

Memorandum

To: Programs, Projects and Operations Subcommittee
Re: Phase 2 Contract for Engineering Services with HDR Engineering, Inc. for WP5
Date: March 1, 2010
From: Amanda Grint, Water Resources Engineer

In December 2008, the Board approved the selection of HDR Engineering, Inc. (HDR) for professional services for the planning, permitting, design and construction of West Papillion Regional Basin Number 5 (WP5). The work was planned to be completed in three phases. Phase 1 provided the feasibility and preliminary design of WP5. An update of the progress will be reported at the Subcommittee meeting. Scope and fees for Phase 2, Final Design and Bidding are presented for consideration. Phase 3, Construction Administration, will be presented at a later date.

A summary of the tasks for Phase 2 is as follows:

- Project Management tasks include progress reports, coordination meetings, a newsletter update and a presentation to the Board.
- Preliminary Design of Lincoln Road and bridge crossing includes evaluating four bridge and trail options for cost and feasibility. The task includes geotechnical work to analyze bridge foundation design and coordination to develop layout and design of Lincoln Road with Sarpy County and Papillion.
- Permit coordination for the USACE 404, Nebraska Department of Natural Resources Permit to Impound Water, NPDES Stormwater permit, and assist with floodplain permit and revision process.
- Prepare final design plans, specifications and estimate of construction cost for dam, roadway, bridge, trail, recreation features, in-lake features, utilities and water quality basins
- Prepare Emergency Action Plan (EAP) for dam
- Provide survey services to create necessary easements for mitigation sites, utility corridors, and roadway. Task includes a final boundary survey of the project property.
- Bidding Services

In conclusion, HDR would provide the professional services noted above for Phase 2 of the WP-5 project, Final Design and Bidding, on an hourly basis not to exceed the amount of \$817,700.

- **Management recommends that the Subcommittee recommend to the Board that the General Manager be authorized to execute the enclosed Professional Services Agreement between the District and HDR Engineering, Inc. for Phase 2 Services for the WP-5 Project in an amount not to exceed \$817,700, subject to changes deemed necessary by the General Manager and approved as to form by District Legal Counsel.**

AMENDMENT TO OWNER-ENGINEER AGREEMENT

Amendment No. 1

1. *Background Data:*

- a. Effective Date of Owner-Engineer Agreement: February 3, 2009
- b. Owner: Papio-Missouri River Natural Resources District (P-MRNRD)
- c. Engineer: HDR Engineering, Inc. (HDR)
- d. Project: WP-5 Flood Control Facility

2. *Description of Modifications:*

- a. The Scope of Services currently authorized to be performed by Engineer in accordance with the Agreement and previous amendments, if any, is modified as follows:
 - 1) Per Exhibit A, Part 1.A1.02 of the original agreement, the scope of services for Phase II, including final design and bidding assistance services is included as Attachment 1 to this amendment.
- b. For the Phase II services set forth above, Owner shall pay Engineer the following additional compensation:
 - 1) An amount equal to Engineer's Direct Labor Costs times a factor of 3.15 for the services of Engineer's employees engaged on the Project, plus Reimbursable Expenses, provided however, and notwithstanding anything to the contrary contained in this Agreement, the total amount of money due to ENGINEER for such services and for Reimbursable Expenses and Engineer's Consultant's charges shall not exceed the amount of \$817,700.00 unless an additional payment for the services, expenses, or charges resulting in such excess is authorized in writing by Owner in advance of such services, expenses or charges being furnished, expended, or incurred, the amount of \$817,700 being intended by the parties as the maximum amount of money to be due to the Engineer under this Amendment for Phase II services.

- c. The schedule for rendering services is included as Attachment 3 to this amendment.

Attachment 1 WP-5 Phase II Scope of Services

Attachment 2 WP-5 Phase II Fee

Attachment 3 WP-5 Phase II Schedule

3. *Agreement Summary (Reference only)*

a. Original Agreement amount:	\$ 529,000
b. Net change for prior amendments:	\$ -
c. This amendment amount:	\$ 817,700
d. Adjusted Agreement amount:	\$ 1,346,700

The foregoing Agreement Summary is for reference only and does not alter the terms of the Agreement, including those set forth in Exhibit C.

Owner and Engineer hereby agree to modify the above-referenced Agreement as set forth in this Amendment. All provisions of the Agreement not modified by this or previous Amendments remain in effect. The Effective Date of this Amendment is _____.

OWNER:

ENGINEER:

By: John Winkler

By: Matthew Tondl, P.E.

Title: General Manager

Title: Senior Vice President

Date
Signed: _____

Date Signed: _____

Attachment 1 – Scope of Services

**Regional Detention Basin WP-5
for Papio-Missouri River Natural Resources District
Sarpy County, NE**



ENGINEERING PROPOSAL – PHASE II FINAL DESIGN SERVICES



BACKGROUND AND BASIS OF PROPOSAL

HDR Engineering, Inc. was selected by the P-MRNRD to provide planning, permitting, preliminary and final design and construction contract administration services for WP-5. WP-5 is a proposed regional detention basin to be located on an unnamed tributary to West Papillion Creek located in Sarpy County and is located near 126th and Cornhusker Road in Papillion, Nebraska. The contributing drainage area at the proposed retention basin is approximately 5.2 square miles. The drainage area of WP-5 is primarily agricultural land with minimal development.

To more concisely respond to project requirements, a phased approach is proposed. In Phase I, a feasibility study and preliminary design has been conducted to define the details of the project. Phase II generally including preparing final design documents and providing bidding assistance, while Phase III will consist of construction contract administration services.

This Scope of Services is to document Phase II professional services to the Papio-Missouri River NRD (P-MRNRD) for the final design of WP-5 (Project).

SCOPE OF SERVICES – PHASE II – FINAL DESIGN

HDR will perform preliminary and final design services. The Phase II scope of work is segmented into eleven (11) task series:

- Task Series 100 – Project Management
- Task Series 200 – Lincoln Road Roadway and Bridge Preliminary Design
- Task Series 300 – Permitting
- Task Series 400 – Interim Contract Document Preparation
- Task Series 500 – Dam and Roadway (Non-Bridge) Final Contract Document Preparation
- Task Series 600 – Bridge Final Design Document Preparation
- Task Series 700 – Design Documentation Report
- Task Series 800 – Emergency Action Plan
- Task Series 900 – Survey
- Task Series 1000 – Bidding Services

The HDR Team proposes to provide the following professional services for Phase II over an anticipated eight (8) - month project period from the time of contract authorization.

TASK SERIES 100 PROJECT MANAGEMENT

Task Objective: Confirm that Project elements are being completed.

HDR Activities: **Task 110 Project Management.** Includes Project scheduling, administration and coordination activities on the Project. Internal HDR Project Team meetings will be conducted to discuss tasks, provide Project updates and review deliverables. Prepare monthly invoices and progress reports.

Task 120 Coordination Meetings. Coordination meetings will be conducted with P-MRNRD during the Project. An agenda will be prepared prior to the meeting and meeting minutes prepared after the meeting.

120.1 **P-MRNRD Coordination Meetings.** Meet with P-MRNRD personnel to review and discuss Project progress. Assume a total of 6 meetings.

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(Attachment 1 – Scope of Services)

120.2 Board/Subcommittee Presentation. Conduct 1 presentation to the P-MRNRD Board/Subcommittee to provide the results of the final design. A PowerPoint presentation will be prepared. One preparation meeting for the presentation is assumed.

Task 130 Newsletter Update. The HDR Team will create an electronic 2-page update on the Project to be posted on the P-MRNRD's and/or City of Papillion's websites. One newsletter will be prepared.

Task Deliverables:

- Monthly invoices and progress report
- Meeting agenda and minutes
- PowerPoint presentation for P-MRNRD Board/Subcommittee Presentation
- One newsletter update

Key Understandings:

- The duration of the project is 8 months.
- Meetings will be held at the offices of the P-MRNRD and attended by 2 HDR professionals.
- Six (6) coordination meetings are assumed.
- One (1) P-MRNRD Board/Subcommittee meeting presentation is assumed.

TASK SERIES 200 LINCOLN ROAD ROADWAY AND BRIDGE ALTERNATIVES

Task Objective:

Determine a vertical and horizontal alignment of Lincoln Road necessary to span the upper pool of proposed WP-5. Develop conceptual plans of 4 alternatives for the crossing structure: 1) Single span with trails under bridge; 2) 3-span with trails under bridge; 3) 3-span with 2 box culvert trail crossings; 4) 3-span with 2 bridge trail crossings. Conceptual plans showing proposed bridge configuration, size, orientation and structure type for each alternative will be prepared.

HDR Activities:

Task 210 Roadway and Bridge Coordination. Coordinate with city of Papillion, Sarpy County, and Royals Ballpark consultants on the design of the roadway and bridge. A total of five (5) meetings are planned.

Task 220 Geotechnical Data Collection and Analysis Conduct a subsurface investigation to collect geotechnical information to select type of piles and design pile foundations for bridge. This will include 6 borings advanced into non-yielding material (glacial till or sand). Two (2) of the borings will extend at least 30 feet into the glacial till. A total of 340 linear feet of drilling is estimated, with laboratory testing for bridge foundation design conducted. Geotechnical evaluation will analyze structure foundation capacities for the bridge and embankment stability for the roadway fill sections. Preparation of technical memo documenting geotechnical evaluation.

Task 230 Roadway Alternatives

- 230.1 Design Criteria. Define design criteria for the roadway. Establish alignment, design speed, and roadway typical grade and pavement section. The current anticipated typical roadway section is a 3-lane urban section with a 10-foot wide sidewalk on both sides. Review existing utilities for any conflicts that may affect design.
- 230.2 Geometrics. Define preliminary centerline profile of Lincoln Road from the proposed roundabout at approximately 126th Street to 132nd & Lynam Streets. Establish horizontal and vertical alignment of Lincoln Road for the design segment. Two horizontal alignments will be investigated.
- 230.3 Roadway Modeling. Preliminary roadway earthwork modeling will be accomplished using AutoCAD Civil 3D design software.

- 230.4 Preliminary Drawings. Preliminary drawings shall be prepared as per the Nebraska Department of Roads format. The following roadway drawings will be prepared:
- o Typical Roadway Sections
 - o Plan and Profile Sheets (scale 1"= 40')
- 230.5 Easements Exhibits. Determine the limits of permanent easement to be controlled by the City of Papillion and Sarpy County for O&M activities.

Task 240 Bridge Alternative Evaluation

- 240.1 Conceptual Layout of Alternatives. Development of conceptual layout of four bridge alternatives, including plan and profile sketches. Anticipated alternatives are: 1) Single span with trails under bridge; 2) 3-span with trails under bridge; 3) 3-span with 2 box culvert trail crossings; 4) 3-span with 2 bridge trail crossings.

Task 250 Alternative Memo

- 250.1 Conceptual Cost Opinions. Develop conceptual cost opinions of each road and bridge alternative.
- 250.2 Alternative Memo. Preparation of technical memo documenting the roadway and bridge alternative evaluations.

Task Deliverables:

- Alternatives Technical Memo
- Geotechnical Evaluation Technical Memo
- Coordination Meeting Minutes

Key Understandings:

- Drafting for the roadway will be AutoCAD, Civil 3D and drafting for the bridge design will be Micro Station, Version J.
- Roadway design is limited to the proposed Lincoln Road alignment from the proposed roundabout at approximately 126th Street westerly to 132nd & Lynam Streets.
- No traffic control/signalization or roadway lighting analysis is included.
- City/County to provide pavement thickness and specifications.
- Lincoln Road will be graded and paved as part of the dam project.
- P-MRNRD currently owns a portion of the land along roadway corridor. P-MRNRD will coordinate with local jurisdictions to provide permanent easement of the roadway/bridge to the local jurisdiction on portions they currently own.
- Two horizontal roadway alignments will be investigated
- Bridge concepts will be developed to be transferable to either horizontal roadway alignment.

TASK SERIES 300 PERMITTING

Task Objectives:

To coordinate with permitting agencies, and prepare and submit appropriate permits for the project.

HDR Activities:

Task 310 Section 404 Permit

- 310.1 Agency Coordination. Coordinate with USACE relative to project timeframes, wetland and channel mitigation, and potential changes that occur to the design during final design phase. Coordination with USFWS, EPA, NRCS, and Nebraska Game and Parks Commission relative to in-lake, riparian, wetland, and terrestrial habitat design features on the Project Site as well as natural stream design mitigation.
- 310.2 Section 404 Additional Alternative Evaluations. During the preparation of the Section 404 Application, EPA and other commenting agencies requested additional alternatives beyond those originally scoped be evaluated as part of the application. The range of alternatives considered for practicability included:

- No Action
- Zoning
- Floodplain Acquisition
- Current Conservation Measures
- Future Conservation Measures
- Wetlands Storage Areas (EPA added)
- Stream Restoration (EPA added)
- Stream Restorations with Wetland Storage (EPA added)
- Inflatable Dams (EPA added)
- Improving Conveyance
- Raising Existing Levees and Bridges

Alternatives carried forward for environmental screening included raising existing levees and bridges and the WP-5 project. Finally, minimization alternatives included:

- WP-5 as a dry detention structure
- Multiple small detention dams within watershed
- WP-5 with a normal pool elevation of 1069

- 310.3 Stream Mitigation Development. Develop mitigation plan drawings, specifications, and cost estimates for stream channel impacted by the Project. This includes coordination with P-MRNRD relative to the potential mitigation site. It is anticipated that stream mitigation will be approximately 1,300 feet. The following drawings will be prepared:
- Plan and Profile (2 sheets)
 - Typical Details (1 sheet)
 - Cross Sections (1 sheet)
- 310.4 Wetland Mitigation Development Develop mitigation plan drawings, specifications, and cost estimates for wetlands impacted by the project. This includes coordination with P-MRNRD relative to the potential mitigation site. It is anticipated that the wetland mitigation will be approximately 0.5 acres. The following drawings will be prepared:
- Plan and Profile (1 sheet)
 - Typical Details (1 sheet)
 - Cross Sections (1 sheet)
- 310.5 Permit Conditions Summary. Summarize permit conditions for inclusion in bid documents for Owner and contractors.
- 310.6 Baseline Mitigation Monitoring. HDR to establish the baseline mitigation monitoring for the stream and wetlands lost by the project.

Task 320 NDNR Permits. Permit Preparation. Prepare documentation to complete a DNR Application for a "Permit to Impound Water" and "Application for Approval of Plans for Dams" for main dam and 2 water quality basins.

Task 330 NPDES Construction Activity Permit. NPDES construction activity permit and Papillion/Sarpy County grading permit.

- 330.1 Agency Coordination. Coordinate with city of Papillion and Sarpy County on preparation of Papillion Creek Watershed Partnership (Partnership) Grading permit.
- 330.2 Permit Preparation. Prepare drawings, narrative plan, and application, to comply with NPDES stormwater associated with construction activity. Plan drawings include:
- Stormwater Pollution Prevention Plan Cover Sheet and Notes (1 sheet)
 - Stormwater Pollution Prevention Plan Grading Plan (2 sheets)
 - Stormwater Pollution Prevention Plan Grading and Erosion Control Plan (3 sheets)

- Stormwater Pollution Prevention Plan Erosion Control Notes and Details (3 sheet)
- Stormwater Pollution Prevention Plan Latitude -Longitude Grid (2 sheets)

Task 340 Floodplain Permit Technical Assistance. Provide technical data to P-MRNRD in FEMA's map revision process.

Task 350 Roadway Agreement Technical Assistance. Assist P-MRNRD in providing technical information in its preparation of an agreement with NDOR and Sarpy County to occupy its right-of-way.

Task Deliverables:

- Section 404 mitigation plan
- NDNR permit applications
- Papillion Creek Watershed Partnership Grading Permit
- Wetland and Channel Mitigation plans
- Floodplain permit technical data
- Supporting information for Sarpy County and NDOR roadway agreements.

Key Understandings:

- Mitigation design for channel and wetlands is limited to one (1) location each. Design of mitigation measures is incorporated into the final bid documents and bid with Project.
- No additional topographic survey or land survey work for additional acquisition for mitigation areas is included in this scope of work.
- Any required tree mitigation will be monitored and developed by P-MRNRD.
- P-MRNRD is responsible for site access and negotiations.
- Assumes no major changes in design that would create the need for a permit amendment or re-evaluation of the 404 permit application.
- P-MRNRD is responsible for payment of permit application fees.
- Assumed mitigation will occur on project lands.

TASK SERIES 400 INTERIM DESIGN AND CONTRACT DOCUMENT PREPARATION (60%)

Task Objective: To prepare 60% design for dam and roadway (non-bridge) features.

HDR Activities: **Task 410 Water Quality Basin Design** Design efforts for the two water quality basins located upstream of 132nd Street. Nebraska DNR has indicated that the two structures are likely to be classified as dam structures and will need to be designed and permitted individually per minimum state standards

- 410.1 **Geotechnical Investigation.** Conduct a subsurface investigation to collect geotechnical information for the water quality basins. It is assumed that 14 borings (7 each site) will be drilled and laboratory testing conducted.
- 410.2 **Geotechnical Evaluation.** Geotechnical evaluation and design of two water quality basins.
- 410.3 **Hydrologic and hydraulic Design.** Conduct hydrologic and hydraulic design of the principal and auxiliary spillways.
- 410.4 **Structural Design of Principal Spillway.**

Task 415 Dam Design. HDR will perform the final design computations for the WP 5 outlet structure. Guidelines as adopted by the State of Nebraska will be incorporated into this task. The dam is to be designed in accordance with the NRCS publication "Earth Dams and Reservoirs", Technical Release 60 (TR-60). The principal outlet will be designed for the 100-year event.

- 415.1 **Main Dam Principal Spillway.** Finalize design for the type, size and location of the principal spillways. Design elements include:
 - Riser Structural Design

- Spillway Hydraulics and Final Reservoir Routing
- Spillway outlet pipe design (surcharge, structural, joint ext., etc.)
- Drawdown outlet design
- Spillway energy dissipater (hydraulic and structural design)
- 415.2 Main Dam Auxiliary Spillway. Final design of auxiliary spillway plan, geometry, profile, and grading plans. Task also includes final hydraulic analysis and spillway erodibility assessment using NRCS SITES program.
- 415.3 Dam Embankment Final Design. Final design of the dam earthen embankment. Design elements to include:
 - Wave run-up and shoreline protection
 - Time rate of settlement analysis
 - Strength gain analysis for staged construction
 - Dam instrumentation types and locations
 - Define overbuild requirements
- 415.4 Quantities and Quantity Checks. Compute quantities and quantity checks for pay items.
- 415.5 Design Documentation. Prepare a technical memorandum documenting the dam design.

Task 420 Trail System and Basic Park Features.

- 420.1 Design Criteria. Define design criteria for the trail design, including typical cross section and grade limitations.
- 420.2 Trail Design
 - 420.2.1 Geometrics. Establish horizontal and vertical alignment of the trail.
 - 420.2.2 Trail Modeling. Trail modeling will be accomplished using AutoCAD Civil 3D design software.
 - 420.2.3 Trail Crossing Design. Design for three (3) pedestrian trail crossing over reservoir.
- 420.3 Park Features.
 - 420.3.1 Layout of proposed basic recreation features per PCWP agreement. (picnic shelters, vault restrooms, parking, and access points)
 - 420.3.2 Design of proposed basic recreation features (picnic shelters, restrooms, parking, and access points)
- 430.4 Design Documentation. Prepare a technical memorandum documenting the results of the trail system and basic park features.

Task 430 In-Lake Features.

- 440.1 Agency Coordination. HDR will coordinate with NGPC on in-lake features.
- 440.2 Design Criteria. Define design criteria for the in-lake features, including typical cross section, locations, grading, etc. to refine concept plan used in 404 permit application.
- 430.3 Design Prepare design of in-lake features, including boat ramp and dock, for main reservoir pool.
- 430.4 Design Documentation. Prepare a technical memorandum documenting the results of the in-lake features design.

Task 440 Utility Design.

- 440.1 Agency Coordination. HDR will coordinate with city of Papillion on sanitary sewer design, and Westmont utility staff on waterline coordination.
- 440.2 Design Criteria. Define design criteria for the sanitary and any water system components required.
- 440.3 Sanitary Sewer Design Final design of sanitary sewer trunk line along the west side of reservoir pool.
- 440.4 Westmont Water System Analysis to determine potential impact to Westmont water system.
- 440.5 Electrical Design Solar photocells are anticipated at picnic shelters and restrooms (one unit for each combination, two total), boat ramp (2 units), and trail crossing structures (one unit at each). NRD and City of Papillion to specify

preferred units. HDR to provide design details, drawings, and specifications for bidding and construction.

- 440.6 Water Service. Design water service for picnic areas. It is anticipated that one water service line will be designed for the west side of the reservoir, tapping into the MUD water main along 132nd Street. No water service is anticipated at this time on the east side of the reservoir as service is not available adjacent to NRD lands. Design of connection to MUD main will be provided by MUD. Plan and profile of water line will not be prepared.
- 440.7 Design Documentation. Prepare a technical memorandum documenting the utility design.

Task 450 Roadway Design

- 450.1 Horizontal and Vertical Control Profiles. Finalize the horizontal and vertical alignments of Lincoln Road to provide for an adequate structure opening for the pool levels and accommodate selected bridge option from Task 200.
- 450.2 Lincoln Road Storm Drainage. Prepare hydrology and hydraulics design of storm drainage system associated with Lincoln Road improvements. Coordinate storm sewer systems with ballpark development. Design and prepare interim level plans for two storm sewer outlets with energy dissipation. Assume sewer and inlets to be based upon City of Papillion design standards. Assume 2 points of access to south side of roadway will be provided.
- 450.3 Utility Coordination. Coordinate relocation of overhead power pole at Lynam Drive connection.
- 450.4 Roadway Modeling. Roadway modeling will be accomplished using AutoCAD Civil 3D design software. Roadway grading plans will be prepared.
- 450.5 Design Documentation. Prepare a technical memorandum documenting the roadway design.

Task 460 Construction Drawings. Prepare construction drawings for the dam and roadway work. ROW legal descriptions for any additional project lands identified through the 60% design will be prepared. A preliminary drawing list includes:

- Title Sheet (1 sheet)
- General Notes, Legend, Abbreviations, Hydrologic/Hydraulic Data and Quantities (2 sheets)
- Clearing, Grubbing & Removals Plan (2 sheets)
- Main Dam and Auxiliary Spillway Horizontal Control Plan (1"=50', 2 sheets)
- Typical Sections (typical cross section along principal spillway, auxiliary spillway section, 2 sheets)
- Main Dam Grading Plan and Embankment Drain Plan (1"= 50', 2 sheets)
- Main Dam Principal Spillway Surcharge Plan and Section (1"= 50', 2 sheets)
- Main Dam Details (e.g. embankment drain detail, toe drain detail, slotted drain detail, and cutoff detail, 1 sheet)
- Water Quality Basin 132nd Street North Plan and Details (1"= 50', 3 sheets)
- Water Quality Basin 132nd Street South Plan and Details (1"= 50', 3 sheets)
- Trail Grading (1"= 200', 5 sheet)
- In-Reservoir Fish Habitat (3 sheets)
- Lincoln Road General Layout and Control Data (1 sheet)
- Lincoln Road Typical Sections (1 sheet)
- Lincoln Road Geometrics & Jointing Plan (2 sheets)
- Lincoln Road Plan and Profile (2 sheets)
- Lincoln Road Storm Drainage Plan & Profile (2 sheets)
- Lincoln Road Storm Drainage Details (1 sheet)
- Lincoln Road Signing/ Striping Plan (1 sheet)
- Sanitary Sewer Relocation Plan and Profile (5 Sheets)

- Sanitary Sewer Notes & Details (2 sheets)
- Instrumentation and Controls (e.g. piezometer, settlement plate, 1 sheet)
- Structural Details (e.g. riser, stilling basin, 10 sheets)
- Miscellaneous Details (trash rack, 3 sheets)
- Dam Cross Sections (every 100', 6 sheets)
- Parking Lots and Access Road (2 sheets)
- Boat Ramp and Dock (2 sheets)
- Picnic Shelters (2 sheets)
- Vault Bathrooms (1 sheets)
- Trail Crossings (2 sheets)
- Trail/Lincoln Road Lighting (1 sheets)
- Picnic Shelter (2) (2 sheets)
- Water Service (1 sheet)

Task 470 Specifications.

- 470.1 Front- End Specifications. Prepare Divisions 0&1 of the contract documents for P-MRNRD review. EJCDC General Conditions will be used along with CSI 3-part format specifications.
- 470.2 Technical Specifications. Prepare table of contents for technical specifications for the construction of the dam and roadway.

Task 480 Opinion of Probable Construction Cost. Prepare an opinion of probable construction costs.

Task 490 Independent Reviews

- 490.1 Independent Technical Review (ITR). Independent Quality Control review to verify design complies with applicable standards, criteria and acceptable practices.
- 490.2 Sustainability Review. Review of design, materials, and construction methods for opportunities and provide recommendations to include sustainable features in accordance with P-MRNRD policies. Included in this effort will be development of a 'sustainable scorecard' to record and communicate inclusion of sustainable feature into the project design and maintenance.

Task 495 Design Meeting. Conduct a design review meeting with P-MRNRD staff of 60% design drawings, documentation, and cost estimates.

Task Deliverables:

- ROW legal descriptions for any additional project lands (see task 1050)
- Design meeting agenda and minutes.
- Interim Construction Drawings and Opinion of Probable Construction Cost (.pdf format and 3 hard copies)
- Design Documentation Report Draft Sections (.pdf format and 2 hard copies)

Key Understandings:

- Nebraska DNR has indicated that the two structures are likely to be classified as dam structures and will need to be designed and permitted individually per minimum state standards.
- EJCDC contract documents will be used for the General Conditions.
- Interim design is approximately a 60% design.
- Interim construction drawing will be half-size (11" x 17") drawings.
- Meeting agenda and minutes will be prepared by HDR and reviewed by P-MRNRD.

TASK SERIES 500 DAM AND ROADWAY (NON-BRIDGE) FINAL DOCUMENT PREPARATION

Task Objective: To prepare final contract documents for dam and roadway (non-bridge project elements).

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(Attachment 1 – Scope of Services)

March 3, 2010

HDR Activities:

- Task 510 Pre-Final Design.** Perform final design calculations for dam, utilities, roadway and basic park features, and in-lake features.
- 510.1 Construction Drawings. Comments from 60% review comments will be incorporated and pre-final drawings prepared.
- 510.2 Front-end and Technical Specifications. Pre-final specifications for project elements will be prepared.
- 510.3 Opinion of Probable Construction Cost. Opinion of Probably Construction Cost will be prepared based on pre-final design.
- 510.4 Deliverables. Preparation of drawings, specifications, and construction cost opinions.
- 510.5 Final Independent Reviews Independent technical reviews of project elements.
- 510.6 Design Meeting Review meeting for pre-final design submittal.

Task 520 Final Design. Perform final design calculations for dam, utilities, roadway and basic park features, and in-lake features.

- 520.1 Final Construction Drawings.
- 520.2 Front-end and Technical Specifications.
- 520.3 Opinion of Probable Construction Cost
- 520.4 Deliverables.

Task Deliverables:

- Design meeting agenda and minutes.
- Pre-Final and Final Bid Documents and Opinion of Probable Construction Cost (.pdf format and 3 hard copies)

Key Understandings:

- HDR to provide 2 half-size drawings and PDF files to the P-MRNRD for submittals.
- Pre-Final and Final construction drawing will be on "D" size sheets (22" x 34").
- Final design conference will be at approximately a 95% design effort.
- Roadway and bridge will be included as part of the dam project bid-letting.

TASK SERIES 600 BRIDGE FINAL DESIGN DOCUMENT PREPARATION

Task Objective: Prepare final design for Lincoln Road bridge crossing

HDR Activities:

Task 610 Final Bridge Design. Perform final design calculations for bridge superstructure, substructure and foundation elements. Develop design sketches to be utilized for final bridge plan production.

- 610.1 Construction Drawings. Prepare construction drawings of selected Lincoln Road crossing structure.
- 610.2 Technical Specifications. Prepare technical specifications for bridge construction documents. Specifications for the bridge construction will be based on NDOR standards.
- 610.3 Opinion of Probable Construction Cost Construction cost opinions will be prepared for bridge elements.
- 610.4 Deliverables. Preparation of drawings, specifications, and construction cost opinions.

Key Understandings: The following assumptions are made:

- Bridge will be a steel plate deck girder bridge. Drawings for a concrete bridge alternative will not be prepared.
- Design of independent trail crossing at Lincoln Road not included in this scope of services.
- EJCDC contract documents will be used for the General Conditions.
- HDR to provide 2 half-size drawing and PDF to the P-MRNRD for submittals.
- Final construction drawing will be on "D" size sheets (22" x 34").

- Aesthetics treatments are limited to tinting and form liners and will be determined by Sarpy County, City of Papillion, and NRD.
- Front-end specifications will be prepared under the dam and roadway design tasks

TASK SERIES 700 DESIGN DOCUMENTATION REPORT

Objective: Document the final design process.

HDR Activities: **Task 710 Design Documentation Report** Each design discipline will document design activities for compilation in a Design Documentation Report (DDR) of the project design. The DDR shall contain information necessary to describe and validate the design including: narrative, diagrams or sketches, calculations, computer print-outs, and documentation of all technical review comments and resolution.

710.1 **Draft Design Documentation Report** Prepare a draft design analysis.

710.2 **Final Design Documentation Report** Incorporate the comments from the draft design analysis and prepare a final design analysis.

Task Deliverables:

- Draft Design Documentation Report
- Final Design Documentation Report

Key Understandings:

- One copy of a draft design analysis will be submitted for review.
- Two copies of the final design analysis will be submitted.

TASK SERIES 800 EMERGENCY ACTION PLAN

Task Objectives: To prepare an emergency action plan in accordance with NDNR requirements.

HDR Activities: **Task 810 Dam Breach Analysis.** A dam breach analysis will be conducted to define potential inundation areas should the structure fail. The breach routing will extend from the structure downstream to a point where the flood wave water surface has been attenuated below the regulatory 100-yr water surface elevation. The regulatory HEC-RAS will be the basis for the dam breach analysis. Breach modeling will be based on 'no levees' downstream to be consistent with current floodplain mapping. Inundation maps will be prepared as part of the dam breach analysis for inclusion in the Emergency Action Plan.

Task 820 Draft Emergency Action Plan. HDR will develop an emergency action plan based on the current NDNR template.

Task 830 Final Emergency Action Plan. The draft Emergency Action Plan will be submitted to NDNR with the "Application for Approval of Plans for Dams". Comments on the EAP from NDNR will be incorporated into a Final Emergency Action Plan.

Task Deliverables:

- Draft Emergency Action Plan
- Final Emergency Action Plan

Key Understandings: Emergency Action Plan to follow NDNR plan template.

TASK SERIES 900 SURVEY

Task Objectives: Provide survey in support of final design activities.

HDR Activities: **Task 910 Additional Field Survey** Topographic surveys for water quality basins (2 locations), channel and wetland mitigation sites, boat ramp site, and at three (3) pedestrian trails crossing over the reservoir.

Task 920 Lincoln Road Survey. Conduct a detailed topographic survey of the proposed roadway/bridge corridor. Survey will extend from 132nd Street to the P-MRNRD eastern property limits (approx. 126th Street) and a 300-ft wide corridor along the proposed centerline of the road. Topographic survey of channel configuration at crossing will also be collected.

Task 930 Boring Location Surveys Survey bore hole locations for six (6) borings for Lincoln Road bridge structure and fourteen (14) borings for the two water quality basins.

Task 940 Boundary Survey of Project Lands. Boundary map of total project lands, including easements, and metes and bounds description of NRD project lands as a single parcel.

Task 950 Legal Descriptions and Documentation. Prepare legal descriptions and documentation (exhibit drawings and legal descriptions) for the following:

- Channel Mitigation easement from NRD to USACE
- Wetland Mitigation easement from NRD to USACE
- Lincoln Road easement to Sarpy County for Lincoln Road
- Sanitary sewer easement to Sarpy County and City of Papillion
- Vacation of ROW along Cornhusker
- Additional project land acquisition documentation for two parcels near 126th St. cul-de-sac
- Easement from Sarpy County for water line crossing under 132nd Street.

Task Deliverables:

- Topographic survey data for WQ basin sites, channel and wetland mitigation areas, boat ramp, and three pedestrian crossing sites
- Topographic survey data for Lincoln Road
- Boring location survey data for Lincoln Road and Water Quality basins
- Boundary Survey of Project Lands
- Legal exhibits and documents as outlined in Task 950

Key Understandings:

- P-MRNRD to submit and pay for all documentation and recordation fees.

TASK SERIES 1000 BIDDING SERVICES

Task Objectives:

To provide bidding assistance. For purposes of this scope development, it is assumed that one (1) bid package will be prepared.

HDR Activities:

Task 1010 Prepare Documents for Distribution. Prepare contract documents for distribution. Coordinate with reprographic firm as issuing agent for contract documents and issuing addenda as necessary. Reprographic firm will maintain record of plan holders.

Task 1020 Distribute to Reprographic Firm/Plan Houses. Provide electronic and hard copy set of plans and specifications to Plan Houses and to reprographic firm for reproduction. A maximum of three (3) sets to plan houses will be provided.

Task 1030 Addendum Preparation/Distribution. Issue addenda as appropriate to interpret, clarify or expand Contract Documents and to respond to Contractor's questions.

Task 1040 Pre-bid/Site Showing. Attend pre-bid/site showing hosted by P-MRNRD. HDR to prepare agenda and record meeting notes. NRD to distribute record meeting notes.

Task 1050 Bid Opening. Attend bid opening, tabulate Contractor's project costs and make a recommendation of award.

Task Deliverables:

- Project description for advertising
- Three (3) sets of contract documents for plan houses.
- Addendums
- Electronic copy of grading plans (DTM model)
- Pre-bid/Site Showing agenda, record meeting notes.
- Bid tabulation and letter of award recommendation

Key Understandings:

- No mylars will be produced.
- P-MRNRD will be responsible for advertising.
- P-MRNRD will be responsible for arranging pre-bid meeting room.

ATTACHMENT 2
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
FINAL DESIGN OF WP-5
FEE ESTIMATE - MARCH 2, 2010

[illegible]

HDR Engineering, Inc. Estimated Hours/Costs													Sub-Consultant Estimated Costs			Est. Total Cost	
TASKS		Physed Manpower	Specified Senior Staff	BSA/eq	Tech Support	Chief/Asst	Total Hours	Total Labor Cost	Per Hour	Travel	Meals	Total Expenses [1]	Totals	LMA	Private Consultant	Total Task Costs	Est. Total Cost
Roadway Design																	
Subtask 400.1																	
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ATTACHMENT 3
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
FINAL DESIGN OF WP-5
SCHEDULE

Tasks		Feb '10	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec '10	Jan '11
TASK SERIES 100 – PROJECT MANAGEMENT													
Task 110	Project Management												
Subtask 120.1	Coordination Meetings												
Subtask 120.2	Board/Commission Meetings												
Subtask 120.3	Board/Commission Presentation												
Task 130	Newsletter Update												
TASK SERIES 200 – LINCOLN ROAD ROADWAY AND BRIDGE ALTERNATIVES													
Task 210	Roadway and Bridge Coordination												
Subtask 220.1	Geotechnical Data Collection												
Subtask 220.2	Roadway Alternatives												
Subtask 230.1	Geometrics												
Subtask 230.2	Roadway Modeling												
Subtask 230.3	Roadway Drawings												
Subtask 230.4	Estimate Exhibits												
Task 240	Bridge Alternatives												
Subtask 240.1	Conceptual Layout of Alternatives												
Task 250	Preliminary Bridge Design												
Subtask 250.1	Options of Probable Construction Costs												
Subtask 250.2	Alternatives Memo												
TASK SERIES 300 – PERMITTING													
Task 310	Section 404 Permit												
Subtask 310.1	Agency Coordination												
Subtask 310.2	Section 404 Alternatives Evaluation												
Subtask 310.3	System Migration Development												
Subtask 310.4	Water Migration Development												
Subtask 310.5	Permitting Migration Summary												
Subtask 310.6	Basin Migration Monitoring												
Task 320	NEH Permit												
Subtask 320.1	Permit Preparation												
Task 330	NEDES Construction Activity Permit												
Subtask 330.1	Agency Coordination												
Subtask 330.2	Permit Preparation												
Task 340	Floodplain Permit Technical Assistance												
Task 350	Technical Assistance on Roadway Agreement												
TASK SERIES 400 – WATER QUALITY AND DOCUMENT PREPARATION													
Task 410	Water Quality Basin Design												
Subtask 410.1	Geotechnical Investigation												
Subtask 410.2	Geotechnical Evaluation												
Subtask 410.3	Hydrologic and Hydraulic Design												
Subtask 410.4	Structural Design of Principal Spillway												
Task 415	Dam Design												
Subtask 415.1	Main Dam Principal Spillway												
Subtask 415.2	Main Dam Auxiliary Spillway												
Subtask 415.3	Dam Embankment Final Design												
Subtask 415.4	Gravels and Quarry Checks												
Subtask 415.5	Design Documentation												
Task 420	Trail System and Basic Park Features												
Subtask 420.1	Design Criteria												
Subtask 420.2	Trail Design												
Subtask 420.2.1	Trail Design												
Subtask 420.2.2	Trail Modeling												
Subtask 420.2.3	Trail Crossing Design												
Subtask 420.3	Park Features												
Subtask 420.3.1	Landscape												
Subtask 420.3.2	Design												
Subtask 420.3.2	Design Documentation												
Task 430	In-Lake Features												
Subtask 430.1	Agency Coordination												
Subtask 430.2	Design Criteria												
Subtask 430.3	Design												
Subtask 430.4	Design Documentation												

ATTACHMENT 3
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
FINAL DESIGN OF WP-5
SCHEDULE

Tasks	Feb '10	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec '10	Jan '11
TASK 400												
Subtask 400.1 Utility Design												
Subtask 400.2 Utility Agency Coordination												
Subtask 400.3 Design Criteria												
Subtask 400.4 Wastewater System Design												
Subtask 400.5 Wastewater System												
Subtask 400.6 Electrical Design												
Subtask 400.7 Water Service												
TASK 450												
Subtask 450.1 Roadway Design												
Subtask 450.2 Horizontal and Vertical Control Profiles												
Subtask 450.3 Uniform Road Storm Drainage												
Subtask 450.4 Utility Coordination												
Subtask 450.5 Roadway Modification												
Subtask 450.6 Design Documentation												
TASK 460												
Subtask 460.1 Construction Drawings												
TASK 470												
Subtask 470.1 Specifications												
Subtask 470.2 Technical Specifications												
TASK 480												
Subtask 480.1 Option of Probable Construction Cost												
TASK 490												
Subtask 490.1 Independent Review												
Subtask 490.2 Independent Technical Review (ITR)												
TASK 495												
Subtask 495.1 Design Meeting												
TASK SERIES 500 DAM AND ROADWAY FINAL DOCUMENT PREPARATION												
TASK 510												
Subtask 510.1 Pre-Final Design												
Subtask 510.2 Construction Drawings												
Subtask 510.3 Specifications												
Subtask 510.4 Option of Probable Construction Cost												
Subtask 510.5 Deliverables												
Subtask 510.6 Final Independent Reviews												
TASK 520												
Subtask 520.1 Design Meeting												
TASK 530												
Subtask 530.1 Construction Drawings												
Subtask 530.2 Specifications												
Subtask 530.3 Option of Probable Construction Cost												
Subtask 530.4 Deliverables												
TASK SERIES 600 BRIDGE FINAL DESIGN DOCUMENT PREPARATION												
TASK 610												
Subtask 610.1 Final Bridge Design												
Subtask 610.2 Construction Drawings												
Subtask 610.3 Specifications												
Subtask 610.4 Option of Probable Construction Cost												
Subtask 610.5 Deliverables												
TASK SERIES 700 DESIGN DOCUMENTATION REPORT												
TASK 710												
Subtask 710.1 Design Documentation Report												
Subtask 710.2 Draft Design Documentation Report												
TASK SERIES 800 EMERGENCY ACTION PLAN												
TASK 810												
Subtask 810.1 Dam Breach Analysis												
Subtask 810.2 Draft Emergency Action Plan												
Subtask 810.3 Final Emergency Action Plan												
TASK SERIES 900 LEGAL SURVEY												
TASK 910												
Subtask 910.1 Additional Field Survey												
Subtask 910.2 Lincoln Road Corridor Survey												
Subtask 910.3 Bridge Location Survey												
Subtask 910.4 Boundary Survey of Project Lands												
Subtask 910.5 Legal Description and Documentation												
TASK SERIES 1000 BIDDING SERVICES												
TASK 1010												
Subtask 1010.1 Documentation Preparation												
Subtask 1010.2 Distribution to Reprographic Firm/Plan Houses												
Subtask 1010.3 Advertisement Preparation/Distribution												
Subtask 1010.4 Pre-Bid Site Showing												
Subtask 1010.5 Bid Opening												

BM **CON** Denotes a P-MNRD Subcommittee or Board meeting
Denotes a quarterly newsletter

BM **CON** Denotes a kick-off meeting with P-MNRD and HDR Project Team
Denotes an internal coordination meeting with P-MNRD and HDR Project Team.

Future Land Use Development Concept

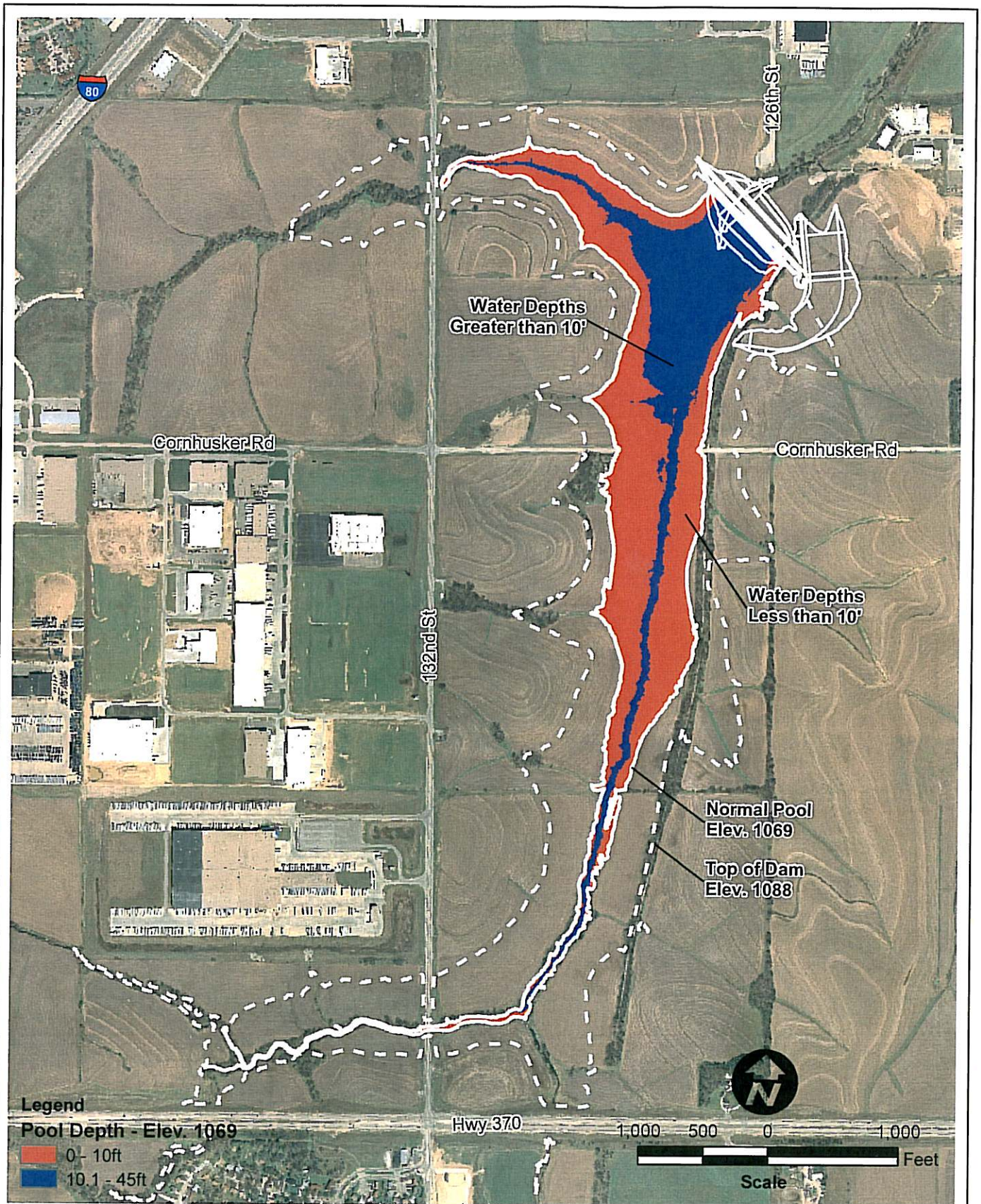
The Future Development Concept highlights the fine grain of the pedestrian oriented, mixed-use developments desired by the participants of the planning process. The mixed-use town center and neighborhood centers are connected to the future lakes and neighborhoods via an interconnected street network and greenways.



HDR



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WP-5 Water Depths with a Normal Pool at Elev. 1069

Papillion Creek Watershed
Regional Detention Basin WP-5, Sarpy County
404 Permit Application



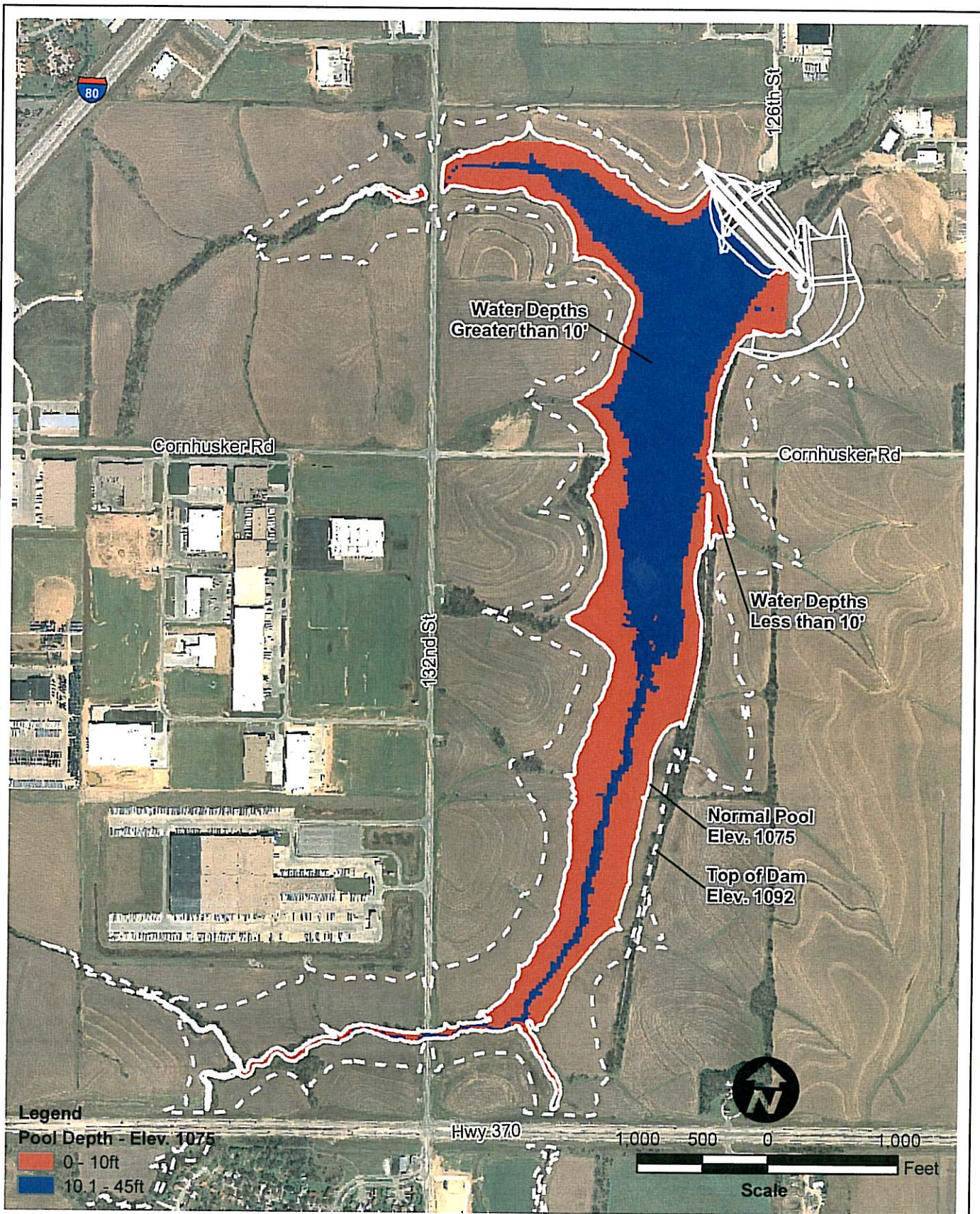
DATE

February 2010

FIGURE

14

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WP-5 Water Depths with a Normal Pool at Elev. 1075

Papillion Creek Watershed
Regional Detention Basin WP-5, Sarpy County
404 Permit Application

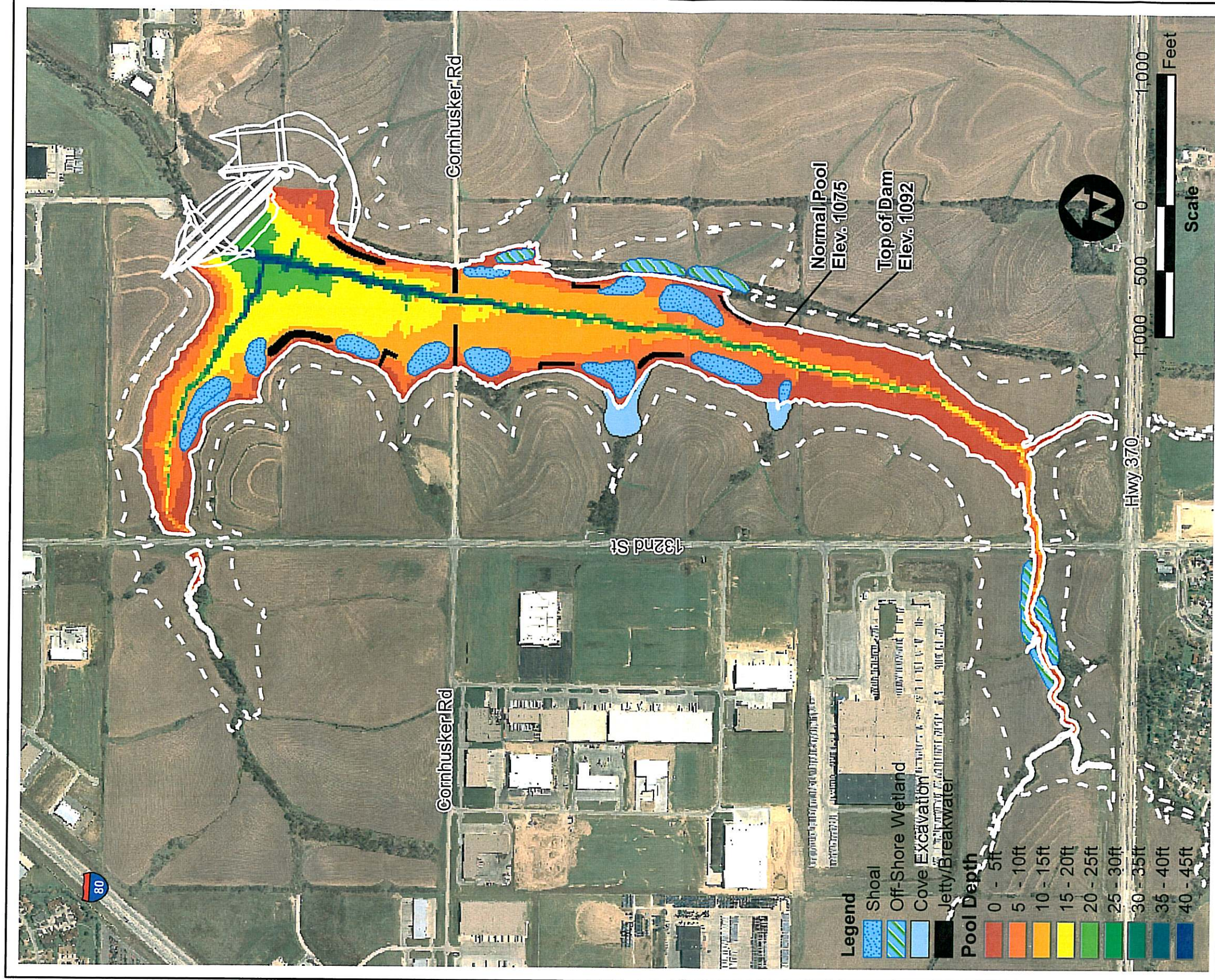


DATE

February 2010

FIGURE

5



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HDR

WP-5 Aquatic and Wildlife Design Measures

Papillion Creek Watershed
Regional Detention Basin WP-5, Sarpy County
404 Permit Application



DATE

February 2010

FIGURE

15

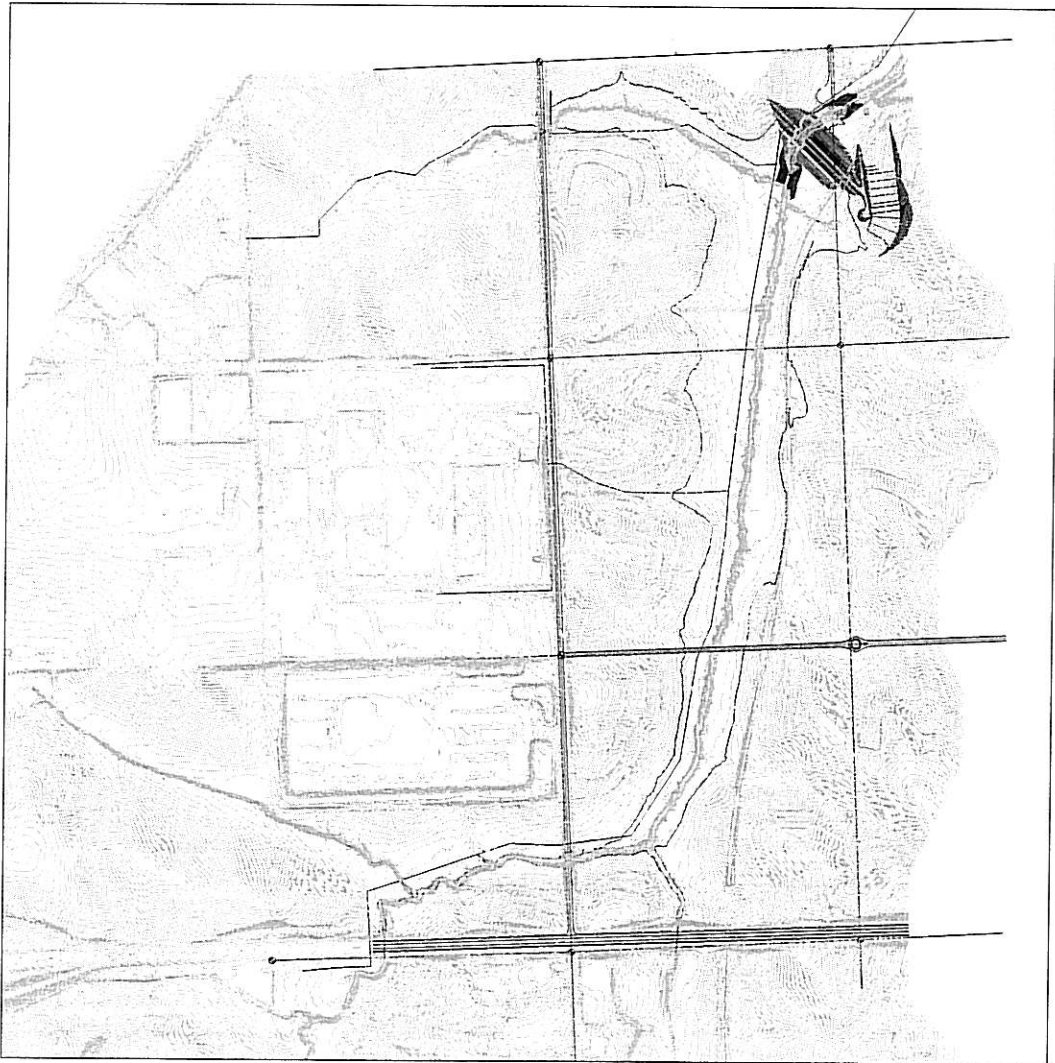
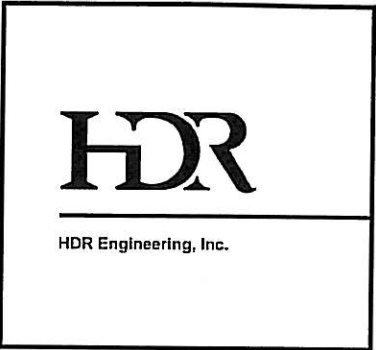
P-MRNRD WP-5 Construction Cost Opinion
30% +/- Design Level

Sheet1
File No. 98326
Sheet: 1 of 1
Date: 3/9/2010

Project: P-MR NRD WP-5

Item No.	Description	Quantity	Unit	Unit Price	Amount
General					
1	Mobilization	1	LS	\$ 10,000	\$ 10,000
2	Watershed Drainage/Site Management	1	LS	\$ 25,000	\$ 25,000
3	Survey	1	LS	\$ 50,000	\$ 50,000
4	Channel Clearing (Lincoln Rd to Dam)	10.0	AC	\$ 3,000	\$ 30,000
					\$ 115,000
Erosion Control					
5	Erosion Control	1	LS	\$ 40,000	\$ 40,000
6	Matting for Steep Slopes	23,500	SY	\$ 1.10	\$ 25,850
					\$ 65,850
Removals					
7	Remove Cornhusker Road Bridge	1	LS	\$ 9,750	\$ 9,750
8	Building Demolition & Removal	1	LS	\$ 20,000	\$ 20,000
					\$ 29,750
Sanitary					
9	Remove 30" RCP	450	LF	\$ 22.50	\$ 10,125
10	Remove 27" RCP	325	LF	\$ 20.00	\$ 6,500
11	Remove 10" PVC	725	LF	\$ 15.00	\$ 10,875
12	Remove 8" PVC	250	LF	\$ 15.00	\$ 3,750
13	Remove / Abandon San. Manholes	17	EA	\$ 1,250.00	\$ 21,250
14	Pipe Plugs	5	EA	\$ 250.00	\$ 1,250
15	Construct 36" RCP	10,840	LF	\$ 42.50	\$ 460,700
16	<20' Depth Extra Charge	350	LF	\$ -	\$ -
17	20-25' Depth Extra Charge	340	LF	\$ 15.00	\$ 5,100
18	25-30' Depth Extra Charge	2,875	LF	\$ 30.00	\$ 86,250
19	30-35' Depth Extra Charge	6,525	LF	\$ 55.00	\$ 358,875
20	35-45' Depth Extra Charge	750	LF	\$ 75.00	\$ 56,250
21	Construct 10" PVC	500	LF	\$ 17.50	\$ 8,750
22	Construct 72" I.D. Manhole (32)	1,150	VF	\$ 475.00	\$ 546,250
23	6" Perf. Drain Pipe	700	LF	\$ 10.00	\$ 7,000
24	Connect to Ex. Manhole	2	EA	\$ 1,000	\$ 2,000
25	Rock Bedding	8,500	TN	\$ 20.00	\$ 170,000
26	Silt Fence	10,800	LF	\$ 2.00	\$ 21,600
					\$ 1,776,525
Principal Spillway & Drawdown Structures					
27	Construct 18" D.I.P.	540	LF	\$ 110.00	\$ 59,400
28	Construct Gate Valve & 4'x6' Manhole	1	LS	\$ 20,000	\$ 20,000
29	Construct Drawdown Headwall	1	LS	\$ 4,000	\$ 4,000
30	Construct Principal Spillway Inlet Structure	1	LS	\$ 80,000	\$ 80,000
31	Construct 48" RCCP	491	LF	\$ 250.00	\$ 122,750
32	Construct 72" I.D. Manhole	24	VF	\$ 375.00	\$ 9,000
33	Construct Impact Stilling Basin	1	LS	\$ 45,000	\$ 45,000
34	Construct Riprap	800	TN	\$ 28.00	\$ 22,400
					\$ 362,550
Dam Earthwork					
35	Clearing & Grubbing, Channel Clearing	10.60	AC	\$ 3,000	\$ 31,800
36	Strip & Stockpile Topsoil	45,000	CY	\$ 1.75	\$ 78,750
37	Channel Bank Excavation	35,500	CY	\$ 2.00	\$ 71,000
38	Construct Inspection Trench	14,000	CY	\$ 4.50	\$ 63,000
39	Earthwork (As Excavation of On-Site Material)	354,800	CY	\$ 2.10	\$ 745,080
40	Auxiliary Spillway Excavation & Compaction	10,000	CY	\$ 1.75	\$ 17,500
41	Construct Embankment Chimney and Finger Drains	1	LS	\$ 120,000	\$ 120,000
42	Construct Riprap	7,500	TN	\$ 28.00	\$ 210,000
					\$ 1,337,130
Fisheries Enhancements					
43	Jetty Embankment (As On-Site Excavation)	250,000	CY	\$ 1.50	\$ 375,000
44	Construct Riprap	6,000	TN	\$ 28.00	\$ 168,000
					\$ 543,000
Water Quality Basins					
45	Construct Water Quality Basin	2	LS	\$ 400,000	\$ 800,000
					\$ 800,000
Lincoln Road					
46	Strip & Stockpile Topsoil	5,900	CY	\$ 1.75	\$ 10,325
47	Clearing & Grubbing, Channel Clearing	4.25	AC	\$ 3,000	\$ 12,750
48	Silt Fence	6,000	LF	\$ 2.00	\$ 12,000
49	Power Pole Relocation	1	EA	\$ 7,500	\$ 7,500
50	Lincoln Road Embankment (As On-Site Excavation)	175,000	CY	\$ 2.10	\$ 367,500
51	Construct Storm Sewer Curb Inlets	6	EA	\$ 2,000.00	\$ 12,000
52	Construct 24" RCP Storm Sewer Pipe	750	LF	\$ 30.00	\$ 22,500
53	Construct 24" FES w/ Riprap Outlet	2	EA	\$ 3,000.00	\$ 6,000
54	Construct 3-span Bridge (3 lane w/ 10 walk 1 side, no lighting)	1	LS	\$ 855,000	\$ 855,000
55	Construct 8" PCC Pavement w/ Int. Curbs (2 lane)	7,200	SY	\$ 27.50	\$ 198,000
56	Construct 10' Trail (North side of road)	1,965	LF	\$ 30.00	\$ 58,950
57	Construct 5' Sidewalk (South side of Road)	2,135	LF	\$ 15.00	\$ 32,025
58	Seeding	9	AC	\$ 1,250	\$ 11,250
59	Matting for Steep Slopes	26,500	SY	\$ 1.10	\$ 29,150
					\$ 1,634,950
Cornhusker Road					
60	Construct 8" PCC Pavement w/ Int. Curbs (2 lane, west entrance to boat ramp)	170	SY	\$ 27.50	\$ 4,675
61	Cornhusker Road Contingencies (Storm Sewer, grading, seeding...) @ 100%	1	LS	\$ 4,675	\$ 4,675
					\$ 9,350
Trails					
62	10' PCC Trail	20,550	LF	\$ 30.00	\$ 616,500
63	12'x12' R.C. Box Trail Structures w/ Wingwalls	2	EA	\$ 125,000	\$ 250,000
64	Undercross Lighting	2	LS	\$ 15,000	\$ 30,000
65	Wood Chip Trail - WQ Basin 2 (Trail only, no access or channel crossing)	2,800	LF	\$ 4.00	\$ 11,200
66	Pedestrian Bridge	3	EA	\$ 100,000	\$ 300,000
					\$ 1,207,700
Park & Recreation Improvements					
67	8" PCC Pavement (Drives & Parking Areas)	10,000	SY	\$ 32.50	\$ 325,000
68	Boat Ramp	1	EA	\$ 100,000	\$ 100,000
69	Park Shelter (no electrical)	2	EA	\$ 20,000	\$ 40,000
70	Picnic Table	20	EA	\$ 1,250	\$ 25,000
71	Vault Restroom Structure (no electrical)	2	LS	\$ 25,000	\$ 50,000
72	2" Water Line & Fountain	1	LS	\$ 12,500	\$ 12,500
73	Area Lighting	1	LS	\$ 100,000	\$ 100,000
74	Seeding	10	AC	\$ 1,250	\$ 12,500
75	Park & Rec Contingencies (Grading, site prep, trees...) @ 20%	1	LS	\$ 133,000	\$ 133,000
					\$ 798,000
Stream & Wetland Mitigation					
76	Stream Mitigation	1	LS	\$ 75,000	\$ 75,000
77	Wetland Mitigation	1	LS	\$ 25,000	\$ 25,000
					\$ 100,000
Misc.					
78	Seeding	460.0	AC	\$ 1,200	\$ 552,000
79	Project Contingencies @ 10%	1	LS	\$ 933,000	\$ 933,000
					\$ 1,485,000
	Total Estimated Construction Cost				\$ 10,264,800
					\$ 10,264,800

MARCH 2010
PAPIO - MISSOURI RIVER
NATURAL RESOURCES
DISTRICT



CONTRACT DRAWINGS FOR

**P-MRNRD
WEST
PAPILLION CREEK
BASIN 5**

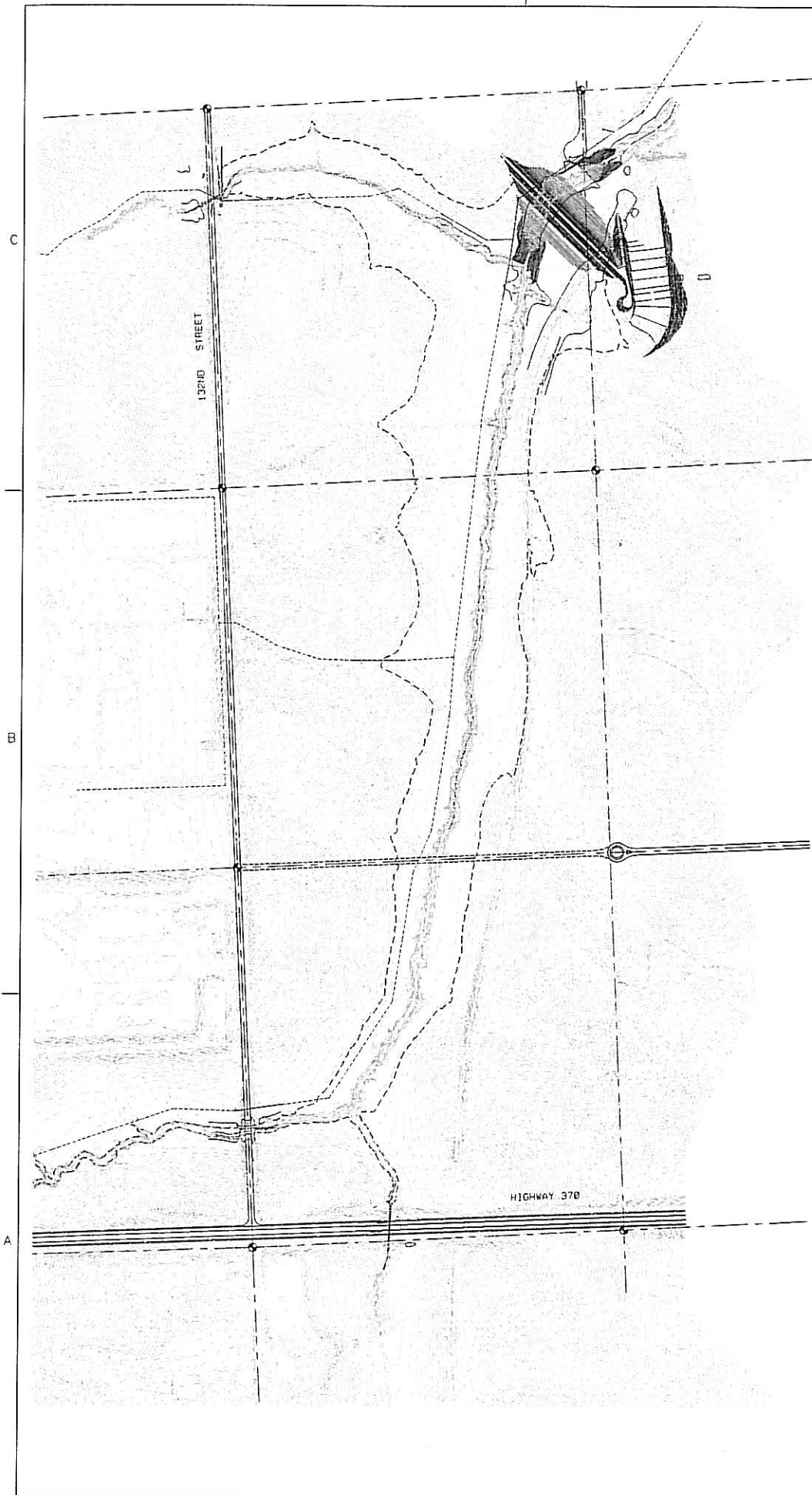
CONCEPTUAL DESIGN PLANS

HDR PROJECT NO.
000000000098326

SARPY COUNTY, NEBRASKA
MARCH 2010

INDEX OF DRAWINGS

SHEET	NAME	TITLE
00	00G100	COVER INDEX LOCATION MAP
01	00G101	OVERALL PLAN AND RESERVOIR DATA
02	00G102	SITE BORINGS AND GEOLOGIC PROFILE
03	00X101	DEMOLITION PLAN - NOT INCLUDED
04	00C101	SECTION MAIN DAM ALONG PRINCIPAL SPILLWAY
05	00C102	PROFILE DRAW DOWN STRUCTURE
06	00C103	PROFILES AND TYPICAL SECTIONS
07	00C104	GRADING PLAN SHEET 01 OF 02
08	00C105	GRADING PLAN SHEET 02 OF 02
09	00C106	FISHERIES AND TRAIL IMPROVEMENTS SHEET 01 OF 03
10	00C107	FISHERIES AND TRAIL IMPROVEMENTS SHEET 02 OF 03
11	00C108	FISHERIES AND TRAIL IMPROVEMENTS SHEET 03 OF 03
12	00C109	WATER QUALITY BASIN PLAN AND DETAIL
13	00C111	SANITARY SEWER PLAN AND PROFILE SHEET 01 OF 05
14	00C112	SANITARY SEWER PLAN AND PROFILE SHEET 02 OF 05
15	00C113	SANITARY SEWER PLAN AND PROFILE SHEET 03 OF 05
16	00C114	SANITARY SEWER PLAN AND PROFILE SHEET 04 OF 05
17	00C115	SANITARY SEWER PLAN AND PROFILE SHEET 05 OF 05
18	00S101	STRUCTURAL DETAILS SHEET 01 OF 05
19	00S102	STRUCTURAL DETAILS SHEET 02 OF 05
20	00S103	STRUCTURAL DETAILS SHEET 03 OF 05
21	00S104	STRUCTURAL DETAILS SHEET 04 OF 05
22	00S105	STRUCTURAL DETAILS SHEET 05 OF 05



MAIN DAM ROUTING DATA						
TYPE OF STORAGE	24-HOUR PRECIP (INCHES)	ELEVATION (FT MSL)	POOL SURFACE AREA	STORAGE VOLUME (AC-FT)	INFLOW (CFS)	PEAK DISCHARGE OUTFLOW (CFS)
VALLEY FLOOR		1052.00				
NORMAL POOL MAIN DAM		1075.00	134	1445		
AUXILIARY SPILLWAY CREST		1085.00	220	3195		
100-YEAR	6.7	1082.40	196	2650	9,205	330
PSH (500-YEAR)	8.7	1084.50	215	3085	12,420	335
ASH	11.2	1086.50	235	3540	14,560	1355
FBH (PMP)	24.0	1091.80	288	4925	30,300	13,000

BENCHMARK

- TBM-1
2" BRASS CAP AT THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER OF SECTION 30, T14N, R12E OF THE 6TH P.M.
ELEVATION = 1104.74 NAVD 88
- TBM-2
2" BRASS CAP AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SECTION 19, T14N, R12E OF THE 6TH P.M.
ELEVATION = 1122.63 NAVD 88
- TBM-3
2" BRASS CAP AT THE NORTHEAST CORNER OF THE SOUTHWEST QUARTER OF SECTION 19, T14N, R12E OF THE 6TH P.M.
ELEVATION = 1064.51 NAVD 88

GENERAL NOTES

- ALL ELEVATIONS SHOWN ARE FINAL ELEVATIONS OF FACILITIES AFTER CONSTRUCTION AND LONG TERM SETTLEMENT HAVE OCCURRED UNLESS OTHERWISE SHOWN.
- THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER BEFORE CONSTRUCTION OF FACILITIES TO INSURE USE OF CURRENT SETTLEMENT CRITERIA.
- CONSTRUCTION SETTLEMENT ADJUSTMENT MUST BE VARIED DURING THE CONSTRUCTION TO ACCOMMODATE CONSTRUCTION PHASE SETTLEMENT.
- LONG TERM SETTLEMENT ESTIMATES WILL BE PERIODICALLY ADJUSTED BY THE GEOTECHNICAL ENGINEER TO REFLECT CONSTRUCTION INSTRUMENTATION DATA.

LEGEND

- NORMAL POOL ELEV. 1075.0
- - - - - DRAWDOWN POOL ELEV. 1046.0

PRINCIPAL SPILLWAY
RISER CREST
= 1075.0

100-YEAR
= 1082.4

500-YEAR
= 1084.5
AUXILIARY SPILLWAY
CREST = 1085.0

TOP OF DAM
= 1092.0

STRUCTURE CAPACITY MAIN DAM ROUTING DATA			
ELEVATIONS	SURFACE AREA	ACRE FEET	TOTAL ACRE FEET
1028	0	0	0
1030	0	0	0
1032	1	1	1
1034	1	2	3
1036	2	3	6
1038	2	4	10
1040	3	5	15
1042	4	7	22
1044	5	8	30
1046	6	11	41
1048	6	12	53
1050	7	13	66
1052	9	16	82
1054	13	23	105
1056	20	30	135
1058	28	45	180
1060	35	65	245
1062	44	80	325
1064	57	100	425
1066	70	125	550
1068	81	150	700
1070	94	175	875
1072	109	205	1080
1074	126	230	1310
1075	134	135	1445
1076	142	135	1580
1078	156	300	1880
1080	172	330	2210
1082	192	360	2570
1084	210	400	2970
1085	220	225	3195
1086	230	225	3420
1088	250	480	3900
1090	270	520	4420
1092	290	560	4980

PAPIO - MISSOURI RIVER
NATURAL
RESOURCES
DISTRICT



ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	



OVERALL PLAN
AND
RESERVOIR DATA

SCALE 1 : 500

01

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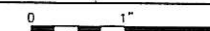
HDR

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PAPIO - MISSOURI RIVER
NATURAL
RESOURCES
DISTRICT



ISSUE	DATE	DESCRIPTION
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GED ENGINEER	PAP	
CAD TECH	FL	

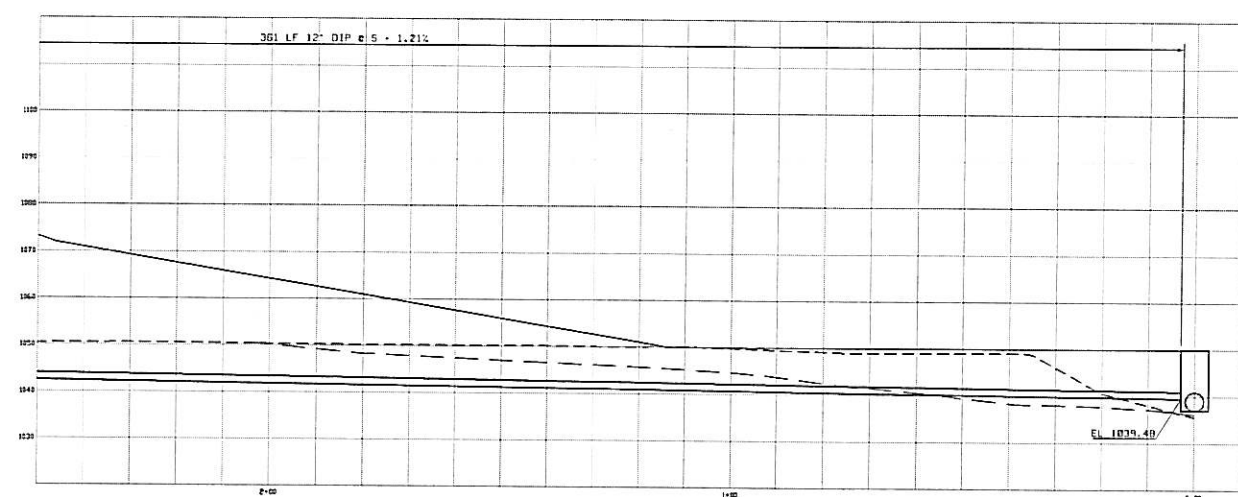
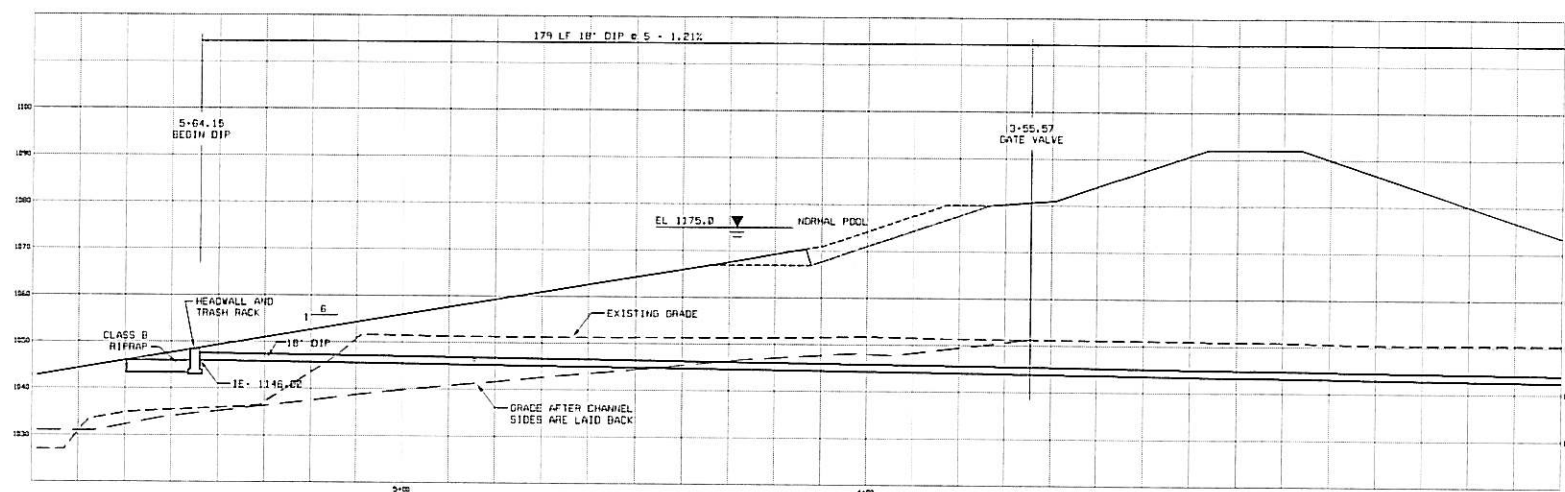


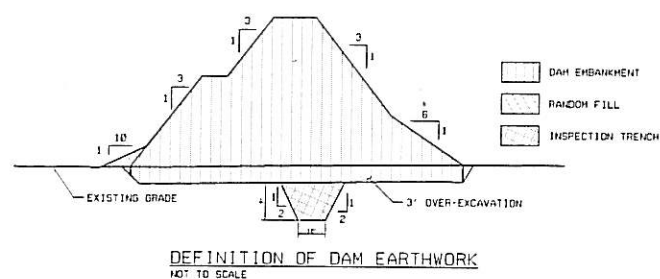
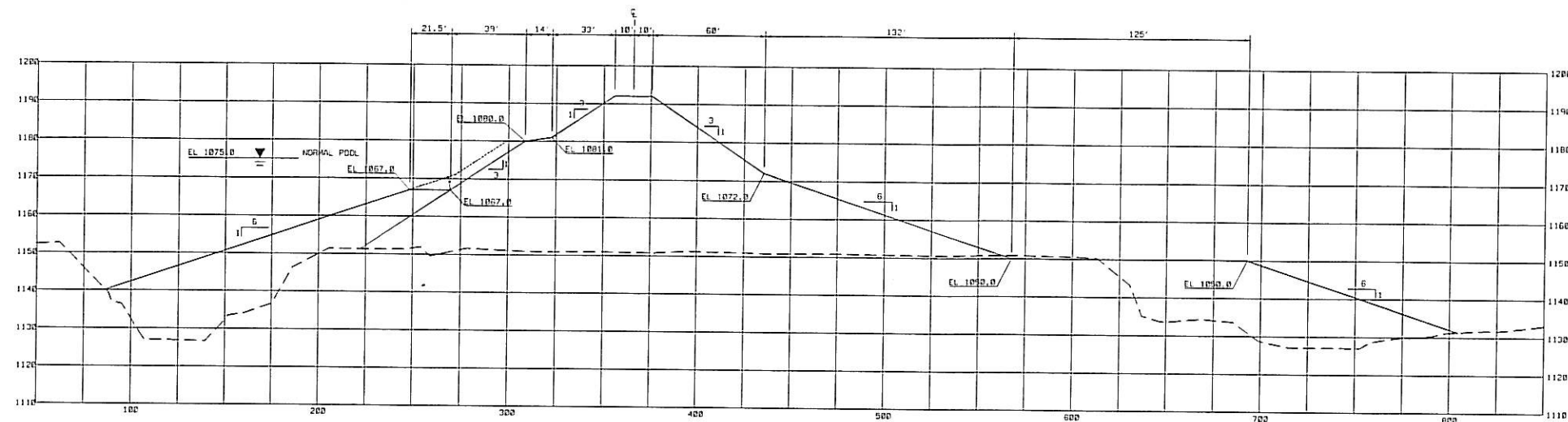
PROFILE
DRAW DOWN STRUCTURE

SCALE 1" = 20'

05

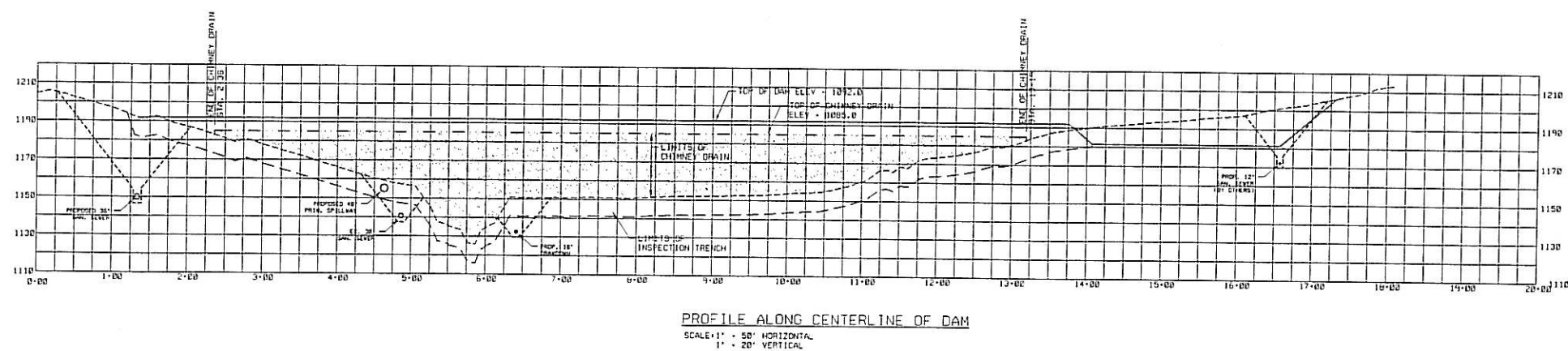
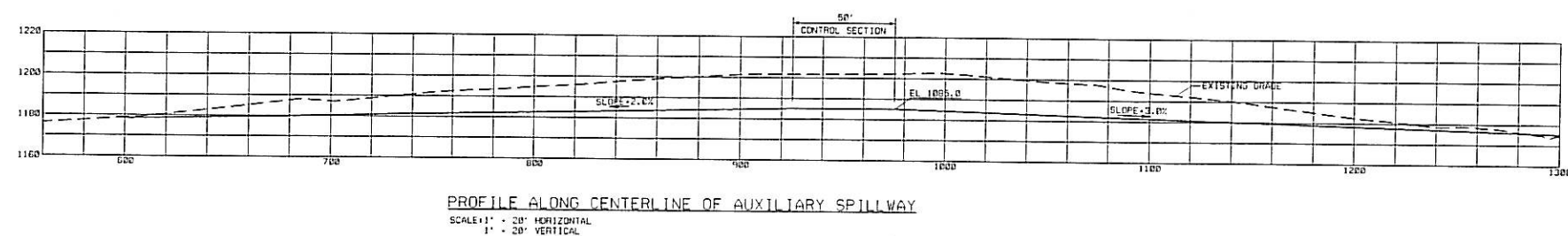
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- GENERAL NOTES :

1. ALL ELEVATIONS SHOWN ARE FINAL ELEVATIONS OF FACILITIES AFTER CONSTRUCTION AND LONG TERM SETTLEMENT HAVE OCCURRED.
2. CAMBER DRAIN BASED ON 1" TOTAL SETTLEMENT AT DAW CENTERLINE.
3. TOTAL SETTLEMENT UNDER MAXIMUM ENGINEERING SECTION IS ESTIMATED TO BE 4.5".
4. SET EACH PIPE BELL AT THE DESIGN GRADE PLUS THE CAMBER AS NOTED HEREIN.
5. THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER BEFORE CONSTRUCTION OF LONG TERM SETTLEMENT ESTIMATES.
6. THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER BEFORE CONSTRUCTION OF LONG TERM SETTLEMENT ESTIMATES.
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13. THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER BEFORE CONSTRUCTION OF LONG TERM SETTLEMENT ESTIMATES.
14. THE CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER BEFORE CONSTRUCTION OF LONG TERM SETTLEMENT ESTIMATES.
15. OVERBURD TO ACCOUNT FOR LONG TERM SETTLEMENT SHALL BE INCORPORATED INTO THE UPPER 3:1 SLOPES TO PROVIDE UNIFORM SLOPE APPEARANCE.
16. BACKFILLING OF INSPECTING TRENCH SHALL NOT COMMENCE UNTIL THE EXCAVATION HAS BEEN OBSERVED AND APPROVED BY THE ENGINEER.



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PAPIO - MISSOURI RIVER
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ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	

0 1" 2"

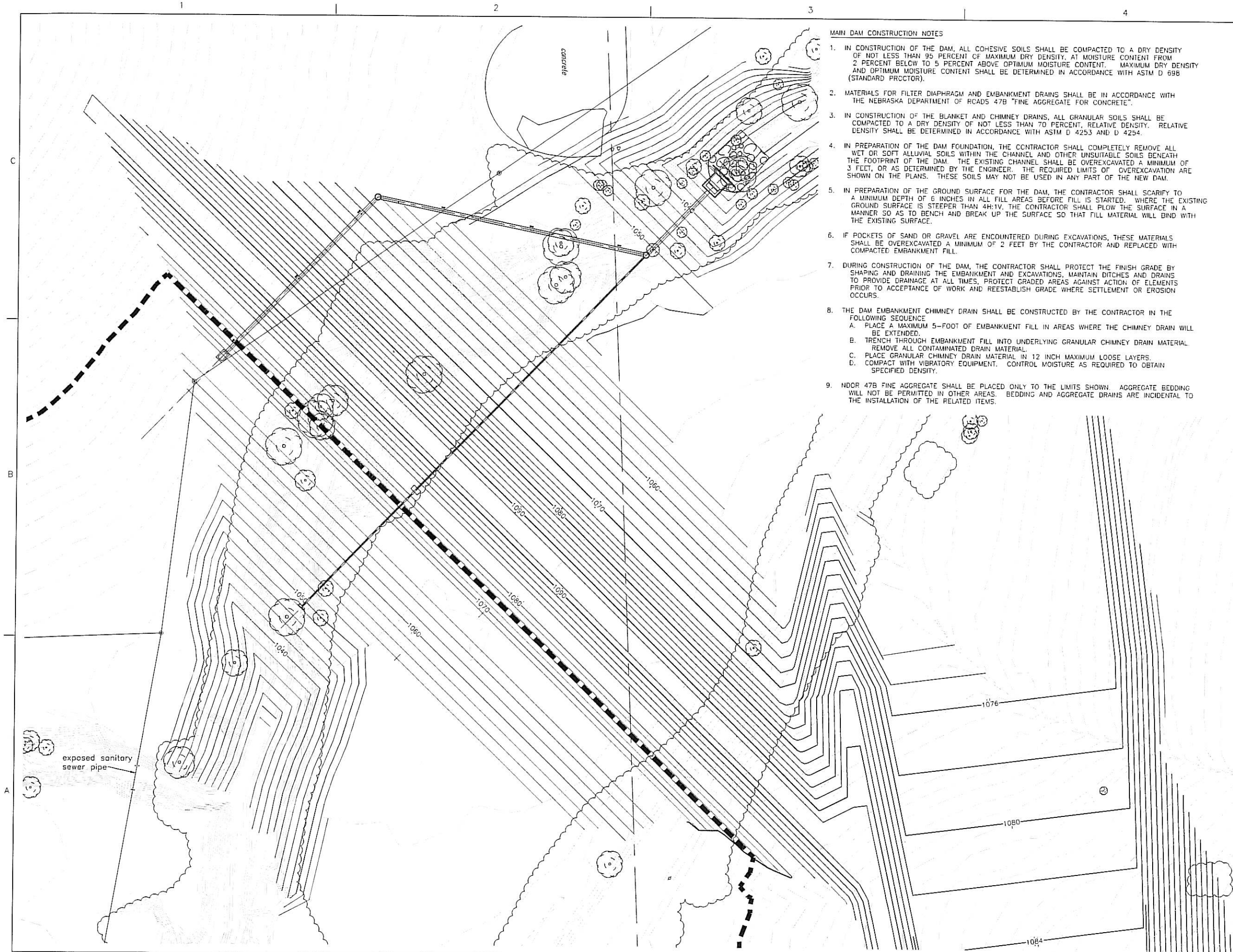


PROFILES AND TYPICAL SECTIONS

SCALE AS SHOWN

06

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MAIN DAM CONSTRUCTION NOTES

1. IN CONSTRUCTION OF THE DAM, ALL COHESIVE SOILS SHALL BE COMPACTED TO A DRY DENSITY OF NOT LESS THAN 95 PERCENT OF MAXIMUM DRY DENSITY, AT MOISTURE CONTENT FROM 2 PERCENT BELOW TO 5 PERCENT ABOVE OPTIMUM MOISTURE CONTENT. MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D 698 (STANDARD PROCTOR).
2. MATERIALS FOR FILTER DIAPHRAGM AND EMBANKMENT DRAINS SHALL BE IN ACCORDANCE WITH THE NEBRASKA DEPARTMENT OF ROADS 47B "FINE AGGREGATE FOR CONCRETE".
3. IN CONSTRUCTION OF THE BLANKET AND CHIMNEY DRAINS, ALL GRANULAR SOILS SHALL BE COMPACTED TO A DRY DENSITY OF NOT LESS THAN 70 PERCENT, RELATIVE DENSITY. RELATIVE DENSITY SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D 4253 AND D 4254.
4. IN PREPARATION OF THE DAM FOUNDATION, THE CONTRACTOR SHALL COMPLETELY REMOVE ALL WET OR SOFT ALLUVIAL SOILS WITHIN THE CHANNEL AND OTHER UNSUITABLE SOILS BENEATH THE FOOTPRINT OF THE DAM. THE EXISTING CHANNEL SHALL BE OVEREXCAVATED A MINIMUM OF 3 FEET, OR AS DETERMINED BY THE ENGINEER. THE REQUIRED LIMITS OF OVEREXCAVATION ARE SHOWN ON THE PLANS. THESE SOILS MAY NOT BE USED IN ANY PART OF THE NEW DAM.
5. IN PREPARATION OF THE GROUND SURFACE FOR THE DAM, THE CONTRACTOR SHALL SCARIFY TO A MINIMUM DEPTH OF 6 INCHES IN ALL FILL AREAS BEFORE FILL IS STARTED. WHERE THE EXISTING GROUND SURFACE IS STEEPER THAN 4H:1V, THE CONTRACTOR SHALL PLOW THE SURFACE IN A MANNER SO AS TO BENCH AND BREAK UP THE SURFACE SO THAT FILL MATERIAL WILL BIND WITH THE EXISTING SURFACE.
6. IF POCKETS OF SAND OR GRAVEL ARE ENCOUNTERED DURING EXCAVATIONS, THESE MATERIALS SHALL BE OVEREXCAVATED A MINIMUM OF 2 FEET BY THE CONTRACTOR AND REPLACED WITH COMPACTED EMBANKMENT FILL.
7. DURING CONSTRUCTION OF THE DAM, THE CONTRACTOR SHALL PROTECT THE FINISH GRADE BY SHAPING AND DRAINING THE EMBANKMENT AND EXCAVATIONS, MAINTAIN DITCHES AND DRAINS TO PROVIDE DRAINAGE AT ALL TIMES, PROTECT GRADED AREAS AGAINST ACTION OF ELEMENTS PRIOR TO ACCEPTANCE OF WORK AND REESTABLISH GRADE WHERE SETTLEMENT OR EROSION OCCURS.
8. THE DAM EMBANKMENT CHIMNEY DRAIN SHALL BE CONSTRUCTED BY THE CONTRACTOR IN THE FOLLOWING SEQUENCE:
 - A. PLACE A MAXIMUM 5-FOOT OF EMBANKMENT FILL IN AREAS WHERE THE CHIMNEY DRAIN WILL BE EXTENDED.
 - B. TRENCH THROUGH EMBANKMENT FILL INTO UNDERLYING GRANULAR CHIMNEY DRAIN MATERIAL. REMOVE ALL CONTAMINATED DRAIN MATERIAL.
 - C. PLACE GRANULAR CHIMNEY DRAIN MATERIAL IN 12 INCH MAXIMUM LOOSE LAYERS.
 - D. COMPACT WITH VIBRATORY EQUIPMENT. CONTROL MOISTURE AS REQUIRED TO OBTAIN SPECIFIED DENSITY.
9. HDOR 47B FINE AGGREGATE SHALL BE PLACED ONLY TO THE LIMITS SHOWN. AGGREGATE BEDDING WILL NOT BE PERMITTED IN OTHER AREAS. BEDDING AND AGGREGATE DRAINS ARE INCIDENTAL TO THE INSTALLATION OF THE RELATED ITEMS.

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PAPIO - MISSOURI RIVER
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ISSUE	DATE	DESCRIPTION
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HDR PROJECT NUMBER	98326
PROJECT MANAGER	JJE
PROJECT ENGINEER	TRM
GEO ENGINEER	PAP
CAD TECH	FL

0 1" 2"

GRADING PLAN
SHEET 01 OF 02

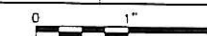
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ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	



**GRADING PLAN
SHEET 02 OF 02**

SCALE	1 : 50
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08

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LEGEND

- NORMAL POOL ELEV. 1875.8
- SHOAL/COVE EXCAVATION
- JETTY
- TRAIL ALIGNMENT



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PAPIO - MISSOURI RIVER
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ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER 98326		
PROJECT MANAGER JJE		
PROJECT ENGINEER TRM		
GEO ENGINEER PAP		
CAD TECH FL		



**FISHERIES AND TRAIL
IMPROVEMENTS
SHEET 01 OF 03**

SCALE 1" = 200'

09

FILENAME 00C106.dwg

HDR

HDR Engineering, Inc.

PAPIO - MISSOURI RIVER
NATURAL
RESOURCES
DISTRICT



ISSUE	DATE	DESCRIPTION

HDR PROJECT NUMBER 98326
PROJECT MANAGER JJE
PROJECT ENGINEER TRM
GEO ENGINEER PAP
CAD TECH FL

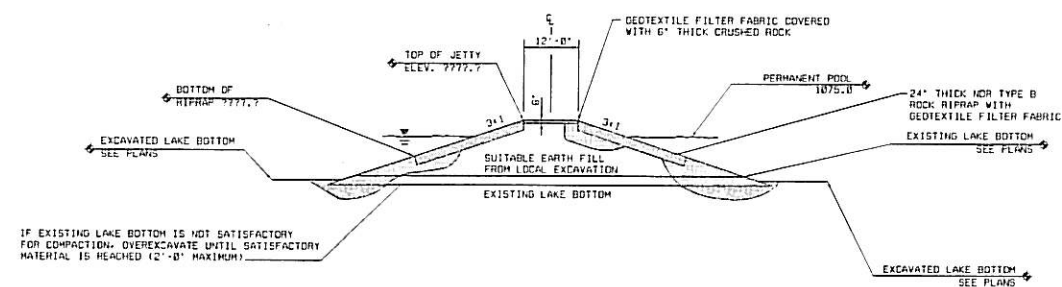
0 1" 2"

FISHERIES AND TRAIL
IMPROVEMENTS
SHEET 03 OF 03

SCALE 1 : 200

11

FILENAME OOC105.dwg



TYPICAL SECTION THROUGH JETTY
SCALE NOT TO SCALE

LEGEND

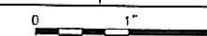
- NORMAL POOL ELEV. 1075.0
- SHOAL/COVE EXCAVATION
- JETTY
- TRAIL ALIGNMENT



PAPIO - MISSOURI RIVER
NATURAL
RESOURCES
DISTRICT

[illegible]

ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	

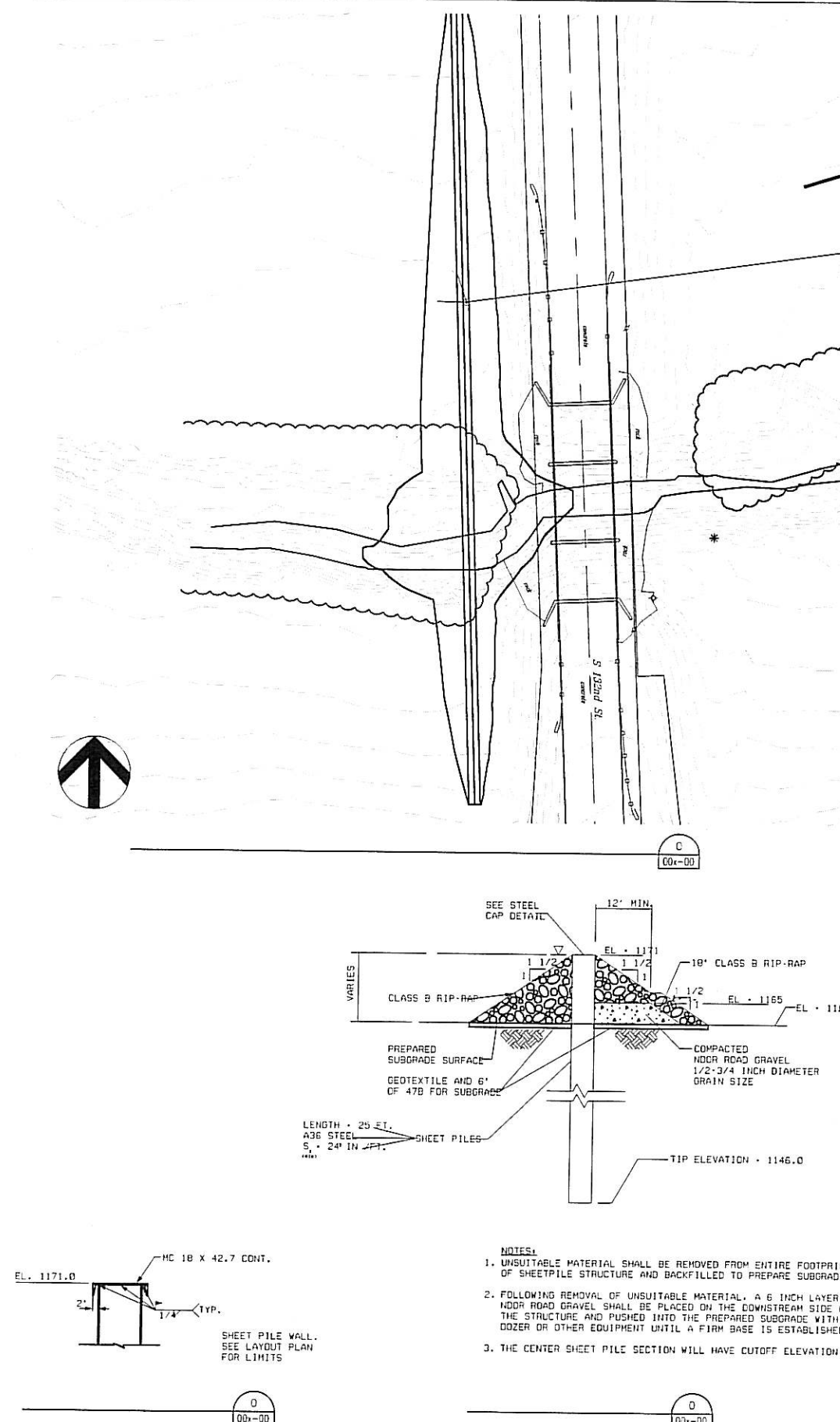
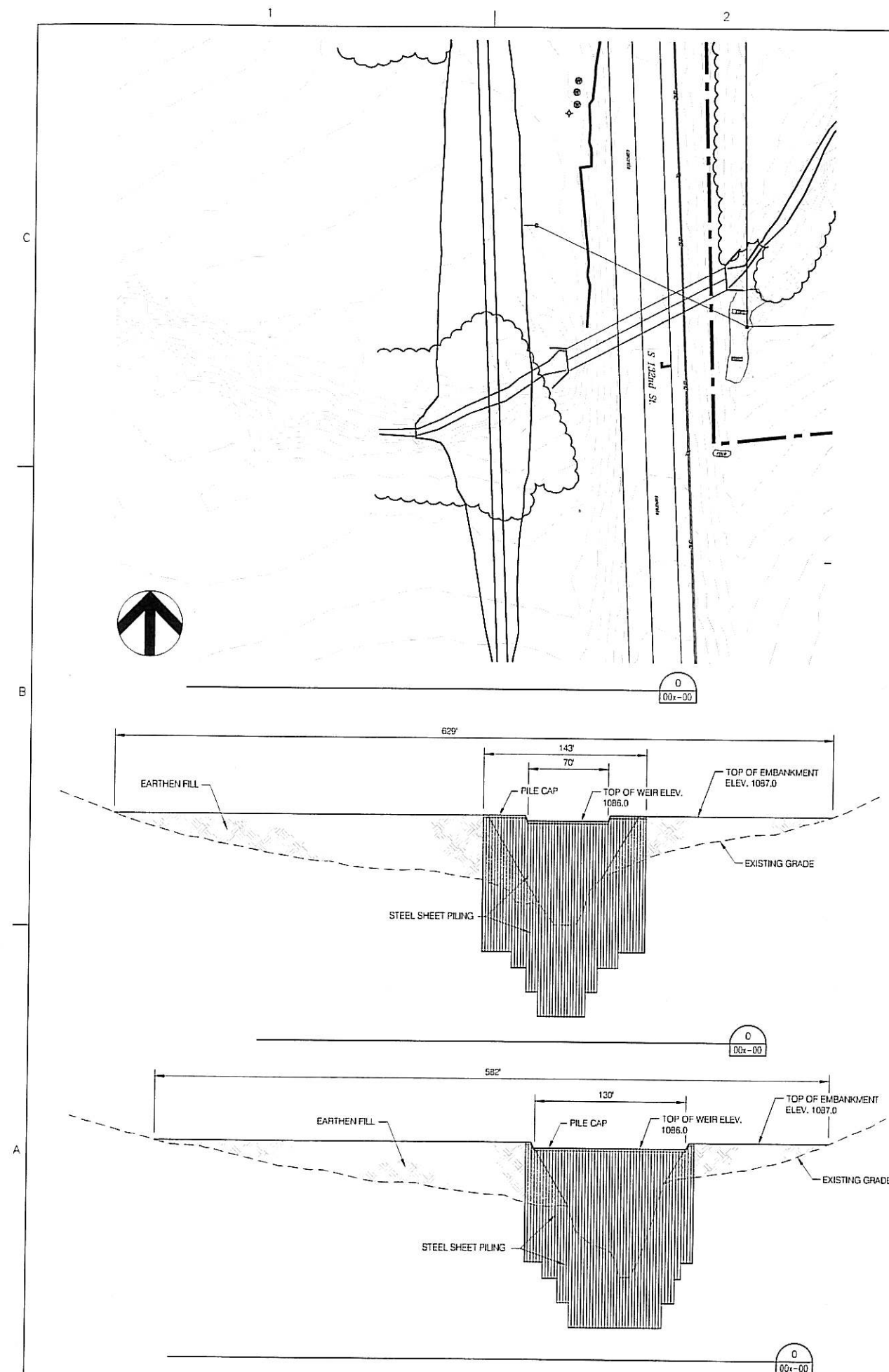


WATER QUALITY BASIN PLAN AND DETAIL

SCALE	1 : 50
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12

FILENAME	DOC109.dwg
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- NOTES:
1. UNSUITABLE MATERIAL SHALL BE REMOVED FROM ENTIRE FOOTPRINT OF SHEETPILE STRUCTURE AND BACKFILLED TO PREPARE SUBGRADE.
 2. FOLLOWING REMOVAL OF UNSUITABLE MATERIAL, A 6 INCH LAYER OF NODD ROAD GRAVEL SHALL BE PLACED ON THE DOWNSTREAM SIDE OF THE STRUCTURE AND PUSHED INTO THE PREPARED SUBGRADE WITH A DOZER OR OTHER EQUIPMENT UNTIL A FIRM BASE IS ESTABLISHED.
 3. THE CENTER SHEET PILE SECTION WILL HAVE CUTOFF ELEVATION OF 1165.0

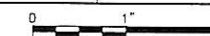
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ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	

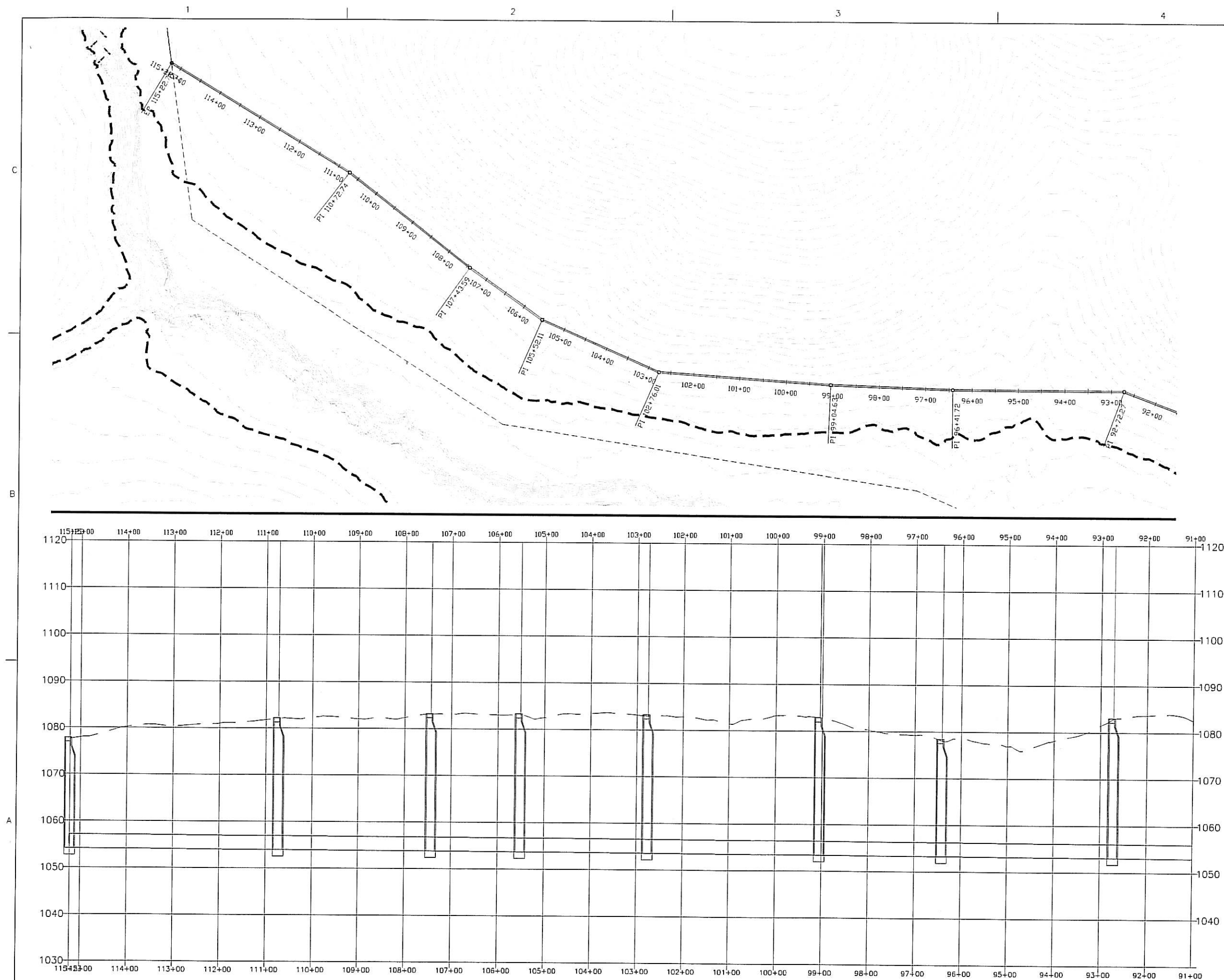


**SANITARY SEWER
PLAN AND PROFILE
SHEET 01 OF 05**

SCALE 1" = 100'

13

FILENAME 00C111.dwg



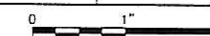
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NATURAL
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ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	

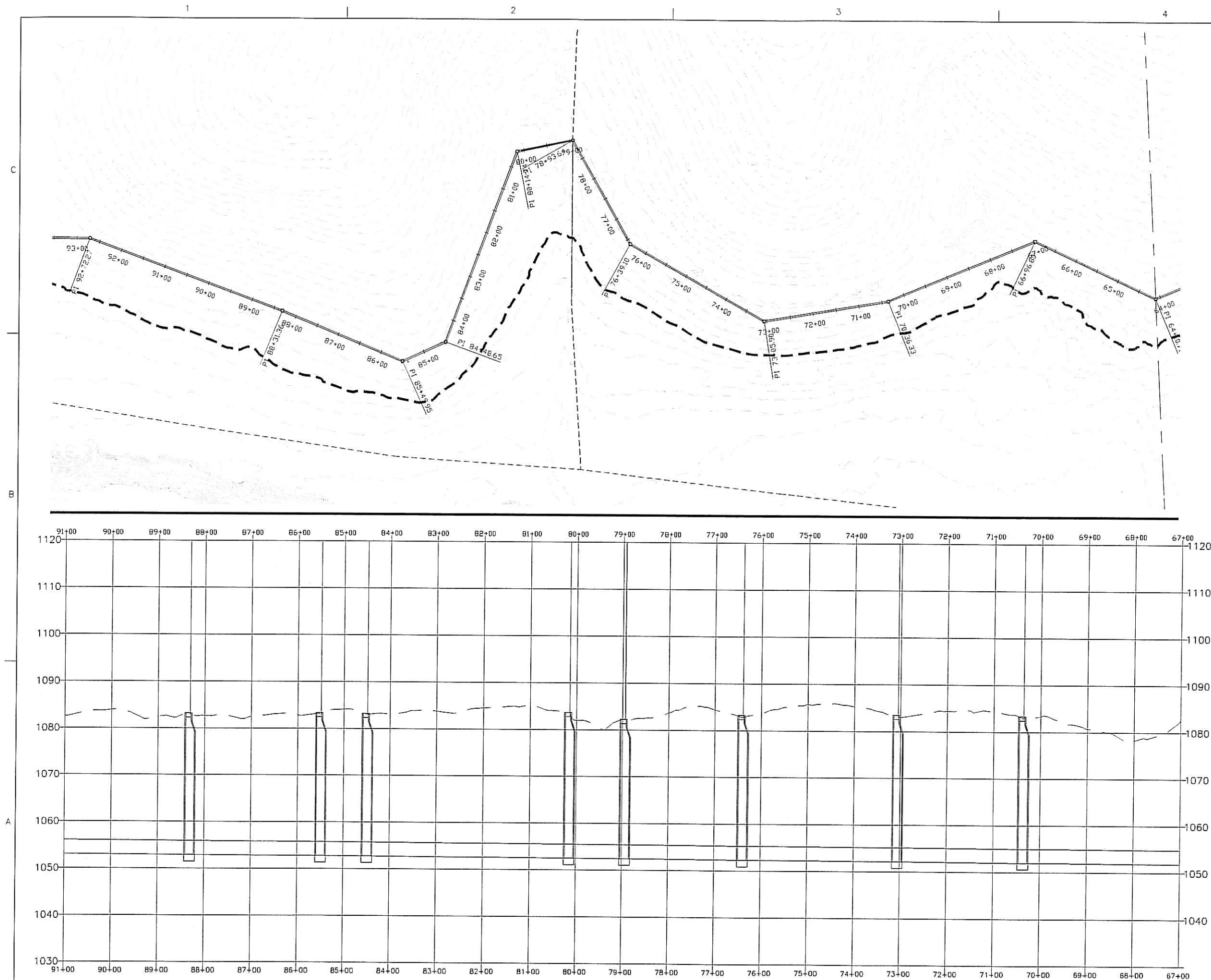


**SANITARY SEWER
PLAN AND PROFILE
SHEET 02 OF 05**

SCALE 1" = 100'

14

FILENAME 00C112.dwg



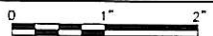
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ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO. ENGINEER	PAP	
CAD TECH	FL	

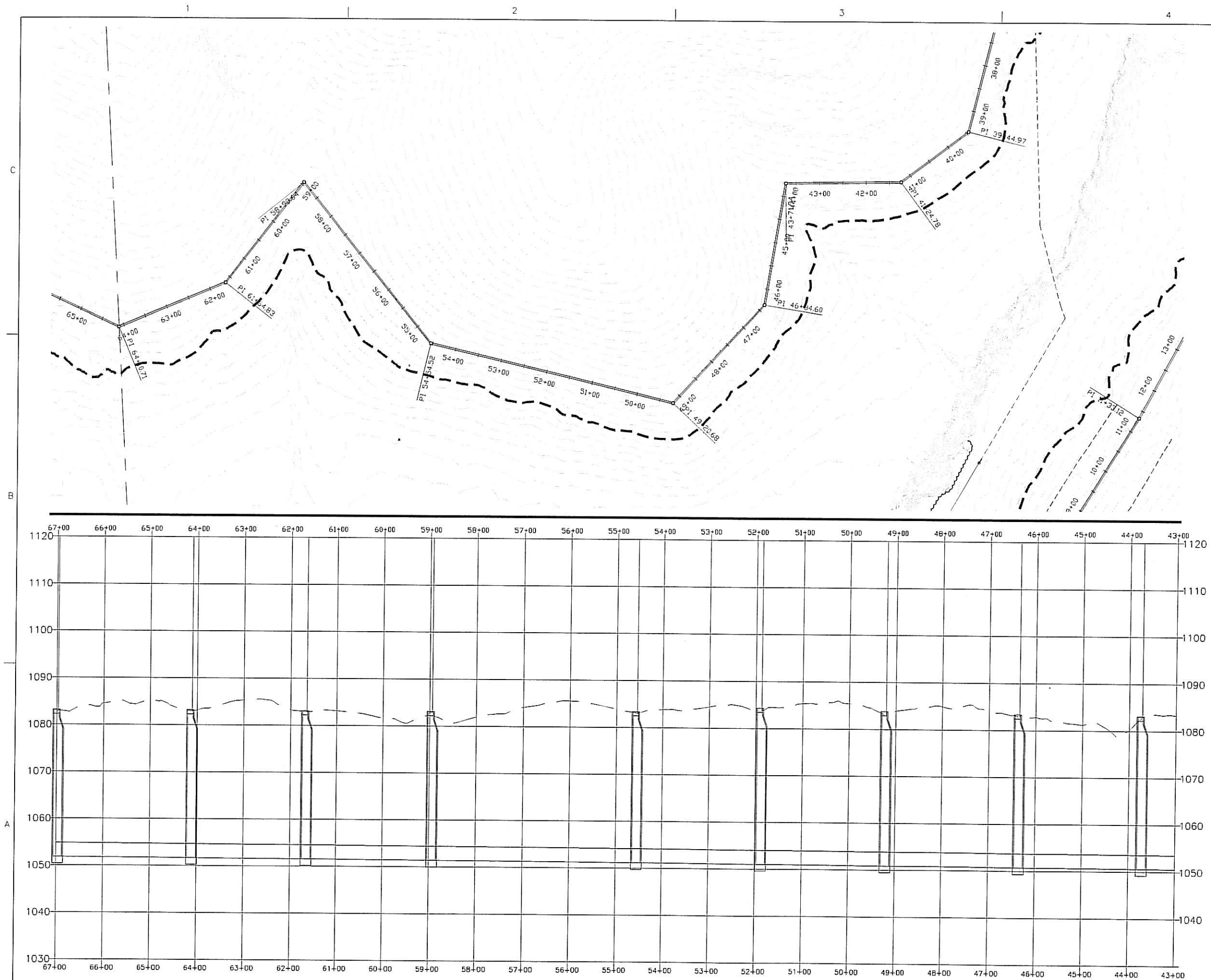


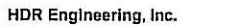
**SANITARY SEWER
PLAN AND PROFILE
SHEET 03 OF 05**

SCALE 1" = 100'

15

FILENAME 00C113.dwg

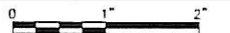




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[illegible]

ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
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GEO ENGINEER	PAP	
CAD TECH	FL	

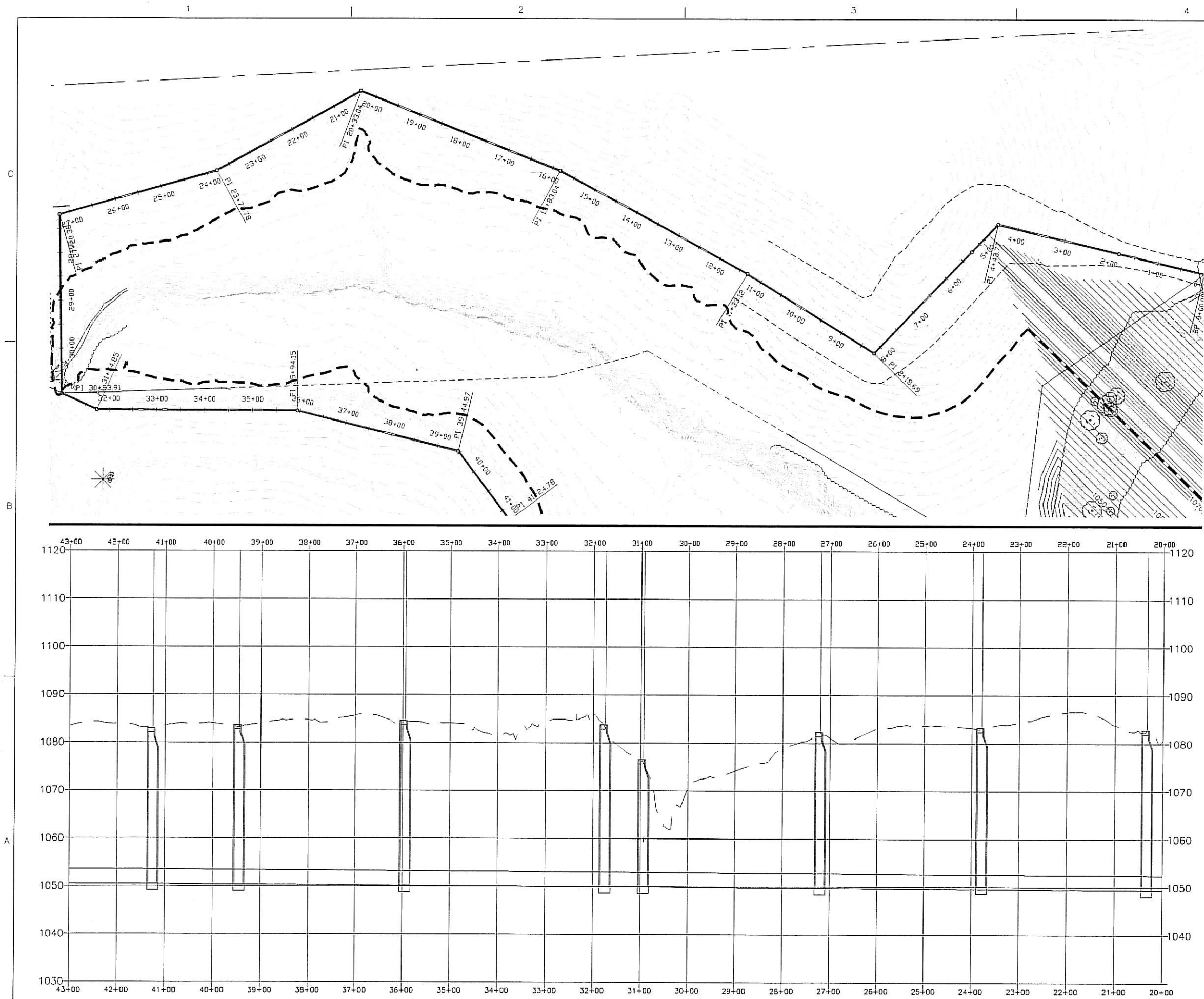


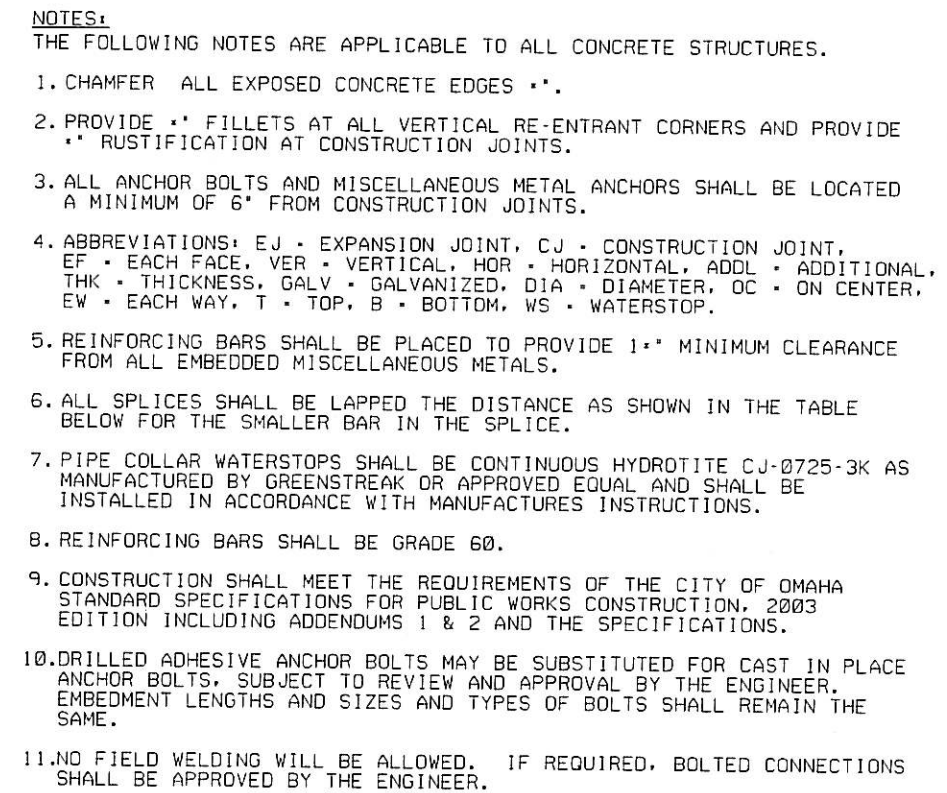
**SANITARY SEWER
PLAN AND PROFILE
SHEET 04 OF 05**

SCALE 1" = 100'

16

FILENAME	DOC114.dwg
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The diagram illustrates a mechanical assembly in a cross-sectional view. It features a central horizontal shaft passing through a cylindrical housing. The housing is composed of several concentric layers, with the innermost layer being a thick, solid ring. The outer layers are thinner and appear to be part of a larger assembly. The central shaft is shown with a flange or coupling on the left end and a smaller component on the right end. The overall design suggests a robust, high-pressure or high-speed mechanical component.

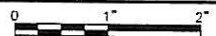
H&R

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PAPIO - MISSOURI RIVER
NATURAL
RESOURCES
DISTRICT

[illegible]

ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	



**STRUCTURAL DETAILS
PRINCIPAL SPILLWAY
INLET STRUCTURE
SHEET 01 OF 05**

SCALE	AS SHOWN
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18

FILENAME	00S101.dwg
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HDR

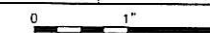
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REF = 00S-DET01-01.dwg

ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER 98326		
PROJECT MANAGER JJE		
PROJECT ENGINEER TRM		
GEO ENGINEER PAP		
CAD TECH FL		

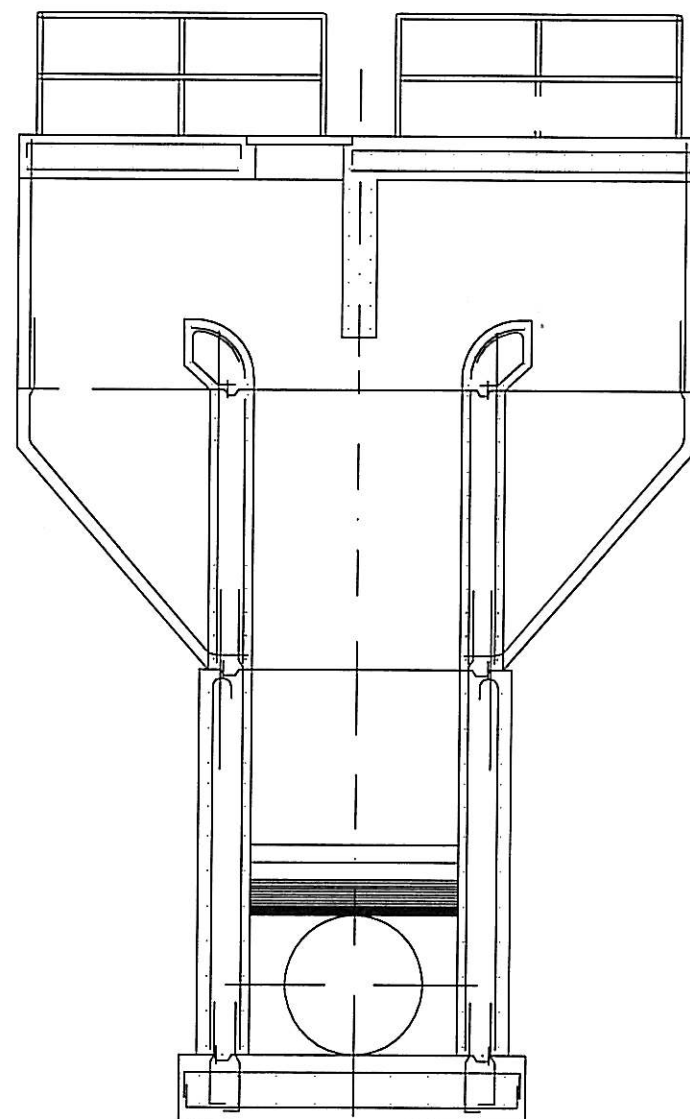


**STRUCTURAL DETAILS
PRINCIPAL SPILLWAY
INLET STRUCTURE
SHEET 02 OF 05**

SCALE AS SHOWN

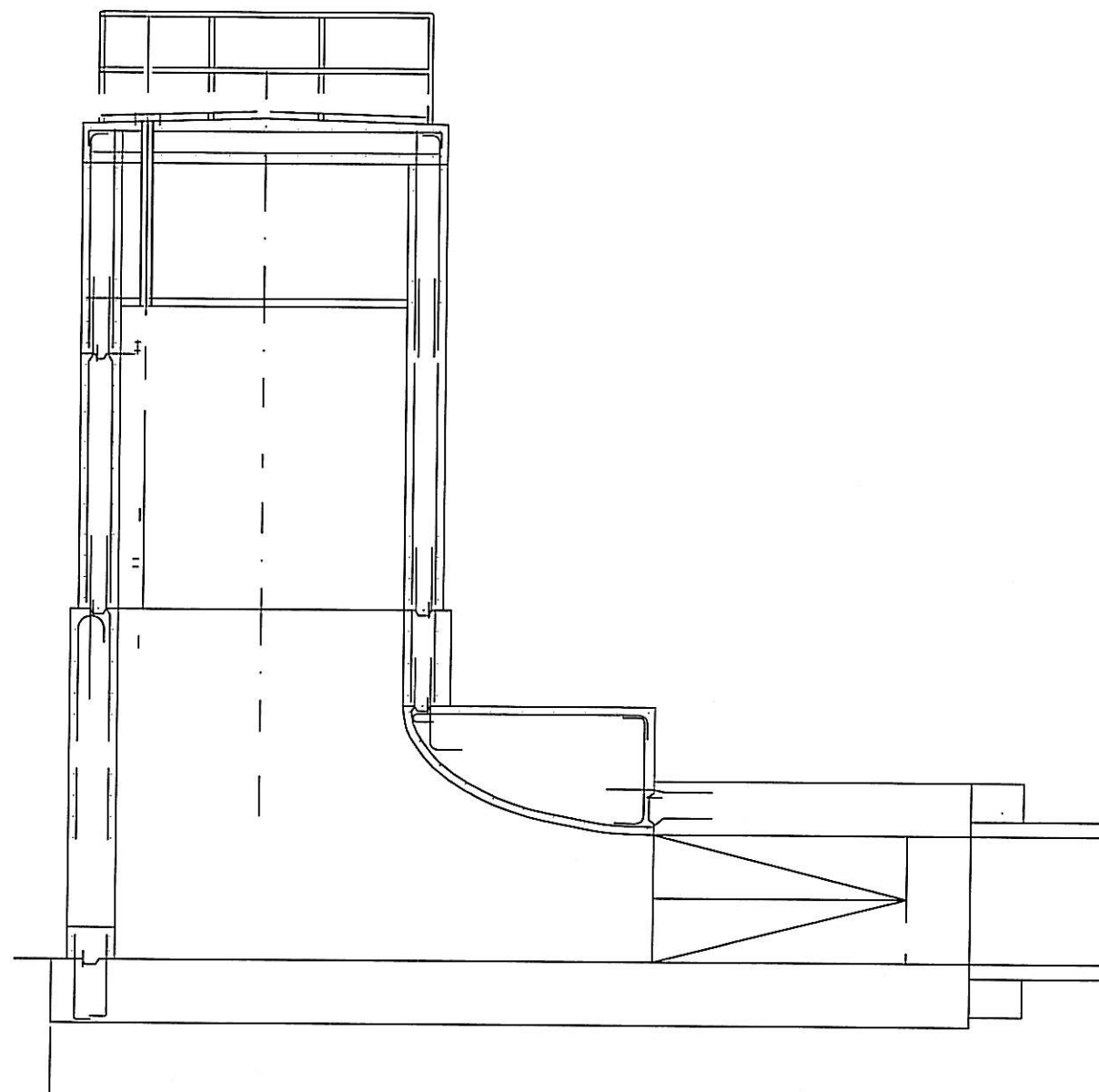
19

FILENAME 00S102.dwg



SECTION
SCALE: 1/4"=1'-0"

NOTE:
ELEVATION WILL BE ADJUSTED
AS DIRECTED BY ENGINEER TO
COMPENSATE FOR LONG TERM
AND SHORT TERM SURCHARGE
SETTLEMENT.



SECTION
SCALE: 1/4"=1'-0"

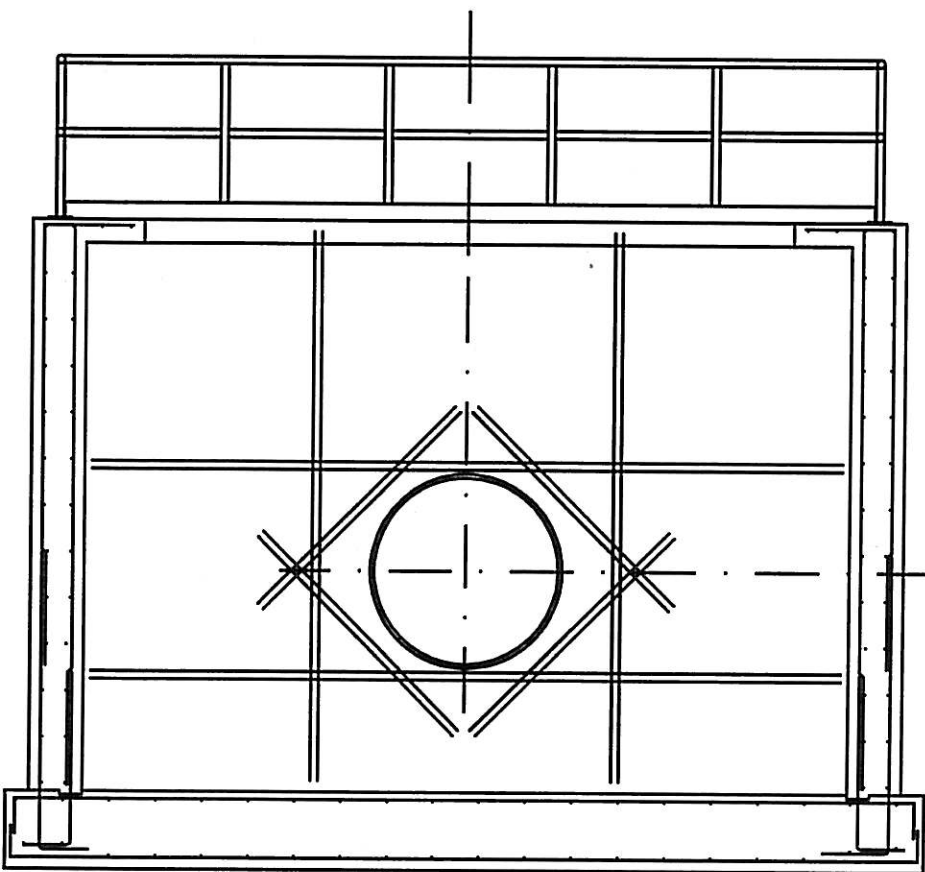
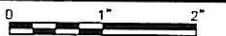
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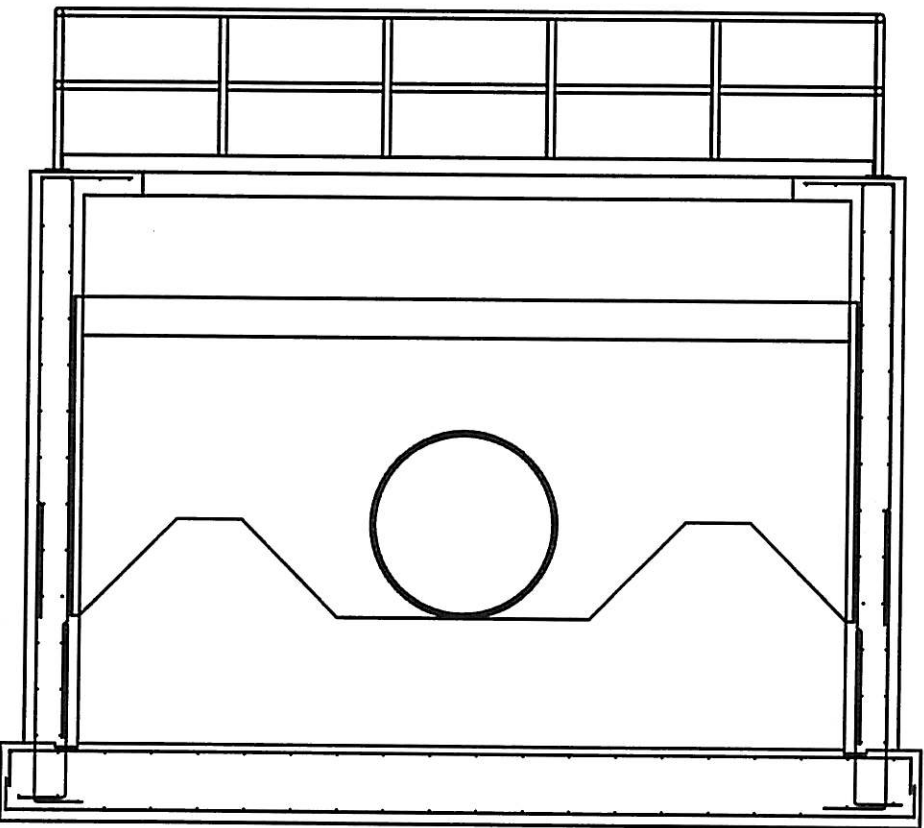
ISSUE	DATE	DESCRIPTION
HDR PROJECT NUMBER	98326	
PROJECT MANAGER	JJE	
PROJECT ENGINEER	TRM	
GEO ENGINEER	PAP	
CAD TECH	FL	



SECTION

SCALE: 1/4"=1'-0"

NOTE:
SEE GENERAL NOTES ON
SHEET 21.



SECTION

SCALE: 1/4"=1'-0"

NOTE:
WALL REINFORCING SHOWN IS TYPICAL
UNLESS NOTED OTHERWISE.

STRUCTURAL DETAILS
OUTLET STRUCTURE
SHEET 05 OF 05

SCALE AS SHOWN

22

FILENAME QDS105.dwg