



VILLAGE OF FORT RECOVERY

Subdivision Regulations Construction Standards & Drawings Design Criteria

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SUBDIVISION REGULATIONS

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Subdivision Regulations

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ARTICLE I
General Provisions

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ARTICLE I - GENERAL PROVISIONS

Section 100 Title

The provisions of this chapter shall be known as the Subdivision Regulations of the Village of Fort Recovery and shall be referred to hereinafter as these Regulations.

Section 101 Authority

The authority for the preparation, adoption, and implementation of these subdivision regulations by the Council of Fort Recovery and the Fort Recovery Planning Commission, is derived from Section 711.09 of the Ohio Revised Code, which enables the two bodies to adopt uniform rules and regulations governing plats and subdivisions of land falling within their legal authority.

Section 102 Intent

These Regulations are adopted to secure and provide for the following:

- A. The proper arrangement of streets or highways in relation to existing or planned streets or highways or to the official Land Development Plan.
- B. Adequate and convenient open spaces for vehicular and pedestrian traffic, utilities, access of fire-fighting apparatus, and recreation.
- C. The establishment of standards for the construction of any and all improvements as herein required.
- D. Conformance with the existing Zoning Code.
- E. To facilitate the orderly and efficient layout and the appropriate use of the land.
- F. To provide for the accurate surveying of land, preparing and recording of plats and the equitable handling of all subdivision plats by providing uniform procedures and standards for observance by both the approving authority and subdividers.
- G. To protect and provide for the public health, safety and general welfare of the citizens.
- H. To guide public and private policy and action in order to provide adequate and efficient transportation, drainage, water, sewerage and other public requirements and facilities.

- I. To assure that land to be subdivided shall be of such character that it can be used safely for building purposes without danger to health, or peril from fire, flood or other menace.
- J. To achieve individual property lots of maximum utility and livability as well as of such size and design as to be harmonious with the development of the neighboring properties.
- K. To provide for streets of adequate width, proper design, and a coordinated street system accommodating the flow of present and projected traffic volumes as well as facilitating ready accessibility by emergency vehicles.

Section 103 Planning Commission Organization

The Planning Commission shall be composed of five members, consisting of the Mayor, one member of the legislative authority to be elected thereby for the remainder of their term as such member of the legislative authority and three citizens of the Village to be appointed by the Mayor for terms of six years each, except that the term of one of the members of the first commission shall be for four years and one for two years. All such members shall serve without compensation. The organization of the Planning Commission is derived from Section 713.01 of the Ohio Revised Code. The Planning Commission shall require a quorum of three (3) members at all its meetings and the concurring vote of three (3) members shall be necessary to effect any order. Meeting of the Planning Commission shall be held at the call of the Chairman or two other members and at such other regular times as it may by resolution determined. All meetings of the Planning Commission shall act by resolution or motion and shall keep minutes of its proceeding showing the vote of each member upon each question or if absent or failing to vote, indicating such facts and a statement of the facts of each item considered by the Commission and the section of these regulations where applicable which the Commission has been considering in approving or disapproving any petition or other matter brought before the Commission. The Commission shall keep records of its examinations and other official actions, all of which shall be immediately filed in the office of the Village of Fort Recovery and shall be a public record.

Section 104 Administration

The Planning Commission shall be responsible for the uniform administration of these Regulations, and shall make recommendations to Council when amendments to these Regulations would further the intent and objective of these Regulations.

Section 105 Relation to Other Laws

The provisions of these Regulations shall supplement any and all laws of the State of Ohio, ordinances of the Village of Fort Recovery, Village of Fort Recovery Design Criteria and Construction Standards and Drawings, or any and all rules and regulations promulgated by authority of such law or ordinance relating to the intent and scope of

these Regulations. Whenever the requirements of these Regulations are at variance with the requirements of any law, ordinance, regulations of the Board of Health or Ohio Environmental Protection Agency (OEPA), the most restrictive or that imposing the higher standards shall govern.

Section 106 Conformity to Development Plans and Zoning

The arrangement, character, width, and location of all arterial and collector thoroughfares or extensions thereof shall conform to the requirements of the Village of Fort Recovery Land Development Plan, if applicable. Lack of a Land Development Plan or thoroughfares not contained in the aforementioned plan shall conform to the recommendations of the Planning Commission based upon these Regulations. In addition, no final plat shall be approved if in conflict with an existing Zoning Code.

Section 107 Interpretation and Separability

- A. Interpretation - In their interpretation and application, provisions of these Regulations shall be held to be the minimum requirements for the promotion of the public health, safety and general welfare.

- B. Separability - If any part or provision of these Regulations or the application thereof to any person or circumstance is judged invalid by any court of competent jurisdiction, such judgment shall be confined in its operation to the part, provision or application directly involved in all controversy in which such judgment shall have been rendered and shall not affect or impair the validity of the remainder of these Regulations or the application thereof to other persons or circumstances. The Council hereby declares that it would have enacted the remainder of these Regulations even without any such part; provision or application.

Section 108 Amendment

These Regulations may be amended, after public hearing and other requirements as specified in the Ohio Revised Code.

Section 109 Cooperation

The Fort Recovery Planning Commission may make agreements with Mercer County Planning Commission for the joint review of plats or subdivisions occurring outside and near the corporate limits of Fort Recovery, in order to carry out these regulations more effectively.

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ARTICLE II - DEFINITIONS

Interpretation of Terms or Words

For the intent of these Regulations, certain terms or words used herein shall be interpreted as follows:

- A. The word “person” includes a firm, association, organization, partnership, trust, company, or corporation as well as an individual.
- B. The present tense includes the future tense, the singular number includes the plural, and the plural number includes the singular.
- C. The word “shall” is a mandatory requirement, the word “may” is a permissive requirement, and the word “should” is a preferred requirement.
- D. The words “used” or “occupied” include the words “intended, designed, or arranged to be used or occupied”.
- E. The word “lot” includes the words “plot” or “parcel”.
- F. Regardless of capitalization, definitions are standard.

ALLEY (See Thoroughfare)

BLOCK

Property abutting one side of a street and lying between the two (2) nearest intersecting streets, crossing or terminating, or between the nearest such street and railroad right-of-way, un-subdivided acreage, waterway, or between any of the foregoing and any other barrier to the continuity of development or corporate lines of the Village.

BUILDING LINE (See Setback Line)

COMMUNITY FACILITIES

Existing, planned and proposed parks, playgrounds, schools, other public lands and buildings of the Village for which these Regulations are in effect.

CONSTRUCTION DRAWINGS

A complete set of engineering drawings drawn to scale containing, but not limited to, grading plans, street plans and profiles, cross sections, sanitary sewer plans and profiles, water main plans and profiles, storm sewer plans and profiles, a complete topographical layout of all existing appurtenances and structures located within the right-of-way, and any other requirement as outlined in the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

CORNER LOT (See Lot)

CROSS-WALK WAY (See Pedestrian Walkway)

CUL-DE-SAC (See Street)

DEAD-END STREET (See Street)

DEDICATION

The appropriation of land to the Village by its owner for any public use.

DEED RESTRICTIONS (See Protective Covenants)

DEVELOPER

Any person, subdivider, partnership, or corporation or duly authorized agent who constructs or contracts to construct improvements on subdivided land.

DEVELOPMENT (See Subdivision)

EASEMENT

Authorization by a property owner for the use by another, and for a specified purpose, of any designated part of his property.

ENGINEER

Any person registered to practice professional engineering by the State Board of Registration as specified in the Ohio Revised Code.

ENGINEER, VILLAGE

Such person designated as the Village Engineer for the Village.

FINAL PLAT (See Plat)

GREENBELTS OR BUFFER PARKS

A strip of parcel of land, privately restricted or publicly dedicated as open space located between a residential development and other incompatible use for the purpose of protecting and enhancing the residential environment.

IMPROVEMENTS

Street pavement or resurfacing, curbs, gutters, sidewalks, pedestrian walkway, water lines, sanitary and storm sewers, landscaping and other related matters normally associated with the development of land into building sites.

INSPECT, INSPECTION

The visual observation of construction to permit the Village or their representative to render his or her professional opinion as to whether the contractor is performing the services in a manner indicating that, when completed, the services will be in accordance with the Village of Fort Recovery Subdivision Regulations, Construction Standards and Drawings, and Design Criteria. Such observations shall not be relied upon in any part as acceptance of the services, nor shall they relieve any party from fulfillment of customary and contractual responsibilities and obligations.

LAND DEVELOPMENT PLAN

A plan, which may consist of several maps, data, policies, and other descriptive matter, for the physical development of the Village which has been adopted by the Village to indicate the general location for proposed physical facilities including housing, industrial and business uses, major streets, parks, schools, public sites, and other similar information.

LOT

A piece or parcel of land occupied or intended to be occupied by a principal building or a group of such buildings and its accessory buildings and uses, and having frontage on an improved public or private street.

- A. Corner - A lot located at the intersection of two (2) or more streets.
- B. Through Frontage - A lot other than a corner lot with frontage on more than one (1) street. Through lots abutting two (2) streets may be referred to as double frontage lots.
- C. Interior - A lot with only one (1) frontage on a street.

LOT AREA

The computed area contained within the lot lines.

MAINTENANCE SURETY

A surety by a subdivider or developer with the Village for the amount of 10% of the performance surety guaranteeing the maintenance of the physical improvements according to the plans and specifications within the time prescribed.

MINOR SUBDIVISION (See Subdivision)

MONUMENTS

Permanent concrete or iron markers used to establish definitely all lines of the plat of a subdivision, including all lot corners, boundary line corners, and points of change in street alignment shall comply with the State of Ohio Minimum Standards for Boundary Surveys.

OFFICIAL THOROUGHFARE PLAN

The part of the Land Development Plan which sets forth the location, alignment, and dimensions of existing and proposed streets and thoroughfares.

PARCEL

A piece of land that can not be designated by lot number.

PEDESTRIAN WALKWAY

A right-of-way dedicated for the purpose of a pedestrian access through residential, commercial, and industrial areas, and located so as to connect to two or more streets, or a street and a public land parcel.

PERFORMANCE SURETY

A surety by a subdivider or developer with the Village for the amount of the estimated construction cost guaranteeing the completion of physical improvements according to the plans and specifications within the time prescribed.

PLANNING COMMISSION

The Village of Fort Recovery Planning Commission.

PLAT

A map of a tract or parcel of land, made from a survey by a registered surveyor in the State of Ohio.

- A. Preliminary Plat - A plat showing all requisite details of a proposed subdivision submitted to the Planning Commission for purpose of preliminary consideration, prepared in conformance with these Regulations.
- B. Final Plat - A plat of all or part of a subdivision providing substantial conformance to the Preliminary Plat of the subdivision prepared in conformance with these Regulations and suitable for recording by the County Recorder.

PROTECTIVE COVENANT

A restriction on the use of all private property within a subdivision, to be set forth on the plat and/or incorporated in each deed, for the benefit of the property owners, and to provide mutual protection against undesirable aspects of development which would tend to impair stability of values.

PUBLIC AREA

A portion of a subdivision which is set aside for public use and made available for public use or acquisition.

PUBLIC UTILITY

A firm, association, syndicate, corporation, co-partnership, municipal authority or public agency, board or commission, duly authorized to furnish, and furnishing under governmental regulations, to the public: facilities, products or services such as gas, electricity, sewage disposal, communication, telephone, transportation, water, etc.

REPLATS/VACATION PLATS

Alteration, modification or adjustment of existing lots, lot lines, property lines or right-of-way lines and/or vacation thereof within the Village shall require Planning Commission and Village Council approval.

RESTRICTIVE COVENANTS (See Protective Covenant)

RIGHT-OF-WAY

Land reserved, used, or to be used for a street, alley, walkway, or other public purpose.

SETBACK LINE

A line established by the Zoning Code, generally parallel with and measured from the lot line, defining the limits of a yard in which no portion of any principal structure other than an accessory building may be located, except as may be provided in said Zoning Code.

SKETCH PLAN

An informal plan or sketch showing the existing features of a site and its surroundings and the general layout of a proposed subdivision which can be presented to the Planning Commission for informal discussions.

STREET

A public right-of-way dedicated to public use, which provides for vehicular and pedestrian access to abutting properties.

- A. Alley - A right-of-way used primarily for vehicular service access to the back or side of properties abutting on another street.
- B. Arterial Street - A general term denoting a highway primarily for through traffic, carrying heavy loads and large volumes of traffic, usually on a continuous route.
- C. Collector Street - A street, whether within a residential, industrial, commercial, or other type of development, which primarily carries traffic from local streets to arterial streets, including the principal entrance and circulation routes within residential subdivisions.
- D. Cul-de-sac - A local street with one end open to traffic and the other end terminating in a vehicular turnaround.
- E. Dead-end Street - A street temporarily having only one outlet for vehicular traffic and intended to be extended or continued in the future.

- F. Local Street - A street primarily for providing access to residential, commercial, or other abutting property and discourage through traffic.
- G. Loop Street - A type of local street, each end of which terminates at an intersection with same arterial or collector street, and whose principal radius points of the 180° system of turns are not more than 1000 feet from said arterial or collector street, nor normally more than 600 feet from each other.

SUBDIVIDER (See Developer)

SUBDIVISION

The division of any parcel of land shown as a unit or as contiguous units on the last preceding tax roll, into two or more parcels, sites, or lots, any one of which is less than five (5) acres, for the purpose, whether immediate or future, of transfer of ownership, provided however, that (1) the division or partition of land into parcels of more than five (5) acres not involving any new streets or easements of access shall be exempted, and (2) the sale or exchange of parcels between adjoining lot owners where such sale or exchange does not create additional building sites, shall be exempted, or the improvement of one or more parcels of land for residential, commercial, or industrial structures or groups of structures involving the division or allocation of land for the opening, widening, or extension of any street or streets, except private streets serving industrial structures, the division or allocation of land as open spaces for common use by owners, occupants or lease holders, or as easements for the extension and maintenance of public sewer, water, storm drainage, or other public facilities.

- A. Major Subdivision - Division of a lot or parcel of land into more than five (5) lots or parcels, and/or the creation or establishment of new streets or roadways by the division of a lot or parcel of land.
- B. Minor Subdivision - Division of a lot or parcel of land along an existing public thoroughfare into not more than five (5) lots or parcels not establishing a new street or roadway.

SURVEYOR

Any person registered to practice surveying by the State Board of Registration as specified in the Ohio Revised Code.

THOROUGHFARE (See Street)

VACATION PLATS (See Replats/Vacation Plats)

VARIANCE

A variance is a modification of the strict terms of the relevant Regulations where such modification will not be contrary to the public interest and where owing to conditions peculiar to the property, and not the result of the action of the applicant, a literal enforcement of the Regulations would result in unnecessary and undue hardship.

VICINITY MAP

A drawing located on the plat which sets forth, by dimensions or other means, the relationship of the proposed subdivision or use to other nearby development or landmarks and community facilities and services within the Village in order to better locate and orient the area in question.

ZONING ORDINANCE

The Zoning Ordinance for the Village of Fort Recovery which regulates the use of land by land districts or zones.

ARTICLE III
Minor Subdivision

Section 300	Minor Subdivision Conditions
Section 301	Submission for Approval of Minor Subdivision
Section 302	Minor Subdivision Plat Contents
Section 303	Supplementary Information
Section 304	Approval of a Minor Subdivision

ARTICLE III - MINOR SUBDIVISION

Section 300 Minor Subdivision Conditions

Approval without a plat of a minor subdivision may be granted by the Village Administrator, as the properly designated representative of the Planning Commission, if the proposed subdivision of the parcel of land meets all of the following conditions:

- A. The proposed subdivision is located along an existing improved public road and involves no opening, widening, or extension of any street or road.
- B. No more than five (5) lots are involved after the original parcel has been subdivided.
- C. The proposed subdivision is not contrary to applicable Subdivision Regulations, Design Criteria, Construction Standards and Drawings, or Zoning Code.
- D. Plat and description of the property is based on a survey completed by a professional surveyor.
- E. The physical characteristics of the property are suitable for building sites.

Section 301 Submission for Approval of a Minor Subdivision

The subdivider shall prepare and submit one (1) original and three (3) copies of the minor subdivision plat to the Village Administrator. The minor subdivision plat shall be considered officially filed on the day it is received and properly noted and shall be so dated. However, the minor subdivision plat shall not be considered properly submitted until all applicable fees are paid (see Schedule of Fees - Section 151.94) and all plats are provided to the Village Administrator.

Prior to receiving consideration for a Minor Subdivision, a Minor Subdivision Plat shall consist of a survey plat drawn by a registered professional surveyor and it shall be in compliance with Mercer County platting regulations.

Section 302 Minor Subdivision Plat Contents

The minor subdivision plat shall contain the following information:

- A. Name of the subdivider.
- B. Location by section, range, township or by subdivision name and lot number.
- C. Date, north arrow, scale, and acreage to thousandths of acre.
- D. Existing buildings, septic facilities and wells, if applicable.

- E. Registration number, seal, and signature of the surveyor responsible for the plat.
- F. Name of abutting streets including right-of-way width.
- G. Areas within the 100-year floodplain and within floodways, as determined by mapping provided by the Federal Emergency Management Agency (FEMA), shall be delineated.
- H. Name and address of owners of parcel and adjoining parcels.
- I. Survey boundaries and lot lines drawn on an 11" x 17" sheet and at a scale between 1" = 10' and 1" = 100'. All dimensions shall be shown in feet and hundredths of feet.
- J. Location of monuments and their descriptions.
- K. Other items or provisions deemed necessary by the Planning Commission.
- L. The survey shall conform to the minimum standards for boundary surveys in the State of Ohio (ORC 4733-37).
- M. The Minor Subdivision Plat shall be clearly and legibly drawn. A plat shall indicate the size of the parcel, existing and proposed rights-of-way within 100 feet; existing and proposed ownership; any existing parcel within 100 feet, its owner and size; a north arrow; and the professional surveyor's signature and seal.
- N. Approval signature lines with date for Village Administrator and County Engineer.

Section 303 Supplementary Information

Any of the following information may be required by the Planning Commission or Village Administrator on the basis of the characteristics of the subject property.

- A. Lot grading and drainage plan, illustrating a plan for the handling of surface and subsurface drainage, showing proposed finished grade elevations, the type, size, location, and outlet of all existing and proposed drainage systems, swales, easements, and the proposed ground cover.
- B. Spot elevations.
- C. Other information as deemed necessary by the Planning Commission or Village Administrator in order to create building sites and promote the public health, safety and welfare.

Section 304 Approval of a Minor Subdivision

After the complete submittal is considered officially filed, a copy of the survey plat is then checked by the Village Administrator for its conformity with these Regulations. The authorized representative of the Planning Commission shall stamp and sign the plat "approved no plat required" if the lot in question meets all codes as stipulated above, within seven (7) working days after submission, the plat shall then be taken by the subdivider to the County Auditor for the transfer of property and then to the County Recorder where it will become a legal lot of record. Lot split requests expire if not recorded within one (1) year of initial fee payment. A proposal remaining unapproved by the Planning Commission representative for one (1) year from the date of fee payment shall expire and become void. Incomplete or deficient proposals shall be disapproved and the subdivider notified of issues and reasons for the disapproval. The subdivider shall furnish the Village with a reproducible of the recorded plat.

ARTICLE IV

Preliminary Plat

Section 400	Intent
Section 401	Submission for Preliminary Plat Approval
Section 402	Preliminary Plat Form
Section 403	Preliminary Plat Contents
Section 404	Approval of Preliminary Plat
Section 405	Preliminary Plat Approval Period
Section 406	Preliminary Plat Checklist

ARTICLE IV - PRELIMINARY PLAT

Section 400 Intent

The purpose of the preliminary plat is to show on a map for a major subdivision all the facts which may enable the Planning Commission to determine whether the proposed layout of land including street layout, utilities and storm water controls is satisfactory from the standpoint of the public interest. The plat shall be prepared by a registered surveyor and engineer of the state. Approval of the preliminary plat, in effect, provides a “concept approval” of the subdivision proposal.

Section 401 Submission for Preliminary Plat Approval

The Subdivider shall prepare and submit the following to the Village Administrator:

- A. Eight (8) copies of the preliminary plat and construction plans of the proposed subdivision.
- B. Completed preliminary plat checklist with remarks.
- C. Fees as outlined in Article VIII, Section 803.

The preliminary plat shall be considered officially filed on the day it is received and properly noted and shall be so dated. The preliminary plat shall not be considered properly submitted until all applicable fees are paid by the developer (see Schedule of Fees - Section 803) and until all plats and plans are provided to the Village Administrator. The subdivider shall provide a copy of the preliminary plat to the local utility companies.

Section 402 Preliminary Plat Form

The preliminary plat shall be clearly and legibly drawn. The size of the plat shall not be less than 24” x 36”. If the preliminary plat is to be drawn in sections, each section shall be accompanied by a key map, showing the location of the sections. The plat of a subdivision containing six (6) acres or less shall be drawn to a scale of 1” = 50’. All other subdivisions shall be drawn to a scale of 1” = 100’.

Section 403 Preliminary Plat Contents

The preliminary plat shall clearly show the following features and information:

- A. Items of title
 - 1. Proposed name of subdivision. The name of the subdivision and proposed streets shall not duplicate, or too closely approximate, the name of any other subdivision or street, subject to Planning Commission approval.
 - 2. Location by numerically labeled inlot or outlot.

3. Name and address of property owner/developer.
4. Scale of the plat.
5. North arrow.
6. Name and address of the professional surveyor who prepared the plat, as well as the stamp and signature of the surveyor certifying the accuracy of the plat.
7. Date of preparation.
8. Location by section, town, range or by other legal description.
9. Signature line and date for the Planning Commission Chairman and Village Administrator.
10. Stamp and signature of the Professional Surveyor and Professional Engineer.

B. Existing site conditions/characteristics

1. Perimeter boundaries of the proposed subdivision indicated by a heavy solid line, and the approximate acreage comprised therein.
2. Location, widths, and names of all existing or platted streets, indicated as to: dedicated, undedicated, constructed or unimproved, official thoroughfares or other public ways, railroad and utility rights-of-way, easements, parks and other open spaces, permanent buildings, section and corporation lines within or adjacent to the subject tract.
3. Location and size of all existing utilities: sewers, water mains, telephone, electric, gas, culverts, or other underground items located within or adjacent to the subject tract.
4. Names of adjacent subdivisions and owners of adjoining parcels.
5. Areas within the 100-year floodplain and within floodways, as determined by mapping provided by the Federal Emergency Management Agency (FEMA), shall be delineated.
6. Topographic map of such proposed subdivision shall be submitted with the preliminary plat, showing 1-foot contour intervals for all land within and 50 feet adjacent to the subject site.
7. Current zoning classification of the tract and adjoining properties.
8. The vicinity map shown on the preliminary plat at a scale appropriate for a subdivision.

C. Proposed site conditions/characteristics

1. Street layout, including street names and widths, alleys, cross-walkways and easements and their dimensions.
2. Layout, numbers and approximate dimensions of lots, including lot area (as measured in acres or square feet). When a lot is located on a curved street or cul-de-sac, or when side lot lines are not at 90 degree angles, the width at the setback line shall be shown.
3. Parcels of land intended to be dedicated or temporarily reserved for public use, and the conditions of such dedication or reservation.
4. Setback lines, along all streets, with dimensions.

5. Indication of the zoning designation to identify the potential development so as to reveal the nature of the impact the proposal will have on traffic flow, fire hazard, congestion, public utility capacities, and required services.
6. A typewritten copy of the protective covenants or deed restrictions, if any.
7. Indication of any developmental phasing or staged development timing.

D. Construction Plans

The proposed preliminary subdivision plat shall be accompanied by preliminary construction plans consisting of:

1. A centerline profile for each street shown thereon, drawn to a scale of at least 1" = 100'.
2. A preliminary layout, drawn to a scale of at least 1" = 100', including proposed placement of water lines, sanitary sewers, and storm sewers. These may be incorporated in the above preliminary plat.
3. A preliminary drainage plan including proposed storm detention location. This may be incorporated in the above preliminary plat.

E. Supplementary Information

The following information shall be supplied in addition to the requirements in Section 306.

1. Statement of proposed use of lots, giving type and number of dwelling units and type of business or industry.
2. Location and approximate dimensions of all existing buildings.
3. For commercial and industrial development, the location, dimensions, and approximate grade of proposed parking and loading areas, alleys, pedestrian walks, streets, and the points of vehicular ingress and egress to the development.
4. Description of proposed covenants and restrictions.

Section 404 Approval of Preliminary Plat

The Village Administrator shall check for completeness of the preliminary plat as required by these Regulations. When completed, the Village Administrator shall schedule a Planning Commission meeting.

The Fort Recovery Planning Commission, on its own initiative or upon petition by a citizen or neighboring property owner may, prior to acting on a preliminary plat of a subdivision, hold a public hearing thereon at such time and upon such notice as the Commission may designate.

The Planning Commission shall review all details of the proposed subdivision within the framework of the applicable Zoning Code, the various elements of these Regulations, the Design Criteria, the Construction Standards and Drawings, and the various elements of the Land Development Plan.

The Planning Commission shall give careful study to the preliminary plat, taking into consideration the requirements of the community and the best possible use of the land to be subdivided, together with its prospective character, whether residential, commercial, or industrial. Attention shall be given to street widths, arrangement and circulation; surface drainage; lot sizes and arrangements; and to such neighborhood and community requirements as park, school and playground sites and main thoroughfare widths and locations.

The Planning Commission shall forward copies of the preliminary plat to such officials and agencies as may be necessary for the purpose of study and recommendation. This shall include at least the Village Engineer.

After receipt of such reports from such officials and agencies, the Planning Commission shall determine whether the preliminary plat shall be approved, approved with modifications, or disapproved. If a plat is disapproved, the reasons for disapproval shall be stated in writing and recorded in the minutes of the Planning Commission meeting.

The Planning Commission shall act on the preliminary plat within thirty (30) days after filing unless such time is extended by agreement with the subdivider. When a preliminary plat has been approved by the Planning Commission, the chairman shall sign and date all copies and return one to the subdivider.

Section 405 Preliminary Plat Approval Period

The approval of the preliminary plat shall be effective for a maximum period of twelve (12) months unless the first section has been filed for final approval. If no subsequent sections are filed within three (3) years from the recording of the previous sections, the approval of the remainder of the preliminary plat is no longer effective.

Section 406 PRELIMINARY PLAT CHECKLIST

SUBDIVISION _____

DATE _____

This list is not all inclusive, but is to be used as a guideline for submittals and reviews.

√	DESCRIPTION	REMARKS
	1 Fees paid.	
	2 Eight copies of plat (at a scale of not more than 1" = 100').	
	3 Name of Subdivision.	
	4 Location of property with respect to surrounding property and streets.	
	5 Location by township, section, town, and range.	
	6 Names of all adjoining property owners, or names of adjoining developers.	
	7 Name of adjoining subdivisions.	
	8 Location and names of adjoining streets.	
	9 Location of corporation line, if applicable.	
	10 Location and dimensions of all boundary lines of the property in feet and decimals of a foot.	
	11 Vicinity map of appropriate scale.	
	12 Indication of zoning.	
	13 Location of existing easements.	
	14 Location of existing water bodies, streams, and other pertinent features such as railroads, buildings, parks, cemeteries, drainage ditches, bridges, etc.	
	15 Locations, dimensions, and areas of all proposed or existing lots.	
	16 Location and dimensions of all property proposed to be set aside for park or playground use, or other public or private reservation, with designation of the purpose thereof, and conditions, if any, of the dedication or reservation.	
	17 Date of plat.	
	18 Scale of plat.	
	19 North arrow.	

√	DESCRIPTION	REMARKS
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20	Data from which the location, bearing, and length of all lines can be determined and reproduced on the ground.	
21	Names of new streets as approved by the Planning Commission.	
22	Indication of the use of any lot and all uses other than residential.	
23	Lots consecutively numbered.	
24	Approximate dimensions of lots, including lot area.	
25	Front setback lines.	
26	Width of side setback for curved lots.	
27	Profiles showing existing and proposed elevations along centerlines of all streets.	
28	Approximate stationing on all streets.	
29	Location, size, and invert elevations of all existing and proposed sanitary sewers and stormwater sewers and structures.	
30	Preliminary drainage plan including proposed storm water detention location.	
31	Location and size of all water lines.	
32	Topography at the same scale with contour interval of 1'.	
33	Other specifications and references required by the local government. Construction standards and specifications, including a site grading plan for the entire subdivision.	
34	Title of property, name and address of owner, and signature of professional surveyor and professional engineer.	
35	Date, including revision dates.	
36	Notation of approval, signature line for Planning Commission Chairman.	
37	Name and address of subdivider and/or developer.	
38	Copy of protective covenants, if applicable.	
39	Indication of any developmental phasing or staged development timing.	
40	Meets zoning requirements (i.e. Minimum frontage, setbacks, area, etc.)	

ARTICLE V
Final Plat

Section 500	Final Plat Required
Section 501	Submission for Approval of Final Plat
Section 502	Final Plat Form
Section 503	Final Plat Contents
Section 504	Supplementary Information
Section 505	Approval of Final Plat
Section 506	Recording of Final Plat
Section 507	Final Plat Checklist

ARTICLE V - FINAL PLAT

Section 500 Final Plat Required

The Subdivider, having received approval of the preliminary plat of the proposed subdivision, shall submit a final plat of the subdivision and drawings and specifications of the improvements required therein. The final plat shall have incorporated all changes in the preliminary plat required by the Planning Commission. Otherwise, it shall conform to the preliminary plat, and it may constitute only that portion of the approved preliminary plat which the subdivider proposes to record and develop at that time. The final plat and the supplementary information shall be certified by a professional surveyor. Construction plans, drawings and specifications shall be certified by a professional engineer.

In case of a replat or vacation plat, the plat must follow the applicable regulations in this Article V, Final Plat. The determination on what is applicable for a replat or vacation plat will be determined by the Village.

Section 501 Submission for Approval of Final Plat

The Subdivider shall prepare and submit the following:

- A. Eight (8) copies of the final plat of the proposed subdivision.
- B. Three (3) copies of construction drawings related to the improvements to be constructed in the proposed subdivision.
- C. Two (2) copies of an itemized engineer's estimate with quantities for all proposed improvements including the estimate of cost for each item.
- D. A copy of the storm sewer and storm detention calculations and other applicable calculations for design.
- E. Completed final plat checklist with remarks.
- F. Completed final construction plan checklist with remarks (see Design Criteria for list.)
- G. Fees as outlined in Article VIII, Section 803.

All final plats, construction drawings, and supporting documents shall meet all Design Criteria and Construction Standards and Drawings established by the Village, the Zoning Code of the Village, or requirements established by other governmental organizations having jurisdiction over the improvements. The most restrictive requirements shall apply.

The final plat shall be considered officially filed on the day it is received and properly noted and shall be so dated. However, the final plat shall not be considered properly submitted until all applicable fees are paid by the developer (see Schedule of Fees - Section 151.94) and until all plans, supporting documents and materials are provided to the Village Administrator. This is required within twelve (12) months after preliminary plat approval for the first phase.

Section 502 Final Plat Form

The final plat shall be clearly legibly drawn on reproducible mylar. The size of the plat shall be 24" x 36". The plat of a subdivision containing five (5) acres or less, shall be drawn to a scale of 1" = 50'. All other subdivisions shall be drawn to a scale of 1" = 100'. The minimum lettering height shall be 3/32" and all lot dimensions shall be 1/8" or larger. Lot number lettering shall be 1/4" or larger and underlined or circled.

If the final plat is drawn in two or more sections, each section shall be accompanied by a key map showing the location of the sections. All final plat sections shall either totally include or totally exclude intersections and all lots fronting such intersections.

Construction Drawings shall be submitted in the form stated in the Village of Fort Recovery Design Criteria. The plans shall consist of the required improvements stated in these Regulations.

Section 503 Final Plat Contents

The final plat shall contain the following information:

- A. Name of the subdivision (which shall not duplicate or closely resemble the name of any other subdivision in the County), location by section, town, range and township, or by other survey number, date, north arrow and basis of bearing, acreage to thousandths of an acre (total lot acreage and total street acreage) and deed book and page reference.
- B. Name and address of the subdividers, and the professional engineer and registered surveyor who prepared the plat and appropriate registration numbers and seals.
- C. The total area being platted shall include all perimeter courses and be outlined by a heavy-line border. Courses are to be listed in a clockwise direction. All dimensions, both lineal and angular, shall be determined by an accurate control survey in the field. The error of closure shall conform to the Ohio Administrative Code.
- D. Bearings and distances to the nearest centerline of intersecting roads or the intersection of right-of-way lines; lot corners of recorded plat with plat reference; or section corner or quarter section corner.

- E. Names, exact location, dimensions, and right-of-way width of all streets and railroads within and adjoining the plat and building setback lines. Street names shall be approved by the Planning Commission.
- F. Radii, internal angles, points of curvature, tangent bearings, lengths of arcs, and chord length bearing of all applicable streets within the plat area shall be illustrated on the plat.
- G. The exact locations, dimensions, and uses of easements shall be illustrated on the plat.
- H. All lots accurately dimensioned in feet and hundredths with lot numbers and acreage. The lot numbers shall be consecutive for each platted section and shall be placed in the center of the lot with acreage under the lot number. Replatted lots shall illustrate existing lot numbers, lot lines dashed and utility easements on the plat .
- I. Accurate location and a description of all monuments as to type, size, and whether the monument was found or set. If a monument has been omitted or offset, a notation shall appear on the plat indicating the reason for the omission; or if it has been offset, its true location in relation to the property corner or lot corner shall be noted.
- J. Accurate outlines of areas to be dedicated or reserved for public use, or any area to be reserved for the common use of all property owners. The use and accurate boundary locations shall be shown for each parcel of land to be dedicated.
- K. Any restrictions and covenants shall be shown on the final plat unless otherwise directed by the Planning Commission. Restrictions and covenants shall be so written that they may be amended to meet changing conditions.
- L. Certification shall contain the following:
 - 1. The total acres being subdivided.
 - 2. Current ownership.
 - 3. Deed reference.
- M. Acknowledgment dedication statement of the owner or owners to the plat and restrictions, including dedications to public use of all public streets, alleys, parks or other open spaces shown thereon and the granting of the required easements, as shall be indicated by the following statement on the plat tracing: "Easements shown on this plat are for the construction, operation, maintenance, repair, replacement, or removal of water, gas, sewer, electric, telephone, or other utilities or services, and for the express privilege of removing any and all trees or other obstructions to the free use of said utilities and for providing of ingress and egress to the property for said purposes, and are to be maintained as such indefinitely."

A statement of intention and request for the vacation of lot lines and easements on previously platted properties, and the signature of authorized representatives of local utility companies (electric, telephone, cable television, etc.) acknowledging the abandonment of easements.

- N. The names of record of all abutting parcels with deed reference, acreage, and survey record reference, if applicable. Platted land shall show the name of the subdivision, lot numbers, plat book, and page reference.
- O. Any section lines, corporation limits, township, and county lines shall be accurately documented and located on the plat and their names lettered thereon.
- P. Location of permanent facilities and easements for same used for drainage control such as detention ponds, retention ponds, infiltration beds, etc., and statement of the provisions for the maintenance of these facilities.
- Q. Approval signature lines with date shall be provided for Mayor, Clerk of Council, Planning Commission Chairman, Village Administrator, and County Engineer.

Section 504 Supplementary Information

The following information shall be supplied in addition to the above requirements:

- A. If a zoning change is involved, certification from the Zoning Inspector shall be required indicating that the change has been approved and is in effect.
- B. Certification shall be required showing that all required improvements have been either installed and approved by the proper officials or agencies, or that a surety has been furnished assuring installation and initial maintenance of the required improvements.
- C. In flood prone areas the subdivider shall provide information detailing how the structures will be protected from flood hazard.
- D. The Planning Commission may require the applicant to submit additional topographic information, detailed plans for proposed uses and other information to determine possible flood or erosion hazards, the effect of the subdivision uses upon flood flows, and the adequacy of proposed flood protection measures. The Planning Commission may consult with expert persons or agencies for technical assistance and advice.
- E. These construction plans shall be submitted to the OEPA for approvals as required. Certification of OEPA approval shall be provided on the plans where applicable. Construction shall not commence until such approvals are granted.

- F. The Village Engineer's and Village Administrator's signatures shall be provided on the approved construction plans to verify compliance with the applicable specifications and the requirements of these Regulations.

Section 505 Approval of Final Plat

The Planning Commission shall approve or disapprove the final plat within thirty (30) days after it has been officially and properly filed with the Planning Commission and so noted in the minutes. **Failure of the Planning Commission to act upon the final plat within such time shall be deemed as approval of the plat.** If the plat is disapproved, the grounds for disapproval shall be stated in the records of the Planning Commission, and a copy of said record shall be forwarded to the subdivider. If disapproved, the subdivider shall make the necessary corrections and resubmit the final plat within thirty (30) days to the Planning Commission for final approval. When the final plat has been approved by the Planning Commission, the original shall be forwarded to the Village Council for their approval and endorsement. The original shall be returned to the subdivider.

Section 506 Recording of Final Plat

After the final plat has been approved by the Planning Commission, dedications accepted by the Council, and the necessary approval endorsed in writing thereon, the subdivider shall record the plat in the office of the County Recorder. The final plat shall be recorded in the office of the County Recorder as required by law within sixty (60) days after the date of final approval. The subdivider shall furnish the Village with a reproducible of the recorded plat.

The Village Administrator will determine house numbers at the time a building permit is obtained.

Section 507 FINAL PLAT CHECKLIST

SUBDIVISION _____

DATE _____

This list is not all inclusive, but is to be used as a guideline for submittals and reviews.

√		DESCRIPTION	REMARKS
	1	Fees paid.	
	2	Eight copies of the final plat.	
	3	Three copies of construction drawings.	
	4	Two copies of engineer's estimate.	
	5	One copy of storm sewer calculation, storm detention calculation, and other necessary design calculations.	
	6	Performance surety.	
	7	Name of subdivision.	
	8	Location by section, town, range, and township.	
	9	Date of plat.	
	10	North arrow and basis of bearing.	
	11	Acreage to thousandths of an acre.	
	12	Deed book and reference page. (Plat book, if available.)	
	13	Name and address of the subdividers.	
	14	Name and address of professional engineer who prepared plans, including registration number and seal.	
	15	Name and address of professional surveyor who prepared plat, including registration number and seal.	
	16	Perimeter of subdivision to be outlined by a heavy border.	
	17	All dimensions.	
	18	Bearings and distances to the nearest centerline of intersecting roads.	
	19	Names, exact location, dimensions, and right-of-way width of all streets.	
	20	Radii, internal angles, points of curvature, tangent bearings, chord length and bearings, lengths of arcs of all applicable streets within the plat area.	

√		DESCRIPTION	REMARKS
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	21	The exact locations, dimensions, and uses of easements shall be illustrated on the plat.	
	22	All lots accurately dimensioned in feet and hundredths with lot numbers and acreage.	
	23	Replatted lots shall illustrate old lot numbers and lot lines dotted on the plat.	
	24	Accurate location and a description of all monuments as to type, size, and whether the monument was found or set.	
	25	Any restrictions and covenants shall be shown on the final plat.	
	26	Acknowledgment dedication statement of the owner or owners to the plat.	
	27	A statement of intention and request for the vacation of lot lines and easements.	
	28	The signature of authorized representatives of local utility companies acknowledging the abandonment of easements.	
	29	Names of record of all abutting parcels with deed reference, acreage, and survey record reference.	
	30	Any section lines, corporation limits, township, and county lines.	
	31	Location of permanent facilities and easements for same used for drainage control such as detention basin, retention ponds, infiltration beds, etc., and statement of the provisions for the maintenance of these facilities.	
	32	Construction plans submitted to the Ohio Environmental Protection Agency (OEPA) for approvals as required.	
	33	Submitted within 12 months of preliminary approval.	
	34	Conforms to preliminary plat and incorporates suggested changes.	

√	DESCRIPTION	REMARKS
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ARTICLE VI
Assurance for Completion and
Maintenance of Improvements

- Section 600 Improvements and Performance
 Surety
- Section 601 Inspection of Improvements
- Section 602 Maintenance of Improvements and
 Maintenance Surety
- Section 603 Deferral or Waiver of Required
 Improvements
- Section 604 Issuance of Zoning Permits
- Section 605 Procedure in Case of Default

ARTICLE VI - ASSURANCE FOR COMPLETION AND MAINTENANCE OF IMPROVEMENTS

Section 600 Improvements and Performance Surety

In order that the Village has the assurance that the construction and installation of such improvements such as street surfacing, curbs, gutters, storm sewers and appurtenances, sanitary sewer, waterlines, sidewalks, street lighting, street signs, and other required improvements will be constructed, the subdivider shall provide performance surety.

- A. Performance Surety - To get a final plat signed by the Mayor and Clerk before improvements, the subdivider shall furnish either a bond, executed by a surety company, cash deposit (certified check), or Irrevocable Letter of Credit (form must be approved by the Village Solicitor) equal to the cost of construction of such improvements as shown on the plans, and based on an estimate approved by the Village Engineer.

The performance surety, cash deposit (certified check), or Irrevocable Letter of Credit to the Village shall run for a period of one (1) year and be extendable for two (2) years from the date of execution, and shall provide that the subdivider, their heirs, successors and assigns, their agent or servants, will comply with all applicable terms, conditions, provisions, and requirements of these Regulations, and will faithfully perform and complete the work of constructing and installing such facilities or improvements in accordance with such laws and these Regulations. Before said surety is accepted it shall be approved by the Village Solicitor. Whenever a cash deposit (certified check) is made, the same shall be made out to the Village.

- B. Installment Agreement - When a performance surety is made pursuant to the proceeding article, the Village of Fort Recovery shall have the authority to enter into a written agreement, or to accept a release type performance surety which itemizes the several phases of the construction or installation in sequence with an amount equal to the cost of each phase and which further provides that 90% of each amount listed may be released to the subdivider upon completion and after inspection and approval of the particular phase of such work. However, 10% of the performance bond or letter of credit shall not be released until all construction covered by the bond or letter of credit is completed, inspected and accepted by the Village of Fort Recovery.
- C. Extension of Time - If the construction or installation of any improvement or facility, for which guarantee has been made by the developer in the form of a surety, is not completed within two (2) years from the date of final approval of the record plat, the developer may request the Village to grant an extension, provided he can show reasonable cause for inability to complete said improvements within the required two (2) years.

- D. Acceptance of Dedication Offers - Acceptance of formal offers of dedication of streets, public areas, easements, and parks shall be by ordinance of the Village Council. The approval by the Planning Commission of a subdivision plat shall not be deemed to constitute or imply the acceptance by the local government of any street, easement, or park shown on said plat.

Section 601 Inspection of Improvements

Periodic inspections during the installation of improvements shall be made by the Village to ensure conformity with the approved plans and specifications as required by these Regulations.

The subdivider shall notify proper Village officials at least 24 hours before each phase of the improvements is ready for inspection. The presence and/or absence of an inspector during construction shall not relieve the subdivider from full responsibility of required improvements to the Village of Fort Recovery Construction Standards and Drawings and to the satisfaction of the Village. See the Village of Fort Recovery Design Criteria for inspection requirements.

Section 602 Maintenance of Improvements and Maintenance Surety

The applicant shall be required to maintain all improvements, if required, until approval of said improvements. Once the required public improvements have been constructed and approved in the subdivision, and prior to the release of the performance surety, the subdivider shall post with the Village a maintenance surety in the amount of 10% of the performance surety and in a form as approved by the Village Solicitor.

No public improvements shall be approved until the subdivider has posted an approved maintenance surety, and this maintenance surety will extend for one (1) year from the actual date that the final punch list has been completed and approved by the Village.

Acceptance by the Village of the public improvements will not take place until the Village releases the maintenance surety and the Village receives record drawings as outlined in the Village of Fort Recovery Design Criteria.. Record drawings shall be stamped by a registered professional engineer or surveyor verifying the accuracy of the drawings.

Prior to release of the maintenance surety by the Village, the developer shall have paid all public improvement fees required by these Regulations and has completed all maintenance punch list items.

Section 603 Deferral or Waiver of Required Improvements

The Planning Commission and Village Council may defer or waive at the time of final approval, subject to appropriate conditions, the provision of any or all such improvements as, in its judgment, are not requisite in the interests of the public health, safety, and general welfare, or which are inappropriate because of inadequacy or lack of connecting facilities.

Whenever it is deemed necessary by the Planning Commission to defer the construction of any improvement required herein because of incompatible grades, future planning, inadequate or lack of connecting facilities, or for other reasons, the applicant shall pay his share of the costs of the future improvements as approved by the Village Engineer and Village Council to the Village prior to signing of the final subdivision plat.

Section 604 Issuance of Zoning Permits

Unless otherwise approved by the Village Administrator, Zoning Permits will not be issued until the street improvements are completed with curb and asphalt being installed. The subdivider is responsible for any damage to improvements.

The Village Administrator will issue house numbers upon subdivision approval.

Section 605 Procedure in Case of Default

Procedure in Case of Failure to Complete Improvement – The subdivider shall be in default of this performance surety when one of the following conditions exist:

- A. The installation of all required public improvements as called for in these Regulations has not taken within the two (2) year time period agreed upon in the subdivider's contract with the Village, and the subdivider has failed to establish reasonable cause for such delay to the satisfaction of the Planning Commission and thereby to receive a time extension.
- B. The subdivider has not constructed the required public improvements in accordance with the minimum standards specified in these Regulations, and the subdivider is unwilling to modify and to upgrade said public improvements within a six (6) month time period so as to be in compliance with the provisions of these Regulations.

The subdivider shall be in default of his maintenance surety when the required public improvements have not been properly maintained over the one (1) year period as established in Section 151.51 Improvements and Performance Surety or when the required public improvements are not in accordance with the "as-built" plans submitted by the subdivider to the Village. The same shall apply whenever construction of improvements is not performed in accordance with applicable standards and specifications. In such cases of default, the Village of Fort Recovery shall proceed to

utilize the performance surety and/or maintenance surety to construct the required public improvements to the minimum design standards as required in these Regulations

ARTICLE VII
Requirements for Construction
Improvements and Design

Section 700	General Statement
Section 701	Conformity to Development Plans and Zoning
Section 702	Suitability of Land
Section 703	Street Improvements
Section 704	Street Signs and Street Names
Section 705	Special Street Types
Section 706	Streets for Commercial Subdivisions
Section 707	Streets for Industrial Subdivisions
Section 708	Easements
Section 709	Sidewalks
Section 710	Blocks
Section 711	Lots
Section 712	Survey Monuments
Section 713	Street and Walkway Lighting
Section 714	Water Supply Improvements
Section 715	Sanitary Sewer Improvements
Section 716	Drainage Improvements
Section 717	Culverts and Bridges
Section 718	Electric, Gas, Cable Television, and Telephone Improvements
Section 719	Over-Sized, Over-Depth and Off- Site Improvements
Section 720	Cost of Over-Sized and Over-Depth Improvements
Section 721	Extension to Boundaries
Section 722	Off-Site Extension
Section 723	Non-Annexed Subdivisions
Section 724	Record Drawings

ARTICLE VII - REQUIREMENTS FOR CONSTRUCTION IMPROVEMENTS AND DESIGN

Section 700 General Statement

The Regulations contained in this section and the Village of Fort Recovery Design Criteria and Construction Standards and Drawings shall control the manner in which streets, lots, and other elements of a subdivision are arranged on the land. These design controls shall help ensure convenient and safe streets, creation of usable lots, provision of space for public utilities, and reservation of land for recreational uses. The planning of attractive and functional neighborhoods shall be promoted, minimizing the undesirable features of unplanned, haphazard growth.

The Planning Commission has the responsibility of reviewing the design of each future subdivision early in its design development. The Planning Commission shall ensure that all the requirements of this section and the Village of Fort Recovery Design Criteria and Construction Standards and Drawings are met.

Section 701 Conformity to Development Plans and Zoning

The arrangements, character, width, and location of all arterial and collector thoroughfares or extensions thereof shall conform to the adopted Village of Fort Recovery Land Development Plan. Lack of a Land Development Plan or thoroughfares not contained in the aforementioned plan shall conform to the recommendation of the Planning Commission, based upon the design standards set forth in this section and the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. In addition, no final plat shall be approved if in conflict with an existing Zoning Code.

Section 702 Suitability of Land

If the Planning Commission finds that land proposed to be subdivided is unsuitable for subdivision development due to flooding, bad drainage, topography, inadequate water supply and other such conditions which may endanger health, life, or property; and if from investigations conducted by the public agencies concerned it is determined that in the best interest of the public the land should not be developed for the desired purpose, the Planning Commission shall not approve the land for subdivision unless adequate methods are advanced by the subdivider for solving the problems that will be created by the development of the land.

Section 703 Street Improvements

The arrangements, character, extent, width, grade, construction, and location of all streets shall conform to the Land Development Plan of the Village, and shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. Street design shall take into consideration their relationship to existing and planned streets, topographical conditions, and public convenience and safety; and in their

appropriate relation to the proposed uses of land to be served by such streets. The street pattern shall discourage through traffic in the interior of a subdivision. The subdivider shall provide within the boundaries of the plat, the necessary right-of-way for the widening, continuance, or alignment of such streets in conformity with the Land Development Plan.

The subdivider shall improve all streets which are part of the subdivision, including that portion of the subdivision located on existing streets. The required improvements shall be such that all items of work are in accordance with the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. Existing streets shall be improved so that they meet the above standards including storm drainage. The subdivider shall pay the full construction cost for the required improvements.

Curbs and gutters shall be required for all streets including existing streets.

Appropriate access to and from any subdivision in the form of a standard Village street with required improvements must be provided by a developer in instances where development is not located contiguously along an improved public street right-of-way. No subdivision shall be approved where a parcel, tract or lot has frontage only on the "stub end" of a discontinued or dead-end street. Such street must first be extended or reconstructed as a cul-de-sac in accordance with these Regulations. No subdivision showing reserved strips controlling the access to public ways will be approved.

All street widths shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. In cases where the designation of the street is in question, the Planning Commission shall determine the type of street designation.

Section 704 Street Signs and Street Names

- A. Street name signs and other traffic control signs shall be erected by the Village.
- B. For purposes of street naming, the following is recommended:
 - 1. Circle, Place, or Court should be used only for cul-de-sac type streets.
 - 2. The words north, south, east, or west should be avoided as part of a street name whenever possible.
- C. To avoid duplication and confusion, the proposed names of all streets shall be approved by the Planning Commission prior to such names being assigned or used.
- D. House numbers shall be assigned in accordance with the current house numbering system in effect in the Village.

Section 705 Special Street Types

The following requirements shall apply to special street types:

- A. Permanent dead-end streets shall not be permitted. Temporary dead-end streets shall be permitted only as part of a continuing street plan and only if a temporary turnaround satisfactory to the Planning Commission in design is provided.
- B. Dedication of new half-streets shall not be permitted. Where a dedicated or platted half-street exists adjacent to the tract being subdivided, the other half shall be platted.
- C. Alleys shall not be approved.

Section 706 Streets for Commercial Subdivisions

Streets serving business developments and accessory parking areas shall be planned to connect with arterial streets or marginal access drives so as not to generate traffic problems. The intersections of driveways from parking areas with arterial or collector streets shall be located so as to cause the least possible interference with traffic movement on the streets. The location of streets and driveways for business developments shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

Section 707 Streets for Industrial Subdivisions

Collector streets for industrial subdivisions shall be planned to serve industrial areas exclusively and shall connect with arterial streets so that no industrial traffic will be directed into any residential street. Streets shall be planned to be extended to the boundaries or any adjoining land planned for industry, except when severe physical conditions exist or if the Planning Commission finds such extension is not in accordance with the approved plan of the area. The location of streets and driveways for industrial developments shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

Section 708 Easements

- A. Utility Easements - Public utility easements at least ten (10) feet in total width may be required along the rear, front, and sides of lots where needed for the accommodation of a public utility, drainage, or sanitary structures or any combination of the foregoing. Where deemed necessary by the Planning Commission, an additional easement width shall be provided.
- B. Watercourses - The subdivider shall dedicate rights-of-way or provide easements for storm drainage purposes which conform substantially with the lines of any natural watercourses, channels, streams, or creeks which traverse the subdivision or for any new channel which is established to substitute for a natural watercourse, channel, stream, or creek. Such rights-of-way or easements shall be

of a width which will provide for the maintenance needs of the channel and incidental structures as determined by the Planning Commission. Easements shall be provided for entire area of detention basins/retention ponds.

Section 709 Sidewalks

Sidewalks are required on both sides of the street in all residential and commercial lots. Public sidewalks may be required for industrial lots, subject to approval of the Fort Recovery Planning Commission.

All sidewalks shall be constructed in accordance with the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. The Village is responsible for any sidewalk located on a property that is dedicated to the Village. Homeowners will be required to install sidewalks on individual properties within twelve (12) months of finalized building construction (occupation of the building). Once 60% of the lots within that particular phase of the subdivision are developed, and upon passage of Village Council to construct sidewalks, sidewalks must be installed on all lots by whomever owns the properties. If the sidewalks are not installed, the Village will perform the installation and assess the property owner for all cost incurred.

Section 710 Blocks

The following Regulations shall govern the design and layout of blocks:

- A. The arrangement of blocks shall be such as to conform to the street planning criteria set forth in this section and to the street design criteria established in the Village of Fort Recovery Design Criteria and Construction Standards and Drawings, and shall be arranged to accommodate lots and building sites of the size and character required for the zoning district as set forth in the Zoning Code and to provide for the required community facilities.
- B. The Planning Commission may require that the characteristics of blocks bear close relation to the use of the land.
- C. Irregularly shaped blocks, those intended for cul-de-sacs or loop streets, and those containing interior parks or playgrounds, may be approved by the Planning Commission if properly designed and located and if the maintenance of interior public spaces is covered by an agreement.
- D. No block shall be longer than 1400 feet nor less than 300 feet and the block width shall accommodate two (2) tiers of lots, except where unusual topography or other exceptional physical circumstances exists.
- E. Where blocks are over 900 feet in length, a public walkway easement not less than 10 feet in width at or near the halfway point may be required, if necessary, to provide proper access to schools, recreational areas, and other facilities. The

Planning Commission has the authority to require an easement of 10 feet, 5 feet from each lot through the tier of two (2) lots for pedestrian access to school, playgrounds, or other facilities. A sidewalk shall be constructed. The width for a sidewalk shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

- F. All block corners shall be rounded with a radius of not less than 25 feet measured at the back of the curb.
- G. Irregularly shaped blocks, those intended for cul-de-sacs or loop streets, and those containing interior parks or playgrounds, may be approved by the Planning Commission if properly designed and located and if the maintenance of interior public spaces is covered by agreement.

Section 711 Lots

The following Regulations shall govern the design and layout of lots:

- A. The lot arrangement and design shall be such that all lots will provide satisfactory building sites, properly related topography, and the character of surrounding development.
- B. All lots shall conform to or exceed the requirements for the zoning district in which they are located and the use for which they are intended.
- C. All lots shall abut by their full frontage on a publicly dedicated street or a street that has received the legal status of such. The minimum lot size, widths, and setbacks, shall be as specified in the Zoning Code.
- D. All side lot lines shall be as close to right angles as possible to the street line and radial to curved street lines, except where the Planning Commission determines that a variation to this rule would provide a better layout.
- E. Lots with double frontage shall be avoided except where the Planning Commission determines it is essential to provide separation of residential development from arterial streets.
- F. All corner lots shall have front yard setbacks on both streets and lots shall be of an area sufficient to permit adequate building site.
- G. No lot shall have an average depth which is more than three (3) times its average width, nor shall it have a depth of less than 110 feet except that, whenever a lot fronts upon an exterior curved portion of a street, lot depth may be reduced to not less than 100 feet.

- H. In the case of vacation of lots, or parts of lots, in the Village previously recorded in the Office of the Recorder of Mercer County, Ohio, the same procedure, rules and regulations shall apply as for a new plat, except that a preliminary plat may not be required. The title of the vacation plat shall indicate what is being vacated, and the final plat shall include enough of the surrounding plat or plats to show its relations to adjoining areas.
- I. Whenever a subdivider or developer proposes a re-subdivision of a plat previously recorded in the Office of the Recorder of Mercer County, Ohio he shall follow the same procedures as for a new plat, except that a preliminary plat may not be required if changes in street alignment or similar changes are not included in the proposal. The lots in the re-subdivision shall conform as to size and arrangement with the requirements of these Regulations and the appropriate requirements of the Zoning Code of the Village.
- J. When a preliminary plat is submitted, all lots shall have the front setback lines clearly marked on them.

Section 712 Survey Monuments

A survey shall be made by a registered surveyor and shall conform to the “Minimum Standards for Boundary Surveys in the State of Ohio”.

Iron pins shall be set at all exterior subdivision boundary corners, lot corners, and intersections of change, at the point of curvature, and the point of tangent of all curves and where the radius of direction changes. The intent is to identify and establish all lines of the plat. All monuments or iron pins shall be placed prior to Village acceptance of improvements.

Monument boxes with permanent markers shall be set at all street intersections and center point of cul-de-sac. Railroad spikes shall be set at all other point of intersections. If the point of intersections are not in the paved area of the street, the railroad spikes shall be placed at the point of curvature and point of tangent of all curves. In the instances of concrete pavement, monument boxes shall be used where all railroad spikes are specified above.

All monuments and iron pins shall be set as shown on the final plat. The size, location, and type of material used shall also be shown. A professional surveyor’s affidavit shall be filed in the plat volume and page and cross-referenced with the original plat when, for any reason, a monument or permanent marker must be offset from the original location or the type of iron pin is changed.

Boundary lines shall be monumented at all points where there is a change of direction and at all lot corners by suitable monuments as specified in the “Minimum Standards for Boundary Surveys in the State of Ohio.”

Section 713 Street and Walkway Lighting

The Developer will provide for all equipment, labor, and materials for trenching, backfilling and conduit, where necessary for all street lights to be installed. Decorative street lights are required. Such lights shall be located at each street intersection within the subdivision. Street and walkway lighting shall be installed at a distance of no more than 150 feet apart. The Village will approve layout and spacing of street lights in the subdivision. The subdivider shall place the layout of street lighting on the construction plans for Village review and approval.

Section 714 Water Supply Improvements

The subdivider shall install a public water system, if applicable, to adequately serve all lots, including lateral connections to the public system. Public water system extensions shall meet the requirements and approval of the Ohio Environmental Protection Agency and conform to the standards and specifications established in the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

Section 715 Sanitary Sewer Improvements

The subdivider shall install public sanitary sewers to adequately serve all lots, including lateral connections to the public system. Public sewer system extensions shall meet the requirements and approval of the Ohio Environmental Protection Agency and conform to the standards and specifications of the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

No individual septic systems or combined sanitary and storm sewers shall be allowed.

Section 716 Drainage Improvements

The subdivider shall construct all necessary facilities including underground pipe, inlets, catch basins, open drainage ditches, and detention basins as approved by the Village Engineer, to provide for adequate disposal of subsurface and surface water and maintenance of natural drainage course. The developer shall also provide all necessary soil sediment pollution control. Design and construction shall be in accordance with the Design Criteria and Construction Standards and Drawings of the Village. Adequate provisions shall be included in design and construction to accommodate all upstream drainage and, where necessary, extend all drainage improvements to plat limits.

It shall state on the final plat that all natural watercourses, detention basins, retention ponds, and appurtenances shall be maintained by the property owner. An easement shall be provided to ensure that there will not be any building within the drainage area and to provide for major maintenance and inspection. See the Village of Fort Recovery Design Criteria for inspection and ownership of detention basin requirements for placement of statement on deeds.

Section 717 Culverts and Bridges

Where natural drainage channels intersect any street right-of-way, it shall be the responsibility of the subdivider to have satisfactory bridges and/or culverts constructed. Where culverts are required, minimum requirements shall be observed as follows:

- A. All culverts and bridges shall extend, at a minimum, across the entire right-of-way width of the proposed street. The cover over the culvert and its capacity shall be approved by the Village Engineer. Headwalls are required.
- B. Driveway culverts shall be as approved in accordance with the Village of Fort Recovery Design Criteria and Construction Standards and Drawings. The driveway culverts shall be laid so as to maintain the flow lines of the ditch or gutter. Headwalls are required.
- C. All culverts and bridges shall conform to the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

Section 718 Electric, Gas, Cable Television, and Telephone Improvements

- A. Electric, cable television, and telephone service shall be provided within each subdivision. Gas service may be required where reasonably accessible. Whenever such facilities are reasonably accessible and available, they may be required to be installed within the area prior to the approval of the final plat. Telephone, electric, street lighting wires, conduits, and cables shall be constructed underground except in cases where the Village determines that topographic, bedrock, or underground water conditions would result in excessive cost to the subdivider.
- B. Overhead utility lines, where permitted, shall be located at the rear of all lots. The width of the easement per lot shall be not less than 10 feet and the total easement shall be not less than 20 feet.
- C. Whenever a sanitary sewer, water main or storm sewer, and electric and/or telephone line are each placed underground in the same utility easement, the following provision shall be applicable:
 - 1. The total easement width shall not be less than 20 feet.
 - 2. The sanitary sewer, water main or storm sewer shall be installed on one side of the easement.
 - 3. Electric, gas, cable television, and telephone shall not be installed within 10 feet of either sanitary sewer, water main, or storm sewer.

Section 719 Over-Sized, Over-Depth and Off-Site Improvements

The utilities, pavements, and other land improvements required for the proposed subdivision shall be designed to incorporate any required over-sizing and any extensions needed to provide service to nearby adjoining lands as determined by the Village.

Section 720 Cost of Over-Sized and Over-Depth Improvements

The subdivider shall be required to pay for all of the construction costs for the installation of utilities which are serving the proposed subdivision as determined by the Village and the Subdivider's Estimates. The Village may elect to have the utilities over-sized to service the surrounding areas, providing the improvement is beneficial to the Village. The Village shall pay the difference between the cost of the requirements of the subdivision and required over-sizing improvements as follows:

- A. Water Mains - A subdivider shall install water mains according to the Village's specifications. The material's cost difference between the minimum required size of pipe and appurtenances, and over-sized pipe required by the Village, will be paid by the Village.
- B. Sanitary Sewers - A subdivider shall install sanitary sewers according to the Village's specifications. The material's cost difference between the minimum required size of pipe and appurtenances, and over-sized pipe required by the Village, will be paid by the Village. The construction cost difference as determined by the Village Engineer for the minimum depth needed for installation, and the greater depth of installation required by the Village, will be paid by the Village.
- C. Storm Sewers - A subdivider shall install storm sewers according to the Village's specifications. The material's cost difference between the minimum required size of pipe and appurtenances, and over-sized pipe required by the Village, will be paid by the Village. The construction cost difference as determined by the Village Engineer for the minimum depth needed for installation, and the greater depth of installation required by the Village, will be paid by the Village.
- D. Streets - The type and composition of street paving and surfacing shall be installed as per current Village specifications, or County Engineering specifications where applicable, and shall be commensurate with the volume, street classification, character, and general circulation requirements, as determined by the Village. The cost of materials for the paved surface and its sub-base of an existing street, and any over-sizing cost in excess of the owner's required responsibility needed to meet the dimensional standards for roadways, as shown on the Village of Fort Recovery Land Development Plan, shall be at the Village's expense. The costs for the minimum street width, as required by these Regulations, including curb, gutter, and sidewalks, shall be the developer's responsibility and at his or her expense.

Section 721 Extension to Boundaries

The subdivider shall be required to extend the necessary improvements to the boundary of the proposed subdivision to serve adjoining un-subdivided land.

Section 722 Off-Site Extensions

If streets or utilities are not available at the boundary of a proposed subdivision, the subdivider will be responsible for extending those streets or utilities, obtaining necessary easements or rights-of-way, and to construct and pay for such extensions to serve the proposed subdivision. Such improvements shall be available for connection by subdividers of adjoining land and become the property of the Village; however, a utility extension agreement will be provided to the developer for partial reimbursement from adjoining property owners of extended utilities.

Section 723 Non-Annexed Subdivisions

Any subdivision that lies outside the corporation limits of the Village but is connected to any of the Village's utilities, must install all utilities to meet these Regulations and the Village of Fort Recovery Design Criteria and Construction Standards and Drawings.

If a subdivision is connected to any one of the Village utilities, the residents of that subdivision, at the time annexation is determined to be possible by the Village, must not oppose annexation. A statement to this effect must be included with each property deed and recorded in the Office of the Mercer County Recorder.

Section 724 Record Drawings

Record drawings shall be furnished to the Village before a final maintenance inspection. The submittal of record drawings as outlined in the Village of Fort Recovery Design Criteria.

ARTICLE VIII
Miscellaneous Provisions

Section 800	Recording of Plat
Section 801	Revision of Plat After Approval
Section 802	Sale of Land Within Subdivisions
Section 803	Schedule of Fees
Section 804	Penalties
Section 805	Variances
Section 806	Appeal

ARTICLE VIII - MISCELLANEOUS PROVISIONS

Section 800 Recording of Plat

No plat of any subdivision shall be recorded or have any validity until said plat has received final approval in the matter prescribed in these Regulations.

Section 801 Revision of Plat After Approval

No changes, erasures, modifications, or revisions shall be made in any plat of a subdivision after approval has been given by the Planning Commission, and endorsed in writing on the plat, unless said plat is first resubmitted to the Planning Commission.

Section 802 Sale of Land Within Subdivisions

No owner or agent of the owner of any land located within a subdivision shall transfer or sell any land by reference to, exhibition of, or by the use of a plat of the subdivision before such plat has been approved and recorded in the manner prescribed in these Regulations. The description of such lot or parcel by metes and bounds in the instrument of transfer or other documents used in the process of selling or transferring shall not exempt the transaction from the provisions of these Regulations.

Section 803 Schedule of Fees

The Village Council establishes the following schedule of fees:

Minor Subdivision plats	\$ 25.00
Vacation/Dedication plats	\$ 25.00
Replats	\$ 25.00
Preliminary plats	\$ 50.00
Preliminary plat reapproval	\$ 25.00
Final plats	\$100.00

The schedule of fees shall be posted in the office of the Village Clerk and may be altered, or amended only by the Village Council. Until all applicable fees, charges, and expenses have been paid in full, no action shall be taken on any application or appeal.

Section 804 Penalties

The following penalties shall apply to the violations of these Regulations:

- A. Whoever violates any rule or regulation adopted by the Village Council for the purpose of setting standards and requiring and securing the construction of improvements within a subdivision or fails to comply with any order pursuant thereto is creating a public nuisance and the creation thereof may be enjoined and maintenance thereof may be abated by action at suit of the County or any citizen thereof. Whoever violates these

Regulations shall forfeit and pay not less than \$100.00 or more than \$1,000.00 for each offense. Each day such violation continues shall be considered a separate offense. Such sum may be recovered with costs in a civil action suit brought in the Court of Common Pleas of Mercer County.

- B. Whoever, being the owner or agent of owner of any land within or without a municipal corporation, transfers any lot, parcel or tract of such land from or in accordance with a plat of a subdivision before such plat has been recorded in the office of the County Recorder, shall forfeit and pay the sum of not less than \$100.00 or more than \$500.00 for each lot parcel, or tract of land so sold. The description of such lot, parcel, or tract by metes and bounds in the deed or transfer shall not serve to exempt the seller from the forfeiture provided in this section.

Section 805 Variances

The following Regulations shall govern the granting of variances of these Regulations:

- A. Where the Planning Commission finds that extraordinary and unnecessary hardship may result from strict compliance with these Regulations, due to exceptional topographic or other physical conditions, it may vary the Regulations so as to relieve such hardships, provided such relief may be granted without detriment to the public and without impairing the intent and purpose of these Regulations or the desirable development of the neighborhood or community. Such variations shall not have the effect of nullifying the intent and purpose of these Regulations, the comprehensive plan, or the zoning code, if such exists.
- B. In granting variances or modifications, the Planning Commission may require such conditions as will, in its judgment, secure substantially the objective of the standards or requirements so varied or modified.

Section 806 Appeal

Any person who believes he has been aggrieved by these Regulations or the action of the Planning Commission, has all the rights of appeal as set forth in the Ohio Revised Code.

VILLAGE OF FORT RECOVERY

CONSTRUCTION STANDARDS & DRAWINGS

Prepared and Presented By:



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VILLAGE OF FORT RECOVERY

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**VILLAGE OF FORT RECOVERY
DESIGN CRITERIA
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FOREWORD

This manual has been prepared to aid engineers in the preparation of subdivision plans and engineering design and to inform interested persons of the procedures and standards for the Village of Fort Recovery, Ohio. It is also intended to be used during reconstruction or replacement of existing facilities or utility construction within the Village. The rules, standards, specifications, criteria, etc. are to supplement the Zoning Regulations and Subdivision Regulations of the Village.

It is not the intent of this manual to take away from the designing engineer any responsibility for the technical adequacy of this design or freedom to use his engineering judgment and discretion. It is recognized that matters of engineering design cannot be set out in writing to cover all situations, however, the design standards as set out herein represent good engineering practice. Any design methods or criteria different than that listed will receive consideration for approval, provided the proposed variances and the reasons for their use are submitted to the Village.

The Village, at any time during design or construction, shall have the authority to modify any engineering or construction detail, whenever required for the protection of the public interest.

Though the Village has no jurisdiction in areas outside of the corporation limits, the Village recommends that any subdivision constructed within close proximity of the Village be designed and constructed to these standards. This will help ensure that, if the subdivision is incorporated into the Village, the subdivision will be accepted by the Village without additional upgrades. If a subdivision or residence is annexed, all streets and utilities must be brought up to Village Standards at the Developer's or homeowner's expense. Also, if a subdivision or residence outside of the corporation limits of the Village will be connected to Village utilities, the utilities will be constructed to Village Standards and Specifications.

The Village, at its discretion, may request that infrastructure and utility facilities in any particular subdivision be installed to accommodate future expansion within the Village. If this were requested, the Village would pay the difference to oversize these particular items per the Village Subdivision Regulations.

REFERENCES

The Village of Fort Recovery Design Criteria and Construction Standards and Drawings are to be used to supplement the following references. Whenever there are differences in these references and the Design Criteria and Construction Standards and Drawings, the more restrictive or higher standard shall apply as determined by the Village of Fort Recovery.

- ◆ Ohio Department of Transportation (ODOT), latest versions
 - ⇒ Construction and Material Specifications
 - ⇒ Location and Design Manuals
 - Volume 1 - Roadway Design
 - Volume 2 - Drainage Design
 - ⇒ Standard Construction Drawings
 - ⇒ Standard Design Drawings
 - ⇒ Supplemental Specifications
 - ⇒ Traffic Control for Uniform Control Devices

- ◆ American Association of State Highway and Transportation Officials (AASHTO), latest version
 - ⇒ A Policy on Geometric Design of Highways and Streets

- ◆ Great Lakes Upper Mississippi River Board (GLUMRB) (Ten State Standards), latest version
 - ⇒ Recommended Standards for Wastewater Facilities
 - ⇒ Recommended Standards for Water Works

- ◆ American Water Works Association (AWWA)

- ◆ American Society for Testing and Materials (ASTM)

100.00
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100.00 GENERAL PROVISIONS

100.01 General

- A. The Design Criteria and Construction Standards and Drawings along with 100% performance surety and 10% maintenance surety shall apply to all public improvement construction projects that will eventually be taken over by the Village of Fort Recovery. The 100% performance surety and 10% maintenance surety shall follow the regulations in the Village of Fort Recovery Subdivision Regulations even if a major subdivision is not applicable.
- B. The Developer/Owner shall design and construct improvements not less than the standards outlined in the Village of Fort Recovery Subdivision Regulations and this document. The work shall be done under the Village's supervision and shall be completed within the time fixed or agreed upon by the Village.
- C. It is the responsibility of the Developer/Owner and his engineer to investigate local conditions that may require additional improvements.
- D. In the event any conflicting standards are encountered, the most restrictive shall always apply as determined by the Village of Fort Recovery.
- E. Upon request of the Developer/Owner or his representative, the Village will evaluate requests to provide open excavation of existing utilities to allow accurate elevation information.

100.02 Construction Procedures and Materials

A. PRE-CONSTRUCTION MEETING

A pre-construction meeting with the Village is required. The Developer/Owner, his contractor, his engineer, and representatives from utility companies involved shall be present at the meeting. It shall be the Developer's responsibility to arrange the preconstruction meeting.

B. MATERIALS

All work and materials shall conform to the Ohio Department of Transportation, (ODOT) Construction and Material Specifications, and the Standards and Specifications of the Village of Fort Recovery, Ohio.

C. INSPECTIONS

1. Definition

Inspect, inspection is the visual observation or observation by instrument of construction to permit the Village or its representative to render his or her professional opinion as to whether the contractor is performing the services in a manner indicating that, when completed, the services will be in accordance with the Village of Fort Recovery Subdivision Regulations, Construction Standards and Drawings, and Design Criteria. Such observations shall not be relied upon in any part as acceptance of the services, nor shall they relieve any party from fulfillment of customary and contractual responsibilities and obligations.

2. Periodic Inspection

Periodic inspection during the installation of improvements shall be made by the Village to ensure conformity with the approved plans and specifications as required by these and other regulations. The Developer/Owner shall notify proper Village officials at least twenty-four (24) hours before each phase of the improvements is ready for inspection. The presence and/or absence of an inspector during construction shall not relieve the Developer/Owner and/or contractor from full responsibility of required improvements to the Village of Fort Recovery Construction Standards and Drawings and to the satisfaction of the Village.

3. Inspections shall be as follows:

a) Sanitary Sewer

- 1) Sanitary pipe and manhole installation
- 2) Lateral location
- 3) Proper backfill installation
- 4) Air test sanitary lines
- 5) Vacuum test manholes
- 6) Deflection test on PVC sewers

b) Water Main

- 1) Water main installation
- 2) Valve installation
- 3) Hydrant installation
- 4) Restraining glands and/or blocking installation
- 5) Service installation and location
- 6) Pressure test
- 7) Disinfection
- 8) Proper backfill installation

- c) Storm Sewer
 - 1) Storm sewer installation
 - 2) Manhole and catch basin installation
 - 3) Field tile connections
 - 4) Proper backfill installation
 - 5) Individual storm outlet location, if applicable

 - d) Roadway
 - 1) Subgrade preparation
 - 2) Subgrade undercutting
 - 3) Subbase installation
 - 4) Street coring operations
 - 5) Curbing installation
 - 6) Sidewalk and approach installation
 - 7) Prime coat application
 - 8) Asphalt installation
4. Weight and delivery tickets shall be furnished to the Village to substantiate the type, quantity, and size of material used.

D. RESPONSIBILITY

All work shall be under the control and supervision of the Developer/Owner until written final approval is given by the Village.

E. FINAL INSPECTION

Upon completion of all the improvements, the Developer/Owner shall request, in writing, a final inspection by the Village. The final inspection shall be performed by officials from the Village with the Developer. The Developer's engineer and the Developer's contractor will be present.

SUBDIVISION INSPECTION

SUBDIVISION _____

DATE _____ INSPECTOR _____

This list could vary depending upon the types of construction included in the project. This is a sample list (not all-inclusive) of items in which an inspector may utilize.

√	DESCRIPTION	REMARKS
A.	PRIOR TO INSPECTION	
	Review plans, special provisions, construction & material manuals and specifications that apply to your assigned duties.	
	Discuss your responsibility & authority with the project engineer.	
	Discuss notification, changes, connections, delays, rejections, and tolerances.	
B.	PRE-CONSTRUCTION CONFERENCE	
	Attendees: Village Representatives, Developer/Owner, Engineer, Contractor, Superintendent, Foreman, Utility Companies	
	Discuss phasing & schedules	
	Discuss materials	
	Discuss coordination	
	Discuss safety (public & job)	
	Discuss responsibilities	
C.	SANITARY SEWER & LATERALS TO R/W	
	Check pipe type & quality	
	Trench condition	
	Straight alignment & joints	
	Bedding	
	Proper initial backfill	
	Proper backfill	
	Prohibit groundwater from entering sanitary	
	Wye installation & location	
	Air test mainline & laterals	
	Mandral test on PVC	

√	DESCRIPTION	REMARKS
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D.	SANITARY MANHOLE	
	Check type & condition	
	Steps condition & alignment	
	Cone type & condition	
	Risers precast/mastic	
	Casting - rim & lid	
	Proper pipe connection	
	Installation with O-rings	
	Installation on good base	
	Proper backfill, compacted granular under or near roadway	
	Exfiltration test	
	Rim & risers to proper finish grade	
	Chimney Seal	
E.	WATER MAIN	
	Type & condition	
	Valve type & condition	
	Hydrant type & condition	
	Trench condition	
	Pipe alignment & joints	
	Air release valves	
	Isolation Valve installation & location	
	Hydrant assemble installation & location	
	Restrained, as needed	
	Bedding	
	Initial backfill, compacted granular	
	Proper backfill, compacted granular under or near roadway	
	Pressure test	
	Purification test	
	Valve & hydrant operation	
	Laterals: Corp stop K-copper Curb stop Meter set Compacted granular backfill Proper backflow prevention Backflow prevention devices	

√	DESCRIPTION	REMARKS
F.	STORM SEWER	
	Check pipe type, size, & quality	
	Check catch basin & grate type, size, & quality	
	Check manhole type, size, & quality	
	Trench condition	
	Straight alignment & joint sealing	
	Bedding	
	Proper initial backfill	
	Proper backfill, compacted granular under or near roadway	
	Proper connection to catch basin & manholes	
	C.B. set in good horizontal & vertical alignment with curbs	
	Slope & grade: Review control stakes & adjacent terrain for drainage.	
	Field tile & other pipes reconnected & noted on plans	
G.	ROADWAY	
	Subgrade:	
	All topsoil removed in roadway	
	Compacted granular or clay fill only	
	Proper cross slope	
	Proper elevation	
	Free of roots, large stones, & excess dust	
	Proper compaction	
	Proofroll or density test, if soft undercut and/or underdrains.	
	Subbase:	
	Proper material	
	Compacted in appropriate layers	
	Density test, if soft	
	Protect subgrade from being rutted or damaged (back in over subbase & blade, if necessary)	
	Proofroll subbase before prime coat	
	Measure elevation & cross slope	
	Surface:	
	Appropriate moisture & temperature conditions	
	Visual inspection of material (be aware of acceptable temperature range of mix & compensation)	
	Proper distribution & roller	
	Proper prime coat	
	Lay in proper layer	
	Watch joints & overlaps	
	Seal against concrete curbs, etc.	

√	DESCRIPTION	REMARKS
	Measure elevation & cross slope	
	Keep traffic off for 24 hours, if possible	
H.	FIXED STRUCTURES, CURBS, SIDEWALK, HEADWALL, ETC.	
	Determine proper concrete mix	
	Appropriate moisture & temperature conditions	
	Check all underground portions	
	Check backfill, operation, & material	
	Check subgrade	
	Check subbase under curbs	
	Review requirements for reinforcing steel	
	Check all reinforcement	
	Check all dowels	
	Check for expansion joints	
	Be aware of time concrete was batched & allowable time for placement	
	Observe mix & placement	
	Observe finishing procedure	
	Needs curing material ASAP	
	If required, check cold weather protection	
	Needs saw joints ASAP	
	Note when forms are removed	
I.	MISCELLANEOUS	
	Keep daily logs	
	Pre-mark all existing utilities	
	Reconnect all existing utilities	
	Mark ends of all laterals in field-Contractor's responsibility	
	Mark ends of all laterals on plans	
	Restoration	
	Grade to drain	
	Check trench settlement	
	Seeding & Mulching	
	Erosion Control	
	Inlets	
	Outlets	
	Curb lines	
	Ditches	
	Basins	
	Final check for debris & flow	
	Sanitary sewer	
	Storm sewer, manhole, & catch basin	
	Curb lines	

100.03 Submission of Plans

A. CONSTRUCTION DRAWINGS

1. Complete construction drawings on 24" x 36" polyester film mylar, 4-mil thickness, double matte or other approved reproducible media signed and approved by a registered engineer shall be made for all new or reconstructed streets, utilities, and other improvements to be constructed in any subdivision in the Village. Said drawings are to be approved by the Village before any construction may begin and before the plat of said subdivision may be recorded.
2. Submission of plans shall comply with the Subdivision Regulations.

B. STANDARD TITLE BLOCK

All plan sheets shall display a standard title block containing the following:

1. Name, address, telephone number, and fax number (logo optional)
2. Plan sheet number
3. Subdivision name
4. Sheet title
5. Date
6. Revision block
7. Drawn by
8. Checked by

C. REQUIRED PLAN LAYOUT ORDER

1. Title Sheet
 2. Final Plat
 3. Schematic Plan
 4. Typical Sections
 5. General Notes
 6. General Details
 7. Site Grading Plan and Erosion Control Plan/Storm Water Pollution Prevention Plan
 8. Erosion Control Details
 9. Miscellaneous Details (example: Pump Station, Intersection Plan)
 10. Plan and Profile
 11. Cross-Sections
 12. Detention Basin or Retention Pond Plan and Details
 13. Off-site Utilities Plan and Profile (1" = 20' horizontal, 1" = 5' vertical)
- *Other scales may be used with prior approval.

1. TITLE SHEET

- a) Title of Project, Village, County, Township, and State.
- b) Index of sheets and sheet numbering.
- c) Vicinity map with north arrow and project site call-out.
- d) Village standard drawings reference.
- e) Underground utilities note (O.U.P.S.).
- f) Signature and stamp.
- g) Date of finished plans.
- h) Project description.
- i) Approval plan signatures.
- j) Name, address, telephone number, and fax number of firm that plans are prepared by.

2. FINAL PLAT

- a) Copy of approved final plat.
- b) See Subdivision Regulations.

3. SCHEMATIC PLAN - LARGE SCALE LAYOUT OF SITE

- a) At a measurable scale to show the whole site on one sheet (max. scale 1" = 100').
- b) Show right-of-way, property lines and roadway, lot numbers, street names, and existing adjoining property lines and owners.
- c) Show proposed utilities and numbering of sanitary and storm manholes and catch basins.
- d) Stationing of intersections and streets.
- e) Multi-baseline legend, (sheet number, stationing, description, etc.)
- f) North arrow and scale.
- g) Benchmarks and locations.
- h) Centerline stationing.

4. TYPICAL SECTIONS

- a) Detailed labeling.
- b) Legend of pavement composition.
- c) Limiting stations for each section.
- d) Dimensioning, pavement, curb and gutter, curb lawn, sidewalk, right-of-way, and pavement slopes.

5. GENERAL NOTES

All notes necessary for construction which are not defined clearly elsewhere within the plans.

6. GENERAL DETAILS

- a) All details necessary for construction which are not represented by Village of Fort Recovery Standard Drawings.
 - b) Modified Village of Fort Recovery Standard Drawings shall be redrawn for approval.
7. SITE GRADING PLAN AND EROSION CONTROL PLAN/STORM WATER POLLUTION PREVENTION PLAN

Site Grading Plan

- a) A final site grading plan must be included with the construction drawings and approved by the Village.
- b) Proposed 1-foot contours showing all lots having proper drainage.

Storm Water Pollution Prevention Plan

A Storm Water Pollution Prevention Plan will be required to be included with the construction drawings and approved by the Village. This plan shall follow OEPA and NPDES permit requirements and shall be submitted to and approved by OEPA prior to construction.

- a) Show and label existing and proposed 1-foot contours.
 - b) Proposed storm manholes, catch basins, pipes, etc., labeled and numbered.
 - c) Concentrated flows.
 - d) Property lines, right-of-way, lot numbers, and owners.
 - e) Proposed/existing roadways.
 - f) Proposed diversions and erosion control (Example: diversion ditches, fabric fence, straw bales, sediment basin).
 - g) Erosion control construction sequence list.
 - h) Limits of grading.
 - i) Proposed storm sewer pipe flows and capacities.
 - j) Sediment basin location.
 - k) North arrow scale.
 - l) At a measurable scale to show the entire site on one sheet (maximum scale 1" = 100').
8. EROSION CONTROL DETAILS

Any details necessary for construction which are not represented by Village of Fort Recovery Standard Drawings.

9. MISCELLANEOUS DETAILS (Example: Pump Station, Intersection Plan, etc.)

Plans shall include a detailed drawing with all proper labeling and dimensions.

10. PLAN AND PROFILE

- a) The plan and profile shall be at a scale of 1" = 20' horizontal, 1" = 5' vertical.
- b) Plan and profile sheets shall show all necessary data in sufficient detail for the complete construction of all work and improvements to be made in the plat.
- c) All grade elevations shall be based on U.S.G.S. and Village of Fort Recovery datum.
- d) Plan and profile sheets will be required for all off-site utility extensions.
- e) More specifically, all plans and profile sheets must show and include the following items:

10A General - Plan

- a) Show all proposed lots, streets, curbs, etc.
- b) Show all existing pavements, headwalls, piers, utilities, mailboxes, trees, etc.
- c) Typical street and curb sections.
- d) Construction notes.
- e) Structural details.
- f) North arrow (preferably up or to the right) and scale (horizontal and vertical).
- g) Street names.
- h) Centerline stations and ticks every 100 feet (south to north and west to east where possible).
- i) Easements for utilities and storm drainage.
- j) Lot numbers, dimensions, and frontage.
- k) Curb radius at intersections with back of curb elevations at quarter points (if not covered in separate intersection detail).
- l) Curve data: radius, delta, chord length, chord bearing, arc length, station of PC, PT, PCC, PI, PRC.
- m) Sheet reference.
- n) Plat section lines (boundary lines) showing stations.
- o) Dimension and station utility locations.
- p) Centerline bearings and/or intersecting centerline angles.
- q) Final monument box call-outs set at PC, PT, PCC, PI, PRC (in pavement) intersections.
- r) Drive apron stationing and width call-outs.
- s) Show all existing features within 50 feet of right-of-way.
- t) Proposed electric, telephone, gas, cable locations, and easements.
- u) Proposed light pole layout and electric feed, including all lighting conduit.
- v) Match lines with stationing.
- w) Intersection elevation for proper storm water drainage.
- x) Benchmarks.

10B General - Profile

- a) Existing centerline and proposed centerline profile.
- b) Label proposed centerline grades (minimum grade 0.50%).
- c) Show all mainline existing utilities.
- d) Existing and proposed grade elevations every 25 feet (existing elevation on bottom of sheet and proposed elevation on top of sheet. Note as to centerline or top of curb.)
- e) Show and label all vertical curves (Stations, elevations, and length).

10C Storm Sewer - Plan

- a) Show and station, with offsets, the proposed storm sewers: manholes, laterals, catch basins, headwalls, etc.
- b) Label each pipe size and type.
- c) Number proposed storm manholes and catch basins.

10D Storm Sewer - Profile

- a) Show length of span, size, grade, and class and/or type of proposed pipe.
- b) Label existing pipe size and type.
- c) Existing and proposed storm.
 - 1) Label existing and proposed mainline storm water manholes, junction boxes, catch basins, etc., and show centerline of streets and stations of each.
 - 2) Show invert elevations of all pipe at manholes, headwalls, junction boxes, catch basins, etc.
 - 3) Show elevation on top of manhole or catch basin.
 - 4) Number proposed storm manholes and catch basins.

10E Water - Plan

- a) Show and station with offsets the proposed waterline, laterals, deflection points, hydrants, valves, etc.
- b) Label pipe size, tees, crosses, etc.
- c) Station above items.

10F Water - Profile

- a) Show length, size, depth, and class and/or type of pipe.
- b) Show deflection points.
- c) Show stations and any critical elevations for above items.
- d) Label minimum coverage of water main.

10G Sanitary Sewer - Plan

- a) Show sanitary sewers, manholes, laterals, cleanouts, etc. with station and offset labeled.
- b) Label each pipe size.
- c) Number proposed sanitary manholes and cleanouts.

10H Sanitary Sewer - Profile

- a) Show length of span, size, grade, and class and/or type of proposed pipe.
- b) Show existing and proposed sanitary.
- c) Show invert elevation of all pipe at manholes.
- d) Show top elevations of manholes.
- e) Number proposed sanitary manholes and clean-outs.

11. CROSS-SECTIONS

- a) The cross-sections shall be at a scale of 1" = 5' horizontal, 1" = 5' vertical.
- b) Cross-sections shall be every 50 feet and at other critical areas.
- c) Show all existing utilities with labels.
- d) Show all proposed utilities with labels.
- e) Show all proposed and existing roadway sections with existing and proposed centerline elevation.
- f) Cross-sections at each drive and intersection roadway.

12. DETENTION BASIN OR RETENTION POND PLAN AND DETAILS

- a) Detailed site plan including inlet and outlet elevations, top of bank elevations, and emergency overflow elevations.

13. OFF-SITE UTILITIES PLAN AND PROFILE

Refer to Page 11 Plan and Profile.

SUBDIVISION CONSTRUCTION PLANS CHECKLIST

SUBDIVISION _____

DATE _____

√	DESCRIPTION	REMARKS
	REQUIRED PLAN LAYOUT ORDER	
	Title Sheet	
	Final Plat	
	Schematic Plan	
	Typical Sections	
	General Notes	
	General Details	
	Site Grading and Erosion Control Plan	
	Erosion Control Details	
	Misc. Details (e.g. pump station, intersection plan)	
	Plan and Profile (1"=20' horizontal, 1"=5' vertical)	
	Cross-Sections (1"=5' horizontal, 1" = 5' vertical)	
	Detention Basin or Retention Pond Plan and Details	
	Off-Site Utilities Plan and Profile (1"=20' horizontal, 1" = 5' vertical)	
	GENERAL	
	Acceptable natural drainage and erosion control	
	Right-of-way widths meet minimum criteria	
	Pavement widths	
	Radius of curvature	
	Horizontal visibility	
	Vertical alignment and visibility	
	Grades	
	Cul-de-sacs	
	Turn around radius, right-of-way, and pavement	
	Dead-end streets	
	Alignment of intersection	
	Space of intersection relative to difference in road classifications	
	Avoidance of multiple intersection	
	Pavement and right-of-way of intersection	
	Streets for commercial subdivisions	
	Repair of pavements	

√	DESCRIPTION	REMARKS
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	GENERAL (Con't)	
	Streets for industrial subdivision	
	Lengths of blocks meet minimum criteria	
	Crosswalks	
	Street Monuments	
	Subgrade	
	Base Course	
	Surface Course	
	Grading Plan	
	Storm drainage system type	
	Manholes	
	Catch basins	
	Headwalls	
	Sufficient easements for utilities or open drainage	
	Other utilities	
	Underground utilities	
1.	TITLE SHEET	
	Title of Project, Village, County, Township, State	
	Index of sheets and sheet numbering	
	Vicinity map with north arrow and project site callout	
	Village Standard Drawings reference	
	Underground utilities note (O.U.P.S.)	
	Signature and stamp	
	Date of finished plans	
	Project description	
	Approval plan signatures	
	Name, address, telephone number, and fax number of firm that plans are prepared by	
2.	FINAL PLAT	
	Copy of approved final plat	
	See Subdivision Regulations	

√	DESCRIPTION	REMARKS
3.	SCHEMATIC PLAN - LARGE SCALE LAYOUT OF THE SITE	
	At a measurable scale to show the whole site on one sheet (max. scale 1" = 100')	
	Show right-of-way, property lines, roadway, lot numbers, street names, and existing adjoining property lines and owners	
	Show proposed utilities and numbering of sanitary and storm manholes and catch basins	
	Stationing of intersections and streets	
	Multi-baseline legend, (sheet number, stationing, description, etc.)	
	North arrow and scale	
	Benchmarks and locations	
	Centerline stationing	
4.	TYPICAL SECTION	
	Detailed labeling	
	Legend of pavement composition	
	Limiting stations for each section	
	Dimensioning, pavement, curb and gutter, curb lawn, sidewalk, right-of-way, and pavement slopes	
5.	GENERAL NOTES	
	All notes necessary for construction which are not defined clearly elsewhere within the plans	
6.	GENERAL DETAILS	
	All details necessary for construction which are not represented by Village of Fort Recovery Standard Drawings	
	Modified Village of Fort Recovery Standard Drawings shall be redrawn for approval	

√	DESCRIPTION	REMARKS
7.	SITE GRADING PLAN AND EROSION CONTROL	
	A final site grading plan must be included with the construction drawings and approved by the Village	
	Proposed 1-foot contours showing all lots having proper drainage	
	A Storm Water Pollution Prevention Plan will be required to be included with the construction drawings and approved by the Village. This plan shall follow the OEPA and NPDES permit requirements and shall be submitted to and approved by OEPA prior to construction	
	Show and label existing and proposed 1-foot contours	
	Proposed storm manholes, catch basins, pipes, etc., labeled and numbered	
	Concentrated flows	
	Property lines, right-of-way, lot numbers, and owners	
	Proposed/existing roadways	
	Proposed diversions and erosion control (e.g. diversion ditches, fabric fence, straw bales, sediment basins.)	
	Erosion control construction sequence list	
	Limits of grading	
	Proposed storm sewer pipe flows and capacities	
	Sediment basin location	
	North arrow and scale	
	At a measurable scale to show the whole site on one sheet (Maximum scale 1" = 100')	
8.	EROSION CONTROL DETAILS	
	Any details necessary for construction which are not represented by the Village of Fort Recovery Standard Drawings	
9.	MISC. DETAILS (e.g. pump station, intersection plan etc.)	
	Shall include a detail drawing with all proper labeling and dimensioning	

√	DESCRIPTION	REMARKS
10.	PLAN AND PROFILE	
	Use a scale of 1" = 20' horizontal, 1"=5' vertical	
	Show all necessary data in sufficient detail for the complete construction of all work and improvements to be made in the plat	
	All grade elevations shall be based on U.S.G.S. and Village of Fort Recovery datum	
	Plan and profile sheets are required for all off-site utility extensions	
10A	GENERAL - PLAN	
	Show all proposed lots, streets, curbs, etc.	
	Show all existing pavements, headwalls, piers, utilities, mailboxes, trees, etc.	
	Typical street and curb sections	
	Construction notes	
	Structural details	
	North arrow (preferably up or to the right) and scale (horizontal and vertical)	
	Street names	
	Centerline stations and ticks every 100 feet (south to north and west to east where possible)	
	Easements for utilities and storm drainage	
	Pavements and right-of-way widths	
	Lot numbers, dimensions, and frontage	
	Curb radius and intersections with back of curb elevations at quarter points (if not covered in separate intersection detail)	
	Curve data: radius, delta, chord length, chord bearing, arc length, station of PC, PT, PCC, PI, PRC	
	Sheet reference	
	Plat section lines (boundary lines) showing stations	
	Dimension and station utility locations	
	Centerline bearings and/or intersecting centerline angles	
	Final monument box call-outs set at PC, PT, PCC, PI, PRC (in pavement) intersections	
	Drive apron stationing and width call-outs	
	Show all existing features within 50 feet of right-of-way	

√	DESCRIPTION	REMARKS
	Proposed electric, telephone, gas, cable locations, and easements	
	Proposed light pole layout and electric feed	
	Match lines with stationing	
	Intersection elevation for proper storm water drainage	
	Benchmarks	
10B	GENERAL - PROFILE	
	Existing centerline and proposed centerline profile	
	Label proposed centerline grades (minimum grade 0.50%)	
	Show all mainline existing utilities	
	Existing and proposed grade elevations every 25 feet (existing elevation on bottom of sheet and proposed elevation on top of sheet. Note as to centerline or top of curb.)	
	Show and label all vertical curves (stations, elevations, and length)	
10C	STORM SEWER - PLAN	
	Show and station, with offsets, the proposed storm sewers: manholes, laterals, catch basins, headwalls, etc.	
	Label each pipe size and type	
	Number storm manholes and catch basins.	
10D	STORM SEWER - PROFILE	
	Show length of span, size, grade, and class and/or type of proposed pipe	
	Label existing pipe size and type	
	Label existing and proposed storm water manholes, junction boxes, catch basins, etc., and show centerline of streets and stations of each	
	Show invert elevations of all pipe at manholes, headwalls, junction boxes, catch basins, etc.	
	Show elevation on top of manhole or catch basin	
	Number proposed storm manholes and catch basins	

√	DESCRIPTION	REMARKS
10E	WATER - PLAN	
	Show and station, with offsets, the proposed waterline, laterals, deflection points, hydrants, valves, etc.	
	Label pipe size, tees, crosses, etc.	
	Station above items	
10F	WATER - PROFILE	
	Show length, size, depth, and class and/or type of pipe	
	Show deflection points	
	Show stations and any critical elevations for above items	
	Label minimum coverage of water main	
10G	SANITARY SEWER - PLAN	
	Show sanitary sewers, manholes, laterals, cleanouts, etc. with station and offset labeled	
	Label each pipe size	
	Number proposed sanitary manholes and cleanouts	
10H	SANITARY SEWER - PROFILE	
	Show length of span, size, grade, and class and/or type of proposed pipe	
	Show existing and proposed sanitary	
	Show invert elevation of all pipe at manholes	
	Show top elevations of manholes	
	Number proposed sanitary manholes and cleanouts	
11.	CROSS-SECTIONS	
	Cross-sections shall be at a scale of 1"=5' horizontal, 1"=5' vertical	
	Cross-sections shall be every 50 feet and at other critical areas	
	Show all existing utilities with labels	
	Show all proposed utilities with labels	
	Show all proposed and existing roadway sections with existing and proposed centerline elevations	
	Cross-section at each drive and intersection roadway	

√	DESCRIPTION	REMARKS
12.	DETENTION BASIN OR RETENTION POND	
	Detailed site plan including inlet and outlet elevations, top of bank elevations, and emergency overflow elevations.	
13.	OFF-SITE	
	Refer to Page 11 Plan and Profile.	

100.04 Record Drawing Requirements

A. RECORD DRAWING REQUIREMENTS

1. At the completion of construction, the original shall be revised as necessary to provide “Record Drawings”. This work shall be done by the Developer/Owner’s engineer, who was responsible for setting grades and staking for improvements. The “Record Drawings” shall include the following information:
 - a) Location of all water and sanitary services as well as storm outlets if provided.
 - b) Final elevations and locations of the following:
 - 1) Storm sewer inlets, outlets, and manholes with all inverts
 - 2) Drainage swales, detention basins including structures with all elevations, and capacity recalculated
 - 3) Sanitary sewer manholes, inverts, and lateral locations
 - 4) Curb, gutter, centerline elevations at locations where the roadway ends and the potential for future roadway expansion exists.
 - 5) Light pole layout and all conduit locations.
 - c) Location of any changes in street, water, sanitary, or storm from design to completed construction.
 - d) The original and any computer drawings shall become the property of the Village.

200.00
Definitions

AASHTO	23	Main Sewer	28
ANSI	23	Manhole	28
APHA	23	Manning Roughness Coefficient ...	28
ASCE	23	Meter	28
ASTM	23	NSF	28
Average Daily Flow	23	Normal Depth.....	28
AWWA	23	OEPA	28
Bedding	23	Outlet Control	28
Catch Basin	23	Overflow	28
Collector Sewer.....	23	Peak.....	29
Corporation Stop.....	23	Rainfall Intensity.....	29
Critical Depth.....	24	Rational Formula	29
Cross-Connection.....	24	Runoff Coefficient	29
Culvert	24	Sanitary Sewer Lateral.....	29
Curb Inlet	24	Sanitary Wastewater	29
Design Storm	24	Sediment	29
Detention/Retention	24	Sediment Basin	29
Discharge	25	Sediment Control Plan	29
Drainage Area	25	Sediment Pollution.....	30
Drop Manhole	25	Service	30
Earth-Disturbing Activity	25	Tailwater	30
Energy Gradient.....	25	Time of Concentration	30
Energy Gradient Line.....	25		
Energy Head.....	25		
Energy Line.....	25		
Erosion	25-26		
Exfiltration	26		
Fire Hydrant.....	26		
Grassed Waterway	26		
Headwall	26		
Headwater	26		
House Connection.....	27		
House Sewer	27		
Infiltration	27		
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Inflow	27		
Inlet Control.....	27		
Interceptor Sewer	27		
Joints	27		
Jurisdiction.....	27-28		
Main	28		

200.00 DEFINITIONS

Interpretation of Terms or Words

Regardless of capitalization, definitions are standard for the intent of these Design Criteria.

AASHTO

American Association of State Highway and Transportation Officials

ANSI

American National Standard Institute

APHA

American Public Health Association

ASCE

American Society of Civil Engineers

ASTM

American Society for Testing and Materials

AVERAGE DAILY FLOW

The total quantity of liquid tributary to a point divided by the number of days of flow measurement.

AWWA

American Water Works Association

BEDDING

The earth or other materials on which a pipe or conduit is supported.

CATCH BASIN

A structure intended to collect surface runoff and direct it into the storm sewer system.

COLLECTOR SEWER

A sewer normally less than 15 inches in diameter that receives wastewater from the sanitary laterals and transports it to the interceptor sewer.

CORPORATION STOP

The fixture tapped into a water main to connect a service to the main.

CRITICAL DEPTH

The depth at which point the control for determining the headwater for culverts changes.

CROSS-CONNECTION

- A. A physical connection through which a supply of potable water could be contaminated or polluted.
- B. A connection between a supervised potable water supply and an unsupervised supply of unknown potability.

CULVERT

A structure which allows surface runoff to flow through a roadway fill or similar obstruction of open flow. Culverts may be corrugated metal pipe, reinforced concrete, etc.

CURB INLET

A specialized catch basin (see catch basin) designed to collect runoff from pavement with curbing.

DESIGN STORM

The expected frequency of the storm for which the capacity of a structure will be equaled or exceeded. The capacity of a storm sewer designed for a 10-year storm has a 1 in 10 chance of being equaled or exceeded in any given year.

DETENTION/RETENTION

The term detention/retention basin refers to the use of a storm water storage facility which will store storm water and release it at a given rate. The objective of a detention/retention facility is to regulate the rate of runoff and control the peak discharges to reduce the impact on the downstream drainage system.

Type of Storm Water Storage Facilities:

- A. Detention Basin or Dry Basin - Dry basins are surface storage areas created by constructing a typical excavated or embankment basin.
- B. Retention Basins or Ponds - Retention basins are permanent ponds where additional storage capacity is provided above the normal water level.
- C. Parking Lot Storage - Parking lot storage is a surface storage facility where an inlet is undersized causing shallow ponding to occur in specific graded areas of the parking lot.
- D. Subsurface Storage - Subsurface storage is a structure constructed below grade for the specific purpose of detaining storm water runoff.

DISCHARGE

The amount of flow carried by a sanitary sewer, culvert, or storm sewer, normally measured in cubic feet per second.

DRAINAGE AREA

The area, in acres, which drains to a particular catch basin, culvert, or similar structure.

DROP MANHOLE

A manhole installed in a sewer where the elevation of the incoming sewer considerably exceeds that of the outgoing sewer; a vertical waterway outside the manhole is provided to divert the wastewater from the upper to the lower level so that it does not fall freely into the manhole except at peak rate of flow.

EARTH-DISTURBING ACTIVITY

Any grading, excavating, filling, or other alteration of the earth's surface where natural or manmade ground cover is destroyed and which may result in or contribute to erosion and sediment pollution.

ENERGY GRADIENT

The slope of the energy line of a body of flowing water with reference to a datum plane.

ENERGY GRADIENT LINE

The line representing the gradient which joins the elevation of the energy head.

ENERGY HEAD

The height of the hydraulic grade line above the centerline of a conduit plus the velocity head of the mean velocity of the water in that section.

ENERGY LINE

A line joining the elevation of the energy heads; a line drawn above the hydraulic grade line by a distance equivalent to the velocity head of the flowing water at each section along a stream, channel, or conduit.

EROSION

- A. The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.
- B. Detachment and movement of soil or rock fragments by wind, water, ice, or gravity.

C. Erosion includes:

1. Accelerated erosion: Erosion much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of the activities of man.
2. Floodplain erosion: Abrading and wearing away of the nearly level land situated on either side of a channel due to overflow flooding.
3. Gully erosion: The erosion process whereby water accumulates in narrow channels during and immediately after rainfall or snow or ice melt and actively removes the soil from this narrow area to considerable depths such that the channel would not be obliterated by normal smoothing or tillage operations.
4. Natural erosion (geological erosion): Wearing away of the earth's surface by water, ice, or other natural environmental conditions of climate, vegetation, etc., undisturbed by man.
5. Normal erosion: The gradual erosion of land used by man which does not greatly exceed natural erosion.
6. Rill erosion: An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed soils.
7. Sheet erosion: The removal of a fairly uniform layer of soil from the land surface by wind or runoff water.

EXFILTRATION

The quantity of wastewater which leaks to the surrounding ground through unintentional openings in a sewer. Also, the process whereby this leaking occurs.

FIRE HYDRANT

A fixture installed throughout urban water distribution systems to provide water for the fire fighting needs.

GRASSED WATERWAY

A broad or shallow natural course or constructed channel covered with erosion-resistant grasses or similar vegetative cover and used to conduct surface water.

HEADWALL

A structure placed at the ends of a culvert to prevent movement of the culvert and reduce erosion.

HEADWATER

The vertical distance from a culvert invert at the entrance to the water surface upstream from the culvert.

HOUSE CONNECTION

The pipe carrying the wastewater from the building to a common sewer. Also called building sewer, house sewer, or sanitary lateral. The house connection begins at the outer face of the building wall.

HOUSE SEWER

A pipe conveying wastewater from a single building to a common sewer or point of immediate disposal. (See House Connection)

INFILTRATION

The discharge of ground waters into sewers, through defects in pipe lines, joints, manholes, or other sewer structures.

INFILTRATION/INFLOW

A combination of inflow wastewater volumes in sewer lines with no way to distinguish either of the two basic sources, and with the same effect as surcharging capacities of sewer systems and other sewer system facilities.

INFLOW

The discharge of any kind of water into sewer lines from such sources as roof leaders, cellars, sump pumps and yard-area drains, foundation drains, commercial and industrial so-called “clean water” discharges, drains from springs and swampy areas, etc. It does not “infiltrate” into the system and is distinguished from such wastewater discharge, as previously defined.

INLET CONTROL

A situation where the discharge capacity of a culvert is controlled at the culvert entrance by the depth of headwater and the entrance geometry, including the area, shape, and type of inlet edge.

INTERCEPTOR SEWER

A sewer which receives the flow from collector sewers and conveys the wastewater to treatment facilities.

JOINTS

The means of connecting sectional lengths of sewer pipe into a continuous sewer line using various types of jointing materials with various types of pipe formations that make possible the jointing of the sections of the pipe into a continuous collecting sewer line. The number of joints depends on the lengths of the pipe sections used in the specific sewer construction work.

JURISDICTION

Any governmental entity, such as town, village, county, sewer district, sanitary district or authority, or other multi-community agency which is responsible for and operates sewer systems, pumping facilities, regulator-overflow structures, and wastewater treatment works.

MAIN

The large water-carrying pipe to which individual user services are connected. Mains are normally connected to each other in a grid-type system.

MAIN SEWER

In larger systems, the principal sewer to which branch sewers and submains are tributary, are also called trunk sewer. In small systems, a sewer to which one or more branch sewers are tributary.

MANHOLE

An opening in a sewer provided for the purpose of permitting a man to enter or have access to the sewer.

MANNING ROUGHNESS COEFFICIENT

The roughness coefficient in the Manning Formula for determination of the discharge coefficient in the Chezy Formula.

METER

The flow-measuring device installed at each service on a distribution system to measure the amount of water consumed by users at that service.

NSF

National Sanitation Foundation

NORMAL DEPTH

The depth at which water will flow in a pipe or channel by virtue of its slope and roughness, based on the Manning formula.

OEPA

Ohio Environmental Protection Agency

OUTLET CONTROL

A situation where the discharge capacity of a culvert is controlled by the barrel of the culvert, rather than the inlet.

OVERFLOW

A pipe line or conduit device, together with an outlet pipe, which provides for the discharge of a portion of sewer flow into receiving water or other points of disposal.

PEAK

The maximum quantity that occurs over a relatively short period of time. Also called peak demand, peak load.

RAINFALL INTENSITY

The amount of rain falling over a specified period of time. Rainfall intensity is usually measured in inches per hour.

RATIONAL FORMULA

The method used to determine the amount of runoff from a specified area of known surface characteristics.

RUNOFF COEFFICIENT

A coefficient used in the Rational Formula to express the ratio of runoff to rainfall.

SANITARY SEWER LATERAL

The sewer line extending from the public sewer to the nearest property line of the property to be served.

SANITARY WASTEWATER

- A. Domestic wastewater with storm and surface water excluded.
- B. Wastewater discharging from the sanitary conveniences of dwellings (including apartment houses and hotels), office buildings, industrial plants, or institutions.
- C. The water supply of a community after it has been used and discharged into a sewer.
- D. See Ordinance 72-19 dated November 20, 1972 for further explanation.

SEDIMENT

Solid material both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by wind, water, gravity, or ice, and has come to rest on the earth's surface above or below sea level.

SEDIMENT BASIN

Barrier, dam, or other suitable detention facility built across an area of waterflow to settle and retain sediment carried by the runoff waters.

SEDIMENT CONTROL PLAN

A written description, acceptable to the approving agency, of methods for controlling sediment pollution from accelerated erosion on a development area of 5 or more contiguous acres or from erosion caused by accelerated runoff from a development area of 5 or more contiguous acres.

SEDIMENT POLLUTION

Failure to use management or conservation practices to abate wind or water erosion of the soil or to abate the degradation of the waters of the state by soil sediment in conjunction with land grading, excavating, filling, or other soil-disturbing activities on land used or being developed for commercial, industrial, residential, or other purposes.

SERVICE

The pipe carrying water to individual houses or other users on a distribution system.

TAILWATER

The vertical distance from a culvert invert at the outlet to the water surface downstream from the culvert.

TIME OF CONCENTRATION

The time for water to reach a certain point in the drainage area. In the case of gutter flow, the time of concentration includes the time to the gutter and the time of flow in the gutter to a specified point.

300.00
Roadways

300.01 General.....31

300.00 ROADWAYS

300.01 General

All street design and layout shall follow the Village of Fort Recovery Construction Standards and Drawings; ODOT Location and Design Manual, Volume One, Roadway Design, latest version; and AASHTO. The most restrictive shall apply as determined by the Village Engineer. These criteria cover design factors and provide guidelines for evaluations of plans and specifications by the political subdivisions having jurisdiction over the review of the plans and specifications. The design shall be consistent with the requirements of AASHTO and ODOT.

600.00
Storm Drainage

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600.00 STORM DRAINAGE

600.01 General

The following Design Criteria are summarized herein to establish practical uniform design of storm sewers for the Village. These criteria cover design factors and provide guidelines for evaluation of plans and specifications by the political subdivisions having jurisdiction over the review of plans and specifications. These Design Criteria are also intended to conform to the standard drawings for storm sewers. Storm sewer design should follow these criteria and Ohio Department of Transportation Location and Design, Volume Two, Drainage Design.

600.02 Storm Sewer and Inlet Grate Design

An adequate storm drainage system shall be constructed for all proposed developments. Natural drainage areas should be closely followed.

Outlets for the storm water runoff for development upstream of the proposed development must be provided. All storm sewer calculations must be submitted to the Village before any approvals will be given.

Storm runoff from urban areas may constitute a large volume of flow. The rational method is the preferred method for estimating storm runoff for areas less than or equal to 200 acres. Once the runoff is determined, the Manning Formula is the preferred method to calculate the capacity of the storm sewer pipes. Storm sewer shall be designed based on the full flow capacity of all pipes being able to carry at least the runoff from a 5-year storm event.

Also, the Hydraulic Grade Line (HGL) should be checked to ensure that a 25-year storm event will not cause ponding water at catch basins and manholes.

The Rational Formula used to compute the runoff that reaches a storm sewer inlet consists of the following:

$$Q = CiA$$

Q = Peak rate of runoff in cubic feet per second (cfs)

C = A coefficient expressing the ratio of runoff to the average rainfall rate during the time of concentration

i = Intensity of rainfall, in inches per hour

A = Drainage area, in acres

Other methods for determination of peak runoff rates may be used upon approval from or by request of the Village.

TABLE 6.1
RUNOFF COEFFICIENT - C

<u>Predominant Land Use</u>	
Business:	
Downtown Area	.80
Neighborhood Area	.70
Residential:	
Single-Family Areas	.40
Multi-Family Areas	.60
Industrial:	
Light Areas	.70
Heavy Areas	.80
Parks, Cemeteries	.30
Playgrounds	.35
Railroad Yard Areas	.35
Row Crops or Open Land	.25
 <u>Surface Characteristics</u>	
Street:	
Asphalt	.90
Concrete	.90
Drives and Walks	.90
Roofs	.85
Lawns	
Flat -- 2% or less	.25
Average -- 2% to 7%	.35
Steep -- 7% or greater	.40

Table 6.1

Lists values of “C” for several land uses and surface characteristics. If more than one land use is present in a particular drainage area, a composite “C” value should be computed to represent the site.

Figure 6.1
Time of Concentration Worksheet
(to be utilized when overland flow is less than 1,000 feet)

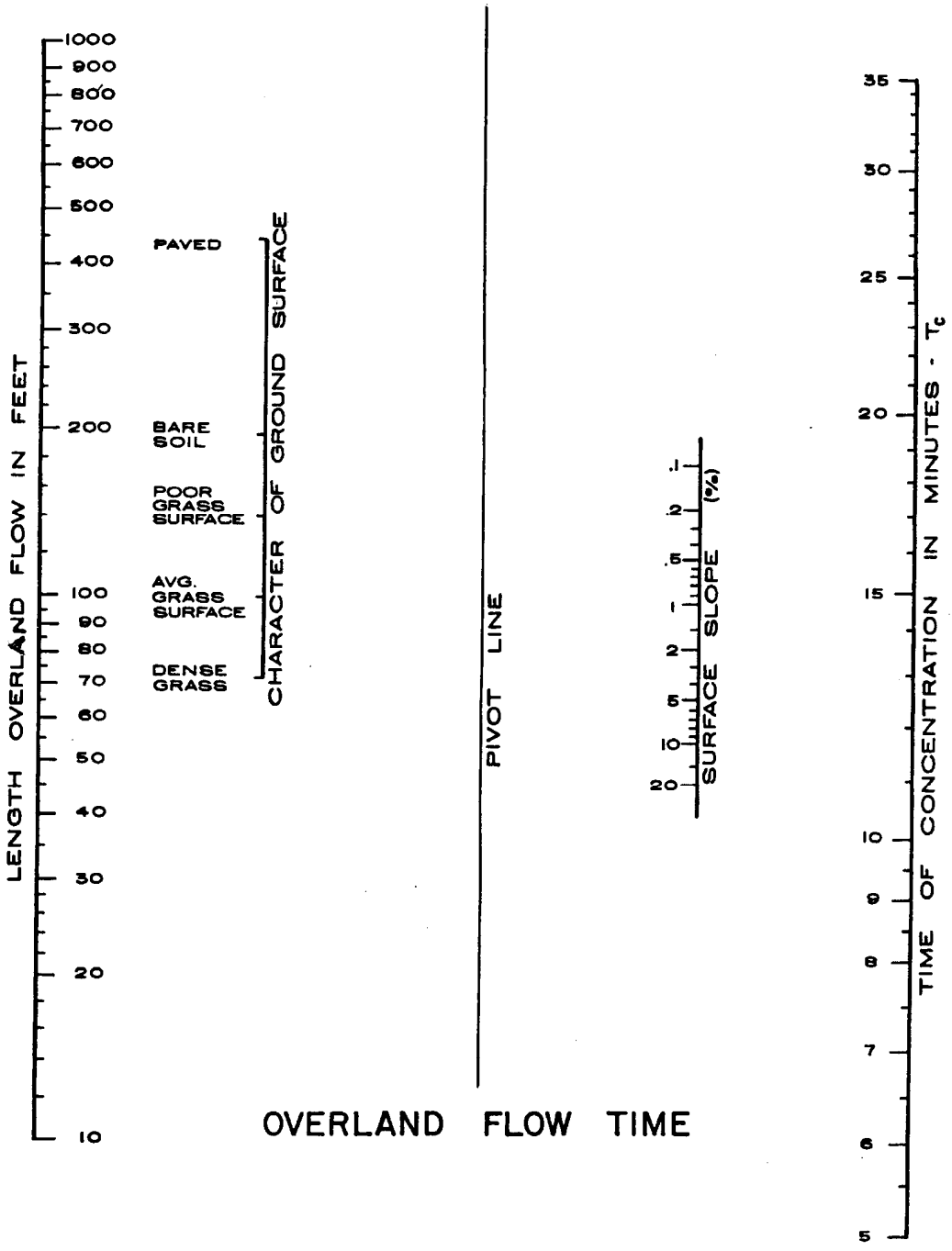


Figure 6.2
Time of Concentration Worksheet, Derived from TR-55
(to be utilized when overland flow is greater than 1,000 feet)

Project: _____ By: _____ Date: _____
 Location: _____ Checked: _____ Date: _____
 Circle one: Present Developed _____
 Circle one: T_c T_t through subarea _____
 NOTES: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Overland (Sheet) flow (Applicable as part of T_c computation only) Segment ID			
1. Surface description: paved or unpaved			
2. Manning's roughness coeff., n (See Figure 6.3).....			
3. Flow length, L (total $L \leq 300$ ft for unpaved, $L \leq 100$ ft for paved)	ft		
4. Two-yr 24-hr rainfall, P_2	in	2.16	2.16
5. Land slope, s	ft/ft		
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t	hr		+ <input type="text"/> = <input type="text"/>
Shallow concentrated flow Segment ID			
7. Surface description: paved or unpaved			
8. Flow length, L.....	ft		
9. Watercourse slope, s	ft/ft		
10. Average velocity, $V_{unpaved} = 16.1345(s)^{0.5}$, or $V_{paved} = 20.3282(s)^{0.5}$. ft/s			
11. $T_t = \frac{L}{3600 V}$ Compute T_t	hr		+ <input type="text"/> = <input type="text"/>
Channel flow Segment ID			
12. Cross sectional flow area, a	ft ²		
13. Wetted perimeter, p_w	ft		
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft		
15. Channel slope, s	ft/ft		
16. Manning's roughness coeff., n.....			
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V	ft/s		
18. Flow length, L.....	ft		
19. $T_t = \frac{L}{3600 V}$ Compute T_t	hr		+ <input type="text"/> = <input type="text"/>
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr		<input type="text"/>

Figure 6.3

Surface Description	n ¹ Coeff.
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated Soils: Residue cover <= 20%	0.06
Residue cover >= 20%	0.17
Grass: Short grass prairie	0.15
Dense grasses ²	0.24
Bermuda grass	0.41
Range (natural)	0.13
Woods: ³ Light underbrush	0.40
Dense underbrush	0.80
¹ The n values are a composite of information compiled by Engman (1986). ² Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures. ³ When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.	

Source: *TR-55, Urban Hydrology for Small Watersheds*, U.S. Dept. of Agriculture, Soil Conservation Service, Engineering Division, June 1986.

Table 6.2
Intensity – Duration – Frequency Table

Hours	Minutes	Return Frequency – Rainfall Intensity (in/hr)					
		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
.08	5*	4.15	5.54	6.25	7.12	7.82	8.54
.17	10	3.35	4.51	5.08	5.87	6.20	6.97
.25	15	2.90	3.81	4.37	5.08	5.57	6.08
.33	20	2.50	3.29	3.81	4.46	4.80	5.36
.50	30	1.86	2.54	2.97	3.50	3.86	4.28
.75	45	1.40	1.88	2.20	2.60	2.88	3.22
1	60	1.12	1.52	1.78	2.10	2.34	2.61
2	120	0.68	0.91	1.08	1.27	1.42	1.55
3	180	0.50	0.675	0.80	0.94	1.05	1.16
6	360	0.30	0.40	0.48	0.56	0.62	0.68
12	720	0.16	0.23	0.27	0.37	0.36	0.39
24	1440	0.09	0.13	0.15	0.18	0.20	0.22

* Minimum Time of Concentration

** Interpolation is acceptable to obtain values not provided in the above table.

Table 6.2

This can be used to determine values of “I” for several storm frequencies.

The Manning Formula, used to compute flow in open conduits, consists of the following:

$$Q = \frac{1.486}{n} R^{2/3} S^{1/2} A$$

Q = Flow in cubic feet per second (cfs)

n = Coefficient of conduit roughness (n = 0.013)

R = Hydraulic radius, ratio of flow area to wetted perimeter in feet

S = Channel or pipe slope, in feet per feet

A = Area of Cross-section of flow in square feet

The design of storm sewers in the Village of Fort Recovery shall be outlined as follows.

- A. Prepare a contour map of the drainage area including the surrounding area, drainage limits, and direction of surface flow.
- B. Divide the area into the subareas tributary to the proposed sewer inlets. These inlets should be located at reversals of road grade from negative to positive and at street intersections. A maximum distance of 300 feet between catch basins will be allowed along long street grades.
- C. Determine the acreage and imperviousness of each area.
- D. Calculate the required capacity of each inlet using the appropriate time of concentration, the tributary area and the rational method.
- E. Beginning at the highest elevation, compute the flow to be carried by each line. The time of concentration for each line other than the first in a series is the sum of the time of concentration to the inlet next upstream and the flow time in the connecting pipe. Where more than two lines meet, the time of concentration to be used for the succeeding line is the longest time in the lines meeting. Each line will thus require calculation of time of concentration, tributary area (all upstream areas), and flow.
- F. Select tentative pipe sizes and grades using the Manning Formula. Each line must be selected in order since the time of concentration for subsequent lines will be dependent upon the time of flow in all upstream lines.
- G. Minimum cover requirements specified by ASTM specifications must be met.
- H. Figure 6.4, Computation for Storm Sewer Design, may be used for storm sewer calculation.

600.03 Minimum Diameter

The minimum diameter of storm sewer pipe shall be 12 inches. The diameter shall be increased as necessary according to the design analysis.

600.04 Minimum Cover

The minimum cover over storm sewer pipe shall be 2 feet unless otherwise approved by the Village Engineer. Cover is measured from the top of pipe to the finished grade directly above the pipe.

600.05 Minimum Slope

The minimum recommended slope for storm sewers shall be 0.10 foot per 100 feet, unless a greater slope is required to obtain the minimum mean velocity. Culverts may be installed on flatter grades as approved by the Village Engineer.

600.06 Minimum Velocity

The absolute minimum mean velocity for all storm sewers shall be 2.0 feet per second when flowing full based on Manning's Formula using an "n" value of 0.013. Use of other "n" values will be considered if deemed justifiable on the basis of extensive field data. The desirable minimum velocity is 3.0 feet per second based on the same criteria.

600.07 Maximum Velocity

The maximum velocity of all storm sewers shall be 10 feet per second. If the velocity is greater than 10 feet per second, provisions should be made to protect against displacement and erosion of the pipe.

600.08 Maximum Headwater

The maximum allowable headwater depth for culverts shall be 2 feet below pavement surfaces and/or finish floor elevations.

600.09 Manholes

Manholes shall be installed at the end of each line, at all changes in grade, size, alignment, and at all pipe intersections. Manholes shall be installed at distances not greater than 400 feet. Intervals of more than 400 feet may be approved in sewers 42 inches and larger. Manholes may be either poured in place or precast concrete. Concrete construction shall conform to ASTM C-478.

The flow channel through manholes should be made to conform in shape, slope, and smoothness to that of the sewers.

All manhole covers shall be adjusted to grade by the use of no more than 12 inches of precast adjusting collars.

Manholes shall be consistent with those shown in the standard drawings.

600.10 Manhole Minimum Diameter

Manholes shall be constructed large enough to allow access to all sewers. The minimum diameter of manholes shall be 48 inches. Where large sewers require the use of manholes diameters greater than 48 inches, the manhole shall be returned to the 48-inch diameter as soon as practical above the sewer crown. Manhole openings of 24 inches or larger are recommended for easy access with safety equipment and to facilitate maintenance.

600.11 Catch Basins

Curb inlets shall be placed at all low points, points of change to a flatter street grade, the dead end of descending streets, and at the Point of Curvature and Point of Tangency of all intersection radius curves where the street grade descends toward the radius curve and at all intersections. The basis for the design and spacing of curb inlets shall conform to the Bureau of Roads Hydraulic Engineering Circular No. 12, "Drainage of Highway Pavements".

Under normal conditions, curb inlets shall be placed on both sides of the street at intervals indicated by the street grade. Approximate spacing ranges from 150 feet to 300 feet maximum under normal conditions for the spread of flow-in gutters.

Catch basins not placed in the street shall be selected and placed so that they blend with the surrounding and not appear unsightly.

Curb inlets shall be placed on the property lines if at all possible.

Catch basin types shall be consistent with the types shown in the standard drawings.

600.12 Basis of Culvert Design

The basis of design for highway culverts shall be the Bureau of Roads Hydraulic Engineering Circular No. 5, "Hydraulic Charts for the Selection of Highway Culverts". Design shall be based on a 25-year storm for full flow capacity and an overtopping capacity of at least a 100-year storm.

600.13 Open Drainage Ditches

The basis of design for drainage ditches shall be the Manning Formula, as defined in Section 600.02. Figure 6.2 may be used to determine the value of "n", Manning's Roughness Coefficient, to be used in the calculations. These calculations of open ditch capacity should be provided to the reviewing agency along with the construction drawings.

TABLE 6.3

<u>CHANNEL MATERIAL</u>	<u>n</u>
Vitrified clay	0.014
Cast iron pipe	0.015
Smooth earth	0.018
Firm gravel	0.023
Corrugated metal pipe	0.022
Natural channels in good condition	0.025
Natural channels with stones and weeds	0.035
Very poor natural channels	0.060

600.14 Channel Protection

Channel protection material shall be placed at pipe outlets and other areas of high velocity flow to prevent erosion. The type, location and depth of the protective material shall be reviewed and approved by the Village.

600.15 Storm Water Detention Basin/Retention Pond Size Requirements

It is recognized that the outlets for storm water runoff in the Village are very limited. These outlets do not have the capacity to receive and convey the increased runoff resulting from rapid development around the Village.

Developer/Owners must participate in providing detention storage to eliminate the excessive runoff during heavy storm periods. Where impervious areas are planned or contemplated, it is the intent that detention be provided as required by the provisions hereinafter set forth. It is proposed that well maintained landscaped areas would be provided to act jointly as detention reservoirs and recreation facilities as aesthetic focal points in new developments. Other control methods to regulate the rate of storm water discharge which may be acceptable, include detention on parking lots, streets, lawns, underground storage, oversized storm sewers with restricted outlets, etc. However, these methods must be approved by Village officials.

It is recognized that in order to better serve the long-range interests of the Village and the surrounding area, comprehensive basin-wide planning for runoff control should be formulated, adopted, and implemented. Comprehensive planning is far more beneficial than small, on-site detention areas, although on-site detention does provide protection and is acceptable for compliance.

Detention of storm water shall be required for all developments and proposed development which would alter storm runoff as to flow, velocity or time of concentration. These basins are required to detain the peak post-developed runoff which exceeds the runoff created by a 5-year storm under predeveloped condition. The Village reserves the option to require more stringent detention requirements based upon the estimated capacity of the existing storm sewers. All calculations must be submitted to the Village for approval. Calculations must include a profile of the existing storm sewer from the proposed connection point to a point 500 feet downstream or the first outfall structure nearest to or beyond the required 500 feet. The calculated full flow capacity of the existing storm water outfall shall also be provided.

Design of storm water detention facilities shall be based on the following:

- A. The Village suggests that runoffs and capacities are to be computed using the Rational Method and Manning Formula as determined in Section 600.02 of this document for areas less than 200 acres.
- B. The release rate shall not be greater than the storm runoff created by the pre-developed site during a five-year frequency storm. The allowable outflow rate used in Figure 6.5 "Computation Worksheet for Detention Storage Using Rational Method" is derived using a C coefficient of 0.2 and a rainfall intensity of 3.81 inches based on 5 years with a duration of 15 minutes. Consideration may be given for different intensity and coefficient based on the situation.

- C. Storage volume shall not be less than the storm runoff created by the post-developed site during a 100-year storm event. The storage volume may be computed by using Figure 6.5, “Computation Worksheet for Detention Storage Using Rational Method”.

The percentage of impervious area is used to calculate detention required. Generally 30% may be used for single-family residences, 50% for multi-family residences, 70% for industrial sites, and 90% for commercial property. If another percentage would be more appropriate for the individual site, the more appropriate number should be used.

The Runoff Coefficient C for various storm durations is given in Table 6.4 for each land use.

Table 6.4

Storm Duration t_d (hrs)	30% of Impervious Area	50% of Impervious Area	70% of Impervious Area	90% of Impervious Area
0.17	0.28	0.36	0.44	0.51
0.33	0.36	0.45	0.53	0.61
0.50	0.42	0.50	0.59	0.67
0.67	0.46	0.54	0.63	0.71
0.83	0.49	0.57	0.66	0.74
1.0	0.51	0.59	0.68	0.77
1.5	0.56	0.65	0.73	0.82
2.0	0.59	0.69	0.76	0.84
3.0	0.64	0.72	0.79	0.86

- D. Outlet size shall be determined by using the orifice equation as defined by:

$$Q = CA\sqrt{2gH}$$

$$C = 0.6$$

A = Area in square feet

$$g = 32.2 \text{ ft./s}^2$$

H = height from the center of the pipe to the top of the water surface

- E. Special detention consideration may be given by the Village Engineering Department for high impervious areas that are smaller than 2 acres in size.

An emergency overflow from the basin to a major storm system must be provided to protect the facility and adjacent properties. The designer should investigate the capacity of the downstream drainage facilities to determine if they will be adequate to handle the design

flow from this particular development. If the downstream facilities are inadequate, it may be necessary to provide on-site retention or ponding basins to limit the flow to an amount which the downstream system can accept.

Figure 6.5

COMPUTATION WORKSHEET FOR DETENTION STORAGE USING RATIONAL METHOD

Project Information

Project _____

Designer _____

Determination of Allowable Outflow Rate

Watershed Area (A) _____ acres

Allowable Outflow Rate (O) _____ cfs

Storm Duration t_d (hrs)	Runoff Coefficient C _____% Impervious	Rainfall Intensity i (inches/hr)	Post Inflow Rate (100 year) $I(t_d)$ (CiA) (cfs)	Pre Allowable Outflow Rate (5 year) O (.2)(3.65)(A) (cfs)	Storage Rate $I(t_d)-O$ (cfs)	Required Storage $[I(t_d)-O]t_d/12$ (acre-ft)
0.17		6.97				
0.33		5.36				
0.50		4.28				
0.67		3.58				
0.83		3.05				
1.0		2.61				
1.5		2.01				
2.0		1.55				
3.0		1.16				

600.16 Detention Basin/Retention Pond Guidelines

A. RECOMMENDATIONS FOR DRY DETENTION BASINS

1. Where water quality during dry weather periods in a small basin would be a potential problem due to lack of adequate dry weather flow, direct pollution from surface water runoff, or high nutrients in the flow; the basin should be designed to remain dry except when in flood use.
2. Dry detention basins shall be designed to minimize the wetness of the bottom so that water does not remain standing in the bottom; thereby harboring insects and limiting the potential use of the basin. This shall be accomplished by means of a concrete low flow channel between inlet and outlet structures. Minimum slope shall be no less than 0.4 percent. A possible alternative upon Village approval to a concrete low flow channel would be an underdrain. In this case, a minimum of 1 percent slope shall exist between inlet and outlet structures and the surface above the underdrain shall be grass sod.
3. The detention basin should be designed to have a multi-purpose function. Recreational facilities, aesthetic qualities, etc., as well as flood water storage should be considered in planning the basin.
4. Side slopes shall be 3 to 1 or flatter.
5. There shall be a minimum of a 3-foot berm at 2 percent between right-of-way and top basin slopes.

B. RECOMMENDATIONS FOR BASINS CONTAINING PERMANENT WATER

1. In order to provide better management for water quality, retention basins containing permanent lakes should have a water area of at least one-half acre. The lake area should be an average depth of 5 feet to inhibit weed and insect growth, and should have no extensive shallow areas. A system to augment storm flows into the lake with water from other sources should be provide to enhance the water quality, if necessary. These systems would include the use of public water supplies or wells on site.
2. In excavated lakes, the underwater side slopes in the lake should be stable.
3. A safety ledge 4 to 6 feet in width is recommended and should be installed in all lakes approximately 18 to 24 inches below the permanent water level to provide a footing if people fall into the water. In addition, there shall be a minimum of a 5-foot berm at 2 percent slope beginning at least 1 foot above normal pond elevation. The slope between two ledges should be stable and of a material which will prevent erosion due to wave action (see Figure 6.6). Walkways consisting of a non-erosive material should be provided in areas where extensive population use tramples growth. One

area in particular would be along the shoreline of a heavily fished lake. Side slopes above the berm shall be 3 to 1 or flatter.

4. Side slopes of the pool shall be 2 to 1 or flatter.
5. To obtain additional recreational benefits from developed water areas and provide for insect control, ponds may be stocked with fish. For best results, stocking should follow recommendations for warm water sport fishing by the Ohio Department of Conservation, Division of Fisheries, or similar organizations.
6. Periodic maintenance will be required in lakes to control weed and larval growth. The basin should also be designed to provide for the easy removal of sediment which will accumulate in the lake during periods of basin operation. A means of maintaining the designed water level of the lake during prolonged periods of dry weather is also recommended. One suggested method is to have a water hydrant near the pond site.
7. No rubble or construction refuse shall be disposed of at any time.
8. No pond with a permanent water elevation shall be placed within one mile of a runway approach or landing approach to an airport.

C. RECOMMENDATIONS COMMON TO EITHER DRY DETENTION BASINS OR RETENTION BASINS WITH PERMANENT WATER

1. A 20-foot-wide Village easement shall be provided for access to all storm water storage ponds.
2. All basins shall have an emergency overflow.
3. All excavated spoils should be spread so as to provide for aesthetic and recreational features such as sledding hills, sports fields, etc. Slopes of 4 horizontal to 1 vertical are recommended except where recreation uses call for steeper slopes. Even these features should have a slope no greater than 3 horizontal to 12 vertical for safety, minimal erosion, stability, and ease of maintenance.
4. When conduits are used for the outlet of the reservoir, they shall be protected by bar screens as approved by the Village or other suitable provisions so that debris or similar trash will not interfere with the operation of the basin.
5. Safety screens should also be provided for any pipe or opening to prevent children or large animals from crawling into the structures. For safety, a suggested maximum opening is 6 inches.
6. Grass or other suitable vegetative cover should be maintained throughout the entire reservoir area. Grass should be cut regularly no less than five times a year.

7. Debris and trash removal and other necessary maintenance should be performed after each storm to assure continued operation in conformance to the design.

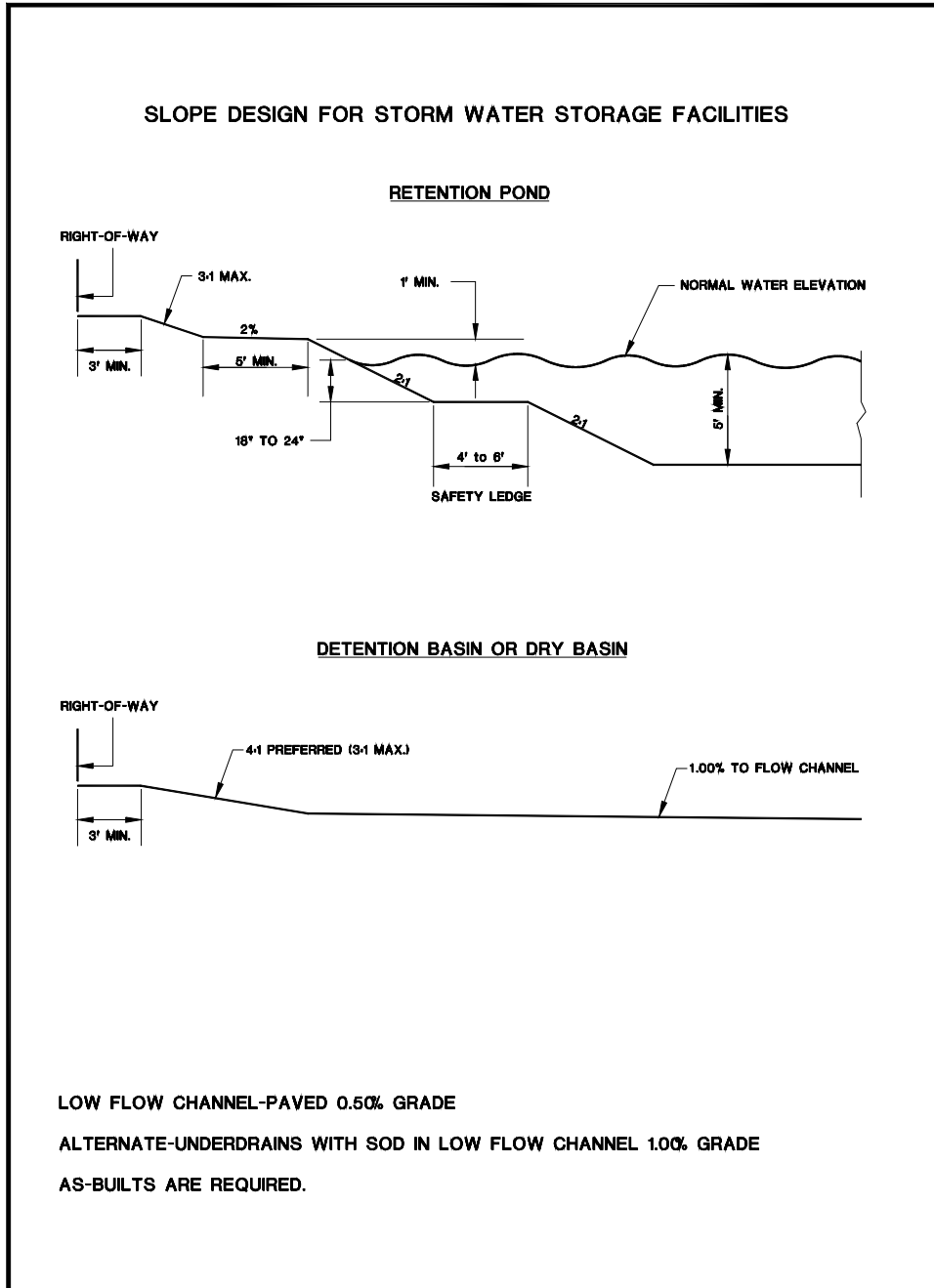
D. INSPECTION OF BASINS

1. Record drawings will be required for all basins to assure compliance with all applicable requirements.
2. The Village may inspect all private detention basins and if problems exist, report these to the owner. The owner shall be given a reasonable amount of time to correct the problem, weather permitting.
3. The Village shall perform such work as it deems necessary and charge owner if the owner fails to correct the problem.

E. DETENTION BASIN OWNERSHIP

1. Detention basin maintenance and ownership shall remain private unless the Village accepts ownership through approval by the Village Council.

Figure 6.6



600.17 Site Grading

A. SITE GRADING PLAN

Site grading plans shall be prepared with 1 foot existing and proposed contours showing all lots or lots having proper drainage. Site grading plans for developments shall also have proposed building pad elevations to ensure proper drainage of the development. Individual site plans within a development must conform to the subdivision drainage site plan.

B. CUTS AND FILLS

No land shall be graded, cut, or filled so as to create a slope exceeding a vertical rise of 1 foot for each 3 feet of horizontal distance between abutting lots, unless a retaining wall of sufficient height and thickness is provided to retain the graded bank. Major cuts, excavation, grading, and filling, where the same material changes the site and its relationship with surrounding areas, shall not be permitted as such excavation, grading, and filling will result in a slope exceeding a vertical rise of 1 foot for each 3 feet of horizontal distance between abutting lots or between adjoining tracts of land, except where adequate provision is made to prevent slides and erosion by cribbing and retain walls.

C. COMPACTION OF FILL

All fill shall be compacted to a density of 90% or greater. Inspection of fill shall be conducted by the Village Engineer.

D. RETAINING WALLS

Retaining walls may be required whenever topographic conditions warrant or where necessary to retain fill or cut slopes within the right-of-way. Such improvements shall require the approval of the Village Engineer.

E. FILLING OF EXISTING AREAS

No existing area shall be filled or graded to adversely affect adjoining properties as determined by the Village Engineer.

600.18 Responsibility for Maintenance of Private Storm Water Facilities and Drainage on Private Property

- A. Any owner or possessor of private property upon which storm water drainage facilities, whether man-made or natural, exist for the purpose of collecting, conveying, retaining, or detaining storm water within that property and which are not public facilities, shall be responsible for the maintenance of these facilities to ensure proper operation.

- B. The Village shall not be responsible for resolving drainage problems on private property where such problems pose a nuisance, do not impact the operation of the overall storm water management system of the Village, or do not involve the function of public facilities. Private property owners bear the responsibility to remedy these types of problems.
- C. The Village may cooperate with private property owners to extend public facilities of the storm water management system to the private property, to enable the resolution of these drainage problems if the Village Council decides that suitable resources are available, the project can be accommodated within the context of the Village's overall Capital Improvement Plan, and the Village Engineer determines that the Village's storm water management system is capable of handling any additional flows that may be placed in the system as a result of implementing the proposed solution.

600.19 Runoff from Upstream Drainage Areas

The runoff from drainage areas upstream of the proposed development or improvement must be provided with an unobstructed outlet and an emergency overflow. The outlet should provide the capacity needed to carry the runoff from a 5-year storm in its existing land use condition.

600.20 Runoff onto Contiguous Properties

All site drainage shall be contained on-site. No land altering activity shall disperse runoff into areas adjacent to the area experiencing development.

600.21 Soil Sediment Pollution Control Regulations

- A. The purpose of the regulation is to prevent the undue polluting of public waters by sediment from accelerated soil erosion and accelerated storm water runoff caused by earth-disturbing urban areas. Control of such pollution will promote and maintain the health, safety and general well-being of all life and inhabitants herein the Village.

B. SCOPE

This shall apply to earth-disturbing activities on areas of land used or being developed for commercial, industrial, residential, recreational, public service or other non-farm purposes which are within the Village unless otherwise excluded within or unless expressly excluded by state law.

C. DISCLAIMER OF LIABILITY

Neither submission of a plan under provisions of this article nor compliance with provisions of these regulations shall relieve any person from responsibility for damage to any person or property otherwise imposed by law, nor imposed any liability upon the Village or its appointed representative for damage to any person or property.

D. SEVERABILITY

If any clause, section, or provision of this resolution is declared invalid or unconstitutional by a court of competent jurisdiction, validity of the remainder shall not be affected thereby.

E. REQUIREMENTS

No person shall cause or allow earth-disturbing activities on a development area except in compliance with the standards and criteria and the applicable item listed below:

1. When a proposed development area consists of five (5) or more acres and earth-disturbing activities are proposed for the whole area or any part thereof, the responsible person shall develop and submit for approval a sediment control plan prior to any earth-disturbing activity. Such a plan must contain sediment pollution control practices so that compliance with other provisions of this resolution will be achieved during and after development. Such a plan shall include specific requirements established by regulation.
2. When a proposed development area involves less than five (5) acres, it is not necessary to submit a sediment control plan; however, the responsible person must comply with the other provisions of these regulations. All earth-disturbing activities shall be subject to surveillance and site investigation to determine compliance with the standards and regulations.

F. STANDARDS AND CRITERIA

In order to control sediment pollution of water resources, the owner or person responsible for the development area shall use conservation planning and practices to maintain the level of conservation established by one or more of the following standards:

1. Timing of Sediment-Trapping Practices - Sediment control practices shall be functional throughout earth-disturbing activity. Settling facilities, perimeter controls, and other practices intended to trap sediment shall be implemented as the first step of grading and within seven (7) days from the start of earth disturbing activities. They shall continue to function until the upslope developed area is restabilized.
2. Stabilization of Denuded Areas - Denuded areas shall have soil stabilization applied within seven (7) days if they are to remain dormant for more than forty-five (45) days. Permanent or temporary soil stabilization shall be applied to denuded areas within seven (7) days after final grade is reached on any portion of the site, and shall also be applied within seven (7) days to denuded areas which may not be final grade, but will remain dormant (undisturbed) for longer than forty-five (45) days.

3. Settling Facilities - Concentrated storm water runoff from denuded areas shall pass through a sediment-settling facility. The facility's storage capacity shall be 67 cubic yards per acre of drainage area.
4. Sediment Barriers - Sheet flow runoff from denuded areas shall be filtered or diverted to a settling facility. Sediment barriers such as sediment fence or diversions to settling facilities shall protect adjacent properties and water resources from sediment transported by sheet flow.
5. Storm Sewer Inlet Protection - All storm sewer inlets which accept water runoff from the development shall be protected so that sediment-laden water from soils that are not permanently stabilized will not enter the storm sewer system without first being filtered or otherwise treated to remove sediment, unless the storm sewer system drains to a settling facility.
6. Working in Crossing Streams
 - a. Streams including bed and banks shall be restabilized immediately after in-channel work is completed, interrupted, or stopped. To the extent practicable, construction vehicles shall be kept out of streams. Where in-channel work is necessary, precautions shall be taken to stabilize the work area during construction to minimize erosion.
 - b. If a live (wet) stream must be crossed by construction vehicles regularly during construction, a temporary stream crossing shall be provided.
7. Construction Access Routes - Measures shall be taken to prevent soil transport onto surfaces where runoff is not checked by sediment controls, or onto public roads.
8. Sloughing and Dumping
 - a. No soil, rock, debris or any other material shall be dumped or placed into a water resource or into such proximity that it may readily slough, slip, or erode into a water resource unless such dumping, or placing is authorized by the approving agency, and, when applicable, the U.S. Army Corps of Engineers, for such purposes, including but not limited to, constructing bridges, culverts, and erosion control structures.
 - b. Unstable soils prone to slipping or land sliding shall not be graded, excavated, filled or have loads imposed upon them unless the work is done in accordance with a qualified professional engineer's recommendations to correct, eliminate, or adequately address the problems.
9. Cut and Fill Slopes - Cut and fill slopes shall be designed and constructed in a manner which will minimize erosion. Consideration shall be given to the length and

steepness of the slope, soil type, upslope drainage area, groundwater conditions, and slope stabilization.

10. Stabilization of Outfalls and Channels - Outfalls and constructed or modified channels shall be designed and constructed to withstand the expected velocity of flow from a post-development, 10-year frequency storm.
11. Establishment of Permanent Vegetation - A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized.
12. Disposition of Temporary Practices - All temporary erosion and sediment control practices shall be disposed of within thirty (30) days after final site stabilization is achieved or after the temporary practices are no longer needed, unless otherwise authorized by the approving agency. Trapped sediment shall be permanently stabilized to prevent further erosion.
13. Maintenance - All temporary and permanent erosion and sediment control practices shall be designed and constructed to minimize maintenance requirements. They shall be maintained and repaired as needed to assure continued performance of their intended function. The person or entity responsible for the continued maintenance of permanent erosion controls shall be identified to the satisfaction of the approving agency.

The standards are general guidelines and shall not limit the right of the approving agency to impose additional, more stringent requirements, nor shall the standards limit the right of the approving agency to waive individual requirements.

Erosion and sediment control practices used to satisfy the standards shall meet the specifications in the current edition of water management and sediment control for urbanizing areas (Soil Conservation Service, Ohio).

G. MAINTENANCE

The property owner shall assume responsibility for maintenance of structures and other facilities designed to control erosion.

600.22 Railroad and Highway Crossing

When boring is required, the casing pipe shall be designed to meet the requirements of the authority having jurisdiction and in compliance with the Village of Fort Recovery Construction Standards and Drawings. The size of the casing pipe shall be at least 4 inches greater than the largest outside diameter of the sewer pipe, joints, or couplings.

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800.00 WATER DISTRIBUTION

800.01 General

The following Design Criteria are summarized herein to establish practical, uniform design of water distribution systems for the Village. These criteria cover design factors and provides guidelines for evaluation of plans and specifications by the political subdivision having jurisdiction over the review of plans and specifications. These Design Criteria are also intended to conform to the construction standards and drawings for water systems and the regulations of the OEPA.

800.02 Basis of Design

The basis of design for water distribution systems shall be the Hazen-Williams Equation, an empirical formula for estimating pipe flow:

$$V = 1.318CR^{0.63}S^{0.54}$$

V = Velocity in feet per second

C = Roughness Coefficient

R = Hydraulic Radius (pipe diameter in feet for pipes flowing full) in feet

S = Head loss per unit length of pipe

Distribution systems shall be designed for the estimated maximum day rate of flow, or the fire flow plus the estimated average day rate of flow, whichever is more demanding.

800.03 Minimum Pressure

The minimum allowable pressure in the water distribution system, at times of no fires, shall be 50 pounds per square inch in all mains and 8 pounds per square inch at the most remote house fixture in the system. The minimum fire flow for design purposes shall be 600 gallons per minute at a residual pressure of 20 pounds per square inch.

800.04 Maximum Velocity

The maximum velocity of the water in the system shall be 10 feet per second.

800.05 Water Mains

The value of C to be used in the Hazen-Williams Equation shall be C=140. The minimum size of water mains shall be 6 inches in diameter. Dead-ending mains shall be minimized by looping of all mains. Where dead-ends occur, they should be provided with a fire hydrant for flushing purposes.

The minimum depth of water mains shall be 4 feet 6 inches from the top of the pipe to the finished grade elevation. The maximum depth of water mains shall be 5 feet and 6 inches

from the top of the main to the finished grade elevation, except where utilities must be underpassed or as directed by the Village.

800.06 Water Service Lines

The value of C to be used in the Hazen-Williams Equation shall be $C = 130$. The minimum diameter of service lines shall be 3/4 inch, unless the distance from the main to the meter exceeds 120 feet, where the minimum service line diameter shall be 1 inch. Table 8.1 lists required minimum service sizes as determined by residential population. Fire hydrant services shall have a minimum diameter of 6 inches, but shall be no larger than the water main. For services larger than 2 inches, a tapping sleeve and valve must be installed. Table 8.2 shows the maximum size of service taps allowed for various sizes of water mains.

TABLE 8.1

**MINIMUM SIZE -- WATER SERVICES AND METERS
 RESIDENTIAL AREAS**

<u>No. of Families</u>	<u>Service Size (inches)</u>	<u>Meter Size (inches)</u>
1	3/4	5/8 x 3/4
2-5	1	1
6-8	1-1/2	1 1/2
9-12	2	1 1/2
13-20	2	2
21-50	4	3
51-115	4	4

TABLE 8.2

MAXIMUM SIZE - WATER SERVICE TAPS

Pipe Diameter (inches)	6	8	10	12
Tap Sizes (inches)	1	1-1/4	1 1/2	2

The minimum depth of service lines shall be 3 feet and 6 inches from the top of the line to the finished grade elevation. The maximum depth of service lines shall be 5 feet from the top of the line to the finished grade elevation, except where utilities must be underpassed.

A curb stop and curb box shall be installed between the curb and sidewalk or between the walk and right-of-way line where there is not a curb lawn for each house and apartment unit unless otherwise approved the Village. The curb stop box shall be plumbed and centered over the curb stop and shall be free of debris. House service installations shall conform to the Standard Drawings.

800.07 Restraining and Concrete Blocking for Water Mains

All water main bends of more than 5 degrees shall be securely blocked against movement by using concrete blocking placed against undisturbed earth. Dimensions and quantities of blocking shall be as shown on the Standard Drawings. All mechanical bends, tees, etc. shall be restrained using mechanical restraining joints.

800.08 Fire Hydrants

Fire hydrants shall be placed at all intersections and never more than 500 feet apart.

Fire hydrants shall be installed with a break flange located approximately 2 inches above the ground level to protect against flooding in case of impact to hydrant. Fire hydrants shall be consistent with the Standard Drawings.

A valve must be installed on all fire hydrant service lines. All connections between the main and the hydrant shall be restrained by anchoring pipe, tie bolts, or retainer glands.

800.09 Meter Installation

Meter installation for individual services shall be consistent with the Standard Drawings. Table 8.3 lists required meter sizes as determined by Maximum Flow Demand for Commercial-Industrial applications. Meters must be installed prior to connecting the service to the main and before service starts. No common meters will be approved. All meters must have remote readers.

TABLE 8.3

METER SIZE FOR COMMERCIAL-INDUSTRIAL APPLICATIONS

<u>Maximum Flow Demand (GPM)</u>	<u>Meter Size (inches)</u>
20	5/8 x 3/4
30	3/4
50	1
100	1 1/2
160	2
320	3
500	4
1000	6

800.10 Valves

Valves shall be located at all branches of cross and tee intersections and at intervals not to exceed 800 feet in residential districts and 500 feet in commercial and industrial districts.

800.11 Backflow Prevention

All commercial, industrial, and other OEPA required users shall provide adequate backflow prevention between the public water system and the customer's system. These devices shall be approved by OEPA and the Village prior to installation. These devices shall be tested and inspected annually. These devices shall be repaired or replaced if they do not meet the testing requirements. An annual report shall be submitted to the Village detailing the testing procedures and results.

800.12 Railroad and Highway Crossings

When boring is required, the casing pipe shall be designed to meet the requirements of the authority having jurisdiction and in compliance with the Village of Fort Recovery Construction Standards and Drawings. The size of the casing pipe shall be at least 4 inches greater than the largest outside diameter of the sewer pipe, joints, or couplings.

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900.00 SANITARY SEWERS

900.01 General

The following Design Criteria are summarized herein to establish practical, uniform design of sanitary sewers within the Village. These criteria cover design factors and approved guidelines for evaluation of plans and specifications by the political subdivisions having jurisdiction over the review of plans and specifications. These design factors are consistent with the requirements of the OEPA. If these Design Criteria should conflict in the future with the requirements of the OEPA, these criteria shall be modified to conform to their requirements. These Design Criteria are also intended to conform to the Village Standard Drawings for sanitary sewers.

900.02 Basis of Design

The basis of design shall be the Manning Formula. This is used to calculate the capacity of a pipe flowing full:

$$Q = \frac{1.486}{n} R^{2/3} S^{1/2} A$$

Q = Flow in cfs
A = Area of cross section - square feet
n = Coefficient of roughness (n = 0.013)
R = Hydraulic Radius - feet
S = Slope in ft/ft

900.03 Maximum Depth of Flow

Recommended design practices limit the depth of flow in a sanitary sewer. The maximum depth of flow should be equal to or less than 0.8 of the diameter of the pipe.

900.04 Average Daily Flow

The average daily flow shall be 100 gallons per capita per day and includes normal infiltration.

900.05 Population Density

The average household consists of 4 persons. Therefore, for design purposes, there would be 4 capita per equivalent single-family dwelling.

900.06 Peak Design Flow

Sanitary sewers shall be designed on a peak design flow basis using one of the following methods:

1. The ratio of peak average flow (ADF).
2. Values established from the infiltration/inflow study approved by the OEPA.
3. Values obtained from the flow records of a similar facility over a period of time sufficient to establish with a reasonable degree of reliability the relationship between average dry weather flow and peak design flow.
4. Peak flows as determined by the Great Lakes Upper Mississippi River Board (GLUMRB) (Ten States Standards), latest version.

Use of other values for peak design flow will be considered, if justified, on the basis of extensive documentation.

SUGGESTED SEWAGE FLOW GUIDE

ESTIMATED SEWAGE FLOW (ADF)

<u>WASTEWATER SOURCE</u>	<u>GALLONS PER DAY</u>	<u>LITERS PER DAY</u>
Airports		
Per Employee	20	76
Per Passenger	5	19
Apartments		
One Bedroom	250	947
Two Bedrooms	300	1,137
Three Bedrooms	350	1,326
Assembly Halls		
Per Seat	2	8
Bowling Alleys (no food service)		
Per Lane	75	284
Camps		
Individual bath units - per units	50	189
Central Bathhouse - per person	35	133
Car Wash (per car, no recycling)	80	304
Churches		
Small - per sanctuary seat	3-5	11-19
Large with kitchen-per sanctuary seat	5-7	19-27
Country Clubs (including food service)		
Per member	50	189
Dance Halls		
Per person	2	9
Factories		
No showers - per employee	25	95
With showers - per employee	35	133
Family Dwellings		
Per person	100	379

*Food Service Operations

Ordinary Restaurant (not 24 hour) per seat	35	133
24-hour Restaurant	50	189

*The listed estimated sewage flows are to be used for the design of sewers and should not be used for the design of treatment units.

Banquet Rooms - per seat	5	19
Restaurant along freeway - per seat	100	379
Tavern (very little food service) per seat	35	133
Curb Service (drive in) - per car space	50	189
Vending Machine Restaurants - per seat	35	133
Highway Rest Areas		
Per Car	1-9	4-34
Hospitals		
No resident personnel - per bed	300	1,137
Institutions		
Residents - per bed	100	379
Laundries		
Coin operated - per machine (Standard size machine)	400	1,137
Motels		
Per Unit	100	379
Nursing and Rest Homes		
Per patient	150	568
Per resident employee	100	379
Office Buildings (exclusive of cafeteria or kitchen)		
Per employee per shift	20	76
Parks		
With toilet facility - per person	5	19
With showers, bathhouse, toilets- per person	10	38

Schools		
Elementary (not incl. showers or cafeteria) - per pupil	10	38
High and Junior High (not including showers or cafeteria) - per pupil	15	57
Add for cafeteria - per pupil	5	19
Add for showers - per pupil	5	19
Service Stations		
First bay	1,000	3,789
Each additional bay	500	1,895
Shopping Centers		
(without food service or laundries) -per area of floor space	0.2 per sq. ft.	8 per sq. meter
Stores		
Per toilet per shift	400	1,516
Swimming Pool		
(average with hot water shower) - per swimmer (design load)	3-5	11-19
Theaters		
Drive-In Movies - per car space	5	19
Movie - per seat	5	19
Trailer Parks		
Per trailer space	300	1,137
Travel Trailer Dumping Stations		
At service station	Consult District Office of OEPA	
Travel Trailer Parks and Camps		
- Per trailer or tent space	125	474
Vacation Cottage		
- Per person	50	189
Youth and Recreation Camps		
- Per person	50	189

900.07 Minimum Velocity

All sanitary sewers shall be designed to give a mean velocity of at least 2.0 feet per second, when flowing full, based on Manning's Formula using an "n" value of 0.013. Use of other "n" values will be considered, if deemed justifiable, on the basis of extensive field data.

900.08 Maximum Velocity

The maximum velocity shall be 15 feet per second. If the velocity is greater than 15 feet per second, provisions should be made to protect against displacement.

900.09 Minimum Grades

All sanitary sewers shall be designed to give a mean velocity of at least 2.0 feet per second when flowing full based on Manning's Formula. Values of "n" to be used with the Manning Formula vary from 0.010 to 0.015 with 0.013 recommended. Use of "n" values other than 0.013 may be considered, if justified. Use of formulas other than Manning's Formula may be accepted. If plans are recommended for approval with a slope less than the minimum, the consulting Engineer must show justification for the recommendation and obtain approval from OEPA. See Table 9.1.

TABLE 9.1

REQUIRED MINIMUM SLOPE

**Based on "n" Value of 0.013
Sewer Sizes - 8 through 36 inches**

<u>Sewer Size</u>	<u>Minimum Slope in Feet Per 100 Feet</u>
8	0.40
10	0.28
12	0.22
15	0.15
18	0.12
21	0.10
24	0.08
27	0.067
30	0.058
36	0.046

900.10 Sanitary Sewers

In general, the minimum size of sanitary sewers shall be 8 inches. However, 6-inch sanitary sewers may be used as private lateral sewers for apartments, camps, schools, restaurants, and other semi-public operations, provided their hydraulic capacity is not exceeded because of short run-off periods (high peak flows).

The lateral connections shall be premium joint construction and should be made of the same material as the street sewer whenever possible to minimize infiltration from the connection between the street main and house lateral. When joint material and/or dimensions are not compatible, a commercial adapter shall be provided.

900.11 House Laterals

Minimum of 4-inch sewer pipe may be used for house connections. The cover over the lateral coming out of the house shall be a minimum 3-foot depth. The house connections shall be of premium joint construction and made of PVC schedule 40 pipe or SDR 35. Cleanouts are required outside all structures or units and at property lines. In multi-tenant buildings, individual services shall be provided to a common pipe, then to the main. Individual water meters shall be used for separate sanitary sewers. When joint material and/or dimensions are not compatible, a commercial adapter shall be provided. A copy of an ordinance or regulation requiring this type of construction must be on file with OEPA district office or submitted with all sewer plans to receive approval.

900.12 Invert Drop in Manhole

When a smaller sewer discharges into a larger one, the invert of the larger sewer should be lowered sufficiently to maintain the same energy gradient. An approximate method for securing this result is to place the 0.8 depth point of both sewers at the same elevation or matching the top elevation of the pipes. When a larger sewer discharges into a smaller, the invert of the smaller should not be raised to maintain the same energy gradient.

900.13 Illegal Connections

Roof drains, foundation drains, sump pumps, yard drains, and all other clear water connections to the sanitary sewer are prohibited.

There shall be no physical connection between a public or private potable water supply system and a sewer or appurtenances thereto which would permit the passage of any sewage or polluted water into the potable supply.

900.14 Horizontal Separation

If possible, sanitary sewers and sewage force mains should be laid with at least a 10-foot horizontal separation from any water main.

900.15 Vertical Separation

Sewers (or sewage force main) may be laid closer than 10 feet to a water main if it is laid in a separate trench and elevation of the crown of the sewer (or sewer force main) is at least 18 inches below the bottom of the water main. If it is impossible to maintain the 18-inch vertical separation when the sewer is laid closer than 10 feet to the water main, the sanitary sewer should be constructed of (or encased in) water main type materials which will withstand a 50 psi water pressure test.

If a sewage force main is laid closer than 10 feet to a water main, in no case should the sewage force main be laid such that the crown of the sewage force main is less than 18 inches below the water main.

900.16 Crossing Utilities

Whenever a sanitary sewer and water main must cross, the sewer shall be laid at such an elevation that the crown of the sewer is at least 18 inches below the bottom of the water main. If it is absolutely impossible to maintain the 18-inch vertical separation, the sanitary sewer should be constructed of (or encased in) water main type material which will withstand a 50-psi water pressure test for a distance of 10 feet on both sides of the water main.

Whenever a sewage force main and water main must cross, the sewage force main shall be at least 18 inches below the bottom of the water main.

900.17 Parallel Installation

Sanitary sewers and manholes should be laid with at least 10 feet, measured from edge to edge, horizontal separation from any water main. If separation can not be maintained, the sanitary sewer shall be constructed to water main standards.

900.18 Manholes

Manholes shall be installed at the end of each line; at all changes in grade, size, and alignment; and at all pipe intersections. Manholes shall be installed at a distance not greater than 400 feet. Greater spacing may be allowed in larger sewers and in those carrying a settled effluent.

Manholes may be either poured in place or pre-cast concrete. Concrete construction shall conform to ASTM C-478 with joints between sections conforming to ASTM C-443.

The flow channel through manholes should be made to conform in shape, slope, and smoothness to that of the sewers.

All manhole covers shall be adjusted to grade by the use of no more than 12 inches of pre-cast concrete adjusting collars. In areas outside the pavement, the manhole casting should be adjusted so that the top is slightly above grade to prevent the entrance of the surface water.

900.19 Manhole Minimum Diameter

Manholes shall be constructed large enough to allow access to the sewer. The minimum diameter of manholes shall be 48 inches. Where manhole diameters of greater than 48 inches are used to accommodate the sewer pipes, the manhole shall be returned to 48-inch diameter as soon as practical above the sewer crown. Manhole openings 24 inches or larger are required for easier access with safety equipment to facilitate maintenance.

900.20 Manhole Water Tightness

Manholes shall be constructed to permit casting adjustments by use of cast-in-place or pre-cast concrete adjusting collars not to exceed 12 inches in height. Solid manhole covers shall be used in all pavement locations. In other areas, the manhole casting shall be adjusted so the top of the manhole cover is slightly above grade to prevent the entrance of the surface water. In areas subject to flooding, secured watertight and solid manhole covers should be used. All manhole covers, seating frames, and adapter rings shall be machined to a firm and even bearing to provide a true fit into the frames. Manholes shall be installed with chimney seals and water tight dishes.

Inlet and outlet pipes should be joined to the manhole with a gasketed and/or flexible watertight connection meeting ASTM Specification C-443. Where three or more manholes in sequence are to be constructed with solid, watertight covers, adequate ventilation shall be provided.

900.21 Flow Channel

The invert of the lowest pipe entering a manhole shall be at least 3 inches (75 mm) above the top of the base slab so that the sewer flow channel may be installed and shaped when channel is not precast. The flow channel through the manholes should be made to conform in shape, slope, and smoothness to that of the sewers.

Cut pipe shall not extend beyond the inside face of the manhole wall. Concrete placed inside the manhole to form the channel through the manhole shall not be placed between the pipe and the opening so as to interfere in any way with the flexibility of the joint.

900.22 Drop Manholes

Drop manholes shall be used when the invert of the inflow sewer is 2.0 feet or higher than the manhole invert. When this difference of elevation is less than 2.0 feet, the manhole invert shall be filled and channeled to prevent solids deposition.

Due to the unequal earth pressure that would result from the backfilling operation in the vicinity of the manhole, the entire outside drop connection shall be encased in concrete.

Drop manholes shall be constructed with outside drop connection, except where such connections are not practical. Inside drop connection to be used only with the approval of the Village. Manholes located in isolated areas should be provided with bolted covers for safety and to discourage vandalism.

900.23 Test Inspection

The leakage and deflection tests are to be carried out by the contractor and witnessed and certified by the Village officials and/or their representative.

All pipe which does not meet the testing requirements must be repaired and retested until it meets the requirements.

900.24 Railroad and Highway Crossings

When boring is required, the casing pipe shall be designed to meet the requirements of the authority having jurisdiction and in compliance with the Village of Fort Recovery Construction Standards and Drawings. The size of the casing pipe shall be at least 4 inches greater than the largest outside diameter of the sewer pipe, joints, or couplings.

900.25 Stream Crossings

A. Location of sewers in streams

1. Cover depth

The top of all sewers entering or crossing streams shall be at a sufficient depth below the natural bottom of the streambed to protect the sewer line. In general, the following cover requirements must be met:

- a) One foot of cover where the sewer is located in rock.
- b) Three feet of cover in other material. In major streams, more than 3 feet of cover may be required.
- c) In paved stream channels, the top of the sewer line should be placed below the bottom of the channel pavement.

Less cover will be approved only if the proposed sewer crossing will not interfere with the future improvements to the stream channel. Reasons for requesting less cover shall be provided in the project proposal.

2. Horizontal Location

Sewers located along streams shall be located outside of the streambed and sufficiently removed therefrom to provide for future possible stream widening and to prevent pollution by siltation during construction.

3. Structures

The sewer outfall, headwalls, manholes, gate boxes, or other structures shall be located so they do not interfere with the free discharge of flow through the stream.

4. Alignment

Sewer crossing streams should be designed to cross the stream as nearly perpendicular to the stream flow as possible and shall be free from change in grade. Sewer systems shall be designed to minimize the number of stream crossings.

B. Construction

1. Materials

Sewers entering or crossing streams shall be constructed of ductile iron pipe with mechanical joints; otherwise they shall be constructed so they will remain watertight and free from changes in alignment or grades. Material used to backfill the trench shall be stone, coarse aggregate, washed gravel, or other materials which will not readily erode, cause siltation, damage pipe during placement, or corrode the pipe.

2. Siltation and Erosion

Construction methods that will minimize siltation and erosion shall be employed. The design engineer shall include in the project specifications the method(s) to be employed in the construction of sewers in or near streams. Such methods shall provide adequate control of siltation and erosion by limiting unnecessary excavation, disturbing or uprooting trees and vegetation, dumping of soil or debris, or pumping silt-laden water into the stream. Specifications shall require that cleanup, grading, seeding, and planting or restoration of all work areas shall begin immediately. Exposed areas shall not remain unprotected for more than seven days.

900.26 Sewage Pumping Stations

A. General

1. When sewage pump stations are required, they shall be designed and installed per the following standards:
 - a) Great Lakes Upper Mississippi River Board (GLUMRB) (Ten States Standards) “Recommended Standards for Wastewater Facilities”, latest version.
 - b) OEPA’s latest requirements.
 - c) Village of Fort Recovery Design Criteria and Standard Construction Drawings.
 - d) All other applicable codes and regulations.

2. Flooding

The wastewater pumping station structures and electrical and mechanical equipment shall be protected from physical damage by the 100-year flood. Wastewater pumping stations should remain fully operational and accessible during the 25-year flood. Regulations of state and federal agencies regarding floodplain obstructions shall be followed.

B. Pump Station Type & Standard Requirements

Listed below are the standard requirements for pump stations in the Village. However, it is realized that certain situations may require other types of pump stations. It is highly recommended that early preliminary pumping station plans be submitted to the Village for their approval prior to beginning final engineering.

1. Type

Submersible Pump Stations with separate wet well and valve chamber are preferred by the Village.

2. Pump Type

Submersible explosion-proof pumps capable of pumping raw, unscreened sewage, 3-inch spherical solids, and stringy materials typical of domestic sewage will be required. Village to approve pump manufacturer to keep pumps similar throughout the Village. Multiple pumps shall be provided.

3. Electrical Installation

- a) All electrical installations and components shall be designed and installed per the National Electric Code (NEC) and all other electrical codes.
- b) All equipment and components shall be housed in NEMA 4X stainless steel enclosures.

- c) Controls and other equipment shall be Cutler-Hammer, or equivalent, as approved by the Engineer.
- d) The cabinet shall be provided with a removable backplate on which all the components shall be mounted, with the exception of the H-O-A switches. The pump run lights shall be located on the outside door of the enclosure.
- e) The pump control panel shall contain a circuit breaker, magnetic starter, hand-and-off-auto-selector-switch, run light, and seal leak indicating light for each pump.
- f) There shall be furnished atop the control panel enclosure, a high-water alarm flashing red light.

4. Liquid Level Control

The pumps are to be controlled by four mercury float switches, with brackets fastened inside the wet well.

5. Alarm Appurtenances

- a) Alarm signal shall be initiated by liquid level control system which shall be connected to a telemetering alarm system.
- b) Power failure relay: Provide relay with N.O. contacts for hook up to a telephone line to be de-energized and contacts closed when power to station is interrupted.
- c) High wet well level alarm: Provide high-water alarm for hook up to the telemetering system.

6. Guide System

a) System Design

- 1) Permit removal of pumping units for inspection or service without dewatering wet well or interrupting operation of other pump equipment.
- 2) Pumps, when lowered into place, to be automatically connected to discharge piping with positive seal.
- 3) Incorporate fabricated aluminum access frame with provisions for mounting guide rails and hooks to retain pump cables.

b) Guide Rails

Two lengths of stainless steel pipe with pilots; 2-inch Schedule 40, stainless steel (304) size per pump manufacturer's recommendation. Top and bottom pilots shall be Class 30 cast iron with flake glass/polyester coating.

c) Pump Guides

- 1) Fabricated from bronze for spark proof operation.
- 2) Attached to pump volute with 316 stainless steel hex head cap screws.

d) Lift Chain

Lift chain shall be 304 stainless steel, size to support pump with 4 to 1 safety factor.

7. Valve Pit

- a) Valve pit structure (minimum 6-foot diameter) shall be constructed of pre-cast concrete sections conforming to ASTM C-478.

b) Valve Pit Access

- 1) An aluminum access door and frame assembly shall be installed in the top slab. Minimum size shall be 36" x 36" unless larger is required by the Village.
- 2) The door shall have a handle, latch in the open position, and have a hasp for a padlock. Surface shall be non-skid, diamond tread.

c) Valve Pit Drain

The valve pit floor shall be sloped to drain with a 3-inch drain pipe and check valve at the wet well as shown on the plans.

8. Wet Well Structure

- a) The wet well (minimum 6-foot diameter) shall be constructed of precast concrete sections conforming to ASTM C-478.

b) Wet Well Access

The door shall be of aluminum construction and have a handle, latch in the open position, and have a hasp for padlock. Surface shall be non-skid, diamond tread. Minimum size shall be 36" x 36" unless larger is required by the Village.

c) Vent

A vent with screen shall be installed in the top slab.

d) Hoist Stand

A hoist stand to fit existing pump hoist shall be mounted to the top slab to assure easy pump removal.

9. Piping and Valves

a) Materials

All piping and fittings beginning after the hydraulic sealing flange unit shall be 4-inch diameter ductile iron pipe with flanged joints. Pipe joints shall be flanged and conform with ANSI Specification A21.10 (AWWA C110) for cast iron pipe flanges and flanged fittings, Class 125.

b) Valves

- 1) Check valves to be 4 inch with outside lever and weight. Valves to be rated for 175 psi water working pressure and 350 psi hydrostatic test pressure.
- 2) Eccentric plug valve to be 4 inch, specifically designed for sewage applications with 100% port opening. Valve to have cast iron with Buna-N rubber coating to minimize wear and corrosion. Seat rings to seal at 175 psi. Valves to have flanged ends (ANSI B16.1) and nut operator.
- 3) A guide disconnect assembly as shown on the plans shall be installed in the valve pit.

900.27 Force Mains

A. Velocity and Diameter

At design pumping rates, a cleansing velocity of at least 2 feet per second should be maintained. The minimum force main diameter for raw wastewater shall be 4 inches.

B. Air and Vacuum Relief Valve

An air relief valve shall be placed at high points in the force main to prevent air locking. Vacuum relief valves may be necessary to relieve negative pressures on force mains. The force main configuration and head conditions should be evaluated as to the need for and placement of vacuum relief valves. Force mains shall be installed to keep high points and low points to a minimum.

C. Termination

Force mains should enter the gravity sewer system at a point not more than 2 feet above the flow line of the receiving manhole.

D. Pipe and Design Pressure

Pipe and joints shall be equal to water main strength material suitable for design conditions. The force main, reaction blocking, and station piping shall be designed to withstand water hammer pressures and associated cyclic reversal of stresses that are expected with the cycling of wastewater pump stations.

E. Design Friction Losses

Friction losses through force mains shall be based on the Hazen and Williams formula or other acceptable methods. When the Hazen and Williams formula is used, the value of "C" shall be 100 for unlined iron or steel pipe for design. For other smooth pipe materials such as PVC, lined ductile iron, etc., a higher "C" value not to exceed 120 may be allowed for design.

F. Identification

Where force mains are constructed of material which might cause the force main to be confused with potable water mains, the force main shall be appropriately identified.

G. Leakage Testing

Leakage tests shall be required per the water main testing requirements as shown in the Village of Fort Recovery Standard Construction Drawings.

H. Cleaning of the Force Main

All force mains shall include sealed cleanouts for cleaning purposes at a maximum spacing of 600 feet or as approved by the Village.