



Construction Management - Engineering

NRCS Engineers



Where we left off... Time to Restore!

- Engineering Schedule



Application phase, fast and furious, ~ 2 months



ACEP Team executes supplement (offers), ~ 6 months



ACEP Team works their magic and easement is closed ~ 1 1/2 yr



WRPO required to be obligated, 3 yrs after offer

- Restoration completion, 3 yrs after Easement Closed



Types of Contracts

- Federal Contract
 - Federal agency designs project, advertises, awards, and makes 100% payment on project.
- Landowner agreement contract
 - Private landowner hires contractor to implement agency engineer's design and receives payment from agency.



Roles common to all contracting

- Contractor
- Contracting Officer
 - Agency Contract Specialist in Federal Contract.
 - Landowner in Landowner Agreement Contract.
- Owner
- Engineer
- Inspector



Contractor Role

- Estimates the work and proposes cost (Bid)
- Becomes familiar with design and designer's intent
- Implements design diligently
 - Plans & Specs
- Informs Contracting Officer of errors or omissions in plans
- Performs Quality Control
- May propose changes (modifications)



Contracting Officer's Role

- Awards Contract
- Approves changes (modifications)
- Makes Payment
- Settles Disputes (Claims)
- Makes equitable adjustments in cost and time



Owner's Role

- Approves Plans and Specifications
- Secures Permits
- Secures funding for project
- Makes payments when due
- Accepts completed work

Note: NRCS assumes some of the roles of owner on permanent easements, federal contracts



Engineer Role

- Determines contract performance time
- Provides technical assistance to the CO & Owner
- Determines level of inspection required



Inspector's Role

- Becomes intimately familiar with Plans & Specs
- Observes the work, performs tests, documents results, and records construction activities
 - Quality Assurance
- Informs contractor, engineer, and CO of adequacy of work and recommends acceptance or rejection

Construction Quality Assurance Plan
[REDACTED] DAIRY LWCF

This Construction Quality Assurance (CQA) plan outlines the responsibilities of the parties involved in the construction of the Livestock Waste Control Facility (LWCF). These parties include the Owner, Contractor, Construction Inspector, and the Technical Advisor (designing engineer).

OWNER: The owner is responsible for obtaining the contractor of his choice to install components of the LWCF. The owner is responsible for payment to the contractor for his services. It will be the owner's responsibility to require the contractor to install the LWCF according to the Plans and Specifications.

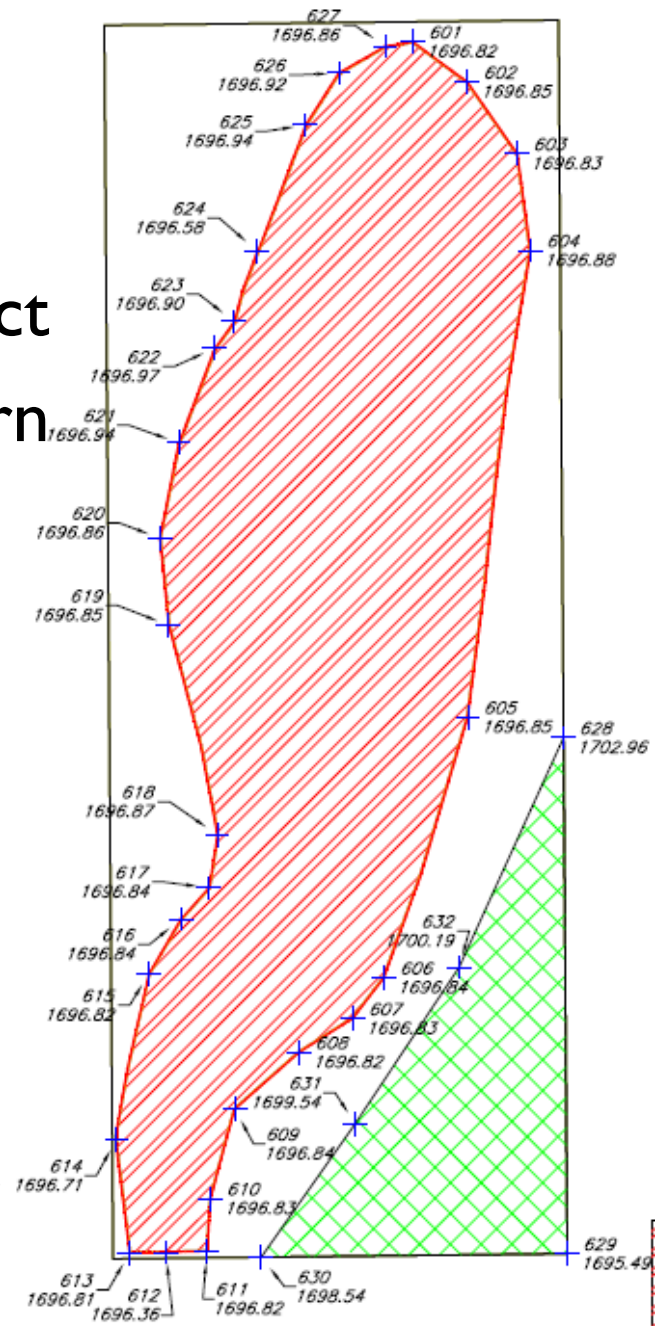
CONTRACTOR: The contractor will install the components of the LWCF as shown on the Plans and Specifications.

INSPECTOR: The Natural Resources Conservation Service (NRCS) will provide the construction inspector for the project. The inspector is responsible to assure the LWCF is being installed according to the approved Plans and Specifications. The construction inspector will serve as the representative of the design engineer. The inspector will not direct or be expected to direct the operations of the contractor. The inspector may provide suggestions to the contractor if asked but the contractor is under no obligation to implement these suggestions. If the inspector determines the Plans and Specifications are not being followed, he/she will notify the design engineer.

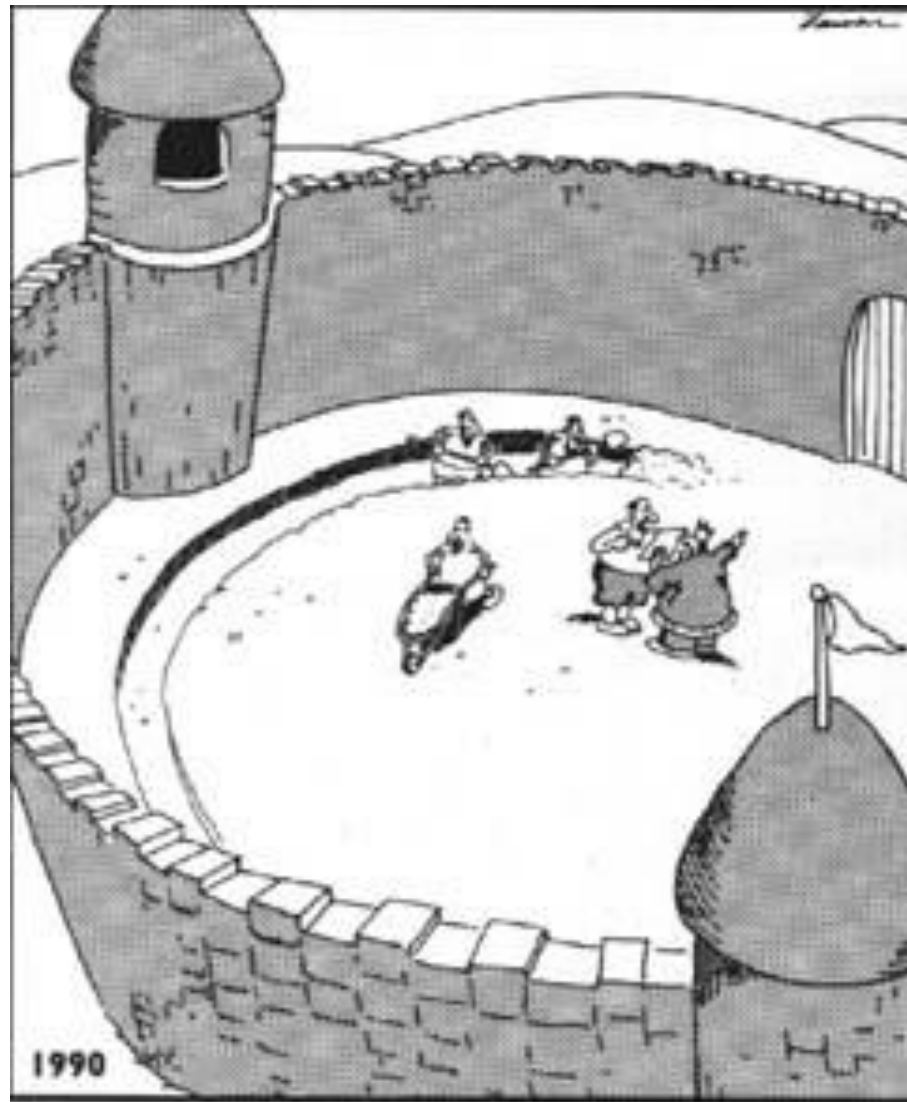
TECHNICAL ADVISOR/DESIGN ENGINEER: Under no circumstances will major modifications be made without first notifying the design engineer. If modifications are necessary, the design engineer will consult with the Nebraska Department of Environmental Quality (NDEQ) before approving the modification. If deficiencies in construction are brought to the attention of the design engineer, he/she will contact the owner and inform them of the deficiencies. If the LWCF is not constructed according to the Plans and Specifications, the design engineer will notify the construction to NDEQ.

Inspector's Role

- Staking a project / Machine Control
 - Done so as a convenience, if there is a conflict the signed construction specs/plans shall govern
- Measures
 - Construction notes & Layout Tables:
 6. *Excavation tolerances on all borrow areas are to grade or -0.2 feet of elevation shown on the drawings.*
 7. *Earthfill tolerances are to grade or $+0.2$ feet of elevation shown on the drawings.*
 - As-built drawings are developed based on every layout point meeting construction notes tolerances



Quality Control?



Suddenly, a heated exchange took place between the king and the moat contractor.



Responsibilities

Responsibilities of:

The purpose of this guide is to help you, the landowner, understand your responsibility in all phases of conservation system construction, from planning and design, through construction and maintenance.

By understanding your role in the project and providing adequate time for each phase of the job, you can avoid inconvenient and costly delays.

"Landowner" as used here is the person responsible for making decisions for the property. In most cases, that is the owner, but it may be an operator or farm manager.

The technical agency is the Natural Resources Conservation Service.

	Landowner	Contractor	Agency
During Planning	<ul style="list-style-type: none"> Identifies problems and management objectives. Checks utility locations. Assists with survey and site investigation as needed. Identifies needed permits. Notifies state historical society, if needed. Selects from alternatives. Identifies and applies for cost-share, if desired. 		<ul style="list-style-type: none"> Inventory resources and identify resource problems. Analyzes resource data. Alerts landowner to apparent wetlands, threatened and endangered species, archeological sites, and utilities. Formulates alternatives to protect resources and meet objectives of landowner. Evaluates alternatives. Develops plan for landowner's selected alternative. Conducts site investigations and surveys as needed. Informs landowner of operation and maintenance responsibilities.
During Design	<ul style="list-style-type: none"> Is available for consultation. Follows up with historical society, if required. Obtains needed permits and easements. Identifies utilities and contacts utility company to locate buried utilities. Reviews design for agreement. Concurs in Operation, Maintenance, and Replacement Plan. 	<ul style="list-style-type: none"> May provide assistance for survey and site investigation. 	<ul style="list-style-type: none"> Surveys site, if needed. Designs system based on plan. Reviews design and specifications with landowner. Prepares cost estimates for construction. Develops operation and maintenance plan. Develops Construction Quality Assurance Plan including staking, inspection, documentation, and certification. Provides agency approval. Informs landowner of safety responsibilities. <p><i>Note: These items may be provided by a consultant. If provided by a consultant, the design must meet NRCS standards and specifications and certified by the consultant.</i></p>
During Construction	<ul style="list-style-type: none"> Is available for consultation and decision. Follows all Federal/state/local laws, rules, and regulations. Hires contractors. Hosts pre-construction conference. Notifies utilities prior to construction activities. Notifies contractor of utility location. Notifies agency before starting construction. Authorizes contractor to begin work. Protects cultural and historical resources, as required. Implements landowner part of Construction Quality Assurance Plan (QAP). Assures compliance with design. 	<ul style="list-style-type: none"> Participates in pre-construction conference. Observes and verifies located utilities. Works safely in accordance with OSHA requirements. Informs landowner of planned construction schedule. Obtains materials, equipment, and appropriately skilled people onsite as scheduled. Implements contractor part of Construction QAP. May provide layout and construction check surveys. Uses materials specified in construction plan. Builds to specific dimensions, elevations, and workmanship. Documents construction materials used. Furnishes measurements and other needed information for certification of completion. 	<ul style="list-style-type: none"> Assists landowner with pre-construction conference. Implements agency part of Construction QAP. Informs landowner and contractor of results of inspections. Informs landowner of presence of unexpected conditions or unexpected cultural and historical resources. Assesses need for design changes and provides alternatives as appropriate. Certifies proper completion of construction.
Maintenance	<ul style="list-style-type: none"> Follows Operation, Maintenance, and Replacement Plan and updates it as needed. Contacts agency for additional assistance, if needed. <p>The landowner is ultimately responsible for the proper construction and maintenance of a conservation system.</p>	<ul style="list-style-type: none"> Provides warranties to landowner as agreed. <p>The contractor is responsible for constructing the system according to design and specifications, for quality control and safety.</p>	<ul style="list-style-type: none"> Follows up with operation and maintenance plan and periodically assists landowner to update plan. <p>The technical agency is responsible for inspecting and certifying that project plans and specifications are met. Agency staff cannot train or serve as foreman for contractors.</p>



Landowner Responsibilities

During Construction

- Is available for consultation and decision.
- Follows all Federal/state/local laws, rules, and regulations.
- Hires contractors.
- Hosts pre-construction conference.
- Notifies utilities prior to construction activities.
- Notifies contractor of utility location.
- Notifies agency before starting construction.
- Authorizes contractor to begin work.
- Protects cultural and historical resources, as required.
- Implements landowner part of Construction Quality Assurance Plan (QAP).
- Assures compliance with design.



Changes and Modifications

- Changes affect the timing of the project, Communicate
- Notify appropriate individuals
- Determine if the change can be made
- Determine if the change affects other practices (domino)
- Get measurements so quantities can be calculated

At NRCS, modifications must be approved before the work is completed!



Don't always Assume



There are no dumb questions...

The only dumb question is the one that should've been asked



Documentation

- Ensuring the Practice Standard and Construction Specifications are or are not met
- Ensuring proper installation, providing supporting information for as-builts
- Recording the units or amounts installed for contract cost share payments
- Remember, if it's not documented it didn't happen



Documentation

- Usually, written words in narrative form
- Photography
- Gather material certifications

512.41 Records

- Document in a job diary or conservation assistance notes



Landowner Contract – Certification of Completion

- Deliverables sent to Team Lead
 - Certification statement with signature
 - Contractor's invoice to landowner
 - Provide comparison of invoice to approved bid schedule
 - Photos
 - As-built drawings

I, NATE GARRETT, HEREBY CONFIRM PROJECT COMPLETION INCLUDING CONSTRUCTION OF ENCLOSED LINE ITEM QUANTITIES AND TOTAL COST TITLED "HAPPOLD WETLAND RESTORATION" AND THAT THE QUANTITIES ARE CORRECT*;

PROJECT CONSTRUCTION DATES INCLUDED THE PERIOD FROM 10/18/2021 TO 12/8/2021.

I FURTHER CERTIFY I HAVE APPROPRIATE CONSTRUCTION JOB APPROVAL AUTHORITY FOR THIS PROJECT.

SIGNATURE: **NATHAN GARRETT**
 Digitally signed by NATHAN GARRETT
 Date: 2021.12.09 17:02:49 -06'00'

CONSTRUCTION CERTIFICATION

* THIS MAY INCLUDE VARIOUS CONTRACT METHODS INCLUDING PAYMENT BASED ON PLANNED QUANTITIES.

certification of completion HAPPOLD WETLAND RESTORATION

BID ITEM	SPEC NO.	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
Site Preparation and Strct Removal, Pit Area	1, 8, 11	1	EA	\$15,250	\$15,250.00
Land Clearing and Grubbing, Pit Area	2A	5.8	AC	\$1,750	\$10,150.00
Site Preparation, Disking Exc Area 1	21, 23	11	AC	RWBJV	\$0.00
Site Preparation, Disking Exc Area 2	21, 23	2.6	AC	RWBJV	\$0.00
Excavation, Stripping Pit Area	21	2,900	CY	\$2.50	\$7,250.00
Excavation, Stripping Ditch Fill	21	1,800	CY	RWBJV	\$0.00
Excavation, Ditch Fill	21	1,000	CY	----	----
Excavation Area 1	21	33,300	CY	----	----
Excavation Area 2	21	3,300	CY	----	----
Earthfill, Stripping, Pit Area	23	3,600	CY	\$1.40	\$5,040.00
Earthfill, Pit	23	29,000	CY	\$1.40	\$40,600.00
Earthfill, Stripping, Ditch Fill	23	2,300	CY	RWBJV	\$0.00
Earthfill, Ditch Fill	23	8,900	CY	RWBJV	\$0.00
Seed / Seeding (Ditch Fill)	6, cpa8	3.4	AC	RWBJV	\$0.00
LUMP SUM NRCS * = \$78,290.00					
BID MATCHES INVOICES					
RWBJV DENOTES LINE ITEMS PREVIOUSLY PAID BY THE JOINT VENTURE					

ESTIMATED TABLE OF QUANTITIES				LAYOUT & CONTROL POINTS				
ITEM	UNIT	QUANTITY	AS-BUILT	Pt. Name	Northing	Easting	Elevation	Description
Site Preparation and Structure Removal, Pit Area	EA	1	1	600	14802158.04	1823233.93	1928.50	Z DitchFill Top
Land Clearing and Grubbing, Pit Area	AC	5.8	5.8	601	14801623.09	1823240.89	1928.50	Z DitchFill Top
Site Preparation, Disking Exc Area 1	AC	11.0	N/A	602	14801263.17	1823244.57	1928.50	Z DitchFill Top
Site Preparation, Disking Exc Area 2	AC	2.6	N/A	603	14800782.46	1823249.42	1928.50	Z DitchFill Top
Excavation, Stripping, Pit Area	CY	2900	2,900	604	14800480.91	1823254.08	1928.50	Z DitchFill Top
Excavation, Stripping, Ditch Fill	CY	1800	1800	605	14800386.55	1823254.88	1928.50	Z DitchFill Top
Excavation, Ditch Fill	CY	1000	1,000	620	14802194.28	1823157.72	1924.10	Z ExcArea1
Excavation Area 1	CY	33300	33,000	621	14800385.83	1823178.93	1924.10	Z ExcArea1
Excavation Area 2	CY	3300	0.0	622	14800314.02	1823095.26	1924.10	Z ExcArea1
Total Excavation		42,300		623	14800588.70	1822785.51	1924.10	Z ExcArea1
Earthfill - Stripping, Pit Area	CY	3600	3,600	624	14800960.85	1822607.41	1924.10	Z ExcArea1
Earthfill - Pit	CY	29000	29,000	625	14801796.02	1822734.54	1924.10	Z ExcArea1
Earthfill - Stripping, Ditch Fill	CY	2300	2300	640	14800134.50	1823122.82	1924.10	Z ExcArea2
Earthfill - Ditch Fill	CY	8900	8900	641	14798890.87	1823115.73	1924.10	Z ExcArea2
Total Earthfill	CY	43,800	43,800	642	14799844.38	1823201.20	1924.10	Z ExcArea2
Seed / Seeding (Ditch Fill)	AC	3.4	3.4	643	14799841.21	1822953.63	1924.10	Z ExcArea2
				644	14800013.12	1822918.62	1924.10	Z ExcArea2
				645	14800114.07	1822899.12	1924.10	Z ExcArea2
				646	14800814.98	1823209.01	1928.50	Z DitchFill Top
				647	14800780.54	1823185.59	1928.50	Z DitchFill Top
				648	14801238.39	1823204.17	1928.50	Z DitchFill Top

Primary borrow area, Excavation Area 1, was utilized to complete earthfill operations. Excavation 2 was not needed to complete project.

DESIGN DATA



Application, Ranking, Offers, Restoration – One engineer’s opinion of timeline

- Engineering Schedule

Ex: FY18

- Application phase, fast and furious, ~ 2 months Jan 2018
- ACEP Team executes supplement (offers), ~ 6 months ← Aug 2018
- ACEP Team works their magic and easement is closed ~ 1 ½ yr ← Apr 2020
- WRPO required to be obligated, 3 yrs after offer ← Aug 2021
- Restoration completion, 3 yrs after Easement Closed ← *Due Apr 2023**

*We've been able to cut a year or so off this date
with all FY18 projects completed in 2021 & 2022