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IOWA WASTEWATER FACILITIES DESIGN STANDARDS

CHAPTER 11

Project Submittals

11.1 GENERAL

11.2 ENGINEERING REPORTS OR FACILITIES PLANS

- 11.2.1 Title of Project
- 11.2.2 Letter of Transmittal
- 11.2.3 Title Page
- 11.2.4 Table of Contents
- 11.2.5 Summary
- 11.2.6 Introduction
- 11.2.7 Existing Conditions and Projections
- 11.2.8 Existing Facilities Evaluation
- 11.2.9 Proposed Facilities Evaluation
- 11.2.10 Combined Sewer Studies
- 11.2.11 Appendices: Technical Information and Design Criteria
- 11.2.12 Construction Grant Project Requirements

11.3 PLANS

- 11.3.1 General
- 11.3.2 Plans of Sewers
- 11.3.3 Plans of Sewage Pumping Stations
- 11.3.4 Plans of Sewage Treatment Plants
- 11.3.5 Construction Grant Project Requirements

11.4 SPECIFICATIONS

- 11.4.1 General
- 11.4.2 Standard Specifications
- 11.4.3 Content
- 11.4.4 Operation During Construction
- 11.4.5 Construction Grant Project Requirements

11.5 REVISIONS TO APPROVED PLANS AND SPECIFICATIONS (ADDENDA AND CHANGE ORDERS)

11.6 OPERATION & MAINTENANCE MANUALS

11.7 PLANS OF OPERATION

CHAPTER 11

Project Submittals

11.1 GENERAL

A construction permit issued by the Iowa Department of Water, Air and Waste Management is required for the construction, installation or modification of any disposal system or part thereof or any extension or addition thereto. A permit to construct minor sewer extensions may be obtained from a local public works department when the Department's permitting authority has been delegated to the local public works department under section 455B.83 of the Code of Iowa and 900--9.4 of the Iowa Administrative Code.

A construction permit shall not be required for the following:

a. Storm sewers that transport only surface water runoff.

b. Any new disposal system or extension or addition to any existing disposal system that receives only domestic or sanitary sewage from a building, housing or occupied by fifteen persons or less.

c. Replacement of previously approved construction where the replacement is done with the exact same methods, materials, capacities and design considerations. However, if there is any change, the proposed construction will require a construction permit.

d. Sanitary sewer service connections, defined as any connection from a single property unit to an existing sanitary sewer.

e. Pretreatment facility where a treatment unit(s) is owned and operated by a person or firm which provides partial reduction of the strength or toxicity of the waste stream prior to additional treatment and disposal by another person, firm, or municipality. However, this Department may require that design basis and construction drawings be filed for information purposes.

f. In-plant modifications of industrial or commercial installations such as process changes, waste reductions, segregation and rerouting of wastes. However, this Department should be informed of all such changes which result in significant changes or reductions.

Engineering services to obtain a construction permit and complete the approved construction shall be performed in 3 stages:

a. Engineering report or facilities plan (not required for minor sewer extensions).

b. Preparation of construction plans, specifications and contractual documents.

c. Construction inspection, administration, compliance and acceptance.

All reports, plans and specifications shall be prepared in conformance with Chapter 114 of the Code of Iowa.

Engineering reports or facilities plans shall be submitted to the Department at least 90 days prior to the date upon which action by the Department is desired, or in accordance with the Iowa Operation Permit or other schedules. The final plans and specifications should not be prepared until the engineering report has been approved. This enables the Department to review the concept and design basis, make appropriate comments, and indicate to the applicant the general acceptability of the proposal before additional expenses are incurred for developing final plans and specifications. After the engineering report has been approved, the final plans and specifications shall be submitted in accordance with 900--60.4 of the Iowa Administrative Code or in accordance with the Iowa Operation Permit or other schedules. These plans and specifications shall be prepared in accordance with the approved engineering report or facilities plan. Any changes from the approved report must receive prior approval from the Iowa Department of Water, Air and Waste Management before incorporation into the plans and specifications.

An application for a permit to construct shall consist of the following:

a. For minor gravity sewer extensions that do not include a lift station, an inverted siphon, a trunk or interceptor sewer or other major appurtenance:

   1. One set of plans and specifications where standard specifications have not been approved.

   2. One copy of the appropriate construction permit application schedules A, B and C and treatment agreement form (Iowa Department of Water, Air and Waste Management Form 29).

b. For non-grant projects other than minor sewer extensions:

   1. Two copies of the preliminary engineering report and any supplement and one copy of construction permit application schedules A, F and G or any other appropriate application schedules.

   2. Initially, one set of plans and specifications with one copy of all applicable construction permit application schedule.

   3. Two additional sets of plans and specifications will be required upon determination that the previously submitted plans and specifications are in accordance with Departmental criteria. The engineer must certify that these plans and specifications include all the details of the previous submittals (original and addenda) and do not include any significant changes or additions.

c. For construction grant projects:

1. Three copies of the facilities plan report and any supplements and one copy of construction permit application schedules A, F and G.

2. Initial four set of plans and specifications with one copy of all applicable construction permit application schedules.

3. Three additional sets of plans and specifications will be required upon determination that the previously submitted plans and specifications are in accordance with Departmental criteria. The engineer must certify that these plans and specifications include all the details of the previous submittals (original and addenda) and do not include any significant changes or additions.

4. One copy of the preliminary Plan of Operation shall be submitted with the project plans and specifications.

A construction permit will not be issued until a complete application has been submitted to the Department and found to be satisfactory. Construction cannot be initiated until the Department has issued a construction permit. The construction must be completed in accordance with the approved plans and specifications. The construction permit shall expire if construction is not commenced within one year of the date of issuance. The executive director may grant an extension of time to commence construction when it is found necessary or justified.

Other local, state, and federal agencies or authorities also have juridiscation over proposed projects falling within the statutory authority of the Iowa Department of Water, Air and Waste Management and must be contacted for the appropriate action necessary.

11.2 ENGINEERING REPORTS OR FACILITIES PLANS

The engineering report or facilities plan assembles basic information; presents design criteria and assumptions; examines alternate projects with preliminary layouts and cost estimates; describes financing methods giving anticipated charges for users; reviews organizational and staffing requirements; offers a conclusion with a proposed project for client consideration; and outlines official actions and procedures to implement the project.

The concept (including process description and sizing), factual data, and controlling assumptions and considerations for the functional planning of sewerage facilities are presented for each process unit and for the whole system. These data form the continuing technical basis for detail design and preparation of construction plans and specifications.

Architectural, structural, mechanical, and electrical designs are usually excluded. Sketches may be desirable to aid in presentation of a project. Outline specifications of process units, special equipment, etc., are occasionally included.

Engineering reports and facilities plans shall be submitted in accordance with 11.1 of these standards. For Construction Grant projects the addi-

tional requirements stated in 11.2.12 of these standards must be met. The following shall be used as a guideline for preparation of the engineering report or facilities plan for projects of significant scope. For projects of limited scope, all items may not apply. Any item deemed necessary by the Department shall be included.

11.2.1 Title of Project

11.2.2 Letter of Transmittal

A one page letter typed on the firm's letterhead and bound into the report should include a statement that this report has been accepted by the client, a statement of the feasibility of the recommended project, an acknowledgement to those giving assistance, and a reference to the project as an outgrowth of an approved areawide wastewater management plan.

11.2.3 Title Page

The title page shall include the title of the project; the municipality, county or other sponsoring agency; the names of officials, managers, superintendents; the name and address of the firm preparing the report; and a certification statement by a registered professional engineer licensed to practice in Iowa, including signature, number and date.

11.2.4 Table of Contents

The table of contents shall include section headings, chapter headings, and subheadings; maps; graphs; illustrations, exhibits; diagrams; and appendices. Number all pages and cross reference by page number.

11.2.5 Summary

The summary shall highlight, very briefly, what was found from the study.

11.2.5.1 Findings

a. Population.

b. Land use and zoning.

c. Receiving waters.

d. Established effluent limitations and expected effluent quality.

e. Wastewater characteristics and concentrations.

f. Immediate and deferred collection system needs.

g. Selected treatment process and site description.

h. Environmental assessment of the selected process.

i. Proposed project cost.

j. Energy requirements.

k. Financing.

l. Administrative organization.

m. Changes - discuss situations that could alter recommended project.

11.2.5.2 Conclusion

11.2.5.3 Recommendations

The recommendations shall include the following appropriate step-by-step actions for the client to implement the conclusions:

a. Official acceptance report.

b. Adoption of recommended project.

c. Submission of report to appropriate agencies for review and approval.

d. Authorization of engineering services for approved project (construction, plans, specifications, contract, documents, etc.).

e. Legal services.

f. Enabling ordinances, resolutions, etc., required.

g. Adoption of sewer-use ordinance and rate structure.

h. Adoption of operating rules and regulations.

i. Financing program requirements.

j. Organization, administration and staffing requirements.

k. Time schedules - implementation, construction and completion dates which reflect applicable hearings, stipulations and abatement orders.

11.2.6 Introduction

11.2.6.1 Purpose

The purpose shall include the reasons for the report and the circumstances leading up to the report.

11.2.6.2 Scope

The scope shall include a definition of the extent of the project and a discussion of the factors, limitations, etc. which were considered in determining the scope of the project.

11.2.7 Existing Conditions and Projections

The report shall include a section on existing conditions and projections including the following:

11.2.7.1 Planning Period

The planning period shall include the total period of time over which waste treatment is evaluated.

11.2.7.2 Land Use

a. Existing service area, expansion, annexation, intermunicipal service, ultimate planning area.

b. Drainage basin, portion covered.

c. Residential, commercial and industrial land use, zoning, population densities, industrial types and concentrations.

11.2.7.3 Demographic and Economic Data

11.2.7.3.1 Demographic Data

a. Population growth, trends, increase during design life of facility (graph).

b. Employment from within and outside service area.

c. Transportation systems, effect of commuter influx.

11.2.7.3.2 Economic Data

a. Sources of funding and status of these sources.

b. Recommended ordinance amendments, revisions, or cancellation and replacement.

c. Sewer-use ordinance.

d. Industrial wastewater surcharges.

e. Existing contracts and agreements (intermunicipal, industrial, etc.).

f. Enforcement provisions including inspection, sampling, detection, penalties, etc.

11.2.8 Existing Facilities Evaluation

The report shall include a section on existing facilities evaluation:

11.2.8.1 Existing Collection System

a. Inventory of existing sewers.

b. Isolation from water supply wells.

c. Adequacy to meet project needs (structural, condition, hydraulic capacity tabulation).

d. Flow monitoring and determination of the amounts of dry weather flow, infiltration and inflow.

e. Overflows and required maintenance, repairs, improvements, and methods for elimination or control.

f. Repair, replacement, and stormwater separation requirements.

g. Sewer system rehabilitation priorities, if selected.

h. Recommended annual program to maintain the sewer system.

i. Required annual expenditure.

11.2.8.2 Existing Treatment Plant Site

a. Area for expansion.

b. Terrain.

c. Subsurface conditions.

d. Isolation from habitation.

e. Isolation from water supply structures.

f. Enclosure of units, odor control, landscaping, etc.

g. Flooding (Elevation of 25 and 100-year flood stage).

11.2.8.3 Existing Treatment Facilities

a. Capacities and adequacy of units (wastewater treatment, sludge processing, and sludge disposal). Tabulate.

b. Relationship and/or applicability to proposed project; consider present design standards.

c. Age and condition.

d. Adaptability to different usages.

e. Structures to be retained, modified, or demolished.

f. Outfall line.

11.2.8.4 Existing Wastewater Characteristics

a. Water consumption from records [total, residential (total and per capita) commercial, industrial].

b. Wastewater flow data - average dry weather, average wet weather, maximum wet weather and peak hourly wet weather flows. (Verify accuracy of installed metering equipment.)

c. Physical, chemical, and biological characteristics, concentrations and mass loadings (pounds).

d. Residential, commercial, industrial, infiltration and inflow fractions, considering organic, solids, toxic, corrosive, etc., substances; tabulate each fraction separately and summarize.

11.2.9 Proposed Facilities Evaluation

The report shall include a section on propsed facilities evaluation.

11.2.9.1 Proposed Collection System

a. Area of service.

b. Inventory of proposed additions and rehabilitation, including initial and projected loadings.

c. Isolation from water supply wells, reservoirs, facilities, etc.

d. Unusual construction problems.

e. Utility interruption and traffic interference.

f. Restoration of pavements, lawns, etc.

g. Basement flooding prevention during power outage.

11.2.9.2 Design Wastewater Characteristics

a. Design wastewater flow - average dry weather, average wet weather, maximum wet weather, and peak hourly wet weather flows.

b. Design physical, chemical, and biological characteristics, concentrations, mass loadings (pounds), and design temperature.

c. Design residential, commercial, industrial, infiltration and inflow fractions, considering organic solids, toxic, corrosive, etc., substances; tabulate each fraction separately and summarize. Treatment agreement forms (Iowa Department of Water, Air and Waste Management Form 31) shall be submitted for each major contributing industry as required in Chapter 64 of the Iowa Department of Water, Air and Waste Management rules.

d. Character of wastewater necessary to insure amenability to process selected.

e. Evaluation of the need for pretreatment of industrial wastewater before discharge to sewers.

11.2.9.3 Receiving Stream Considerations

a. Downstream water uses including water supply, recreation, agricultural, industrial, etc.

b. Impact of proposed discharge on receiving waters.

c. Correlations of plant performance versus receiving water requirements.

11.2.9.4 Treatment Plant Site Requirements

All sites must comply with all applicable siting requirements in 900--64.2 (2 and 3) and 900--64.4 (455B) of the Iowa Administrative Code. Compare advantages and disadvantages relative to cost, hydraulic requirements, flood control, accessibility, enclosure of units, odor control, landscaping, etc., and isolation with respect to potential nuisances and protection of water supply facilities. If the project lies in the flood plain, the Iowa Natural Resources Council should be contacted for appropriate action.

11.2.9.5 Alternatives

All alternatives shall be conformed with the established effluent limitations. The effluent limitations shall delineated. Alternatives shall consider such items as regional solutions, optimum operation of existing facilities, flow and waste reduction, location of facili-

ties, phased construction, necessary flexibility and reliability, sludge disposal, alternative treatment sites, alternative processes, and institutional arrangements. The evaluation of the alternative processes and sites shall include the following.

a. Describe and delineate (schematic diagrams).

b. Preliminary design for cost estimates.

c. Estimates of project costs (total) dated, keyed to construction cost, index, escalated, etc.).

d. Advantages and disadvantages of each.

e. Individual differences, requirements, limitations.

f. Characteristics of process effluent.

g. Comparison of process performance.

h. Environmental assessment of each (including both primary and secondary impacts).

i. Operation and maintenance expenses and energy requirements.

j. Annual expense requirements (tabulation of annual operation, maintenance, personnel, debt of obligation for each alternative.

11.2.9.6 Selected Process and Site

a. Identify and justify process and site selected.

b. Adaptability to future needs.

c. Environmental assessment.

d. Outfall location.

e. Describe immediate and deferred construction.

f. Describe method of providing treatment during construction.

11.2.9.7 Project Financing

a. Review applicable financing methods.

b. Effect of state and federal assistance.

c. Assessment by valuation, front foot, area unit, or other benefit.

d. Charges by connection, occupancy, readiness-to-serve, water consumption, industrial wastewater discharge, etc.

e. Existing debt service requirements.

f. Bond retirement schedule.

g. Tabulate all expenses.

h. Show how representative properties and users are to be effected.

i. Show anticipated typical annual charge to user and non-user.

11.2.9.8 Legal, and Other Considerations

a. Enabling legislation, ordinances, rules and regulations.

b. Statutory requirements and limitations.

c. Contractural considerations and intermunicipal cooperation.

d. Public information and education.

11.2.10 Combined Sewer Studies

A study of the treatment and control of all combined sewer system flow shall be required in the engineering report or facilities planning stage, where applicable.

11.2.10.1 Definition of Combined Sewer

A combined sewer is defined as a sewer designed and constructed with capacity to carry both storm water and sanitary flow.

11.2.10.2 Scope of Combined Sewer Study

Prior approval of the scope of the study must be obtained before initiation of the study. As a minimum the following information must be contained in the scope of the combined sewer study and submitted for approval.

a. Description of the known or estimated extent of the combined sewers in the system.

b. Receiving stream characteristics and water qualit criteria.

c. Potential health hazards.

d. Scope of work necessary to comply with study requirements contained in 11.2.10.3.

e. Cost of study.

f. Other pertinent information.

11.2.10.3 Study Requirements

Good engineering practice dictates and it will be a requirement that the following be submitted during the engineering report or facilities planning stage.

a. The controls and associated cost estimates needed to protect the beneficial use of the stream must be addressed.

b. The alternative and associated general cost estimates for eliminating bypassing of sanitary wastes by installing a separate storm sewer system must be addressed.

c. The alternative and associated general cost estimates for providing treatment to handle all excess flows and eliminating any bypassing must be addressed. This may be accomplished by either building a storm water retention lagoon and gradually returning the excess flow to the treatment plant during off-peak periods or providing a plant large enough to handle all flows. Either of these alternatives must provide treatment to meet the limitations of the Operation Permit. This evaluation should include duration, frequency and intensity data for rainfall.

   The methodology of arriving at treatment plant unit capacities and storage volumes should be outlined as well as the mode of operation of the plant during extended wet and dry periods and during the flow transition.

d. The alternative and associated general cost estimates for segregating sanitary sewers from the area served by combined sewers must be addressed. This alternative should include not only the rerouting of the present separate sewers but also the prevention of any sewer extensions tributary to the existing combined sewers.

e. A long range plan should be presented for segregation of combined sewers for these areas where neither elimination or treatment are determined to be feasible.

11.2.10.4 Required Action Resulting from Study

This Department will review on a case-by-case basis the necessary action needed to minimize, reduce, or eliminate the volume and frequency of bypassing. The alternative plans presented will be used in evaluating the controls necessary in each case. The required controls may be elimination of the combined sewers, providing treatment, segregation of combined sewers or varying combinations of all three options. The applicant will be informed of the action required during the engineering report or facilities planning stage of the treatment upgrade. The required action will be undertaken by the applicant through local financing unless this Department and EPA specifically state that item(s) will be eligible for construction grant funding.

11.2.11 Appendices: Technical Information and Design Criteria

The report shall include an appendices section including the following:

11.2.11.1 Collection System

a. Design tabulations - flow, size, velocities, etc.

b. Regulator or overflow design.

c. Pump station calculations, including energy requirements and stand-by power.

d. Special appurtenances.

e. Stream crossings.

f. System map.

11.2.11.2 Process Facilities

a. Influent hydraulic and organic loadings - minimum, average, peak and effect. (Wastewater and sludge processes).

b. Process selection and basis - flow equalization, prelmininary treatment processes (screening and grit removal), biological treatment processes, tertiary treatment processes, disinfection and solids handling system.

c. Chemical addition and control facilities.

d. Physical control and flow metering facilities.

e. Recycle.

f. Unit dimensions.

g. Rates and velocities.

h. Detentions.

i. Loadings to and removal effeciencies through each unit operation; total removal efficiency and effluent quality (concentration and pounds).

j. Energy retirement.

k. Flexibility.

i. Reliability and stand-by power.

11.2.11.3 Process Diagrams

a. Wastewater flow diagram showing process configuration, interconnnecting piping, reliability, flexibility, etc.

b. Solids handling flow diagram showing process configuration, interconnecting piping, reliability, flexibility, etc.

11.2.11.4 Collection System Operation and Maintenance

11.2.11.5 Process Facilities Operation and Maintenance

11.2.11.6 Laboratory Testing, Personnel, Space and Equipment Requirements.

11.2.11.7 Office Space for Administrative Personnel and Records

11.2.11.8 Personnel Services - Locker Rooms and Lunch Rooms

11.2.11.9 Support Data

a. Outline unusual specifications, construction materials, and construction methods.

b. Maps, photographs, diagrams.

c. Other.

11.2.12 Construction Grant Project Requirements

Facilities plans subject to federal grant funding shall meet the content and format requirements as specified by appropriate Federal Regulations and Guidelines as published by the U.S. Environmental Protection Agency as well as the previously listed items in this section.

The design engineer should obtain 40 CFR 35 "Construction Grants for Waste Treatment Works" to serve as a basic document. Other local, state and federal agencies or authorities also have jurisdication over proposed projects falling within the statutory authority of the Iowa Department of Water, Air and Waste Management and must be contacted for the appropriate action necessary. These include Office for Planning and Programming, regional planning agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Iowa Natural Resources Council, and the State Historical Preservation Officer.

11.3 PLANS

11.3.1 General

All plans for sewage works shall bear a suitable title showing the name of the muncipality, sewer district, institution or other owner; and shall show the scale in feet, a graphical scale, the north arrow, date and a certification statement by a registered professional engineer licensed to practice in Iowa, including signature, number and date. A space should be provided for signature and approval stamp of the appropriate reviewing and approving officials and agencies.

The plans shall be clear and legible (suitable for microfilming). They shall be drawn to a scale which will permit all necessary information to be plainly shown. The size of the plans generally should not be larger than 30 inches by 42 inches nor smaller than 22 inches by 36 inches. Datum used should be indicated. Locations and logs of test borings, when made, shall be shown on the plans. Blueprints shall not be submitted.

Detail plans shall consist of plan views, elevations, sections and supplementary views which, together with the specifications and general layouts, provide the working information for the contract and construction of the works. Dimensions, relative elevations of structures, location and outline form of equipment, location and size of piping, water levels, and ground elevations shall be included.

For Construction Grants projects, the additional requirements stated in 11.3.5 of these standards must be met.

11.3.2 Plans of Sewers

Plans shall be submitted in accordance with 11.1 of these standards.

11.3.2.1 General Location Plan

A comprehensive plan of the existing and proposed sewers for projects involving new sewer systems and additions to or replacement of existing systems shall include the following:

a. Existing or proposed streets and all streams or water surfaces shall be clearly shown.

b. The boundary lines of the municipality or the sewer district, and the area to be sewered, shall be shown.

c. For new sewer systems, the plan shall show the location, size and direction of flow of all proposed sanitary sewers draining to the treatment works concerned. For sewer extensions to existing systems, the plan shall show the location, size and direction of flow of all existing and proposed sanitary and combined sewers in the adjacent area. An index to the location of the detail plan sheets shall be included.

11.3.2.2 Detail Plans

Profiles should have a horizontal scale of not more than 100 feet to the inch and a vertical scale of not more than 10 feet to the inch. Plan view should be drawn to a corresponding horizontal scale and preferably be shown on the same sheet. Plans and profiles shall show:

a. Location of streets and sewers.

b. Line of ground surface; size of pipe; length between manholes; invert and surface elevation at each manhole; and grade of sewer between each two adjacent manholes. All manholes shall be numbered on the profile.

Where there is any question of the sewer being sufficiently deep to serve any residence, the elevation and location of the basement floor shall be plotted on the profile of the sewer which is to serve the house in question. The engineer shall state that all sewers are at least 2 feet below adjacent basement floor elevations except where otherwise noted on the plans.

c. Locations of all special features such as inverted siphons, concrete encasements, elevated sewers, etc.

d. All known existing structures and utilities, both above and below ground, which might interfere with the proposed construction, particularly water mains, gas mains, storm drains, and telephone and power conduits.

e. Special detail drawings, made to a scale to clearly show the nature of the design, shall be furnished to show the following particulars:

All stream crossings and sewer outlets, with elevations of the stream bed and of normal and extreme high and low water levels.

Details of all special sewer joints and cross-sections.

Details of all sewer appurtenances such as manholes, lampholes, inspection chambers, inverted siphons, regulators, and elevated sewers.

11.3.3 Plans of Sewage Pumping Stations

Plans shall be submitted in accordance with 11.1 of these standards.

11.3.3.1 General Location Plan

A location plan shall be submitted for projects involving construction or revision of pumping stations. This plan shall show the following:

a. The location and the extent of the tributary area.

b. Any boundary lines of the municipality, sewer district or development within the tributary area.

c. The location of the pumping station, force main, and downstream sewer.

11.3.3.2 Detail Plans

Detail plans shall be submitted showing the following, where applicable:

a. Topography of the site.

b. Existing pump station.

c. Proposed pumping station, including provisions for installation of future pumps or ejectors.

d. Elevation of high water at the site and maximum elevation of sewage in the collection system upon occasion of power failure.

e. Maximum hydraulic gradient in downstream gravity sewers when all installed pumps are in operation.

f. Soil borings and groundwater elevations.

11.3.4 Plans of Sewage Treatment Plants

Plans shall be submitted in accordance with 11.1 of these standards.

11.3.4.1 General Location Plan

A location plan shall be submitted, showing the sewage treatment plant in relation to the remainder of the system.

Sufficient topographic features shall be included to indicate its location with relation to streams and the point of discharge of treated effluent.

11.3.4.2 General Layouts

Layouts of the proposed sewage treatment plant shall be submitted, including:

a. General plant layout showing topography of the site, location of plant structures, location of utility systems serving the plant processes, location of soil borings, and areas for future expansion.

b. Schematic flow diagram showing the flow through various plant units.

c. Piping diagram, including any arrangements for by-passing individual units. Materials handled and direction of flow through pipes shall be shown.

d. Minimum, average and peak hydraulic profiles showing the flow of sewage, supernatant liquor, and sludge.

11.3.4.3 Detail Plans

Detailed plans shall show the following:

a. Location, dimensions, and elevations of all existing and proposed plant facilities.

b. Detailed piping arrangement for wastewater and sludge streams.

c. Elevations of high and low water level of the body of water to which the plant effluent is to be discharged.

d. Adequate description of any features not otherwise covered by specifications or engineer's report.

e. Drainageways on treatment plant site and existing and proposed erosion controls.

11.3.5 Construction Grant Project Requirements

Plans subject to federal grant funding shall meet the content and format requirements as specified by appropriate Federal regulations and guidelines as published by the U.S. Environmental Protection Agency as well as the previously listed items in this section.

11.4 SPECIFICATIONS

11.4.1 General

Complete technical specifications for the construction of sewers, sewage pumping stations, sewage treatment plants, and all appurtenances, shall accompany the plans.

Specifications shall be submitted in accordance with 11.1 of these standards. For Construction Grant projects, the additional requirements stated in 11.4.5 must be met.

11.4.2 Standard Specifications

Governing agencies and private engineering firms may file for approval of their standard sanitary sewer construction specifications with this Department. A minimum of two copies of the proposed standard specifications shall be submitted. The standard specifications must contain the following:

a. Certification statement by a registered professional engineer licensed to practice in Iowa, including signature, number and date.

b. If the engineer preparing the specifications is not a permanent, full-time employee of the agency submitting the specifications, then the governing body of the agency submitting the specifications must also submit a resolution adopting th specifications submitted as the official specifications of the agency.

Upon arrival of standard specifications for sanitary sewer construction, the Department will not require submission of specifications with the plans. However, the Department will require that all plans contain a statement that all construction shall be in accordance with the approved standard specifications currently on file with the Department. Additional special provisions for a particular project can also be utilized in conjunction with approved standard specifications. The applicant should submit copies of the special provisions properly certified by an engineer. When a revision to an approved standard specification is required by revision of Department standards or governing agency initiative, three copies of the revision, properly certified and adopted, shall be submitted.

11.4.3 Content

The specifications shall include a certification statement by a registered professional engineer licensed to practice in Iowa, including signature, number and date.

The specifications accompanying construction drawings shall include, but not be limited to, all construction information not shown on the drawings which is necessary to inform the builder i, detail of the design requirements as to the quality of materials and workmanship and fabrication of the project and the type, size,

strength, operating characteristics, and rating of equipment; allowable infiltration; the complete requirements for all mechanical and electrical equipment, including machinery, valves, piping, and jointing of pipe; electrical apparatus, wiring, instrumentation, and meters; laboratory fixtures and equipment; operating tools; construction materials; special filter materials such as stone, sand, gravel, or slag; miscellaneous appurtenances, chemicals when used; instructions for testing materials and equipment as necessary to meet design standards; and performance tests for the completed works and component units. It is suggested that these performance tests be conducted at design load conditions wherever practical.

11.4.4 Operation During Construction

Specifications shall contain a program for keeping existing treatment plant units in operation during construction of plant additions. Should it be necessary to take plant units out of operation, a shutdown schedule which will minimize pollutional effects on the receiving stream shall be reviewed and approved in advance by the Iowa Department of Water, Air and Waste Management and shall be adhered to.

11.4.5 Construction Grant Project Requirements

Specifications subject to federal grant funding shall meet the content and format requirements as specified by appropriate federal regulations and guidelines as published by the U.S. Environmental Protection Agency as well as the previously listed items in this section.

11.5 REVISIONS TO APPROVED PLANS AND SPECIFICATIONS (ADDENDA AND CHANGE ORDERS)

Any deviations from approved plans or specifications affecting capacity, flow, operation of units, or point of discharge shall be approved in writing before such changes are made. Plans or specifications so revised should, therefore, be submitted well in advance of any construction work which will be affected by such changes, to permit sufficient time for review and approval. The applicant or a representative shall submit a minimum of three copies of each revision for non-grant projects and a minimum of five copies for construction grant projects. The submittal shall include any appropriate revised construction permit application schedules.

Structural revisions or other minor changes not affecting capacities, flows, or operation will be permitted during construction without approval. "As Built" plans clearly showing such alterations shall be submitted to the reviewing agency at the completion of the work.

Revisions subject to federal grant funding will meet the content and format requirements as specified by appropriate federal regulations and guidelines as published by the U.S. Environmental Protection Agency as well as the previously listed items in this section.

11.6 OPERATION AND MAINTENANCE MANUALS

A complete operation and maintenance manual shall be provided for each wastewater treatment facility with larger than 15 P.E. design capacity prior to the beginning of the operation of the facility. The applicant or a representative shall initially submit one copy of the manual. When the manual is determined to be in accordance with applicable criteria, three final copies of the manual shall be submitte.

The manual shall be written in a manner easily understandable to the treatment plant operator and should have two distinct sections: operational section and maintenance section. The manual should cover the Iowa Operation Permit for the facility and all reporting requirements contained therein. The manual should cover all details of the operation and maintenance of the wastewater treatment facility to include valve or gate settings, piping diagrams, lubrication schedules, safety, emergency operation, sludge disposal and other items of concern. When the project utilizes federal funds, applicable federal guidelines as to format and content and submission schedules shall be followed.

11.7 PLANS-OF OPERATION

A Plan of Operation for a new or expanded wastewater treatment facility utilizing construction grant funding should provide an action plan and implementation schedule to assure that all necessary actions to properly prepare for facility start-up and continued operation are accomplished in a timely manner. The Plans of Operation shall meet the content and form requirements as specified by appropriate federal regulations and guidelines as published by the U.S. Environmental Protection Agency.

A preliminary Plan of Operation is required prior to submittal of a final Plan of Operation. The preliminary Plan of Operation is required as a special condition of a Step 2 grant and one copy shall be submitted to the Iowa Department of Water, Air and Waste Management with the project plans and specifications.

The final Plan of Operation is required as a special condition of a Step 3 grant and four copies shall be submitted to the Iowa Department of Water, Air and Waste Management with the Operation and Maintenance Manual. The final Plan of Operation should essentially be the same as the preliminary Plan of Operation with the exception that the implementation schedule shall contain actual dates.