Drawings and not mentioned in the Specifications, or Work described in the Specifications and not shown on any Drawings, is to be regarded as included under this Contract the same as if set forth in the Specifications and exhibited on the Drawings.

B. In interpreting the Contract Documents, words describing materials, or Work having a well-known technical or trade meaning, unless otherwise specifically defined, shall be construed in accordance with such well-known meaning recognized by Engineers, Designers, Architects and the trades. In resolving inconsistencies among two (2) or more sections of the Contract Documents, precedence shall be given in the following respective order:

1. The Contract Agreement (and any Addenda / Change Orders thereto)
2. Supplementary Conditions
3. General Conditions
4. Specifications
5. Drawings

C. The organization of the Specifications into divisions, sections and articles in the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or establish the extent of the Work to be performed by any trade.

D. In the case of any discrepancy either in figures, in the Drawings, or in the Specifications, the matter shall be submitted in writing to the Owner's representative who shall make a determination in writing. Any adjustment by the Contractor without such determination shall be at its own risk and expense. The Owner shall furnish from time to time such detail drawings and other information as it may consider necessary unless otherwise provided.

## **PART 9 MISCELLANEOUS**

### **9.1 TERMS**

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

### **9.2 ASSIGNMENT OF CONTRACT**

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility

under the Contract Documents.

### **9.3 SUCCESSORS AND ASSIGNS**

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

### **9.4 SEVERABILITY**

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

### **9.5 NO WAIVER**

A. No waiver by the Owner of any provision, term or condition of the Contract Documents, or any obligation of the Contractor, shall constitute a waiver of such provision, term or condition on any other occasion or waiver of any other breach by or obligation of the Contractor.

### **9.6 LEGAL COMPLIANCE**

A. Contractor and its Subcontractors shall comply with all laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the Work, including, but not limited to those laws and regulations which require appropriate actions to protect the environment. If the Contractor performs or continues to perform any Work knowing it to be contrary to any law, ordinances, rules and regulations Contractor shall assume full responsibility and shall bear all attributable costs.

B. Contractor shall be responsible for all fines or penalties which are imposed as a result of Contractor's failure to comply with applicable Federal, state and local laws and implementing regulations. The Owner expressly reserves the right to withhold from any periodic progress payment an amount equal to the amount of any unpaid fine or penalty which has been imposed on Contractor for its failure to comply with applicable Federal, state and local environmental laws and implementing regulations.

C. Contractor shall indemnify, defend, and hold harmless the Owner, its officers, agents, and employees, from and against all claims, damages, liabilities, and court awards, including expenses, and reasonable attorney fees, to the extent caused by the negligence or any wrongful act, error, or omission of Contractor, its officers, agents, and employees resulting from or related to Contractor's failure to comply with all applicable Federal, state and local laws and any and all implementing regulations which govern Contractor's construction activities as set forth in the Construction Documents. Contractor shall provide the Owner with prompt notice of any claim for which Contractor or Owner may be liable. The Owner will provide Contractor with prompt notice of any

claim for which indemnification may be sought hereunder. Nothing herein is intended to be or shall be construed to be a waiver of the Owner's governmental immunity under C.R.S. Section 24-10-101, et seq, as amended.

## **9.7 EQUAL OPPORTUNITY**

A. Neither Contractor nor its Subcontractors shall discriminate against any employee or applicant or employment because of race, color, religion, sex, national origin, disability, age, sexual orientation, gender identity, genetic information, familial status, marital status, or veteran status. Contractor shall adhere to acceptable affirmative action guidelines in selecting employees and shall ensure that employees are treated equally during employment without regard to their race, color, religion, sex, national origin, age, sexual orientation, gender identity, genetic information, familial status, marital status, veteran status or disability. Such action shall include, but not be limited to, employment, upgrading, transfer, demotion, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

## **9.8 EXAMINATION OF RECORDS**

A. The Internal Auditor of the Owner, or a duly authorized representative of the Owner shall, until three (3) years after final payment under this Contract have access to and the right to examine any of the Contractor's directly relevant books, documents, papers, or other records involving transactions related to this Contract.

B. The Contractor agrees to include in first-tier subcontracts under this Contract a clause to the effect that the Owner's Internal Auditor, or a duly authorized representative of the Owner shall, until three (3) years after final payment under the subcontract have access to and the right to examine any of the subcontractor's directly relevant books, documents, papers, or other records involving transactions related to the subcontract. "Subcontract," as used in this clause, excludes (1) purchase orders not exceeding \$10,000 and (2) subcontracts or purchase orders for public utility services at rates established to apply uniformly to the public, plus any applicable reasonable connection charge.

C. The periods of access and examination in paragraphs A. and B. above, for records relating to (1) claims, disputes, litigation, arbitration or settlement of claims arising from the performance of this Contract, or (2) costs and expenses of this Contract to which the Owner's Internal Auditor, or duly authorized representative of the Owner has taken exception, shall continue until such claims, disputes, appeals, litigation, or exceptions are finally resolved.

## **9.9 NOTICE**

A. The address given in the Contractor's Proposal is hereby designated as the place to which all communications to the Contractor shall be delivered or mailed.

B. All written communications and notifications to the Owner shall be addressed to:

Houston Engineering, Inc.  
Attention: Mark Jacobs, P.E.  
100 Court Avenue, Suite 202  
Des Moines, IA 50309

Or via email to: [mjacobs@houstoneng.com](mailto:mjacobs@houstoneng.com)

C. The delivery at the above designated place by mail, courier service, or personal delivery of any notice, letter or other communication to the Contractor shall be considered adequate service upon the Contractor and the date of such service shall be the date of delivery.

#### **9.10 LEGAL NOTICES**

A. All legal notices, demands, or other documents or instruments required or permitted to be served upon either Party hereto shall be in writing and shall be deemed duly served when delivered in person to an officer or partner of the Party being served, by facsimile transmission or when mailed certified or registered mail, return receipt requested, postage prepaid addressed to parties at the addresses stated below:

Owner: Sundown Lake Rural Improvement Zone Board of Trustees  
15129 Wild Turkey Lane  
Moravia, Iowa 52571

**In WITNESS WHEREOF**, the Parties hereto have executed this Agreement as of the day and year first above written.

***Sundown Lake Rural Improvement Zone Board of Trustees***

By: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_, 20\_\_\_\_

**ATTEST:** \_\_\_\_\_

**CONTRACTOR:**

CORPORATE SEAL

Company Name: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature – attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Business address: \_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_, 20\_\_.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public in and for Iowa  
My Commission Expires: \_\_\_\_\_

**SECTION 00610**  
**PERFORMANCE BOND**

\_\_\_\_\_ as Principal, hereinafter called the Contractor, and \_\_\_\_\_ as Surety, with general offices in \_\_\_\_\_, a corporation organized under the laws of the State of \_\_\_\_\_ and authorized to transact business in the State of Iowa, are hereby bound unto the **Sundown Lake Rural Improvement Zone Board of Trustees**, as OBLIGEE, hereinafter called the Owner, in the penal sum of \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_) in United States currency for the payment of which sum the Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally.

WHEREAS, the Contractor has entered into a written contract with the Owner dated \_\_\_\_, 202\_\_ for the project in accordance with the contract documents ("contract"), a copy of which is attached hereto and made a part hereof;

NOW, THEREFORE, the conditions of this Performance Bond are such that, if the Contractor shall satisfactorily perform the contract, then this bond shall be null and void; otherwise it shall remain in full force and effect.

THE UNDERSIGNED SURETY for value received hereby agrees that no extension of time, change in, addition to, or other modification of the terms of the contract or work to be performed thereunder or of the specifications of the contract documents shall in any way affect its obligation on this bond and the Surety does hereby waive notice of any such extension of time, change, addition, or modifications. (Any action against the Surety on this bond shall be brought no later than two (2) years from the date fixed for final settlement of the contract)

EXECUTED on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

(SEAL)

\_\_\_\_\_  
CONTRACTOR

By: \_\_\_\_\_  
President

Attest: \_\_\_\_\_

\_\_\_\_\_  
SURETY COMPANY

By: \_\_\_\_\_  
Attorney-In-Fact



**SECTION 00615  
PAYMENT BOND**

\_\_\_\_\_, as Principal, hereinafter called the Contractor, and \_\_\_\_\_  
as Surety, with general offices in \_\_\_\_\_, a corporation organized under the  
laws of the State of \_\_\_\_\_ and authorized to transact business in the State of  
Iowa, are hereby bound unto the **Sundown Lake Rural Improvement Zone Board of Trustees**, as  
OBLIGEE, hereinafter called the Owner, in the penal sum of \_\_\_\_\_  
DOLLARS (\$\_\_\_\_\_) in United States currency for the  
payment of which sum the Contractor and Surety bind themselves, their heirs, executors,  
administrators, successors, and assigns, jointly and severally.

WHEREAS, the Contractor has entered into a written contract with the Owner dated \_\_\_\_\_, 202\_\_  
for the **Sundown Lake SW Basin** in accordance with the contract documents ("contract"), a copy of  
which is attached hereto and made a part hereof;

NOW, THEREFORE, the conditions of this Payment Bond are such that, if the Contractor shall at all  
times promptly make payments of all amounts lawfully due to all persons supplying or furnishing him  
or his subcontractors with labor or material, rental machinery, tools, or equipment used or performed  
in the prosecution of the work provided for in the contract and shall indemnify and save harmless the  
Owner to the extent of any payments in connection with the performance of such contracts that the  
City of Creston may be required to make under law, then this obligation shall be null and void;  
otherwise it shall remain in full force and effect.

THE UNDERSIGNED SURETY for value received hereby agrees that no extension of time, change in,  
addition to, or other modification of the terms of the contract or work to be performed thereunder or  
of the specifications of the contract documents shall in any way affect its obligation on this bond and  
the Surety does hereby waive notice of any such extension of time, change, addition, or  
modifications.

(Any action against the Surety on this bond shall be brought no later than two (2) years from the date  
fixed for final settlement of the contract)

EXECUTED on this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
CONTRACTOR

(SEAL)

By: \_\_\_\_\_  
President

\_\_\_\_\_  
SURETY COMPANY

By: \_\_\_\_\_  
Attorney-In-Fact

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.



24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.



2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
  1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

## **ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

### **5.01 *Availability of Lands***

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

### **5.02 *Use of Site and Other Areas***

- A. *Limitation on Use of Site and Other Areas:*
  - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
  - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.



## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

#### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

#### 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

#### 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01   *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02   *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### **7.03   *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and



guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
- 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
- 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to



provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01    *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02    *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03    *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04    *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05    *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06    *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07    *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.



- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### ARTICLE 12 – CLAIMS

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### **13.01 *Cost of the Work***

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.



- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

## ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

### 14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### 14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.



- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SECTION 01019**  
**CONTRACT CONSIDERATIONS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Codes and regulations.

1. Contract document interpretation.
2. Lands of work.
3. Guarantee.
4. Contract amount.
5. Measurement and payment – unit prices.
6. Contractor's Liability Insurance.

**1.2 RELATED SECTION**

A. All sections.

**1.3 CODES AND REGULATIONS**

A. Comply with all applicable codes and regulations.

**1.4 CONTRACT DOCUMENT INTERPRETATION**

A. Items required or indicated to be done for the project are the responsibility of the Contractor unless otherwise identified in the Contract Documents as being someone else's responsibility.

B. If discrepancies or conflicts are found in the Contract Documents, request interpretation from the Engineer before proceeding with the work.

C. Failure to request interpretation will not excuse completion of the work in an unsatisfactory manner.

**1.5 LANDS FOR WORK**

A. Perform all work within the right-of-ways or limits of construction indicated on the drawings.



B. Minimize disruption of the designated lands for work. Disturb only areas which need to be used to properly accomplish the work.

C. Save the Owner and its agents harmless for all damages resulting from disruption of private or public property outside the designated lands for work.

D. Coordinate work with all utilities companies which may occupy right-of-ways designated as lands for work.

E. Coordinate work with other entities which may be performing work on right-of-ways designated as lands of work.

F. If access to rights-of-way or property outside the designated lands for work is necessary to perform the work; Contractor shall make all necessary arrangements for agreements with landowners for such access or right-of-way and shall schedule all construction operations with the appropriate Owner(s) at least 48 hours in advance.

## **1.6 GUARANTEE**

A. Guarantee all work for one year after acceptance of the project.

B. Promptly repair or replace at no cost to the Owner all defects in material or workmanship which may appear during the guarantee period.

## **1.7 CONTRACT AMOUNT**

A. Final contract amount(s) will be computed by applying unit bid prices to the actual quantity of each pay item authorized by the Owner and constructed as specified. Unless otherwise indicated in 1.8 Measurement and Payment – Unit Prices, unit bid prices shall include all materials, labor, tools, equipment, profit and all overhead cost for bonds, insurance, taxes, mobilization, freight, regulatory work items for which there is no specific pay item, etc.

B. Minor items necessary to provide complete, serviceable facilities shall be included in the bid prices and furnished even if not specifically called for by the plans or specifications.

C. Items of work which are called for by the plans and specifications, but for which no pay item is described shall be considered subsidiary to the cost of related pay items.

## **1.8 MEASUREMENT AND PAYMENT – UNIT PRICES**

A. Mobilization shall include all bonds, permits, insurance, administrations, transportation to and from the site, operating supplies, staking for construction, detailed construction layouts, meetings, and coordination necessary to provide, manage, and maintain a construction force

at the project site complete and ready to perform all work required under the contract. Protection methods to avoid damage to existing infrastructure (pipes, utilities, buildings, fences, etc) are included in this item as well as clean up to the construction site(s), restoring site(s) to original condition and de-mobilization of construction forces upon approval of the completed project. Clean-up will include repairing roads, trails, and any paved surfaces to original condition if damaged. The pay item is a lump sum.

- B. Clearing and Grubbing shall include all materials, disposal and incidental items necessary to complete the clearing and grubbing as described on the plan set of trees, shrubs, and other vegetation not specifically identified under a separate bid item. Removal of debris, and trash or rubbish is included as required under the contract. The pay item is a lump sum.
- C. Handling of Water shall include all labor, materials, planning, and coordination of the development, implementation and execution of a water handling plan to handle rainfall, surface water runoff through the site or impounded by the existing or proposed embankments, and groundwater that may seep up into work areas. It is intended that the water will be handled to allow the contractor to perform work under sufficiently dry conditions. The pay item is one lump sum for all work included in this bid package.
- D. Erosion Control, Stormwater Pollution Prevention Plan (SWPPP) shall include applying for and obtaining the National Pollutant Discharge Elimination System (NPDES) permit through Iowa Department of Natural Resources and all preparation, installation, record keeping, management/maintenance for regulatory compliance, excavation, dewatering, backfill, materials, supplemental BMPs, and incidental items necessary to construct and maintain sediment and erosion control during the construction period in compliance with NPDES regulations and to remove and dispose of non-permanent sediment control practices after vegetation is established. **Seeding and Erosion Control Blanket are not to be included in this line item**, individual line items have been provided as needed below. The pay item is a lump sum.
- E. Survey & Staking shall include all preparation, installation, record keeping, management/maintenance of control points and/or temporary benchmarks, using GPS files and equipment, and any staking the Contractor requires for proper construction. The pay item is a lump sum.
- F. Earthen Embankment shall include all materials, stripping, subgrade preparation, dewatering, excavation, spreading, mixing, rolling, grading, water necessary for proper compaction in accordance with the plans and specification requirements, and incidental items necessary to complete the construction of the earth embankments for the project per the construction documents. Excavation of borrow material (including any stripping or overexcavation required to get to the material) and hauling from within proposed cell required for the

embankment is subsidiary to this pay item and is to be completed according to the construction documents. Monitoring the embankment for settlement and performing the necessary repairs to meet plan and specification requirements is included in this pay item. The pay item is one cubic yard in place, as computed from proposed grading and existing surface contours and measured in place as planned.

- G. Strip, Stockpile and Replace 9" Topsoil shall include all items necessary to remove nine (9) inches of topsoil from the locations shown for excavation on the construction documents, stockpiling the material and then replacing the topsoil in the same locations. This shall include all labor, materials, dewatering, excavation, stockpiling, spreading and finish-grading topsoil in the areas detailed in the construction documents. The pay item is one cubic yard in place on completed work areas, measured as planned.
- H. Excavation – Local Spoil shall include all cost for materials, disposal, dewatering, and incidental items necessary to complete excavation of soil or rippable rock materials as shown on the plans. The pay item is one cubic yard as measured and computed from proposed grading and existing surface contours.
- I. Seeding – Grass Seed Mix shall include all labor, materials, subgrade preparation, handling of water, and related work necessary to seed, mulch, establish and maintain planned vegetation turf areas as required under the contract. Mulch will not be required in locations where erosion control matting is placed. The pay item is one acre, as planned, of the type(s) listed in the specification, computed to the nearest one-tenth acre from measured dimensions of seeded areas within the limits of construction.
- J. Seeding – Floodplain Mix shall include all labor, materials, subgrade preparation, handling of water, and related work necessary to seed, mulch, establish and maintain planned channel and floodplain vegetation areas as required under the contract. Mulch will not be required in locations where erosion control matting is placed. The pay item is one acre, as planned, of the type(s) listed in the specification, computed to the nearest one-tenth acre from measured dimensions of seeded areas within the limits of construction.
- K. Erosion Control Matting shall include all materials, subgrade preparation, handling of water, and related work necessary to place and secure erosion control blanket and maintain as required under the contract. The pay item is one square yard, measured in place as planned.
- L. Formed Concrete for Riser shall include all labor, materials, equipment, excavation, subgrade preparation, aggregate base if necessary, backfill compaction, gate(s), accessories, forms, waterstops, waterlogs, dewatering, appurtenance and incidental items necessary to construct the riser structure as required by the construction plans. The pay item is one cubic yard, measured in place as planned according to detail.

- M. Steel Reinforcing Bars shall include all materials, and incidental items necessary for completing steel reinforcement for concrete. The pay item is one pound measured by the computed weight of reinforcing steel required for construction as planned.
- N. Angle Iron Trash Rack & Appurtenances shall include all labor, materials, equipment, accessories, and incidental items necessary to construct the solid rock trash rack and secure to the top of Cell 3 outlet structure as required by the construction plans. The pay item is lump sum.
- O. 24" Outside Diameter HDPE Pipe shall include all labor, materials, accessories, trenching, dewatering, subgrade preparation, compacted backfill, joint fusing, and incidental items necessary to install solid wall HDPE pipe as required in the contract documents. The pay item is one linear foot, measured in place between the ends of the pipe as planned.
- P. 24" SMP Placement shall include all labor, materials, accessories, trenching, dewatering, subgrade preparation, compacted backfill, joints, connections, and incidental items necessary to install solid wall SMP pipe as required in the contract documents. The pay item is one linear foot, measured in place between the ends of the pipe as planned.
- Q. Class "E" Rock Riprap shall include the materials, excavation, dewatering, subgrade preparation, hauling, placement, and incidental items necessary to complete rock riprap construction of the rock grade control structures, weir outlet protection, low water crossing, and cell principal spillway outlet protection per the construction documents. The pay item is ton, as delivered (with delivery tickets).
- R. Gravel shall include the materials, excavation, dewatering, subgrade preparation, hauling, placement, and incidental items necessary to complete gravel construction of the low water crossing. The pay item is cubic yard, as delivered (with delivery tickets).

## **1.9 CONTRACTOR'S LIABILITY INSURANCE**

A. Contractor agrees to purchase and maintain during the life of this contract the following types of insurance: (1) General Liability (\$1,000,000) Per occurrence-General Aggregate (\$2,000,000), Products - Comp/OPS Aggregate (\$2,000,000), Personal and Advertising Injury (\$1,000,000), Fire Damage (any one fire) (\$50,000), Medical Expense (any one person) (\$10,000); (2) Automobile Liability- Bodily Injury and Property Damage Liability including owned, non-owned, and hired autos, Combined single limit (\$1,000,000); and (3) Worker's Compensation and Employer's Liability (\$50,000), Statutory Limits (\$1,000,000) Each occurrence, Umbrella Coverage (\$2,000,000) Aggregate liability limits shown, and Sundown Lake Rural Improvement Zone to be named as an additional insured and a Waiver of Subrogation in Favor of Sundown Lake Rural Improvement Zone.

B. Contractor agrees to indemnify, defend, and hold harmless Sundown Lake Rural Improvement Zone for bodily injury, personal injury and property damage caused out of or in connection with their

work to the extent the loss or damage is caused by them or their Subcontractor. Further, the Contractor agrees to waive its rights of subrogation from its insurance carrier in relation to any loss or damage.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**SECTION 01039**  
**COORDINATION AND MEETINGS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Coordination
- B. Field engineering
- C. Preconstruction meeting

**1.2 RELATED SECTIONS**

- A. All sections

**1.3 COORDINATION**

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Coordinate and schedule all construction operations to comply with access restrictions of the limits of construction.
- C. Coordinate and schedule all construction operations within project limits of construction so that free access of vehicular and pedestrian traffic to adjacent property is maintained at all times.
- D. Provide all required traffic control, flagmen, barricades, signs, etc.
- E. Identify all utility companies which have facilities which may be impacted by project construction operations.
- F. Coordinate work adjacent to or involving utilities, with utility companies.
- G. Schedule all work which may impact any utility with the appropriate utility companies at least 48 hours before commencing such work.
- H. Coordinate all construction operations with those of utility company forces which may be on site to accomplish utility relocations or reconstruction.
- I. Coordinate completion and clean up of Work of separate project segments in preparation for Substantial Completion.

#### **1.4 FIELD ENGINEERING**

A. Contractor is solely responsible for the means and methods of construction staking and for the adequacy and accuracy of the layout of the Work.

B. Contractor to record and document project component layout information and assist Owner/Engineer with review or field checking of layouts.

C. Record and document project component layout information and assist Owner/Engineer with review or field checking of layouts.

#### **1.5 PRECONSTRUCTION MEETING**

A. Preconstruction conference details are as defined in Section 1.07 of the General Conditions.

#### **PART 2 PRODUCTS**

Not Used

#### **PART 3 EXECUTION**

Not Used

## **SECTION 01300 SUBMITTALS**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Product data.
- E. Shop drawings.
- F. Samples.
- G. Manufacturer's installation instructions.
- H. Manufacturers certificates.

#### **1.2 RELATED SECTIONS**

- A. All sections.

#### **1.3 SUMMITTAL PROCEDURES**

- A. Transmit each submittal with a transmittal letter or form listing items submitted.
- B. Sequentially number the transmittal form. Revise submittal with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp or statement, signed or initialed certifying Contractor has reviewed the submittal and verified Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project and deliver to Engineer's office. Coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from the contractor.



G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

H. Revise and resubmit as required, identify all changes made since previous submission.

I. Submittals not requested will not be recognized or processed.

#### **1.4 CONSTRUCTION PROGRESS SCHEDULES**

A. Submit initial schedule along with Bid.

B. Submit schedule revisions with each Application for Payment, identifying changes since previous version.

#### **1.5 PROPOSED PRODUCTS LIST**

A. Within 20 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference stands.

#### **1.6 PRODUCT DATA**

A. Submit the number of copies which the Contractor wants returned, plus three copies which will be retained by the Engineer and Owner.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufactures' standard data to provide information unique to this Project.

#### **1.7 SHOP DRAWINGS**

A. If multiple hard copies are requested to be returned to the Contractor, submit the number of opaque reproductions which Contractor requires returned, plus three copies which will be retained by Engineer and Owner.

B. If a single, scanned electronic copy of the processed drawing is acceptable to the Contractor, a single electronic copy may be submitted to the Engineer for approval.

#### **1.8 SAMPLES**

A. If requested submit samples of the following items:

1. Geotextile materials.

2. Concrete materials.

### 3. Pipe Products

#### **1.9 MANUFACTURER INSTALLATION INSTRUCTIONS**

A. When specified in individual specification sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.10 MANUFACTURER CERTIFICATES**

A. When specified in individual specification sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.

B. Indicate materials or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be based on recent or previous test results on material or Product, if acceptable to Engineer.

#### **PART 2 PRODUCTS**

Not Used

#### **PART 3 EXECUTION**

Not Used

## **SECTION 01325 CONSTRUCTION STAKING**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

A. This Section specifies administrative and procedural requirements for construction staking. All field survey efforts required for the effective prosecution of the Work, except for those items specifically identified as provided by Owner or Engineer, are to be provided by Contractor.

#### **1.2 QUALITY ASSURANCE**

A. Work described shall be performed under the direct supervision of a Professional Surveyor registered in the State of the work being conducted.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

#### **3.1 CONSTRUCTION STAKING**

A. Contractor is solely responsible for setting Control Points.

B. Contractor is solely responsible for the means and methods of construction staking and for the adequacy and accuracy of the layout of the Work.

C. Electronic files will be provided for GPS compatible equipment.

D. Site layout/staking point data can be provided by Engineer upon request by Contractor once under contract. A minimum of 7 days notice required for such request.

#### **3.2 EXAMINATION**

A. All control points will be set at the beginning of the Work. Contractor is responsible for verifying layout and utility information. Once control points as described are set, Contractor shall protect stakes and other markings, and replace them at Contractor's cost if they are lost or destroyed.

B. Verify layout information shown on Drawings in relation to the property survey and existing benchmarks. Locate and protect existing benchmarks and control points, including city monuments in intersections. Preserve permanent reference points and construction stakes during construction.

C. Should minor adjustments to the "design" be needed as Work progresses to accommodate actual field conditions, notify Resident Project Representative immediately. Such adjustments shall be reviewed with the Resident Project Representative before the Work is performed.

D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning Site Work, investigate and verify the existence and location of underground utilities and other construction.

1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping.

C. Should minor adjustments to the "design" be needed as Work progresses to accommodate actual field conditions, notify Resident Project Representative immediately. Such adjustments shall be reviewed with the Resident Project Representative before the Work is performed.

D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning Site Work, investigate and verify the existence and location of underground utilities and other construction.

1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping.

### **3.3 PERFORMANCE**

A. Contractor to establish markers to set lines and levels at each area of Work and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Prepare "cut sheets" and other construction aids as required to accurately install the Work. Note any changes in line or grade on the Record Drawings to be delivered to Engineer at the completion of Project.

## **SECTION 01400 QUALITY CONTROL**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Quality assurance – control of installation.
- B. Tolerances.
- C. References.
- D. Testing.
- E. Manufacturer field services and reports.

#### **1.2 RELATED SECTIONS**

- A. All sections.

#### **1.3 QUALITY ASSURANCE – CONTROL OF INSTALLTION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instruction conflict with Contract Documents, request clarification from Resident Project Representative before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

#### **1.4 TOLERANCES**

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Resident Project Representative before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

## **1.5 REFERENCES**

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

The contractual relationship, duties, and responsibilities of the parties in Contract as well as those of the Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference documents.

## **1.6 TESTING**

A. Testing performed as part of the testing allocation allowance includes testing required by the following specification sections:

Section 02205 – Soil Materials

Section 02223 – Backfilling

Section 03300 – Cast-In-Place Concrete

B. Unless otherwise specified perform and pay for all other test and instrument installation required for the Project.

C. Submit reports of required tests to Engineer indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

D. Cooperate with Engineer or independent firm performing any tests not required to be performed by Contractor. Furnish samples of materials, design mixes, equipment, tools, storage, safe access, and assistance by incidental labor as requested

E. Testing does not relieve Contractor from performing Work to contract requirements.

## **1.7 MANUFACTURER FIELD SERVICES AND REPORTS**

A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and to initiate instructions when necessary.

B. Report observation and site decisions or instruction given to applicators or installers that are supplemental to or different from manufacturers' written instructions to the Engineer prior to work.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

**SECTION 01500**  
**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Construction Facilities: Sanitary facilities, protection, access roads, parking, and progress cleaning.

**1.2 RELATED SECTIONS**

A. All sections.

**1.3 TEMPORARY SANITARY FACILITIES**

A. Provide and maintain temporary sanitary facilities and enclosures to comply with applicable regulatory agency requirements.

**1.4.1 TRAFFIC CONTROL AND PROTECTION**

A. Provide adequate vehicular and pedestrian traffic management measures and devices for temporary (or permanent where applicable) closing of transportation routes that will be disrupted by the project; ensure public safety; and to comply with applicable governmental regulations regarding traffic control.

B. Provide pedestrian trail management and devices for temporary closing of pedestrian trail routes that may be disrupted by the project as per the contract documents.

C. Prepare, implement, and maintain a traffic control plan for the Project that is consistent with requirements of the Manual of Uniform Traffic Control Devices (MUTCD), and is acceptable to Project sponsors and transportation route owners.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

**1.5 WATER CONTROL**

A. Grade site to drain. Maintain excavations sufficiently free of water to allow proper construction of Work items. Provide, operate, and maintain pumping equipment as necessary.

B. Protect site and construction items from damage by puddling or running water.

C. During entire construction period, provide and maintain construction erosion and sediment control measures as required by Contract Documents.

**1.6 PROTECTION OF INSTALLED WORK**



A. Protect installed work from damage. Provide special protection where specified in individual specification sections or construction plans.

B. Provide temporary and removable protection for installed Products. Control activity in immediate work areas to prevent damage.

C. Provide protection for all stored material to be used in the Project construction.

## **1.7 ACCESS ROAD**

A. Construct and maintain temporary access as needed and approved by Engineer to serve construction areas and adjacent properties. Remove and restore site to original conditions upon completion of Work.

## **1.8 PARKING**

A. Provide for temporary parking areas within the Project site to accommodate construction personnel and equipment. Remove and restore site to original conditions upon complete of Work.

## **1.9 PROGRESS CLEANING AND WASTE REMOVAL**

A. Maintain project site free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Finish and clean up individual portions of project as they are completed.

## **PART 2 PRODUCTS**

Not Used.

## **PART 3 EXECUTION**

Not Used.

**END OF SECTION**

**SECTION 01600**  
**MATERIAL AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

**1.2 RELATED SECTIONS**

- A. All sections.

**1.3 PRODUCTS**

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

**1.4 TRANSPORTATION AND HANDLING**

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

**1.5 STORAGE AND PROTECTION**

- A. Store and protect Products in accordance with manufacturer's instruction, with seals and labels intact and legible.
- B. Store sensitive Products in weather tight, climate-controlled enclosures.
- C. For exterior storage of fabricated Products, place on sloped supports above ground.
- D. Provide off-site storage and protection when site does not permit onsite storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular material on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

## **1.6 PRODUCT OPTIONS**

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or descriptions.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

## **1.7 SUBSTITUTIONS**

A. Engineer will consider requests for Substitutions before bid opening, or within 15 days after date of Notice to Proceed.

B. Substitutions may subsequently be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
2. Will provide the same or greater warranty for the Substitution as for the specified Product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete, with no additional cost to the Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities if requested by Owner.

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## **SECTION 01770 CONTRACT CLOSEOUT**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

A. This Section specifies administrative and procedural requirements for Contract closeout including, but not limited to:

1. Warranties and Bonds.
2. Requirements for Substantial Completion.
3. Project record document submittal.
4. Equipment acceptance.
5. Operating and maintenance manual submittal.
6. Final cleaning.

B. Refer to the General Conditions for terms of CONTRACTOR's special warranty of workmanship and materials.

C. Specific requirements for warranties for the Work and products and installation that are specified to be warranted, are included in the individual Sections of Divisions 2 through 16.

D. Certifications and other commitments and agreements for continuing services to OWNER are specified elsewhere in the Contract Documents.

#### **1.2 WARRANTY REQUIREMENTS**

A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with CONTRACTOR.

B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding; reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether OWNER has benefited from use of the Work through a portion of its anticipated useful service life.

E. OWNER's Recourse: Written warranties made to OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which OWNER can enforce such other duties, obligations, rights, or remedies.

F. Rejection of Warranties: OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with the requirements of the Contract Documents.

G. OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

### **1.3 SUBSTANTIAL COMPLETION**

A. Before requesting inspection for certification of Substantial Completion, complete the following. Contractor shall list exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.
2. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
3. Advise OWNER of pending insurance changeover requirements.
4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
5. Obtain and submit releases enabling OWNER unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates, and similar releases.
6. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, Resident Project Representative will either proceed with inspection or advise CONTRACTOR of unfilled requirements.

1. ENGINEER will prepare the Certificate of Substantial Completion following inspection or advise CONTRACTOR of construction that must be completed or corrected before the certificate will be issued.

2. Resident Project Representative will repeat inspection when requested and assured that the Work has been substantially completed.

3. Results of the completed inspection will form the basis of requirements for final acceptance.

C. The warranty period for specific portions of the Work will begin on the date established on Component Acceptance Form or at such other date as agreed by OWNER, ENGINEER, and CONTRACTOR.

#### **1.4 FINAL ACCEPTANCE**

A. Before requesting final inspection for certification of final acceptance and final payment, complete the following. Contractor shall list exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Price.

3. Submit a copy of ENGINEER's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by ENGINEER.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when OWNER took possession of and responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit a final liquidated damages settlement statement.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

8. Submit record drawings, maintenance manuals, final Project photographs, damage or settlement survey, property survey, and similar final record information.

9. Deliver tools, spare parts, extra stock, and similar items.

10. Make final changeover of permanent locks and transmit keys to OWNER. Advise OWNER's personnel of changeover in security provisions.

11. Complete start-up testing of systems, and instruction of OWNER's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

B. Reinspection Procedure: ENGINEER will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to ENGINEER.

1. Upon completion of reinspection, ENGINEER will prepare a certificate of final acceptance, or advise CONTRACTOR of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

## **1.5 SUBMITTALS**

A. Submit written warranties to ENGINEER prior to the date certified for Substantial Completion. If ENGINEER's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of ENGINEER.

B. When a designated portion of the Work is completed and occupied or used by OWNER, by separate agreement with CONTRACTOR during the construction period, submit properly executed warranties to ENGINEER within 15 days of completion of that designated portion of the Work.

C. When a special warranty is required to be executed by CONTRACTOR, or CONTRACTOR and a subcontractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to OWNER through ENGINEER for approval prior to final execution.

## **1.6 RECORD DOCUMENT SUBMITTALS**

A. Record Drawings:

1. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown.

2. Mark whichever Drawing is most capable of showing conditions fully and accurately.

3. Where shop drawings are used, record a cross-reference at the corresponding location on Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.



4. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

5. Mark new information that is important to OWNER but was not shown on Contract Drawings or Shop Drawings.

6. Note related Change Order numbers where applicable.

7. Organize Record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

B. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work.

1. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to ENGINEER for OWNER's records.

## **PART 2 PRODUCTS**

Not Used.

## **PART 3 EXECUTION**

### **3.1 FINAL CLEANING**

A. General cleaning during construction is required by the General Conditions.

B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Comply with regulations of authorities having jurisdiction and safety standards for cleaning.

1. Do not burn waste materials. Do not bury debris or excess materials on OWNER's property.

2. Do not discharge volatile, harmful, or dangerous materials into drainage systems.

3. Remove waste materials from Site and dispose of in a lawful manner.

E. Where extra materials of value remaining after completion of associated Work have become OWNER's property, arrange for disposition of these materials as directed.

**END OF SECTION**

## **SECTION 02205 SOIL MATERIALS**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Subsoil materials
- B. Topsoil materials

#### **1.2 RELATED SECTIONS**

- A. All sections

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 - Contract Considerations.

#### **1.4 REFERENCES**

- A. ASTM 0698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb Rammer and 12 inch Drop.
- B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D2167 - Test Method for Density and Unit Weight of Soils in Place by the Rubber Balloon Method.
- D. ASTM 02487 - Classification of Soils for Engineering Purposes.
- E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- F. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

### **PART 2 PRODUCTS**

#### **2.1 SUBSOIL MATERIALS**

- A. Subsoil, Class "A": Clay or clayey subsoil, and glacial till subsoil, from project excavations and borrow sites, substantially free of organic material, graded free of vegetative material, gravel or lumps larger than 3 inch size, and debris; conforming to ASTM D2487 group symbol CL or CH with at

least 51% passing the No. 200 sieve as determined by ASTM D1140; sand content not more than 25% by weight; capable of being broken down, mixed, compacted and kneaded to form a dense uniform; and relatively impervious earth fill.

B. Subsoil, Class "B": Clayey subsoil from project excavations and borrow site, graded free of vegetative material, rocks or lumps larger than 6" size, and debris.

## **2.2 TOPSOIL MATERIALS**

A. Topsoil stockpiled from site stripping and clearing operations, graded free of roots, debris and rocks or lumps larger than 1-1/2 inch size and substantially free of vegetative material.

## **PART 3 EXECUTION**

### **3.1 SOIL REMOVAL**

A. Excavate subsoil and topsoil from areas designated for project grading or construction.

B. Remove lumped soil, vegetative material, boulders, and rock.

C. Stockpile sufficient excavated material on-site to construct project fills in accordance with Section 02223 - Backfilling. Waste excess material not being used for project fills at locations indicated on drawings.

### **3.2 STOCKPILING**

A. Separate topsoil and subsoil materials to prevent mixing.

B. Prevent contamination of stockpiled material.

C. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

### **3.3 STOCKPILE CLEANUP**

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

**SECTION 02207**  
**AGGREGATE MATERIALS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Aggregate materials other than rock riprap materials.

**1.2 RELATED SECTIONS**

A. All sections.

**1.3 MEASUREMENT AND PAYMENT**

A. Section 01019 - Contract Considerations.

**1.4 REFERENCES**

A. AASHTO M147 - Materials for Aggregate and Soil Aggregate.

B. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

C. ASTM D698 - Test Methods for Moisture-Density Relations of Sails and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

D. ASTM D4253 - Maximum Index Density and Unit Weight of Soils using a vibratory table.

E. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

F. ASTM D2487 - Classification of Soils for Engineering Purposes.

G. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

H. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

I. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

J. ASTM D2434 - Test Method for Permeability of Granular Soils (Constant Head).

K. State of Iowa Department of Transportation - Standard Specifications with GS-15009 Revisions.

L. ASTM C33 - Standard Specifications for Concrete Aggregates.

## **1.5 SUBMITTALS FOR REVIEW**

A. Section 01300 - Submittals: Procedures for submittals.

B. Submit supplier's testing laboratory gradation analysis of proposed aggregate material(s).

C. Submit supplier's testing laboratory density analysis for proposed aggregate material(s).

D. Submit supplier's testing laboratory permeability analyses for proposed drainage system aggregates.

## **PART 2 PRODUCTS**

### **2.1 AGGREGATE MATERIALS**

A. Gravel: material for low-water crossing shall conform to Iowa DOT Class C Gravel (Granular Surfacing - Gradation No. 10) gradations and material requirements as per Section 4120 of the Iowa DOT Standard Specification.

### **2.2 SOURCE QUALITY CONTROL**

A. Section 01400 - Quality Control.

B. Provide materials of each type from same source throughout the work unless original source cannot meet requirements.

## **PART 3 EXECUTION**

### **3.1 STOCKPILING**

A. Stockpile materials on site.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials to prevent mixing.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

### **3.2 STOCKPILE CLEANUP**

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

## **SECTION 02222 EXCAVATING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Excavation and salvaging of topsoil.
- B. Excavation and preparation of foundation for fills.
- C. Excavation of site borrow area(s).
- D. Excavation of site to planned grade and contours.

#### **1.2 RELATED SECTIONS**

- A. All sections.

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 - Contract Considerations.

#### **1.4 FIELD MEASUREMENTS**

- A. Verify that survey benchmarks and existing contours for the work site are as indicated on the drawings.

#### **1.5 DEFINITIONS**

- A. Maximum Dry Density: As defined by ASTM D698-78.
- B. Optimum Moisture Content: Determined by the ASTM standard specified to determine the maximum dry density or relative density. Field moisture content shall be determined on the basis of the fraction passing the 3/4 inch sieve.
- C. Relative Density: As defined by ASTM D4253 and D4254.
- D. Prepared Ground Surface: The ground surface after clearing, grubbing, stripping, excavation, and scarification and/or compaction.
- E. Completed Course: A course or layer that is ready for the next layer or next phase of the work.
- F. Well-Graded: A mixture of particle sizes that has no specific concentration or lack of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of

uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

G. Waste: Excess soil from designated excavations, oversize soil or rock particles, excess stripping, borrow that is frozen or borrow that the Contractor chooses not to utilize because it is too wet or dry for immediate placement. Waste does not include trash, debris from clearing and grubbing, or any other garbage.

H. Earth Excavation shall be defined as the excavation of all types of materials that can be excavated, transported, and unloaded (without the absolute necessity of blasting) by use of heavy ripping equipment, wheel tractor-scrapers, and pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by means of excavators equipped with attachments (such as shovel, bucket, backhoe, drag line or clam shell) appropriate to the character of the materials and the site conditions.

I. Heavy ripping equipment shall be defined as a rear-mounted, heavy duty, single tooth, ripping attachment mounted on a tractor having a power rating of 200-300 net horsepower (at the flywheel).

J. Wheel tractor-scraper shall be defined as a self-loading (not elevating) and unloading scraper having a struck bowl capacity of 12-20 yards.

K. Pusher tractor shall be defined as a track type tractor having a power rating of 200- 300 net horsepower (at the flywheel) equipped with appropriate attachments.

L. Borrow: Material excavated from required excavations, designated borrow areas, or Contractor-selected borrow areas, as approved by the Engineer.

M. Backfill: Materials used to construct embankments, fill excavations and trenches, or to fill around or beneath structures or pipes.

N. Imported Material: Material obtained by the Contractor from sources off the site.

## **1.6 SHORING, SHEETING, BRACING, AND SLOPING**

A. Install and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of the excavation, to keep and to prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Install and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations and agencies.



## **1.7 EXCAVATION SAFETY**

A. The Contractor shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to retain excavation side slopes and prevent rock falls to ensure that persons working in or near the excavation are protected.

## **1.8 CODES, ORDINANCES, AND STATUTES**

A. Contractors shall familiarize themselves with, and comply with, all applicable codes, ordinances, statutes, and bear sole responsibility for the penalties imposed for noncompliance.

## **1.9 TOLERANCES**

A. All excavations to finish grade shall be constructed within a tolerance of 0.1 foot except where dimensions or depths are shown or specified as minimum. All grading shall be performed to maintain slopes and drainage as shown. No unplanned reverse slopes will be permitted.

## **1.10 SUBSURFACE INVESTIGATION AND CONDITIONS**

A. The submission of a Bid shall be conclusive evidence that the Bidder has investigated the site and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the Contract Documents.

B. The Contractor may make arrangements with the Owner for permission to conduct such additional subsurface investigation as may be necessary to verify existing conditions.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

A. Vegetation and debris to be removed from site or wasted in locations approved by Engineer.

B. Stone or rubble to be removed from site.

C. Subsoil and topsoil which may be suitable for backfilling.

D. Subsoil and topsoil which may need to be removed from site or wasted in locations on-site approved by Engineer.

### **2.2 ON-SITE MATERIALS**

A. General: Obtain on-site materials from required excavation for the various facilities; from designated supplemental borrow areas located on the project site or in the reservoir below normal pool elevation, as indicated by the drawings or as approved by the Engineer. Bidders are cautioned

that wide variations in the nature, excavation characteristics, moisture content, and consistency of the on-site materials are to be anticipated. Variations in the level of effort necessary for excavation, obtaining satisfactory moisture content and obtaining an acceptable uniform mixture of fill material is to be expected.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect above and below grade utilities that are to remain from damage.
- C. Notify utility companies to remove or relocate utilities where necessary to complete work.
- D. Protect plant life, and other landscape features remaining as a portion of final landscaping.
- E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

### **3.2 TOPSOIL SALVAGING**

- A. Excavate and salvage topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
- B. Do not excavate topsoil which is saturated due to wet weather or temporary inundation.
- C. Stockpile salvaged topsoil in area(s) on-site to depth(s) not exceeding 8 feet and protect from erosion.
- D. Dispose of excess topsoil, not intended for reuse, at on-site waste areas in a manner acceptable to Engineer.

### **3.3 EXCAVATION**

- A. Perform and complete all earth excavation of every description, regardless of the type, nature, or condition of material encountered, as specified, shown, or necessary to accomplish the excavation. The Contractor shall assume all responsibility for deductions and conclusions as to the nature of the materials to be excavated and the difficulties of making and maintaining the required excavations.
- B. The presence of isolated boulders or rippable rock ledges will not in itself be sufficient cause to change the definition or classification of the excavation.
- C. Excavate to the lines and grades as shown and as necessary to complete the construction. Allow for forms, working space, riprap, bedding, finish topsoil, etc., as shown or necessary. Do not carry excavation for footings and slabs deeper than the elevation shown. Excavation carried below the grade lines shown or established by the Engineer shall be repaired as specified hereinafter. Correct all over-excavated areas at the Contractor's sole expense.
  - 1. Where the overlying area is not to receive class "A" fill or backfill, replace the over-excavated material and compact to a density equal to that required for class "B" Fill.
  - 2. Excavations under structures shall be filled with concrete of strength equal to that of the structures, or compacted granular material if acceptable to Engineer.
  - 3. Where the overlying area is to receive class "A" fill or backfill, replace with Class "A" fill or backfill material and compact as specified for that material. Cuts below grade shall be corrected by similarly cutting adjoining areas and creating a smooth transition.
- D. All necessary precautions shall be taken to preserve the material below and beyond the established lines of all excavation in the soundest possible condition. Any damage to the work beyond the required excavation lines due to frost damage, wetting, drying, or the Contractor's operations shall be repaired at the Contractor's sole expense.

E. Excavation for embankment, structure foundations, and trenches shall be performed in the dry. No excavation shall be made in frozen materials without written approval.

F. Limits of excavation to safely accomplish the work shall be determined by the Contractor. Any minimum excavation limits shown on the drawings are for the purpose of material identification only and do not necessarily represent safe limits. All excavations shall be free of overhangs, and the sidewalls shall be kept free of loose material. As a minimum, the Contractor shall slope all excavations to prevent these conditions.

G. Accurate trimming of the slopes of the excavations to be filled will not be required, but such excavations shall conform as closely as practicable to the established lines and grades.

H. The method of excavation for structures is optional; however, no equipment shall be operated within 5 feet of newly completed construction. Excavation that cannot be accomplished without endangering the new structures shall be done with hand tools.

I. The Contractors method of excavation shall provide for full utilization of excavated material which is suitable for construction. Unsuitable materials shall be segregated by loads during the excavation operations, without contamination of suitable materials, and disposed of in the waste disposal area. Suitable materials shall be placed in the designated final locations directly from the excavation, or shall be placed in temporary stockpiles and later placed in the designated locations. Excavated materials which are too dry or too wet for immediate compaction shall be moistened or dried and conditioned to the proper moisture content. Moisture content alone shall not be reason for wasting material in a disposal area.

J. The Engineer may direct excavations to be carried below the lines and grades shown on the drawings, if, in the opinion of the Engineer, such work is necessary to ensure adequate support of the proposed embankment, structure, pipe, etc. Payment for such authorized over-excavation and subsequent backfill shall be made at the applicable unit prices for excavation and earthfill.

### **3.4 BORROW PIT OPERATION**

A. Borrow for embankment shall come from the required excavations and borrow area(s), as designated on the plans. The location of borrow areas shall be approved by the Engineer prior to use of the borrow area. Supplemental borrow areas shall be located below the normal reservoir pool elevation, if possible, and no closer than 500 feet from any permanent flood control construction including the auxiliary spillway, principal spillway riser, or dam embankment.

B. All borrow pits shall be kept neat and orderly. Work pits in a systematic manner. Keep borrow pits graded to drain and take all necessary precautions to minimize erosion. The Contractor shall review excavation plans with the Engineer prior to any excavation from borrow areas. Leave all surplus material in the borrow pits, but Contractor is to manage borrow pit operation and excavation to assure enough suitable material is excavated to complete the embankment construction volume(s) required under the contract. Do not excavate material that will not be installed on this project.

C. Maintain access roads as necessary at Contractors expense. Borrow from any areas which are not within the normal reservoir pool shall be limited to that depth which will permit the completed area to slope to drain to the surrounding area after completion of all work. Finish slopes shall be no steeper than 3H:1V. Slope to drain and blend neatly with surrounding terrain at completion of borrow operations.

### **3.5 REMOVAL OF WATER**

A. Provide and operate equipment adequate to keep all excavations and trenches free of water. Remove all water during periods when concrete is being deposited, when pipe is being laid, during the placing of backfill, and at such other times as required for efficient and safe execution of the work. Avoid settlement or damage to adjacent property. Dispose of water in a manner that will not damage adjacent property. When dewatering open excavations, dewater a point below the bottom of the excavation when possible. Design dewatering system to prevent removal of fines from existing ground.

### **3.6 CONSTRUCTION ROADS**

A. Construct and maintain roads necessary for temporary site access for construction. Construction roads shall not cut into the dam abutments. Any cut into dam abutments shall be repaired to the natural slope with compacted dam embankment material. Compaction shall be as specified for dam embankment. Repairs shall be made at the Contractor's expense. At the completion of the project, scarify, disc and regrade all construction roads, except those below normal pool elevation within the reservoir, to match the surrounding topography; compact as required by Section 02223 - Backfilling. Spread topsoil as required by Section 02223, and seed as specified in Section 02936 - Seeding.

B. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

## **SECTION 02223 BACKFILLING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Construction of fills, backfills, and embankments.
- B. Site grading
- C. Compaction requirements

#### **1.2 RELATED SECTIONS**

- A. All sections

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019- Contract Considerations

#### **1.4 REFERENCES**

- A. ASTM 0698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb Rammer and 12 inch drop.
- B. ASTM 04253 - Maximum Index Density and Unit Weight of Soils using a Vibratory Table.
- C. ASTM 04254 - Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- D. ASTM 01556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- E. ASTM 02167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- F. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth).
- G. ASTM 03017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

## **PART 2 PRODUCTS**

### **2.1 FILL MATERIALS**

A. Soil materials as specified in Section 02205.

### **2.2 WATER FOR COMPACTION**

A. Furnish as necessary to accomplish specified compaction.

### **2.3 EROSION CONTROL MATTING**

A. Section 02246 – Geotextiles

### **2.4 COMPACTION EQUIPMENT**

A. Compaction equipment shall be of suitable type and adequate to obtain the densities specified. Smooth steel-wheeled rollers will not be permitted for compaction of onsite materials; they shall be compacted with tamping foot or sheepsfoot rollers unless the Contractor can demonstrate, to the satisfaction of the Engineer, that other equipment will produce satisfactory results throughout the full depth of each lift.

B. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations. Equipment shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort. If inadequate densities are obtained, larger and/or different types of additional equipment shall be provided by the Contractor. Hand-operated equipment shall be capable of achieving the specified densities.

### **2.5 MOISTURE CONTROL EQUIPMENT**

A. Equipment for applying water shall be of a type and quality adequate for the work, shall not leak, and shall be equipped with a distributor bar or other approved device to assure uniform application. Equipment for mixing and drying out material shall consist of blades, discs, or other approved equipment.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

A. Verify stockpiled earth fill material meets requirements of Section 02205 – Soil Materials and is suitable for the intended use on the Project.

B. Verify areas to be backfilled are free of debris and have been properly prepared in accordance with contract requirements.

### **3.2 PREPARATION**

- A. Excavate and salvage topsoil in accordance with requirements of Section 02222 - Excavating.
- B. Break down the sides of stump holes, test pits, and other similar cavities or depressions, where so directed, so as to flatten out the slopes. Scarify the sides of the cut or hole to provide bond between the foundation material and the backfill. Backfill each depression with the same type of material which is to be placed immediately above the foundation. Place, moisten and compact the backfill in accordance with the applicable provisions of this section.
- C. Dewater as needed to provide proper conditions during backfilling operations.
- D. Excavate unsuitable areas of subgrade as authorized by Engineer and replace with approved backfill material. Compact to density equal to requirements for subsequent backfill material.

### **3.3 BACKFILLING AND EMBANKMENT CONSTRUCTION**

#### **A. General:**

1. Complete backfill and embankments to the lines and grades for the various zones as shown on the Drawings.
2. Protect structures and pipes from damage at all times. Select compaction equipment that will not damage the pipe or structures. Construction equipment other than that used in compacting trench backfill around pipelines shall not be operated over pipelines until the compacted backfill is to a 3-foot minimum depth over the exterior crown of the conduit or pipe. After this minimum depth of backfill is placed, the maximum loading over the pipe shall not exceed HS 10 loading as defined in AASHTO Standard Specifications for Highway Bridges until a minimum 10 foot depth of compacted backfill has been placed over the pipe. Any damage to structures or pipelines shall be repaired at the Contractor's sole expense.
3. Backfill shall be brought up evenly on each side of structures.
4. Handle, and place materials in such a manner as to prevent segregation of the materials.
5. Backfill or embankment material shall be brought to the specified moisture content prior to placement and compaction, as specified under paragraph MOISTURE CONTROL. Compaction of each layer shall be as specified under paragraph COMPACTION.
6. No material shall be placed on foundation or previously placed material that is frozen, previously frozen, or is too soft, smooth, wet, dry, or that has been damaged by drying, cracking, frost, or construction activities. Prior to placement of material on or against the surfaces of natural ground, or previously placed and compacted portions of the embankment, all damaged materials that are frozen, that have become soft or loose due to



exposure to weather, that contain erosion channels or cracks, or that are excessively dry shall be removed. Remove disturbed or damaged foundation material and prepare the exposed material as herein before specified under PREPARATION. The surface of previously placed embankment shall be disked and recompacted as hereinafter specified and the new embankment bonded to the existing embankment. The replaced materials shall be compacted as required by these specifications for the type of material being compacted. Damaged or loosened surfaces shall be compacted as originally specified for the material being compacted. Excavating, replacing, and compacting disturbed soil, or loosening, moistening, and re compacting the surface of the previously completed portion of the embankment shall be performed as directed by the Engineer at the Contractor's sole expense.

7. No brush, roots, sod, or other perishable or unsuitable materials shall be placed in the embankment.

8. The Contractor shall maintain the embankment including sloping the surfaces to drain, preventing or repairing gullies, and maintaining surfaces free of weeds or other unauthorized vegetation, until final completion and acceptance of all the work under the Contract.

#### B. Dam Embankment:

1. Construct embankment with class "A" subsoil per Section 02205 - Soil Materials.

2. The distribution and gradation of the materials shall be such that the embankment will be free from lenses, pockets, streaks, voids, or layers of material differing substantially in texture, gradation, or water content from surrounding material, except where zones of different material are specified. The combined excavating and placing operation shall be such that the subsoil materials, when placed, will be blended sufficiently to secure a high degree of uniformity. Placing of materials includes dumping, spreading, supplemental wetting or drying, mixing, and grading subsoil materials and any other operations necessary to blend the materials to form as homogeneous a layer as practicable prior to compaction. Successive loads shall be dumped and spread so as to produce a uniform distribution of the material.

3. To the extent practicable, subsoil materials shall be brought to the embankment area at the specified moisture content.

4. The materials shall be dumped in continuous horizontal layers and spread in a direction parallel to the centerline of the dam. When windrows of materials are formed as a result of the dumping operations, such windrows shall be parallel to the centerline of the embankment. After a layer has been dumped and spread, it shall be disked as necessary to break up and blend the materials. Smooth, hard surfaces and deep ruts in the surface previously placed material resulting from the passage of construction equipment during placing operations shall be removed or reworked by diskings or scarifying prior to placing subsequent material. Surfaces of cut slopes, slopes in previously compacted embankment,

and the edges of previously placed embankment shall be excavated with shallow benches to expose firm, moist, dense surfaces for bonding with the new embankment just prior to placing the next layer. Disking shall be performed with a heavy disk plow to the full depth of the uncompacted layer and into the surface of the underlying layer as necessary to form a good bond between layers. Remove oversize pieces which do not break up. The embankment materials shall be bladed level prior to disking and compaction, such that layers shall not exceed 8 inches loose thickness prior to disking and the underlying layer shall not be disturbed more than 2 inches after disking.

5. In any separate portion of dam embankment bedding constructed, each layer shall be constructed continuously and approximately horizontally for the width and length of such portion at the elevation of the layer. The height of any longitudinal bonding surface (parallel to the dam centerline) shall be less than 2 feet. The slope of the bonding surface shall be four horizontal to one vertical or flatter.

6. The Contractor will be permitted to construct separate portions of the dam embankment subject to the following conditions:

a. Longitudinal bonding surfaces (surfaces parallel to the centerline of embankment) will not be permitted except as hereinbefore specified.

b. One temporary gap through the dam embankment for diversion of water will be permitted. All transverse slopes (surfaces normal to the centerline crest of embankment) between previously completed portions of embankment and embankment to be placed shall not be steeper than 4:1.

c. Prior to construction of embankment in the temporary openings, remove all loose, disturbed, dry, cracked, or frost damaged embankment from the bonding surface. Prepare the surface by scarifying, moistening, and compacting to provide a good bond between the embankment materials. Excavate shallow benches into the bonded surface for each layer of embankment.

### **3.4 STRUCTURAL BACKFILL**

#### **A. Preparations for Placing Backfill:**

1. Backfill around concrete structures only after the concrete has attained the specified compressive strength indicated in Section 03300. Remove all form materials and trash from the excavation before placing any backfill. Obtain the Engineer's acceptance of concrete work and attained strength prior to backfilling.

2. Do not operate earth-moving equipment within 5 feet of walls of concrete or pipe structures for the purpose of depositing or compacting backfill material. Compact backfill

adjacent to concrete or pipe structures with hand-operated tampers or other method approved by Engineer.

B. Backfill around structures using the designated materials as shown/or specified.

C. Backfill around structures in embankments with material equal to the adjacent embankment material unless otherwise shown. Place backfill in embankment areas in maximum 6-inch loose lifts for hand compaction equipment and 8-inch loose lifts where heavy compaction equipment can operate. Compact each lift as specified for the adjacent embankment material.

D. Backfill around structures not in embankments using Class B subsoil unless otherwise designated. Place backfill in loose lifts less than 6-inches thick for hand compaction equipment and 8-inches thick where heavy compaction equipment can operate, and compact each lift as specified to at least 95 percent of maximum dry density with moisture between -1 and +5 percent of optimum.

### **3.5 COMPACTION**

A. Compact all materials by mechanical means. Flooding or jetting will not be permitted. If tests indicate that compaction or moisture content is not as specified, material placement shall be terminated and corrective action shall be taken by the Contractor prior to continued placement.

B. Embankment shall be compacted to at least the minimum values specified below:

<b>Material</b>	<b>Minimum Compaction Requirement</b>
Dam Embankment	95 percent of maximum dry density
Other Soil Embankment	95 percent of maximum dry density

### **3.6 MOISTURE CONTROL**

A. Prior to and during all compacting operations, maintain moisture content within the limits specified below. Maintain moisture content uniform throughout the lift. In so far as practicable, add water to the material at the site of excavation. Supplement, if required, by sprinkling and mixing into the fill material prior to compaction. The water content of material at the time of compaction shall be as follows:

<b>Material</b>	<b>Allowable Range of Moisture Content</b>
Dam Embankment	-1 to +5 percent of optimum
Other Soil Embankment	-1 to +5 percent of optimum

B. Do not attempt to compact fill material that contains excessive moisture. Aerate material by blading, disking, harrowing, or other methods, to dry the material to acceptable moisture content.

### **3.7 FIELD QUALITY CONTROL**

A. Testing by the Engineer may include laboratory compaction and/or relative density tests and field moisture and density tests. Laboratory compaction tests will be performed in accordance with ASTM 0698. Laboratory relative density tests will be performed in accordance with ASTM D4253 and 04254. Field density and moisture content will be determined by any one or a combination of the following methods: ASTM 02922,01556,02167,03017, or other methods acceptable to the Engineer.

B. Testing will be used to determine if completed courses are in substantial conformance with the Specifications. The Contractor shall perform other testing or retesting as necessary to control the quality of the work within the specifications at the Contractor's sole expense.

C. Material which does not meet the specified compaction and moisture requirements, as determined by testing, shall be removed and replaced, or at the Contractor's option, reworked by disk, aerating, wetting, and/or re compacting at the Contractor's sole expense until the material conforms to the Specifications.

### **3.8 PLACING TOPSOIL**

A. After backfilling and grading is completed and reviewed by the Engineer, spread topsoil over entire graded area, except to borrow areas to be submerged by permanent pool, to a minimum compacted depth of 9 inches with surface elevations as shown. Loosen the previously finished surface to a depth of 2 inches and leave in smooth condition, free from depressions or humps, ready for seeding. Topsoil placed in the upper 6 inches of embankment areas will be paid for under the earth fill pay item(s) rather than the salvage and spread topsoil pay item.

### **3.9 SITE GRADING**

A. Perform all backfilling and embankment construction to the lines and grade as shown and/or established by the Engineer, with proper allowance for topsoil where specified or shown. Shape, trim, and finish slopes to conform with the lines, grades, and cross sections shown. Make slopes free of all exposed roots and stones exceeding 3-inches in diameter. Neatly blend all new grading into surrounding, existing terrain. Finished site grading must be acceptable to the Owner and Engineer.

### **3.10 TOLERANCES**

A. Top surface of soil embankment or backfill in turf areas: Plus 0 to 2 inches from prescribed grade, but do not create ponding.

B. Top Surface of aggregate embankment fill: Plus or minus 2 inches from prescribed grade.

### **3.11 PROTECTION OF FINISHED WORK**

A. Reshape and re-compact fills disturbed by vehicular traffic.

## **SECTION 02225 TRENCHING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Excavate trenches.
- B. Backfilling trenches.
- C. Compaction requirements.

#### **1.2 RELATED SECTIONS**

- A. All sections.

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 - Contract Considerations.

#### **1.4 REFERENCES**

- A. ASTM 0698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5lb (2.49 Kg) Hammer and 12 inch (304.8 mm) Drop.
- B. ASTM 01556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM 02167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- D. ASTM 02922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM 03017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

#### **1.5 PROTECTION**

- A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.
- B. Underpin adjacent structures which may be damaged by excavation work, including utility lines and pipes.

C. Notify Engineer of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

D. Protect bottom of excavations and soil adjacent to and beneath pipe or structures.

E. Grade excavation top perimeter to prevent surface water run-off excavation.

F. Dewater excavations as needed at no additional cost to Owner.

## **PART 2 PRODUCTS**

### **2.1 SELECT BED AND FILL MATERIALS**

A. Select Subsoil from trench or borrow area excavations, graded free of organic material, gravel larger than 1 inch size, and debris.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

A. Verify stockpiled fill to be reused is approved.

B. Verify subgrade has been inspected and approved.

C. Verify construction material installation has been inspected and approved.

D. Verify areas to be backfilled are free of debris, snow, ice, or water and surfaces are not frozen.

### **3.2 PREPARATION**

A. Identify required lines, levels, contours, and datum.

B. Compact subgrade surfaces to density requirements for backfill material.

### **3.3 EXCAVATING**

A. Excavation is unclassified.

B. Excavate subsoil required for construction material installation to required grade.

C. Cut trenches sufficiently wide to enable installation of work items and to allow inspection. Comply with manufacturer's recommendations.

D. Remove lumped subsoil, boulders, or other unsuitable material.

E. Fill over-excavated areas under construction material bearing surfaces with approved materials per Section 02223.

F. Correct unauthorized over-excavation at no cost to Owner.

G. Remove excess subsoil not being reused from the site.

### **3.4 BACKFILLING**

A. Backfill in accordance with requirements of Section 02223 - Backfilling.

B. Support work items to avoid displacement during placement and compaction of backfill material.

C. Properly installed and consolidate or compact bedding material required for installation being made.

D. Backfill trenches to prescribed contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural consolidation. Do not backfill over porous, wet, or spongy subgrade surfaces.

E. Place and compact select fill material per Section 02223.

F. Maintain optimum moisture content of backfill materials per Section 02223.

G. Remove surplus backfill materials from site.

H. Leave stockpile areas completely free of excess fill material.

### **3.5 TOLERANCES**

A. Top Surface of backfilling turf areas or areas to receive subsequent fill: Plus 2 inches, but do not create ponding.

### **3.6      COMPACTION TESTING**

A. Compaction testing will be performed by Contractor's laboratory at the rate of 1 test per lift for each 500 linear feet of trench in accordance with ASTM D1556, ASTM D2167, or ASTM D2922.

### **3.7      SCHEDULE OF LOCATIONS**

A. The paragraphs below identify location, fill material to be used, and density expressed as a percentage of maximum density in comparison with ANSI/ASTM 0698.

B. Pipe bedding: Select subsoil fill compacted to 95 percent.

C. Fill around concrete structures: Select subsoil fill, compacted to 95 percent.

D. Fill under aggregate surfacing or earth embankments: Select subsoil fill to prescribed subgrade elevation, compacted to 95 percent.

E. Fill under turf areas: Select subsoil to finish grade, compacted to 95 percent. Fill to finish grade with topsoil, compacted to 85 percent.



## **SECTION 02230 SITE CLEARING**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

A. Section includes the following:

1. Protection of existing trees.
2. Removal of trees and other vegetation.
3. Topsoil stripping.
4. Clearing and grubbing.
5. Removing above-grade improvements.
6. Removing below-grade improvements.

#### **1.2 DEFINITIONS**

A. Topsoil: Friable surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.

#### **1.3 PROJECT CONDITIONS**

A. Traffic: Conduct Site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

A. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.

1. Protect improvements on adjoining properties and on OWNER's property.

2. Restore damaged improvements to their original condition, as acceptable to property OWNER.

B. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

1. Water trees and other vegetation to remain within limits of Work as required to maintain their health during course of construction operations.

2. Provide protection for roots over 1-1/2-inch diameter that are cut during construction operations. Coat cut faces with emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

3. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to ENGINEER. Employ a licensed arborist to repair damages to trees and shrubs.

4. Replace trees which cannot be repaired and restored to full-growth status, as determined by arborist.

C. Carefully remove items indicated to be salvaged, and store on OWNER's premises where indicated or directed.

### **3.2 SITE CLEARING**

A. Remove trees, shrubs, grass, and other vegetation, rubble, improvements, concrete slabs, tree debris piles, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on Site or premises as specifically indicated. "Removal" includes digging out and off-site disposing of stumps and roots.

1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner, where such roots and branches obstruct installation of new construction.

2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.

a. Remove heavy growths of grass from areas before stripping.

b. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.

c. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.

d. Dispose of unsuitable or excess topsoil same as specified for disposal of waste material.

B. Clearing and Grubbing: Clear Site of trees, shrubs, and other vegetation, in areas called out on the plans.

1. For trees and existing stumps 6" and greater, completely remove stumps, roots, and other debris protruding through ground surface.

2. For trees and existing stumps less than 6", cut trunk near ground level and spray with Pathway Herbicide or approved equal.

3. Use only hand methods for grubbing inside drip line of trees indicated to remain.

4. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

5. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact to a density equal to adjacent original ground.

C. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.

### **3.3 DISPOSAL OF WASTE MATERIALS**

A. Burning is not permitted on OWNER's property.

B. Burning will be permitted only at designated areas and times directed by OWNER. Provide full-time monitoring of burning materials until fires are extinguished.

C. Transport non-combustible waste materials and unsuitable topsoil materials to designated spoil areas on OWNER's property and dispose of as directed.

D. Transport waste materials and unsuitable topsoil materials to designated spoil areas on OWNER's property and dispose of as directed.

E. Remove waste materials and unsuitable or excess topsoil from OWNER's property at CONTRACTOR's expense. CONTRACTOR shall make own arrangements for obtaining disposal areas. Proposed haul routes between the Site and disposal areas shall be submitted by CONTRACTOR to ENGINEER for approval prior to commencing this Work.

## **SECTION 02240 DEWATERING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

A. Section includes the following:

1. Dewatering consisting of performing work necessary to lower and control surface and groundwater levels and hydrostatic pressures to permit excavation and construction to be performed in near-dry conditions.
  - a. Control of surface and subsurface water, ice, and snow are part of dewatering requirements.
  - b. All costs for dewatering trenches shall be included in bid prices for other items of Work listed on Bid Form.

### **PART 2 - PRODUCTS**

Not Used.

### **PART 3 - EXECUTION**

#### **3.1 DEWATERING**

A. Provide an adequate system to lower and control surface and groundwater in order to permit excavation, construction of structures, and placement of fill materials under dry conditions. Install sufficient dewatering equipment to pre-drain water-bearing strata above and below bottom of structure foundations, drains, sewers, and other excavations. The excavations shall be kept dry until exterior walls have been completed and until the structures have been backfilled. Drainage ditches shall not be placed within the area to be occupied by any structure except where permitted by ENGINEER. When such ditches are placed beneath the structures, they shall be backfilled with Class C concrete.

B. Reduce hydrostatic head in water-bearing strata below structure foundations, drains, sewers, and other excavations to extent that water level and piezometric water levels in construction areas are below prevailing excavation surface.

C. Prior to excavation below groundwater level, place system into operation to lower water levels as required and then operate it continuously 24 hours a day, 7 days a week until drains, sewers, and structures have been constructed, including placement of fill materials, and until dewatering is no longer required.

D. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of Work under construction or completed. Dispose of water in a manner to

avoid inconvenience to others engaged in work about Site. Provide sumps, sedimentation tanks, and other flow control devices as required by governing authorities. Effluent water from dewatering methods shall be sediment free or be discharged through an ENGINEER-approved sediment entrapment basin.

E. Provide standby equipment on Site, installed and available for immediate operation if required to maintain dewatering on a continuous basis in event any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform work as may be required to restore damaged structures and foundation soils at no additional expense.

**END OF SECTION**

**SECTION 02275**  
**RIPRAP**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Furnish and place rock riprap where indicated on the drawings.
- B. Subgrade preparation.
- C. Grouting in place where indicated on the drawings.

**1.2 RELATED STUDIES**

- A. All sections.

**1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 - Contract Considerations

**1.4 QUALITY ASSURANCE**

- A. Test for bulk specific gravity and absorption of riprap materials in accordance with ASTM C127.
- B. Test for soundness of riprap materials in accordance with Federal Specifications SS-R-406, Method 203.01.

**1.5 SUBMITTALS**

- A. Section 01300-Submittals: Procedure for submittals.
- B. Submit gradation analysis of proposed riprap material.
- C. Submit a notarized certificate from supplier that riprap source is approved to provide materials for Iowa Department of Transportation work and complies with Contract Document requirements.
- D. Submit supplier's laboratory certification that riprap material from the proposed source conforms to specification requirements for specific gravity, absorption, and soundness.

## **PART 2 PRODUCTS**

### **2.1 ROCK RIPRAP**

A. Broken limestone, dolomite, quartzite, or granite from an approved source as described in Materials I.M. 409 of Iowa Department of Transportation (DOT) Standard Specification and meeting the following requirements.

- A minimum of 50% of the stone is to be composed of beds or slabs more than 5 inches thick.
- A minimum of 10% of the beds or slabs are to be thick enough to produce the required weight of either the stone or concrete, with the greatest dimension not more than two times the smallest dimension.

B. Individual rock fragments shall be dense, sound and free from cracks, seams and other defects conducive to accelerated weathering.

C. Rock fragments shall be angular to sub-rounded in shape.

D. Least dimension of a fragment shall not be less than one-third the greatest dimension of the fragment.

E. Bulk specific gravity (saturated surface-dry basis) not less than 2.5 as determined by ASTM C127.

F. Absorption not more than 2 percent as determined by ASTM Method C127.

G. Weighted average loss in five cycles of soundness testing according to Federal Specification SS-R-406, Method 203.01 shall be not more than 20 percent when sodium sulphate is used or 25 percent when magnesium sulfate is used.

H. Gradation(s) as indicated on the drawings and Bid Form for Rock Riprap shall conform to Iowa DOT E Revetment gradations and material requirements as per Section 4130.01 of the Iowa DOT Standard Specification:

#### **Class E**

- Nominal top size of 250 lbs
- At least 50% of the stones are to weigh more than 90 lbs
- At least 90% of the stones are to weigh more than 5 lbs
- The Engineer may approve using revetment containing material larger than 250 lbs

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

A. Verify stockpiled riprap material is acceptable to Engineer.

### **3.2 PREPARATION**

- A. Excavate subgrade in accordance with Section 02222- Excavating, for placement of rock riprap to indicated depth with finished surface at lines and grades indicated on the drawings.
- B. Remove all sharp or protruding objects from subgrade surface.
- C. Install filter fabric (when called out on plans) in accordance with Section 02246-Geotextiles and drawings.

### **3.3 PLACEMENT**

- A. Place riprap at the locations and to the depths indicated on the drawings.
- B. Construct riprap to the full course thickness in one operation and in such a manner as to avoid significant displacement of the underlying materials.
- C. Place riprap such that material in place is reasonably homogeneous with larger fragments uniformly distributed, firmly in contact one to another with smaller fragments and spalls filling voids between larger fragments.
- D. Place riprap in a manner to prevent damage to structures.
- E. Place riprap fragments by hand where necessary to prevent damage to permanent works. Smaller fragments shall not be a substitute for larger ones, and flat slabs shall be laid on edge.

### **3.4 GROUTING**

- A. Where indicated on drawings, use concrete to grout completed and accepted riprap construction.
- B. Consolidate concrete to fill voids and float finish around exposed riprap surface fragments.
- C. Apply curing compound per Section 03300.



**SECTION 02722**  
**SITE STORM SEWERAGE SYSTEMS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. HDPE Pipe
- B. SMP Pipe
- C. Pipe joints and fittings
- D. Appurtenant structures and accessories

**1.2 RELATED SECTIONS**

- A. All sections.

**1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 – Contract Considerations.

**1.4 REFERENCES**

- A. ASTM C138/C138M (2012a) Standard Test Method for Density ("Unit Weight"), Yield, and Air Content (Gravimetric) of Concrete.
- B. ASTM C150/C150M (2012) Standard Specification for Portland Cement.
- C. ASTM C403/C403M (2008) Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
- D. ASTM C495 (2007) Compressive Strength of Lightweight Insulating Concrete.
- E. ASTM C497 (2005) Concrete Pipe, Manhole Sections, or Tile.
- F. ASTM C581 (2003; E 2008; R 2008) Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures, Intended for Liquid Service.
- G. ASTM C939 (2010) Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
- H. ASTM C942 (2010) Compressive Strength of Grouts for Preplaced-Aggregate Concrete in the Laboratory.

- I. ASTM D1784 (2011) Rigid PVC Compounds and Chlorinated PVC Compounds.
- J. ASTM D2321 (2014) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- K. ASTM D2412 (2011) Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- L. ASTM D3034 (2014) Standard Specification for Type PSM PVC Sewer Pipe and Fittings.
- M. ASTM D3212 (2007; R2013) Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- N. ASTM D3262 (2011) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- O. ASTM D3350 (2012) Polyethylene Plastics Pipe and Fittings Materials,
- P. ASTM D3681 (2006) Standard Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.
- Q. ASTM D3839 (2008) Underground Installation of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
- R. ASTM D4161 (2001; R 2010) "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
- S. ASTM F1697 (2009) Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Strip for Machine Spiral-Wound Liner Pipe Rehabilitation of Existing Sewers and Conduit.
- T. ASTM F1741 (2008) Standard Practice for Installation of Machine Spiral Wound Poly (Vinyl Chloride) (PVC) Liner Pipe for Rehabilitation of Existing Sewers and Conduits.
- U. ASTM F2620 (2012) Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings.
- V. ASTM F477 (2010) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- W. ASTM F585 (1994; R 2007) Standard Practice for Insertion of Flexible Polyethylene Pipe into Existing Sewers.
- X. USACE EM 385-1-1 (2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011; Change 7 2012) Safety and Health Requirements Manual.
- Y. ASTM A760/A760M-01a – Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.
- Z. AASHTO M252, Type S (For HDPE Pipe).
- AA. AASHTO M294, Type S (For HDPE Pipe).

BB. AASHTO M326, Standard Specification for Polyethylene (PE) Liner Pipe, 300- to 1600-mm Diameter.

CC. ASTM F714, Standard Specification for Polyethylene (PE) Pipe (SDR-PR) Based on Outside Diameter.

DD. AWWA C906-99, Polyethylene (PE) pressure pipe and fittings, 4 IN. (100 mm) through 63 IN. (1,575 mm), for water distribution and transmission

## **1.5 SUBMITTALS FOR REVIEW**

- A. Section 01300 – Submittals: Procedures for submittals.
- B. Submit shop drawings for all pipe and pipe appurtenances to be provided.
- C. Submit certification by supplier(s) that pipe and appurtenances to be provided comply with project specifications and requirements.
- D. Submit shop drawings for materials and installation procedures
- E. Submit a detailed work plan to include but not limited to the following:
  - a. Proposed construction sequencing and scheduling.
  - b. Plan for removal of any obstructions encountered.
  - c. Areas requiring special construction techniques.
  - d. Proposed methods for flow control or by-pass to divert excessive flow away from a section of pipe if the need arises during the installation process.
  - e. Joints, gaskets, proposed Resins, Coatings, and other pertinent information as applicable
  - f. Dates of excavation and pipe placement, along with proposed work hours.
  - g. Manufacturer's recommendation regarding methods for repair of damage to pipe following installation.

## **1.6 SUBMITTALS FOR INFORMATION**

- A. Section 01300 – Submittals: Procedures for submittals
- B. For all types of pipe to be used for the project, submit manufacturer's recommended procedures for pipe installation and for field repairs.
- C. For all types of pipe to be used for the project, submit the pipe manufacturer's supporting data of the design strength.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- A. Prevent injury or abrasion to liner pipe during loading, transportation, and unloading. Do not drop pipe from cars or trucks, nor allow pipe to roll down skids without proper restraining ropes. Use suitable pads, strips, skids, or blocks for each pipe during transportation and while awaiting installation in the field. Liner pipe shall be moved by machinery in a controlled manner. Do not allow liner pipe to roll down the levee embankment at any time. Handle and store in accordance with the manufacturer's published recommendations. Remove slip liner pipe with cuts, gashes, nicks, abrasions, or any such physical damage which is deeper than 10 percent of the wall thickness from the site and replace with undamaged pipe at no additional cost to the Owner.

## **PART 2 PRODUCTS**

### **2.1 PIPE MATERIALS**

- A. HDPE Solid Wall Pipe: PE4710 IPS SDR 26 manufactured by Isco, or approved equal. Pipe segment shall be marked on the inside and outside with a coded number which identifies the manufacturer, SDR, size, materials, machine, date and shift on which the pipe was extruded.
- B. SMP: Smooth metal pipe shall be ANSI schedule 40 new, new reject or used seamless and welded steel pipe. Reject or used pipe may be accepted if inspected by the Field Engineer before installation and found to be in good condition. All pipe must have the following minimum wall thickness.

#### Pipe Diameter Minimum Wall Thickness

4-16"	1/4"
18-26"	9/32"
over 26"	3/8"

### **2.2 FITTINGS**

- A. Fittings for HDPE Pipe: As recommended and provided by the pipe supplier.
- B. Fittings for SMP Pipe: As recommended and provided by the pipe supplier.

### **2.3 JOINTS**

- A. Joints shall be watertight over the range of head pressure expected for the pipe.
- B. Joints for HDPE Pipe: As supplied by manufacture, or fusion procedures conforming to ASTM F2620. Joints shall be capable of being joined into a continuous length by an interlocking method such that joints meet the requirements of ASTM D3212. Screw-type or threaded joints will not be allowed unless a positive lock is included in the joint system or the perimeter of the joint is extrusion welded at the bearing assembly, prior to insertion.
- C. Internal beads resulting from butt fusion shall be limited to a 6 mm 0.25 inch projection perpendicular to the inside wall of the pipe. Trim beads larger than 6 mm 0.25 inch 360 degrees

around the interior of the pipe. External beads resulting from butt fusion need not be trimmed unless the bead projection will negatively impact pipe installation or migration of annulus grout.

D. Flanged ends: ANSI A21.10, A21.15, A21.53 and AWWA, C110, C115, C153

### **PART 3 EXECUTION**

#### **3.1 PREPARATION AND INSPECTION**

A. The Engineer makes no guarantee regarding the information, data, and physical condition of underground facilities or existing pipes.

#### **3.2 CONTROL OF FLOW**

A. Provide for maintenance and control of flow as necessary for effective inspection and satisfactory installation of the pipe. Such work may include by-pass pumping or berming.

#### **3.3 INSTALLATION**

A. Install Solid-Wall High Density Polyethylene (HDPE) Liner Pipe in accordance with ASTM F585, manufacturer's recommendations and the provisions of this Section. In the event of a conflict, the most restrictive of the three shall govern.

B. Allow the installed pipe to relax and cool following installation in accordance with manufacturer's recommended time, but not less than 24 hours, prior to any reconnection of lines, grouting of the annulus, or backfilling of the insertion pit. Staged grouting is essential, especially for larger diameter pipes, in order to keep thermal expansion low and to prevent a reduction in the pipe diameter.

#### **3.4 TESTING AND ACCEPTANCE**

A. Rework: Remove any material that has not received prior approval from the Engineer or is not accepted as suitable work by the Engineer and replaced or repaired to the satisfaction of the Engineer with an approved method/material at the Contractor's sole expense. Materials left in place, but not meeting these Specifications, will be paid for at a reduced price.

#### **3.5 ACCEPTANCE INSPECTION**

A. After all work is completed, perform an inspection of each pipe documenting the post-installation conditions. For pipes large enough and safe to enter, a walk-through inspection with digital photography is preferred when confined space entry procedures are followed.

- a. Infiltration of ground water through the pipe will be a basis for non-acceptance.
- b. All connections shall be accounted for and be unobstructed.

- B. Defects: All defects discovered during the post-installation inspection shall be corrected before the work under the Contract will be considered for Substantial Completion. After the defects, if any, are corrected in accordance with manufacturer's recommendations, the affected pipe segments shall be inspected a second time as a follow-up inspection. All follow-up inspections will be performed by the Contractor, and all costs associated with such follow-up inspections associated with the correction of work shall be borne by the Contractor.

**SECTION 02935**  
**EROSION AND SEDIMENTATION CONTROL (INCLUDING SWPPP)**

**PART 1 GENERAL**

**1.1 WORK INCLUDED**

A. Implementation, inspection, maintenance and record keeping of the project Stormwater Pollution Prevention Plan (SWPPP), and erosion/sediment control practices.

B. Related incidental work

**1.2 RELATED WORK**

A. All sections

**1.3 DELIVERY, STORAGE, AND HANDLING**

A. Deliver, store and handle all materials provided in a manner that prevents damage or deterioration.

**1.4 SCHEDULE**

A. Engineer will obtain an NPDES permit from the Iowa Department of Natural Resources once project is awarded and prior to Notice to Proceed.

B. Construct and install construction site erosion and sediment control practices, as necessary, at the beginning of the project as soon as initial construction operations will allow. Comply with requirements of Owner and the NPDES permit.

**PART 2 PRODUCTS**

**2.1 GENERAL**

A. Straw Bales: Firmly bound and undamaged bales of clean wheat straw.

B. Turf Reinforcement Mat: Section 02246 and as indicated on the drawings.

C. Erosion Control Fabric: Section 02246 and as indicated on the drawings.

D. Wood Stakes: Cut from soft wood dimension lumber.

E. Steel fence posts, tee type.

F. Silt Fence: Porous, UV-stabilized woven geotextile and stakes

G. Stabilized Rock Entrance: Hard armor entrances onto public roads.

F. Other materials as may be necessary for proper implementation maintenance of necessary BMP's used to control erosion and sediment.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

A. Check layout and confirm the erosion/sediment control system and practices can be installed and maintained as intended.

B. Protect existing underground improvements from damage.

C. Remove foreign materials and debris from installation site(s) and properly dispose of such material.

#### **3.2 GRADING**

A. Excavate sediment control traps, swales, and terraces at locations indicated on drawings in accordance with applicable requirements of Sections 02222 and 02223.

#### **3.3 SEDIMENT CONTROL BARRIERS.**

A. Install straw bales and sediment control fabric as indicated on the drawings and as staked.

B. Comply with applicable requirements of Section 02246 - Geotextiles.

#### **3.4 EROSION CONTROL BLANKET**

A. At the end of construction, after reshaping finish grading and seeding, install erosion control blanket where designated by the drawings or Engineer.

B. Comply with applicable requirements of Section 02246 - Geotextiles.

#### **3.5 MAINTENANCE**

A. Maintain sediment control traps, swales, terraces and barriers as needed so they are in effective operating condition to comply with the project NPDES permit during the construction period, until permanent construction precludes further maintenance.



B. Reshape and cleanout sediment control traps, swales and terraces whenever sediment level or erosion has made them ineffective in directing runoff and sediment to sediment barriers or traps.

C. Replace at no cost to the Owner any erosion and sediment control system components damaged or destroyed by construction operations.

D. Reshape and clean out sediment control swales, and terraces at the end of construction prior to seeding and installation of erosion control blanket.

### **3.6 DISPOSAL**

A. At the completion of the work, remove and properly dispose of all sediment barrier straw bales, sediment control fabric and stakes unless they are ordered left in place by the Owner.

B. Remove all sediment control terraces unless they are ordered left in place by the Owner.

C. Fill or re-grade any temporary sediment control traps, basins, and swales which are not intended to remain as part of final project grading.

### **3.7 SWPPP/NPDES REQUIREMENTS AND RECORD KEEPING**

A. Maintain records and report as per conditions of permit.

## **SECTION 02936 SEEDING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Preparation of seedbed.
- B. Seeding, mulching and fertilizer.
- C. Seedbed protection.
- D. Maintenance.

#### **1.2 RELATED SECTIONS**

- A. All sections.

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Section 01019 – Contract Considerations

#### **1.4 REFERENCES**

- A. FSO-F-241 - Fertilizers, Mixed, Commercial.

#### **1.5 QUALITY ASSURANCE**

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

#### **1.6 REGULATORY REQUIREMENTS**

- A. Comply with regulatory agency requirements for fertilizer and herbicide composition.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. All materials furnished in accordance with the requirements of this specification shall be delivered, where applicable, in sealed, unbroken packages bearing the brand and maker's name, and shall be stored on platforms and be properly covered to protect them from the weather and damage.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

## **1.8 COORDINATION**

A. Coordinate work under provisions of Section 01039.

## **1.9 SUBMITTALS**

A. Section 01300-Submittals: Procedure for submittals.

B. Submit seed mix products.

## **1.9 MAINTENANCE SERVICE**

A. Maintain seeded areas immediately after placement and until a dense stand grass is well established and exhibits a vigorous growing condition two months after date of germination and over 70% of the ground is covered, as estimated by the field representative. Maintain seeded areas for a minimum of six months after application of the seeding materials. The Engineer reserves the right to accept seeded areas before completion of the six month period.

## **PART 2 PRODUCTS**

### **2.1 SEED**

A. Weed seed content not to exceed 1% by weight. Seed blend to be Certified Interagency Blue Tag and the certified Blue Tag shall be attached to **every** bag of seed.

B. Grass Seed Mix – Low Grow Grass Mixture as distributed by United Seeds, Inc., [website: www.unitedseeds.com](http://www.unitedseeds.com), or approved equal.

C. Floodplain Seed Mix – Floodplain Mixture or approved equal as distributed by United Seeds, Inc.; [website: www.unitedseeds.com](http://www.unitedseeds.com), or approved equal.

D. A cover crop of Oats or Annual Rye will be uniformly drilled on all areas which seeding and mulching/matting. On areas not accessible to machinery, the seed may be uniformly broadcast and will be covered by use of a harrow. Cover crop seeding is to be completed within 7 calendar days, weather permitting, after earthwork is terminated.

### **2.2 SOIL MATERIALS**

A. Topsoil: As specified in Section 02205.

### **2.3 ACCESSORIES**

A. Mulch: Prairie hay or wheat straw are acceptable for temporary use. Hydro-mulch to be used as permanent cover/application on all disturbed area.

B. Fertilizer: Commercial composite fertilizer, uniform in composition, dry and free flowing. It shall bear the manufacturer's guaranteed statement of analysis which shall be 5-10-5 for original fertilization and 10-6-4 for refertilization with 50% organic nitrogen. Any fertilizer which becomes caked or otherwise damaged, rendering it unsuitable for use, will not be accepted.

C. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

D. Erosion Control Matting or Turf Reinforcement Mat: Section 02246 - Geotextiles.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

A. Verify that prepared soil base is ready to receive the work of this section.

#### **3.2 PREPARATION OF SEEDBED**

A. Prepare seedbed to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated soil. Remove all debris and stones having any dimension greater than one inch.

C. Scarify subsoil to a depth of 4 inches to provide a seedbed loose enough to allow proper operation of the grass drill and mulch application equipment. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

D. Rake finish surface smooth.

#### **3.3 RATE OF APPLICATION:**

- |    |                      |  |
|----|----------------------|--|
| A. | Initial Fertilizing: | 1.5 lbs of Nitrogen per 1,000 SF.  |
| B. | Grass Seed Mix:      | 32.0 PLS Pounds per Acre   |
|    | Floodplain Seed Mix: | 20.0 PLS Pounds per Acre   |
| C. | Refertilizing:       | Spring: 0.5 lbs of Nitrogen per 1,000 SF.<br>Fall: 1.5 lbs of Nitrogen per 1,000 SF. |
| D. | Hydro-mulch          | 1,500-2000 lbs of wood fiber/acre  |
| E. | Prairie Hay Mulch:   | 2 tons per acres   |

- F. Wheat Straw Mulch: 3 tons per acres

### **3.4 FERTILIZING**

- A. Apply fertilizer to all seeded areas of composition and at a rate which will provide 40 pounds of available nitrogen and 40 pounds of available phosphate per acre.
- B. Apply fertilizer in accordance with manufacturer's instructions.
- C. Apply after preparation of topsoil.
- D. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- E. Mix thoroughly into upper 2 inches of topsoil.
- F. Lightly water to aid the dissipation of fertilizer.

### **3.5 HYDROMULCHING**

- A. Use a tank-mounted truck equipped with a special pump and continuous agitation system. Pump the slurry through a top-mounted discharge nozzle or discharge can be through 100 to 200 feet of hose.
- B. Water is added first and then the wood fiber, tackifier (if used), fertilizer (if used), and seeds. Any coated seed would be loaded last. Legume seeds should be pellet inoculated with a special bacteria to stimulate the fixing of nitrogen.
- C. Seed should not be added to the slurry until immediately prior to beginning of the operation, and not remain in the tank for more than 30 minutes.
- D. Single application hydroseeding uses 1,500 to 2,000 pounds of wood fiber mulch per acre with the seed and fertilizer. Split application hydroseeding and hydro-mulching uses 500 pounds of wood fiber mulch per acre with the seed and fertilizer in the first pass followed by an application of 1,500 to 2,000 pounds of wood fiber mulch per acre and tackifier (if used). Tackifiers are applied at 100 pounds of dry ingredients per acre.
- E. Hydro-mulching using 500 to 1,000 pounds of wood fiber mulch per acre and tackifier is often applied over loose, blown straw to tack it down. Hydromulching using 2,000 to 3,000 pounds of wood fiber mulch per acre and tackifier can be used for temporary protection where landscaping will be planted after the rainy season.
- F. Wood fiber is usually dyed to aid in uniform distribution, but care should be taken to ensure that concrete or painted surfaces are not stained and that plants and animals are not injured. Wood fiber has natural tackifying properties but adding a tackifier should be considered on steep slopes.

G. Dormant seeding preferably done when ground is not frozen according to methods above. If ground is frozen, apply seed with a no-till or slit seeder.

### **3.6 SEEDING SEASONS**

#### **A. Grass Seed Mix:**

- |    |          |                      |
|----|----------|----------------------|
| 1. | Spring:  | March to June        |
| 2. | Fall:    | NA                   |
| 3. | Dormant: | November to February |

#### **B. Floodplain Seed Mix:**

- |    |          |                   |
|----|----------|-------------------|
| 1. | Spring:  | March to June     |
| 2. | Fall:    | NA                |
| 3. | Dormant: | December to March |

#### **C. Cover Crop: As indicated on the cover crop seed mixes.**

D. All disturbed soil areas shall be treated during the seeding season. Alternative dates authorized by the Engineer do not alter any warranty or establishment conditions or requirements. Perform dormant seeding after November 1. Do not perform seeding or fertilizing operations if the ground is wet, frozen, or otherwise untillable. Do not perform seeding or fertilizing operations when conditions do not allow for a uniform distribution of materials.

### **3.7 SEED PROTECTION**

A. Where indicated by the drawings or the Engineer, install erosion control blanket or turf reinforcement mat (TRM) in accordance with Section 02246.

B. Except where erosion control blanket or TRM is required, apply mulch to any seeded areas that were not hydromulched. Place the mulch covering loosely enough to allow sunlight to penetrate and air to slowly circulate. Place the mulch covering at a thickness that shades the ground, reduces the rate of evaporation, and prevents or reduces erosion due to water or wind. Mulch shall be crimped into the ground by use of a weighted disk or other approved methods.

### **3.8 MAINTENANCE**

A. Water as necessary to establish a dense healthy stand of grass. Water should be applied so that the topsoil is wet to a depth of two inches. Apply one complete coverage to the seeded area in an eight-hour period.

B. Control growth of weeds. Apply appropriate herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

C. After the seed mixture has germinated, reseed all areas which have failed to show a uniform stand of germinated seed. Maintain all seeded areas until acceptance. Suggested maintenance items shall include, but not be limited to any or all of the following, whichever are necessary:

1. Regrading.
2. Refertilizing.
3. Reseeding.
4. Re-Hydromulching or repositioning or replacing erosion control blankets.
5. Watering.
6. Weeding.
7. Rolling.
8. Filling in eroded areas.

D. Second fertilization and overseeding shall be done:

1. In the Fall after a Spring seeding.
2. In the Spring after a Fall seeding.

E. Notify the OWNER in writing when the second fertilization and overseeding is to be done.

**SECTION 03100  
CONCRETE FORMWORK**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Formwork for cast-in place concrete, including shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

**1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION**

- A. Section 03300 - Cast-In-Place Concrete: Supply of concrete accessories for placement by this section.

**1.3 RELATED SECTIONS**

- A. All sections.

**1.4 REFERENCES**

- A. Act 347 - Recommended Practice for Concrete Formwork
- B. PS-1 - Construction and Industrial Plywood

**1.5 MEASUREMENT AND PAYMENT**

- A. Section 01019 - Contract Considerations.

**1.6 DESIGN REQUIREMENTS**

- A. Design, engineer and construct formwork, shoring and bracing to conform to code requirements; resultant concrete to conform to required shape, line and dimension.

**1.7 QUALITY ASSURANCE**

- A. Perform Work in accordance with ACI 301.



## **1.8 REGULATORY REQUIREMENTS**

A. Conform to applicable codes for design, fabrication, erection and removal of formwork.

## **1.9 COORDINATION**

A. Coordinate work under provisions of Section 01039.

B. Coordinate this Section with other Sections of work which require attachment of components to formwork.

C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Engineer.

## **PART 2 PRODUCTS**

### **2.1 FORM MATERIALS**

A. Form Materials: At the discretion of the Contractor, but suitable for producing required quality of concrete construction.

### **2.2 FORMWORK ACCESSORIES**

A. Form Ties: Snap-off type, galvanized metal, fixed or adjustable length, cone type, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete.

C. Corners: Chamfer, rigid plastic or wood strip 3/4 x 3/4 inch size; maximum possible Lengths.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

B. Remove free standing water before placing concrete.

### **3.2 EARTH FORMS**

A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing Concrete.

### **3.3 ERECTION- FORMWORK**

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping damage concrete during stripping.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members which are not indicated on drawings.

F. Provide chamfer strips and exposed external corners.

### **3.4 APPLICATION - FORM RELEASE AGENT**

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

### **3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS**

A. Provide formed openings where required for items to be embedded in or passing through concrete work.

B. Locate and set in place items which will be cast directly into concrete.

C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

D. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

### **3.6 FORM CLEANING**

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

### **3.7 FORMWORK TOLERANCES**

A. Construct formwork to maintain tolerances required by ACI 301.

### **3.8 FIELD QUALITY CONTROL**

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

### **3.9 FORM REMOVAL**

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

**SECTION 03200**  
**CONCRETE REINFORCEMENT**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

**1.2 RELATED SECTIONS**

A. All sections.

**1.3 MEASUREMENT AND PAYMENT**

A. Section 01019 - Contract Considerations.

**1.4 REFERENCES**

A. ACI 301 - Structural Concrete for Buildings.

B. ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.

C. ASTM A184 - Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

D. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

E. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

F. AWS D12.1 - Welding Reinforcement Steel, Metal Inserts and Connections in Reinforced Concrete Construction.

G. CRSI - Placing Reinforcing Bars.

H. ASTM A884 - Epoxy-Coated Steel Wired and Welded Wire Fabric for Reinforcement.

I. CRSI 65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

## **1.5 SUBMITTALS**

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

## **1.6 QUALITY ASSURANCE**

- A. Perform Work in accordance with CRSI Manual of Practice ACI 301.

## **1.7 QUALIFICATIONS**

- A. Design reinforcement under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Iowa.

## **1.8 COORDINATION**

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate with placement of formwork, formed openings and other work.

## **PART 2 PRODUCTS**

### **2.1 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, Unfinished.
- B. Reinforcing Steel Fabricated Deformed Steel Bar Mats: ASTM A184, ASTM A615, grade 60 ksi steel bars or rods, unfinished.
- C. Stirrup Steel: ASTM A82, unfinished.
- D. Welded Steel Wire Fabric: ASTM A185 Plain Type; in flat sheets or coiled rolls; Unfinished.

### **2.2 ACCESSORY MATERIALS**

- A. Tie Wire: Minimum 16 gage annealed type.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

## **2.3 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice or ASTM A184.
- B. Weld reinforcement in accordance with AWS D12.1.
- C. Locate reinforcing splices not indicated on drawings, at point of minimum stress.

## **PART 3 EXECUTION**

### **3.1 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Conform to applicable code for concrete cover over reinforcement.

**SECTION 03300  
CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Cast-in-place concrete

**1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION**

A. Section 03100 -Concrete Formwork

**1.3 RELATED SECTIONS**

A. All sections

**1.4 MEASUREMENT AND PAYMENT**

A. Section 01019 – Contract Considerations

**1.5 REFERENCES**

A. ACI 301 -Structural Steel Concrete for Buildings

B. ACI 302 -Guide for Concrete Floor and Slab Construction

C. ACI 304 -Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete

D. ACI 305R -Hot Weather Concreting

E. ACI 306R -Cold Weather Concreting

F. ACI 308 -Standard Practice for Curing Concrete

G. ASTM 03405 -Concrete Joint Sealer, Hot-Poured Elastic Type

H. ASTM D1751 -Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction  
(Non-extruding and Resilient Bituminous Types)

I. ASTM C33 -Concrete Aggregates

J. ASTM C94 -Ready-Mixed Concrete

K. ASTM C150 -Portland Cement

L. ASTM C260 -Air Entraining Admixtures for Concrete

M. ASTM C494 -Chemicals Admixtures for Concrete

N. ASTM C618 -Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

## **1.6 SUBMITTALS**

A. Submit under provisions of Section 01300

B. Submit aggregate gradation analysis and notarized certification that aggregate supplier IS approved aggregate source for Iowa Department of Transportation.

C. Submit proposed mix design of each class of concrete for review before commencement of work. Submit notarized certification by supplier that concrete supplied meets project requirements.

## **1.7 PROJECT RECORD DOCUMENTS**

A. Submit under provisions of Section 01700

B. Accurately record actual locations of embedded utilities and components which are concealed from view

## **1.8 QUALITY ASSURANCE**

A. Perform Work in accordance with ACI 301

B. Acquire cement and aggregate from same source for all work

C. Conform to ACI 30SR when concreting during hot weather

D. Conform to ACI 306R when concreting during cold weather

## **1.9 COORDINATION**

A. Coordinate work under provisions of Section 01039

B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories



## **PART 2 PRODUCTS**

### **2.1 CONCRETE MATERIALS**

A. Cement: ASTM C150, Type IIA -Air Entraining

B. Fine and Coarse Aggregates: From Iowa Department of Transportation approved source.

C. Coarse Aggregate: Crushed Limestone of the following gradation

<b>Total Percent Retained</b>	<b>Optimum</b>	<b>Minimum</b>	<b>Maximum</b>
1-1.5 inch sieve	0	0	0
1 inch sieve	0	0	8
¾ inch sieve	22	10	34
3/8 inch sieve	70	55	85
No. 4 sieve	94	88	100
No. 20 sieve	97	94	100

D. Fine Aggregate: Sand/Gravel of the following gradation.

<b>Total Percent Retained</b>	<b>Optimum</b>	<b>Minimum</b>	<b>Maximum</b>
1 inch sieve	0	0	0
No. 4 sieve	13	3	23
No. 10 sieve	40	30	50
No. 30 sieve	72	60	84
No. 200 sieve	98.5	97	100
Clay Lumps	Less than 0.5% by weight		

E. Water: Clean and not detrimental to concrete

### **2.2 ADMIXTURES**

A. Air Entrainment: ASTM C260

B. Chemical: ASTM C494

C. Fly Ash: ASTM C618

### **2.3 ACCESSORIES**

A. Curing Compound: FS TT-C-800, Type 1, 30 percent solids

B. Joint Sealant: ASTM D3405

C. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

D. Joint Filler Type A: ASTM 01751, ASTM 0994; Asphalt impregnated fiberboard or felt, 1 inch thick

E. Water Stops: Hydrophilic strip for sealing site formed concrete joints, Sika Hydrotite CJ-0725-3K, or approved equal. All waterstops at intersections where two or more waterstops meet shall be factory fabricated to provide continuity through the joint. All waterstops in the field shall be fused/spliced as per manufacturer's recommendation to provide a continuous waterstop through all joints.

## **2.4 CONCRETE MIX**

A. Mix and deliver concrete in accordance with ASTM C94

B. Select proportions for normal weight concrete in accordance with ACI 301

C. Provide concrete to the following criteria:

1. Mix Design similar to Iowa Department of Transportation Class C Concrete
2. Compressive Strength (28 days): 4,000 psi, minimum
3. Slump: 3 to 4 inches
4. Maximum Water/Cement Ratio: 0.53.

D. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.

E. Use set retarding admixtures during hot weather only when approved by Engineer

F. Add air entraining agent to normal weight concrete mix for work exposed to exterior (5% to 7.5% by volume of plastic concrete)

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

A. Verify site conditions under provisions of Section 01039

B. Verify requirements for concrete cover over reinforcement

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

### **3.2 PREPARATION**

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions
- B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout
- C. Moisten subgrade to minimize absorption of water from fresh concrete

### **3.3 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 301.
- B. Notify Engineer at least 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, and formed joint fillers are not disturbed during concrete placement
- D. Install joint fillers and sealant in accordance with manufacturer's instructions
- E. Separate slabs on grade from vertical surfaces with 1 inch thick joint filler
- F. Extend joint filler from bottom of slab to within 1 inch of finished slab surface
- G. Install joint devices in accordance with manufacturer's instructions
- H. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- I. Place concrete continuously between predetermined expansion, control, and construction joints
- J. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- K. Screed slabs on grade, maintaining surface tolerance of maximum 1/4 inch deviation from finish grade in 10ft.

### **3.4 CONCRETE FINISHING**

- A. Provide concrete surfaces to be left exposed with sand float finish

### **3.5 CURING AND PROTECTION**

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury
- B. Exclude vehicular traffic from standard concrete slab components for at least seven (7) days
- C. Cure concrete in accordance with ACI 308 or by applying curing compound in accordance with manufacturer's recommendations
- D. Leave forms in place until concrete has cured sufficiently to support its own weight and allow form removal without damage to the concrete

### **3.6 FIELD QUALITY CONTROL**

- A. Testing and analysis will be performed in accordance with ACI 301
- B. Take three concrete test cylinders for every 100 or less cubic yards of each class of concrete placed each day
- C. Take one additional test cylinder during cold weather and cure on-site under same conditions as concrete it represents
- D. Deliver test cylinders to an independent laboratory for testing at 7 days and 28 days with one spare
- E. Submit copies of each test to the Owner and the Engineer

### **3.7 PATCHING**

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections in accordance with ACI 301

### **3.8 DEFECTIVE CONCRETE**

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Need for and extent of repair or replacement of defective concrete will be determined by the Engineer
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon expressed approval of Engineer of the procedure proposed by Contractor for each individual defective area.

### **3.9 CONCRETING IN COLD WEATHER**

A. When the atmosphere temperature may be expected to drop below 40°F at the time concrete is delivered to the work site, during placement, or at any time during the curing period, the following provisions also shall apply:

1. The temperature of the concrete at time of placing shall not be less than 50°F nor more than 90°F. The temperature of neither aggregates nor mixing water shall be more than 100°F just prior to mixing with the cement.
2. When the daily minimum temperature is less than 40°F, concrete structures shall be insulated or housed and heated after placement. The temperature of the concrete and air adjacent to the concrete shall be maintained at not less than 50°F or more than 90°F for the duration of the curing period.
3. Methods of insulating, housing and heating the structure shall conform to "Recommended Practice for Cold Weather Concreting," ACI Standard 306.
4. The use of accelerations or antifreeze compounds will not be allowed.
5. When dry heat is used to protect concrete, means of maintaining an ambient humidity of at least 40% shall be provided unless the concrete has been coated with curing compound as specified in Section 3.6 or is covered tightly with an approved impervious material.

### **3.10 CONCRETING IN HOT WEATHER**

A. When climatic or other conditions are such that the temperature of the concrete may reasonably be expected to exceed 90°F at the time of delivery at the work site, during placement, or during the first 24 hours after placement, the following provisions also shall apply:

1. The Contractor shall maintain the temperature of the concrete below 90°F during mixing, conveying, and placing. Methods used shall conform to "Recommended Practice for Hot Weather Concreting," ACI Standard 605.
2. The concrete shall be placed in the work immediately after mixing. Truck mixing shall be delayed until only time enough remains to accomplish it before the concrete is placed.
3. Exposed concrete surfaces which tend to dry to set too rapidly shall be continuously moistened by means of fog sprays or otherwise protected from drying during the time between placement, and finishing and after finishing.
4. Finishing of slabs and other exposed surfaces shall be started as soon as the condition of the concrete allows and shall be completed without delay.

5. Concrete surfaces exposed to the air shall be covered as soon as the concrete has hardened sufficiently and shall be kept continuously wet for at least the first 24 hours of the curing period, and for the entire curing period.

**SECTION 05500  
METAL FABRICATIONS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

A. Shop fabricated ferrous metal items, galvanized.

**1.2 RELATED SECTIONS**

A. All applicable sections.

**1.3 MEASUREMENTS AND PAYMENTS**

A. Section 01019 – Contract Considerations.

**1.4 REFERENCES**

A. ASTM A36 – Structural Steel

B. ASTM A153 – Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

C. ASTM A283 – Carbon Steel Plates, Shapes, and Bars.

D. ASTM A307 – Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

E. ASTM A325 – High Strength Bolts for Structural Steel Joints.

F. SSPC – Steel Structures Painting Council.

**1.5 SUBMITTALS**

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

**1.6 FIELD MEASUREMENTS**

A. Verify that field measurements are as indicated on Drawings.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Steel Sections: ASTM A36 galvanized to ASTM A153 for galvanized component.
- B. Steel Pipe: ASTM A53, Grade B, Schedule 40.
- C. Anchor Bolts: ASTM A307 galvanized to ASTM A153 for galvanized component.
- D. Bolts, Nuts, and Washers: ASTM A325 galvanized to ASTM A153 for galvanized component.
- E. Shop and Touch-up primer for galvanized surfaces: SSPC 20, Type I, inorganic.

### **2.2 FABRICATION**

- A. Fit and shop assemble in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds along all adjoining edges.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### **2.3 FINISHES**

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Smooth any rough or sharp edges or areas.
- C. Coat bare metal edges or areas with touch up primer for galvanized surfaces.

## **PART 3 EXECUTION**



### **3.1 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### **3.2 PREPARATION**

- A. Supply items required to be cast into concrete with setting templates, to appropriate sections.

### **3.3 INSTALLATION**

#### **3.4 INSTALL ITEMS PLUMB AND LEVEL, ACCURATELY FITTED, FREE FROM DISTORTION OR DEFECTS.**

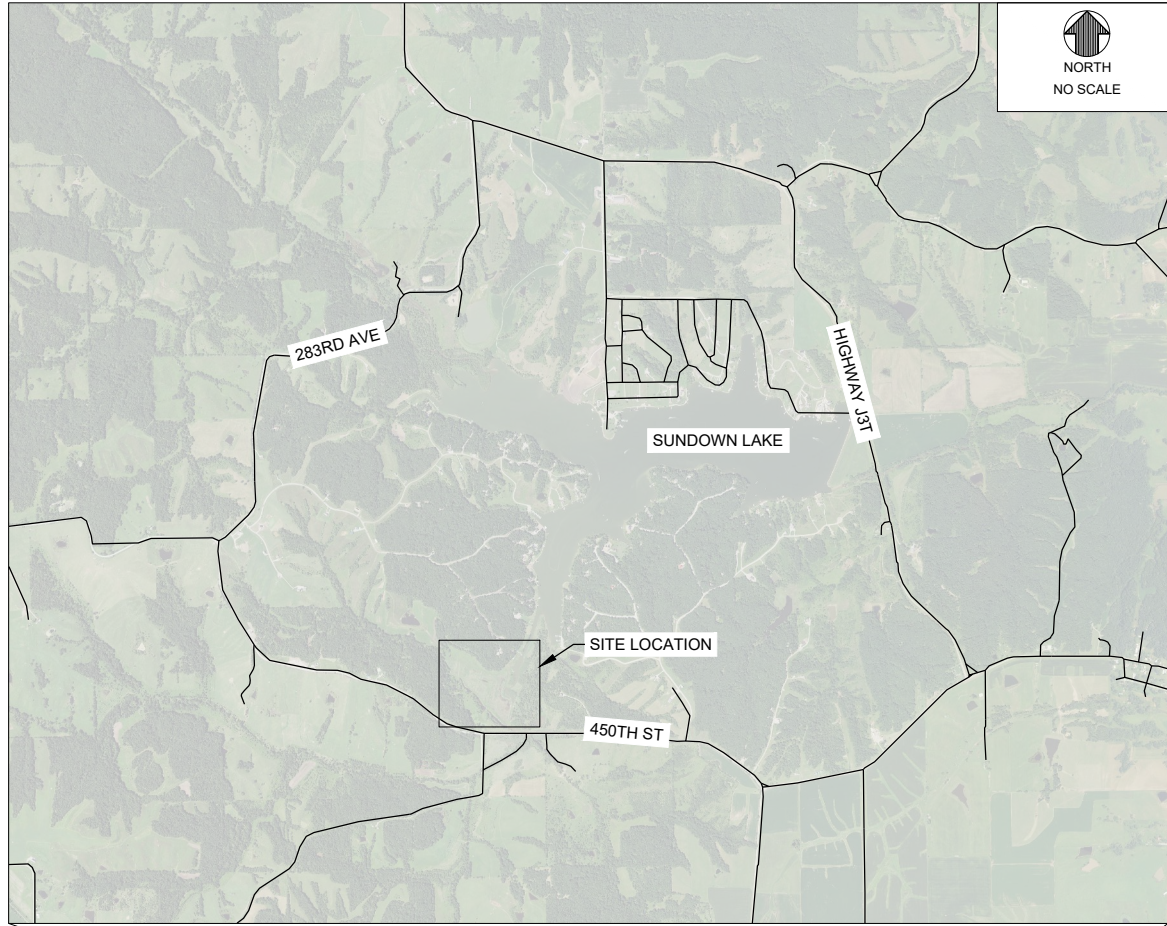
- A. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- B. Obtain Engineer approval prior to site cutting or making adjustments not scheduled.
- C. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- D. Install necessary and required accessories.
- E. Check installed fabrications for proper and easy operation where applicable.

### **3.5 ERECTION TOLERANCES**

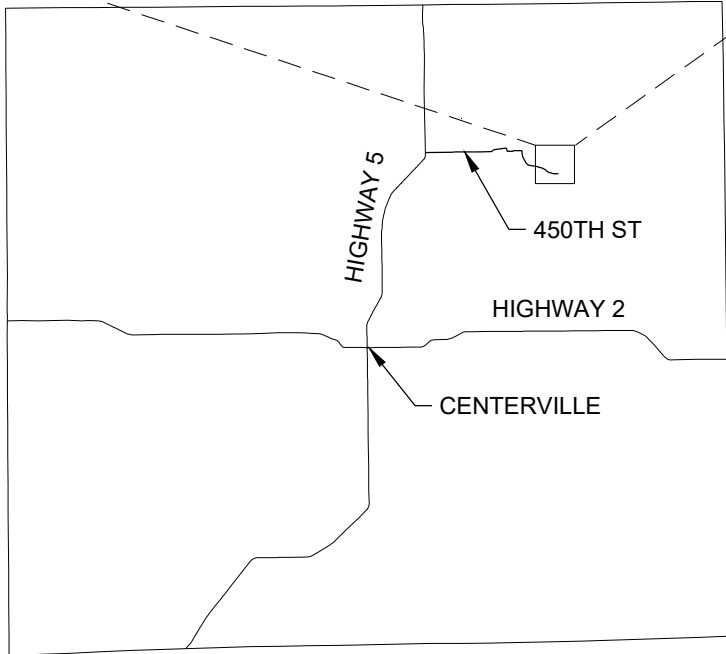
- A. Maximum Variation From Plumb:  $\frac{1}{4}$  inch.
- B. Maximum Offset from True Alignment:  $\frac{1}{4}$  inch.

# SUNDOWN LAKE - SW SEDIMENT BASIN

## SUNDOWN LAKE RURAL IMPROVEMENT ZONE



LOCATION MAP



APPANOOSE COUNTY

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B.7 CELL 3 PLAN & PROFILE

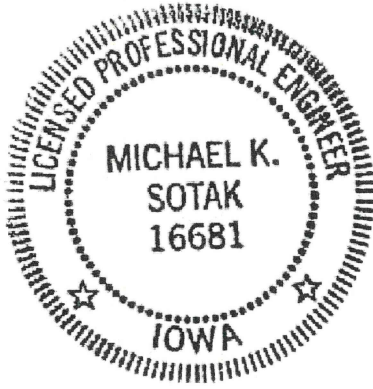
- B.100 EMBANKMENT PROFILES  
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- ## S.1 SWPPP SITE MAP

- S.100 SWPPP DETAILS (1 OF 2)  
S.101 SWPPP DETAILS (2 OF 2)



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

MICHAEL K. SOTAK  
 LICENSE NO: 16681  
 MY LICENSE RENEWAL DATE IS: 12.31.24  
 PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS



GENERAL NOTES

- THE LOCATIONS OF ALL AERIAL AND UNDERGROUND UTILITY FACILITIES ARE APPROXIMATE OR MAY NOT BE INDICATED IN THESE PLANS. UNDERGROUND FACILITIES, WHETHER INDICATED OR NOT, SHALL BE LOCATED AND FLAGGED BY THE CONTRACTOR AND UTILITY COMPANIES 48 HOURS BEFORE WORK IS STARTED. VERIFY UTILITY LOCATIONS BY CONTACTING THE IOWA ONE CALL (ONLINE AT WWW.IOWONECALL.COM AND/OR CALL 811). THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY AND COORDINATE ALL NECESSARY UTILITY SERVICE INTERRUPTIONS WITH THE OWNERS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, PAVEMENT, STRUCTURES, FENCES, POLES, SIGNS, TREES, IRRIGATION LINES, SPRINKLER HEADS, SUB- DRAINS AND OTHER IMPROVEMENTS NOT DESIGNATED FOR REMOVAL. ANY DAMAGE CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC CONTOURS SHOWN ON THE PLANS ARE 2' CONTOURS FROM LIDAR AND TOPOGRAPHIC SURVEY. ELEVATIONS CALLED OUT ON THE PLANS ARE REFERENCED TO NAVD 88 VERTICAL DATUM. HORIZONTAL CONTROL IS NAD83 IOWA STATE PLANE SOUTH.
- CLEARING AND GRUBBING TO BE PERFORMED ONLY IN LOCATIONS ABSOLUTELY NECESSARY TO CONSTRUCT AND ACCESS THE SITE FEATURES. PER THE U.S. ARMY CORPS OF ENGINEERS SECTION 404 NATIONWIDE PERMIT, NO TREES SHALL BE REMOVED OR TRIMMED. CONTRACTOR SHALL LIMIT CONSTRUCTION OPERATIONS WITHIN THE CONSTRUCTION LIMITS SHOWN ON PLANS.
- ALL RUBBLE DEBRIS FROM CONSTRUCTION ACTIVITIES MUST BE REMOVED FROM THE SITE UPON PROJECT COMPLETION.
- THE CONTRACTOR SHALL CONDUCT ALL OPERATIONS AND MAINTAIN CONSTRUCTION WORK AREA IN A SAFE MANNER IN ACCORDANCE WITH OSHA COMPLIANCE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL TEMPORARY MARKERS, LIGHTS, SIGNS, FLAGMEN, BARRICADES AND OTHER PROTECTIVE DEVICES TO PROVIDE ADEQUATE TRAFFIC CONTROL. THIS SHALL INCLUDE ANY BARRICADES OR SIGNS NECESSARY FOR ROAD CLOSURE. CONTRACTOR'S PLAN SHALL BE SUBMITTED AND APPROVED BY SUNDOWN LAKE RURAL IMPROVEMENT ZONE.
- CONTRACTOR IS RESPONSIBLE FOR REPAIRING DAMAGE TO ROADS USED AS HAUL ROUTES. CONDITIONS PRIOR TO CONSTRUCTION TO BE DOCUMENTED BY THE CONTRACTOR AND MUST BE RESTORED TO ORIGINAL CONDITIONS BY SMOOTHING COMPACTED SOILS PRIOR TO FINISHED GRADING AND SEEDING WITH SPECIFIED MIX AND METHODS.
- LIMITS OF CONSTRUCTION SHALL BE WITHIN IDENTIFIED AREA. LIMITS OF CONSTRUCTION CAN BE PROVIDED BY STAKING POINTS OR FLAGGED BY FIELD ENGINEER UPON REQUEST.
- ELECTRONIC GRADING FILES AND STAKING POINTS CAN BE PROVIDED BY ENGINEER UPON REQUEST.
- THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
- CONTRACTOR TO ATTEND THE PRE-CONSTRUCTION CONFERENCE WITH OWNER, ENGINEER, AND OTHER PROJECT STAKEHOLDERS.
- RAMPS AND HAUL ROUTES THAT THE CONTRACTOR CONSTRUCTS FOR HAULING MATERIAL AND TRANSPORTING EQUIPMENT SHALL BE CONSIDERED INCIDENTAL TO MOBILIZATION.
- CONTRACTOR RESPONSIBLE FOR SETTING AND MAINTAINING TEMPORARY CONTROL POINTS REQUIRED FOR CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY AND STAKING REQUIREMENTS. GPS FILES ARE AVAILABLE UPON REQUEST.

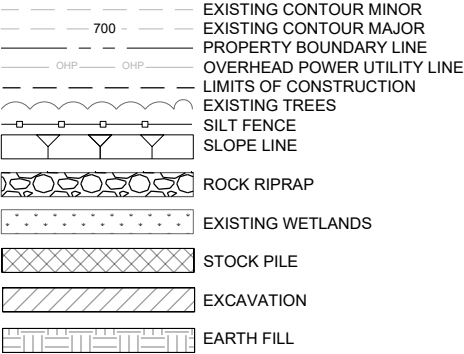
PERMITTING NOTES:

- NO TREE CLEARING PERMITTED BETWEEN APRIL 1 AND SEPTEMBER 30.
- CONTRACTOR MUST DEVELOP ALL DOCUMENTATION REQUIRED TO APPLY FOR AND OBTAIN THE NPDES PERMIT GRANTED BY IOWA DEPARTMENT OF NATURAL RESOURCES. CONTRACTOR MUST ADHERE TO THE REQUIREMENTS OF THE NPDES PERMIT AND SWPPP (SHEET S.1). CONTRACTOR TO IMPLEMENT COVER CROP ON ALL DISTURBED AREAS IMMEDIATELY UPON COMPLETION OF GRADING OPERATIONS AT SITE IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- CONTRACTOR MUST ADHERE TO THE REQUIREMENTS OF THE 404 PERMIT GRANTED BY THE UNITED STATES ARMY CORPS OF ENGINEERS FOR THIS PROJECT. A COPY OF THE REQUIREMENTS WILL BE PROVIDED TO THE SELECTED CONTRACTOR, OR UPON REQUEST.
- DELINEATED WETLANDS ARE SHOWN ON THE PLANS. CONTRACTOR SHALL LIMIT ALL CONSTRUCTION ACTIVITIES FROM ENCROACHING UPON WETLAND AREAS, EXCEPT LOCATIONS SPECIFICALLY DESIGNATED IN THE CONSTRUCTION DRAWINGS. WETLAND AREAS THAT ARE TEMPORARILY DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED AND RESEEDED WITH THE WETLAND SEEDING MIX AS DETAILED IN THE PROJECT SPECIFICATIONS.
- AVOID WETLANDS UNLESS INDICATED ON SHEETS.

TABLE OF QUANTITIES

ITEM	UNITS	QUANTITY
MOBILIZATION	LS	1
CLEARING AND GRUBBING	LS	1
HANDLING OF WATER	LS	1
EROSION CONTROL (SWPPP)	LS	1
SURVEY & STAKING	LS	1
EARTH EMBANKMENT	CY	120387
STRIP, STOCKPILE, AND REPLACE 9" TOPSOIL	CY	3491
EXCAVATION - LOCAL SPOIL	CY	9735
SEEDING - GRASS SEED MIX	AC	6.4
SEEDING - FLOODPLAIN SEED MIX	AC	3.2
EROSION CONTROL MATTING	SY	37600
FORMED CONCRETE FOR RISER	CY	8
STEEL REINFORCING BARS FOR RISER	LBS	1082
ANGLE IRON TRASH RACK AND APPERTUNANCES	LS	1
24" HDPE PIPE	LF	87
24" SMP PLACEMENT	LF	18
CLASS 'E' ROCK RIPRAP	TN	1,750
GRAVEL	CY	14

LEGEND



ABBREVIATIONS

AC	- ACRES
CL	- CENTERLINE
CY	- CUBIC YARD
EL	- ELEVATION
FT	- FEET
MAX	- MAXIMUM
MIN	- MINIMUM
SWPPP	- STORM WATER POLLUTION PREVENTION PLAN
TYP	- TYPICAL
EA	- EACH
TN	- TON
LS	- LUMP SUM
DIA	- DIAMETER
LBS	- POUND
SF	- SQUARE FEET
TOD	- TOP OF DAM
LOC	- LIMITS OF CONSTRUCTION

H:\JB\01000\1520152\_0001 Sundown Lake SW Basin\102-18-02 (SW Basin)\DWG\SHEETS\SUNDOWN - A.1 GENERAL.dwg-A.2 GENERAL NOTES-8/6/2024 1:12 PM-(tbridges)

CONTACT INFORMATION

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15129 WILD TURKEY LANE  
MORAVIA, IOWA 52571

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402.502.7131  
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12702 WESTPORT PARKWAY, SUITE 300  
OMAHA, NEBRASKA 68138

MR. MARK JACOBS, PE, CFM  
515.444.5396  
MJACOBS@HOUSTONENG.COM  
100 COURT AVENUE, SUITE 202  
DES MOINES, IOWA 50309

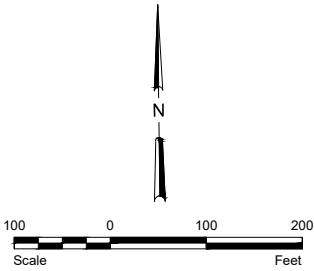
SUNDOWN LAKE SW BASIN  
SUNDOWN LAKE RIZ  
APPANOSE COUNTY, IOWA  
GENERAL NOTES



Drawn By	TDB
Checked By	MKS
Date	8-6-2024
Scale	As Shown
Project No.	152-0001
SHEET	A.2



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SUNDOWN LAKE SW BASIN  
SUNDOWN LAKE RIZ  
APPANOSE COUNTY, IOWA

SITE MAP



Drawn By  
TDB

Checked By  
MKS

Date  
8-6-2024

Scale  
As Shown

Project No.  
152-0001

SHEET  
A.3

Revision

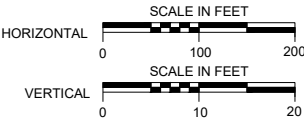
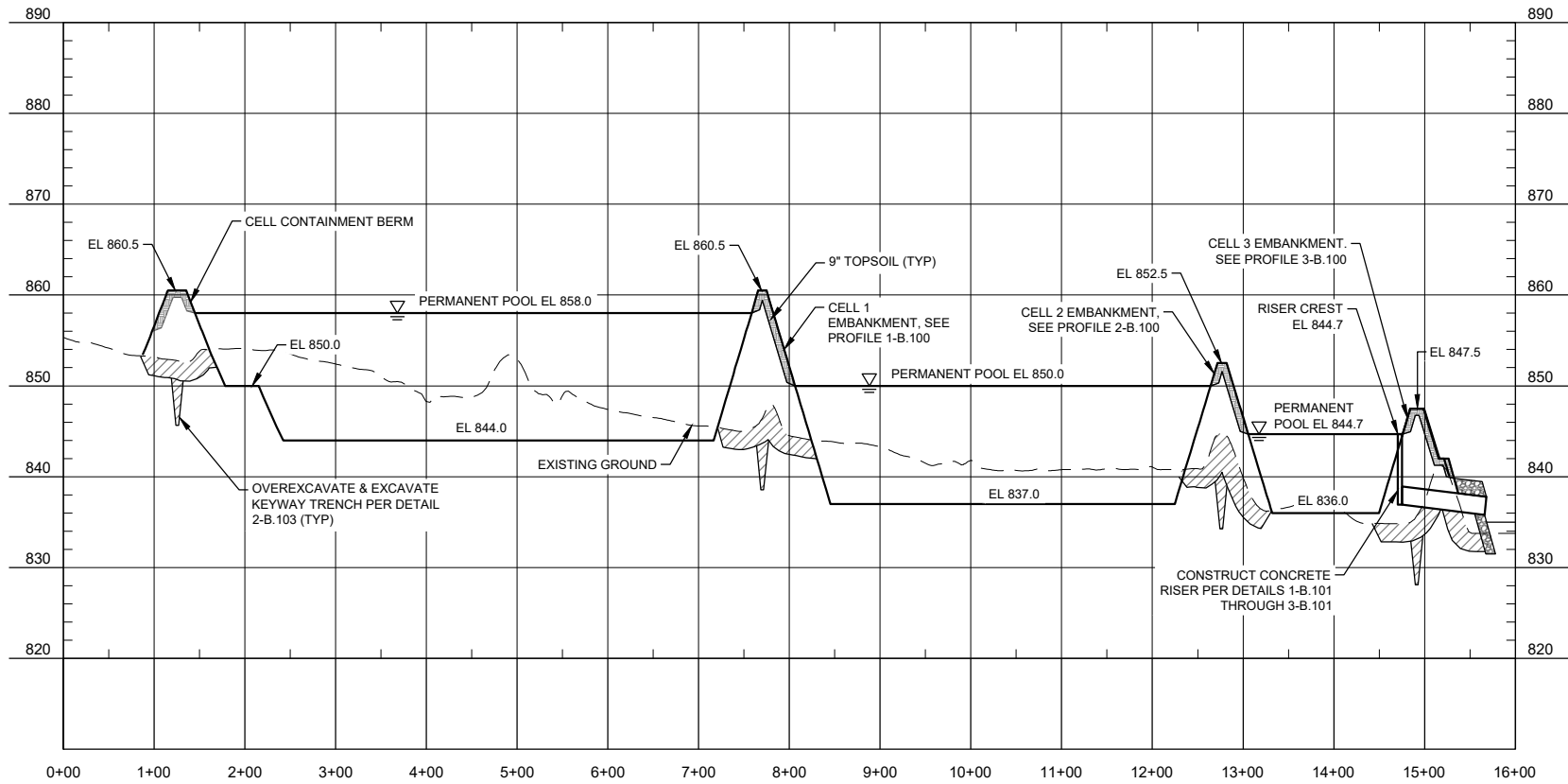
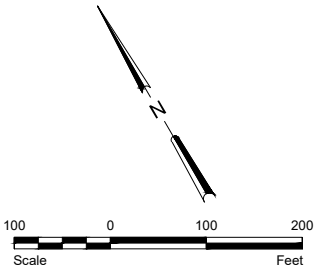
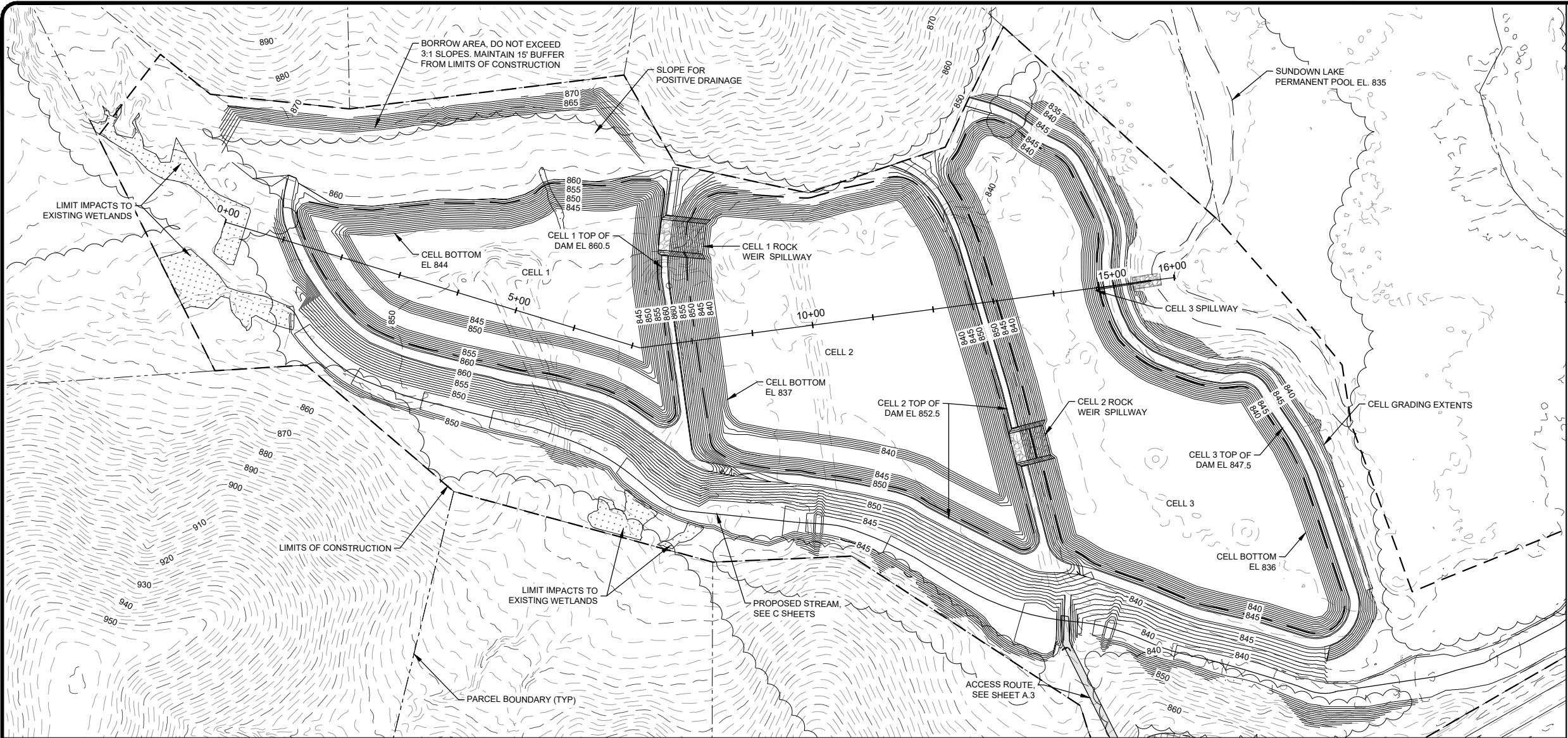
No.

Date

By



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SUNDOWN LAKE SW BASIN  
SUNDOWN LAKE RIZ  
APPANOSE COUNTY, IOWA

SITE PLAN & PROFILE



Drawn By  
TDB

Checked By  
MKS

Date  
8-6-2024

Scale  
As Shown

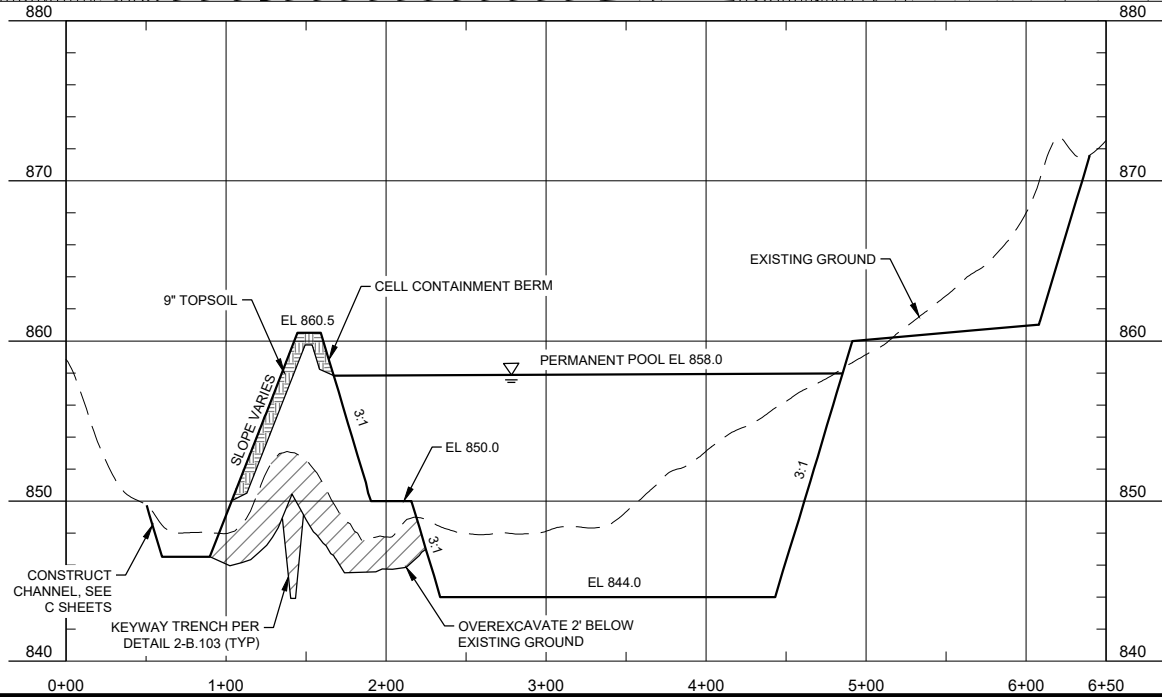
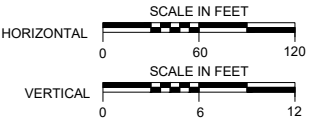
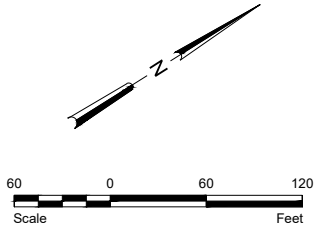
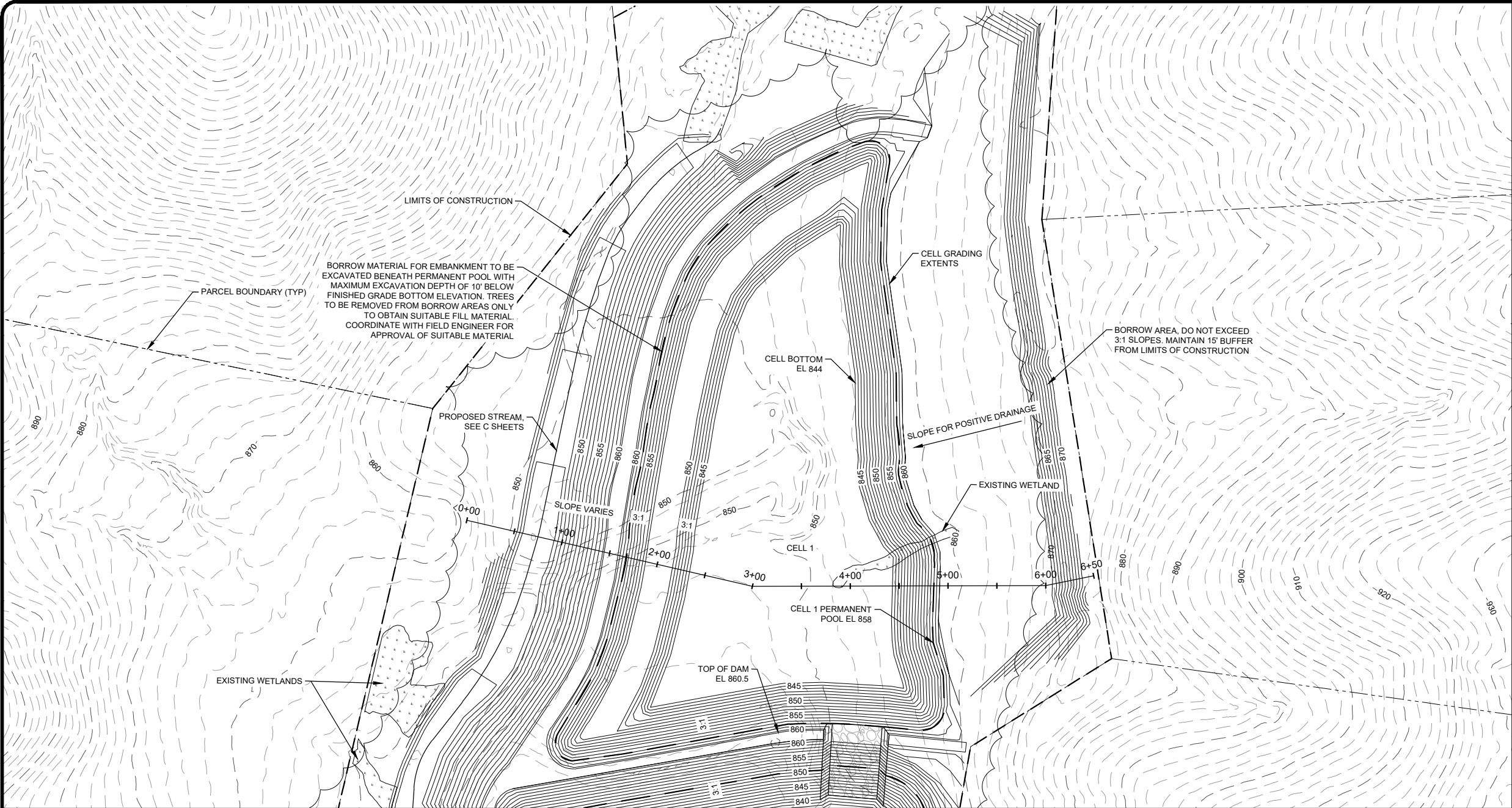
Project No.  
152-0001

SHEET  
B.1





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SUNDOWN LAKE SW BASIN  
SUNDOWN LAKE RIZ  
APPANOOSE COUNTY, IOWA  
CELL 1 PLAN & PROFILE

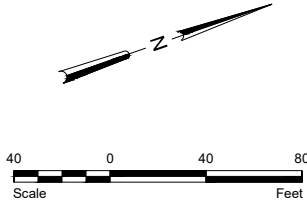
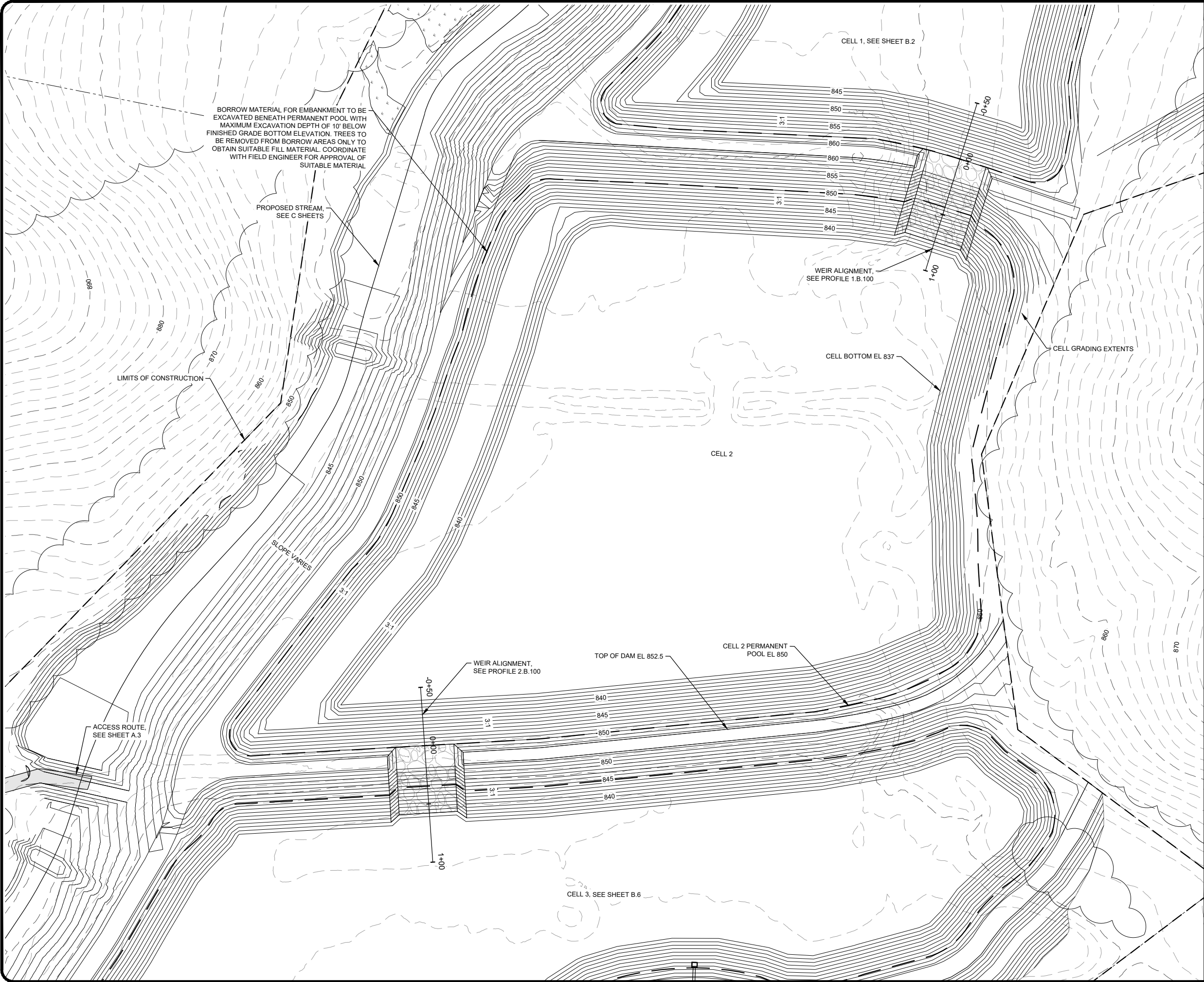


Drawn By  
TDB  
Checked By  
MKS  
Date  
8-6-2024  
Scale  
As Shown  
Project No.  
152-0001

SHEET  
B.3



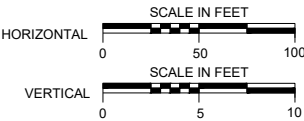
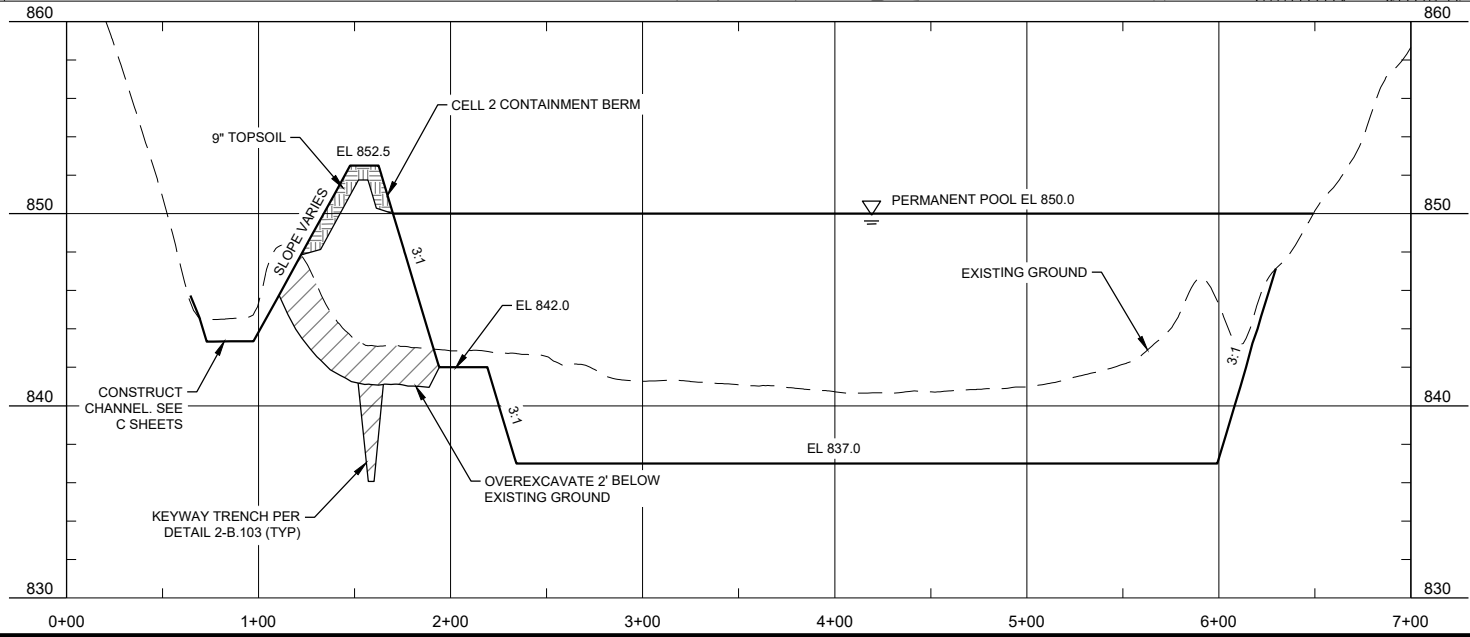
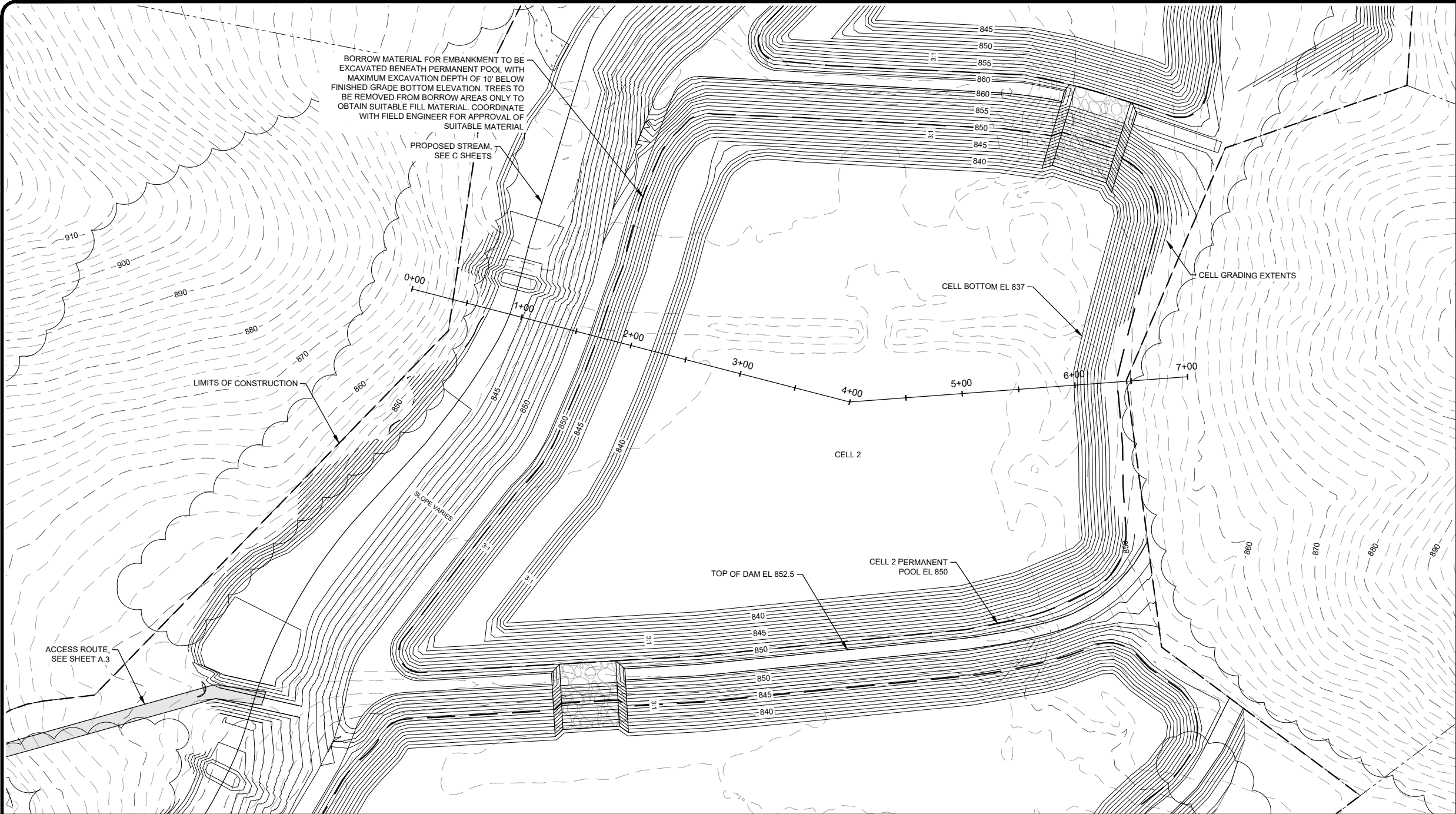
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 HOUSTON engineering, inc.	Drawn By	TDB
	Checked By	MKS
	Date	8-6-2024
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	Project No.	152-0001
	SHEET	B.4
Revision		No.
Date		By



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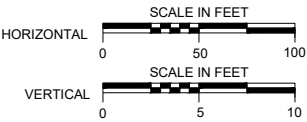
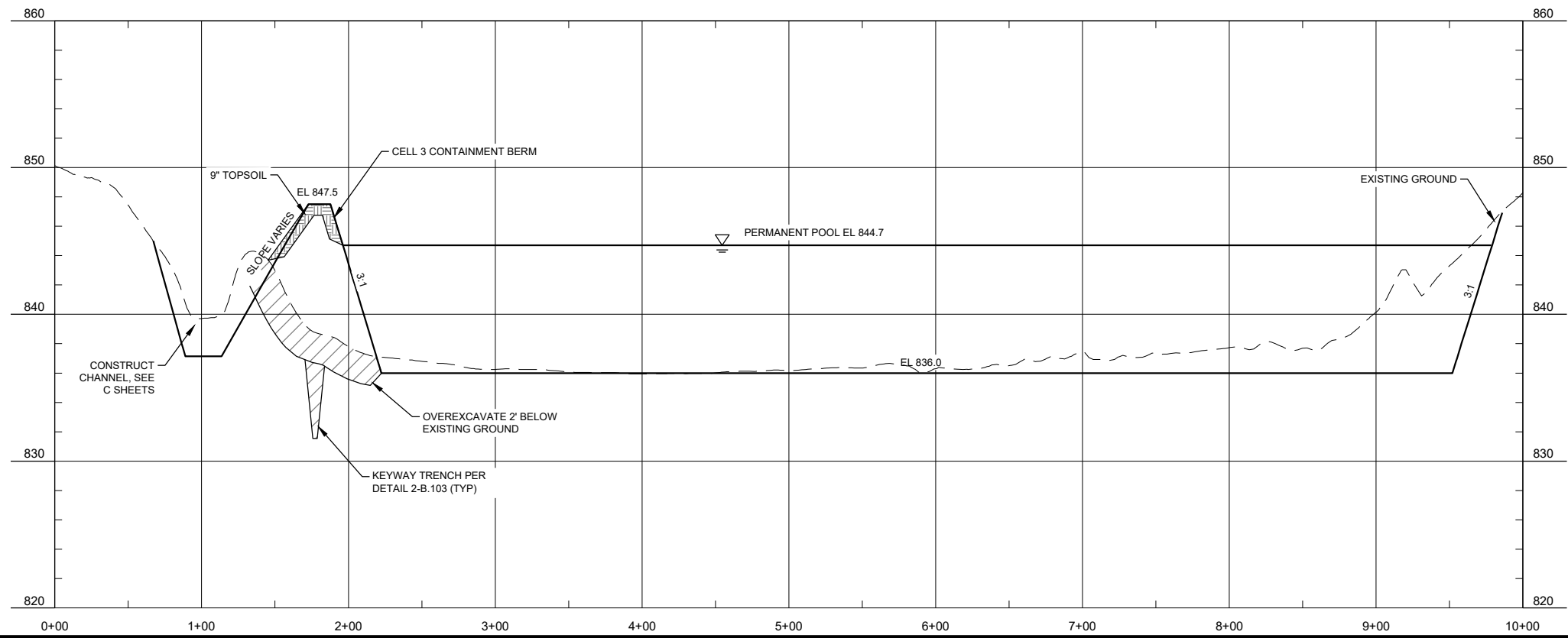
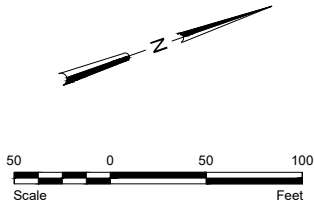
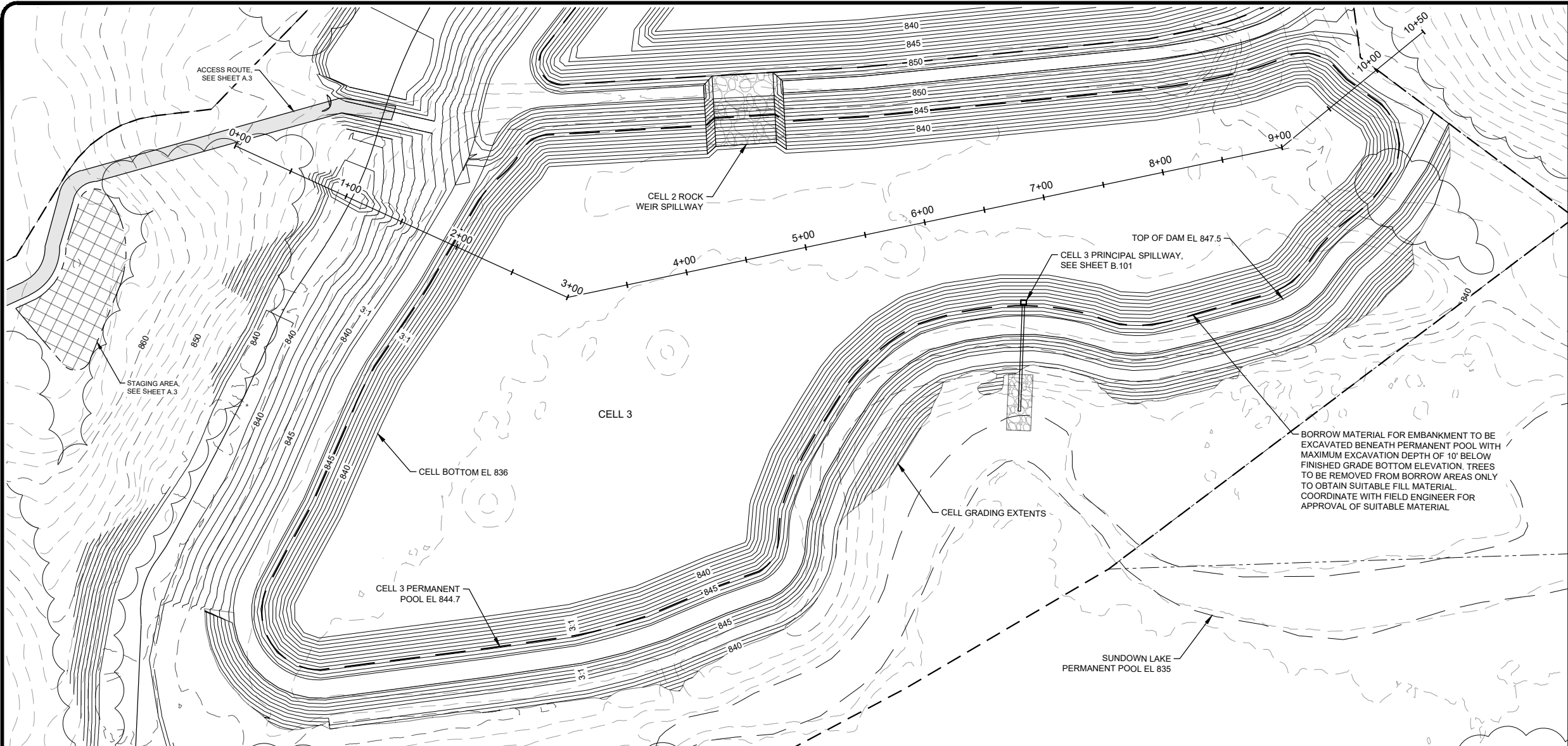


By		Date	
Revision	No.		
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOSE COUNTY, IOWA CELL 2 PLAN & PROFILE			
 Houston Engineering, Inc.			
Drawn By	TDB	Checked By	MKS
Date	8-6-2024	Scale	As Shown
Project No.	152-0001	SHEET B.5	



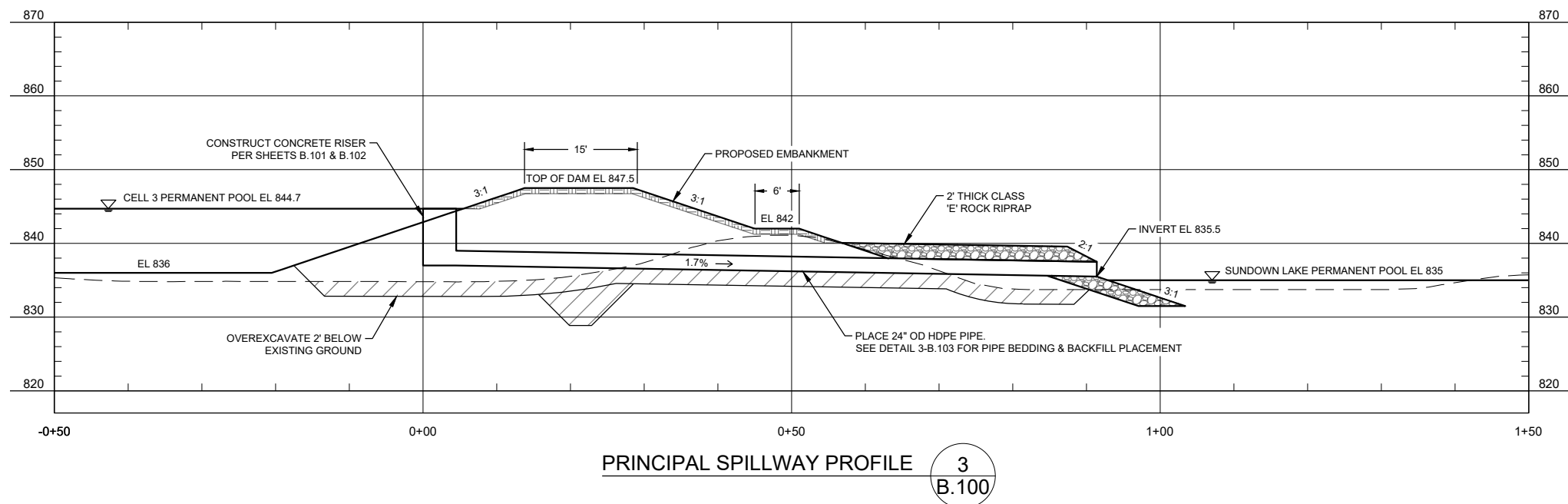
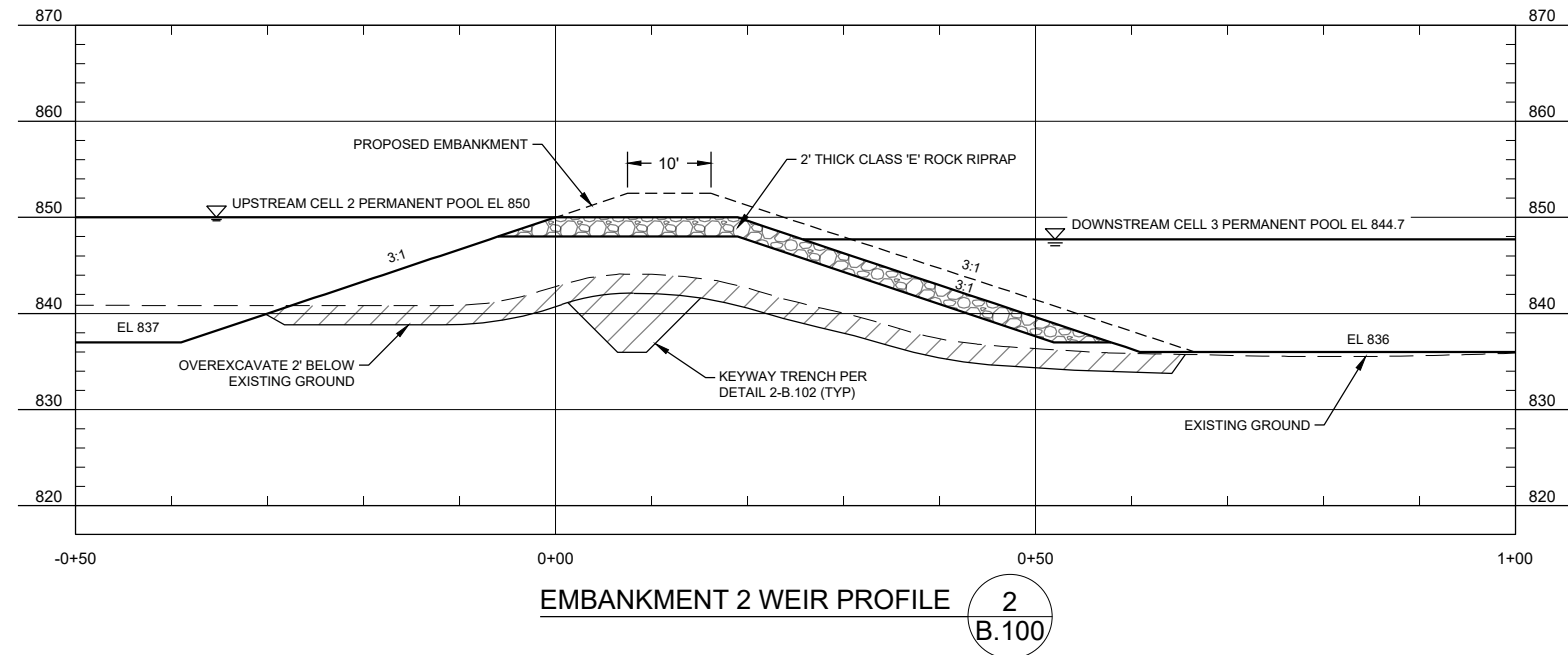
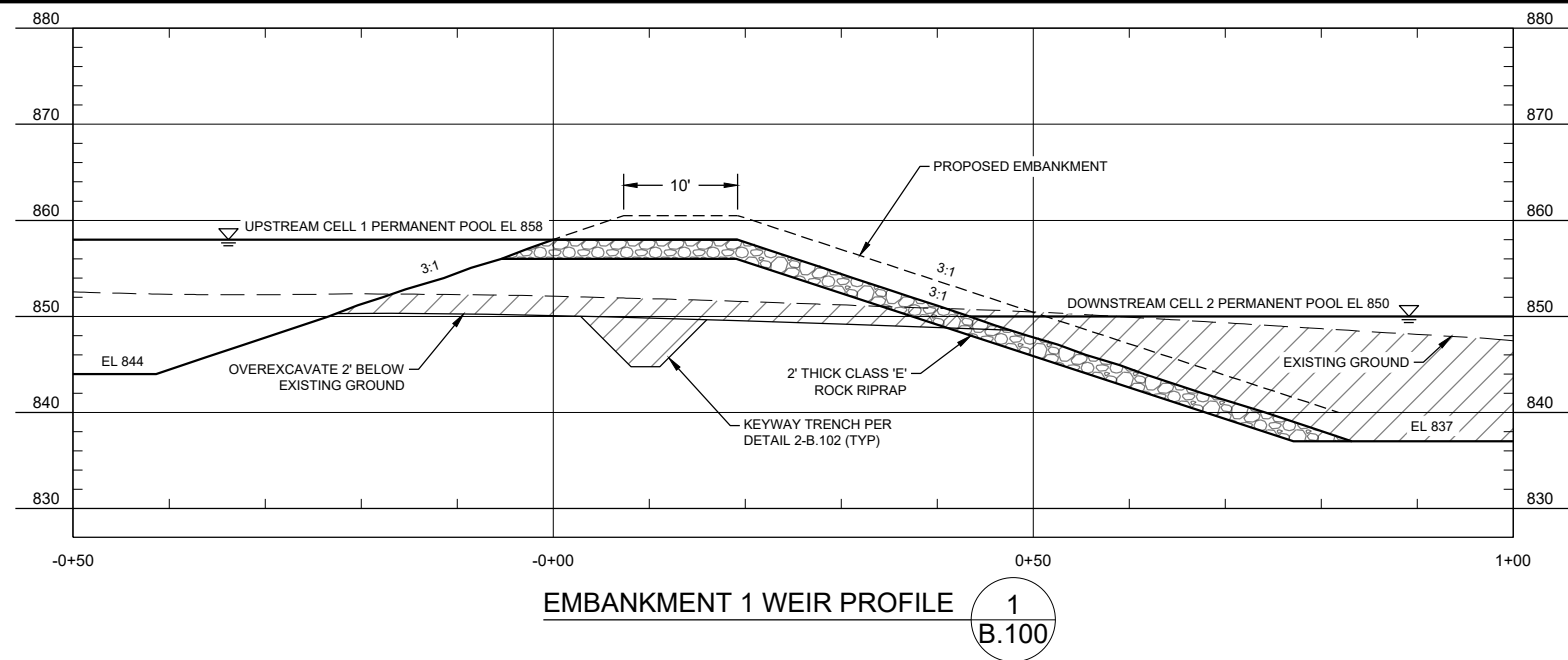


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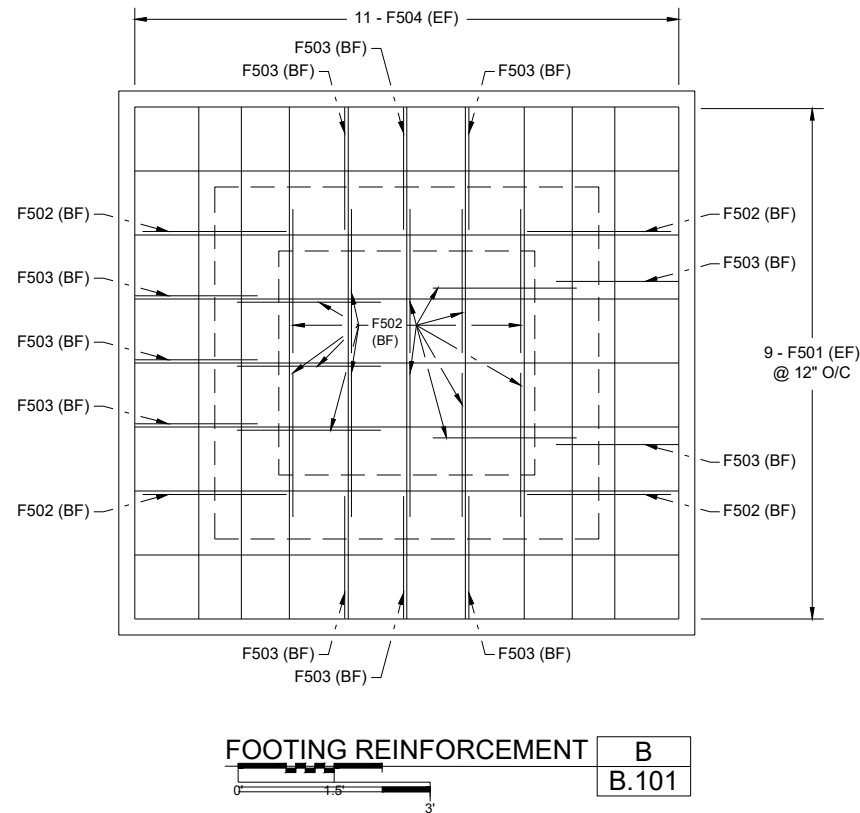
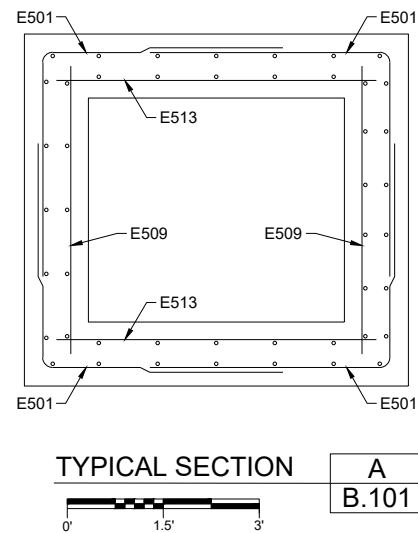
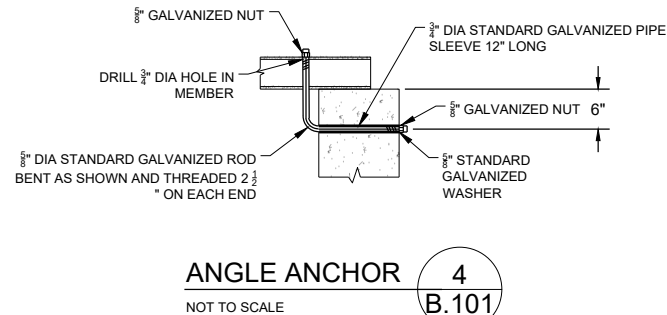
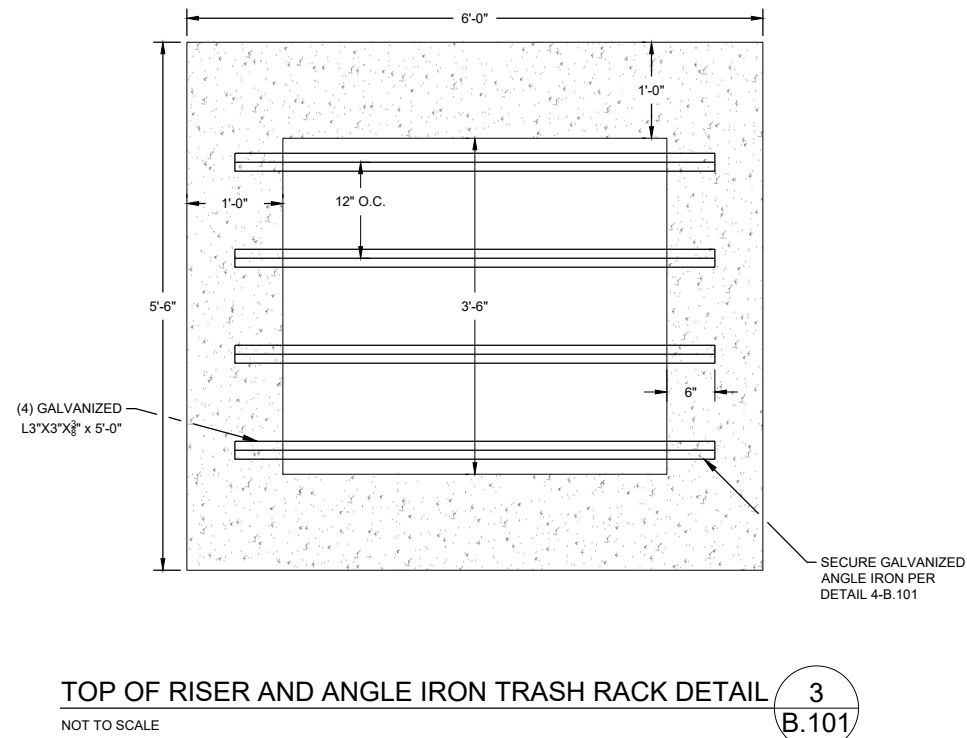
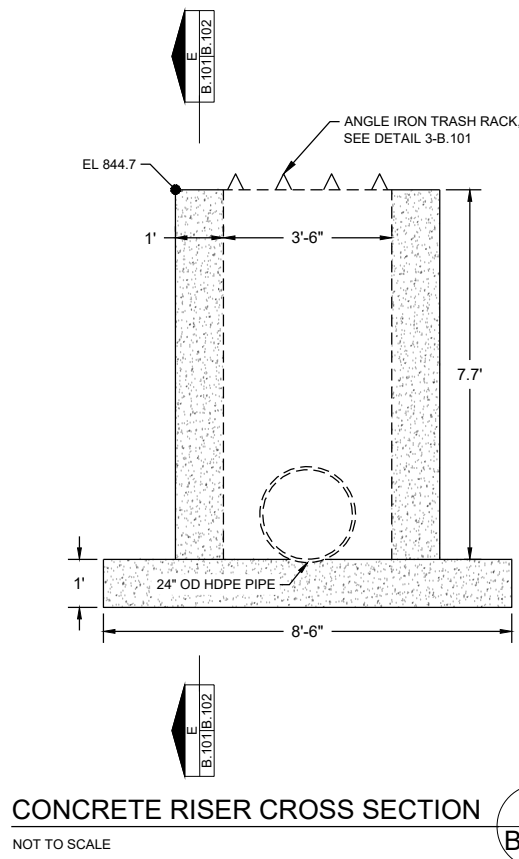
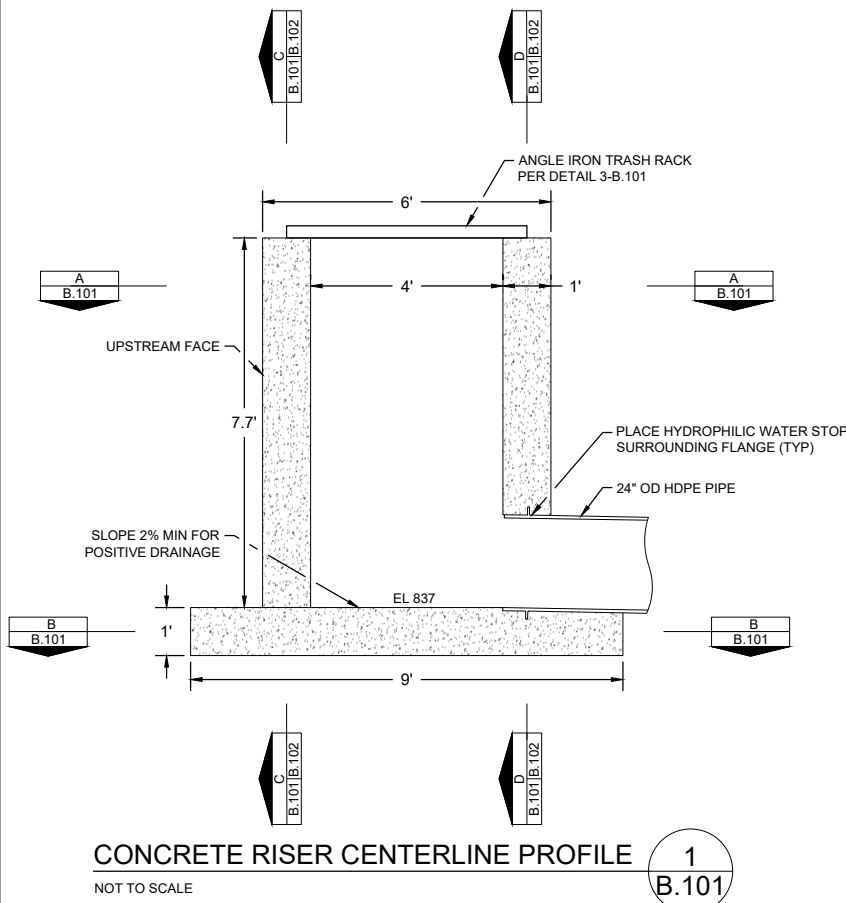
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Date	
Revision	
No.	
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOSE COUNTY, IOWA	
CELL 3 PLAN & PROFILE	
Drawn By	TDB
Checked By	MKS
Date	8-6-2024
Scale	As Shown
Project No.	152-0001
SHEET B.7	

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By	Date	Revision	No.
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOSE COUNTY, IOWA EMBANKMENT PROFILES			
Drawn By	TDB	Checked By	MKS
Date	8-6-2024	Scale	As Shown
Project No.	152-0001	SHEET	B.100

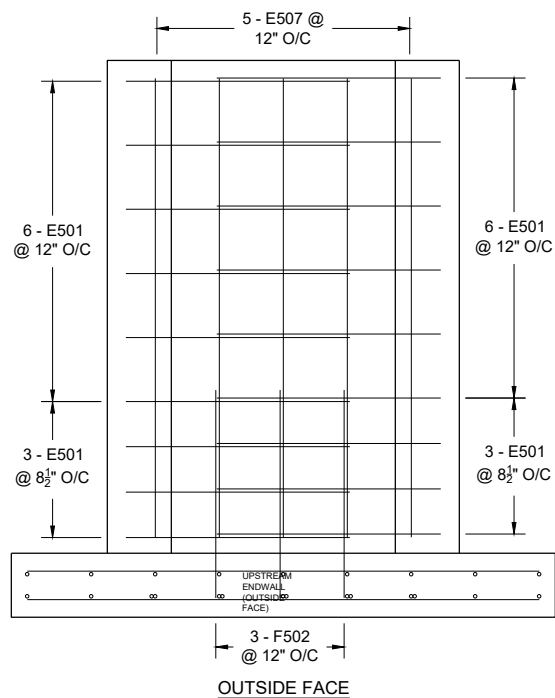
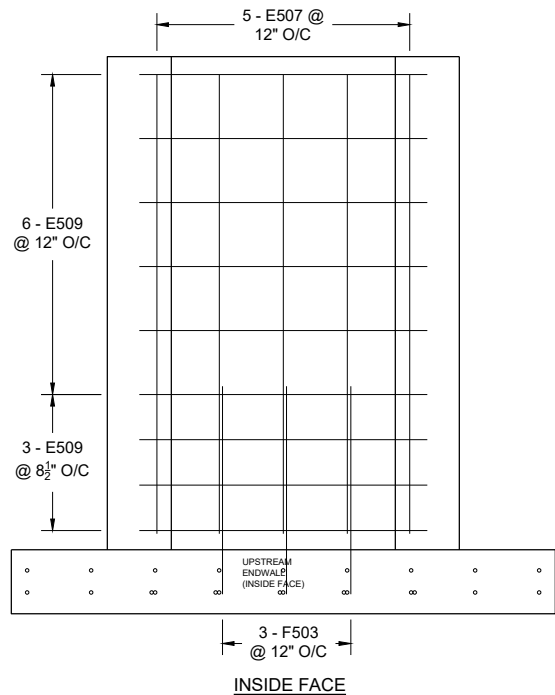
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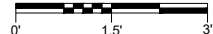
#### GENERAL STRUCTURAL NOTES:

1. THE CONTRACTOR SHALL SUPPORTS, UNDERPIN, BRACE, AND SECURE THE STRUCTURE AS REQUIRED. DURING CONSTRUCTION THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
2. RISER SHALL BE CONSTRUCTED IN DRY CONDITIONS.
3. REINFORCING BARS SHALL HAVE A 3" CLEAR SPACE TO SURFACE OF CONCRETE, UNLESS OTHERWISE STATED.
4. MINIMUM REBAR OVERLAP SHALL BE 40 TIMES THE DIAMETER OF THE REBAR.
5. STEEL PLACEMENT SHALL BE CHECKED AND APPROVED BY THE FIELD ENGINEER PRIOR TO CONCRETE PLACEMENT.
6. CONCRETE STRENGTH SHALL BE 4000 PSI AT 28 DAYS. SEE SPECIFICATIONS FOR MIX DESIGN GUIDELINES.
5. COLD GALVANIZED COMPOUND (NOT SPRAY) TO BE USED ON ALL TRASH RACK WELDS, HOLES, AND ANY NON-GALVANIZED SURFACES. APPLY PER MFG'S RECOMMENDATION.
6. ALL TRASH RACK METAL FABRICATION TO FOLLOW SPECIFICATION ASTM A767.
7. HYDROPHILIC WATERSTOPS SHALL BE PLACED IN CONSTRUCTION JOINTS BETWEEN THE FOOTING AND SIDEWALLS.

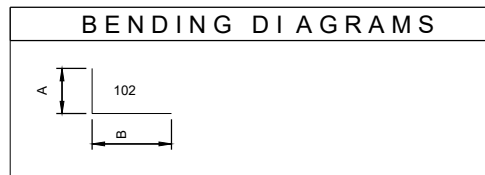
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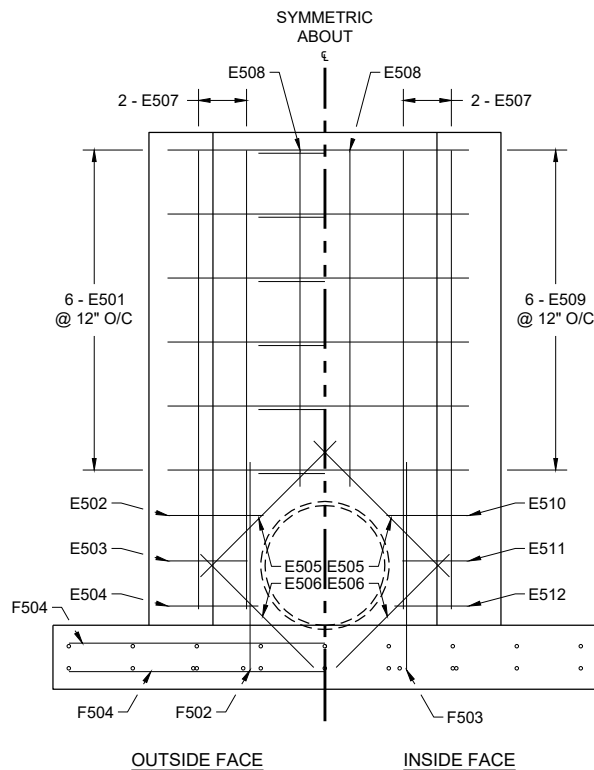
UPSTREAM ENDWALL REINFORCEMENT **C**  
B.101 | B.102



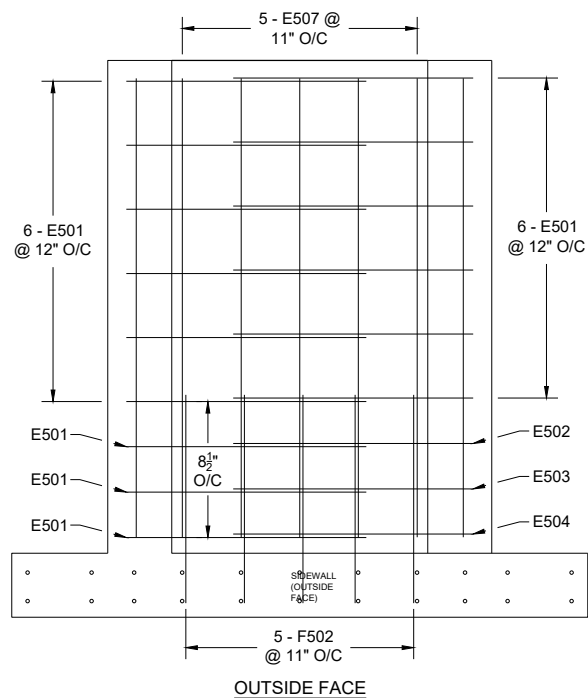
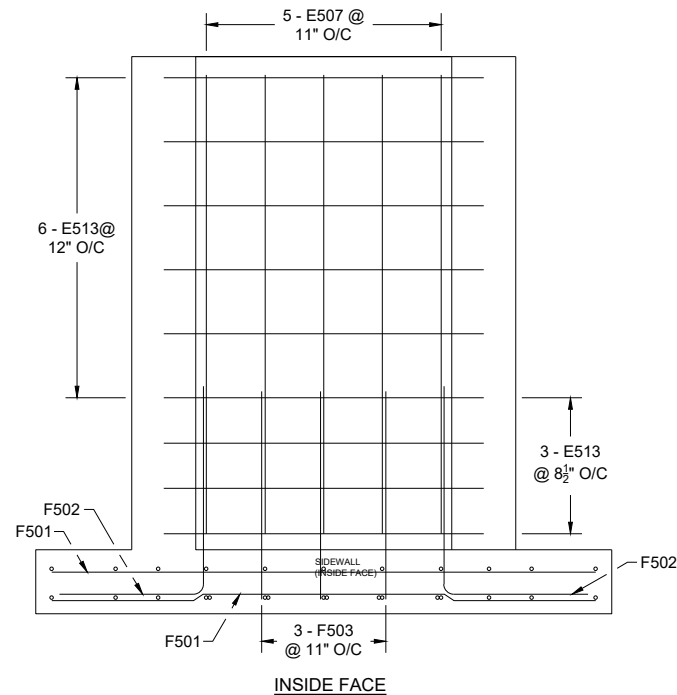
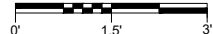
BILL OF BARS							
MARK	NO.	LENGTH	TYPE	A	B	PIN	WEIGHT (LBS)
E501	30	7'-3"	102	3'-9"	3'-6"	2 1/4"	226.9
E502	2	5'-3"	102	3'-9"	1'-6"	3 3/4"	11.0
E503	2	5'-0"	102	3'-9"	1'-3"	3 3/4"	10.4
E504	2	5'-2"	102	3'-9"	1'-5"	3 3/4"	10.8
E505	4	3'-0"	STR	3'-0"			12.5
E506	4	2'-6"	STR	2'-6"			10.4
E507	42	7'-2"	STR	7'-2"			313.9
E508	4	5'-3"	STR	5'-3"			21.9
E509	15	4'-6"	STR	4'-6"			70.4
E510	2	1'-4"	STR	1'-4"			2.8
E511	2	1'-0"	STR	1'-0"			2.1
E512	2	1'-2"	STR	1'-2"			2.4
E513	9	5'-0"	STR	5'-0"			46.9
F501	9	8'-6"	STR	8'-6"			79.8
F502	19	5'-6"	102	3'-3"	2'-3"	3 3/4"	109.0
F503	11	5'-2"	102	3'-3"	1'-11"	3 3/4"	59.3
F504	11	8'-0"	STR	8'-0"			91.8



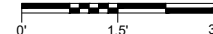
BAR MARK  
E503 E 5 03  
BAR NUMBER  
BAR SIZE  
TYPE OF ELEMENT:  
E = ENDWALL  
F = FOOTING



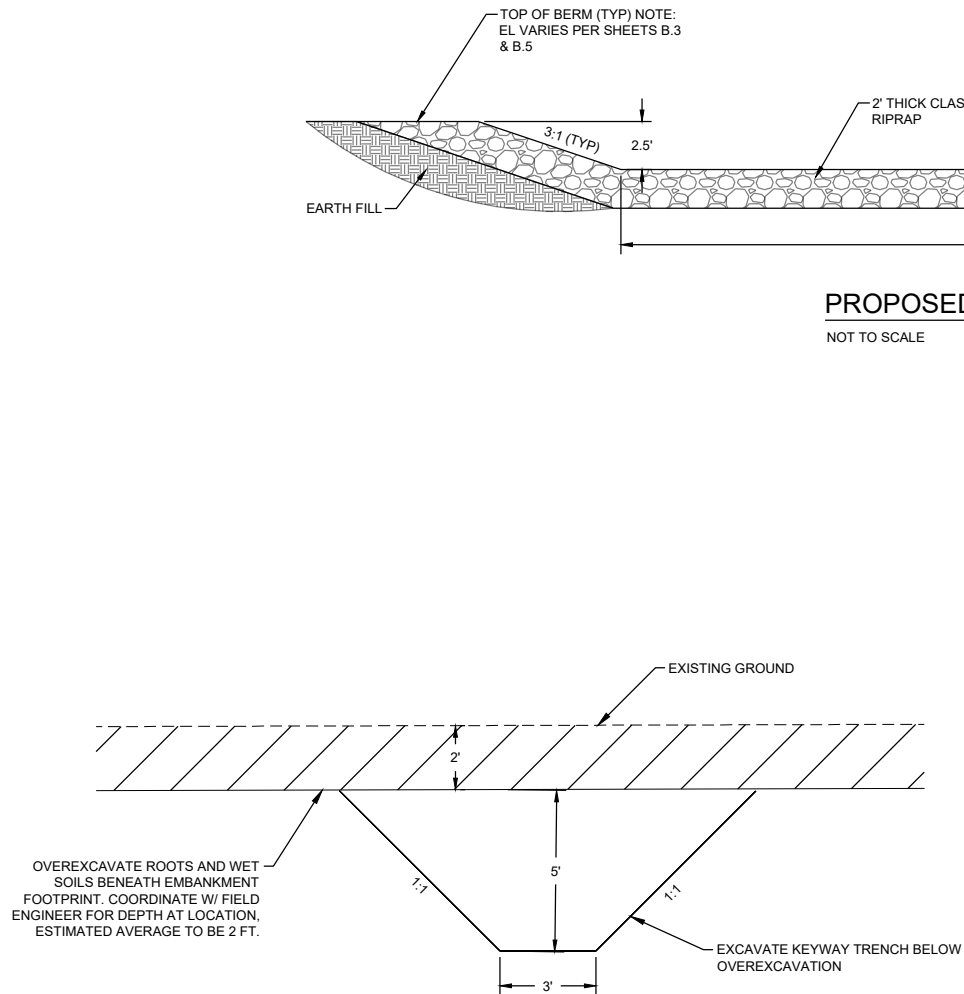
DOWNSTREAM ENDWALL REINFORCEMENT **D**  
B.101 | B.102



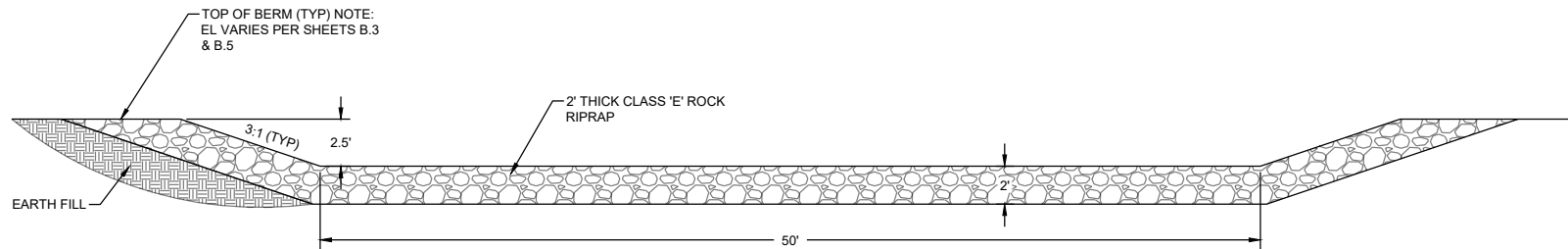
SIDEWALL REINFORCEMENT **E**  
B.101 | B.102



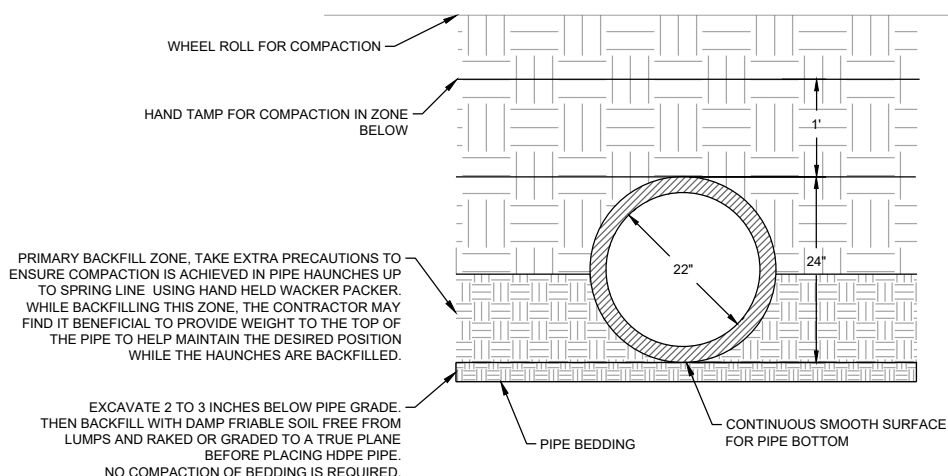
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KEYWAY TRENCH DETAIL (TYP) **2**  
NOT TO SCALE **B.103**



PROPOSED WEIR CROSS SECTION **1**  
NOT TO SCALE **B.103**



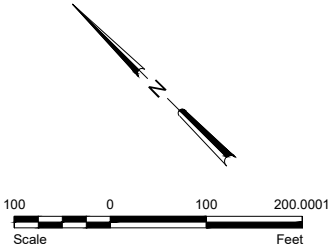
PIPE BEDDING & BACKFILL DETAIL **3**  
NOT TO SCALE **B.103**

CONSTRUCTION NOTE:  
1. BEGIN BACKFILLING IMMEDIATELY AFTER PIPE HAS BEEN PLACED

					By
					Date
					Revision
				No.	
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOSE COUNTY, IOWA					
CELL DETAILS					
					
Drawn By TDB					
Checked By MKS					
Date 8-6-2024					
Scale As Shown					
Project No. 152-0001					
SHEET B.103					



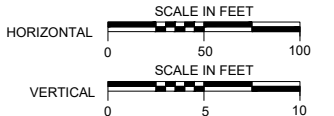
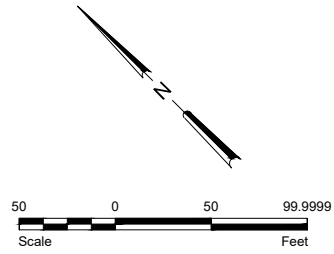
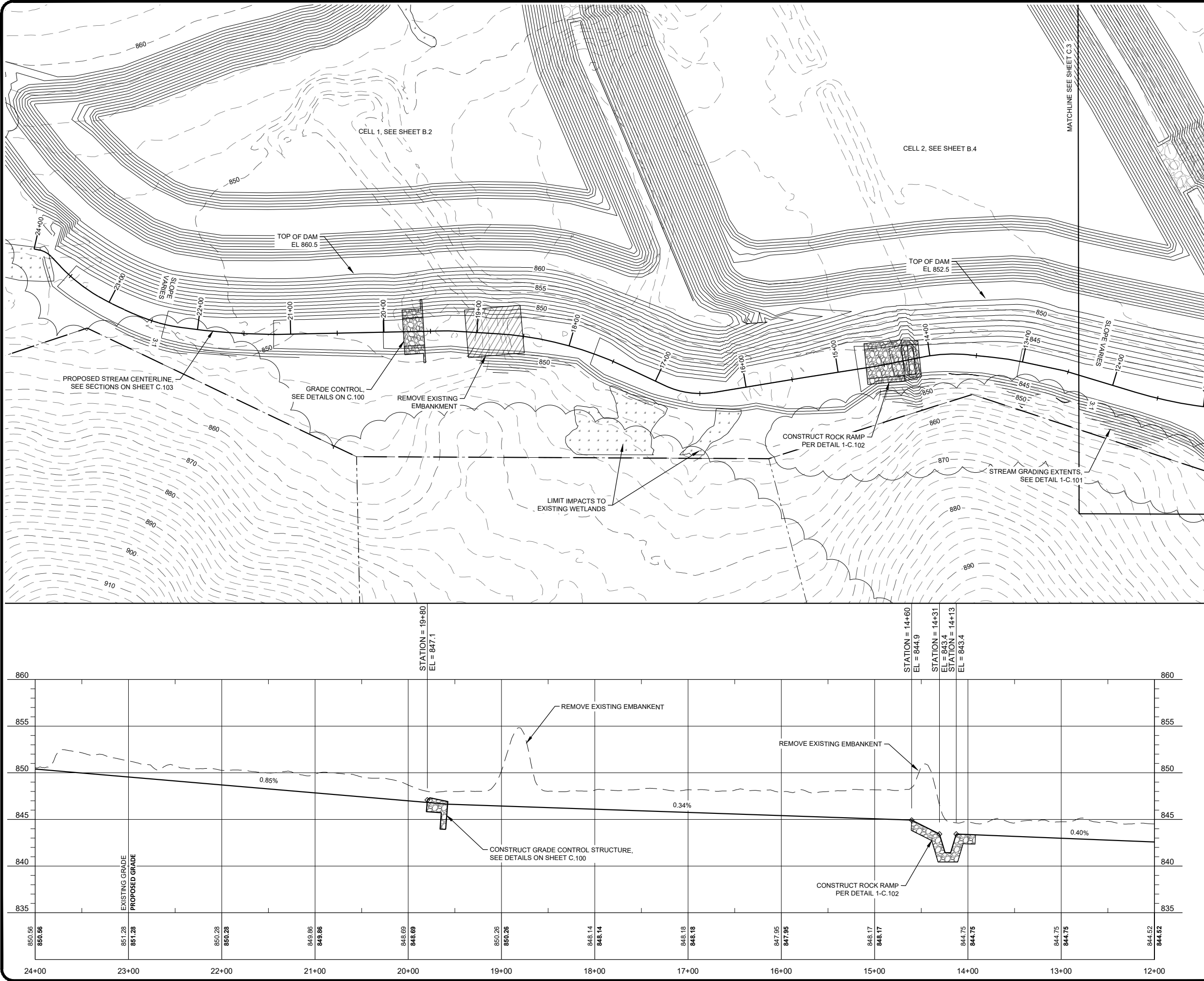
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SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOS COUNTY, IOWA		Revision		By	
STREAM SHEET KEY		No.	Date		
		Drawn By TDB		Date 8-6-2024	
		Checked By MKS		Scale As Shown	
		Project No. 152-0001		SHEET C.1	

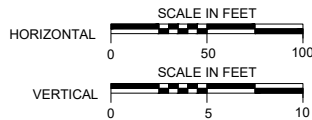
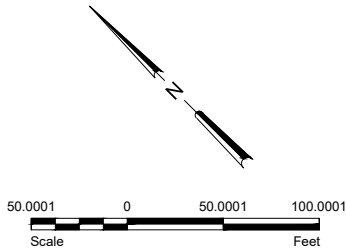
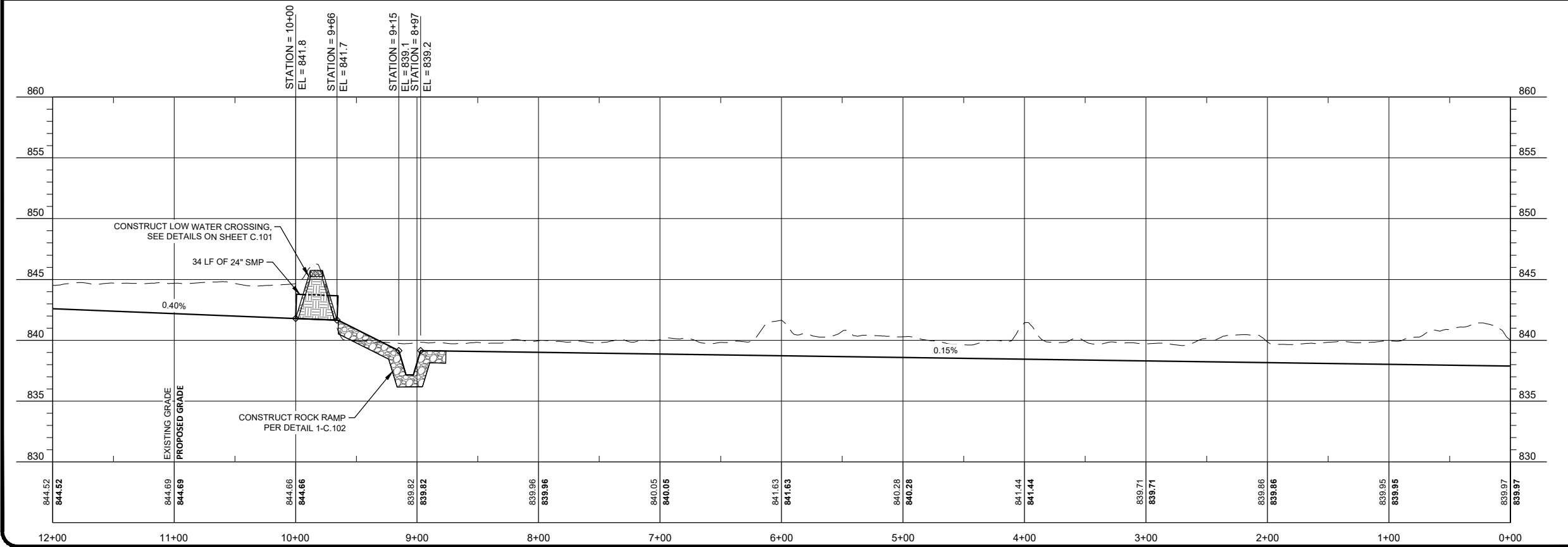
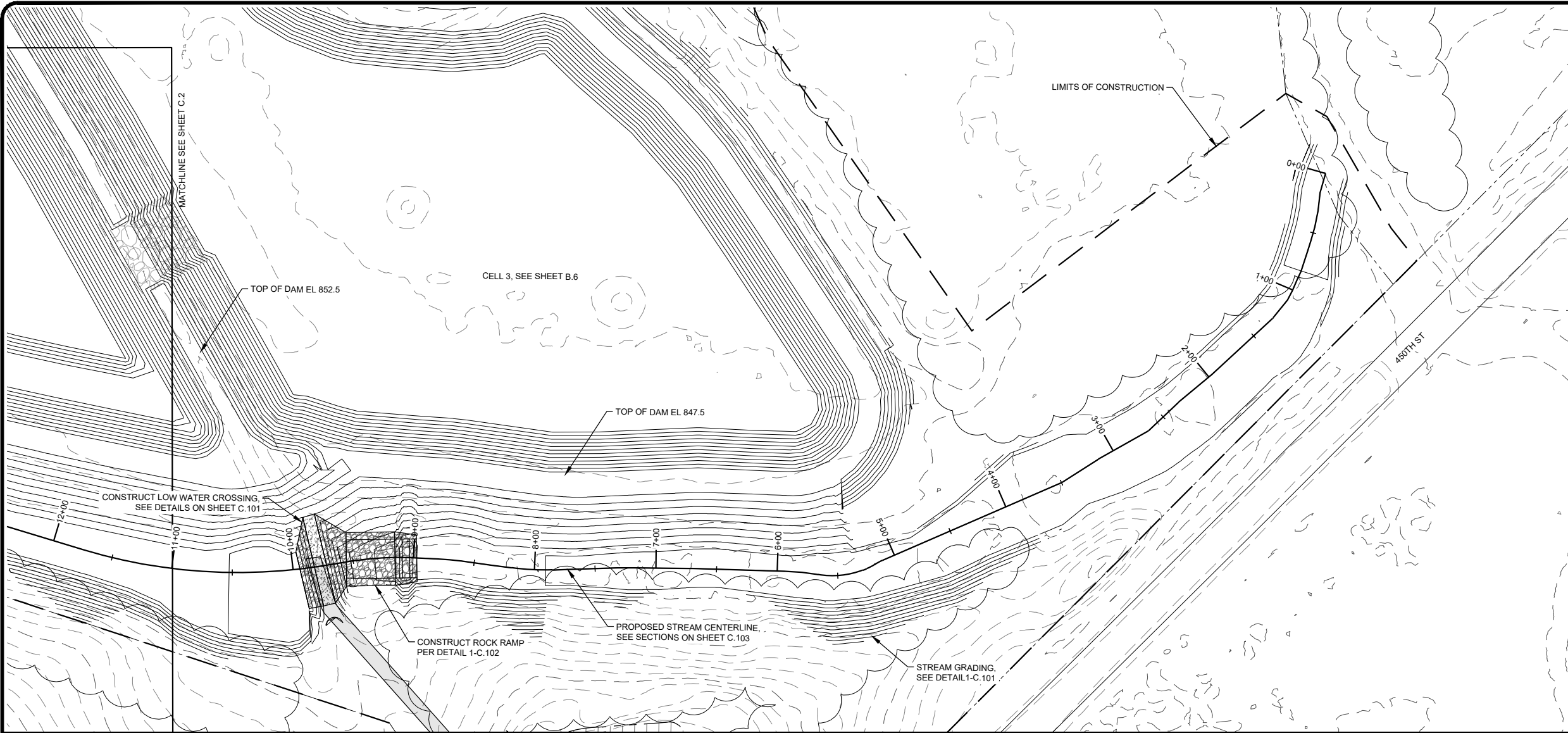


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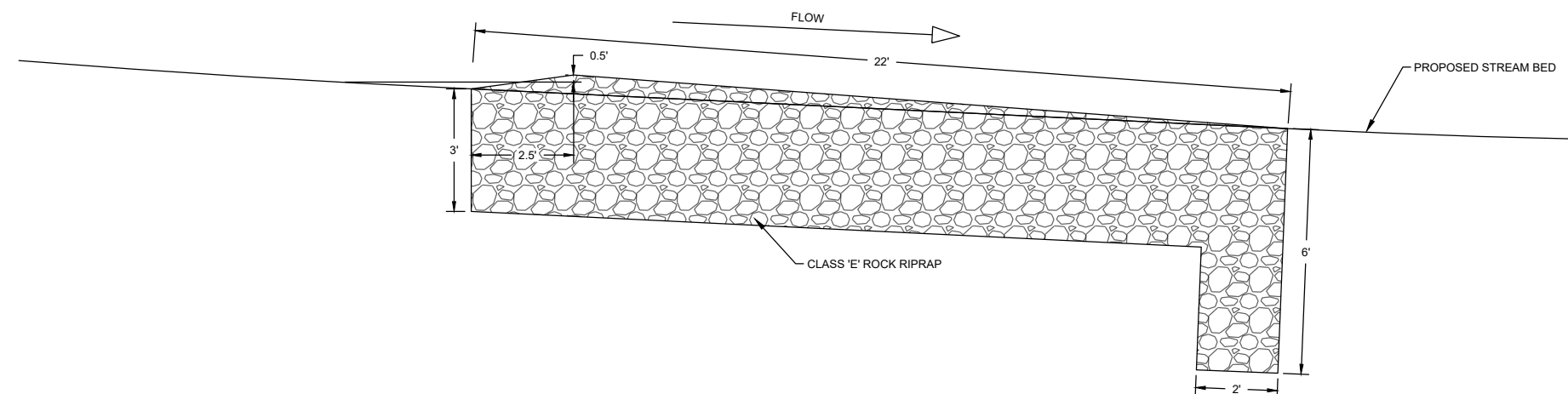


By	Date	Revision	No.
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOS COUNTY, IOWA			
STREAM PLAN & PROFILE (1 OF 2)			
Drawn By	TDB	Checked By	MKS
Date	8-6-2024	Scale	As Shown
Project No.	152-0001	SHEET	
		C.2	

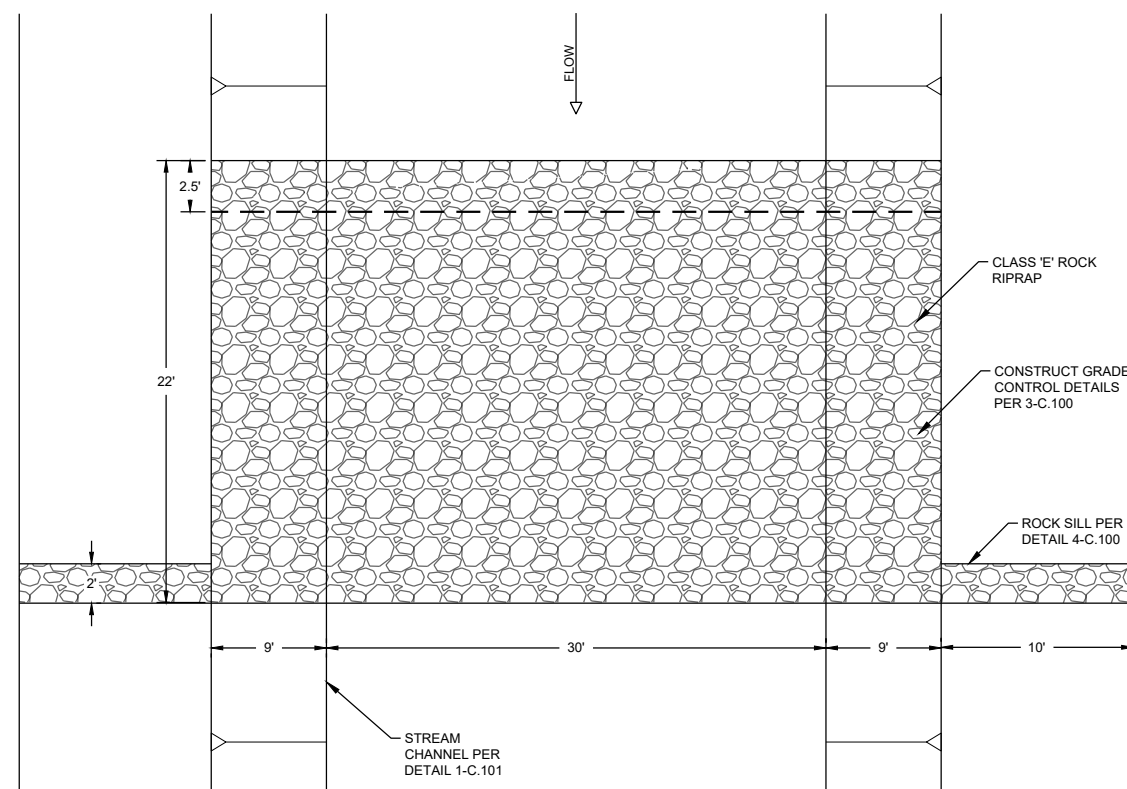
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By	
Date	
Revision	
No.	
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOSE COUNTY, IOWA	
STREAM PLAN & PROFILE (2 OF 2)	
Drawn By	TDB
Checked By	MKS
Date	8-6-2024
Scale	As Shown
Project No.	152-0001
SHEET	C.3



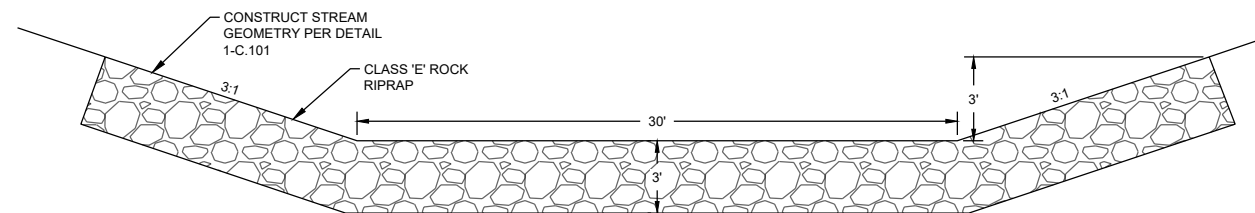
PROPOSED GRADE CONTROL PROFILE



PROPOSED GRADE CONTROL PLAN VIEW

NOT TO SCALE

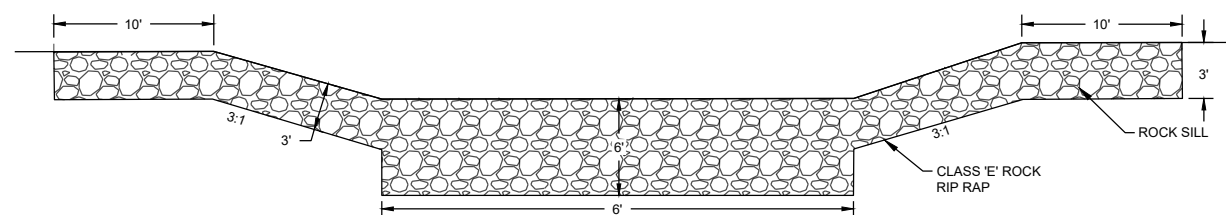
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PROPOSED GRADE CONTROL CROSS SECTION

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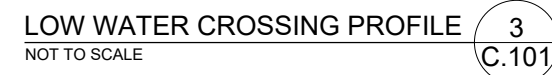
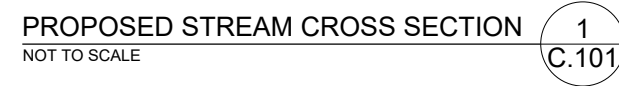


PROPOSED GRADE CONTROL ROCK SILL CROSS SECTION

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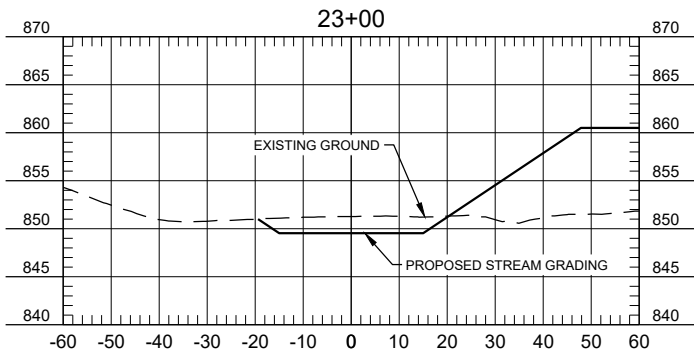
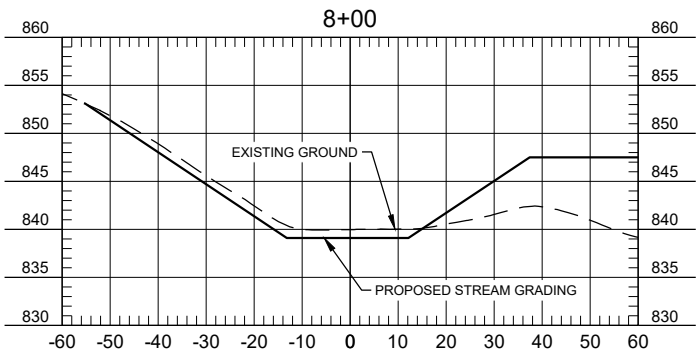
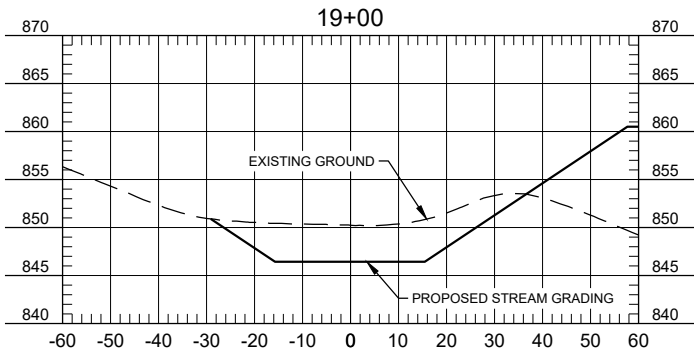
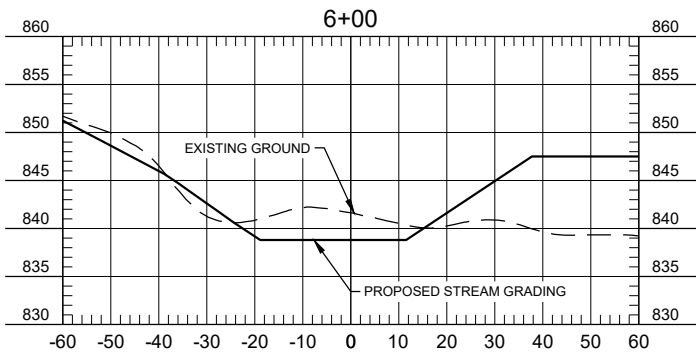
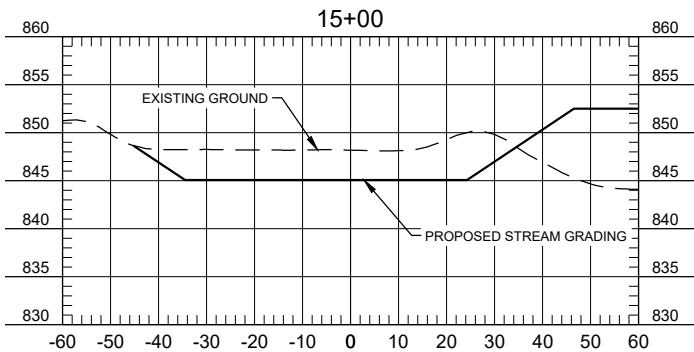
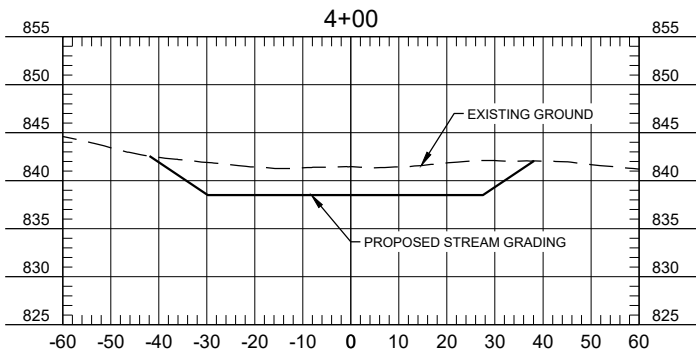
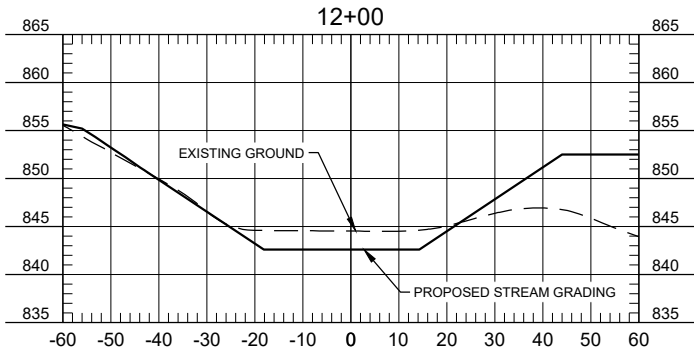
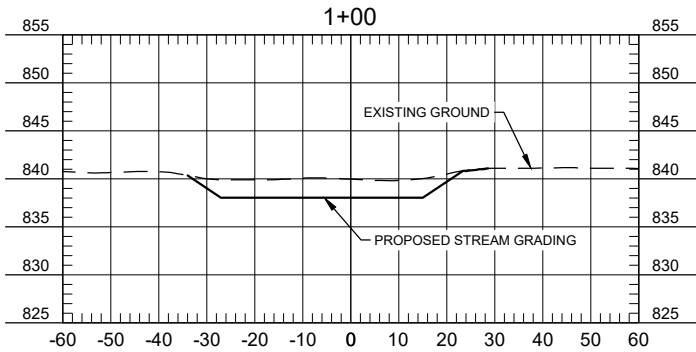
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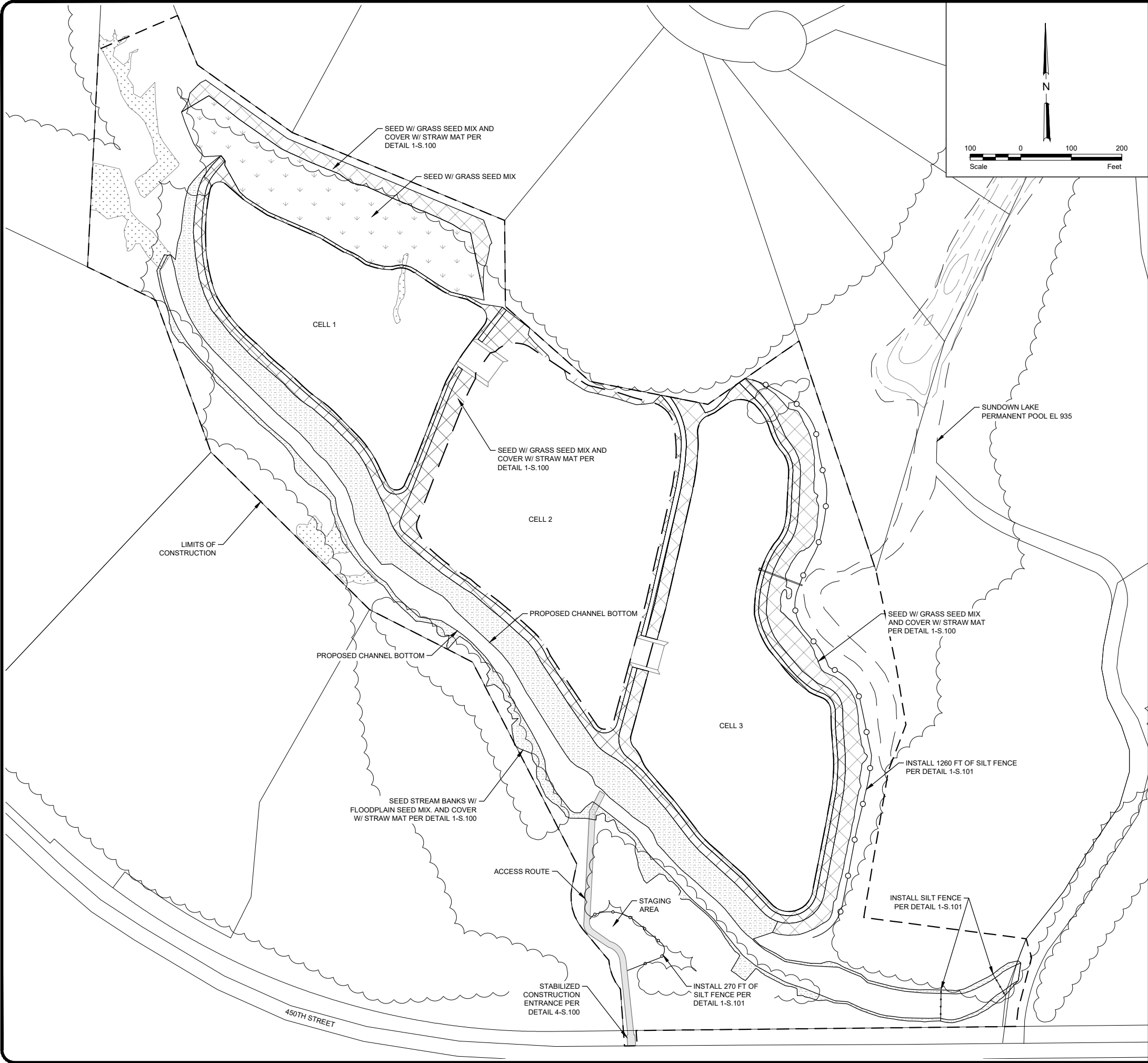


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SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOSE COUNTY, IOWA STREAM SECTIONS	
	
Drawn By TDB	
Checked By MKS	
Date 8-6-2024	
Scale As Shown	
Project No. 152-0001	
SHEET C.103	

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## STORMWATER POLLUTION PREVENTION PLAN

ALL CONTRACTORS/SUBCONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN A MANNER THAT MINIMIZES EROSION AND PREVENTS SEDIMENTS FROM LEAVING THE PROJECT SITE OR ENTERING NEW OR EXISTING STORM WATER SYSTEMS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AND IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THEIR ENTIRE CONTRACT. THIS RESPONSIBILITY SHALL BE FURTHER SHARED WITH SUBCONTRACTORS WHOSE WORK IS A SOURCE OF POTENTIAL POLLUTION AS DEFINED IN THIS SWPPP.

### 1. SITE DESCRIPTION

THIS SWPPP IS FOR THE CONSTRUCTION OF SUNDOWN LAKE SW SEDIMENT BASIN. THIS PROJECT CONSISTS OF THE CONSTRUCTION OF 3 CONNECTED SEDIMENT BASINS, CHANNEL AND INCIDENTAL WORK AS REQUIRED BY THE PLANS AND/OR THE CONSTRUCTION INSPECTOR.

### POTENTIAL SOURCES OF POLLUTION:

SITE SOURCES OF POLLUTION GENERATED AS A RESULT OF THIS WORK RELATE TO SILTS AND SEDIMENT WHICH MAY BE TRANSPORTED AS A RESULT OF A STORM EVENT. HOWEVER, THIS SWPPP PROVIDES CONVEYANCE FOR OTHER (NON-PROJECT RELATED) OPERATIONS. THESE OTHER OPERATIONS HAVE STORM WATER RUNOFF, THE REGULATION OF WHICH IS BEYOND THE CONTROL OF THIS SWPPP. POTENTIALLY THIS RUNOFF CAN CONTAIN VARIOUS POLLUTANTS RELATED TO SITE-SPECIFIC LAND USES. EXAMPLES ARE:

### RURAL AGRICULTURAL ACTIVITIES:

RUNOFF FROM AGRICULTURAL LAND USE CAN POTENTIALLY CONTAIN CHEMICALS INCLUDING HERBICIDES, PESTICIDES, FUNGICIDES AND FERTILIZERS.

### 2. CONTROLS

AT DOWNGRADIANT LOCATIONS WHERE RUNOFF CAN MOVE FROM EACH CONSTRUCTION SITE, CONTROLS SHALL BE PLACED ALONG THE PERIMETER OF THE AREAS TO BE DISTURBED PRIOR TO BEGINNING GRADING, EXCAVATION OR CLEARING AND GRUBBING OPERATIONS. CONTROLS INCLUDE SILT FENCE, STRAW BALES, WATTLES, CONSTRUCTION ENTRANCES (OR APPROVED EQUIVALENTS BY FIELD ENGINEER) AS LAID OUT ON THE SITE PLAN SHEETS. VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION SHALL BE PRESERVED.

TEMPORARY STABILIZING SEEDING SHALL BE COMPLETED AS THE DISTURBED AREAS ARE CONSTRUCTED. IF CONSTRUCTION ACTIVITY IS NOT PLANNED TO OCCUR IN A DISTURBED AREA FOR AT LEAST 21 DAYS, THE AREA SHALL BE STABILIZED BY TEMPORARY SEEDING OR MULCHING WITHIN 14 DAYS. OTHER STABILIZING METHODS SHALL BE USED OUTSIDE THE SEEDING TIME PERIOD. TEMPORARY SEEDING AND MULCHING SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT. UPON REACHING FINAL GRADES, EROSION CONTROL MATTING WILL BE PLACE ON SLOPES AS INDICATED ON PLANS.

AS THE WORK PROGRESSES, ADDITIONAL EROSION CONTROL ITEMS MAY BE REQUIRED AS DETERMINED BY THE CONTRACTOR AFTER FIELD INVESTIGATION. THE CONTRACTOR WILL COMPLETE THE CONSTRUCTION WITH THE ESTABLISHMENT OF PERMANENT PERENNIAL VEGETATION OF ALL DISTURBED AREAS AND EROSION CONTROL MATTING IN SPECIFIED LOCATIONS.

### OTHER CONTROLS:

CONTRACTOR DISPOSAL OF UNUSED CONSTRUCTION MATERIALS AND CONSTRUCTION MATERIAL WASTES SHALL COMPLY WITH APPLICABLE STATE AND LOCAL WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEM REGULATIONS. IN THE EVENT OF A CONFLICT WITH OTHER GOVERNMENTAL LAWS, RULES AND REGULATIONS, THE MORE RESTRICTIVE LAWS, RULES OR REGULATIONS SHALL APPLY.

### APPROVED STATE OR LOCAL PLANS:

DURING THE COURSE OF THIS CONSTRUCTION, IT IS POSSIBLE THAT SITUATIONS WILL ARISE WHERE UNKNOWN MATERIALS WILL BE ENCOUNTERED. WHEN SUCH SITUATIONS ARE ENCOUNTERED, THEY WILL BE HANDLED ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS IN EFFECT AT THE TIME.

### 3. MAINTENANCE


THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL TEMPORARY EROSION CONTROL MEASURES IN PROPER WORKING ORDER, INCLUDING CLEANING, REPAIRING, OR REPLACING THEM THROUGHOUT THE CONTRACT PERIOD. CLEANING OF SILT CONTROL DEVICES SHALL BEGIN WHEN THE FEATURES HAVE LOST 50% OF THEIR CAPACITY.

### 4. INSPECTIONS

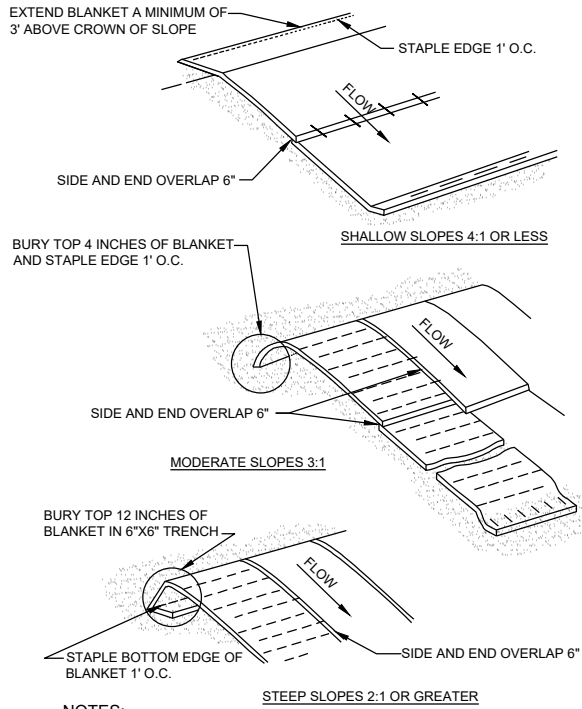
INSPECTIONS SHALL BE MADE JOINTLY BY THE CONTRACTOR AND THE CONTRACTING AUTHORITY EVERY SEVEN CALENDAR DAYS AND AFTER EACH RAIN EVENT THAT IS 1/2" OR GREATER. THE CONTRACTOR SHALL IMMEDIATELY BEGIN CORRECTIVE ACTION ON ALL DEFICIENCIES FOUND. THE FINDINGS OF THIS INSPECTION SHALL BE RECORDED IN THE PROJECT DIARY. THIS SWPPP MAY BE REVISED BASED ON THE FINDINGS OF THE INSPECTION. THE CONTRACTOR SHALL IMPLEMENT ALL REVISIONS. ALL CORRECTIVE ACTIONS SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS OF THE INSPECTION.

### 5. NON-STORM DISCHARGES

THIS INCLUDES SUBSURFACE DRAINS (I.E. LONGITUDINAL AND STANDARD SUBDRAINS), SLOPE DRAINS AND BRIDGE END DRAINS. THE VELOCITY OF THE DISCHARGE FROM THESE FEATURES MAY BE CONTROLLED BY THE USE OF ROLLED EROSION CONTROL, OR RIPRAP.

					By
					Date
					Revision
					No.
SUNDOWN LAKE SW BASIN SUNDOWN LAKE RIZ APPANOOSE COUNTY, IOWA SITE MAP					
					
Drawn By TDB					
Checked By MKS					
Date 8-6-2024					
Scale As Shown					
Project No. 152-0001					
SHEET S.1					

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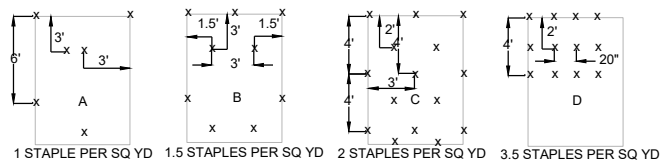
NOTES:

- ON 4:1 OR LESS SLOPES BLANKETS MAY BE APPLIED ACROSS THE SLOPE.
- ALL BLANKET INSTALLED AND STAPLED PER MANUFACTURERS SPECIFICATIONS.

EROSION CONTROL MATTING

NO SCALE

1  
S.100



300	B		C	C		C		D	
225			B	C		C			
150									
75	A		A	B	B				
FT	4:1		3:1	2:1	1:1	LOW FLOW CHANNEL		MED/HIGH FLOW	

\*MINIMUM STAPLE PATTERN GUIDE AND RECOMMENDATION FOR SLOPE AND CHANNEL APPLICATION

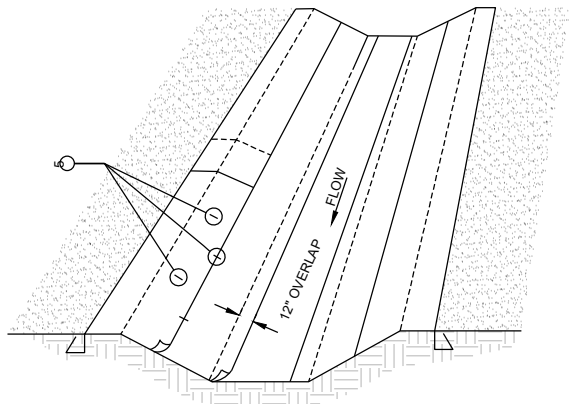
MATting STAPLE PATTERN

NO SCALE

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MATting NOTES:

- SURFACE MUST BE GRADED SMOOTH TO REMOVE ALL DEBRIS AND UNDULATIONS LARGER THAN 1 1/2" IN ANY DIRECTION.
- APPLY SEED AND FERTILIZER PRIOR TO MATting. INSTALL SO THAT MATting IS IN COMPLETE CONTACT WITH SOIL SURFACE.
- STAPLES ARE TO BE INSTALLED PER MANUFACTURES SPECIFICATIONS.
- CHANNEL OR SWALE APPLICATIONS: LENGTHWISE OVERLAP MATting A MINIMUM OF 12"; CROSSWISE OVERLAP A MINIMUM OF 6", AND AVOID JOINING MATERIAL IN CENTER OF DITCH OR SWALE.
- SLOPE APPLICATION: LENGTHWISE OVERLAP MATting A MINIMUM OF 6"; CROSSWISE OVERLAP A MINIMUM OF 6"; AT TOP OF SLOPE, ENTRENCH MATERIAL IN A 6"x6" TRENCH AND STAPLE AT 12" INTERVAL; AT BOTTOM OF SLOPE, EXTEND MAT 2 FEET BEYOND THE TOE OF THE SLOPE, TURN MATERIAL UNDER 4" AND STAPLE AT 12" INTERVAL; ON 4:1 SLOPES, ROLLS MAY BE PLACED IN HORIZONTAL STRIPS; MATS MUST BE STAPLED IN PLACE AS THEY ARE INSTALLED DOWN THE SLOPE FACE EVERY 4' UNTIL THE BOTTOM.
- INSPECT ONCE PER WEEK ON ACTIVE SITES, ONCE EVERY TWO WEEKS ON INACTIVE SITES, AND WITHIN 24 HOURS FOLLOWING A 0.5 INCH RAIN EVENT.
- REPAIR ANY DAMAGED AREAS OF THE NET OR BLANKET AND STAPLE INTO THE GROUND ANY AREAS NOT IN CLOSE CONTACT WITH THE GROUND SURFACE.
- IF EROSION OCCURS, REPAIR AND PROTECT THE ERODED AREA.



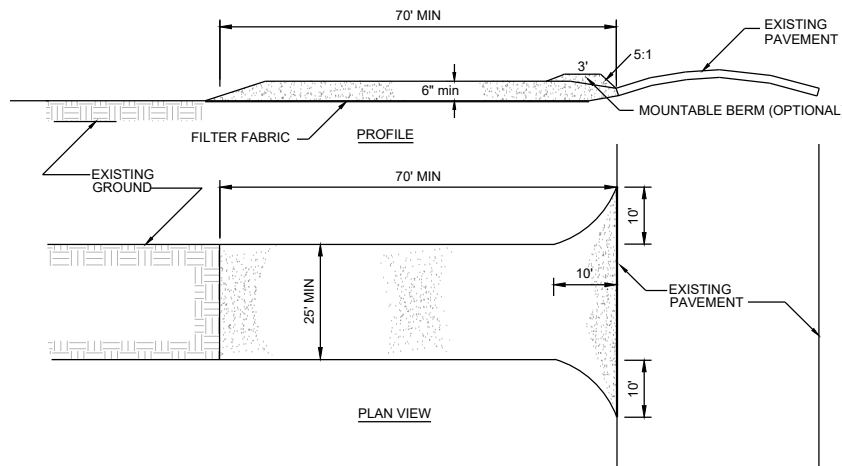
EROSION CONTROL MATting CHANNEL INSTALLATION

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NOTES:

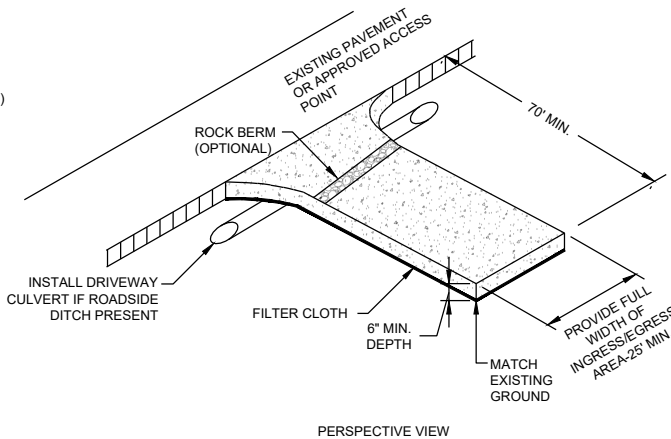
- INFORMATION PROVIDED IS MINIMUM REQUIREMENTS. MANUFACTURERS REQUIREMENTS WHICH ARE MORE STRINGENT SHALL BE USED.
- INSTALL MAT PARALLEL IN CENTER OF CHANNEL IN THE DIRECTION OF FLOW. FOR CULVERT OUTFALLS, PLACE MAT UNDER CULVERT OR RIP RAP A MIN. OF 12".
- IN CHANNEL BOTTOM, OVERLAP LENGTH ENDS A MINIMUM OF 12 INCHES.
- STAPLE PER MANUFACTURERS SPECIFICATIONS.
- LENGTH OF STAPLES SHALL BE DETERMINED BY SOIL TYPE- COHESIVE SOIL USE 6 INCH, NON-COHESIVE SOILS 8-12 INCH.



STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

4  
S.100



SUNDOWN LAKE SW BASIN  
SUNDOWN LAKE RIZ  
APPANOOSE COUNTY, IOWA  
SWPPP DETAILS (1 OF 2)



Drawn By  
TDB

Checked By  
MKS

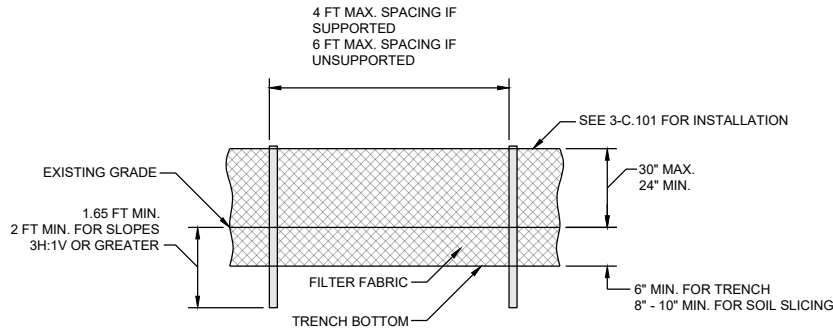
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8-6-2024

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As Shown

Project No.  
152-0001

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ELEVATION

SILT FENCE FABRIC SPECIFICATIONS

PROPERTY	TEST PROCEDURE	MIN. FABRIC VALUE
GRAB TENSILE STRENGTH	ASTM D-4632	100 LBS.
GRAB ELONGATION@ FAILURE	ASTM D-4632	15%
TRAPEZOID TEAR	ASTM D-4533	70 LBS.
MULLEN BURST STRENGTH	ASTM D-3786	250 PSI.
PUNCTURE STRENGTH	ASTM D-4833	50 LBS.
PERMITTIVITY	ASTM D-4491	0.07 SEC-1 MIN.
PERMEABILITY	ASTM D-4491	.005 CM/SEC
APPARENT OPENING SIZE	ASTM D-4751	0.90 MM
UV RESISTANCE(500 HRS)	ASTM D-4355	90%

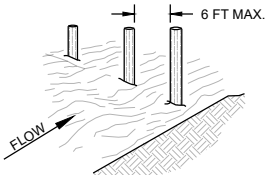
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	SLOPE	MAX. SPACING ON SLOPE
10% FLATTER	10:1 OR FLATTER	300 ft.
10%><15	10:1>x<7.5:1	150 ft.
15%><20	7.5:1>x<5:1	100 ft.
20%><30	5:1>x<3.5:1	50 ft.
30%><50	3.5:1>x<2:1	25 ft.

SILT FENCE BARRIER

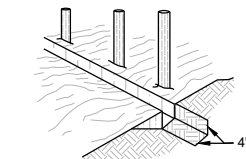
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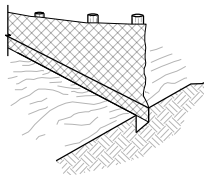
1. SET THE STAKES



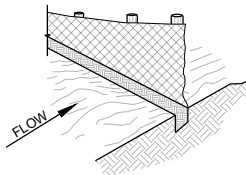
2. EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES



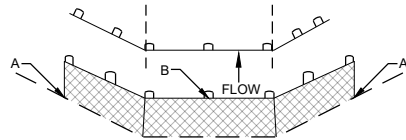
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH



4. BACKFILL AND COMPACT THE EXCAVATED SOIL



SHEET FLOW INSTALLATION  
(PERSPECTIVE VIEW)



POINTS A SHOULD BE HIGHER THAN POINT B

DRAINAGEWAY INSTALLATION  
(ELEVATION)

SILT FENCE INSTALLATION

NOT TO SCALE

2  
S.101

NOTE:  
STEEL FENCE POSTS SHOULD BE USED  
AS STAKES FOR ALL INSTALLATIONS