VILLAGE OF FORT RECOVERY

Subdivision Regulations

Construction Standards & Drawings

Design Criteria

Adopted April 21, 2008

CHOICE ONE ENGINEERING
440 E. Hoewisher Road
Sidney, OH 45365
(937) 497-0200
(937) 497-0300 Fax

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SUBDIVISION REGULATIONS

Prepared and Presented By:

440 E. Hoewisher Road
Sidney, OH 45365
(937) 497-0200
(937) 497-0300 Fax

Subdivision Regulations

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ARTICLE I
General Provisions

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.

ARTICLE II
Definitions

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

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 <u>Supplementary Information</u>

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

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

	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.)	

√		DESCRIPTION	REMARKS
	41	Conformance with major street plan.	
	42	No flood hazards.	
	43	Right-of-way widths, meets minimum criteria.	
	44	Avoidance of multiple intersections.	
	45	Lengths of blocks, meets minimum criteria.	
	46	Submit plans to the utility companies.	
	47	Location and size of all existing utilities: water main, telephone, electric, gas, etc. within or adjacent to the subject tract.	

ARTICLE V
Final Plat

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 <u>Supplementary Information</u>

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

	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**

	35	Street names.	
	36	Size of lots meet minimum requirement.	
	37	Setback lines meet minimum requirement.	
	38	Corner lot size appropriate.	
	39	Sufficient easements for utilities or open drainage.	
	40	Approval signature lines with date.	

ARTICLE VI
Assurance for Completion and Maintenance of Improvements

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

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 <u>Street Signs and Street Names</u>

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 <u>Special Street Types</u>

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 <u>Survey Monuments</u>

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

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:

CHOICE ONE ENGINEERING

440 E. Hoewisher Road
Sidney, OH 45365
(937) 497-0200
(937) 497-0300 Fax

300 - ROADWAYS

500 - GENERAL

600 - STORM DRAINAGE

800 - WATER DISTRIBUTION

900 - SANITARY SEWERS

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

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STREET FUNCTIONAL CLASSIFICATIONS

A. ARTERIAL

A GENERAL TERM DENOTING A HIGHWAY PRIMARILY FOR THROUGH TRAFFIC, CARRYING HEAVY LOADS AND LARGE VOLUMES OF TRAFFIC, USUALLY ON A CONTINUOUS ROUTE.

B. COLLECTOR

A THOROUGHFARE, WHETHER WITHIN A RESIDENTIAL, INDUSTRIAL, COMMERCIAL OR OTHER TYPE OF DEVELOPMENT, WHICH PRIMARILY CARRIES TRAFFIC FROM LOCAL STREETS TO ARTERIAL STREETS OR TO OTHER COLLECTOR STREETS INCLUDING THE PRINCIPAL ENTRANCE AND CIRCULATION ROUTES WITHIN RESIDENTIAL SUBDIVISIONS.

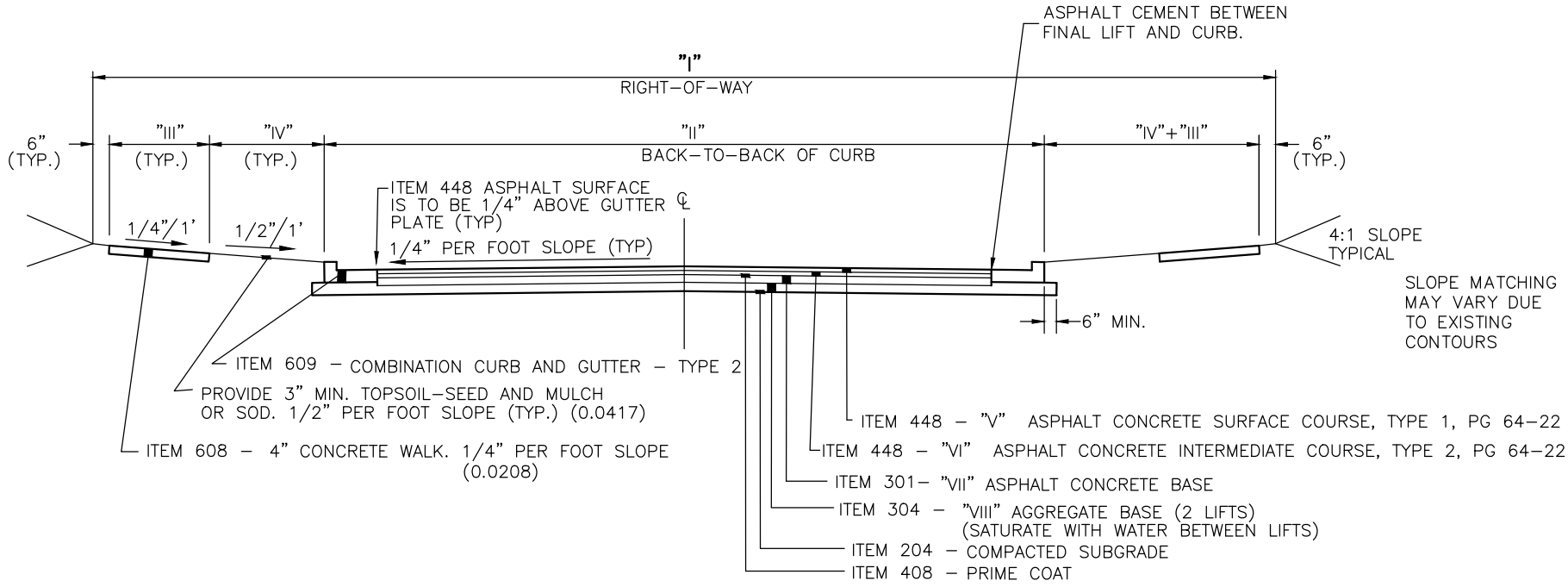
C. LOCAL

A STREET DESIGNED TO PROVIDE ACCESS TO ABUTTING PROPERTY AND HAS NO THROUGH TRAFFIC. IE. CUL DE SAC.

STREET FUNCTIONAL CLASSIFICATION	RIGHT-OF-WAY WIDTH (MIN.)	BACK-TO-BACK CURB (MIN.)
	(FT.)	(FT.)
ARTERIAL	*	*
COLLECTOR - RES.	60	36
INDUSTRIAL AND COMMERCIAL	60	37
LOCAL	50	31

* SEE DESIGN CRITERIA FOR PROPER DESIGN.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	STREET CLASSIFICATIONS AND RECOMMENDED STANDARD STREET DIMENSIONS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-1



STANDARD DIMENSIONS

ITEM	DESCRIPTION	ARTERIAL	INDUSTRIAL & COMMERCIAL	COLLECTOR RESIDENTIAL	LOCAL
I	RIGHT–OF–WAY	*	60'	60'	50'
II	B\B CURB	*	37'	36'	31'
III	SIDEWALK WIDTH	4'	4'	4'	4'
IV	CURB LAWN WIDTH	6'	6'	6.5'	4'
V	ITEM 448	1–1/4"	1–1/4"	1–1/4"	1–1/4"
VI	ITEM 448	1–3/4"	1–3/4"	1–3/4"	1–3/4"
VII	ITEM 301	6"	6"	–	–
VIII	ITEM 304	2–4–1/2" LIFTS	2–3" LIFTS	2–6" LIFTS	2–5" LIFTS

NOTES

A. ALL WORK TO CONFORM TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS LATEST REVISION UNLESS OTHERWISE SPECIFIED.

B. ITEM 407 TACK COAT, SHALL BE REQUIRED WHEN 10 DAYS HAVE ELAPSED BETWEEN ASPHALT PAVEMENT LIFTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. APPLICATION RATE IS 0.10 GALLON PER SQUARE YARD.

C. NO CONCRETE PAVEMENT WILL BE ACCEPTED.

D. SIDEWALKS NOT REQUIRED IN INDUSTRIAL ZONING.

E. ALL BUTT JOINTS SHALL BE SEALED WITH PG 64–22 WITHIN 24 HOURS AFTER PLACEMENT OF ITEM 448.

F. IN AREAS WITH HIGH POTENTIAL OF PUSHING, SHOVING OR HEAVING, USE ITEM 448 ASPHALT CONCRETE SURFACE COURSE TYPE 1 H, PG. 70–22. IN SMALL QUANTITY AREAS USE TYPE 1, PG 64–22 WITH GILSONITE ADDITIVE.

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

TYPICAL SECTIONS AND PAVEMENT COMPOSITION

REVISIONS:

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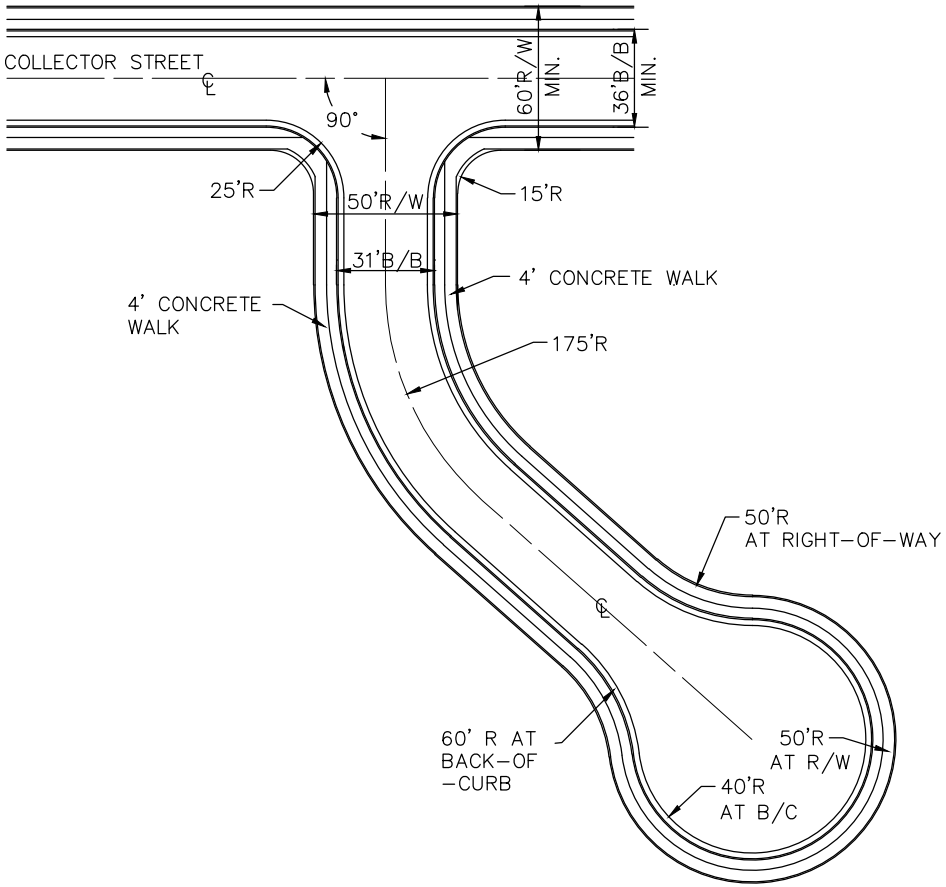
TYPICAL STREET AND CUL-DE-SAC PLAN



STREET DESIGN STANDARDS

	25 mph LOCAL (THRU STREETS)	35 mph COLLECTOR	45 mph ARTERIAL
MINIMUM CENTERLINE GRADES	.50%	.50%	.50%
MAXIMUM CENTERLINE GRADES	10%	7%	4%
MINIMUM LENGTH OF VERTICAL CURVE (SEE NOTE C).	25FT.	50FT.	100FT.
MINIMUM CENTERLINE RADIUS	250FT.	400FT.	600FT.
MINIMUM LENGTH TANGENT BETWEEN CURVES	50FT.	50FT.	100FT.
MINIMUM BACK-OF-CURB RADIUS	25FT.	25FT.	50FT.
MINIMUM HORIZONTAL VISIBILITY	200FT.	300FT.	500FT.
MINIMUM STOPPING SIGHT DISTANCE (MEASURED FROM 3.5' EYE-LEVEL TO 6" OBJECT HEIGHT)	200FT.	300FT.	500FT.
MAXIMUM CENTERLINE GRADE WITHIN 100' OF AN INTERSECTION	3%	3%	3%
RIGHT-OF-WAY WIDTH	50FT.	60FT.	60FT.
MINIMUM PAVEMENT WIDTH BACK-TO-BACK OF CURB	31FT.	36FT.	45FT.

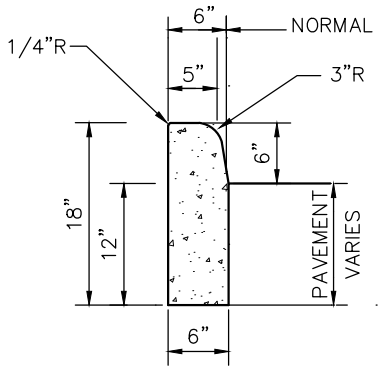
NOTES

A. THESE ARE MINIMUM DESIGN STANDARDS AND MAY BE REQUIRED TO BE INCREASED TO COMPLY WITH THE VILLAGE'S OFFICIAL THOROUGHFARE PLAN.

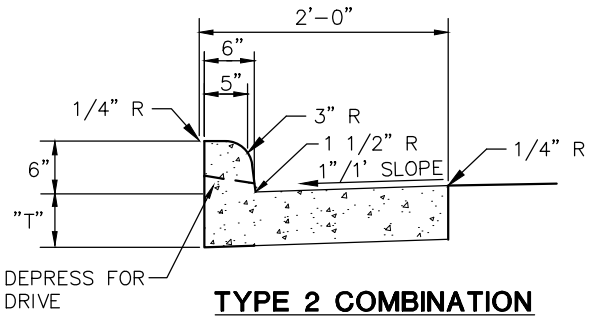
B. THE MAXIMUM LENGTH FOR CUL-DE-SAC STREET SHALL BE 600' CENTER-OF-STREET TO CENTER OF CUL-DE-SAC.

C. MINIMUM LENGTH OF VERTICAL CURVE CAN BE REDUCED OR ELIMINATED TO ALLOW FOR PROPER DRAINAGE, WITH APPROVAL OF THE VILLAGE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	STREET DESIGN STANDARDS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-3

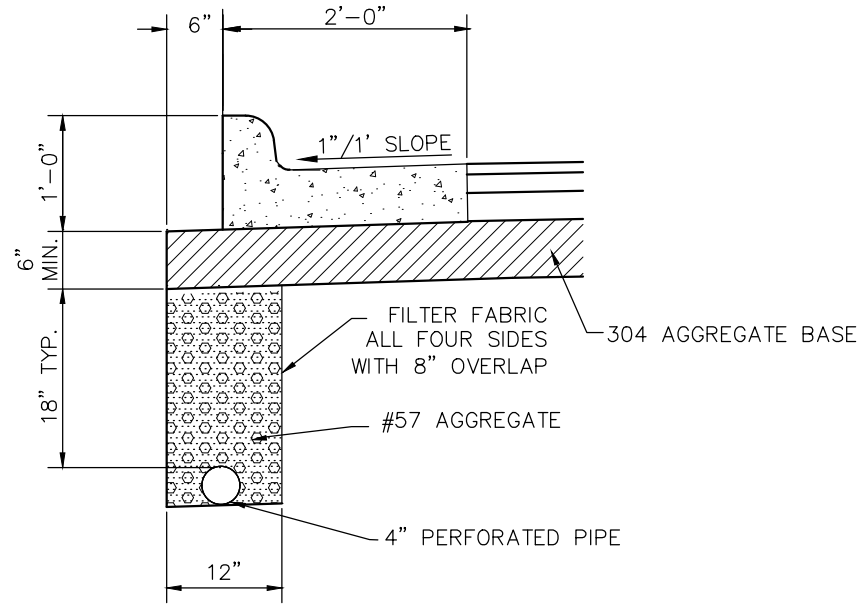


TYPE 6 BARRIER CURB



TYPE 2 COMBINATION CURB AND GUTTER

T=6" LOCAL AND COLLECTOR
T=9" COMMERCIAL, INDUSTRIAL, AND ARTERIAL



4" SHALLOW PIPE UNDERDRAIN DETAIL

(ONLY AS REQUIRED BY THE VILLAGE)

NOTES

A. CONCRETE AND WORK SHALL MEET THE REQUIREMENT SET FORTH IN ODOT ITEM 609 CURBING. VILLAGE INSPECTION OF FORMS IS REQUIRED PRIOR TO POURING CONCRETE.

B. CURBING SHALL HAVE CONTRACTION JOINTS EVERY 10'.

C. MINIMUM OF 6" OF ODOT 304 SHALL BE PLACED UNDER CURBING.

D. CURBING SHALL BE BACKFILLED IMMEDIATELY AFTER FORMS ARE REMOVED OR AS SOON AS PRACTICAL WHEN SLIP FORMING PRIOR TO OTHER CONSTRUCTION OPERATIONS.

E. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

F. APPLY WHITE PIGMENTED CURING COMPOUND ON ALL SURFACES INCLUDING BACK IMMEDIATELY AFTER FINISHING SURFACES. ANY OTHER METHOD OR TYPE OF CURING COMPOUND MUST BE PREAPPROVED.

G. CONCRETE SHALL BE ODOT CLASS A 4000 PSI CONCRETE, PROPORTIONING OPTIONS 1, 2, AND 3 NOT ALLOWED.

H. CONCRETE SHALL CONTAIN 6% ± ± 2% OF AIR ENTRANEMENT.

I. TYPE 6 CURBS ARE FOR USE AROUND MEDIAN SECTION.

J. MINIMUM TYPE AND GRADE OF CURB SHALL BE DETERMINED BY THE VILLAGE.

K. UNLESS OTHERWISE SPECIFIED BY THE VILLAGE, 6 " OF 304 AGGREGATE SHALL BE PLACED UNDER CURBING AND EXTEND 12" BEHIND BACK OF CURB.

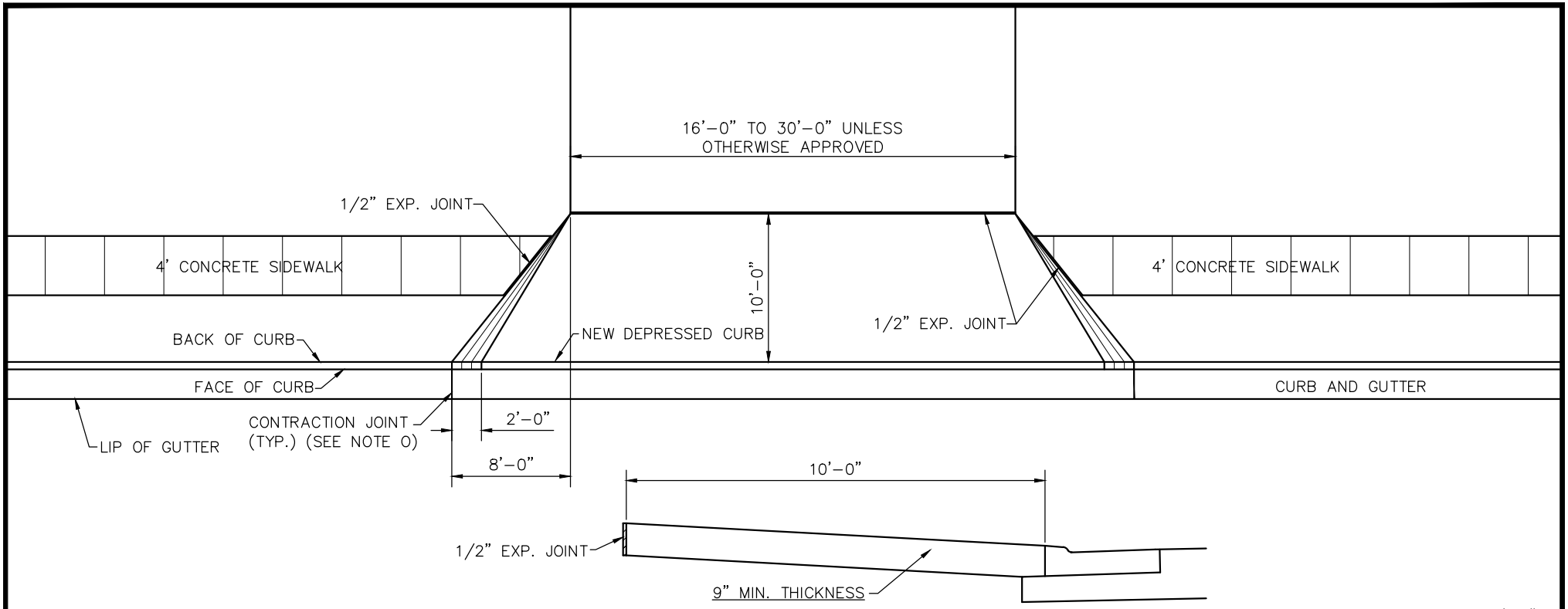
L. CURBING SHALL BE BACKFILLED IMMEDIATELY AFTER FORMS ARE REMOVED.

M. JOINT LOCATIONS:
CONTRACTION JOINTS EVERY 10'
EXPANSION JOINTS EVERY 100' (OR LESS AS DETERMINED BY THE VILLAGE), AT INTERSECTIONS, AND WHERE CURBING IS TO ABUT EXISTING CONCRETE WORK.

N. EXPANSION JOINTS SHALL BE PROFLEX VINYL EXPANSION JOINT AS MANUFACTURED BY OSCODA PLASTICS, INC. 1-800-544-9538, MEETING ASTM D-1752 AND AASHTO 153-98.

O. ALL UNDERGROUND UTILITY LATERALS SHALL BE MARKED IN THE TOP OF CURB WHILE IT IS BEING POURED AS FOLLOWS (UNLESS OTHERWISE DIRECTED BY THE VILLAGE):
"W" - WATER SERVICE
"SD" - STORM LATERAL
"S" - SANITARY LATERAL

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# CONCRETE CURB DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-4



NOTES

A. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST IN PLACE CONCRETE.

B. DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICLY WITH CURB.

C. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY AND TRANSVERSELY WITH JOINTS AT TAPERS.

D. DRIVE APPROACHES SHALL BE KEYED AT ALL CONSTRUCTION JOINTS.

E. EXPANSION JOINTS SHALL BE PROFLEX VINYL EXPANSION JOINT AS MANUFACTURED BY OSCODA PLASTICS, INC. 1–800–544–9538, MEETING ASTM D–1752 AND AASHTO 153–98.

F. COMPACTED GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES IF DETERMINED NECESSARY BY THE VILLAGE.

G. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

H. WHERE CURB AND GUTTER HAS NOT BEEN PROPERLY DROPPED AT DRIVE APPROACHES, THE CURB SHALL BE ENTIRELY REMOVED AND REPLACED BY THE CONTRACTOR OR OWNER AS DIRECTED BY THE VILLAGE.

I. WHERE ASPHALTIC CONCRETE PAVEMENT IS DISTURBED, THE ASPHALT SHALL BE REPLACED AS DIRECTED BY THE VILLAGE.

J. JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE VILLAGE. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.

K. MINIMUM WIDTH FOR ONE–WAY TRAFFIC IS 16'–0". MINIMUM WIDTH FOR TWO–WAY TRAFFIC IS 25'–0". MAXIMUM WIDTH IS 30'–0" UNLESS OTHERWISE APPROVED BY THE VILLAGE.

L. THIS STANDARD DRAWING IS FOR GUIDELINE PURPOSES. EACH INDIVIDUAL DRIVE WILL NEED TO BE DESIGNED AND SUBMITTED TO THE VILLAGE FOR REVIEW AND APPROVAL.

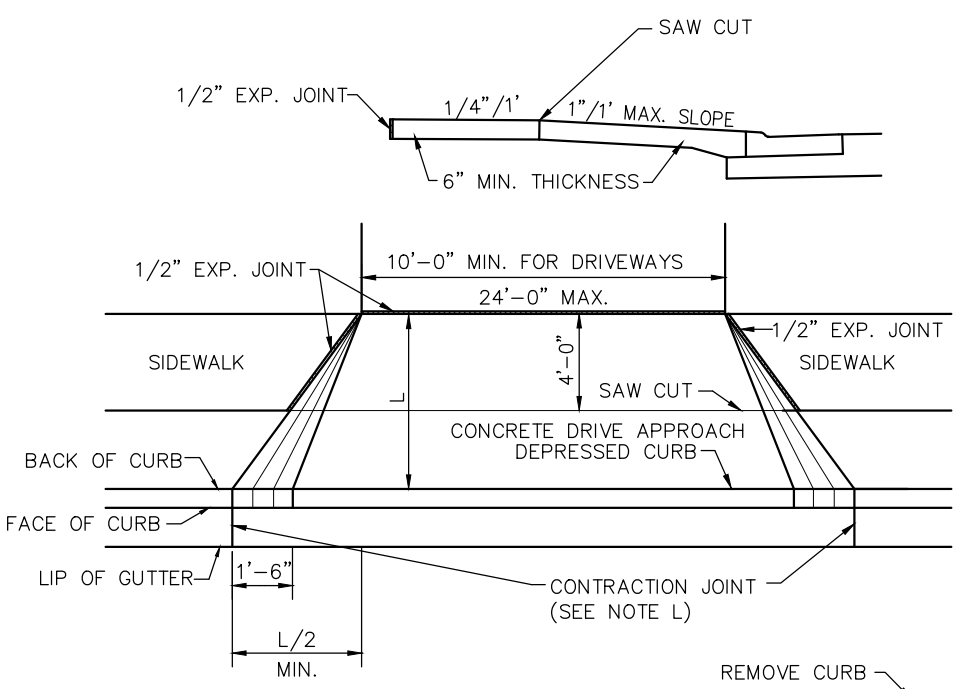
M. CONCRETE SHALL BE ODOT CLASS C. (4000 PSI, 600 LB/CY CEMENT. PROPORTIONING OPTIONS 1, 2, AND 3 NOT ALLOWED.

N. CONCRETE SHALL CONTAIN 6% ± 1% OF THE TOTAL AIR.

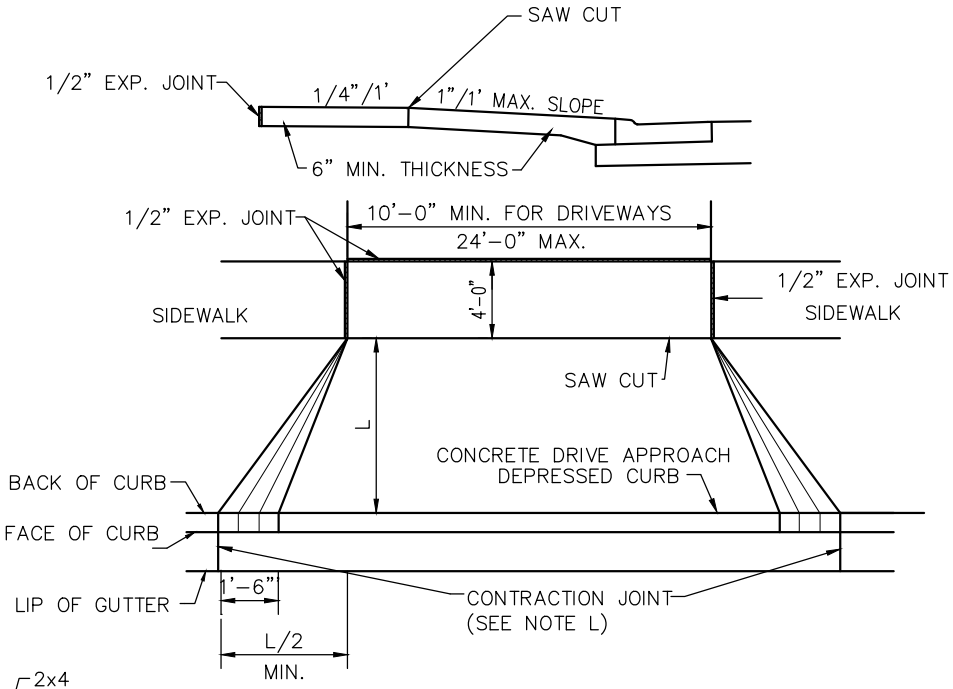
O. CURB IS TO BE REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION. JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.

P. WHITE PIGMENTED CURING COMPOUND ON ALL SURFACES.

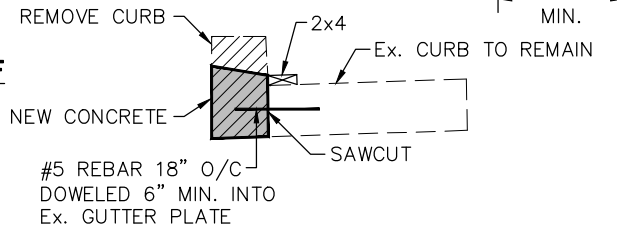
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# COMMERCIAL AND INDUSTRIAL DRIVE APPROACH	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 300–5



FOR CURB LAWNS OF LESS THAN 6'-0"



FOR CURB LAWNS OF 6'-0" OR MORE



NOTES

A. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST-IN-PLACE CONCRETE.

B. DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICLY WITH CURB.

C. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY, TRANSVERSELY AND AT TAPERS.

D. EXPANSION JOINTS SHALL BE PROFLEX VINYL EXPANSION JOINT AS MANUFACTURED BY OSCODA PLASTICS, INC. 1-800-544-9538, MEETING ASTM D-1752 AND AASHTO 153-98.

E. COMPACTED GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES IF DETERMINED NECESSARY BY THE VILLAGE.

F. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.

G. WHERE CURB AND GUTTER HAS NOT BEEN PROPERLY DROPPED AT DRIVE APPROACHES, THE CURB SHALL BE ENTIRELY REMOVED AND REPLACED BY THE CONTRACTOR OR OWNER AS DIRECTED BY THE MUNICIPALITY OR THEY CAN CUT THE BACK OF CURB OFF AND INSTALL NEW CURB BY PINNING IT TO THE GUTTER PLATE AS PER THE DETAIL ABOVE.

H. JOINTS SHALL BE CLEANED AND EDGED BY A 1/4" RADIUS EDGER. LONGITUDINAL JOINTS SHALL BE AS DIRECTED BY THE VILLAGE. EXPANSION JOINTS SHALL BE OF SUCH DIMENSIONS AS SHOWN ON STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.

I. WHERE ASPHALTIC CONCRETE PAVEMENT IS DISTURBED, THE ASPHALT SHALL BE REPLACED AS DIRECTED BY THE VILLAGE.

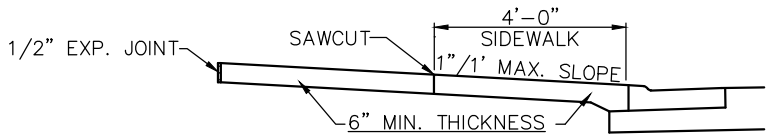
J. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600 LB/CY) CEMENT. PROPORTIONING OPTIONS 1, 2, AND 3 NOT ALLOWED.

K. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.

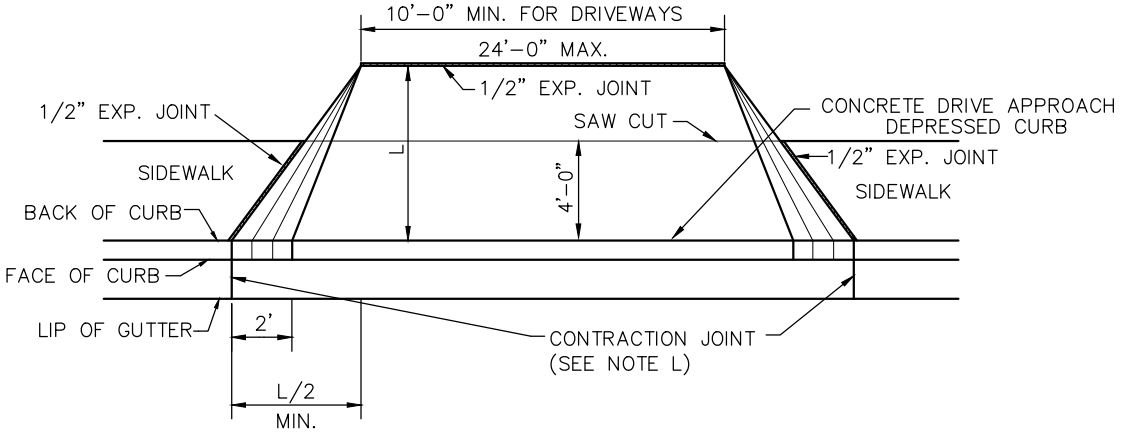
L. WHEN CURB IS REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION, JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.

M. WHITE PIGMENTED CURING COMPOUND ON ALL SURFACES.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# RESIDENTIAL DRIVE APPROACH	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-6

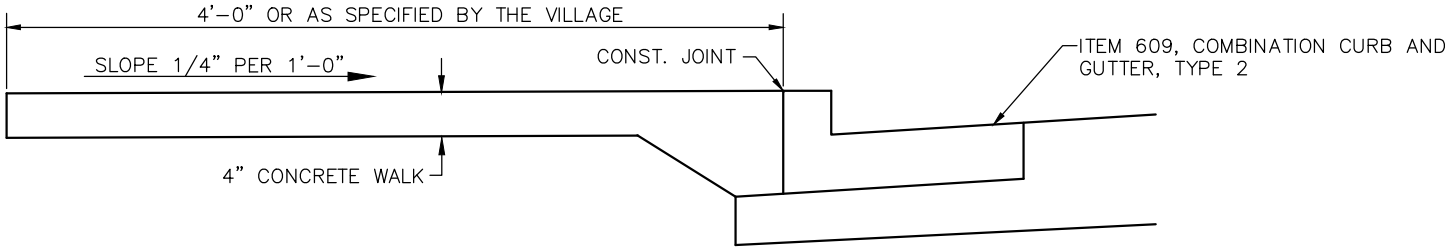


EXPANSION JOINTS SHALL BE PROFLEX VINYL EXPANSION JOINT AS MANUFACTURED BY OSCODA PLASTICS, INC. 1-800-544-9538, MEETING ASTM D-1752 AND AASHTO 153-98.



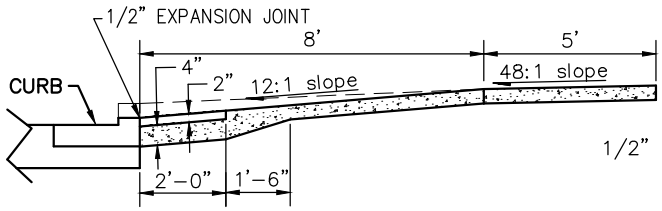
DRIVE APRON WITH NO CURB LAWN

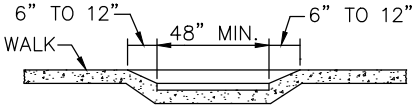
FOR DRIVEWAY NOTES SEE PAGE 300-7



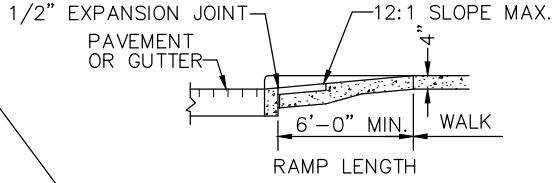
CONCRETE SIDEWALK ABUTTING TYPE 2 CURB DETAIL

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	RESIDENTIAL DRIVE APPROACH AND CONCRETE SIDEWALK DETAIL WITH NO CURB LAWN	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-7

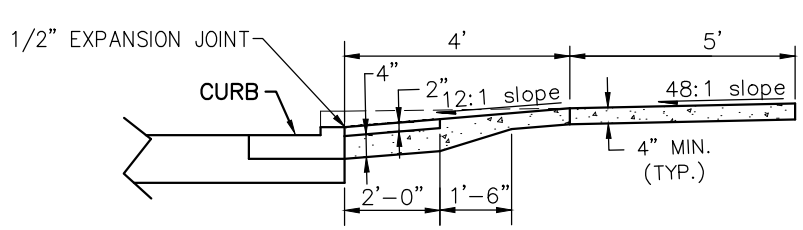


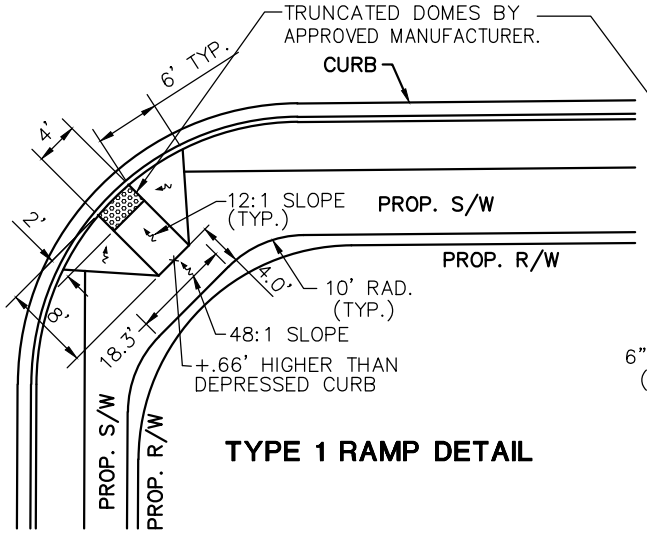


SECTION B-B

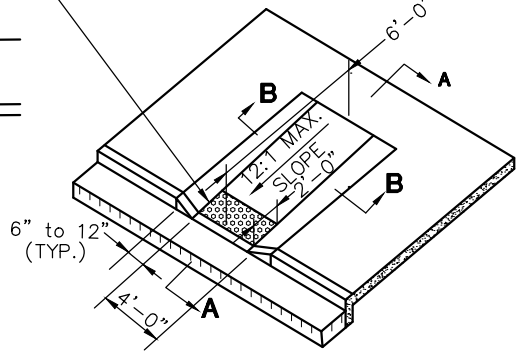


SECTION A-A

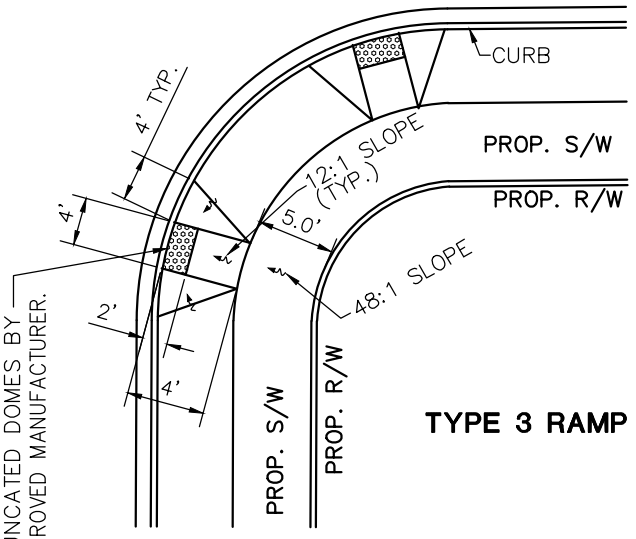




TYPE 1 RAMP DETAIL



TYPE 2 RAMP DETAIL



TYPE 3 RAMP DETAIL

NOTES

A. VILLAGE TO SPECIFY TYPE 1, 2, OR 3 CURB RAMP.
B. ANY COMBINATION OF SIDE SLOPES ON OPPOSITE SIDES OF A RAMP MAY BE USED TO BEST FIT THE SITE CONDITIONS.
C. THE MINIMUM RAMP LENGTH IS 6' FROM BACK OF A 6" CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.
D. WALK THICKNESS IN THE RAMP SLOPES SHALL BE 4" MINIMUM OR THICKER AS NECESSARY TO MATCH ADJACENT WALK THICKNESS.
E. CURB RAMPS SHALL MEET AND BE FINISHED TO AMERICANS WITH DISABILITIES ACT (A.D.A.) STANDARDS.
F. TEXTURE OF CONCRETE SURFACE SHALL BE OBTAINED BY COURSE BROOMING TRAVERSE TO THE RAMP SLOPES AND SHALL BE ROUGHER THAN ADJACENT WALK.
G. CURB RAMPS SHALL MEET THE REQUIREMENTS OF ODOT ITEM 608 UNLESS OTHERWISE SPECIFIED WITHIN.
H. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 600 LB/CY CEMENT). PROPORTIONING OPTIONS 1, 2, AND 3 NOT ALLOWED.
I. CONCRETE SHALL CONTAIN 6% ± 1% OF TOTAL AIR.
J. FOR RECONSTRUCTION JOBS, THE CURB RAMPS WILL HAVE TO BE ADDRESSED BASED ON THE EXISTING CONDITIONS.

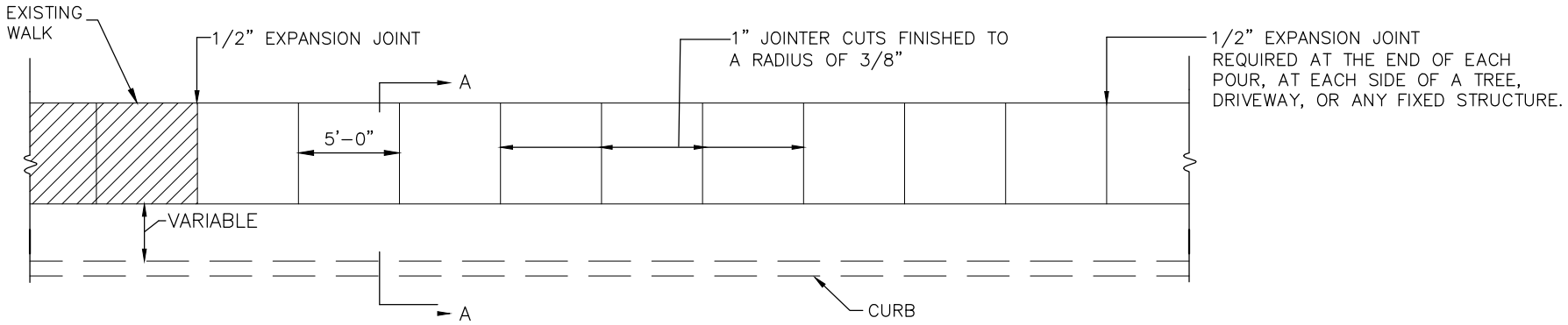
L. TRUNCATED DOME SPECIFICATIONS:
INSTALL DETECTABLE WARNINGS (TRUNCATED DOMES) FOR A DISTANCE OF 24" FROM THE BACK OF CURB FOR THE ENTIRE WIDTH OF THE RAMP OPENING WHERE IT IS FLUSH WITH THE PAVEMENT.

THE TRUNCATED DOMES SHALL BE PANELS MANUFACTURED BY DETECTABLE WARNING SYSTEMS, INC. OR EQUIVALENT:

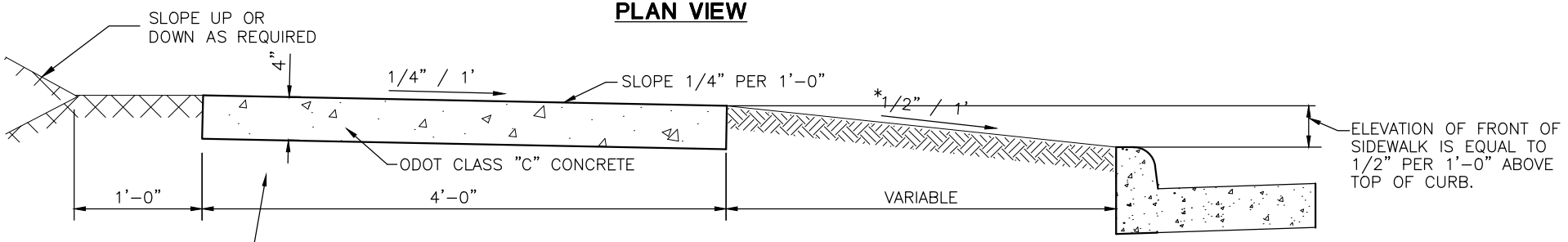
DETECTABLE WARNING SYSTEMS, INC.
6435 JOSHUA TREE AVENUE
ORANGE, CA 92867.
866-999-7452
WWW. DETECTABLE-WARNING.COM

THE PANELS SHALL BE GLASS FIBER POLYMER CERAMIC CEMENT PANELS MOLDED IN THE SQUARE PATTERN. COLOR OF THE PANEL SHALL BE APPROVED BY THE OWNER PRIOR TO ORDERING.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# CURB RAMPS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-8



PLAN VIEW



SECTION A-A

*UNLESS OTHERWISE SHOWN ON CROSS SECTIONS.

SIDEWALK NOTES

A. WALK TO BE POURED ON COMPACTED UNDISTURBED EARTH OR IF OVER EXCAVATED BY THE CONTRACTOR THE WALK SHALL BE POURED ON COMPACTED GRANULAR BEDDING, AND IT WILL BE AT THE COST OF THE CONTRACTOR AND INCIDENTAL TO ITEM 608 4" CONCRETE WALK. VILLAGE INSPECTION OF FORM WORK IS REQUIRED PRIOR TO POURING CONCRETE.

B. PROVIDE BROOM FINISH TO ALL EXPOSED SURFACES. TEXTURE SHALL BE A MEDIUM BROOM WITH TOOL FINISH, VILLAGE TO REVIEW AND APPROVE FIRST POUR.

C. CONCRETE SHALL CONFORM TO ODOT ITEM 499 CONCRETE. CONCRETE WORK SHALL CONFORM TO ODOT ITEM 608, UNLESS OTHERWISE SPECIFIED WITHIN.

D. PROVIDE EDGING AROUND ALL EXPOSED SURFACES.

E. WHITE PIGMENTED CURING COMPOUND ON ALL SURFACES.

F. CONCRETE SHALL BE ODOT CLASS A 4000 P.S.I. CONCRETE PROPORTIONING OPTIONS 1, 2, AND 3 NOT ALLOWED. ALL SIDEWALKS SHALL HAVE A MIN. THICKNESS OF 4".

G. CONCRETE SHALL CONTAIN 6% ± 2% AIR ENTRANEMENT.

H. EXPANSION JOINTS SHALL BE PROFLEX VINYL EXPANSION JOINT AS MANUFACTURED BY OSCODA PLASTICS, INC. 1-800-544-9538, MEETING ASTM D-1752 AND AASHTO 153-98.

I. NO STAMPING OR COLORING OF SIDEWALKS LOCATED IN THE PUBLIC RIGHT-OF-WAY.

J. ALL CURB LAWNS REGARDLESS OF WIDTH MUST BE GRASS (NO WHITE STONE OR OTHER MATERIAL).

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	CONCRETE SIDEWALK DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-9

EXAMPLE: 1/2 INCH TRIP HAZARD

ADJOINING BLOCKS OR PORTIONS THEREOF WHOSE EDGES DIFFER VERTICALLY BY MORE THAN 1/2 INCH.

EXAMPLE: DETERIORATION

ANY SIDEWALK THAT IS DETERIORATED OR SHOWS SURFACE SPALLING, LEAVING IT VERY ROUGH, UNSAFE, OR WITH AGGREGATE PROTRUDING.

EXAMPLE: ABRUPT SLOPE

BLOCKS, OR PORTION OF BLOCKS, THAT CAUSE AN ABRUPT CHANGE OF 1 INCH PER FOOT (OR MORE) IN ANY DIRECTION OF THE SIDEWALK.

EXAMPLE: PLATES, COVERS, ETC.

METAL OR OTHER PLATES, COVERS, OR GRATINGS THAT ARE NOT FLUSH (3/4 INCH OR MORE VERTICAL DIFFERENCE) WITH THE ADJOINING SIDEWALK SURFACE, ARE STRUCTURALLY UNSAFE, OR CAUSE A NUISANCE DUE TO SLIPPERY SURFACES ETC.

EXAMPLE: CRACKS

ANY SIDEWALK BLOCK (BASED ON 20 SQ. FT.) HAVING A CRACK OR CRACKS IN IT OF AT LEAST 3/4 INCH WIDE WITH A MINIMUM OF 4 LINEAL FEET IN ONE BLOCK. (VARIOUS SIZE BLOCKS WILL BE EVALUATED PROPORTIONALLY.)

PERMITS, INSPECTION, AND WORK RULES

A. NO PERSON SHALL TEAR UP OR DIG INTO ANY PUBLIC RIGHT-OF-WAY OR STREET FOR THE PURPOSE OF CONSTRUCTING OR REPAIRING THE SIDEWALK, CURBING, OR GUTTERS THEREON OR FOR ANY OTHER PURPOSE, WITHOUT HAVING FIRST OBTAINED A PERMIT FROM THE ENGINEERING DEPARTMENT TO DO SO.

B. THE CONTRACTOR MUST CALL THE CITY FOR AN INSPECTION AT LEAST THREE WORKING HOURS BEFORE HE PLANS TO POUR THE CONCRETE. THE CONTRACTOR OR HIS FOREMAN MUST BE ON THE JOB WHEN THE INSPECTOR ARRIVES. IF, BECAUSE OF WEATHER CONDITIONS OR FOR SOME OTHER REASON, IT WILL NOT BE POSSIBLE TO HAVE A PERSON ON THE JOB, THE CONTRACTOR IS REQUIRED TO CALL AND CANCEL THE INSPECTION.

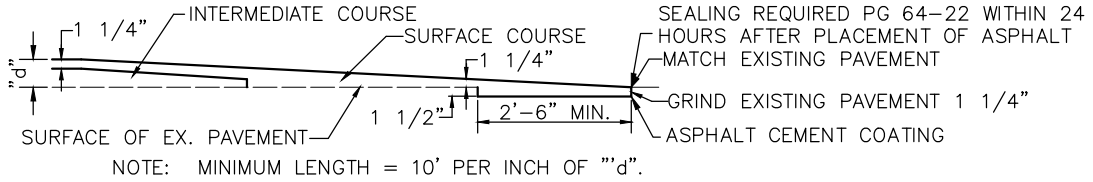
C. THE CONTRACTOR IS CAUTIONED AGAINST ORDERING CONCRETE BEFORE THE INSPECTION IS MADE DUE TO POSSIBLE CORRECTION OF FORMS OR GRADE.

D. THE CONTRACTOR SHALL PROVIDE PROTECTION AND TRAFFIC CONTROL BARRICADES, LIGHTS, SIGNS, AND OTHER DEVICES AS HEREIN SPECIFIED TO PROVIDE WARNING AND PROTECTION FOR VEHICULAR TRAFFIC, PEDESTRIANS, AND THE WORK DURING THE REMOVAL, CONSTRUCTION AND CURING OF SIDEWALK, CURB AND GUTTER, AND DRIVEWAY APRONS.

E. THE CONTRACTOR WILL BE RESPONSIBLE FOR AN IMMEDIATE REMOVAL AND CLEANUP OF ALL EXCAVATED MATERIAL. NO EXCAVATED MATERIAL SHALL BE STORED ON THE PAVEMENT.

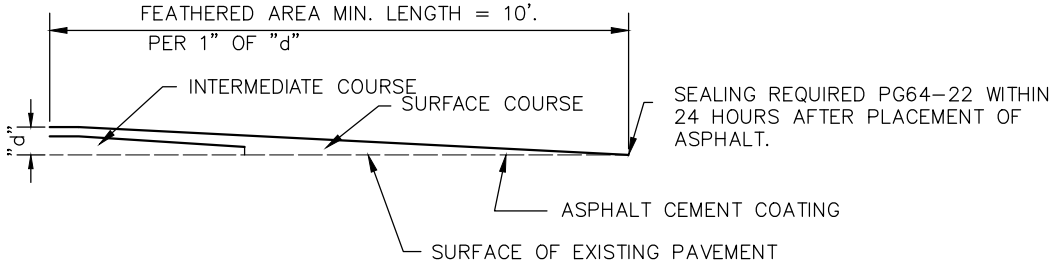
F. ALL CONTRACTORS INSTALLING NEW CURB ARE CAUTIONED THAT IT IS THEIR RESPONSIBILITY TO REPAIR THE STREET PER CITY SPECIFICATIONS BEFORE REMOVING YOUR BARRICADES.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# GUIDELINES FOR REPLACEMENT OF SIDEWALKS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-10

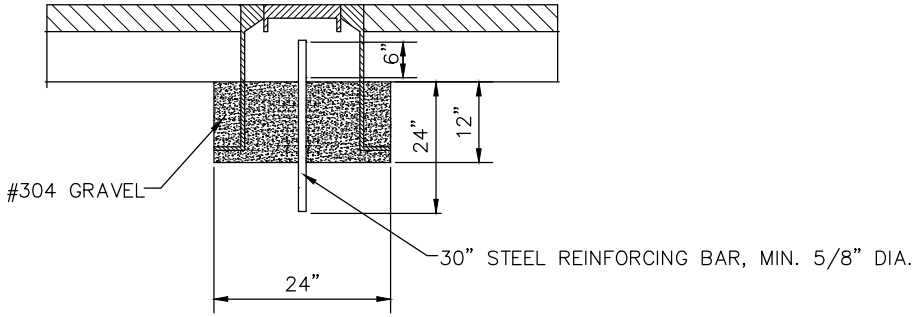


NOTE: MINIMUM LENGTH = 10' PER INCH OF "'d".

BUTT JOINT DETAIL



FEATHERING DETAIL



SURVEY MONUMENT DETAIL

NOTES

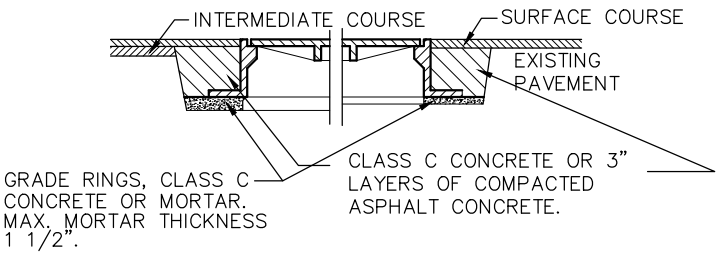
A. MONUMENT BOXES SHALL BE SET AT ALL STREET INTERSECTIONS AND CENTER POINTS OF CUL-DE-SACS.

B. MONUMENT BOXES SHALL BE SET PRIOR TO THE LAYING OF ODOT ITEM 448 SURFACE COURSE ASPHALT UNLESS OTHERWISE PREAPPROVED.

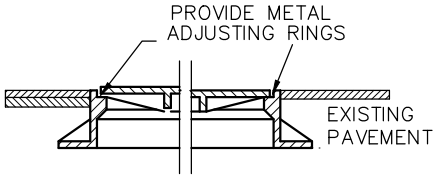
C. MONUMENT ASSEMBLIES SHALL BE NEENAH R-1978-A2 OR EAST JORDAN 8375.

D. MONUMENT BOXES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 604 UNLESS OTHERWISE SPECIFIED WITHIN.

MANHOLES ADJUSTED TO GRADE FOR OVERLAYS



USING CONCRETE OR MORTAR



USING METAL ADJUSTING RINGS

NOTES

METAL ADJUSTING RINGS SHALL:

A. ATTACH SECURELY TO THE EXISTING FRAME BY WELDING OR MECHANICAL DEVICES.

B. CONSIST EITHER OF CAST METAL HAVING AN INTEGRAL RIM AND SEAT, OR BE FABRICATED METAL WITH A STURDY CONNECTION BETWEEN THE SEAT AND RIM.

C. PROVIDE AN EVEN SEAT FOR THE MANHOLE COVER.

D. SHALL BE TYPE DESIGN ACCEPTABLE TO THE VILLAGE.

E. ANY INSTALLATION UNACCEPTABLE TO THE VILLAGE SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	ASPHALT OVERLAY AND MONUMENT	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-11

GENERAL

A. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH ODOT SPECIFICATIONS, LATEST REVISION.

PAVEMENT REPLACEMENT

A. WITHIN 24 HOURS AFTER PLACEMENT OF BACKFILL IN EXISTING STREETS, A TEMPORARY PAVEMENT SHALL BE INSTALLED AND THE STREET OPENED. TEMPORARY PAVEMENT SHALL CONSIST OF 8" OF COMPACTED ODOT SPECIFICATION 411 BASE AND A SURFACE COURSE OF ODOT SPECIFICATION 405 OR 409. THE SURFACE SHALL BE KEPT FLUSH WITH THE EXISTING STREET.

B. PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT. (MINIMUM PAVEMENT COMPOSITION, SEE PAGE 300-2.)

C. ANY SETTLEMENT OF A TRENCH CAUSING A DEPRESSION SHALL BE REFILLED AS REQUIRED BY THE VILLAGE AT THE CONTRACTOR'S EXPENSE. THIS PROVISION APPLIES FOR A ONE-YEAR PERIOD AFTER WORK IS ACCEPTED BY THE VILLAGE.

D. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE VILLAGE. COLD PATCH ALL TRENCHES TO 1" TO 1 1/2" WHEN FINAL ASPHALT WILL NOT BE REPLACED WITHIN 24 HOURS.

TRAFFIC CONTROL

A. THE CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL AT ALL TIMES WITH THE PROPER BARRICADES AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVISES. THESE CONTROL DEVICES SHALL BE IN PLACE PRIOR TO ANY WORK COMMENCING.

B. TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE VILLAGE.

CURB STAKING AND ROADWAY

A. LINE AND GRADE EVERY 25' ON A CONVENIENT OFFSET WITH TACKED HUBS.

PAVEMENT (ASPHALT)

A. THE CONTRACTOR SHALL PROVIDE THE VILLAGE WITH A COPY OF THE NORMAL (MEDIUM TRAFFIC) ODOT 404 JOB MIX FORMULA FOR EACH PLANT THAT PROVIDES HOT MIXED ASPHALT TO THIS PROJECT. ALL MIXES SHALL FOLLOW ODOT JOB MIX FORMULA WITH THE EXCEPTION THAT THE BITUMEN CONTENT SHALL BE 0.2% HIGHER. SECTION 401.02 COMPOSITION OF THE CURRENT ODOT SPECIFICATIONS SHALL BE USED FOR ACCEPTANCE BASED ON THE INCREASED BITUMEN. A 448 OR 446 JOB MIX FORMULA WILL NOT BE ACCEPTABLE. RECYCLED ASPHALT SHALL NOT EXCEED 15% OF ANY 402 MIX PRODUCED. NO RECYCLED ASPHALT MAY BE USED IN THE ITEM 404 SURFACE COURSE.

B. THREE-WHEEL STEEL ROLLER SHALL BE USED FOR INITIAL BREAKDOWN ON ALL PROJECTS.

C. ALL WORK SHALL ADHERE TO ODOT'S LATEST REVISIONS AND TO THE VILLAGE SPECIFICATIONS WHICHEVER IS MORE STRINGENT SHALL PREVAIL UNLESS OTHERWISE APPROVED.

D. PATCHED AREAS SHALL BE SEALED ON THE PERIMETER OF THE PATCH WITH ASPHALT CEMENT.

E. ALL UTILITY ADJUSTMENTS -- MANHOLE, WATER VALVES, ETC., -- SHALL BE RAISED TO FINISHED GRADE BEFORE THE FINAL ASPHALT COURSE IS LAID.

F. ASPHALT CEMENT SHALL BE USED NEXT TO THE LIP OF GUTTER PRIOR TO THE FINAL ASPHALT LIFT BEING PLACED. (SS-1 TACK OR PG64-22 SEAL.)

G. TACK COAT SHALL BE APPLIED PRIOR TO THE PLACEMENT OF THE FINAL LIFT OF ASPHALT IF THE EXISTING ASPHALT LIFT IS DIRTY OR AFTER 3 DAYS UNLESS OTHERWISE APPROVED. TEMPERATURE MUST BE 50°F OR HIGHER.

H. NO ASPHALT SHALL BE PLACED OVER EXCAVATED TRENCHES UNLESS TRENCHES HAVE BEEN COMPACTED AS PER VILLAGE SPECIFICATIONS.

I. NO ASPHALT SHALL BE LAID UNLESS THE VILLAGE IS GIVEN PRIOR NOTICE AND THE AMBIENT TEMPERATURE IS 50°F OR GREATER UNLESS OTHERWISE APPROVED.

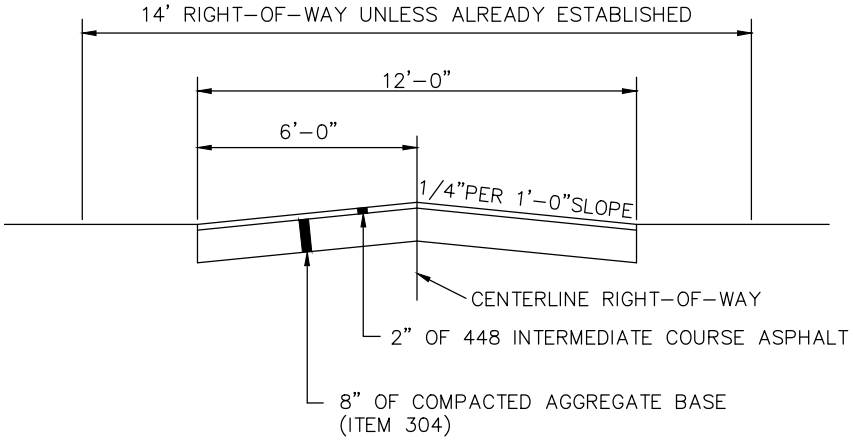
K. FINAL LIFT OF ASPHALT SHALL BE FINISHED TO 1/4" ABOVE THE LIP OF GUTTER.

L. TEMPERATURES FOR BREAKDOWN ROLLING SHALL BE 260°F PLUS 15°F AND FOR FINAL ROLLING 175°F PLUS 15°F.

M. ASPHALT CEMENT SHALL BE USED ON ALL JOINTS AND FEATHERED SURFACES PRIOR TO PLACEMENT OF THE NEXT COURSE OF ASPHALT TO THE ABUTTING JOINT, UNLESS OTHERWISE APPROVED.

N. 325°F IS THE MAXIMUM TEMPERATURE ASPHALT MATERIAL IS TO BE MIXED.

O. ALL EDGES TO BE TRIMMED BACK TO SOLID MATERIAL AND BE STRAIGHT AND NEAT AS PER THE VILLAGE'S INSTRUCTIONS.

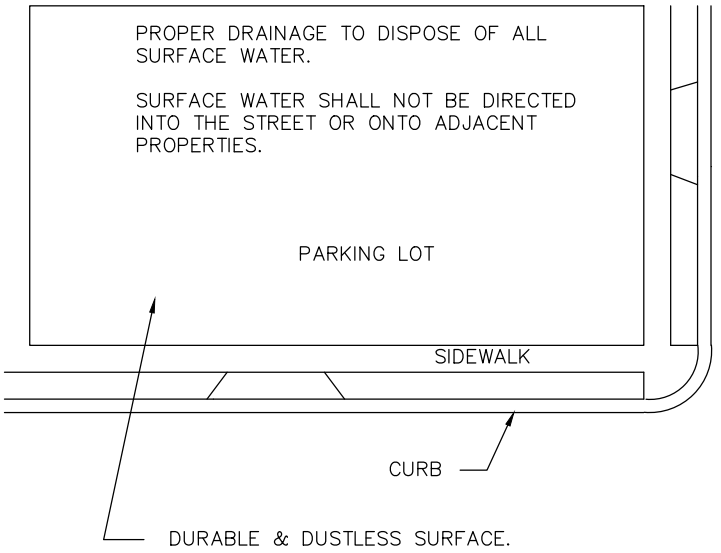


TYPICAL ALLEY CONSTRUCTION

A. MINIMUM STANDARD (UNLESS OTHERWISE APPROVED.)

B. FOR RENOVATION OF EXISTING ALLEYS ONLY. NO NEW ALLEY'S WILL BE APPROVED WITHIN THE VILLAGE.

ADJACENT PARKING AREAS SHALL BE CONNECTED TO LIMIT THE NUMBER OF ACCESS DRIVES TO THE STREET.



PARKING LOT DETAIL

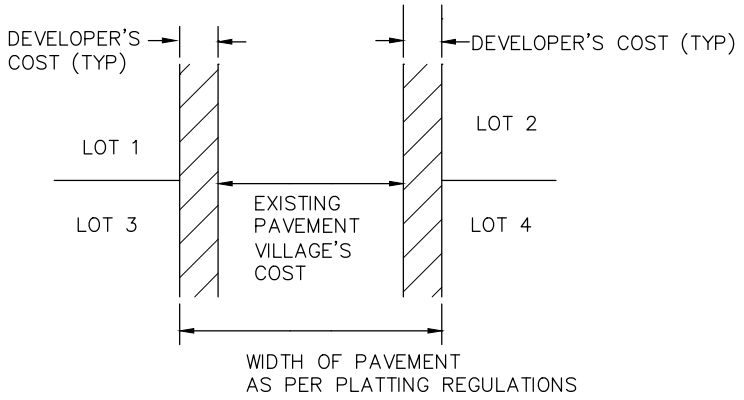
THE FOLLOWING ARE ACCEPTED LOT SURFACES (UNLESS OTHERWISE APPROVED).

A. ASPHALT CONCRETE ITEM 448 INTERMEDIATE COURSE.

B. CONCRETE

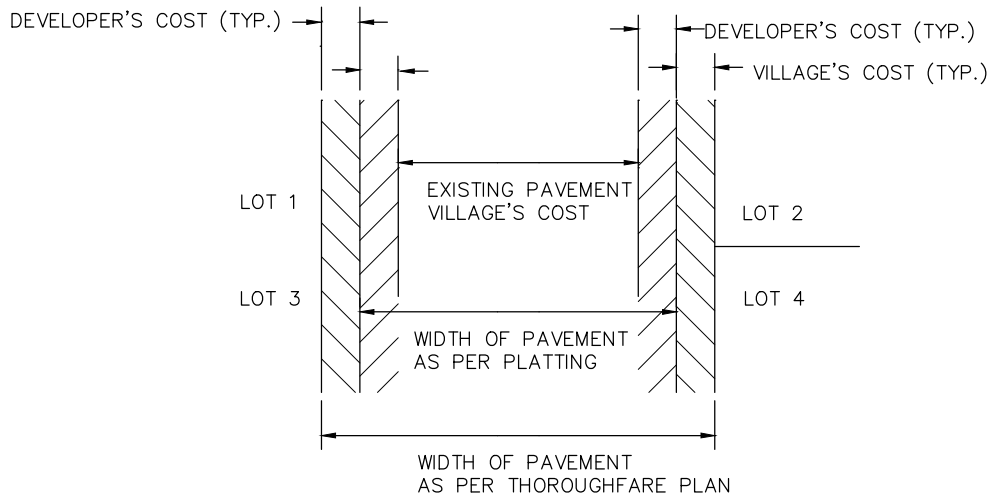
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# ALLEY AND PARKING LOT DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-13

EXAMPLE "A"



STREET IMPROVEMENTS FROM EXISTING STREET WIDTH TO PLATTING REGULATION WIDTH

EXAMPLE "B"



STREET IMPROVEMENTS FROM EXISTING STREET WIDTH TO THOROUGHFARE PLAN WIDTH

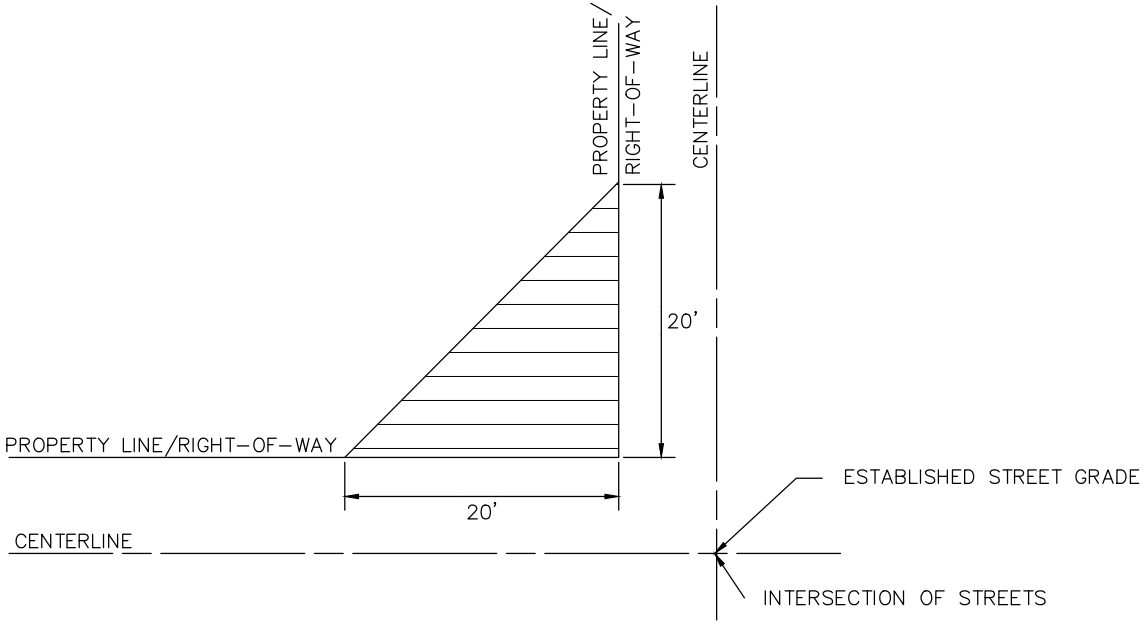
NOTES

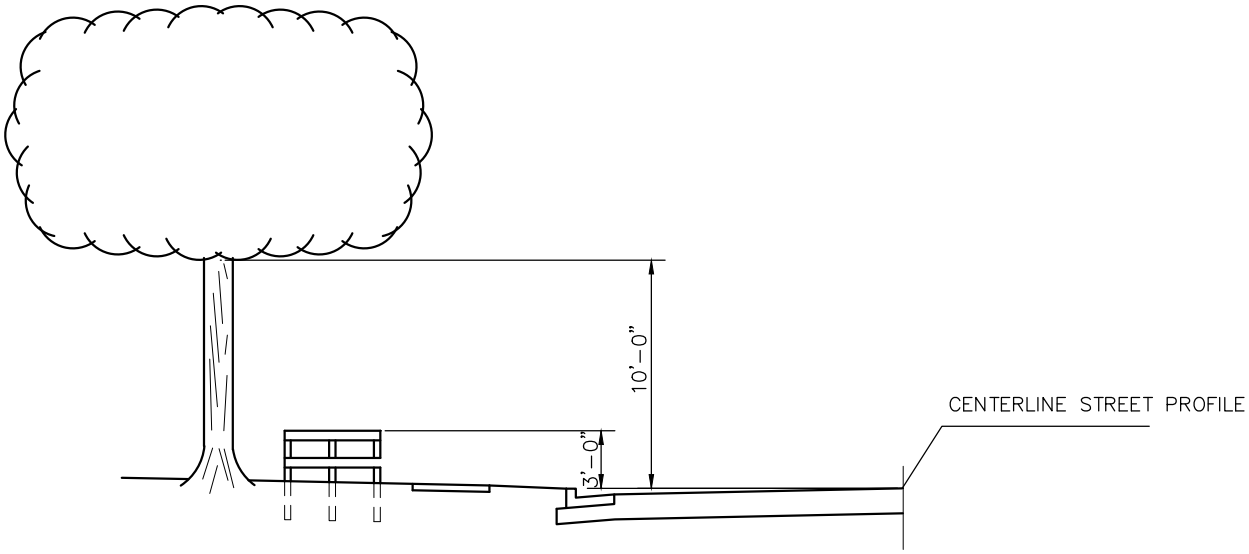
A. IF BOTH SIDES OF A STREET ARE INCLUDED IN THE SUBDIVISION, THE DEVELOPER PAYS THE TOTAL COST FOR ADDITIONAL WIDTH OF EXCAVATION, PAVEMENT, CURB AND SIDEWALK INCLUDING COST TO BRING THE STORM SEWER SYSTEM, WATER, AND SANITARY SEWER UP TO STANDARDS.

B. IF ONE SIDE OF THE SUBDIVISION ABUTS AN EXISTING STREET, THE DEVELOPER SHALL PAY FOR THE TOTAL COST OF ONE SIDE FOR ADDITIONAL WIDTH OF EXCAVATION, PAVEMENT, CURB AND SIDEWALK INCLUDING COST TO BRING THE STORM SEWER SYSTEM, WATER, AND SANITARY SEWER UP TO STANDARDS.

C. THE VILLAGE PAYS CONSTRUCTION COST ON EXISTING STREET WIDTH AND ANY OVERSIZING TO MEET THOROUGHFARE PLAN.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# STREET IMPROVEMENT CONDITIONS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-14



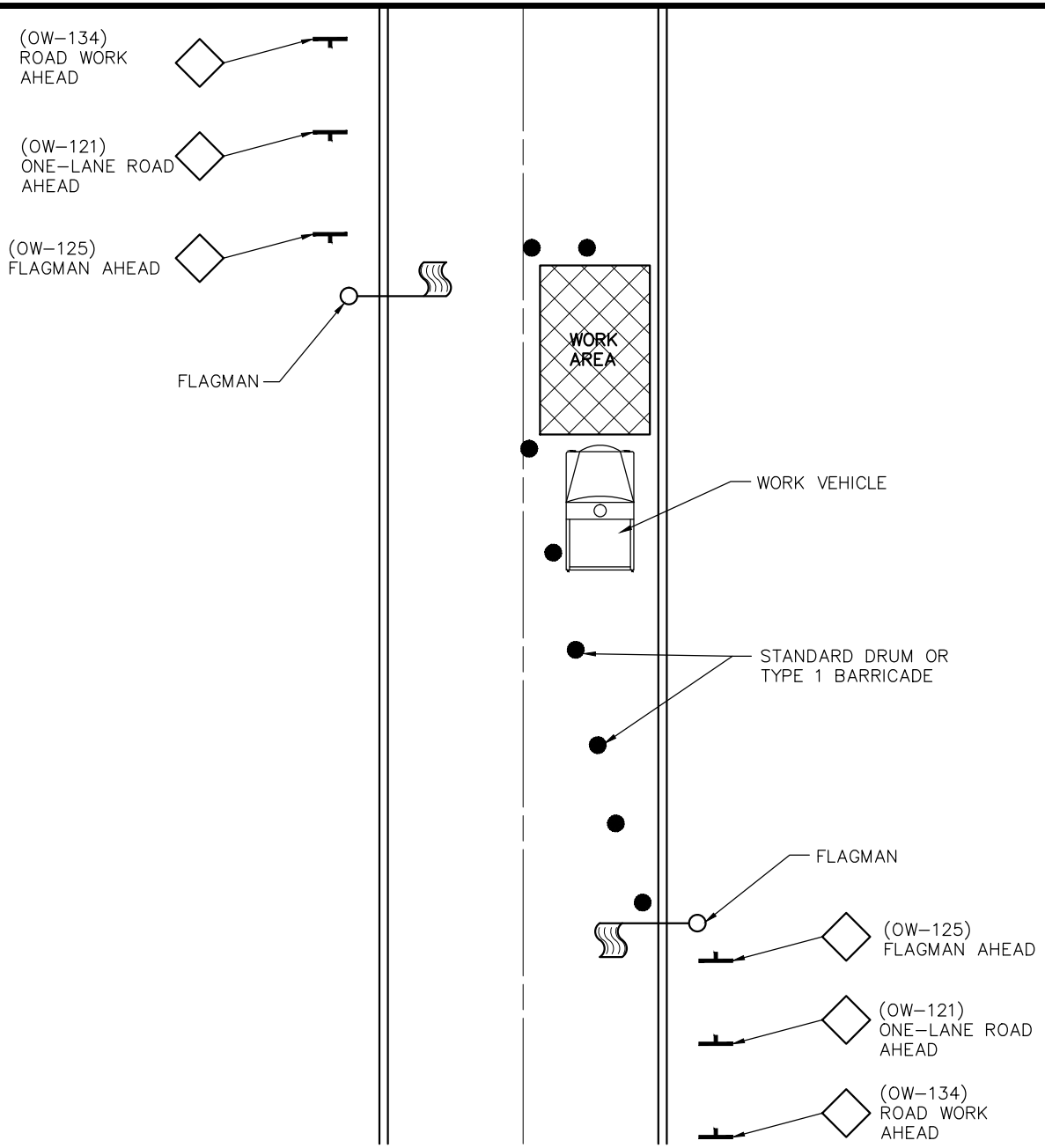


VISION CLEARANCE EXHIBIT

NOTES

THERE SHALL NOT BE ANYTHING ABOVE 3' OR BELOW 10' OF THE ESTABLISHED STREET GRADE IN THE TRIANGULAR SHADED AREA.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# VISION CLEARANCE ON CORNER LOTS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-15



NOTES

A. THE POLICE AND FIRE DEPARTMENTS SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF ANY CONSTRUCTION. NO STREET SHALL BE CLOSED WITHOUT THE APPROVAL OF THE VILLAGE.

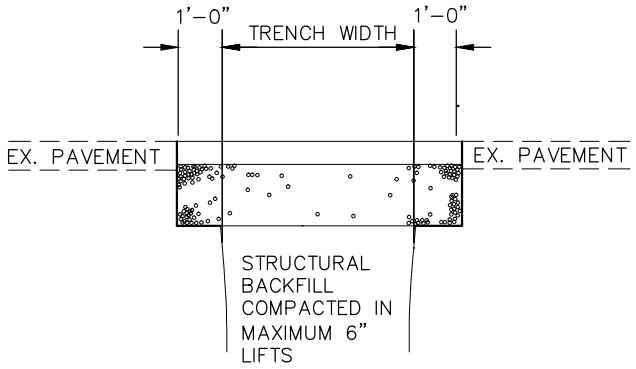
B. IF THE WORK IS TO COVER THE ENTIRE WIDTH OF THE STREET, ONE HALF OF THE STREET SHALL BE MAINTAINED FOR TRAFFIC WHILE ONE HALF OF THE STREET IS REPAIRED.

C. BARRICADE DISTANCE AND SEPARATION OF WARNING TO BE SPACED AS PER JOB SITE ACCORDING TO THE VILLAGE.

D. IF BARRICADES ARE TO BE LEFT UP OVERNIGHT, WARNING LIGHTS (FLASHERS) ARE TO BE USED.

E. ALL STREET CONTROL DEVICES APPLICABLE TO DIFFERENT WIDTH STREETS, TYPE OF CONSTRUCTION, ETC., SHALL CONFORM TO THE LATEST REVISION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, UNLESS OTHERWISE APPROVED BY THE VILLAGE AND SHALL BE IN PLACE AND PROPERLY DISPLAYED PRIOR TO THE COMMENCEMENT OF ANY WORK.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# TRAFFIC CONTROL DEVICES # STATIONARY OPERATIONS IN ONE LANE	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 300–16



TYPICAL PAVEMENT RESTORATION DETAIL

TYPICAL PAVEMENT RESTORATION NOTES

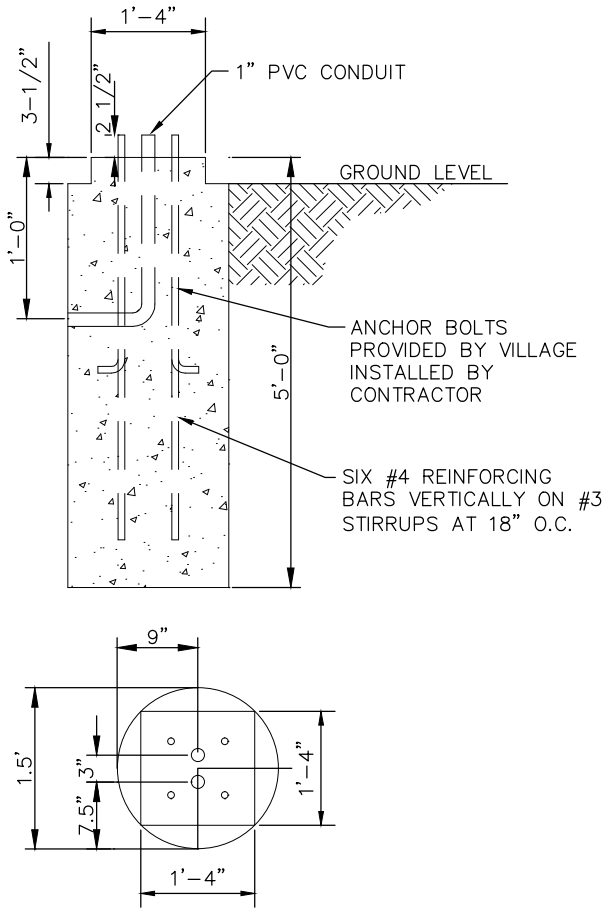
MINIMUM GRAVEL PAVEMENT REPLACEMENT
2" OF ODOT #67 ON
12" OF ODOT ITEM 304, IN LIFTS OF 3" MAXIMUM

MINIMUM ASPHALT PAVEMENT REPLACEMENT
PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT COMPOSITION. (MINIMUM PAVEMENT COMPOSITION SEE PAGE 300-2 UTILIZING APPROPRIATE STREET CLASSIFICATION).

SOIL BORINGS SHALL BE CAPPED WITH A MINIMUM OF 9" OF ODOT CLASS C CONCRETE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	TYPICAL PAVEMENT RESTORATION DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 300-17

STREET LIGHT



POLE BASE DETAIL

TRAFFIC CONTROL DEVICE NOTES

A. ALL TRAFFIC CONTROL DEVICES SHALL BE PER THE LATEST REVISION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND APPROVED BY THE VILLAGE BEFORE INSTALLATION.

B. ALL SIGN POST SHALL BE STANDARD GALVANIZED STEEL POST UNLESS OTHERWISE APPROVED BY THE VILLAGE.

C. ALL STREET NAME SIGNS SHALL BE GREEN IN COLOR WITH WHITE LETTERING UNLESS OTHERWISE APPROVED BY THE VILLAGE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# TRAFFIC CONTROL DEVICES AND STREET LIGHT STANDARDS	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 500–1

SEEDING

A. ALL AREAS DESIGNATED FOR SEEDING SHALL HAVE A MINIMUM OF 6" OF TOPSOIL OVER THE ENTIRE AREAS. THE AREA SHALL BE RAKED, ROLLED, AND DRESSED READY FOR SEEDING. NO STONE OVER 1" IN SIZE PERMITTED.

DRAINS

A. ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE REPAIRED AND PROVIDED WITH UNOBSTRUCTED OUTLETS AS APPROVED AND DIRECTED BY THE VILLAGE AND MARKED ON THE RECORD DRAWINGS.

CONNECTIONS TO EXISTING PIPE

A. WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

UTILITY SEPARATION

A. ANY UNDERGROUND UTILITIES SUCH AS GAS, ELECTRIC, CABLE TV, TELEPHONE, ETC., SHALL HAVE 5' SEPARATION FROM ANY VILLAGE WATER OR SEWER LINES UNLESS OTHERWISE APPROVED.

UTILITIES

A. THE MAXIMUM LENGTH OF ANY UTILITY TRENCH TO BE OPEN AT ANY TIME SHALL BE 250' UNLESS OTHERWISE APPROVED.

COMPACTION METHODS

A. FLOODING SHALL NOT BE PERMITTED.
B. MECHANICAL DEVICES, HAND DEVICES, VIBRATING PLATES OR OTHER EQUIPMENT APPROVED BY THE VILLAGE IS ACCEPTABLE 1' ABOVE PIPE IN UNIFORM LIFTS OF 12" (LOOSE DEPTH) OF EXISTING NATIVE MATERIAL AND 6" OF GRANULAR BACKFILL. THE HEIGHT OF LIFTS WILL DEPEND UPON THE TYPE OF MECHANICAL EQUIPMENT BEING USED. THE HEIGHT WILL BE 6" FOR HAND OPERATED TOOLS AND UP TO 12" ON EQUIPMENT MOUNTED TOOLS. THE COMPACTION EQUIPMENT SHALL BE CAPABLE OF COMPACTING THE MATERIAL UNDER THE HAUNCH OF THE PIPE.

C. JETTING IS APPROVED FOR ODOT 603, TYPE 2 GRANULAR MATERIAL ONLY AND IF A STORM DRAIN IS AVAILABLE AS A DRAINAGE OUTLET FOR THE REMOVAL OF EXCESS WATER. A 4' MAXIMUM LIFT SHALL BE ADHERED TO. SATISFACTORY DRAINAGE SHALL BE PROVIDED BY THE USE OF DRAINAGE DITCHES, PUMPS OR OTHER EQUIPMENT.

D. DENSITY FOR THE ABOVE METHODS SHALL BE NO LESS THAN THAT OF THE SURROUNDING GROUND UNLESS OTHERWISE SPECIFIED.

TYPICAL NOTES - ALL SUBDIVISION CONSTRUCTION DRAWINGS

A. ALL CONSTRUCTION METHODS AND MATERIALS SHALL COMPLY WITH THE VILLAGE ENGINEERING STANDARDS OR ODOT WHICHEVER IS MORE RESTRICTIVE.

B. ALL COMPACTION SHALL MEET THE VILLAGE REQUIREMENTS. IF TESTING OF COMPACTED AREAS IS REQUESTED BY THE VILLAGE, SAID TESTING SHALL BE PERFORMED AT THE EXPENSE OF THE DEVELOPER.

C. THE VILLAGE WILL LOCATE AREAS IN NEED OF UNDERCUTTING UNLESS THE DEVELOPER CHOOSES TO HAVE AT HIS EXPENSE AN INDEPENDENT APPROVED TESTING COMPANY TO DETERMINE UNSUITABLE MATERIAL AREAS THAT NEED UNDERCUTTING.

D. ALL EMBANKMENT AREAS SHALL BE COMPACTED TO A MINIMUM OF 95% OF ASTM D698 STANDARD PROCTOR CURVE AND TESTED TO REPRESENT A DEPTH OF 12" UNLESS OTHERWISE SPECIFIED BY THE VILLAGE.

E. ALL UNPAVED AREAS WITHIN THE STREET RIGHT-OF-WAY SHALL BE SEEDED WITHIN 48 HOURS AFTER THE CURB IS BACKFILLED. STAKED STRAW BALES MAY BE REQUIRED IN ADDITION TO SEEDING TO CONTROL EROSION IF REQUESTED BY THE VILLAGE.

F. STORM WATER POLLUTION PREVENTION SHOULD BE A HIGH PRIORITY ON ALL CONSTRUCTION PROJECTS. ON ALL PROJECTS WHICH DISTURB AT LEAST 1 ACRES OF SOIL, A NPDES PERMIT IS REQUIRED FROM OEPA AND A COPY OF THE PERMIT MUST BE ON FILE AT THE VILLAGE OFFICE BEFORE CONSTRUCTION BEGINS.

LOW STRENGTH MORTAR BACKFILL

A. IN SITUATIONS WHERE UTILITIES CROSS HEAVILY TRAVELED STREETS OR IT MAY BE DIFFICULT TO GET ADEQUATE COMPACTION ON GRANULAR MATERIAL, LOW STRENGTH MORTAR BACKFILL WILL BE REQUIRED PER ODOT ITEM 613 TYPE 1 ONLY. THE VILLAGE MAY REQUIRE THIS TYPE OF BACKFILL AT THEIR DISCRETION WITH THE COST BEING BORE BY THE CONTRACTOR.

BORING/JACKING

A. MATERIALS.

CASING PIPE SHALL BE WELDED STEEL PIPE CONFORMING TO AWWA C–202.

B. INSTALLATION (CASING PIPE).

1. FURNISH PROCEDURE METHODS TO THE VILLAGE FOR APPROVAL.

2. ALL METHODS AND PROCEDURES SHALL BE APPROVED BY THE VILLAGE PRIOR TO CONSTRUCTION.

3. ADEQUATELY SUPPORT ALL TRENCHES AND BORING/JACKING PITS.

4. INSTALL TO LINE AND GRADE SHOWN.

C. INSTALLATION (CARRIER PIPE).

1. PLACE CONDUITS IN CASING PIPE TO SAME RELATIVE POSITIONS AS ADJACENT DUCT BY USE OF SPACERS.

2. FILL THE SPACE BETWEEN CONDUITS INSIDE THE CASING PIPE WITH CLEAN SAND OR OTHER APPROVED MATERIALS AS APPROVED BY THE VILLAGE.

STEEL CASING PIPE

A. STEEL PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.

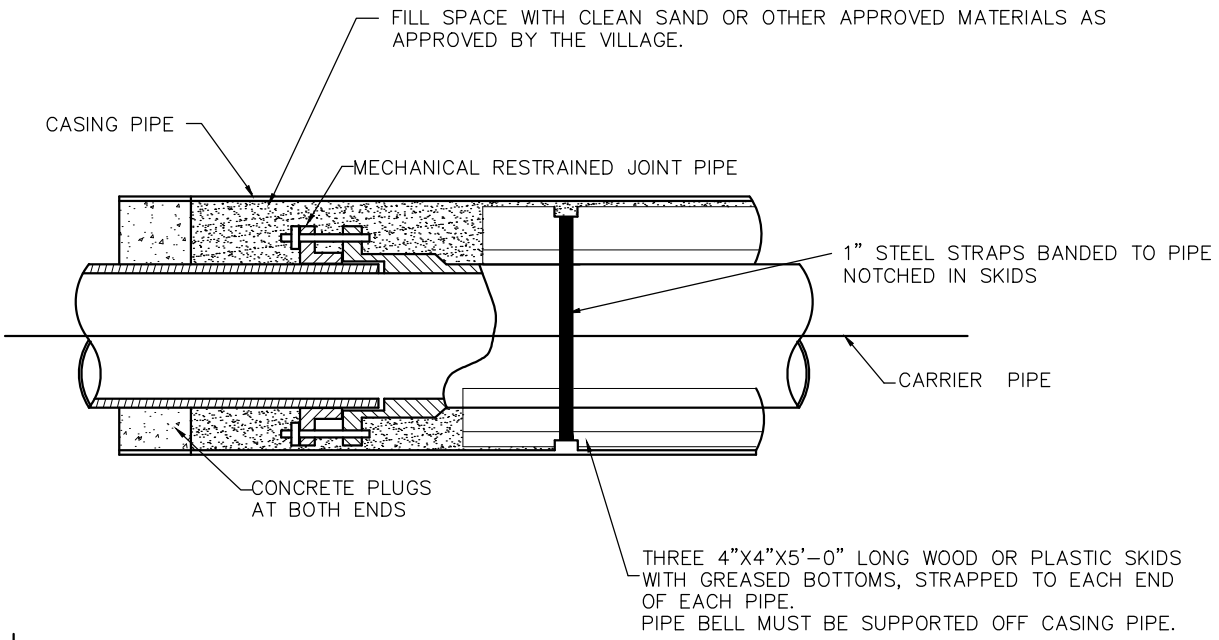
B. JOINTS BETWEEN THE SECTIONS OF PIPE SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.

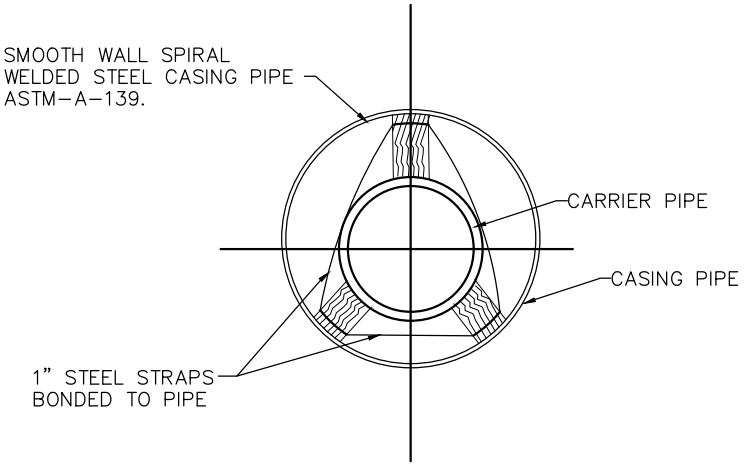
C. SIZE–A MINIMUM OF 4" GREATER THAN THE LARGEST OUTSIDE DIAMETER OF THE CARRIER PIPE.

D. A STEEL CASING PIPE WILL BE REQUIRED FOR STORM SEWER, WATERMAIN, AND SANITARY SEWER.

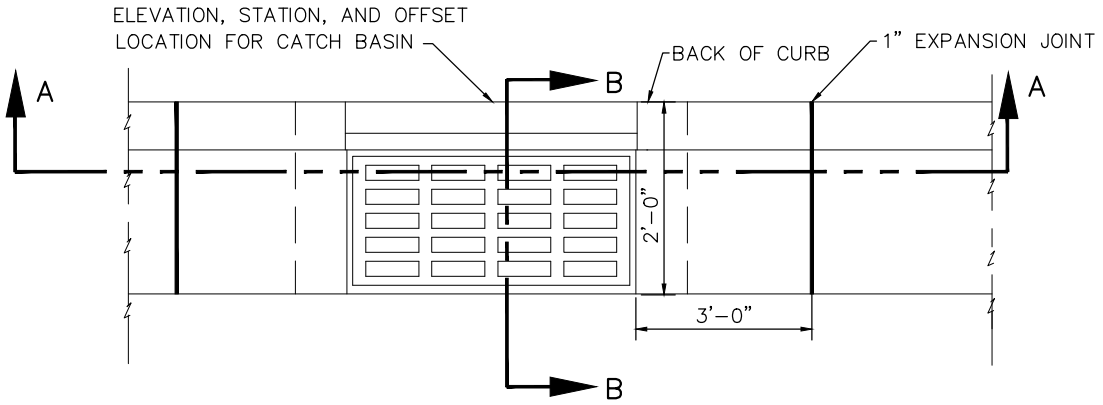
DIAMETER NOMINAL (INCHES)	NOMINAL THICKNESS (INCHES)
10 AND UNDER	0.188
12 & 14	0.250
16	0.281
18	0.312
20 & 22	0.344
24	0.375
26	0.406
28	0.438
30	0.469
32	0.500
34 & 36	0.532
38	0.562
40	0.594
42	0.625
44 & 46	0.657
48	0.688
50	0.719
52	0.750
54	0.781
56 & 58	0.812
60	0.844
62	0.875
64	0.906
66 & 68	0.938
70	0.969
72	1.000

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	LOW STRENGTH MORTAR BACKFILL AND BORING/JACKING	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 500–3

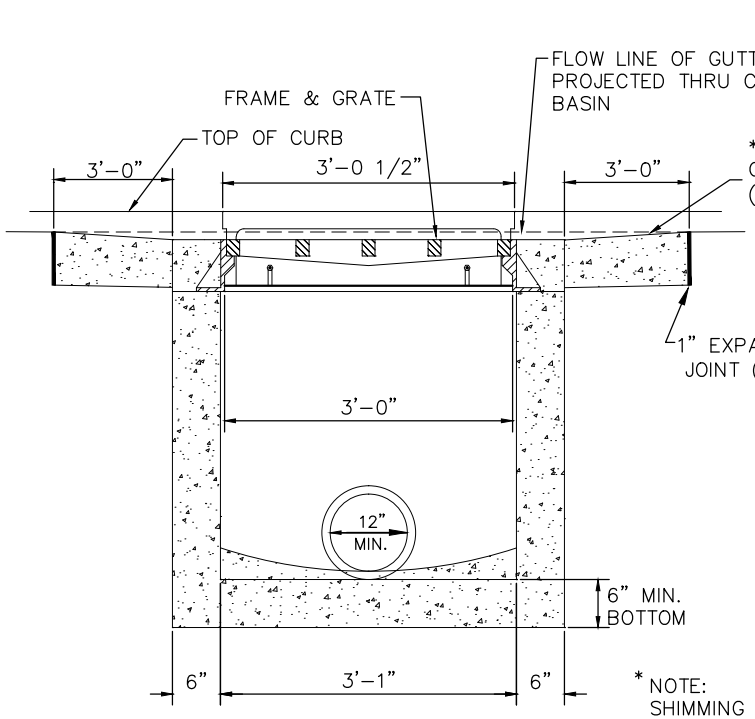




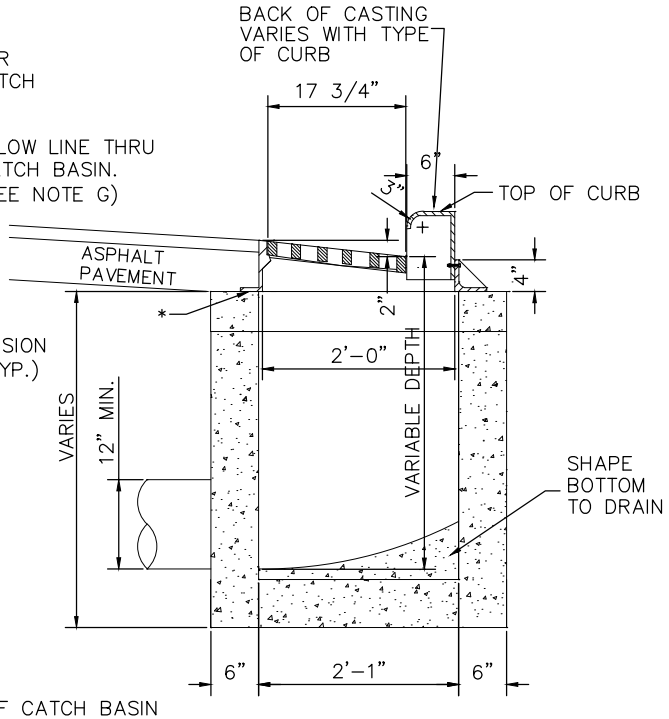
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	CASING PIPE DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 500-4



TOP VIEW



SECTION A-A



SECTION B-B

* NOTE: SHIMMING OF CATCH BASIN FRAME MAYBE REQUIRED TO KEEP LIP OF GUTTER CONSISTENT.

NOTES

A. CASTING SHALL BE EAST JORDAN 7030 OR NEENAH R-3246 OR EQUIVALENT.

B. FOR TYPE 2 COMBINATION CURB AND GUTTER. THE BACK SHALL BE EAST JORDAN TYPE T4 OR NEENAH (3" RADIUS) (R-3246).

C. CATCH BASIN IN DRIVE APPROACHES (TO BE AVOIDED, IF POSSIBLE) THE BACKS SHALL BE EAST JORDAN TYPE T3 OR NEENAH (R-3246-1 WITH CURB PLATE).

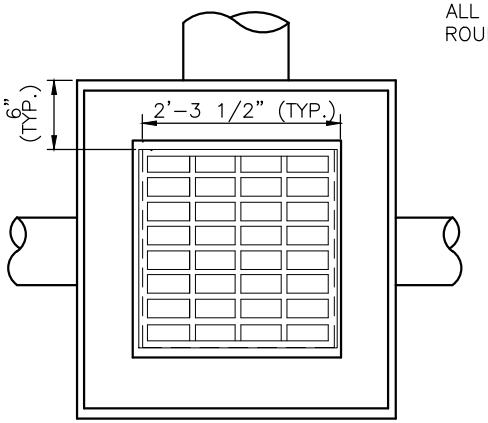
D. STANDARD GRATE SHALL BE EAST JORDAN TYPE M2, NEENAH TYPE C, OR EQUIVALENT. ALL BAR EDGES TO BE ROUNDED 1/8" RADIUS.

E. CONCRETE, CAST-IN-PLACE, TO BE CLASS C. PRECAST CONSTRUCTION PERMITTED AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6±+2% AIR VOID CONTENT IN THE HARDENED CONCRETE. KNOCKOUTS ARE REQUIRED IN PRECAST CONSTRUCTION. PRECAST WALLS SHALL HAVE A SUFFICIENT AMOUNT OF REINFORCEMENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

F. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO CATCH BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" ONLY AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.

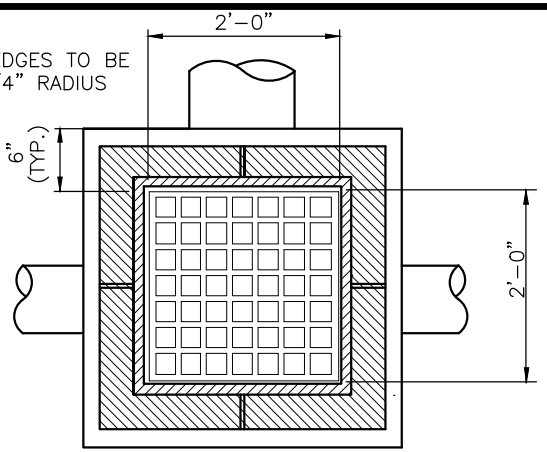
G. DROP FLOW LINE 1/2" WITHIN BLOCK OUT OF COMBINED CURB AND GUTTER WHILE KEEPING LIP OF GUTTER CONSISTENT WITH TOP OF CURB.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	TYPE 1 CATCH BASIN	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-1

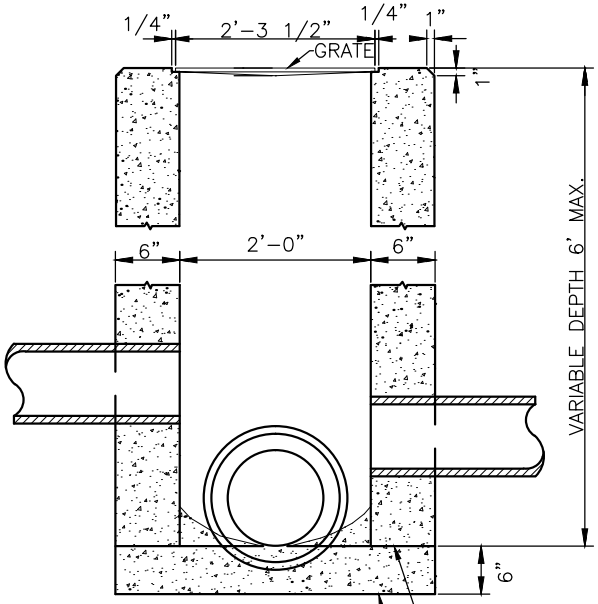


PLAN

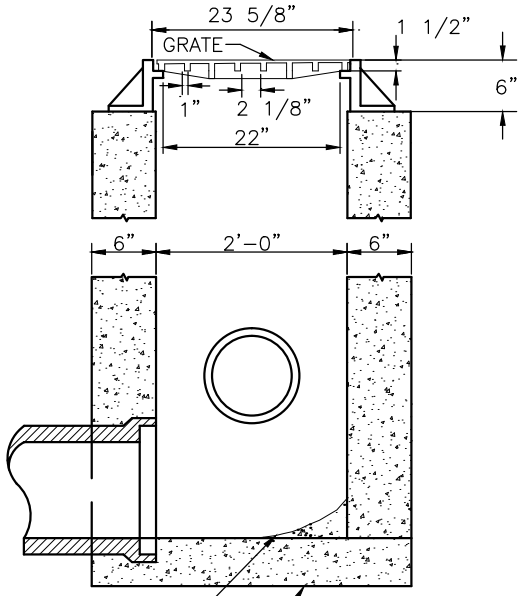
ALL GRATE EDGES TO BE ROUNDED 1/4" RADIUS



PLAN



NONPAVED AREAS



PAVED AREAS

PERMISSIBLE CONSTRUCTION JOINT

BOTTOM SLAB MAY BE CAST SEPARATELY AND THE OUTLET PIPE PLACED ON TOP OF IT WITH THE BOTTOM SHAPED TO DRAIN.

NOTES

A. LOCATION AND ELEVATIONS WHEN GIVEN ON THE PLANS IS TOP CENTER OF THE GRATE. WHEN SIDE OPENINGS ARE PROVIDED, ELEVATION SHALL BE THE FLOW LINE OF THE SIDE INLET.

B. GRATE FOR NONPAVED AREAS SHALL BE EAST JORDAN IRON WORKS 5110 TYPE M3 OR NEENAH CATALOG NO. R-4859-C OR EQUIVALENT.

C. GRATE ELEVATION TO BE PLACED 4" TO 6" BELOW NORMAL DITCH RETURNING TO NORMAL 10' EACH SIDE OF BASIN.

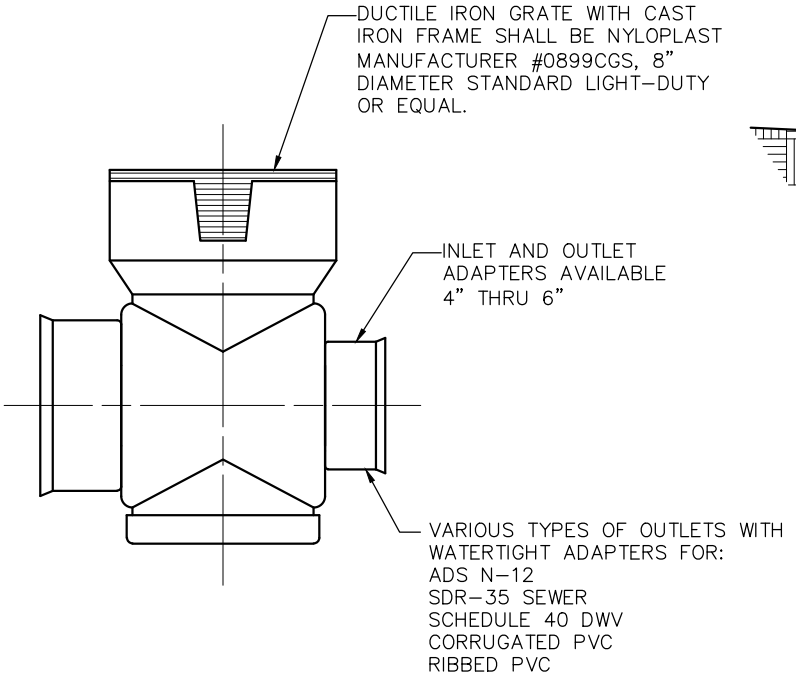
D. PRECAST CONSTRUCTION IS REQUIRED, UNLESS OTHERWISE APPROVED, AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6±+2% AIR VOID CONTENT IN THE HARDENED CONCRETE. KNOCKOUTS SHALL PROVIDED IN PRECAST CONSTRUCTION. PRECAST WALLS SHALL HAVE A SUFFICIENT AMOUNT OF REINFORCEMENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

E. CATCH BASINS NOT PERMITTED IN PAVEMENT AREAS UNLESS USING A FRAME AND GRATE EQUIVALENT OF NEENAH CATALOG NO. R-3405 OR EAST JORDAN IRON WORKS NO. 5250.

F. FOR PIPES OVER 18" REFER TO ODOT CATCH BASIN 2-3 AND 2-4. FOR SIDE INLETS REFER TO ODOT CATCH BASIN 2-2-A.

G. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO CATCH BASIN. PIPE TO INTRUDE INTO CATCH BASIN 1" ONLY AND PIPE MUST BE CUT PARALLEL TO CATCH BASIN. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND CATCH BASIN.

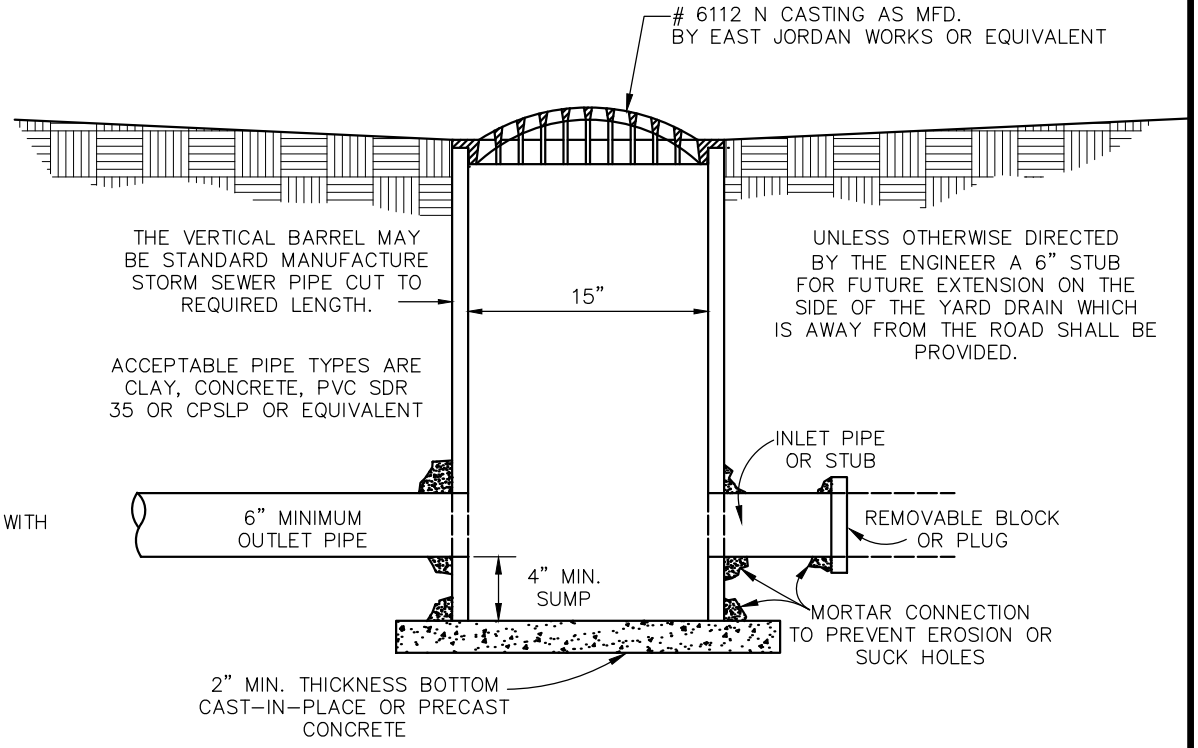
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	TYPE 2-2-B CATCH BASIN	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-2



TYPE 2 YARD DRAIN

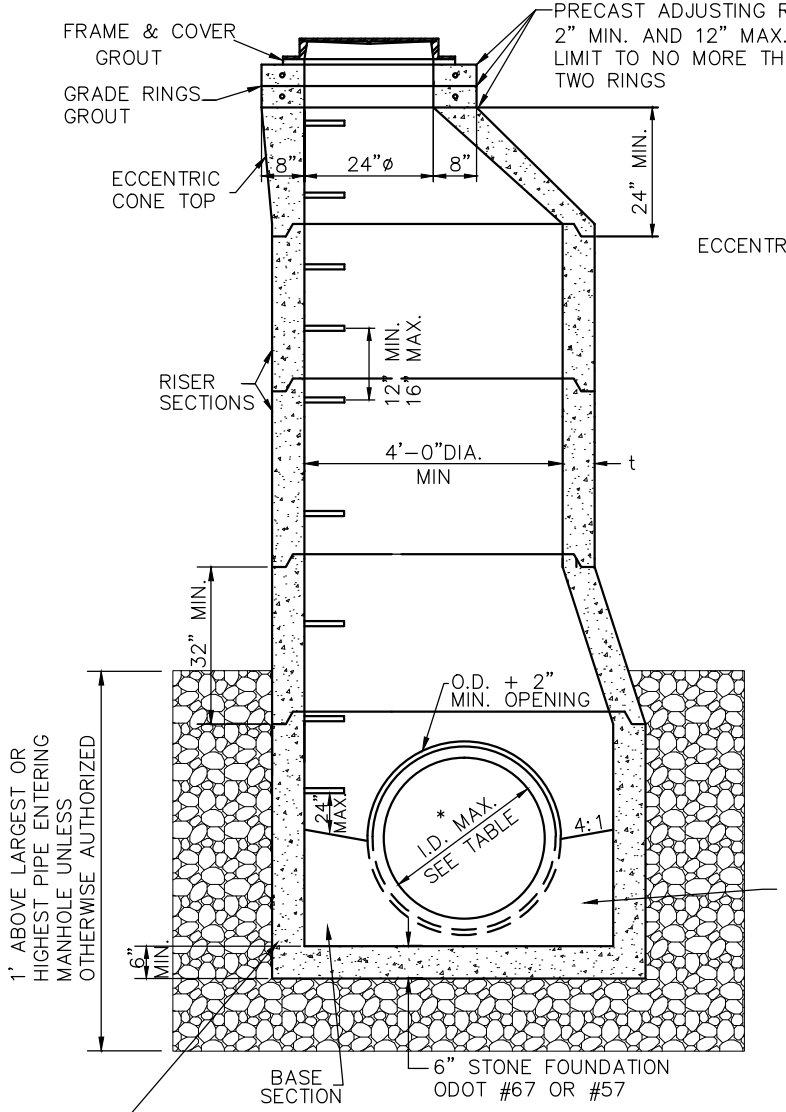
-STANDARD OR CUSTOM DRAIN BASIN FOR VARIABLE INLET HEIGHT SHALL BE NYLOPLAST MANUFACTURER #2808AG OR EQUAL.

-CONTRACTOR TO INSTALL PER MANUFACTURER'S RECOMMENDATIONS.



TYPE 3 YARD DRAIN

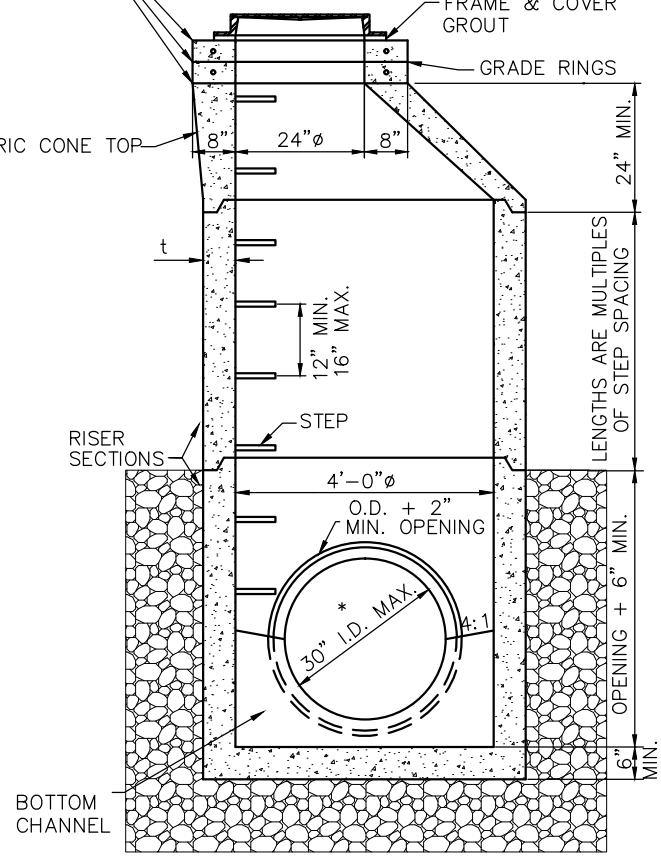
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	YARD DRAIN	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-3



60" TO 96" PRECAST BASE

SEE TABLE FOR MAXIMUM PIPE SIZES

PRECAST OR POURED IN PLACE BASE SECTION WITH 6" GRANULAR BEDDING. USE OF BARREL BLOCKS IS CONTINGENT UPON VILLAGE APPROVAL AND THEN ONLY IN SPECIAL CASES.



48" PRECAST BASE

FOR 30" & SMALLER PIPE

* BASE I.D.	MIN "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7 1/2	60"
96"	8"	60"

*DUE TO PIPE ORIENTATION, LARGER DIAMETER BASE THAN WHAT IS SPECIFIED TO ACCEPT PIPE MAY BE REQUIRED.

NOTES

A. STORM MANHOLE FRAME AND APPROVED VENTED LID SHALL BE EQUAL OF NEENAH NO. R-1767 OR EAST JORDON IRON WORKS NO. 1600 WITH "STORM" STAMPED ON LID.

B. TOP AND TRANSITION (OR REDUCER) SECTIONS MAY BE EITHER ECCENTRIC CONE OR FLAT SLAB.

C. OPENINGS IN RISER SECTIONS FOR 18" AND SMALLER INLET PIPES MAY BE PREFABRICATED OR CUT IN THE FIELD PROVIDED THE SIDES OF THE PIPE AT THE SPRING LINE DO NOT PROJECT INTO THE MANHOLE.

D. MATERIALS FOR BASES AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENT SHALL COMPLY WITH ODOT REQUIREMENT OF 706.13 (ASTM C-478).

E. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

F. FOR PIPE SIZES LARGER THAN 60", REFER TO ODOT TYPE 4 TO 5 MANHOLE.

G. NO LATERALS MAY PROTRUDE INTO THE INTERNAL MANHOLE.

H. MAXIMUM SPACING SHALL BE 400'.

I. WHEN CONNECTING TO AN EXISTING STORM MANHOLE CARE SHALL BE TAKEN TO KEEP OPENING AS MINIMAL AS POSSIBLE. IF POSSIBLE, SAW CUT OR USE ROTARY HAMMER FOR OPENING TO MINIMIZE DAMAGE TO STORM MANHOLE AND PIPE MUST BE CUT PARALLEL TO STORM MANHOLE. USE NONSHRINK GROUT AROUND PIPE TO SEAL BETWEEN PIPE AND STORM MANHOLE.

J. JOINTS BETWEEN SECTIONS TO BE EITHER MORTAR OR BITUMINOUS PIPE JOINT FILLER (ODOT 706.10)

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

TYPE 3 STORM MANHOLE

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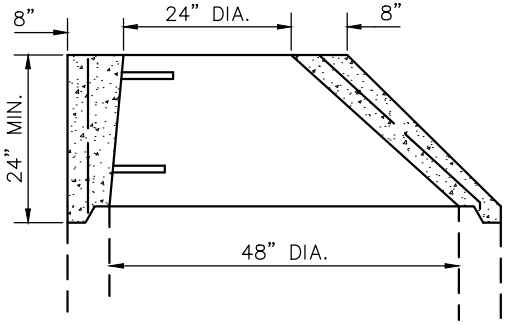
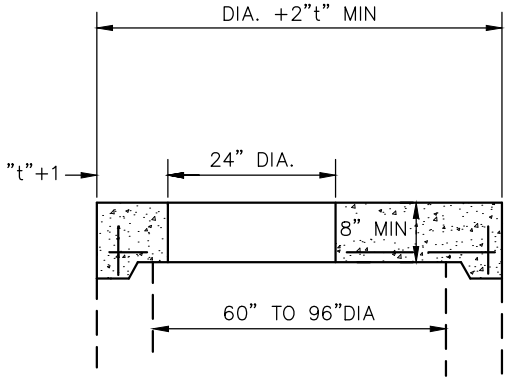
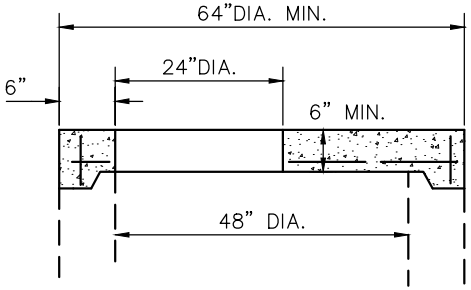


ECCENTRIC CONE TOP

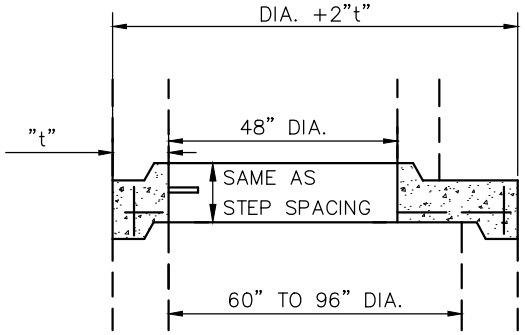


FLAT SLAB TOP

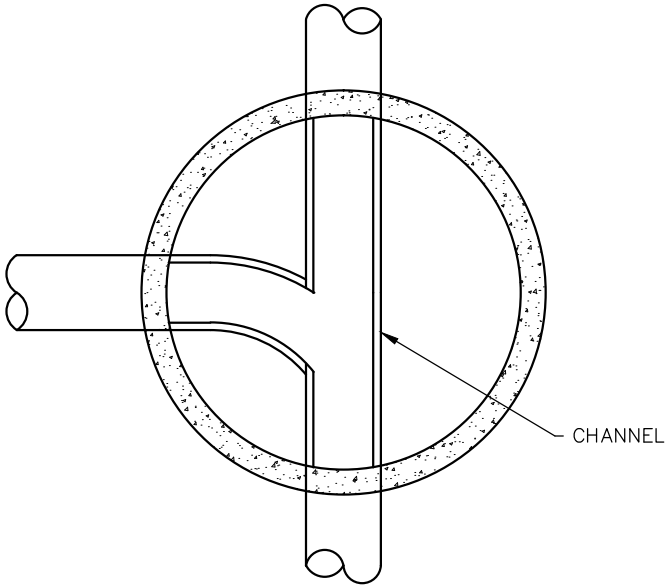
BASE I.D.	MIN "t"	MAX. PIPE SIZE
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7 1/2	60"
96"	8"	60"



FLAT SLAB TOP



FLAT SLAB TRANSITION

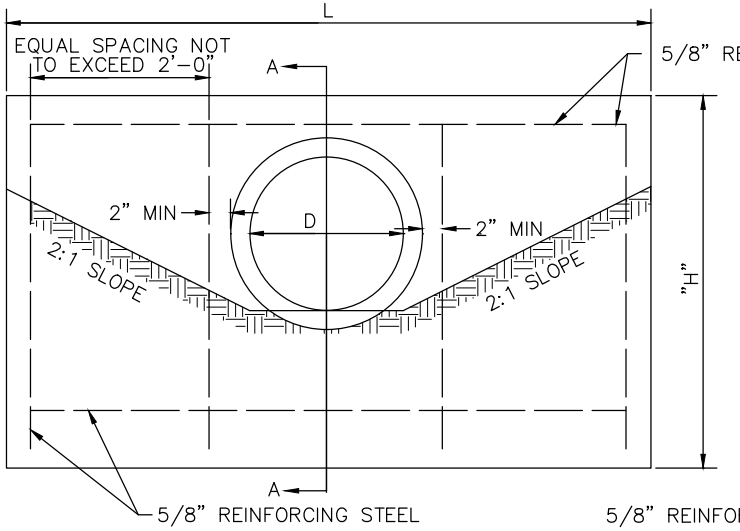


SECTIONAL PLAN

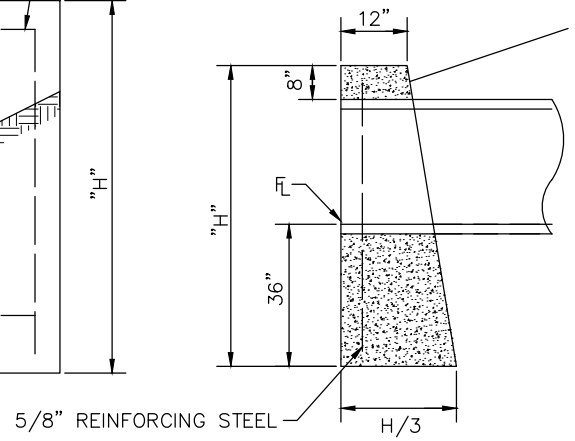
NOTE

ALL INVERTS TO BE CHANNELED FOR OPTIMUM FLOW.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	TYPE 3 STORM MANHOLE DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-5



ELEVATION



SECTION A-A

NOTES

A. THESE FULL HEIGHT HEADWALLS ARE FOR NONSKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS.

B. CONCRETE SHALL BE ODOT CLASS C. REINFORCED STEEL BARS SHALL BE 5/8" ROUND.

C. DIMENSIONS AND QUANTITIES ARE SHOWN FOR CIRCULAR SECTIONS ONLY. IT WILL BE NECESSARY TO DETERMINE DIMENSIONS FOR THE HW-1 HEADWALL REQUIRED FOR REINFORCED ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL PIPE ARCHES IN ACCORDANCE WITH THE EQUATIONS LISTED ON THIS DRAWING.

D. CHAMFER ALL EXPOSED CORNERS 3/4".

E. WHERE THE SOIL BORINGS INDICATE A BEARING CAPACITY OF LESS THAN 2600 LBS. PER SQUARE FOOT, IT WILL BE NECESSARY TO INCREASE THE WIDTH OF THE BASE.

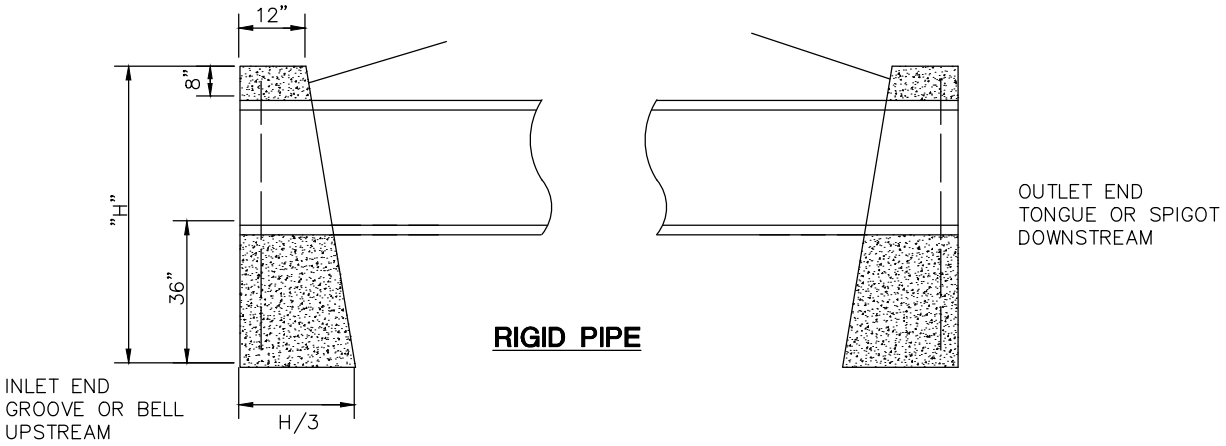
F. MINIMUM COVER FOR REINFORCING STEEL SHALL BE 2".

G. FOR PIPES HAVING A DIAMETER OR RISE OVER 36", REFERENCE ODOT HW-3 HEADWALLS FOR FULL HEIGHT HEADWALL.

H. FOR SKEWED CULVERTS HAVING A DIAMETER OR RISE OF 36" OR LESS, REFERENCE ODOT HW-2 HEADWALLS.

I. HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.

J. LAST 20± OF PIPE BEFORE HEADWALL SHALL BE REINFORCED CONCRETE PIPE.



RIGID PIPE

DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	HEIGHT	LENGTH	CONCRETE C.Y.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS = 5D + 4T
L ELLIPTICAL OR PIPE-ARCH = 4R + 4T + S
H CIRCULAR SECTIONS = D + T + 44"
H ELLIPTICAL OR PIPE-ARCH = R + T + 44"

D = DIAMETER OF PIPE
R = RISE OF PIPE
S = SPAN OF PIPE
T = THICKNESS OF BARREL
L = LENGTH OF HEADWALL
H = HEIGHT OF HEADWALL

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

FULL-HEIGHT HEADWALLS

REVISIONS:

DATE APPROVED: 04-21-2008

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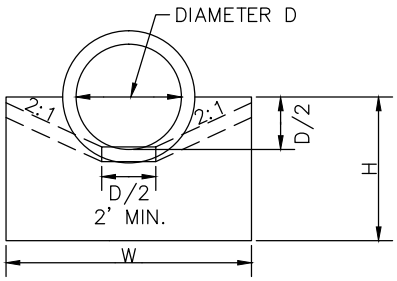
NOTES

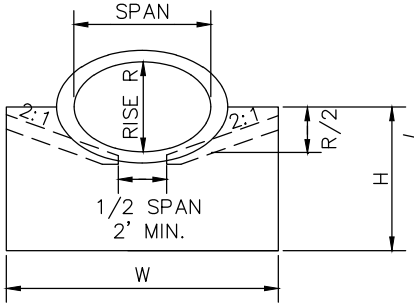
A. CONCRETE FOR HEADWALLS SHALL BE ODOT CLASS C. CONCRETE QUANTITIES ARE BASED ON HEADWALLS ONLY.

B. HEADWALLS MAY BE PRECAST CONCRETE CONSTRUCTED TO THE ABOVE REQUIREMENTS. GROUT AROUND PIPE AFTER INSTALLATION.

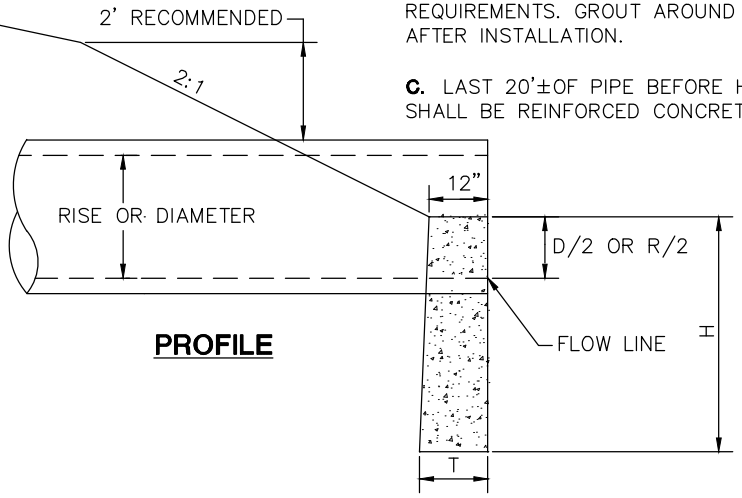
C. LAST 20'±OF PIPE BEFORE HEADWALL SHALL BE REINFORCED CONCRETE PIPE.



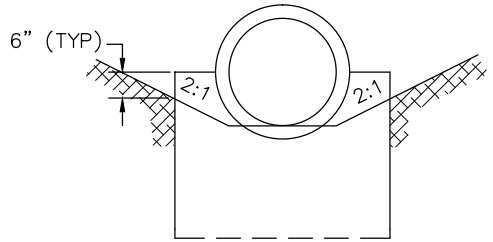
CIRCULAR



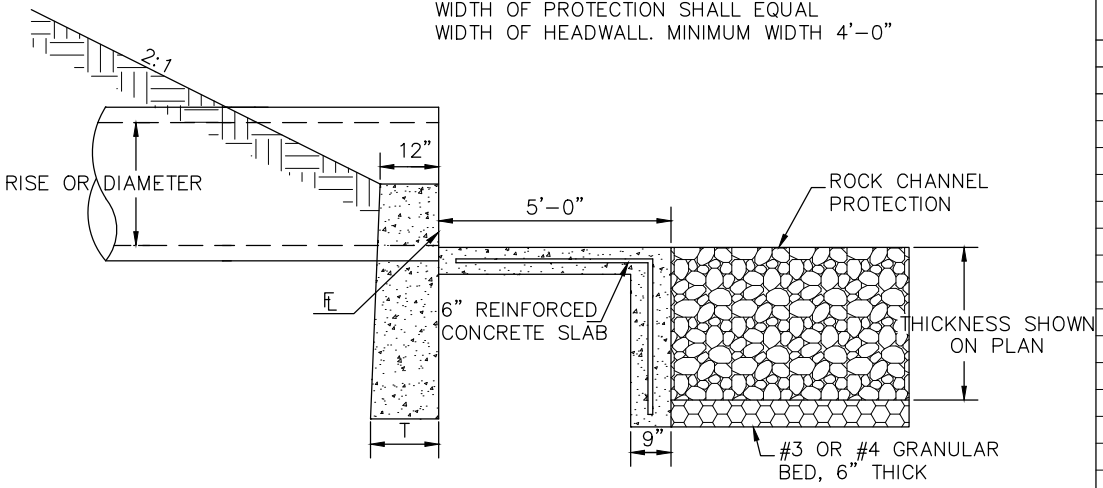
ELLIPTICAL



PROFILE



WIDTH OF PROTECTION SHALL EQUAL
WIDTH OF HEADWALL. MINIMUM WIDTH 4'–0"



OUTLET CHANNEL PROTECTION DETAIL

(CUTOFF WALL DEPTH 2'–6" MINIMUM IS VARIABLE TO MATCH REQUIRED THICKNESS OF ROCK.)

HEADWALL FOR CONCRETE PIPE

CIRCULAR				CONC.	ELLIPTICAL					CONC.
D	W	H	T	C.Y.	SPAN	RISE	W	H	T	C.Y.
12"	2'–0"	3'–0"	12"	.20	23"	14"	3'–0"	3'–2"	12"	.29
15"	2'–6"	3'–2"	12"	.25	30"	19"	3'–7"	3'–4"	12"	.35
18"	3'–0"	3'–3"	12"	.31	34"	22"	3'–11"	3'–5"	12"	.38
21"	3'–6"	3'–4"	12"	.37	38"	24"	4'–6"	3'–6"	12"	.44
24"	4'–0"	3'–6"	12"	.43	42"	27"	4'–8"	3'–7"	12"	.45
27"	4'–6"	3'–8"	12"	.49	45"	29"	5'–2"	3'–8"	12"	.49
30"	5'–0"	3'–9"	12"	.56	49"	32"	5'–5"	3'–10"	12"	.52
33"	5'–6"	3'–10"	12"	.62	53"	34"	5'–11"	4'–0"	14"	.66
36"	6'–0"	4'–0"	12"	.69	60"	38"	6'–10"	4'–2"	14"	.82
39"	6'–6"	4'–2"	12"	.77	68"	43"	8'–0"	4'–4"	16"	1.01
42"	7'–0"	4'–3"	12"	.84	76"	48"	9'–2"	5'–0"	16"	1.34
48"	8'–0"	4'–6"	14"	1.09	83"	53"	10'–4"	5'–2"	18"	1.65
54"	9'–3"	4'–9"	14"	1.32	91"	58"	11'–6"	5'–5"	18"	1.97
60"	10'–6"	5'–6"	16"	1.93	98"	63"	12'–7"	5'–7"	20"	2.38
66"	11'–9"	5'–9"	18"	2.42	106"	68"	13'–9"	5'–10"	20"	2.69
72"	13'–0"	6'–0"	18"	2.77	113"	72"	14'–9"	6'–0"	22"	3.14
78"	14'–3"	6'–3"	20"	3.37	121"	77"	15'–11"	6'–3"	22"	3.49
84"	15'–6"	6'–6"	22"	4.05	128"	82"	17'–0"	6'–5"	24"	4.04

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

HALF-HEIGHT HEADWALL

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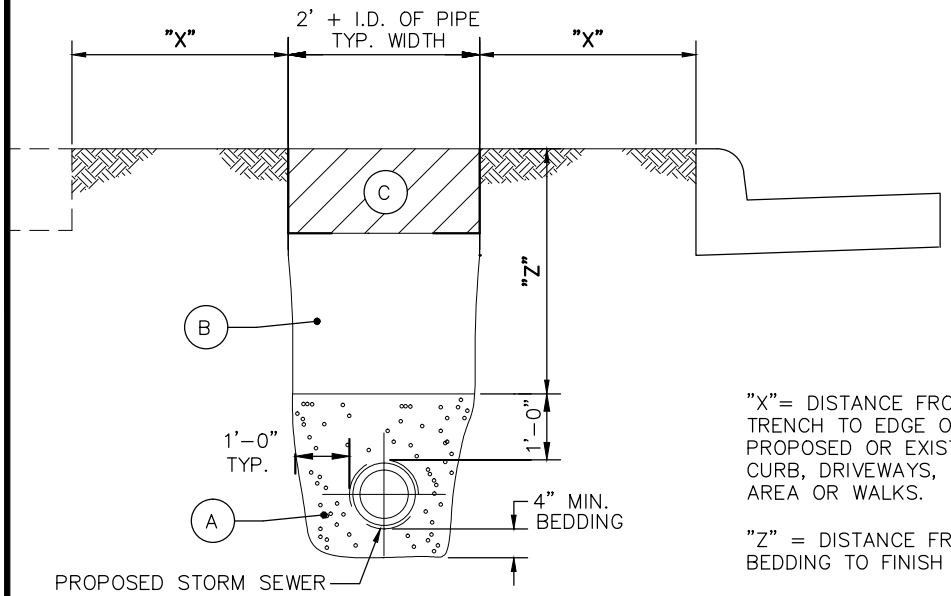
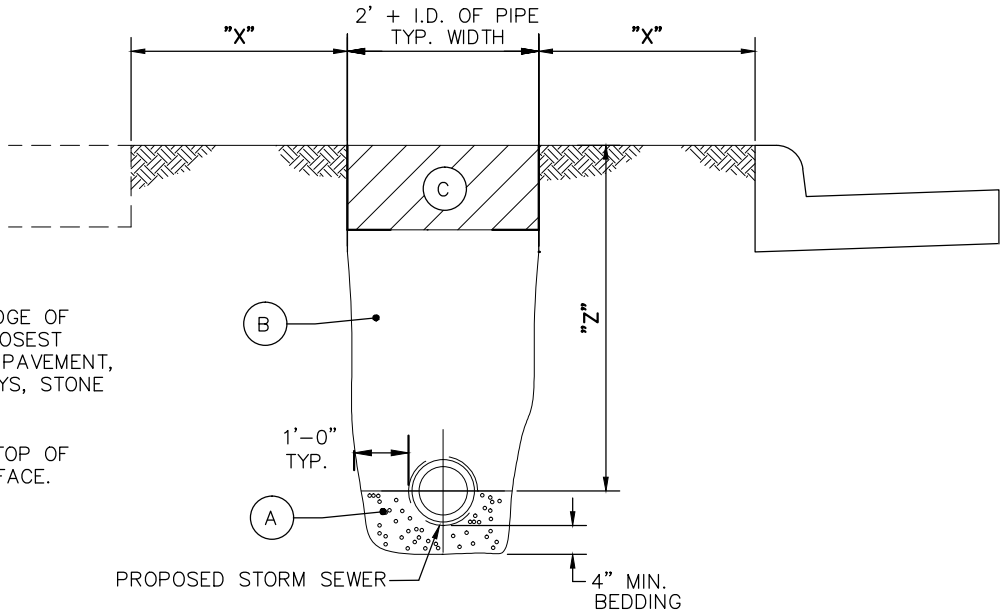


STORM SEWER TRENCH DETAIL

(NON-RIGID PIPE)

"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.



STORM SEWER TRENCH DETAIL

(RIGID PIPE)

TRENCH DETAIL NOTES

A. STRUCTURAL BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #8), OR OTHER APPROVED EQUIVALENT.

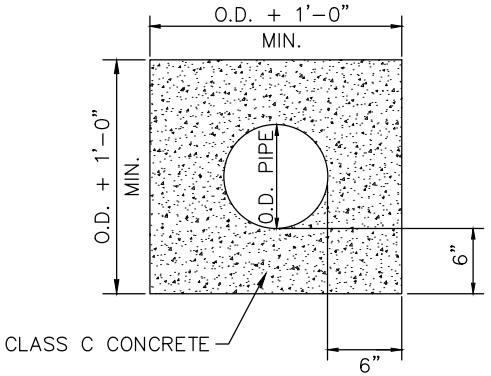
B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE VILLAGE. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH STRUCTURAL BACKFILL MATERIAL ODOT 603 TYPE 3 (#57 OR #8) OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED STRUCTURAL BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

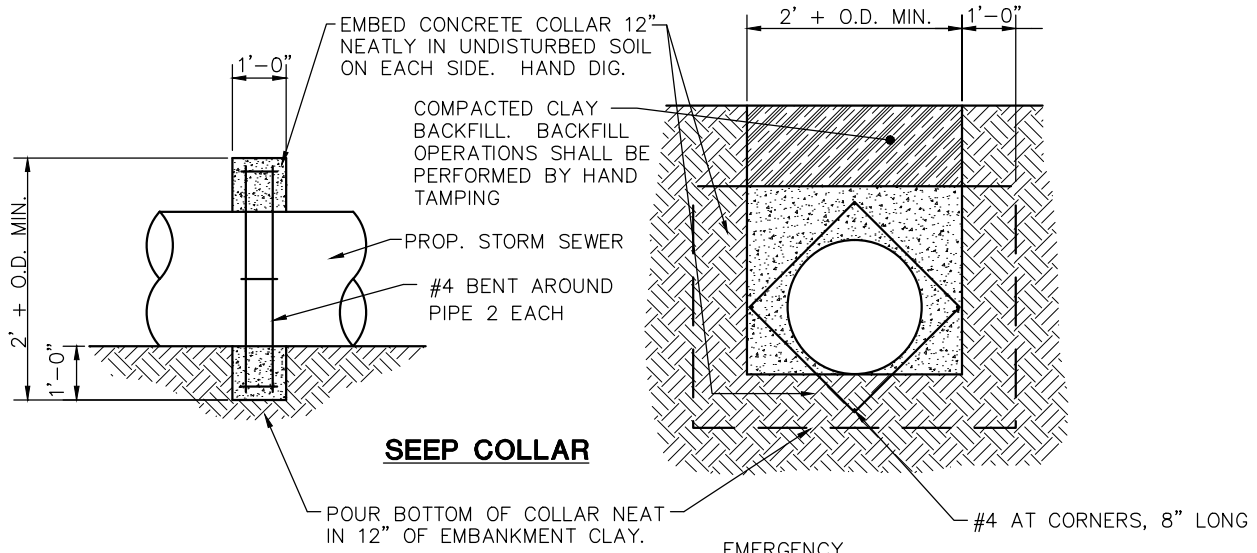
IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-19.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK FOR THE NIGHT.

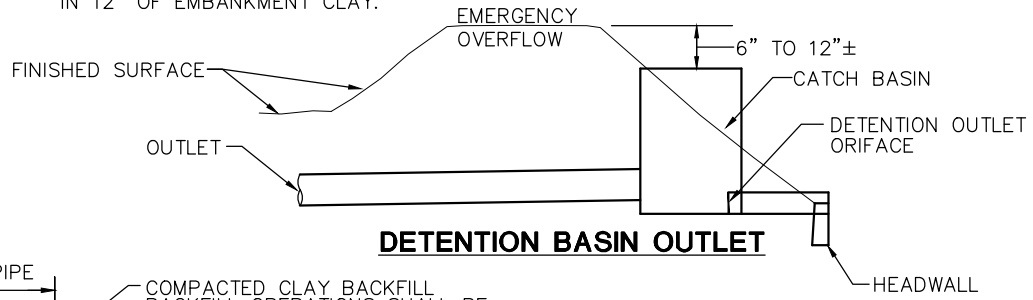


CONCRETE ENCASEMENT DETAIL

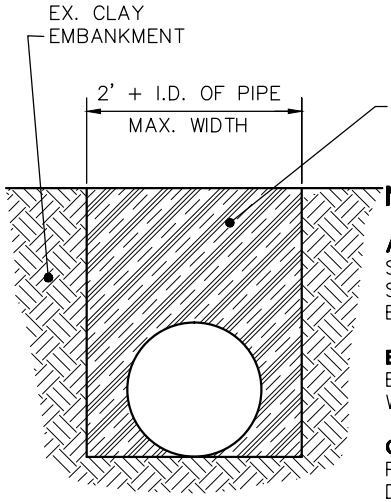
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	STORM SEWER TRENCH DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-8



SEEP COLLAR



DETENTION BASIN OUTLET



CLAY TRENCH DETAIL THROUGH DETENTION BASIN

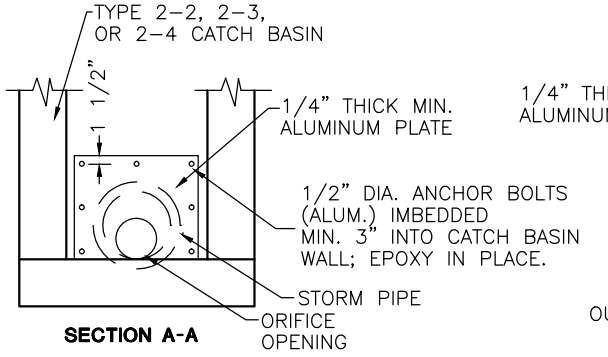
NOTES

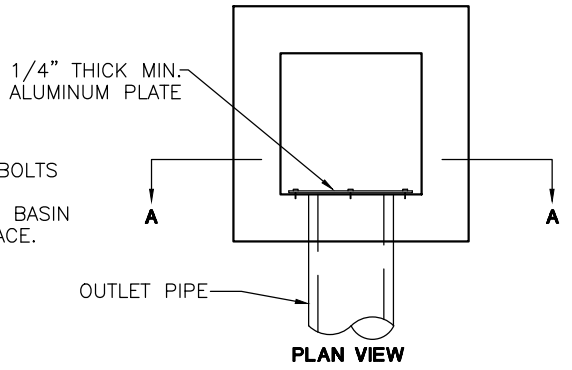
A. EXTRA COMPACTION AND CARE SHALL BE TAKEN TO ENSURE WATER SEALING OF DIKE AND PROPER CLAY BEDDING OF PIPE.

B. COMPACTION REQUIREMENTS SHALL BE 95% STANDARD MAXIMUM DRY WEIGHT DENSITY.

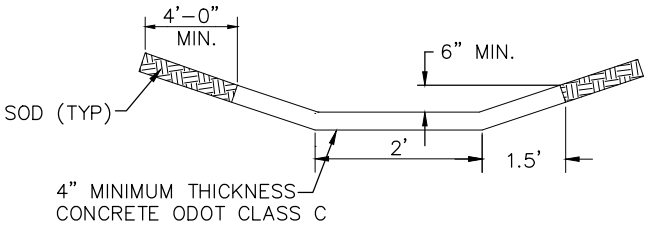
C. THIS SHALL BE REQUIRED AT ALL PIPES ENTERING OR EXITING THE DETENTION BASIN.

D. PAYMENT FOR THESE ITEMS SHALL BE INCIDENTAL TO ITEM 603.





DETENTION/RETENTION OUTLET ORIFICE



PAVED CONCRETE CHANNEL DETAIL

NOTES

A. ANY DETENTION BASINS WITH SLOPES LESS THAN 1% REQUIRE CONCRETE CHANNEL.

B. DIFFERENT SHAPE OR SIZE OF CONCRETE CHANNEL MAY BE REQUIRED DEPENDING ON DESIGN.

C. ALL WORK SHALL BE DONE IN ACCORDANCE WITH VILLAGE SPECIFICATIONS.

D. BOTTOM OF DRAINAGE DITCH SHALL BE FORMED BEFORE PLACING CONCRETE, ALL FORMS SHALL BE SET TO GRADE AND ALIGNMENT.

E. TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED AT 6 FOOT INTERVALS. THE GROOVES SHALL BE SAW CUT TO A MINIMUM DEPTH OF 1 INCH.

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

DETENTION/RETENTION BASIN DETAILS

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NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE VILLAGE UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE VILLAGE.

B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE VILLAGE.

C. ALL STORM SEWER CONSTRUCTION SHALL ADHERE TO ODOT SPECIFICATIONS LATEST REVISION OR WITH THE VILLAGE STORM SEWER SPECIFICATIONS, WHICHEVER IS APPLICABLE AND MORE RESTRICTIVE.

D. HUCKY PUCK IS REQUIRED ON ALL NON O-RING STORM SEWER AND MANHOLES, UNLESS OTHERWISE APPROVED.

E. WHEN A CASTING IS ABANDONED IT REMAINS VILLAGE PROPERTY.

F. ANY DETAILS OR NOTES NOT DIRECTLY ADDRESSED IN THESE ENGINEERING STANDARDS WILL BE REFERRED TO ODOT STANDARD DRAWINGS AND SPECIFICATIONS.

G. ALL STORM SEWER SHALL BE INSTALLED USING A LASER FOR GRADE AND ALIGNMENT.

H. ALL LOTS SHALL HAVE DIRECT ACCESS TO THE STORM SEWER FOR DOWN SPOUTS AND SUMP PUMPS.

UTILITY STAKING

A. OFFSET AND GRADE AT EACH MANHOLE, CATCH BASIN, AND OTHER STRUCTURES. OFFSET AND GRADE 50' AND 100' OUT FROM EACH MANHOLE UNLESS OTHERWISE APPROVED.

PIPE

A. ALL STORM SEWER PIPE SHALL HAVE A MINIMUM DIAMETER OF 12", UNLESS OTHERWISE APPROVED.

B. TYPES OF PIPE PERMITTED

UP TO 48" DIAMETER	**ODOT MATERIALS NUMBER**
REINFORCED CONCRETE PIPE	706.02
REINFORCED CONCRETE ELLIPTICAL PIPE	706.04
CORRUGATED POLYETHYLENE SMOOTH-LINED PIPE	707.33
POLYVINYL CHLORIDE PLASTIC PIPE (NON-PERFORATED)	707.41
POLYVINYL CHLORIDE CORRUGATED SMOOTH-INTERIOR PIPE	707.42
POLYVINYL CHLORIDE PROFILE WALL PIPE	707.43
POLYVINYL CHLORIDE SOLID WALL PIPE	707.45

OVER 48" DIAMETER	**ODOT MATERIALS NUMBER**
REINFORCED CONCRETE PIPE	706.02
REINFORCED CONCRETE ELLIPTICAL PIPE	706.04

EXISTING TILE HOOKUPS

A. THE DRAINAGE TILE CURRENTLY CONNECTED TO THE EXISTING STORM SEWER SHALL BE CONNECTED TO THE PROPOSED STORM SEWER. ANY DRAINAGE TILE DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. ALL THE REMOVED, REPLACED, AND/OR CONNECTED TO THE STORM SEWER SHALL BE NOTED ON THE AS-BUILT DRAWINGS AND SHALL BE INSPECTED BY THE INSPECTOR BEFORE THEY ARE COVERED.

B. ALL FIELD OR STORM DRAINS WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS OR PLUGGED AS APPROVED AND DIRECTED BY THE VILLAGE.

NOTES

A. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL CONSTRUCTION PROJECTS HAVING SIGNIFICANT GRADING. THE CONTROLS ARE PROVIDED DURING CONSTRUCTION TO PREVENT SOIL ERODED FROM THE CONSTRUCTION AREA FROM ENTERING ADJACENT WATERWAYS AND PROPERTIES.

B. CONSTRUCTION ITEMS INCLUDE SEDIMENT BASINS, SEDIMENT DAMS, DIVERSION DIKES AND/OR DITCHES AND FILTER SILT FENCE BARRIER DIKES SHOWN ON ODOT STANDARD DRAWING DM-4.2, 4.3, 4.4, AND 5.1. OTHER MISCELLANEOUS EROSION CONTROL MEASURES INCLUDE REPAIR SEEDING AND MULCHING, COMMERCIAL FERTILIZER, WATER AND MOWING AND ROCK CHANNEL PROTECTION, COVERED IN ODOT SPECIFICATION ITEMS 659 AND 601.

C. THE SIZE OF THE ENTIRE DRAINAGE AREA CONTRIBUTING FLOW IS USED TO DETERMINE THE MOST EFFECTIVE EROSION CONTROL METHOD. IN MANY CASES, THE MAJOR PORTION OF THE CONTRIBUTING AREA WILL BE BEYOND THE PROJECT LIMITS, AND FOR THOSE CASES IT WILL BE NECESSARY TO CONTROL THE FLOW FROM OUTSIDE BEFORE IT REACHES THE AREA DISTURBED BY PROJECT CONSTRUCTION. FLOW FROM THE AREA DISTURBED BY CONSTRUCTION SHALL BE TREATED PRIOR TO COMBINING IT WITH OFF-PAVEMENT DRAINAGE.

D. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED FOR ALL SUBDIVISIONS AND INDIVIDUAL SITES UNLESS OTHERWISE APPROVED. THE CONTROL MEASURES ARE TO BE PROVIDED DURING CONSTRUCTION TO PREVENT EROSION FROM ENTERING ADJACENT WATERWAYS AND PROPERTIES.

E. THERE SHALL BE ONLY ONE CONSTRUCTION ENTRANCE OFF THE SITE, ENTRANCE TO BE CONSTRUCTED OF 8" OF #2 STONE, 75' LONG BY 20' WIDE. CONTRACTOR TO KEEP MUD OFF EXISTING STREETS, NO EQUIPMENT TO BE PARKED ON EXISTING STREETS. MORE THAN ONE ENTRANCE MUST BE APPROVED BY THE VILLAGE.

CONSTRUCTION

A. ALL EROSION AND SEDIMENT CONTROL DEVICES MUST BE INSPECTED AND APPROVED BY THE VILLAGE UNLESS OTHERWISE APPROVED.

STORM WATER PERMITS

A. ON ALL PROJECTS WHICH DISTURB AT LEAST 1 ACRE OF SOIL, A NPDES PERMIT IS REQUIRED FROM OEPA AND A COPY OF THE PERMIT MUST BE ON FILE AT THE VILLAGE BEFORE CONSTRUCTION BEGINS.

B. EROSION CONTROL SUBMITTALS SHALL BE AS PER THE CURRENT STORM WATER MANAGEMENT ORDINANCE.

CONTROL MEASURES

A. DISTURB ONLY THE AREAS NEEDED FOR CONSTRUCTION.

B. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION; PROTECT THE REST TO PRESERVE THEIR ESTHETIC AND EROSION-CONTROL VALUES.

C. INSTALL SEDIMENT BASINS AND DIVERSION DIKES BEFORE DISTURBING THE LAND THAT DRAINS INTO THEM.

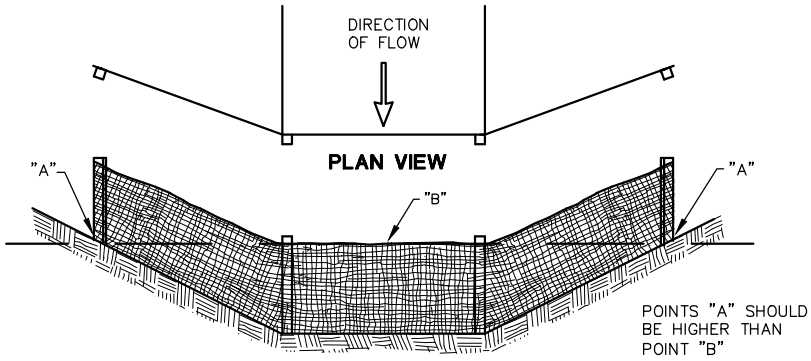
D. INSTALL EROSION AND SEDIMENT CONTROL PRACTICES AS INDICATED IN THE PLAN. THE PRACTICES ARE TO BE MAINTAINED IN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND UNTIL THE DRAINAGE AREAS HAVE BEEN PERMANENTLY STABILIZED.

E. TEMPORARILY STABILIZE EACH SEGMENT, GRADED OR OTHERWISE DISTURBED LAND, INCLUDING THE SEDIMENT-CONTROL DEVICES NOT OTHERWISE STABILIZED, BY SEEDING AND MULCHING OR BY MULCHING ALONE. AS CONSTRUCTION IS COMPLETED, PERMANENTLY STABILIZE EACH SEGMENT WITH PERENNIAL VEGETATION AND STRUCTURAL MEASURES.

F. LEVEL DIVERSION DIKES, SEDIMENT BASINS, AND SILT TRAPS AFTER AREAS THAT DRAIN INTO THEM ARE STABILIZED. ESTABLISH PERMANENT VEGETATION ON THESE AREAS. SEDIMENT BASINS THAT ARE TO BE RETAINED FOR STORM WATER DETENTION MAY BE SEEDED TO PERMANENT VEGETATION AFTER THEY ARE BUILT.

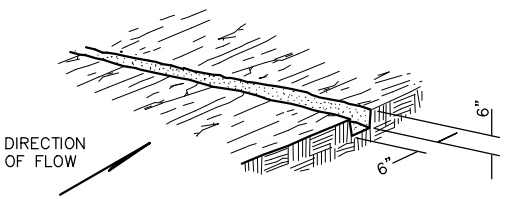
G. DISCHARGE WATER FROM OUTLET STRUCTURES AT NON-EROSIVE VELOCITIES.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	EROSION CONTROL NOTES	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-11



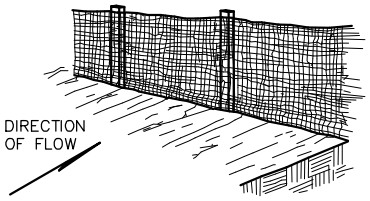
ELEVATION VIEW

PLACEMENT AND CONSTRUCTION OF DITCH CHECK FILTER FABRIC FENCE



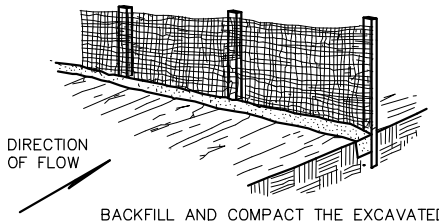
EXCAVATE A 6"X6" TRENCH ALONG THE PROPOSED FENCE LINE.

STEP 1



PLACE FABRIC AND SUPPORT STAKES AND EXTEND FABRIC INTO THE TRENCH.

STEP 2



BACKFILL AND COMPACT THE EXCAVATED SOIL.

STEP 3

PLACEMENT AND CONSTRUCTION OF PERIMETER FILTER FABRIC FENCE

CONSTRUCTION OF A FILTER BARRIER (SILT FENCE)

A. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.

B. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.

C. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.

D. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.

E. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5' (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.

F. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16" ABOVE THE ORIGINAL GROUND SURFACE.

G. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6" DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.

H. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE AND SO THAT 8" OF CLOTH IS BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6" DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED.

I. SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.

J. MAINTENANCE – SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. ALL THE GAPS AND TEARS IN THE FENCE MUST BE ELIMINATED AND REPAIRED. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.

CRITERIA FOR SILT FENCE MATERIAL

A. FENCE POSTS – THE LENGTH SHALL BE A MINIMUM OF 32" LONG. WOOD POSTS WILL BE 2"–BY–2" HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10'.

B. SILT FENCE FABRIC SHALL BE ODOT TYPE C GEOTEXTILE FABRIC OR AS DESCRIBED BY THE CHART BELOW:

FABRIC PROPERTIES	
MINIMUM TENSILE STRENGTH	120 LBS.
MAXIMUM ELONGATION AT 60 LBS	50%
MINIMUM PUNCTURE STRENGTH	50 LBS.
MINIMUM TEAR STRENGTH	40 LBS.
MINIMUM BURST STRENGTH	200 PSI
APPARENT OPENING SIZE	$\leq$ 0.84mm
MINIMUM PERMITTIVITY	$1X10^{-2}$ sec.$^{-1}$
ULTRAVIOLET EXPOSURE STRENGTH RETENTION	70%

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

TEMPORARY EROSION CONTROL

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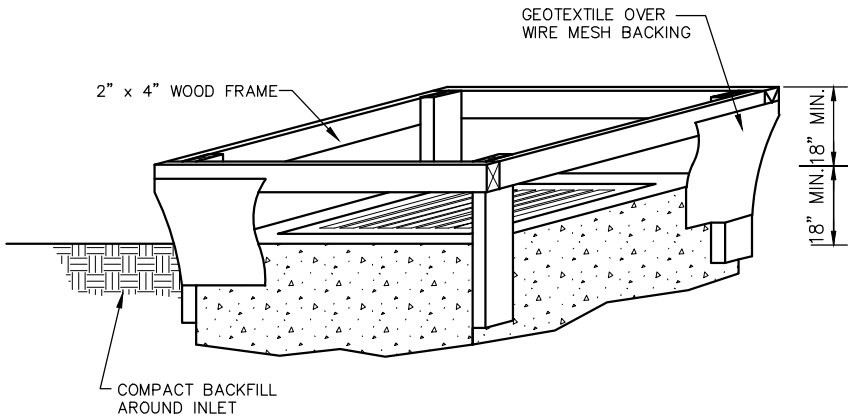


INLET PROTECTION IN SWALES, DITCH LINES OR YARD INLETS

A. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.

B. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH A LEAST 18".

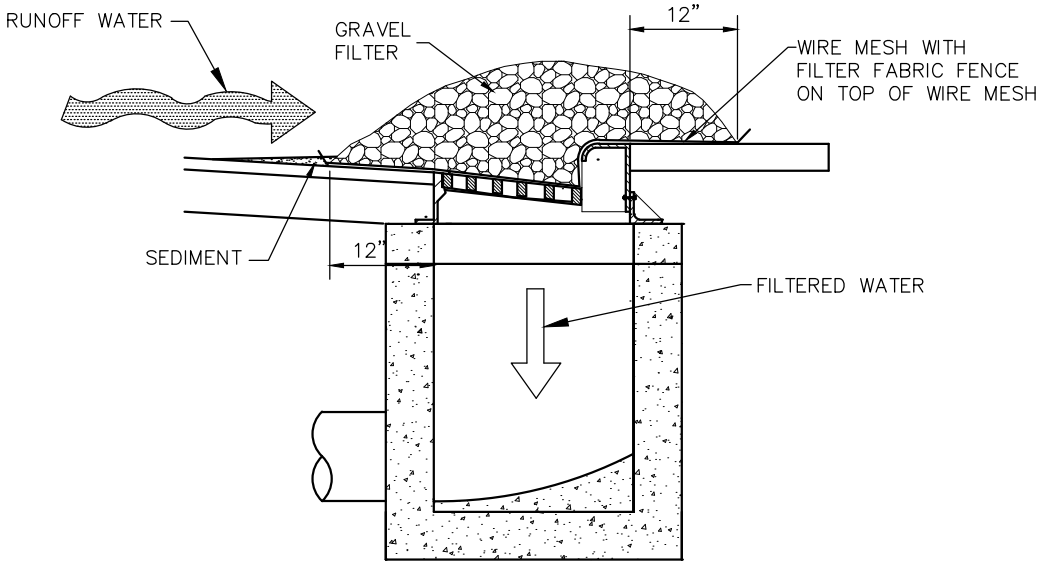
C. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2" BY 4" CONSTRUCTION GRADE LUMBER. THE 2" BY 4" POST SHALL BE DRIVEN 1' INTO THE GROUND AT FOUR CORNERS OF THE INLET AND AND THE TOP PORTION OF 2" BY 4" FRAME ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6" BELOW ADJACENT ROAD, IF PONDED WATER WOULD POSE A SAFETY HAZARD TO TRAFFIC.

D. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.

E. GEOTEXTILE SHALL HAVE AN EQUIVALENT OPENING SIZE OF 20–40 SIEVE AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18" BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAY ACROSS ONE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.

F. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON ENDS AND TOP ELEVATION ON SIDES.

G. A COMPACTED EARTH DIKE OR A CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION, AND IF RUNOFF BY PASSING THE INLET WILL NOT FLOW TO A SETTING POND, THE TOP OF EARTH DIKES SHALL BE AT LEAST 6" HIGHER THAN THE TOP OF THE FRAME.



GRAVEL CURB INLET SEDIMENT FILTER

(AS REQUIRED BY THE VILLAGE)

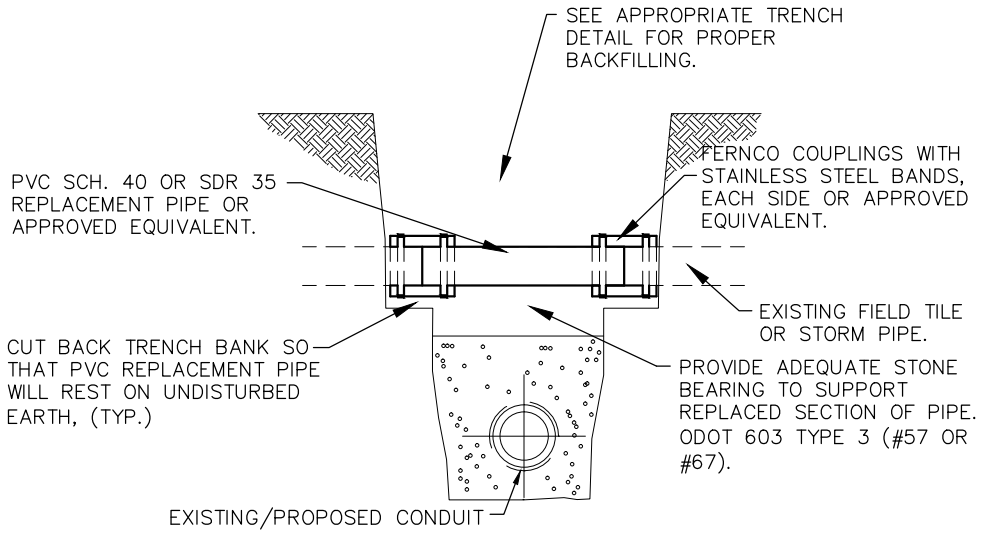
GRAVEL CURB INLET SEDIMENT FILTER NOTES

A. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2–INCH OPENINGS SHALL BE PLACED OVER THE CURB INLET OPENING SO THAT AT LEAST 12 INCHES OF WIRE EXTENDS ACROSS THE INLET COVER AND AT LEAST 12 INCHES OF WIRE EXTENDS ACROSS THE CONCRETE GUTTER FROM THE INLET OPENING, AS ILLUSTRATED.

B. STONE SHALL BE PILED AGAINST THE WIRE SO AS TO ANCHOR IT AGAINST THE GUTTER AND INLET COVER AND TO COVER THE INLET OPENING COMPLETELY. ODOT NO. 1 COARSE AGGREGATE SHALL BE USED.

C. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER PERFORMS ITS FUNCTION, THE STONE MUST BE PULLED AWAY FROM THE CATCH BASIN, CLEANED AND REPLACED.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	TEMPORARY EROSION CONTROL	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 600–13

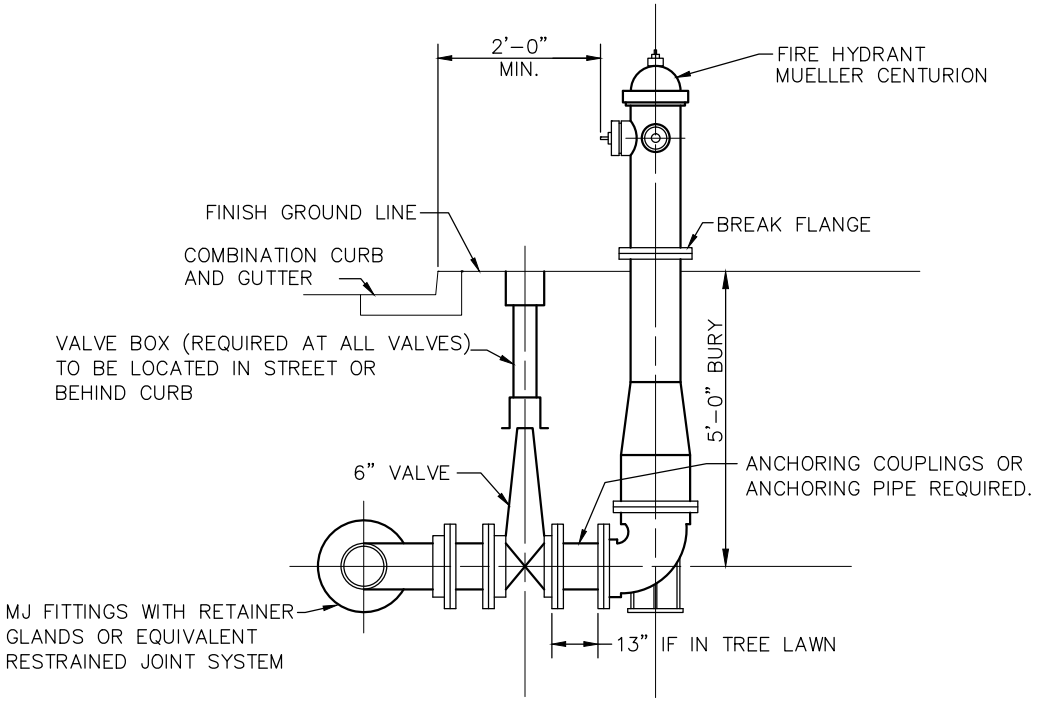


REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL

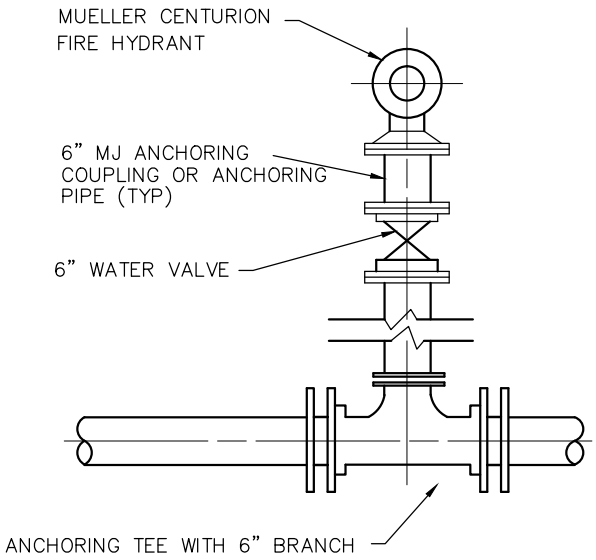
NOTES

CONCRETE REPAIRS OR PATCHES ARE UNACCEPTABLE.

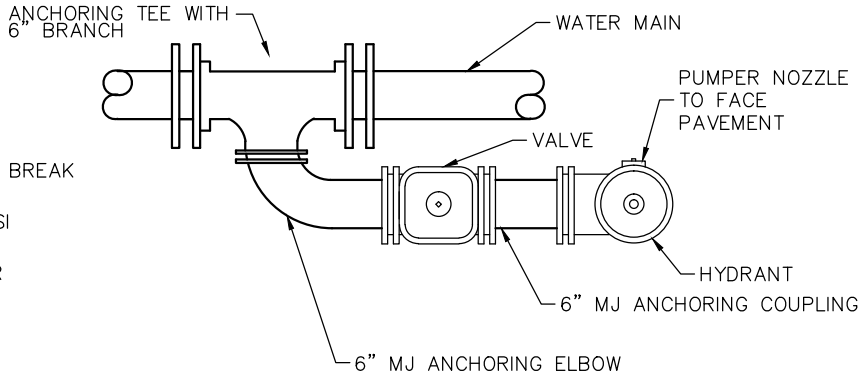
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	REPAIR OF EXISTING FIELD TILE OR STORM PIPE DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 600-14



SECTION VIEW



BASIC TEE DETAIL PLAN



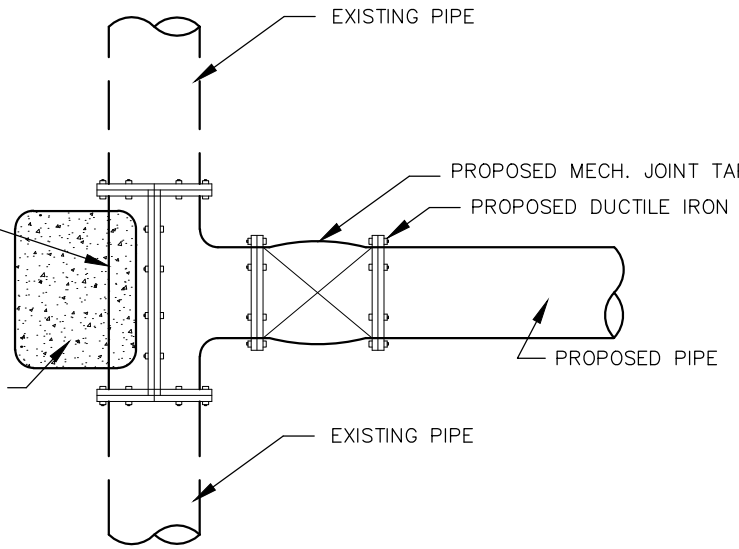
SPECIAL MECHANICAL JOINT

HYDRANT TEE DETAIL PLAN

NOTES

A. FIRE HYDRANTS SHALL BE MUELLER CENTURION, A-423, MECHANICAL JOINT, WITH (2) 2-1/2" HOSE NOZZLES, (1) 4" PUMPER NOZZLE, NATIONAL STANDARDS THREADS CONFORMING TO AWWA CCW TO OPEN, BREAK FLANGES 3" ABOVE GRADE.
B. GATE VALVES SHALL BE AWWA C-509, RESILIENT WEDGE, NONRISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN WITH ARROW INDICATING OPEN DIRECTION, MUELLER OR EQUIVALENT.
C. VALVE BOXES SHALL BE 3-PIECE CAST IRON 6" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.
D. ALL FITTINGS TO BE RESTRAINED.
E. ALL FITTINGS TO BE AWWA C-153 DUCTILE IRON, COMPACT.
F. ALL VALVES AND HYDRANTS SHALL OPEN LEFT BY TURNING IN A COUNTERCLOCKWISE DIRECTION.
G. CONTRACTOR TO FACE HYDRANT AS REQUIRED BY THE VILLAGE.
H. WATER MAIN SHALL BE AWWA C151 DUCTILE IRON PIPE CLASS 350 OR C900 DR 18 CL 150, WITH SLIP-ON JOINTS WITH RUBBER GASKETS AND MEGALUG RESTRAINS OR EQUIVALENT.
I. THE LAYING OF PIPE ON EXISTING DIRT WITH THE BELLS CUT OUT, SHALL NOT BE PERMITTED.
J. THE OPEN ENDS OF ALL PIPES AND SPECIAL CASTINGS SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK FOR THE NIGHT.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# FIRE HYDRANT	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-1



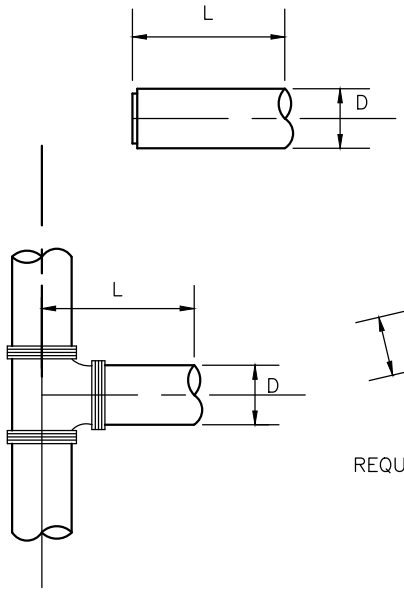
TAPPING SLEEVE AND VALVE DETAIL

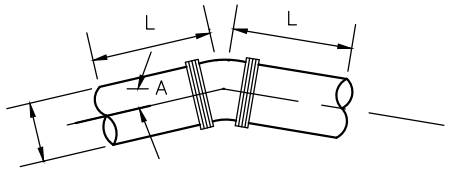
NOTES

A. BELL JOINT RESTRAINTS – FOR PVC, USE EBAA IRON SERIES 1500 OR EQUIVALENT. FOR DIP, USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.

B. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

C. CONTRACTOR TO USE RESTRAINED JOINTS UNLESS THRUST BLOCKING IS PREAPPROVED FOR SPECIAL CONDITIONS BY THE VILLAGE PRIOR TO THE BEGINNING OF CONSTRUCTION.





SEE TABLE FOR L,
REQUIRED LENGTH OF RESTRAINED JOINTS

REQUIRED LENGTH OF RESTRAINED JOINTS IN FEET									
	D–DIAMETER OF PIPE								
A ~ DEGREE OF DEFLECTION		4"	6"	8"	10"	12"	16"	20"	24"
	11 1/4°	*	*	*	*	*	5	5	6
	22 1/2°	*	2	3	5	6	8	10	12
	45°	4	8	12	14	20	30	36	45
	90°	12	26	38	48	66	98	125	145
	TEE	12	26	38	48	66	98	125	145
	END	12	26	38	48	66	98	125	145

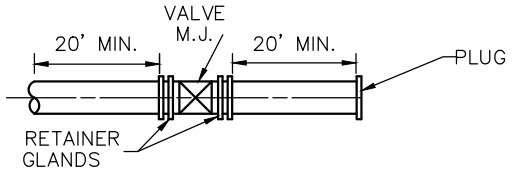
*REQUIRED RESTRAINED JOINT AT FITTING AND ONE BELL JOINT FROM FITTING MINIMUM.

DESIGN PARAMETERS

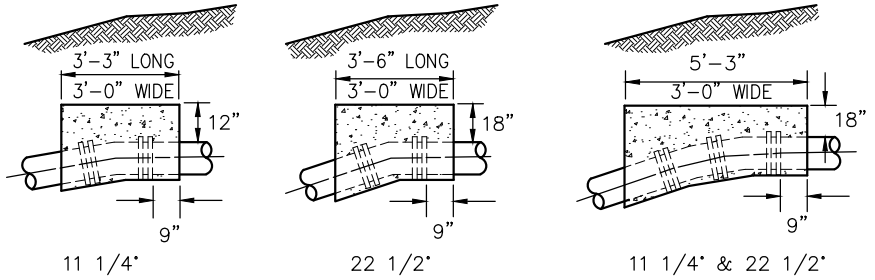
LAYING CONDITIONS – TYPE 5
SOIL DESIGNATION – SILT
DEPTH OF COVER – 4'
DESIGN PRESSURE – 80 PSI
SAFETY FACTOR – 1.50
POLYWRAPPED PIPE
IF WORST CONDITIONS EXIST, ADDITIONAL RESTRAINTS WILL BE NECESSARY.

REQUIRED LENGTH OF RESTRAINED JOINTS FOR WATER MAINS

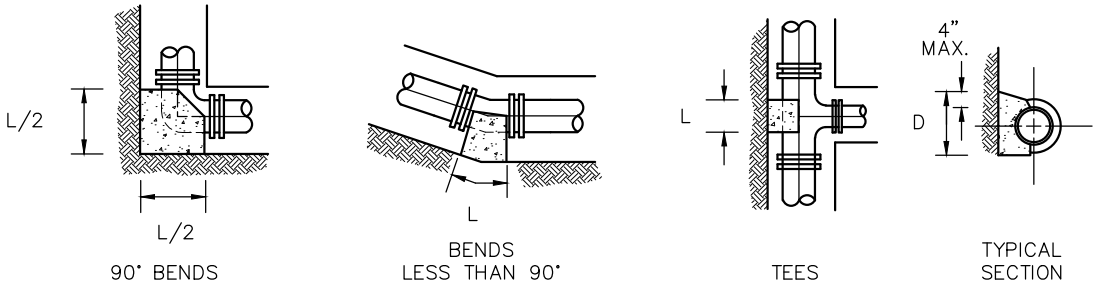
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# RESTRAINING JOINTS AND TAPPING SLEEVE FOR WATER MAINS	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–2



DETAIL - END OF WATER LINE



CONCRETE BLOCKING FOR VERTICAL BENDS



CONCRETE BLOCKING FOR HORIZONTAL BENDS

BENDS								
SIZE OF OPENING	DEGREE OF BEND							
	11 1/4°		22 1/2°		45°		90°	
	L	D	L	D	L	D	L	D
3", 4", 6"	8"	6"	10"	6"	20"	6"	36"	6"
8"	9"	8"	14"	8"	24"	9"	50"	8"
12"	14"	12"	22"	12"	30"	16"	60"	15"
16"	18"	16"	24"	18"	33"	36"	70"	22"

TEES								
RUN	BRANCH							
	3",4",6"		22 1/2°		45°		90°	
	L	D	L	D	L	D	L	D
3", 4", 6"	16"	6"						
8"	14"	8"	18"	12"				
12"	9"	12"	18"	12"	24"	18"		
16"	8"	16"	14"	16"	28"	16"	30"	26"

NOTES

A. CARE SHALL BE TAKEN TO KEEP CONCRETE AWAY FROM MECHANICAL JOINTS BY PLACING VISQUEEN OR OTHER APPROVED MATERIAL OVER PIPE BEFORE PLACING OF CONCRETE.

B. CONCRETE FOR BLOCKING VALVES AND FITTINGS SHALL CONFORM TO SECTION ODOT 499 CLASS C.

C. CONTRACTOR SHALL USE THE THRUST BLOCKS AS SHOWN ONLY IF PREAPPROVED FOR SPECIAL CONDITION BY THE VILLAGE PRIOR TO BEGINNING CONSTRUCTION.

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

CONCRETE BLOCKING FOR WATER MAINS

REVISIONS:

DATE APPROVED: 04-21-2008

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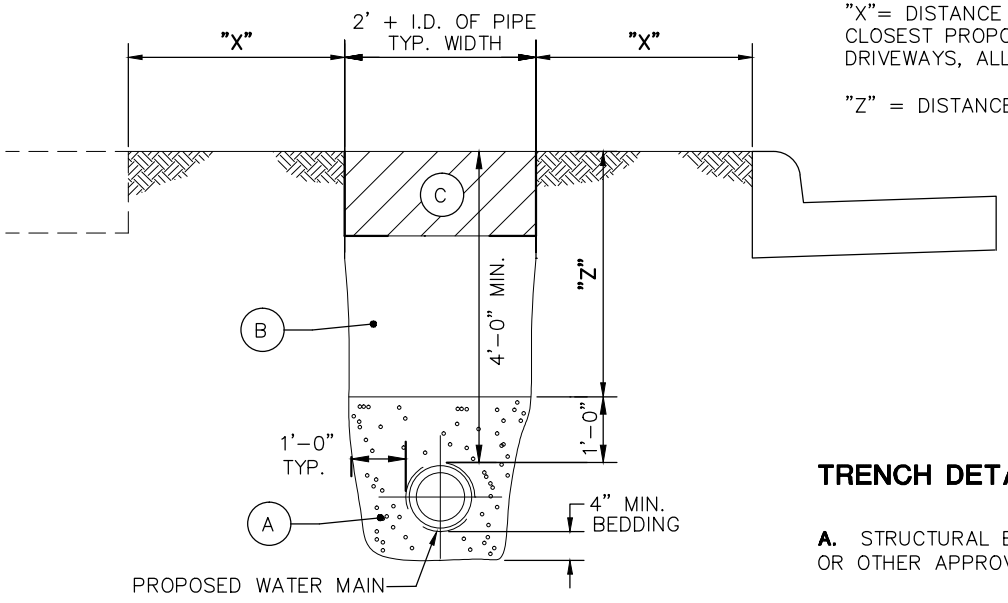


WATER MAIN TRENCH DETAIL

"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.

TRENCH DETAIL NOTES

A. STRUCTURAL BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #8), OR OTHER APPROVED EQUIVALENT.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE VILLAGE. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH STRUCTURAL BACKFILL MATERIAL ODOT 603 TYPE 3 (#57 OR #8) OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED STRUCTURAL BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-19.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK FOR THE NIGHT.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	WATER MAIN TRENCH DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-4

MATERIAL SPECIFICATIONS

A. WATER MAIN SHALL BE AWWA C 151 DUCTILE IRON PIPE CLASS 350 OR C900 DR 18 CL 350, SLIP–ON JOINTS WITH RUBBER GASKETS. TRACER WIRE MUST BE INSTALLED ON ALL PIPE EXCEPT FOR DIP.

B. BELL JOINT RESTRAINTS – FOR PVC, USE EBAA IRON SERIES 1500 OR EQUIVALENT. FOR DIP, USE FIELD LOCK BY US PIPE OR APPROVED EQUIVALENT.

C. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.

D. FIRE HYDRANTS – MUELLER CENTURION, A–423, MECHANICAL JOINT, WITH (2) 2 1/2" HOSE NOZZLES, (1) 4" PUMPER NOZZLE NATIONAL STANDARDS THREADS CONFORMING TO AWWA, CCW TO OPEN, BREAK FLANGES 3" ABOVE GRADE.

E. GATE VALVES – AWWA C–509, RESILIENT WEDGE, NON–RISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN, WITH ARROW INDICATING OPEN DIRECTION.

F. VALVE BOXES – 3–PIECE CAST IRON 6" DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.

G. SERVICE LINE – TYPE K COPPER TUBE WITH COMPRESSION TYPE FITTINGS.

H. CURB STOP – BRASS CONFORMING TO AWWA C–800.

I. CURB BOXES – 2 1/2" SCREW TYPE, BUFFALO STYLE CAST IRON LID WITH PENTAGON HEAD PLUG EM2–45–67.

J. SERVICE CONNECTIONS WILL NOT BE MADE WITHOUT THE INSTALLATION OF A METER.

HYDROSTATIC TEST

A. AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PIPE OR VALVED SECTION, SHALL BE SUBJECTED TO HYDROSTATIC PRESSURE AND LEAKAGE TEST. ALL WATER MAINS MUST BE HYDROSTATICALLY TESTED (AWWA C–600). THE TESTS MUST BE PERFORMED IN THE PRESENCE OF A REPRESENTATIVE OF THE VILLAGE OF FORT RECOVERY. THE LEAKAGE TEST PRESSURE SHALL BE NOT LESS THAN 150 PSI. THE DURATION OF THE LEAKAGE TEST SHALL NOT BE LESS THAN 2 HOURS. HYDROSTATIC PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP TAKING WATER FROM AN AUXILIARY SUPPLY. ALL PIPING MUST BE PROPERLY FILLED AND FLUSHED TO DISPEL ALL AIR BEFORE THE TEST IS MADE USING POTABLE WATER.

B. LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.

C. NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE EXCEEDS THE LEAKAGE DETERMINED BY THE FOLLOWING FORMULA:

$$L = \frac{n \quad D \quad \sqrt{P}}{7400}$$

WHERE: n = NUMBER OF PIPE JOINTS
D = PIPE DIAMETER
P = TEST PRESSURE
L = ALLOWABLE LEAKAGE PER HOUR

THE FOLLOWING TABLE REPRESENTS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR.

D. DURING THE HYDROSTATIC TEST, A THOROUGH EXAMINATION OF ALL PIPING, FITTINGS, VALVES, HYDRANTS, ETC. SHALL BE PERFORMED. LEAKING JOINTS SHALL BE TIGHTENED AND CRACKED OR OTHERWISE DEFECTIVE MATERIAL SHALL BE REMOVED AND REPLACED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

DISINFECTION

A. AFTER SATISFACTORY HYDROSTATIC TESTING, THE COMPLETED WATER WORK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C–651.

B. MAINTAIN PIPES FREE OF DIRT AND FOREIGN MATTER DURING CONSTRUCTION BY DEWATERING TRENCH AND SEALING OPEN PIPE BARRELS. SWAB EACH LENGTH OF PIPE AS IT IS INSTALLED. UPON COMPLETION OF MAIN, ISOLATE MAIN SEGMENTS AND FLUSH PIPE AT 2 FPS VELOCITY.

C. STERILIZE MAIN IN ACCORDANCE WITH AWWA C–651. INJECT 3% TO 5% HYPOCHLORITE SOLUTION TO PROVIDE 50 TO 60 MG PER LITER CONCENTRATION IN MAIN. CHLORINE MAY BE PLACED IN EACH SECTION OF PIPE AT THE TIME OF INSTALLATION. SAMPLE WATER AT EACH HYDRANT OR IF NO HYDRANT IS AVAILABLE, AT A TAP IN THE PROPOSED LINE. ANALYZE SAMPLE USING D.P.D. REAGENT TO VERIFY FREE CHLORINE CONCENTRATION. MAINTAIN CONCENTRATION IN MAIN FOR 24 HOURS. SAMPLE HYDRANTS AT COMPLETION OF STERILIZATION VERIFYING MINIMUM CHLORINE RESIDUAL OF 20 MG PER LITER.

D. FLUSH CHLORINE SOLUTION TO WASTE INTO SANITARY SEWER AT A CONTROLLED RATE, NOT TO EXCEED 25 GPM. IF CHLORINE RESIDUAL DROPS IN 10 MG PER LITER, FLUSH MAIN AT 2 FPS AND REPEAT STERILIZATION PROCEDURE.

E. WATER SAMPLES – PERFORM BACTERIOLOGICAL TEST PER AWWA C–651. SAMPLE MAIN AT A TAP IN THE PROPOSED LINE. DELIVER SAMPLE TO STATE CERTIFIED LABORATORY. DELIVER COPIES OF LABORATORY REPORT TO THE VILLAGE IN THE EVENT OF DETECTION OF COLIFORM ORGANISM, REPEAT FLUSHINGS, STERILIZATION, AND SAMPLING OF MAINS UNTIL 2 CONSECUTIVE ACCEPTABLE TEST RESULTS ARE ACHIEVED. THIS IS TO BE PERFORMED PRIOR TO TRANSFER OF SERVICE.

ALLOWABLE LEAKAGE PER 1000 FT. (305M) OF PIPELINE (GPH+)

AVG. TEST PRESSURE (PSI) BAR	NOMINAL PIPE DIAMETER– INCHES											
	3	4	6	8	10	12	14	16	18	20	24	30
450(31)	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78
400(28)	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50
350(24)	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21
300(21)	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90
275(19)	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73
250(17)	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56
225(16)	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38
200(14)	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19
175(12)	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98
150(10)	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76
120(9)	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52

NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE VILLAGE UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE VILLAGE.

B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE VILLAGE.

C. THE MINIMUM LENGTH OF PIPE NIPPLES SHALL BE 18".

D. ALL CUSTOMERS SHALL MEET BACKFLOW PREVENTION REQUIREMENTS AS PER STATE OF OHIO AND EPA REGULATIONS.

E. ALL WATERLINE CONSTRUCTION SHALL FOLLOW THE VILLAGE STANDARDS, OHIO DEPARTMENT OF TRANSPORTATION ITEM 638, AND AWWA STANDARDS WHICHEVER IS MORE RESTRICTIVE AS DETERMINE BY THE VILLAGE.

PIPE

A. ALL PIPE FITTINGS SHALL BE DUCTILE IRON.

B.

WATER MAIN MINIMUM SIZE UNLESS OTHERWISE APPROVED	
SINGLE AND TWO FAMILY MULTI–FAMILY	8"
COMMERCIAL	10"
INDUSTRIAL	12"
IF THE WATER MAIN IS NOT LOOPED OR THE WATER MAIN LENGTH IN THE TOTAL DEVELOPMENT IS GREATER THAN 600', THE MINIMUM WATER MAIN SIZE SHALL BE 8".	

C. DEADENDS NOT PERMITTED IF AT ALL POSSIBLE.

EXCAVATION AND PIPE LAYING

A. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK FOR THE NIGHT AND AT OTHER TIMES OF INTERRUPTION OF THE WORK.

FITTINGS, VALVES AND HYDRANTS

A. FITTINGS OR SPECIALS IN SIZES 2" THROUGH 48" SHALL CONFORM TO ALL REQUIREMENTS OF ANSI A–21.10 (AWWA C–153). FITTINGS AND SPECIALS 12" AND SMALLER SHALL BE CLASS 250. LARGER FITTINGS AND SPECIALS SHALL BE CLASS 150. FITTINGS AND SPECIALS SHALL HAVE MECHANICAL JOINTS AND SHALL BE DUCTILE IRON.

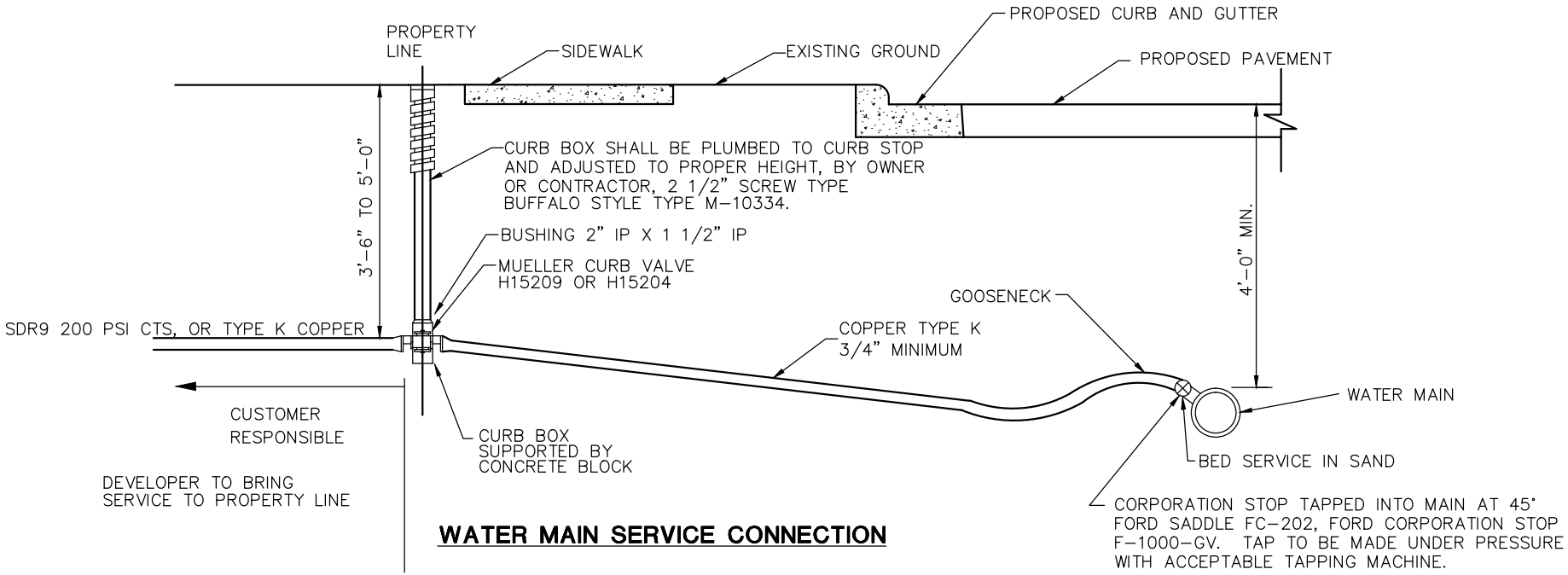
B.

MAXIMUM SPACING UNLESS OTHERWISE APPROVED		
	HYDRANTS	VALVES
SINGLE & TWO FAMILY RESIDENTIAL	500'	800'
INDUSTRIAL, COMMERCIAL & MULTI–FAMILY	300'	500'

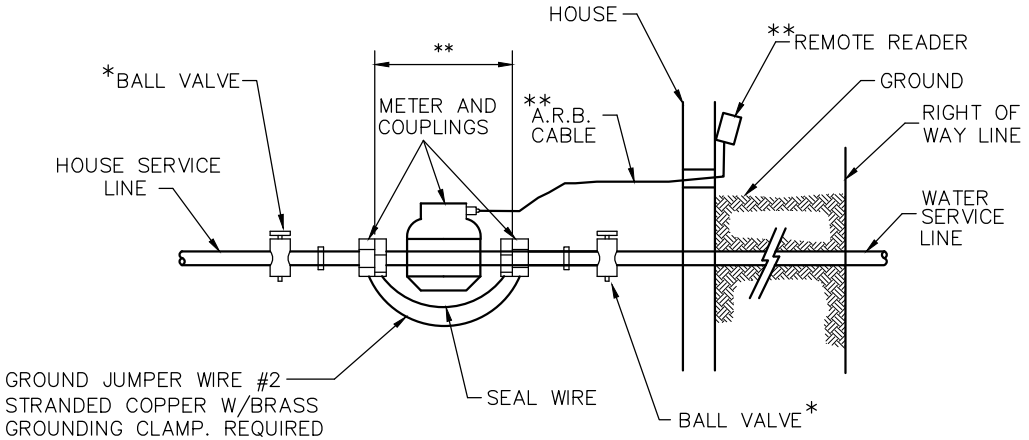
C. ALL TEE'S AND CROSSES SHALL BE VALVED IN EACH DIRECTION UNLESS OTHERWISE APPROVED.

UTILITY STAKING

A. OFFSETS EVERY 25' ON CURVES. OFFSETS EVERY 100' ON STRAIGHT SECTIONS. FLOW LINE OF WATER MAIN (CUT) MARKED EVERY 100' AND OFFSETS SHALL BE CLEARLY MARKED.



WATER MAIN SERVICE CONNECTION



INSIDE WATER METER

*A GATE VALVE IS REQUIRED ON EACH SIDE OF 1" AND LARGER SERVICE LINES

**SUPPLIED BY VILLAGE

NOTES

A. MINIMUM 3/4" WATER SERVICE SHALL BE COPPER TYPE K.

B. WATER SERVICE SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN. WATER SERVICE MAY BE LAID ON BENCH IN THE SEWER LATERAL TRENCH IF CROWN IS A LEAST 18" BELOW INVERT OF WATER SERVICE, AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'-0".

C. INSIDE METER SETTER PROVIDED WITH TAP FEE OR METER PIT PROVIDED WITH HIGHER TAP FEE. INSIDE SETTER CUSTOMER IS RESPONSIBLE FOR METER FREEZE UP. CUSTOMER INSTALLS METER AND REMOTE WIRE TO OUTSIDE.

D. THE CURB BOX TO BE PLACED BETWEEN THE CURB AND PROPERTY LINE. METER PIT SHALL BE PLACED BEHIND PROPERTY LINE WHEN APPROVED BY THE VILLAGE.

E. CURB BOX MAY BE PLACED BETWEEN SIDEWALK AND PROPERTY LINE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	WATER MAIN SERVICE CONNECTION	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-7

NOTES

A. OUTSIDE METER PITS ARE DISCOURAGED, METER PIT INSTALLATION SHALL OCCUR ONLY WITH THE VILLAGE'S PERMISSION. THIS INSTALLATION SHALL NOT BE ALLOWED UNLESS IN THE JUDGMENT OF THE VILLAGE, THIS IS THE ONLY PRACTICAL METHOD TO SERVICE THE ACCOUNT.

B. CONCRETE METER PIT, OTHERS MUST BE APPROVED PRIOR TO INSTALLATION.

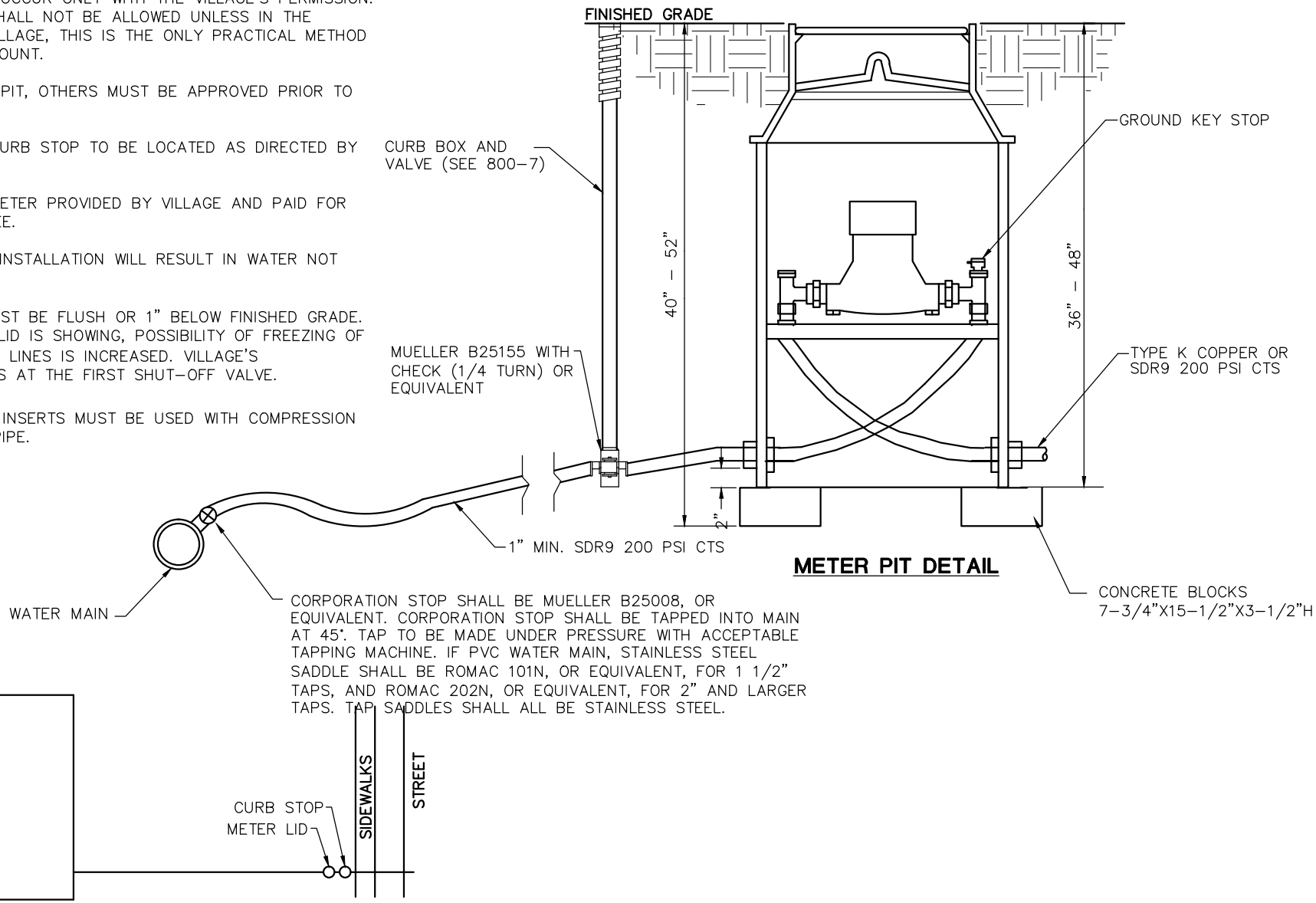
C. METER PIT AND CURB STOP TO BE LOCATED AS DIRECTED BY THE VILLAGE.

D. METER PIT AND METER PROVIDED BY VILLAGE AND PAID FOR THROUGH TAPPING FEE.

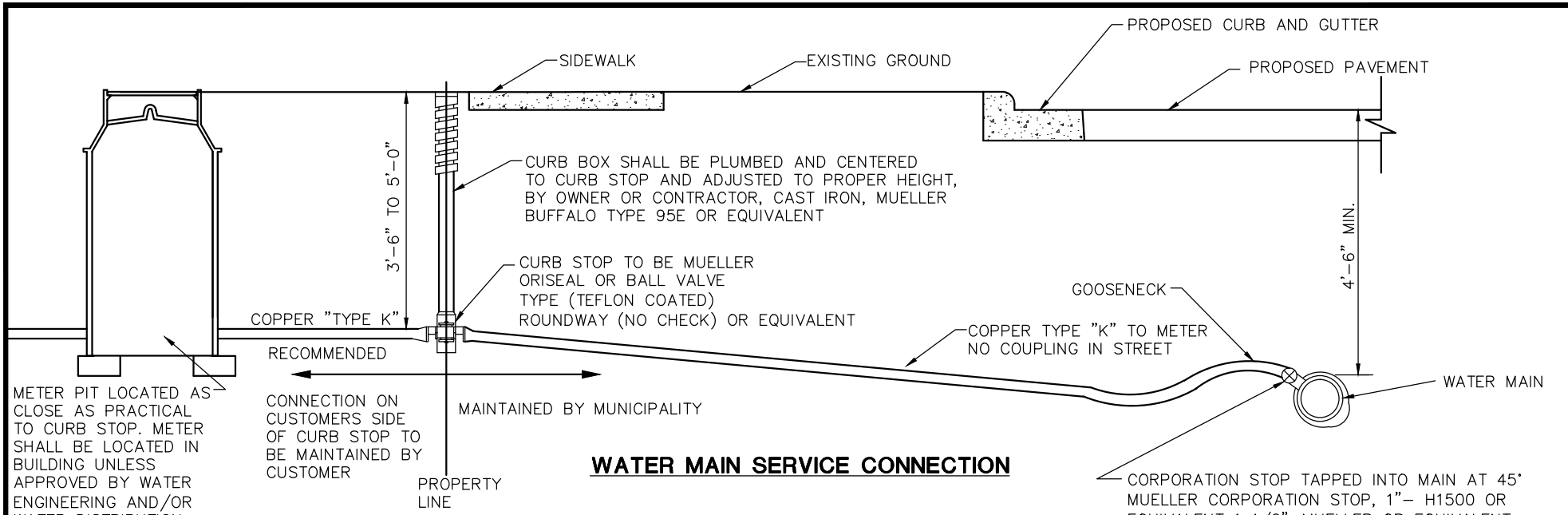
E. UNSATISFACTORY INSTALLATION WILL RESULT IN WATER NOT BEING TURNED ON.

F. METER PIT LID MUST BE FLUSH OR 1" BELOW FINISHED GRADE. IF FRAME OF METER LID IS SHOWING, POSSIBILITY OF FREEZING OF METERS AND SERVICE LINES IS INCREASED. VILLAGE'S RESPONSIBILITY STOPS AT THE FIRST SHUT-OFF VALVE.

G. STAINLESS STEEL INSERTS MUST BE USED WITH COMPRESSION FITTINGS ON SDR 9 PIPE.



VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	METER PIT INSTALLATION	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-8



WATER MAIN SERVICE CONNECTION

NOTES

A. WATER SERVICE SHALL BE SEAMLESS COPPER, TYPE K. 1" SERVICE (100' BETWEEN JOINTS), 1 1/2" SERVICE (60' BETWEEN JOINTS).

B. WATER SERVICE SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN. WATER SERVICE MAY BE LAID ON BENCH IN THE SEWER LATERAL TRENCH IF CROWN IS A LEAST 18" BELOW INVERT OF WATER SERVICE, AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'–0".

C. METER FURNISHED BY VILLAGE UNDER TAP FEE, METER PIT IS TO BE CUSTOMER RESPONSIBILITY..

D. CORPORATION STOP AND CURB STOP ARE TO BE MUELLER OR EQUIVALENT.

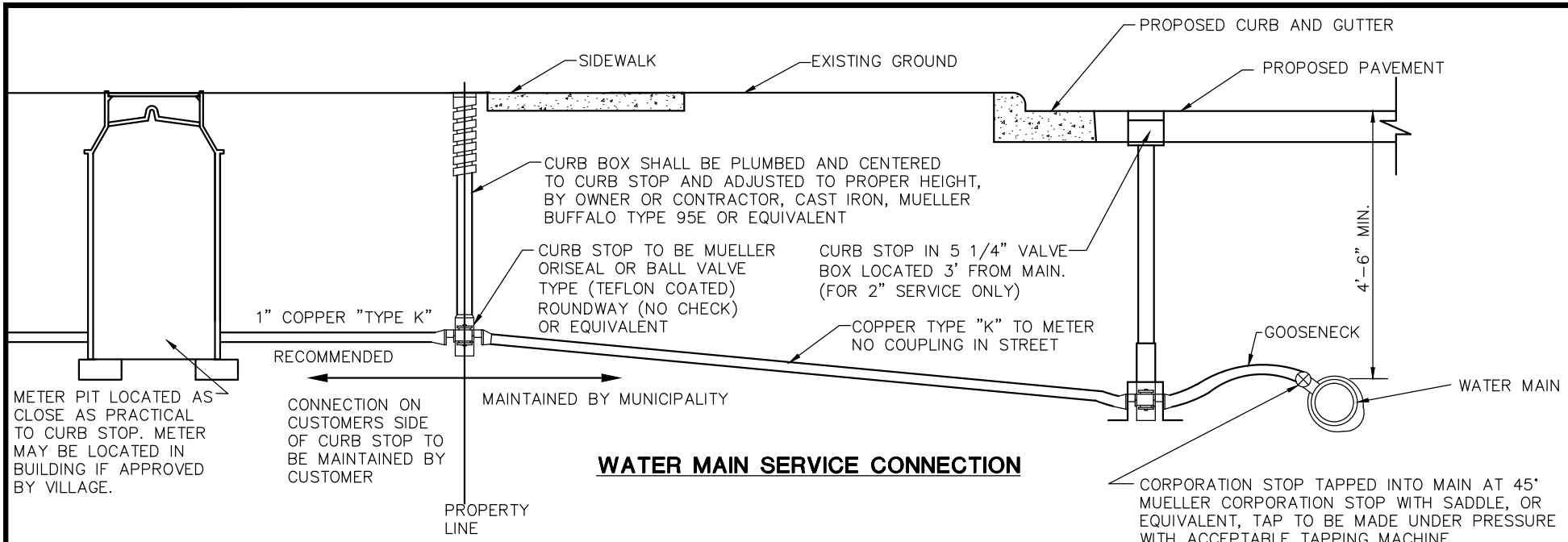
E. FLARED OR COMPRESSION FILLINGS.

G. STOP VALVE REQUIRED IMMEDIATELY AFTER SERVICE ENTERS BUILDING

H. PICKUP OF 3/4" SERVICE IS PERMITTED ONLY IF K–COPPER AND EXISTING STUB–IN WERE INSTALLED AS PART OF A MAIN EXTENSION

I. METER PIT TYPICALLY 3' FROM CURB STOP. MAY BE MOVED TO MEET FIELD CONDITIONS SUBJECT TO APPROVAL.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	1"-1 1/2" WATER MAIN SERVICE CONNECTIONS FOR METERS UP TO 1"	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–9



WATER MAIN SERVICE CONNECTION

NOTES

A. WATER SERVICE SHALL BE SEAMLESS COPPER, TYPE K [40' BETWEEN JOINTS]).

B. WATER SERVICE SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN. WATER SERVICE MAY BE LAID ON BENCH IN THE SEWER LATERAL TRENCH IF CROWN IS A LEAST 18" BELOW INVERT OF WATER SERVICE, AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'-0".

C. METER PIT AND METER FURNISHED BY MUNICIPALITY UNDER METER SET FEE.

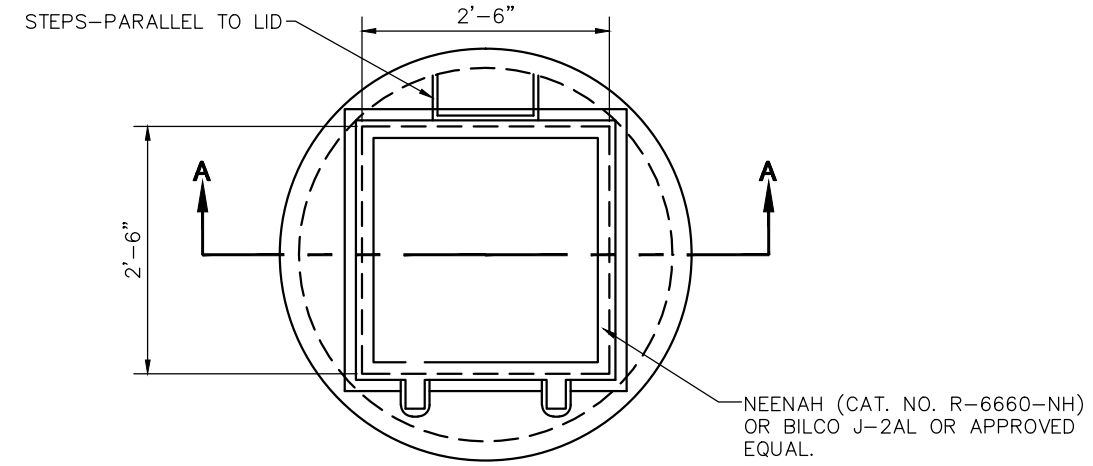
D. CORPORATION STOP AND CURB STOP ARE TO BE MUELLER OR EQUIVALENT.

E. FLARED OR COMPRESSION FITTINGS.

G. STOP VALVE REQUIRED IMMEDIATELY AFTER SERVICE ENTERS BUILDING

H. 1" SERVICE SHALL BE INSTALLED WHERE BUILDINGS ARE MORE THAN 120' FROM WATERMAIN OR WHERE REQUIRED BY PLANS.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 1 1/2"-2" WATER MAIN SERVICE CONNECTIONS FOR 1 1/2" OR 2" METERS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-10



NOTES

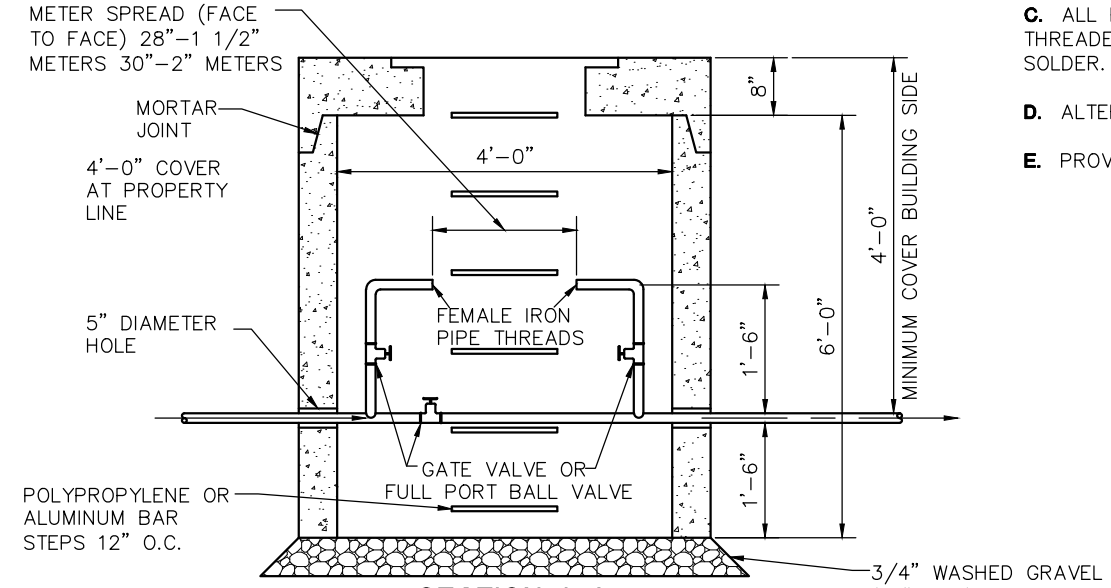
A. ONE METER PER PIT UNLESS WAIVED BY THE VILLAGE.

B. BYPASS ON METER MANDATORY FOR COMMERCIAL ACCOUNTS BYPASS VALVE TO BE LOCKABLE.

C. ALL PIPE K–COPPER OR BRASS TO METER JOINTS IN PIT TO BE THREADED, FLARED, SILVER, SOLDERED OR SOLDERED WITH LEAD FREE SOLDER.

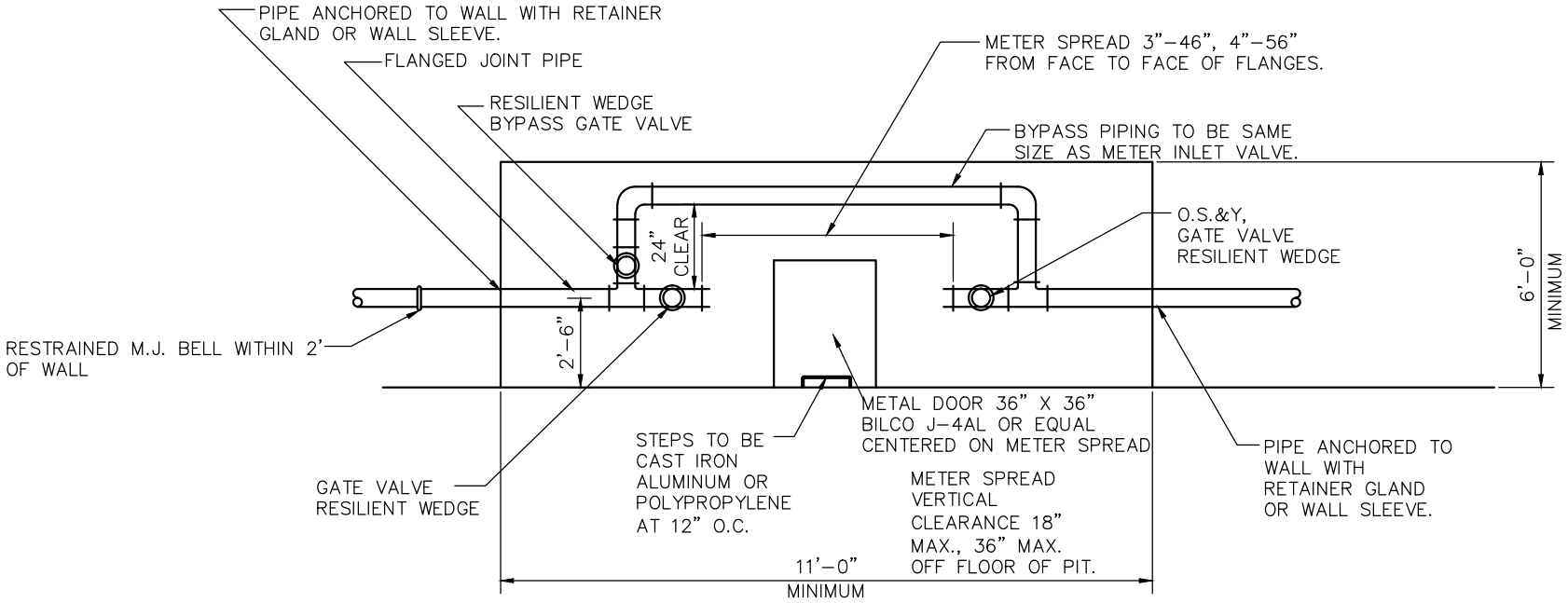
D. ALTERNATE DESIGNS MAY BE SUBMITTED FOR APPROVAL.

E. PROVIDE SPREADER FOR PROPER ALIGNMENT OF SPREAD.



SECTION A-A

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 1 1/2" AND 2" WATER METER PIT (FOR OFF ROAD USE ONLY)	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–11



NOTES:

A. DIMENSIONS SHOWN ARE INSIDE MEASUREMENTS OF PIT.

B. ALL PIPE SHALL BE CL53 DUCTILE WITH FLANGED ENDS.
(COPPER & BRASS MAY BE ACCEPTABLE. SUBMIT FOR APPROVAL)

C. ALL VALVES SHALL BE FLANGED END, HANDWHEEL OPERATED, AND OS&Y GATE VALVES, RESILIENT WEDGE.

D. PIT SHALL HAVE AN INSIDE HEIGHT OF 6' MINIMUM, FROM TOP OF GRAVEL.

E. WALLS TO BE FORMED CONCRETE.

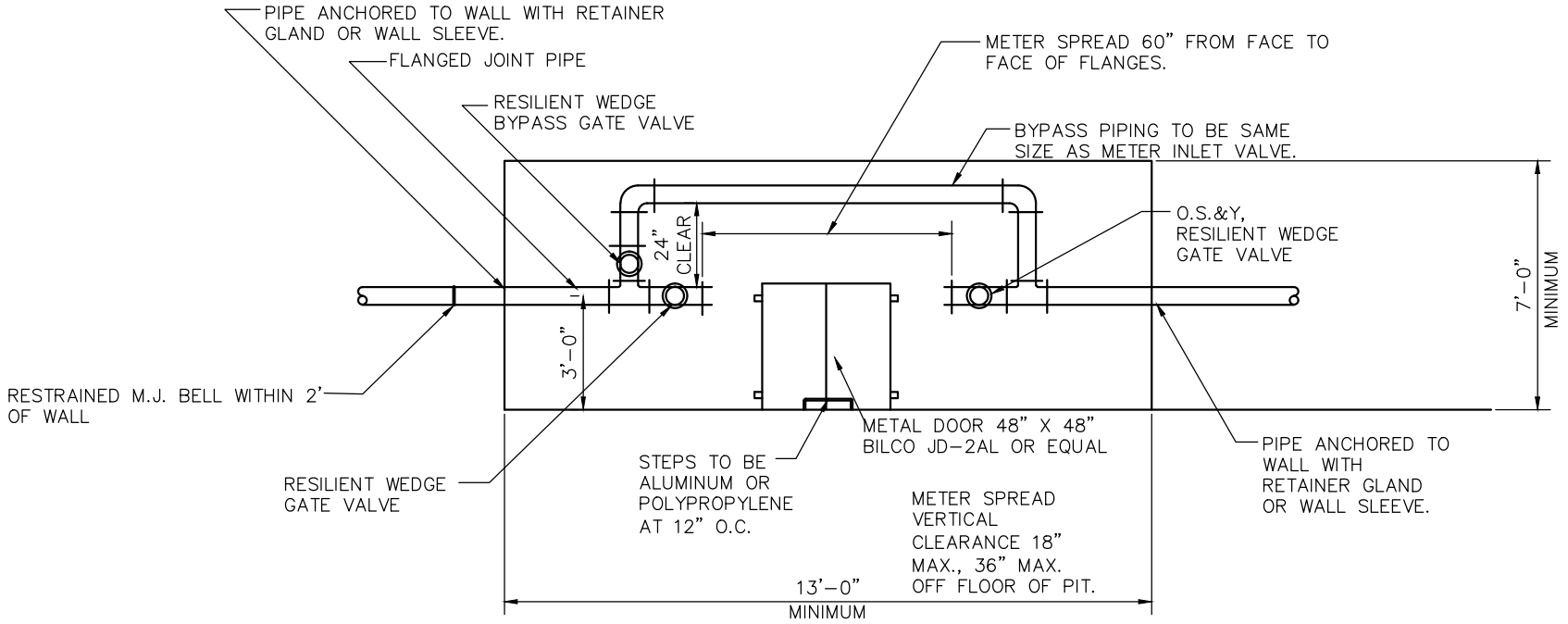
F. PIT TO BE DESIGNED BY REGISTERED ENGINEER OR ARCHITECT AND APPROVED BY THE VILLAGE.

G. 12" MINIMUM 3/4" WASHED GRAVEL IN BOTTOM OF PIT OR CONCRETE SLAB WITH SUMP HOLE.

H. PIPING AND METER SHALL BE SUPPORTED

I. ALTERNATE DESIGNS MAY BE SUBMITTED FOR APPROVAL. SUBMIT COMBINATION PIT INSTALLATIONS FOR APPROVAL CLEARANCES.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	3" AND 4" WATER METER PIT INSTALLATIONS (FOR OFF ROAD USE ONLY)	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–12



NOTES

A. DIMENSIONS SHOWN ARE INSIDE MEASUREMENTS OF PIT.

B. ALL PIPE SHALL BE CLASS 53 DUCTILE WITH FLANGED ENDS.

C. ALL VALVES SHALL BE FLANGED END, HANDWHEEL OPERATED OS&Y GATE VALVES.

D. PIT SHALL HAVE AN INSIDE HEIGHT OF 6' MINIMUM, FROM TOP OF GRAVEL.

E. WALLS TO BE FORMED CONCRETE.

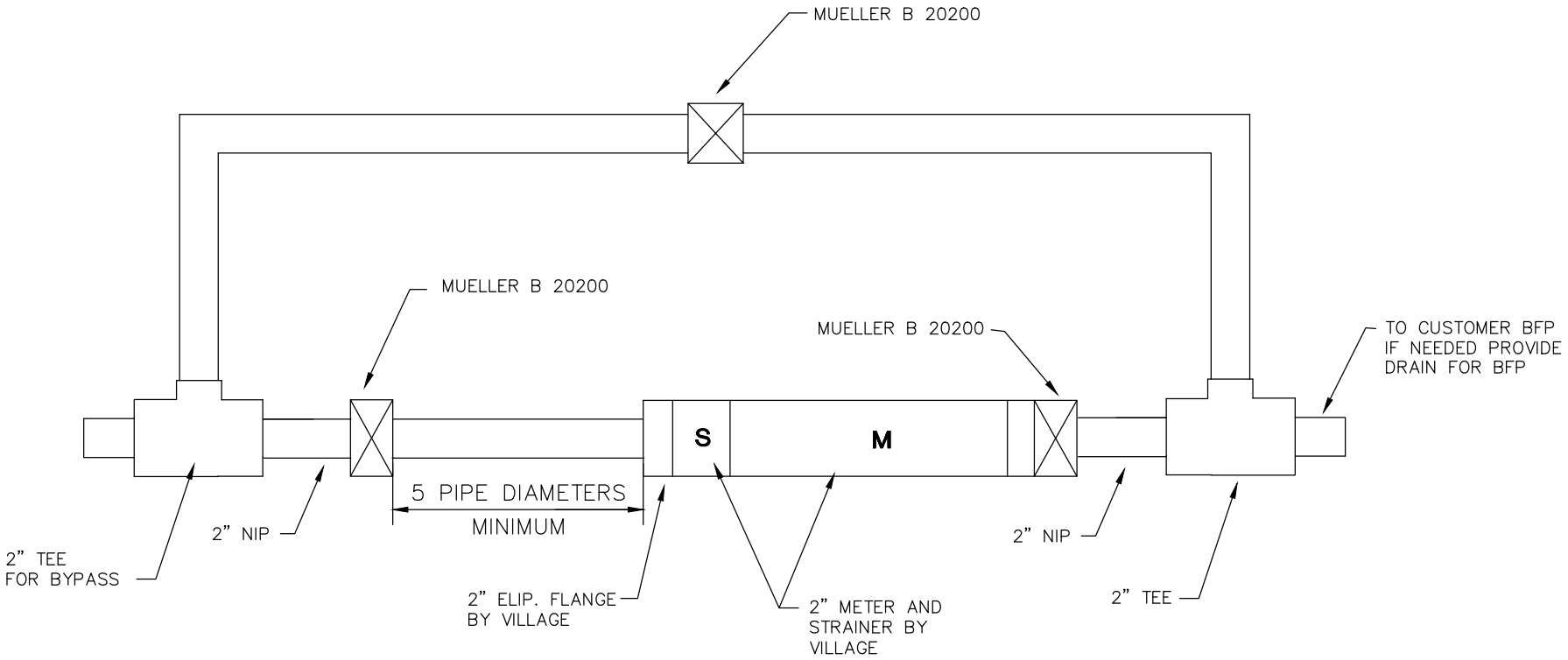
F. PIT TO BE DESIGNED BY REGISTERED ENGINEER OR ARCHITECT AND APPROVED BY THE VILLAGE.

G. 12" MINIMUM 3/4" WASHED GRAVEL IN BOTTOM OF PIT OR CONCRETE SLAB WITH SUMP HOLE.

H. PIPING AND METER SHALL BE SUPPORTED AS APPROVED BY THE ENGINEER, AND WATER DISTRIBUTION.

I. ALTERNATE DESIGN MAY BE SUBMITTED FOR APPROVAL SUBMIT COMBINATION PIT INSTALLATIONS FOR APPROVAL CLEARANCES.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 6" AND LARGER WATER METER PIT INSTALLATIONS (FOR OFF ROAD USE ONLY)	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-13



NOTES

A. CENTERLINE OF METER TO BE NO MORE THAN 36" FROM THE FLOOR.

B. METER MUST BE MOUNTED HORIZONTALLY.

C. USE STAINLESS STEEL OR BRASS NUTS AND BOLTS.

D. METER BYPASS ASSEMBLY AND METER SETTING TO BE CONSTRUCTED OF PVC SCH. 80, BRASS OR COPPER. NO FEMALE PVC THREADS PERMITTED.

E. ALL PIPING TO BE THOROUGHLY SUPPORTED.

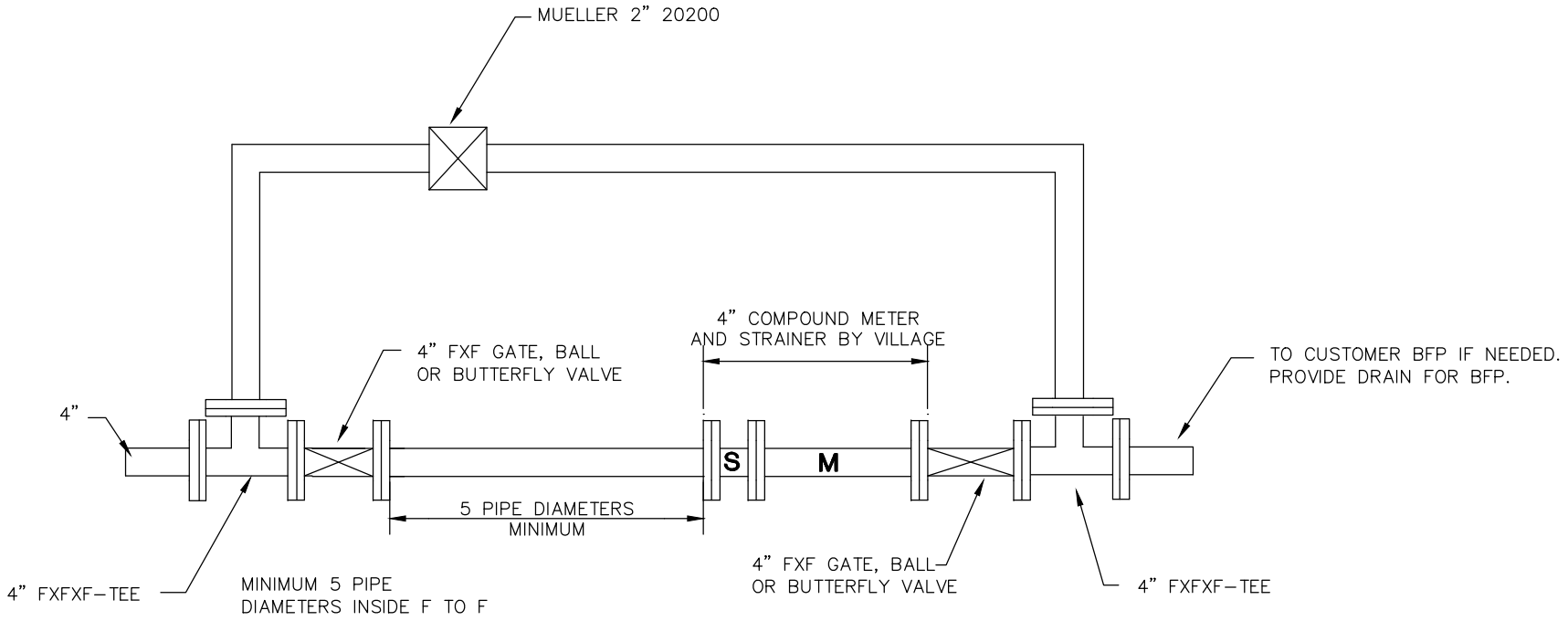
F. THE VILLAGE IS NOT RESPONSIBLE FOR MAINTENANCE OF INSIDE PLUMBING.

G. PROVIDE APPROVED BACKFLOW PREVENTER REGISTERED WITH THE VILLAGE AND THE COUNTY.

H. PROVIDE TWO OR THREE CONDUCTOR WIRE TO OUTSIDE OF BUILDING NEAR ELECTRIC METER 18–22 GAUGE WIRE.

I. BYPASS VALVE SHALL BE LOCKABLE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 2" COMPOUND METER WITH BYPASS	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–14



NOTES

A. CENTERLINE OF METER TO BE NO MORE THAN 36" FROM THE FLOOR.

B. METER MUST BE MOUNTED HORIZONTALLY.

C. FULL FACE FLANGE GASKETS AND STAINLESS STEEL OR BRASS NUTS AND BOLTS TO BE USED.

D. METER BYPASS ASSEMBLY AND METER SETTING TO BE CONSTRUCTED OF PVC SCH. 80, BRASS OR COPPER. NO FEMALE PVC THREADS PERMITTED.

E. ALL PIPING TO BE THOROUGHLY SUPPORTED.

F. THE VILLAGE IS NOT RESPONSIBLE FOR MAINTENANCE OF INSIDE PLUMBING.

G. PROVIDE APPROVED BACKFLOW PREVENTER REGISTERED WITH THE VILLAGE AND THE COUNTY.

H. PROVIDE 2 OR 3 CONDUCTOR WIRE TO OUTSIDE OF BUILDING NEAR ELECTRIC METER 18-22 GAUGE WIRE.

I. BYPASS VALVE SHALL BE LOCKABLE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 4" COMPOUND METER WITH BYPASS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-15

NOTES

A. FOR 4" AND GREATER SERVICES

B. PIPING SHALL BE D.I.P. CLASS 53 TO RIGID FLANGE. FROM RIGID FLANGE THROUGH METER VALVES AND BYPASS TO BE DUCTILE, COPPER OR BRASS.

C. FOR 1 1/2" AND 2" SERVICES: WATER DEPARTMENT RECOMMENDS THE USE OF COPPER PIPING

D. FULL PORT BALL VALVES IN LIEU OF VALVES MAY BE INSTALLED FOR 1 1/2" AND 2" METERS MUST BE LOCKABLE.

E. BYPASS MANDATORY FOR ALL METERS. BYPASS VALVE TO BE LOCKABLE.

F. DUAL INSTALLATION FOR BACKFLOW PREVENTION DEVICES IS OPTIONAL FOR 1 1/2" –2" METERS.

G. ALTERNATE DESIGNS MAY BE SUBMITTED TO WATER ENGINEERING FOR APPROVAL.

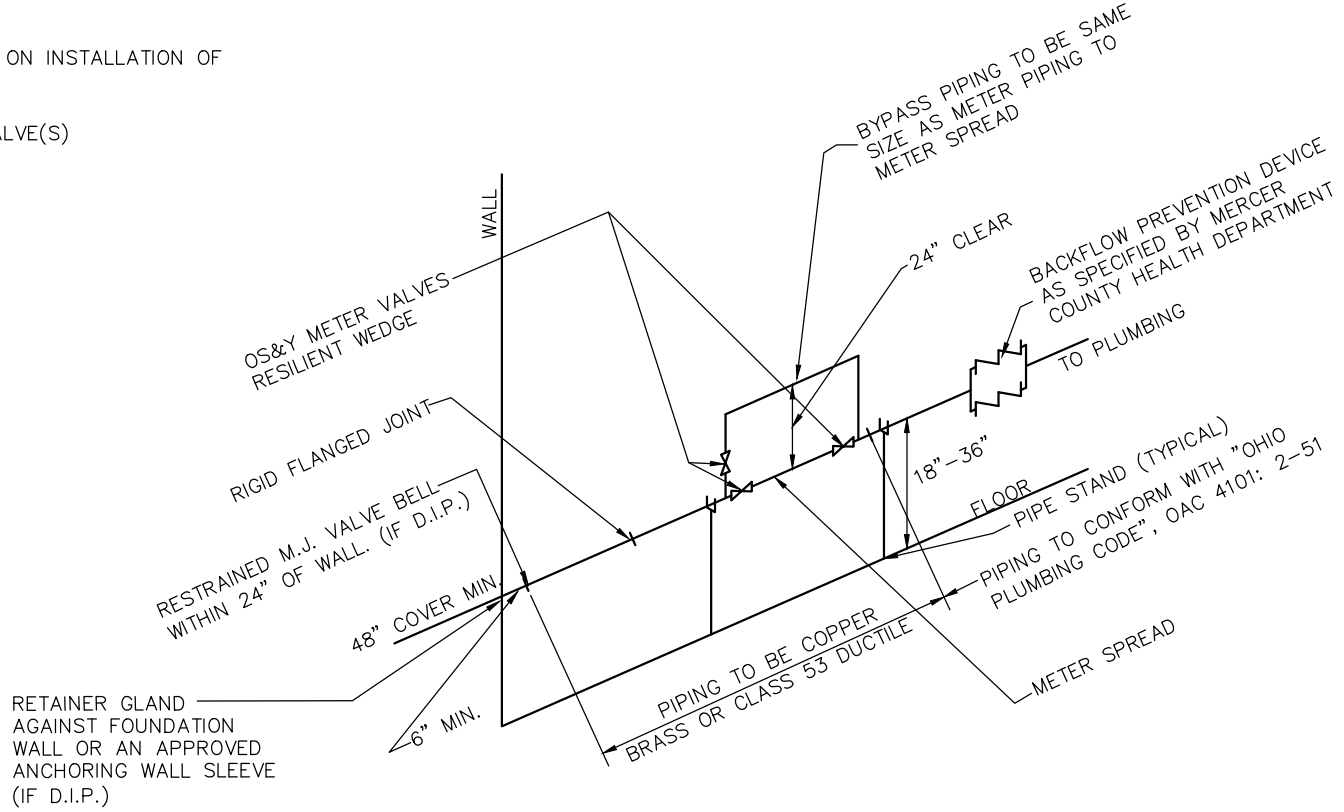
H. PROVIDE SPREADER DEVICE FOR PROPER ALIGNMENT ON INSTALLATION OF METER SPREAD.

I. NO FLANGE ADAPTERS BEFORE INITIAL SHUT–OFF VALVE(S)

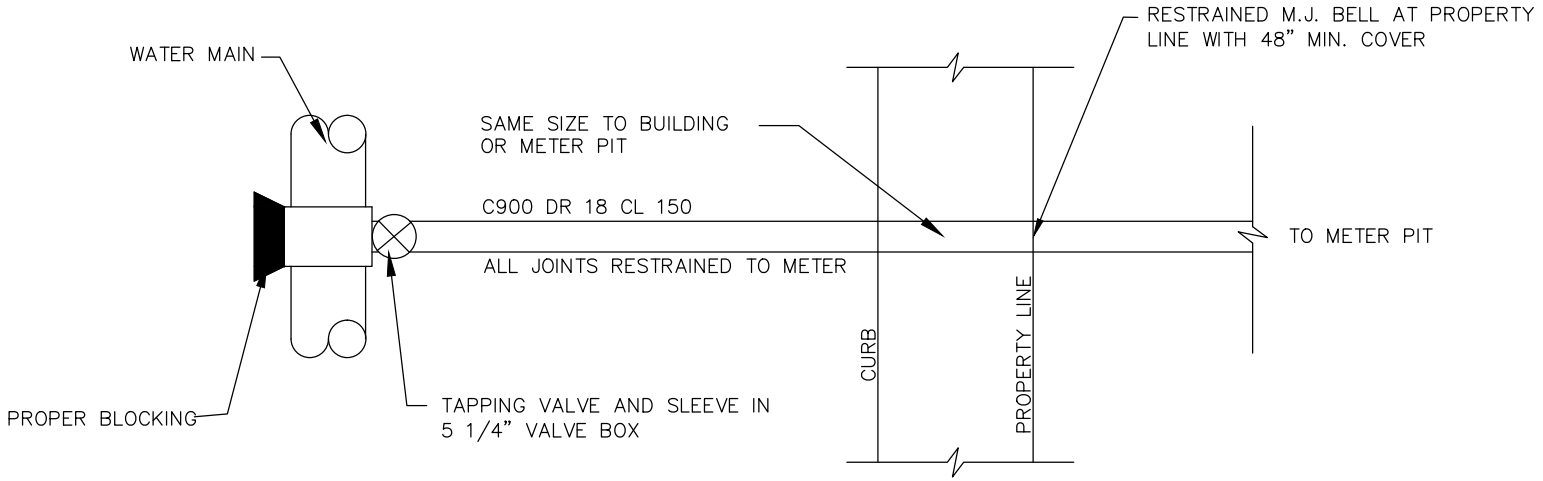
METER SPREAD (FACE TO FACE)

1 1/2"	28"	F.I.P.
2"	30"	FLANGED
3"	46"	FLANGED
4"	56"	FLANGED
5"	60"	FLANGED

8" AND LARGER TO BE REVIEWED BY THE VILLAGE
(F.I.P.– FEMALE IRON PIPE THREAD)



VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# TYPICAL LARGER METER LAYOUT IN BUILDING	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–16



SERVICE TEES ARE PERMITTED IF:

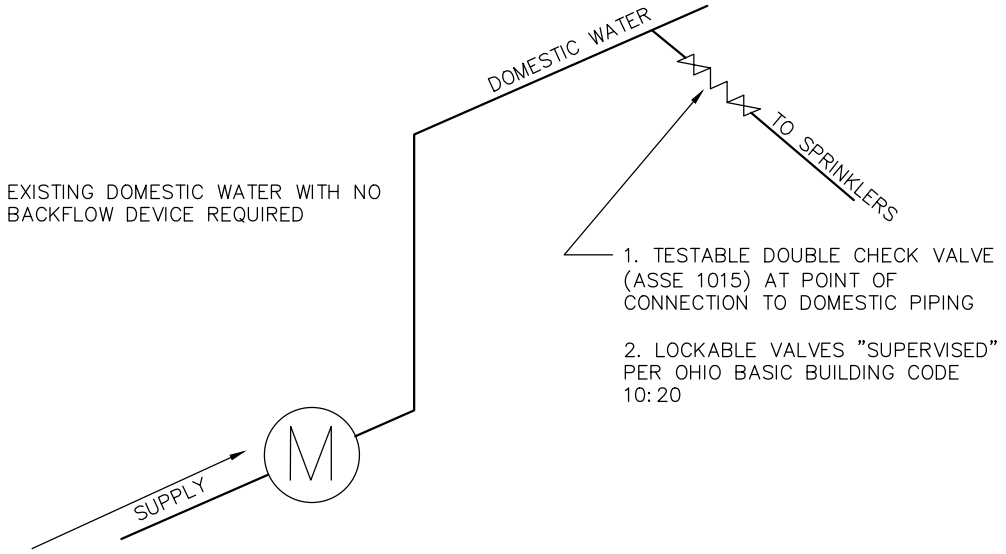
A. SHOWN ON AN APPROVED SET OF CONSTRUCTION PLANS.

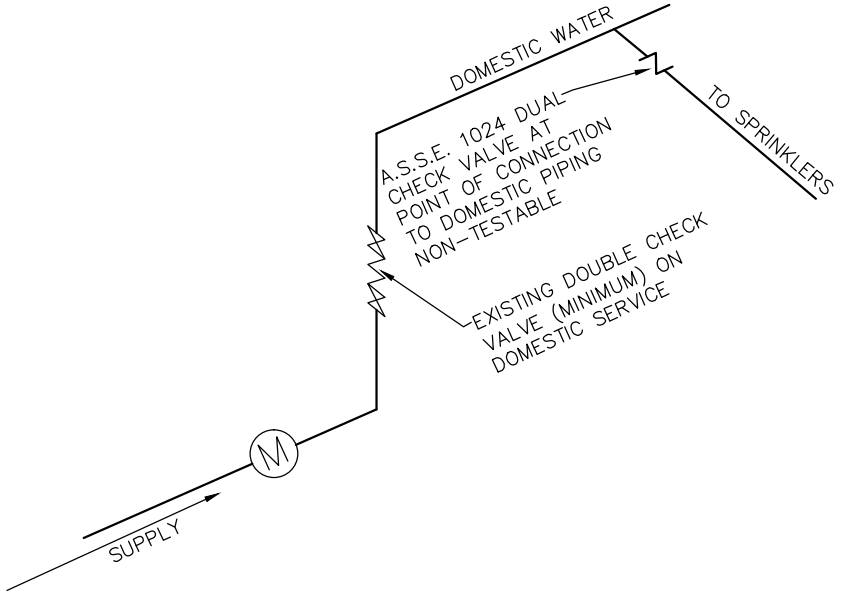
B. 4" MINIMUM BRANCH AND SERVICE LINE WITH GATE VALVE WITHIN 3' OF MAIN.

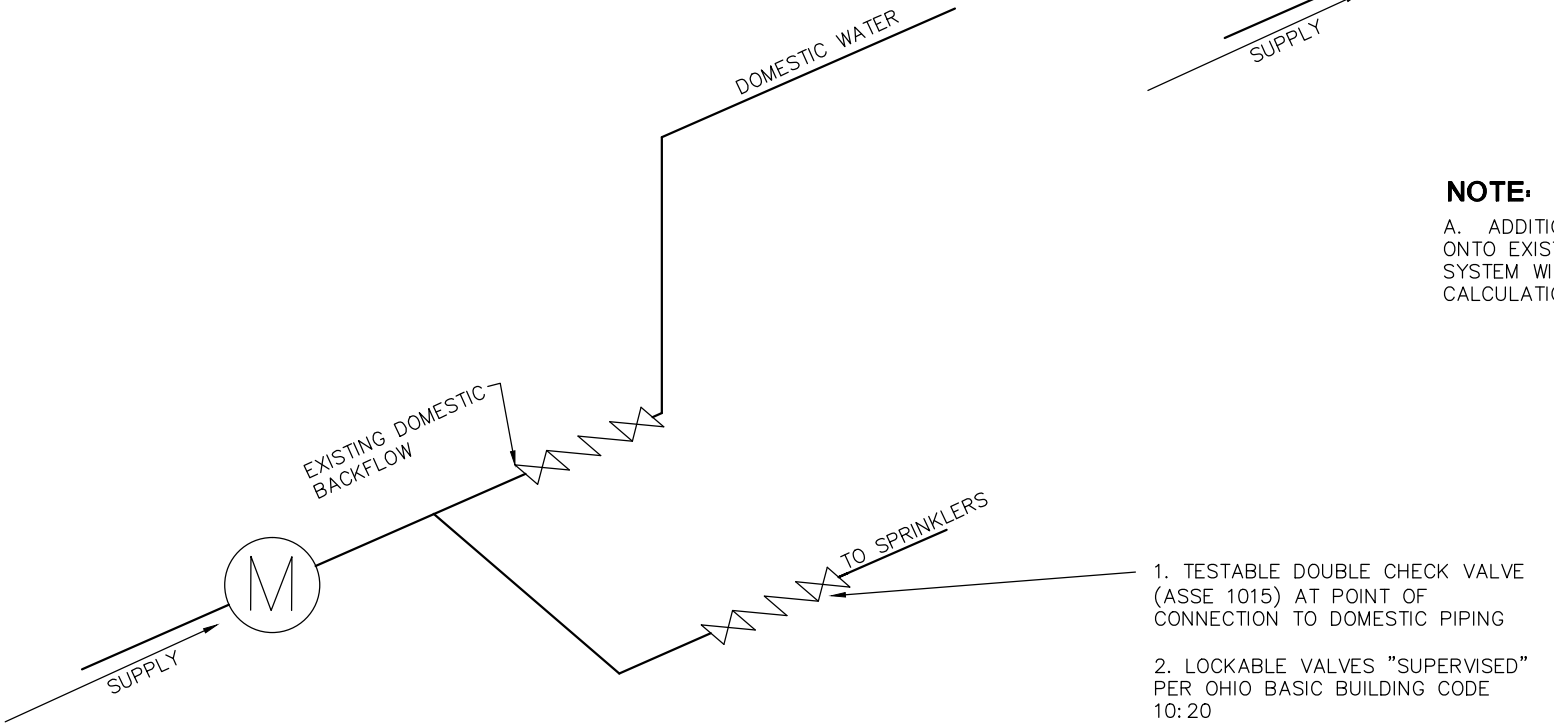
NOTE:

A. IF NO CLEARANCE BETWEEN BUILDING AND PROPERTY LINE, METER MAY BE LOCATED IN BUILDING IF APPROVED BY THE VILLAGE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 4" AND LARGER WATER MAIN SERVICE CONNECTION (DOMESTIC)	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-17



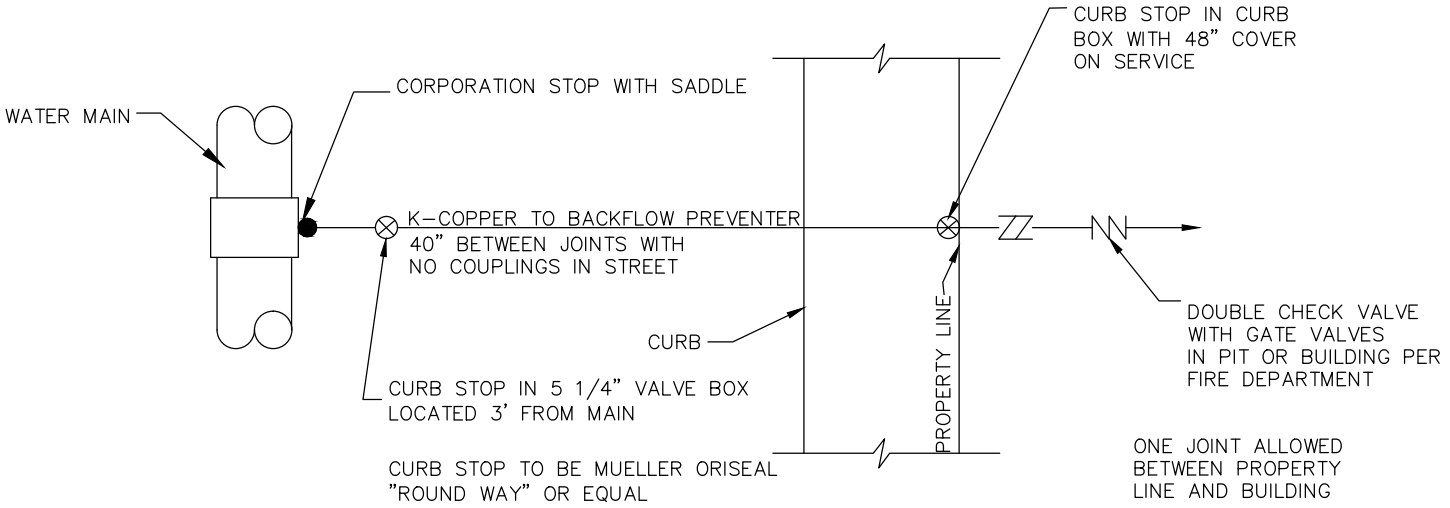




NOTE:

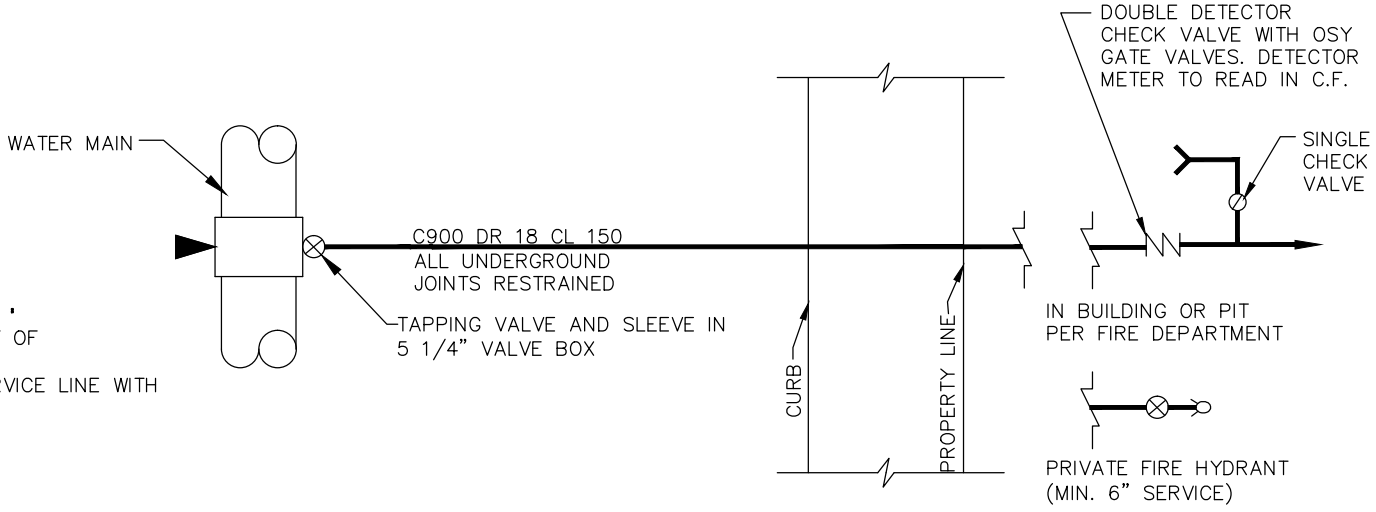
A. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEM WILL AFFECT ORIGINAL FLOW CALCULATION

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# LIMITED AREA SPRINKLER SYSTEM DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-18



2" FIRE LINE SERVICE

(METER REQUIRED)



SERVICE TEES ARE PERMITTED IF :

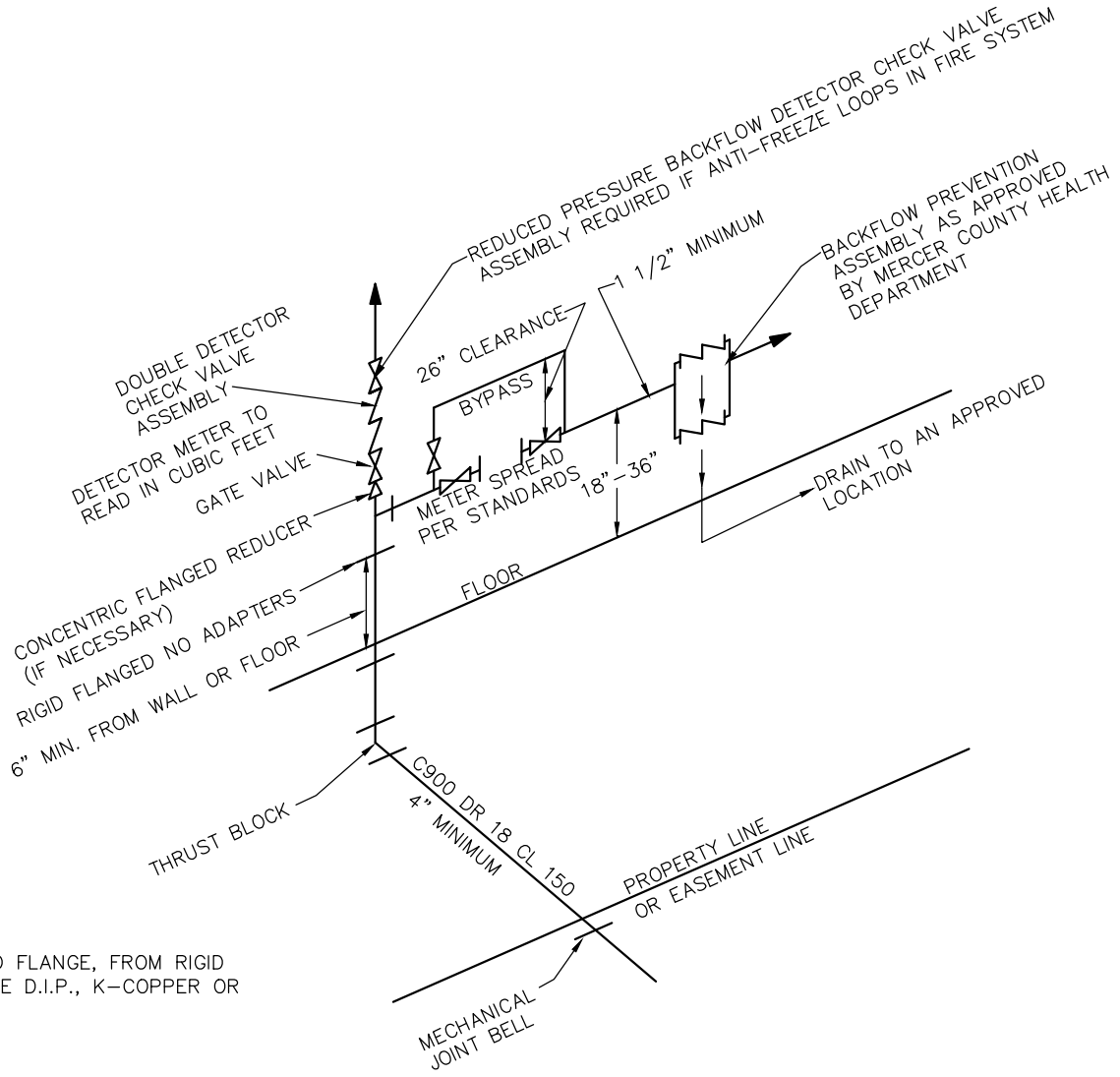
1. SHOWN ON AN APPROVED SET OF CONSTRUCTION DRAWINGS.
2. 4" MINIMUM BRANCH AND SERVICE LINE WITH GATE VALVE WITHIN 3' OF MAIN.

4" AND LARGER FIRE LINE SERVICE

(METER REQUIRED)

WALL/POST INDICATOR VALVES SHALL BE ADDED ON PREMISES AT FIRE DEPARTMENT REQUEST

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# 2" FIRE LINE AND 4" AND LARGER FIRE LINE	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-19



NOTES

A. ALL UNDERGROUND JOINTS MUST BE RESTRAINED.

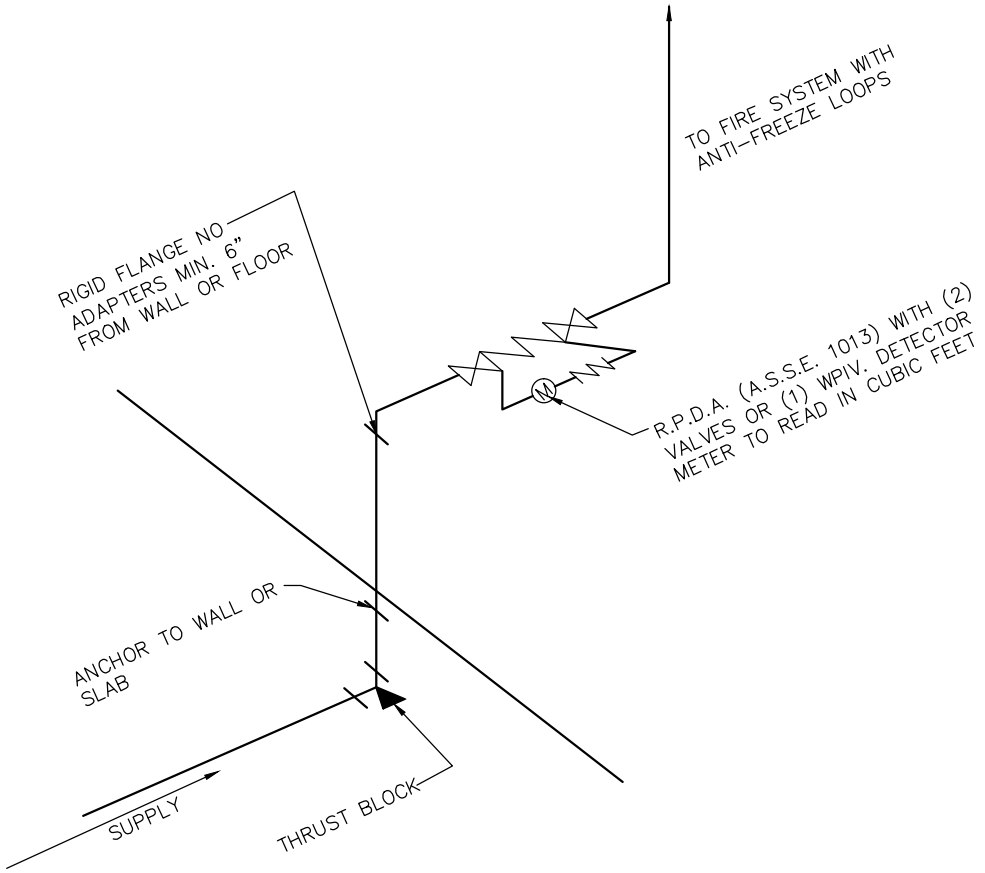
B. INSIDE PIPING SHALL BE D.I.P. CLASS 53 TO RIGID FLANGE, FROM RIGID FLANGE THROUGH METER VALVES AND BYPASS, TO BE D.I.P., K-COPPER OR BRASS.

C. MINIMUM 1 1/2" WATER METER.

D. ALTERNATE DESIGN MAY BE SUBMITTED TO VILLAGE FOR APPROVAL.

E. COMBINATION SERVICE NOT PERMITTED INSIDE BUILDING IF THE DOMESTIC METER IS MORE THAT 75 FEET FROM THE PROPERTY/EASEMENT LINE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# COMBINATION FIRE AND DOMESTIC IN BUILDING	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-20



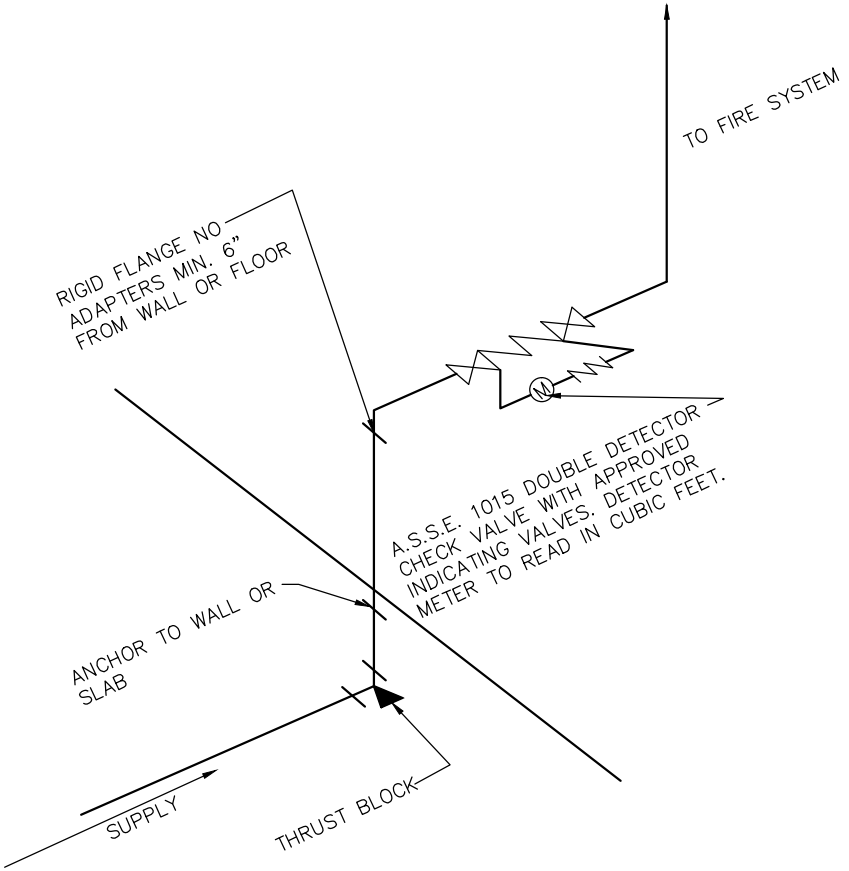
NOTE:

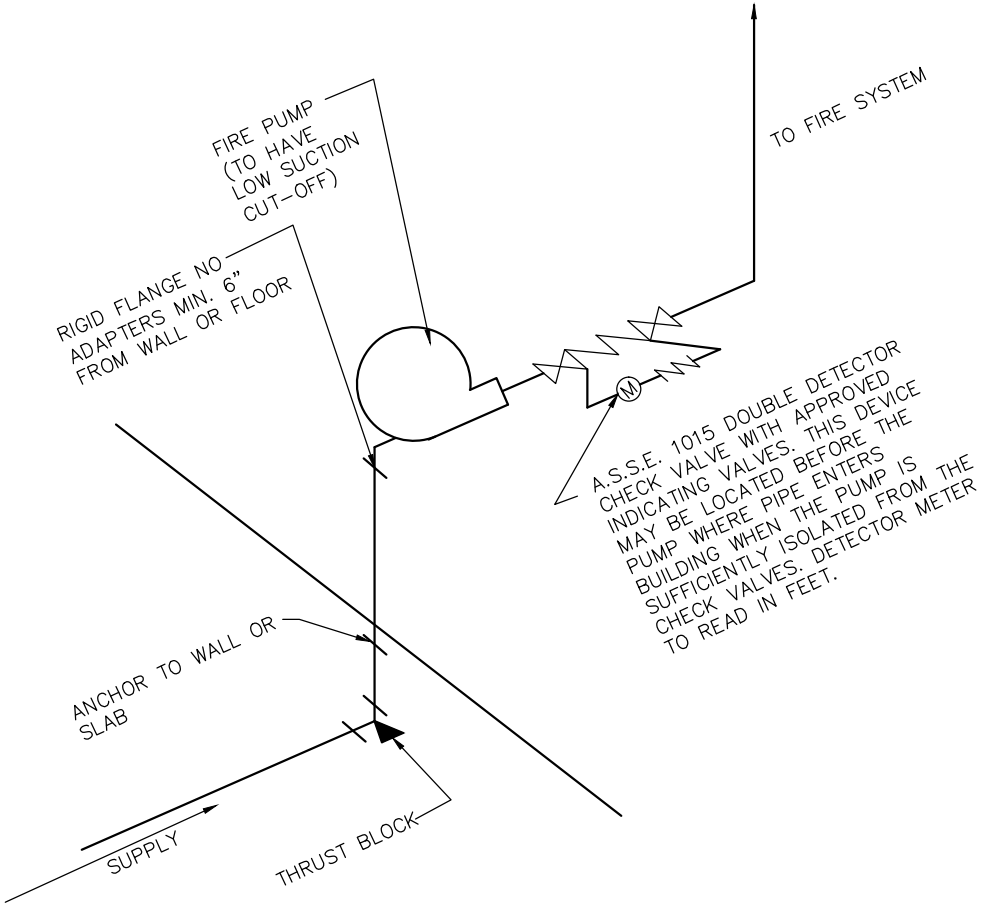
A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED

B. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEMS WILL AFFECT ORIGINAL FLOW CALCULATIONS

C. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# REDUCED PRESSURE DETECTOR ASSEMBLY	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-21





NOTE:
A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED
B. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# DOUBLE DETECTOR CHECK VALVE ASSEMBLY DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 800-22

NOTES

A. SEE "STANDARDS FOR TAPS, SERVICES AND METERS" FOR TYPICAL NOTES

B. BACKFLOW PREVENTION DEVICE REQUIRED–CONTACT WATER ENGINEERING FOR APPROVED DEVICE.

C. PROVIDE APPROVED DRAIN FOR IRRIGATION SYSTEM

D. ALTERNATE DESIGNS MUST BE SUBMITTED FOR APPROVAL.

E. TOP OF PIT LID TO BE INSTALLED AT FINISHED GRADE.

F. THE CURB BOX MUST BE BROUGHT UP TO FINISH GRADE

G. NO OUTLETS ARE ALLOWED BETWEEN METER AND THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER WITH THE EXCEPTION OF ONE SCREW PLUG–IN TAR WINTERIZING/DRAINAGE PURPOSES.

H. THE UNDERGROUND WATER SERVICE SHALL BE K–COPPER UP TO THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER. ALL JOINTS FLARED TYPE JOINTS.

I. IN CASE OF ADD–ON CONSTRUCTION (WITH AN EXISTING DOMESTIC METER AND SERVICE) LEAD FREE SOLDERED JOINTS WILL BE ACCEPTED AT THE TAKE–OFF TEE ONLY

J. THE INSTALLATION SHALL BE INSPECTED BY THE VILLAGE.

INSTRUCTIONS FOR THE INSTALLATION OF IRRIGATION METERS AND BACKFLOW PREVENTERS FOR IRRIGATION

1. MAKE DRAWING OF THE PROPOSED IRRIGATION SYSTEM. THIS DRAWING MUST BE APPROVED BY VILLAGE AND MERCER COUNTY HEALTH DEPARTMENT.

2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE VILLAGE "STANDARDS FOR TAPS, SERVICES AND METERS".

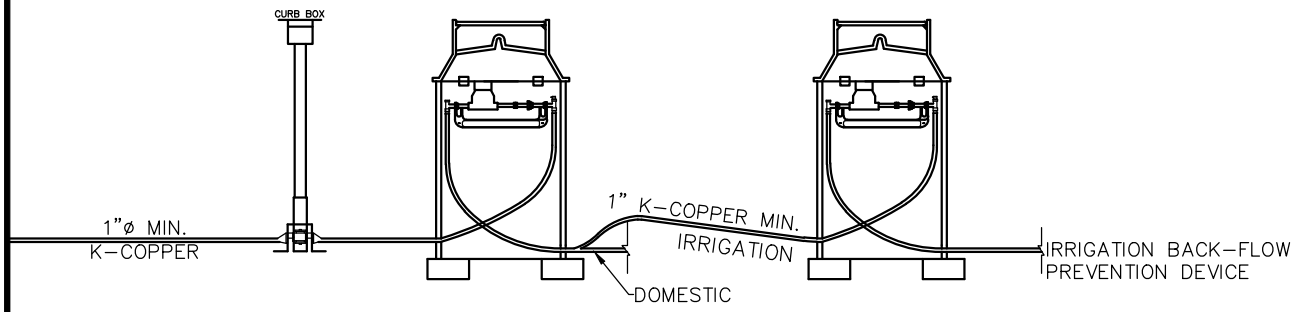
3. GET THE NECESSARY PERMITS.

A) TAPPING FEE FORT RECOVERY

4. GET FORMS AT MERCER COUNTY HEALTH DEPARTMENT FOR EACH BACKFLOW PREVENTER TO BE INSTALLED, PRIOR TO DOING THE WORK.

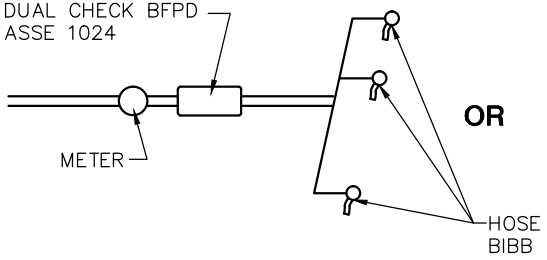
5. AFTER THE BACKFLOW PREVENTERS HAVE BEEN INSTALLED PLEASE FILL OUT THE FORMS COMPLETELY WITH THE OWNER/LESSE'S NAME, ADDRESS (WHERE THE BACKFLOW PREVENTER WAS INSTALLED), LOCATION OF THE BACKFLOW PREVENTER, SIZE, MAKE, MODEL, AND SERIAL NUMBER OF THE BACKFLOW PREVENTER. PLEASE RETURN THE COMPLETED FORMS TO THE VILLAGE AND THE MERCER COUNTY HEALTH DEPARTMENT.

6. CONTACT BOTH VILLAGE AND THE MERCER COUNTY HEALTH DEPARTMENT AFTER THE WORK HAS BEEN COMPLETED. BACKFLOW PREVENTERS HAVE TO BE INSPECTED BY BOTH VILLAGE AND THE MERCER COUNTY HEALTH DEPARTMENT



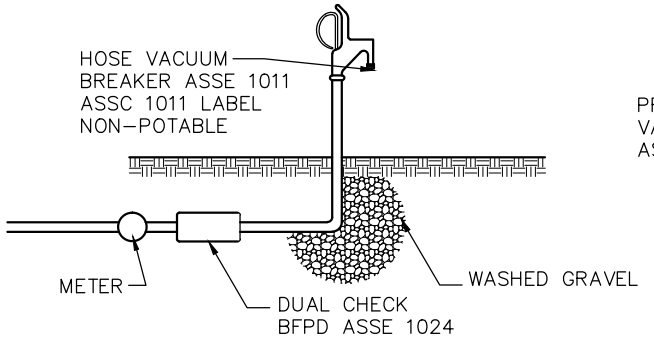
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	STANDARD INSTALLATION FOR IRRIGATION METERS AND BACKFLOW PREVENTER	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–23

HOSE BIBB

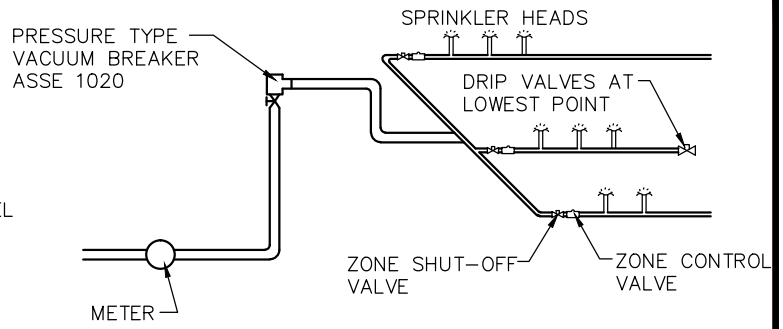


NON–RECERTIFIABLE BFPDS
(ASSE 1001, ASSE 1011) ON
HOSE BIBBS

YARD HYDRANT



SPRINKLER SYSTEM

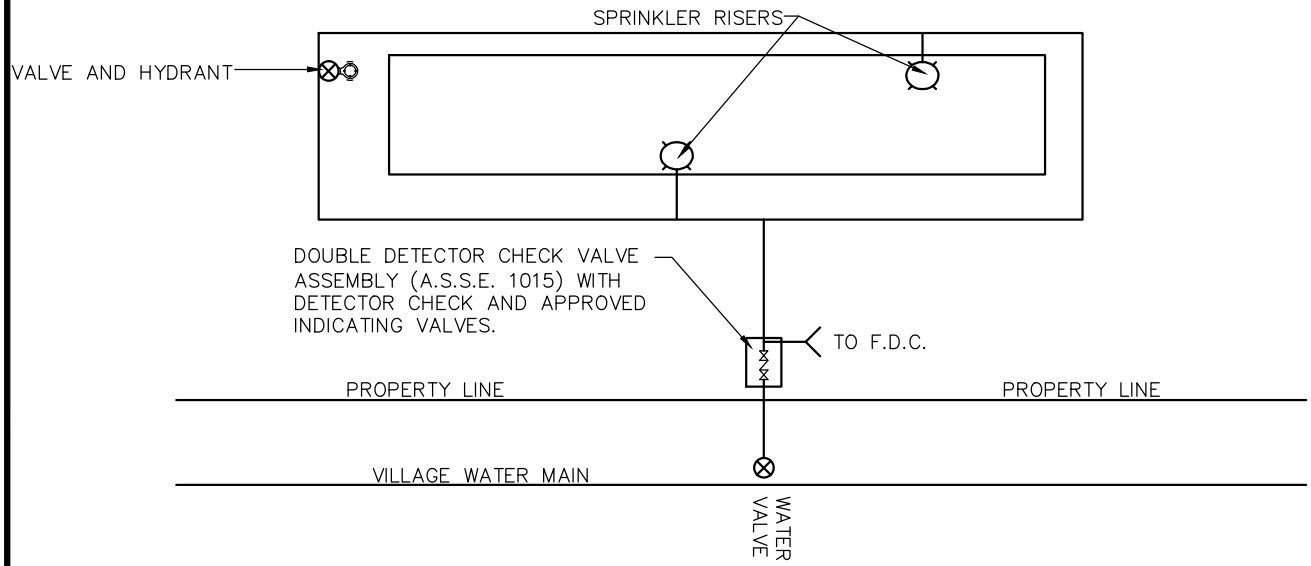


CONDITIONS

A. SHUT–OFF VALVES ARE ALLOWED DOWNSTREAM OF THE BFPD

B. THE PRESSURE TYPE VACUUM BREAKER MUST BE A MINIMUM OF 12" ABOVE THE HIGHEST SPRINKLER HEAD.

YARD MAIN SYSTEM ARRANGEMENT

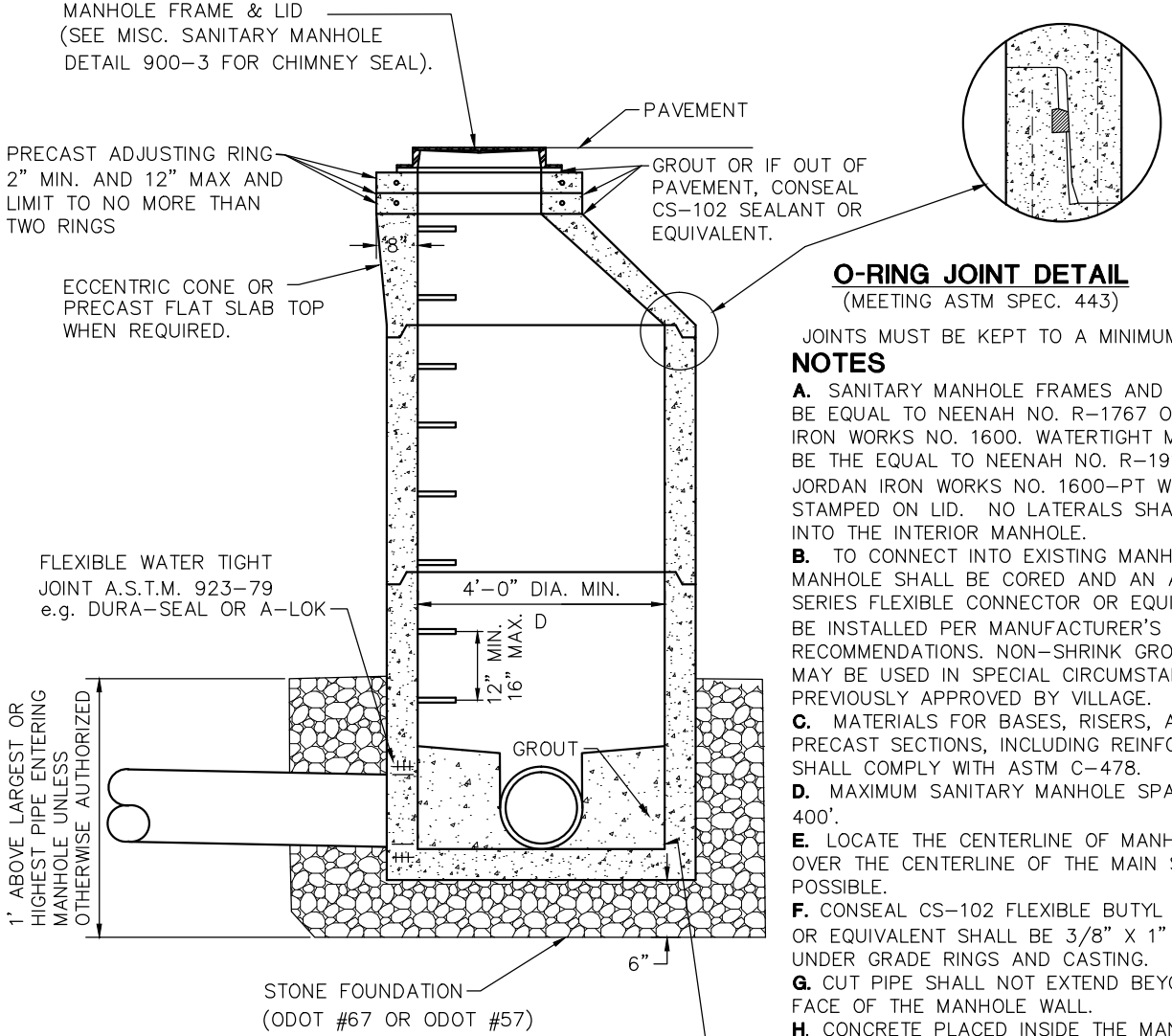


NOTES

A. A DRAWING OF EACH PROPOSED IRRIGATION SYSTEM MUST BE APPROVED BY THE VILLAGE AND MERCER COUNTY HEALTH DEPARTMENT PRIOR TO CONSTRUCTION.

B. IF IRRIGATION SYSTEM IS NONE OF THE ABOVE, USE A REDUCED PRESSURE BACKFLOW PREVENTER, (ASSE 1013), AFTER THE WATER METER.

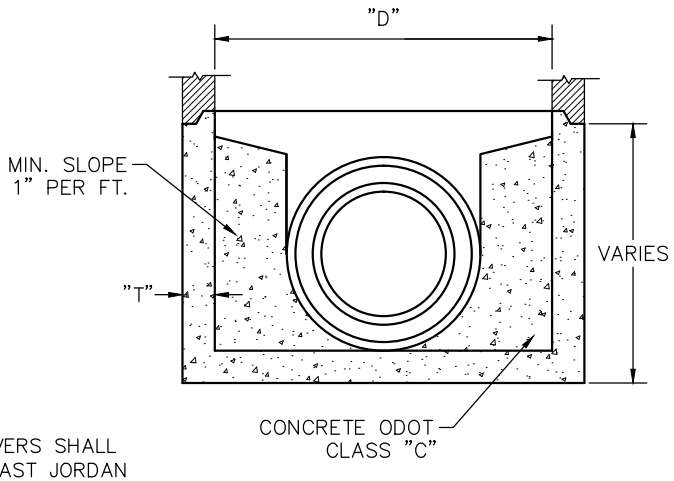
VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# IRRIGATION DETAILS	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 800–24



O-RING JOINT DETAIL

(MEETING ASTM SPEC. 443)

JOINTS MUST BE KEPT TO A MINIMUM



PRECAST BASE SECTION

NOTES

A. SANITARY MANHOLE FRAMES AND COVERS SHALL BE EQUAL TO NEENAH NO. R-1767 OR EAST JORDAN IRON WORKS NO. 1600. WATERTIGHT MANHOLES SHALL BE THE EQUAL TO NEENAH NO. R-1916-D OR EAST JORDAN IRON WORKS NO. 1600-PT WITH "SANITARY" STAMPED ON LID. NO LATERALS SHALL PROTRUDE INTO THE INTERIOR MANHOLE.

B. TO CONNECT INTO EXISTING MANHOLE, THE MANHOLE SHALL BE CORED AND AN A-LOK XP SERIES FLEXIBLE CONNECTOR OR EQUIVALENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. NON-SHRINK GROUT ALTERNATIVE MAY BE USED IN SPECIAL CIRCUMSTANCES WHEN PREVIOUSLY APPROVED BY VILLAGE.

C. MATERIALS FOR BASES, RISERS, AND OTHER PRECAST SECTIONS, INCLUDING REINFORCEMENTS SHALL COMPLY WITH ASTM C-478.

D. MAXIMUM SANITARY MANHOLE SPACING SHALL BE 400'.

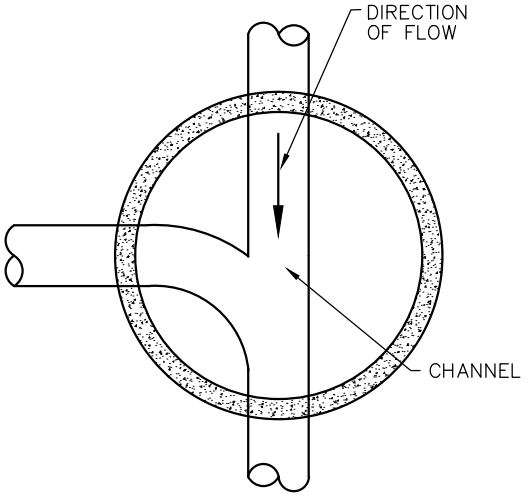
E. LOCATE THE CENTERLINE OF MANHOLE COVERS OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

F. CONSEAL CS-102 FLEXIBLE BUTYL RESIN SEALANT OR EQUIVALENT SHALL BE 3/8" X 1" MINIMUM STRIPS UNDER GRADE RINGS AND CASTING.

G. CUT PIPE SHALL NOT EXTEND BEYOND THE INSIDE FACE OF THE MANHOLE WALL.

H. CONCRETE PLACED INSIDE 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.

PIPE SIZE	T	D
24" & UNDER	5"	48"
27" & ABOVE	6"	60"



STANDARD INVERT CHANNEL

ALL INVERTS TO BE CHANNELED FOR OPTIMUM FLOW.

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

TYPE 3 SANITARY MANHOLE

REVISIONS:

DATE APPROVED: 04-21-2008

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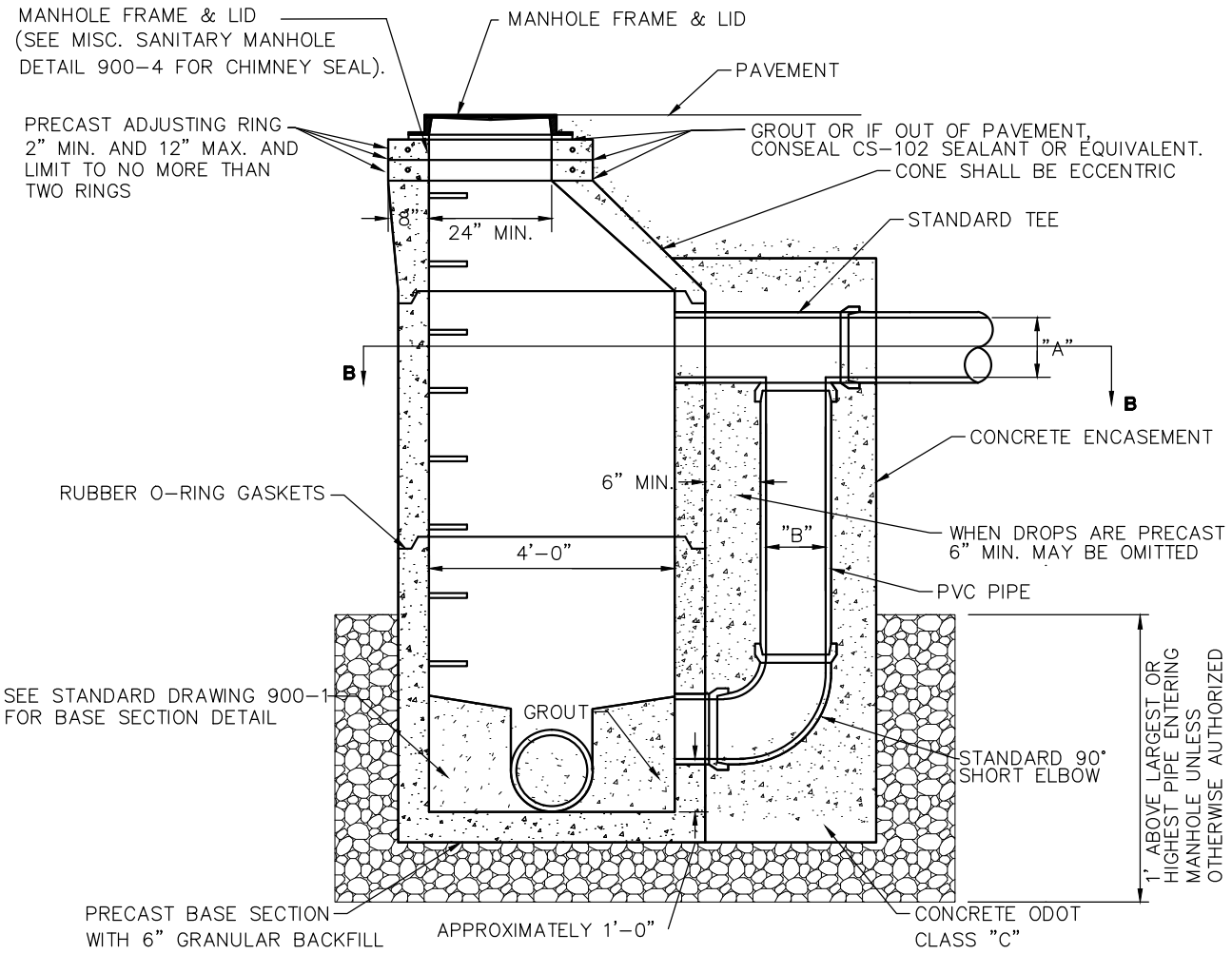
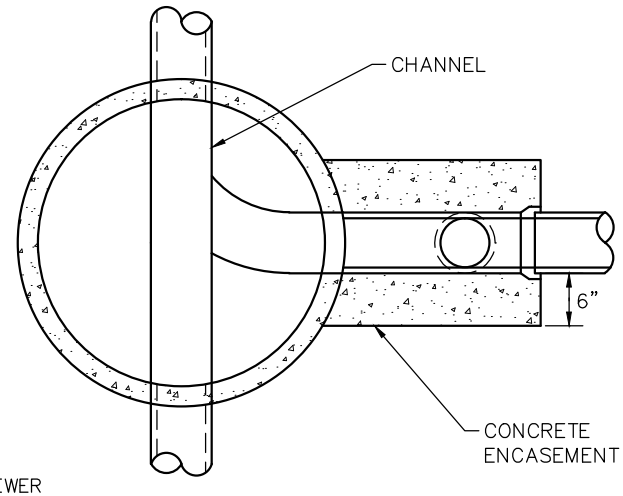


"A"	"B"
8", 10", & 12"	8"
15" & 18"	10"
21" & 24"	12"

DROP CONNECTION MANHOLE



SECTIONAL PLAN B-B

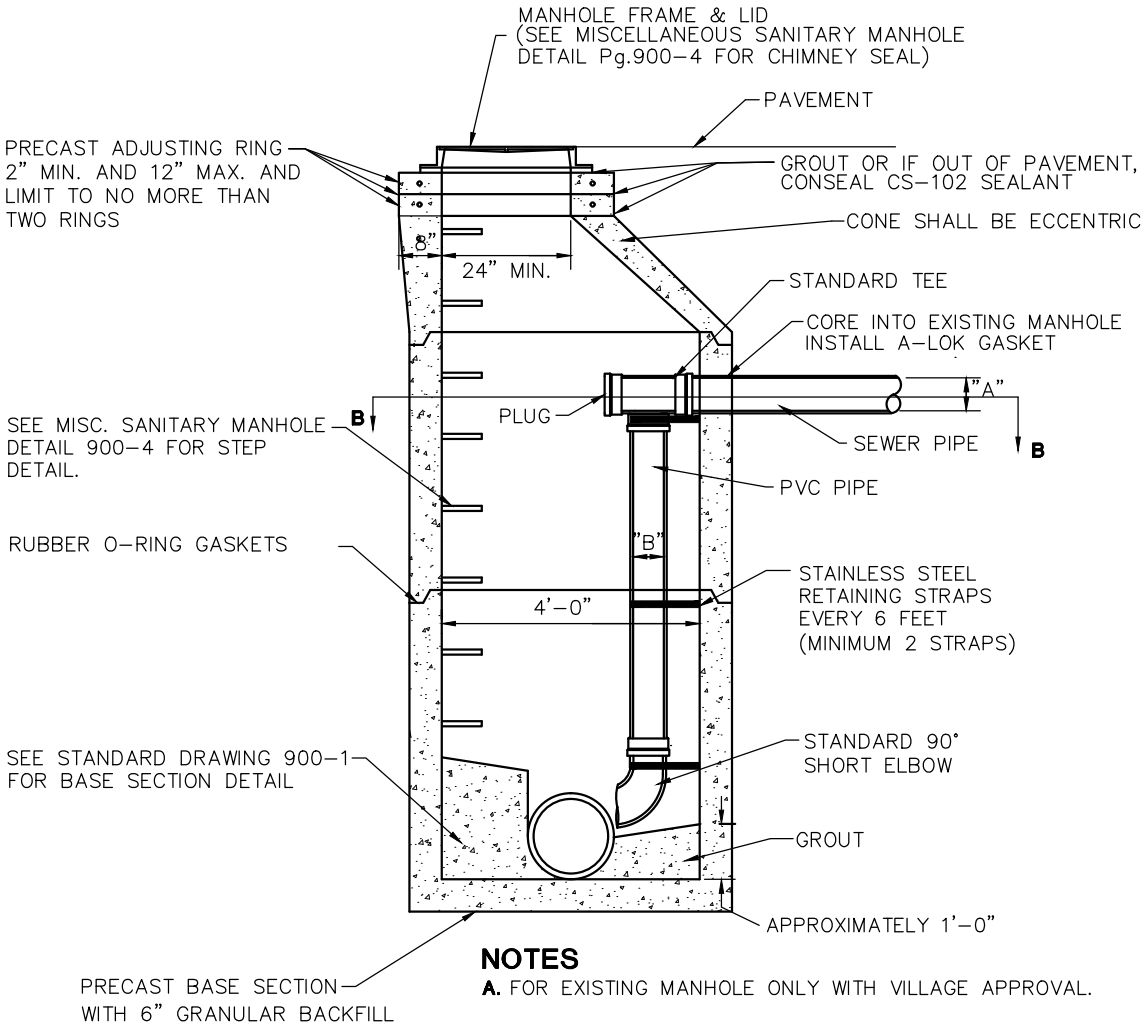
NOTES

A. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

B. TYPE D MANHOLE SHALL BE USED WHERE THE DIFFERENCE IN INVERT ELEVATIONS IS GREATER THAN 2'-0".

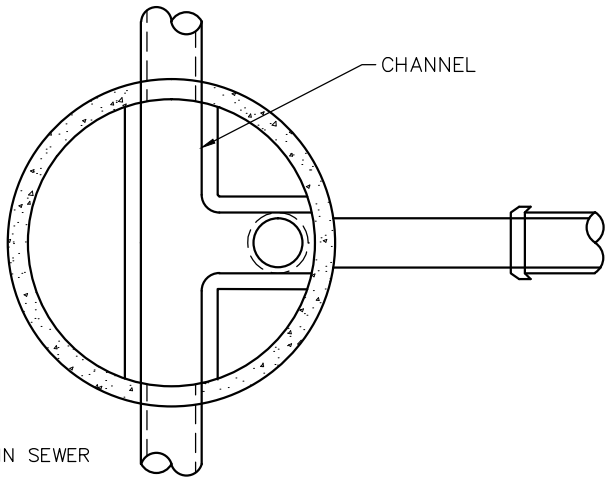
C. ALL NOTES AND ASTM REFERENCES ON THE TYPE 3 SANITARY MANHOLE APPLY ON THE TYPE D SANITARY DROP MANHOLE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# TYPE D SANITARY DROP MANHOLE	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-2



"A"	"B"
8", 10", & 12"	8"
15" & 18"	10"
21" & 24"	12"

DROP CONNECTION MANHOLE



SECTIONAL PLAN B-B

NOTES

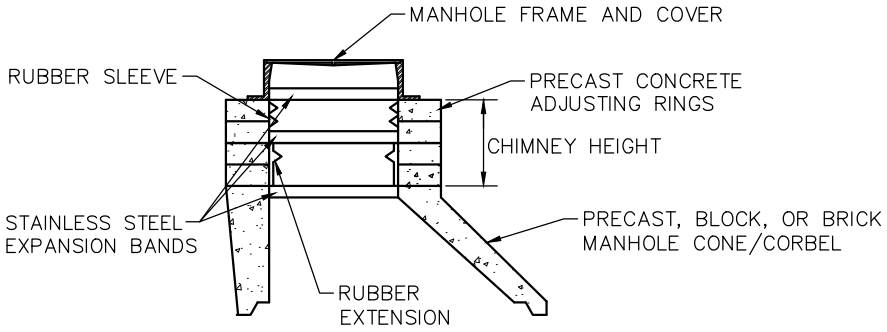
A. FOR EXISTING MANHOLE ONLY WITH VILLAGE APPROVAL.

B. LOCATE THE CENTERLINE OF MANHOLE CONES OVER THE CENTERLINE OF THE MAIN SEWER WHENEVER POSSIBLE.

C. INSIDE DROP MANHOLE SHALL BE USED WHERE THE DIFFERENCE IN INVERT ELEVATIONS IS GREATER THAN 2'0" AND ONLY IN SPECIAL CIRCUMSTANCES WHEN PRE–APPROVED BY THE VILLAGE.

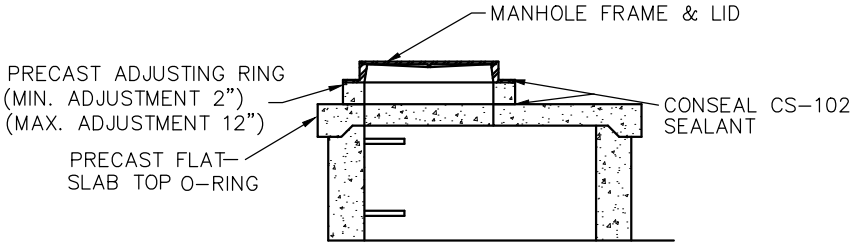
D. ALL NOTES AND ASTM REFERENCES ON THE TYPE 3 SANITARY MANHOLE APPLY ON THE INSIDE DROP SANITARY MANHOLE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# INSIDE SANITARY DROP MANHOLE	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 900–3

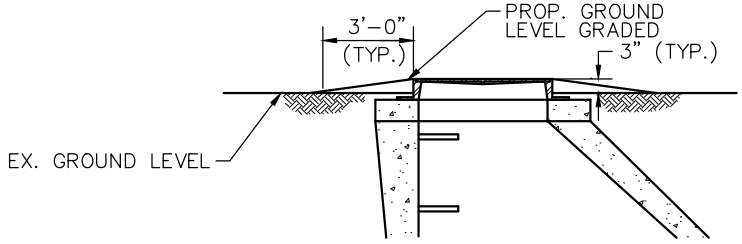


INTERNAL MANHOLE CHIMNEY SEAL

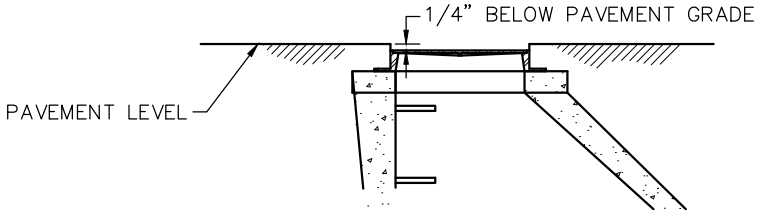
(ONLY WHEN REQUIRED BY VILLAGE)



FLAT TOP SLAB



TYPICAL OFF STREET MANHOLE GRADING



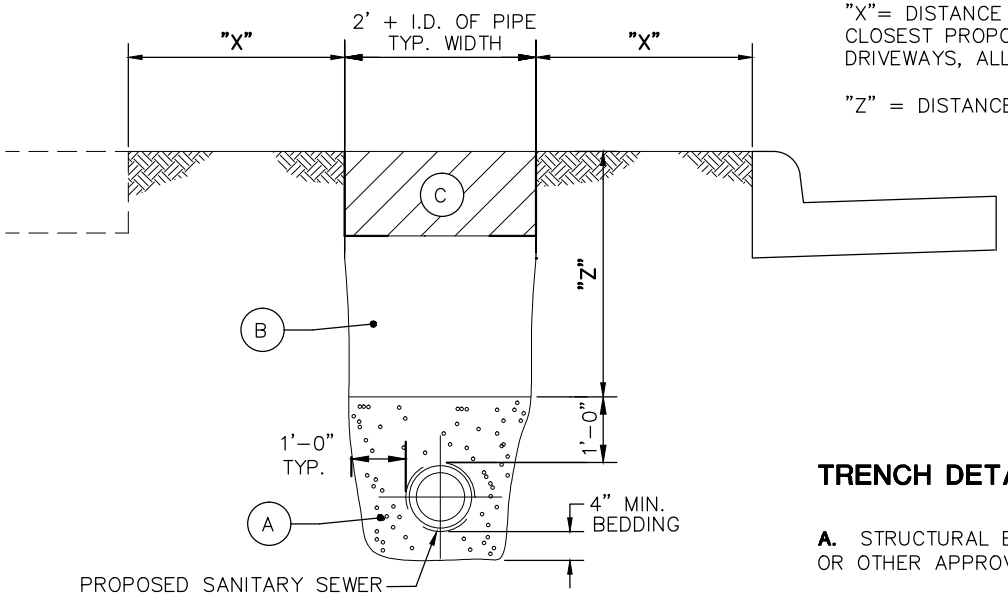
TYPICAL IN STREET MANHOLE GRADING

NOTES

A. MANHOLE STEPS SHALL BE SECURLY INSTALLED INTO EACH MANHOLE SECTION, BY THE MANUFACTURER, PRIOR TO DELEVERY TO THE JOB SITE

B. MANHOLE STEPS SHALL BE PF-1 STEP BY M.A. INDUSTRIES OR EQUVILENT

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# MISCELLANEOUS SANITARY MANHOLE DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-4



SANITARY SEWER TRENCH DETAIL

"X"= DISTANCE FROM EDGE OF TRENCH TO EDGE OF CLOSEST PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS.

"Z" = DISTANCE FROM TOP OF BEDDING TO FINISH SURFACE.

TRENCH DETAIL NOTES

A. STRUCTURAL BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #8), OR OTHER APPROVED EQUIVALENT.

B. ALL TRENCHES WHERE "X" IS GREATER THAN "Z" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE VILLAGE. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4" DIAMETER.

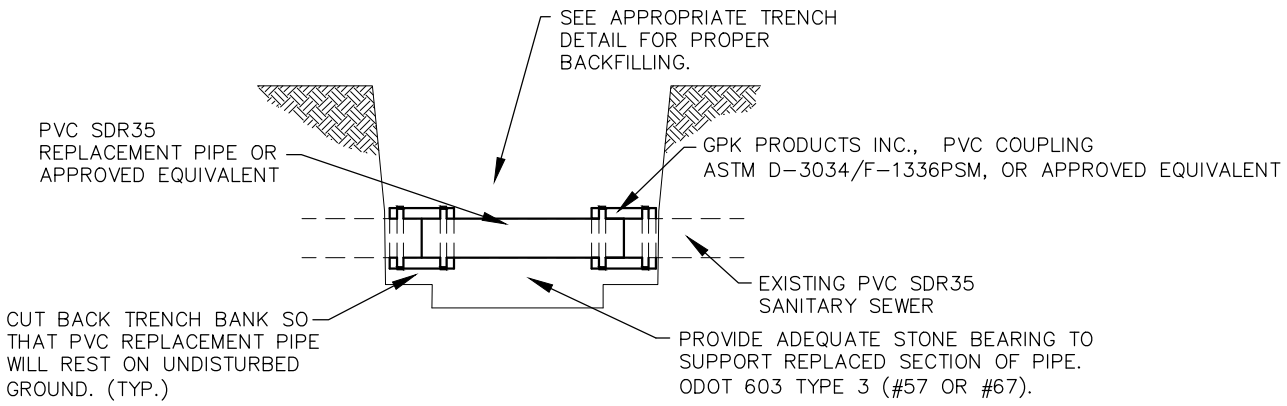
ALL TRENCHES WHERE "Z" IS GREATER THAN "X" FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREA OR WALKS SHALL BE COMPACTED WITH STRUCTURAL BACKFILL MATERIAL ODOT 603 TYPE 3 (#57 OR #8) OR LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613 TYPE 1 UNTIL THE TOP OF THE COMPACTED STRUCTURAL BACKFILL OR LOW STRENGTH MORTAR BACKFILL IS HIGH ENOUGH WHERE "X" IS GREATER THAN "Z".

C. OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6" OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.

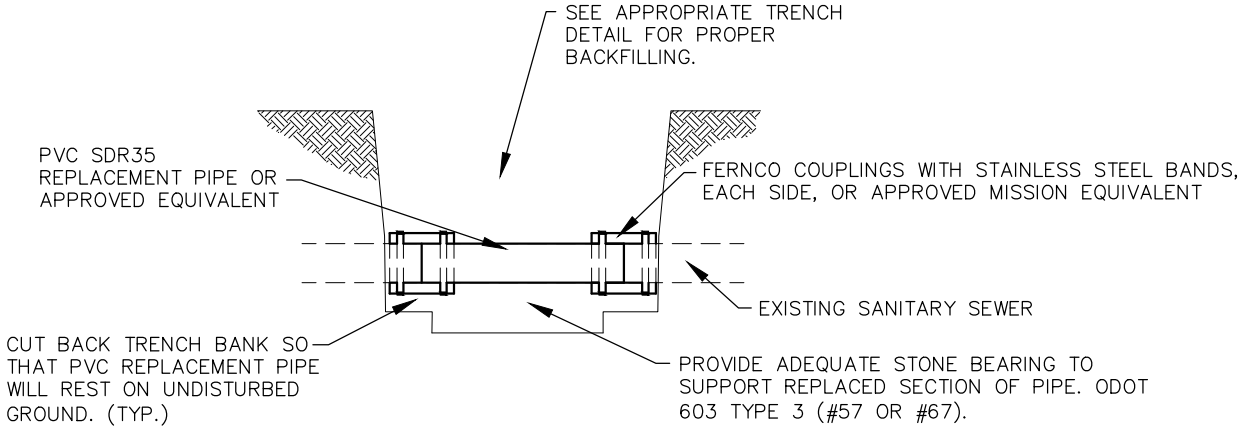
IN-PAVEMENT AREAS SHALL FOLLOW TYPICAL PAVEMENT RESTORATION DETAILS SHOWN ON PAGE 300-19.

D. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK FOR THE NIGHT.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	SANITARY SEWER TRENCH DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-5



REPAIR OF EXISTING PVC SDR35 SANITARY SEWER



REPAIR OF EXISTING SANITARY SEWER OTHER THAN PVC

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# REPAIR OF EXISTING SANITARY SEWER PIPE DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-6

NOTES

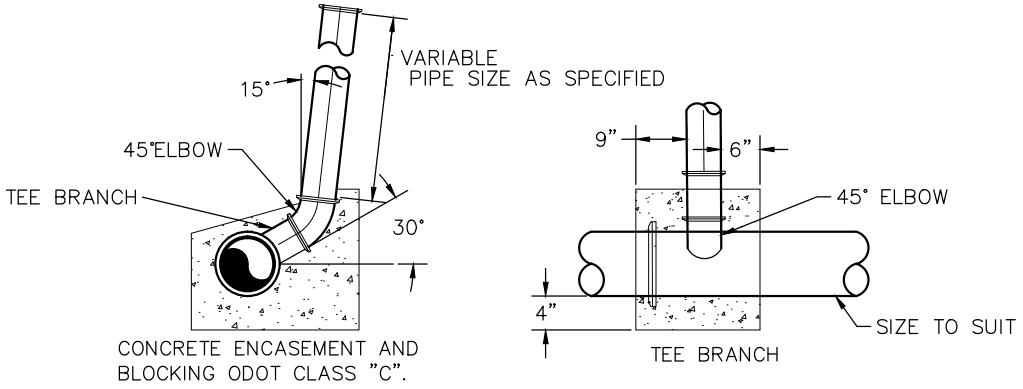
A. RISER PIPE TO BE BEDDED SOLIDLY AGAINST UNDISTURBED GROUND. ALSO, TEE MAY BE SUBSTITUTED FOR WYE BRANCH IF SPECIFIED, AND APPROVED BY VILLAGE.

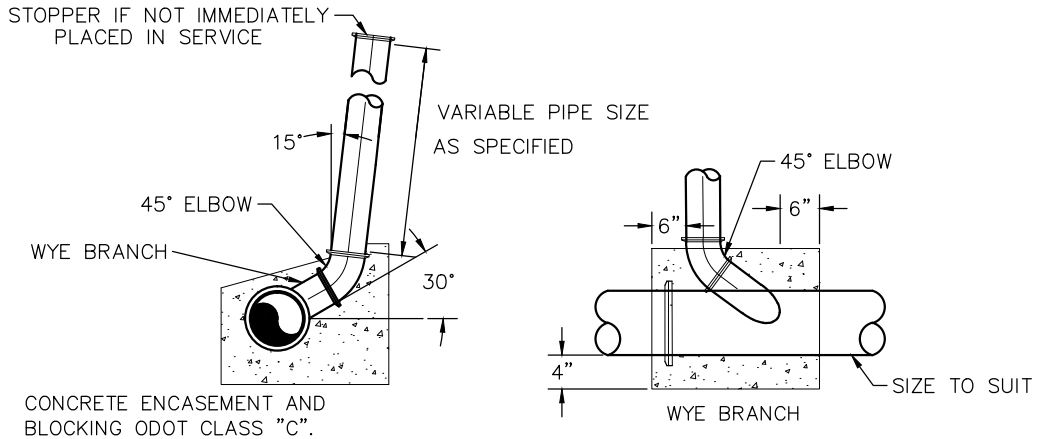
B. ALL SERVICE LATERALS SHALL BE WYE BRANCHES UNLESS APPROVED BY VILLAGE.

C. RISER PIPE TO BE INSTALLED SO THAT CONNECTING SERVICE SHALL HAVE A MINIMUM DEPTH OF 7' AT THE PROPERTY LINE UNLESS OTHERWISE DIRECTED BY THE VILLAGE.

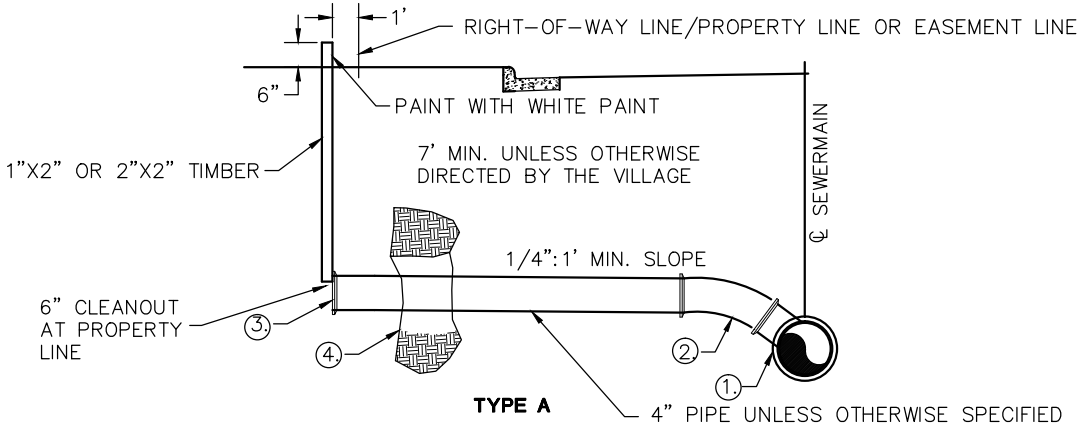
D. CONCRETE ENCASEMENT AND BLOCKING REQUIRED IF DEPTH OF CONNECTION IS 12' OR GREATER.

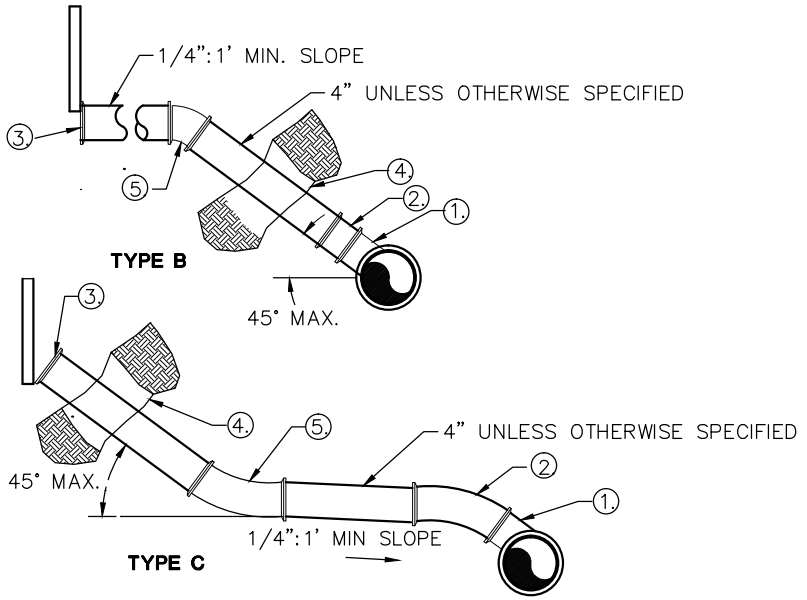
E. EACH SANITARY LATERAL MUST BE IN SEPARATE TRENCHES, UNLESS APPROVED BY THE VILLAGE.





SERVICE RISER

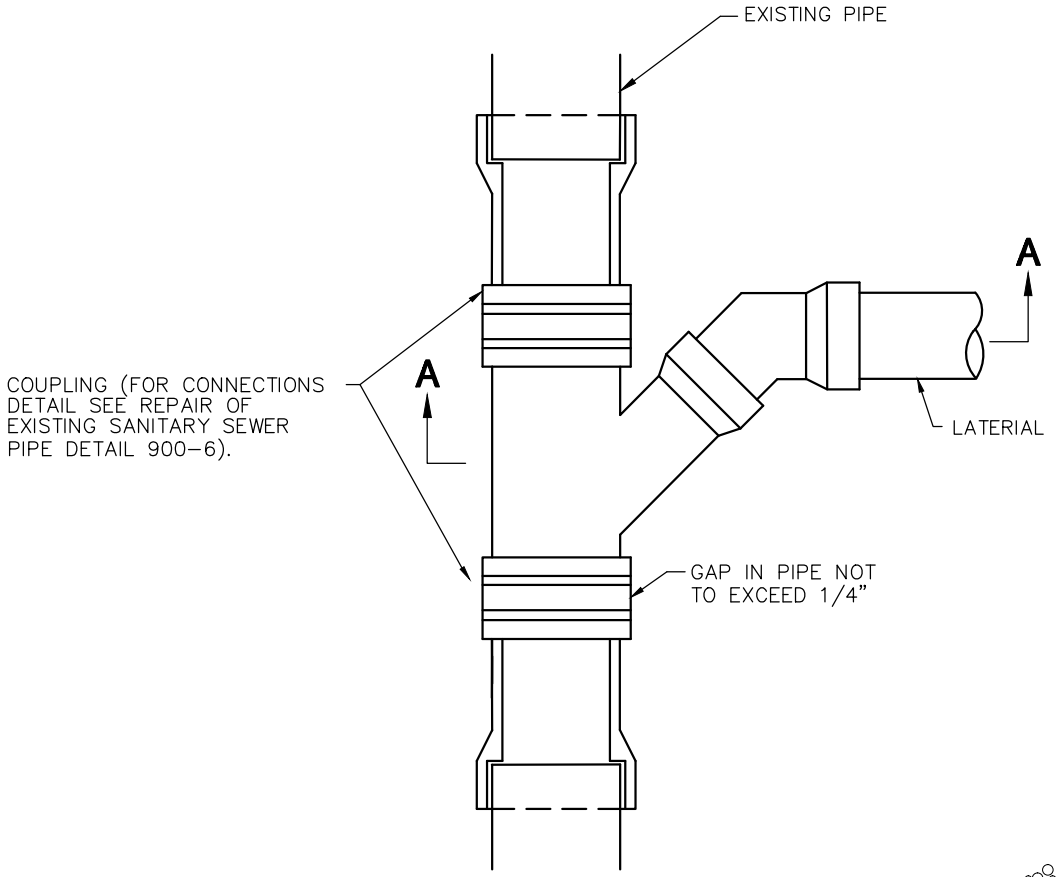




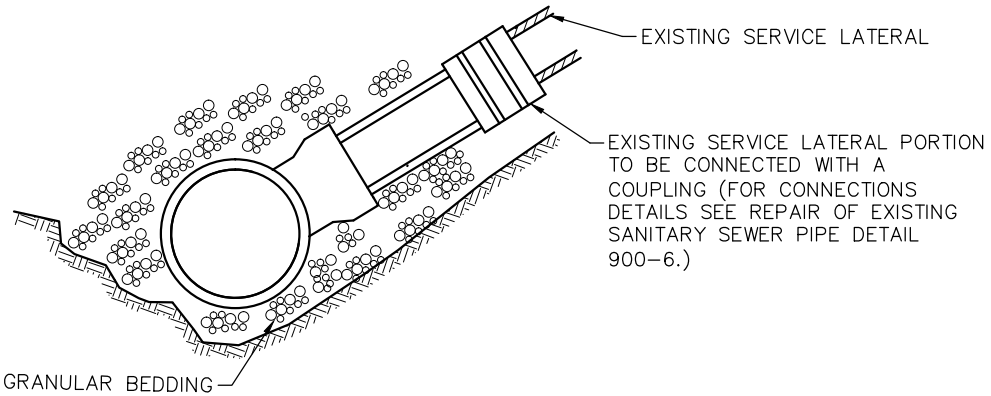
1. 4" TEE OR WYE–ROTATE 45° FROM HORIZONTAL UNLESS OTHERWISE SPECIFIED.
2. 4" 1/8 BEND OR 1/16 BEND AS NEEDED.
3. CAP UNLESS JOINING EXISTING SERVICE LATERAL.
4. BED PIPE WITH 8" STRUCTURAL MATERIAL AND BACKFILL WITH STRUCTURAL MATERIAL TO 8" ABOVE PIPE. ODOT 603 TYPE 3 #57 OR #67.
5. EXACT RECORD OF BEND LOCATIONS MUST BE MADE, AS TO DEPTH FROM SURFACE AND DISTANCE FROM CENTERLINE OF SEWER, BEFORE BACKFILL IS PLACED.

SERVICE LATERAL

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# SERVICE RISER AND SERVICE LATERAL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-7



SERVICE LATERAL



SECTION A-A

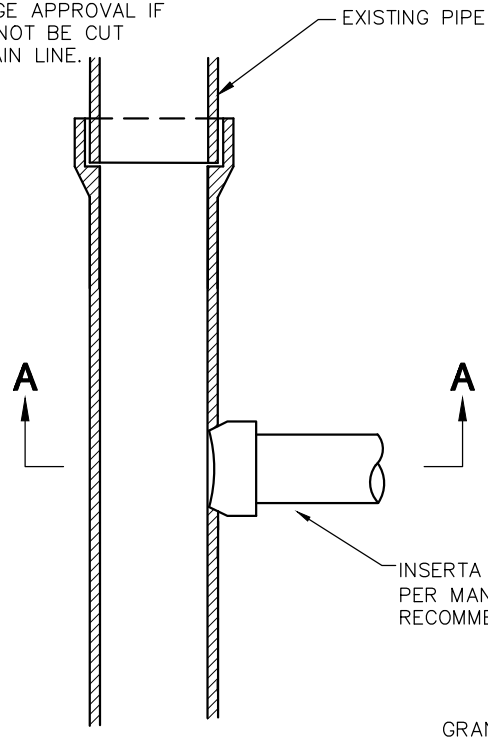
CONNECTION DETAIL

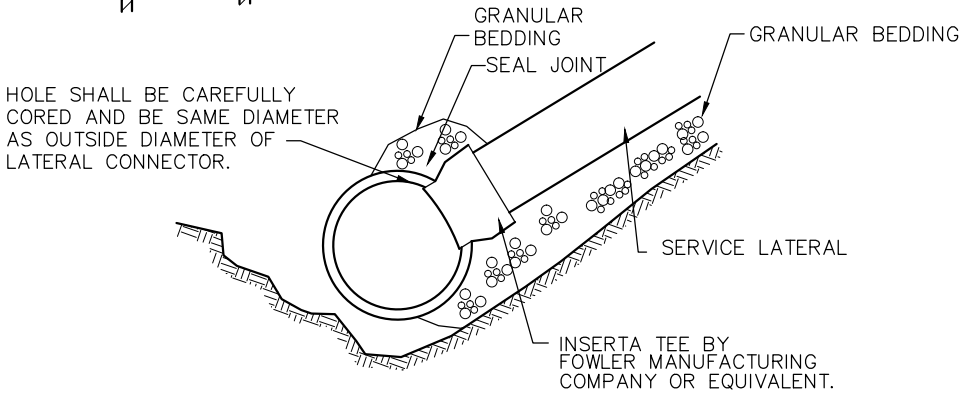
NOTES

A WYE MAY BE CUT IN OR SADDLE PLACED ONLY IF AN EXISTING LATERAL IS NOT PROVIDED.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	SANITARY SEWER CONNECTION DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-8

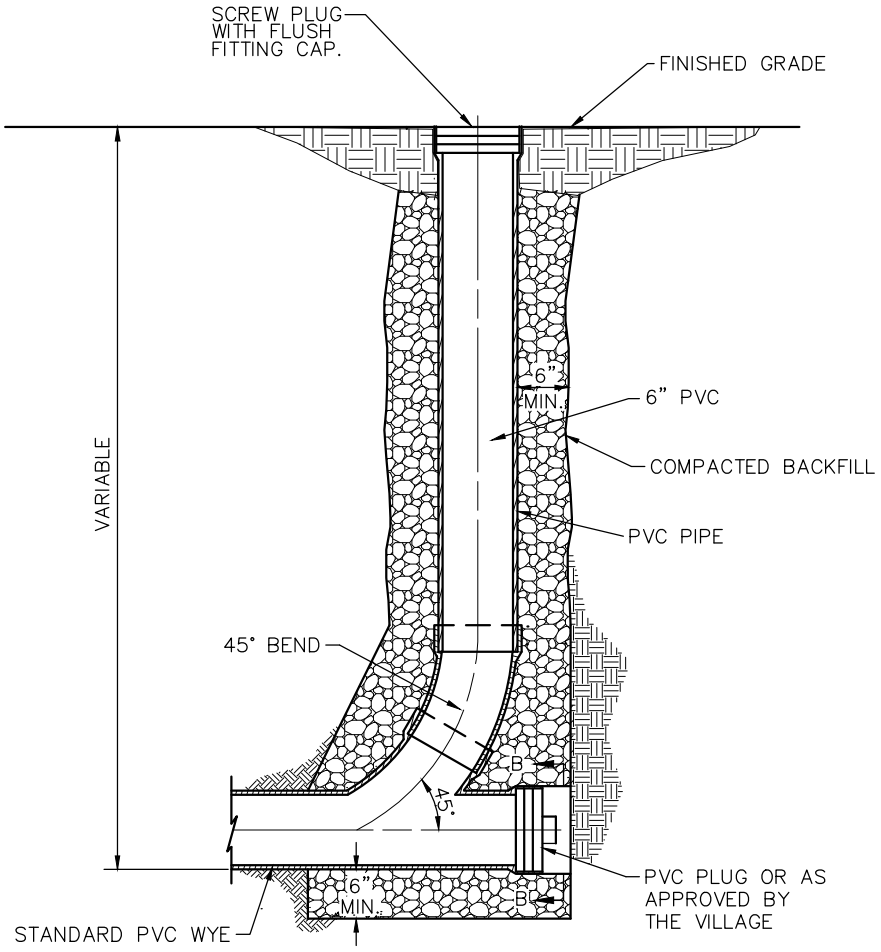
SADDLE TYPE CONNECTION MAY BE USED ONLY WITH PRIOR VILLAGE APPROVAL IF A TEE CAN NOT BE CUT INTO THE MAIN LINE.





SECTION A-A

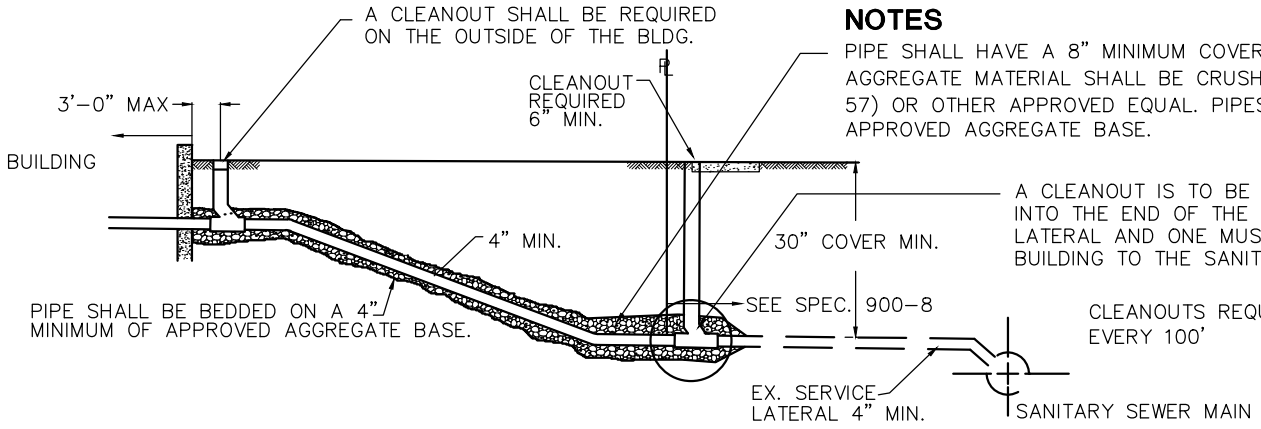
OTHER SADDLE TYPES THAT MAY BE APPROVED ON CASE-BY-CASE BASIS DEPENDING ON SITUATIONS ARE ROMAC STYLE "CB" SEWER SADDLE AND DFW/HPI FLEXIBLE SADDLE.



CLEANOUT DETAIL

AT SANITARY LATERALS ONLY

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	SANITARY SEWER CLEANOUT AND SADDLE DETAILS	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-9



NOTES

PIPE SHALL HAVE A 8" MINIMUM COVER OF APPROVED AGGREGATE MATERIAL. APPROVED AGGREGATE MATERIAL SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (67 OR 57) OR OTHER APPROVED EQUAL. PIPES SHALL BE BEDDED ON A 4" MINIMUM OF APPROVED AGGREGATE BASE.

A CLEANOUT IS TO BE INSTALLED AT THE PROPERTY LINE. THE WYE SHALL BE INSTALLED INTO THE END OF THE EXISTING SERVICE LATERAL. IF THERE IS NO EXISTING SERVICE LATERAL AND ONE MUST BE INSTALLED, THEN THE TEST SHALL EXTEND FROM THE BUILDING TO THE SANITARY SEWER MAIN, UNLESS OTHERWISE APPROVED.

NOTES

A. SEPTIC TANKS, WHEN ABANDONED, SHALL BE DEWATERED AND PROPERLY FILLED WITH GRANULAR MATERIAL WITH ALL TILES BEING PLUGGED WITH CONCRETE.
B. ROOF DOWNSPOUTS, EXTERIOR FOUNDATION DRAINS, AREAWAY DRAINS OR OTHER SURFACE RUNOFF OR GROUNDWATER SHALL NOT BE CONNECTED TO THE SANITARY SEWER MAIN. ALSO SEE MISC. NOTE B.
C. ANY INDIVIDUAL OR FIRM INSTALLING SEWER CONNECTIONS SHALL BE APPROVED BY THE VILLAGE.
D. BEFORE BEGINNING WORK, A SEWER TAP PERMIT MUST BE OBTAINED.
E. WHEN THE BUILDING CONNECTION MUST ENTER INTO A PAVED PORTION OF THE STREET OR ALLEY, A STREET OPENING PERMIT MUST BE OBTAINED BEFORE BEGINNING WORK.
F. WATER SERVICES SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" ABOVE THE CROWN (WHENEVER POSSIBLE) OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN.

PIPE

A. THE PIPE MATERIAL SHALL BE PVC SDR 35, SCHEDULE 40, UTILIZING PURPLE PRIMER, OR AN APPROVED EQUIVALENT.
B. PIPE SIZES FOR BUILDING CONNECTIONS SHALL BE 4" MINIMUM FOR SINGLE RESIDENCE AND 6" MINIMUM FOR ALL OTHER USES. THE LATERALS SHALL BE RUN TO WITHIN 3' OF THE OUTSIDE OF THE BUILDING.

INSPECTION

A. A TAP INSPECTION SHALL BE REQUIRED ON ALL NEW BUILDING CONNECTIONS AND ALSO ON THE REPLACEMENT OF EXISTING BUILDING CONNECTIONS.
B. WHEN THE BUILDING SEWER IS READY FOR INSPECTION, THE VILLAGE SHALL BE GIVEN 24 HOURS ADVANCE NOTICE. THE PIPE SHALL BE LEFT UNCOVERED UNTIL AN INSPECTION HAS BEEN MADE AND APPROVED.
C. ANY NEW BUILDING CONNECTION INSTALLED WITHOUT AN INSPECTION SHALL RESULT IN NO ISSUANCE OF A WATER METER FOR THE BUILDING. IF THIS OCCURS, THE ENTIRE LATERAL SHALL BE UNCOVERED SO THAT A PROPER INSPECTION CAN BE MADE.
D. NO TAP FEE IS REQUIRED IF AN OLD BUILDING SEWER IS TO BE REUSED. AN INSPECTION WILL BE REQUIRED. THE PUBLIC UTILITY DEPT. SHALL INSPECT THE ENTIRE BUILDING CONNECTION FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.
E. WHEN A SADDLE IS TO BE INSTALLED, THE INSPECTOR SHALL BE PRESENT WHILE THE SANITARY SEWER MAIN IS BEING CUT INTO. A SADDLE MAY BE USED WHERE A TEE OR WYE IS NOT PRESENT FOR LATERAL CONNECTION AND WHERE FLOW IS TO GREAT TO ALLOW THE MAIN TO BE CUT. ALWAYS COMPLETELY ENCASE CONNECTIONS AT ANY DEPTH 12' AND OVER AS APPROVED BY THE VILLAGE.

TESTING

A. THE OUTSIDE PLUMBER SHALL BE RESPONSIBLE FOR THE TESTING FROM THE CONNECTION TO THE EXISTING SERVICE LATERAL TO THE CLEANOUT.
B. ALL NEW BUILDING CONNECTIONS SHALL BE BY AIR WITH 4 PSI PRESSURE.
C. THE SEWER TEST SHALL BE FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.
D. WHEN A SUBSTANTIAL AMOUNT OF AN EXISTING LATERAL IS REPLACED, THE NEW PORTION OF THE LATERAL SHALL REQUIRE A TEST UNLESS OTHERWISE APPROVED.

MISC.

A. BASEMENT FLOOR DRAINS AND SUMP PUMPS SHALL BE CONNECTED TO THE STORM SEWER.

PIPE LAYING

A. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE VILLAGE BEFORE LEAVING THE WORK SITE FOR THE NIGHT.
B. THE JOINING OF PIPE WITH CONCRETE SHALL NOT BE ACCEPTED.
C. BEFORE MAKING A CONNECTION TO AN EXISTING SEWER OR SERVICE LATERAL, THE CONTRACTOR SHALL CHECK THE EXISTING PIPE BY UTILIZING A SEWER EEL, STRAP, OR SEWER ROD TO SEE THAT THE EXISTING PIPE IS CONNECTED TO THE SANITARY SEWER MAIN.
D. IN THE CASE WHERE A 90° CORNER IS REQUIRED IN THE BUILDING CONNECTION LINE, 2 45° BENDS SHALL BE USED IN LIEU OF A 90° BEND. A CLEANOUT WILL BE REQUIRED.
E. THE BUILDING CONNECTION LINE SHALL BE LAID IN AS STRAIGHT A LINE, FROM THE BUILDING TO THE EXISTING LATERAL, AS POSSIBLE.
F. ALL NEW CONSTRUCTION SHALL HAVE SANITARY LATERALS INSTALLED.
G. DRAWINGS SHOWING LATERAL LOCATIONS SHALL BE SUBMITTED WITH A BUILDING PERMIT.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# BUILDING CONNECTION DETAIL	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-10

LOW PRESSURE AIR TEST

A. AFTER BACKFILLING, THE AIR TEST SHALL BE CONDUCTED BETWEEN TWO CONSECUTIVE MANHOLES. ALL PIPE OUTLETS MUST BE PLUGGED IN THE SECTION BEING TESTED WITH SUITABLE TEST PLUGS. ONE OF THE PLUGS USED AT A MANHOLE MUST BE TAPPED AND EQUIPPED FOR AN AIR INLET CONNECTION FOR FILLING THE LINE FROM THE AIR COMPRESSOR. AIR SHALL BE SUPPLIED SLOWLY TO THE TEST SECTION UNTIL THE INTERNAL PRESSURE REACHES APPROXIMATELY 4 PSI. IF THE PIPE IS BELOW EXISTING GROUNDWATER LEVEL, THE INTERNAL PRESSURE SHALL BE INCREASED BY THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY BE OVER THE PIPE, BUT IN NO CASE SHOULD THE INTERNAL PRESSURE EVER EXCEED 5 PSI.

B. AT LEAST 2 MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE. WHEN THE PRESSURE HAS STABILIZED AND IS AT OR ABOVE 3.5 PSI, THE AIR SUPPLY SHALL BE DISCONNECTED AND TIMING SHALL BEGIN WITH A STOP WATCH. THE STOP WATCH SHALL BE ALLOWED TO RUN UNTIL THE PRESSURE HAS DROPPED 1.0 PSI. IF THE TIME SHOWN ON THE STOP WATCH IS GREATER THAN THE SPECIFIED MINIMUM TIME, THE SECTION SHALL BE CONSIDERED TO HAVE PASSED THE TEST. TIME MAY BE INTERPOLATED FROM THE FIGURES LISTED BELOW.

PIPE DIA. (IN.)	Time for Longer Length (sec)	Specified Minimum for Length (L) Shown (min:sec)						
		100 FT.	150 FT.	200 FT.	250 FT.	300 FT.	350 FT.	400 FT.
4	0.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	0.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42
8	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08
10	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49
12	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47
15	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36
18	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16
21	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48
24	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10

SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN·SEC)

*ALL TESTS SHALL BE WITNESSED BY A VILLAGE REPRESENTATIVE.

DEFLECTION TEST

A. DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS TO PERMIT STABILIZATION OF THE SOIL–PIPE SYSTEM.

B. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF DEFLECTION EXCEEDS 5%, REPLACEMENT OR CORRECTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE REQUIREMENTS OF APPROVING AGENCY.

C. THE RIGID BALL OR MANDREL USED FOR THE DEFLECTION TEST SHALL HAVE A DIAMETER NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER OR AVERAGE INSIDE DIAMETER OF THE PIPE DEPENDING ON WHICH IS MANUFACTURED. THE PIPE SHALL BE MEASURED IN COMPLIANCE WITH ASTM D–2122 STANDARD TEST METHOD OF DETERMINING DIMENSIONS OF THERMOPLASTIC PIPE AND FITTINGS. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.

SANITARY SEWER TV REQUIREMENTS

BEFORE THE VILLAGE ACCEPTS ANY SANITARY SEWER AND BEFORE THE FINAL PAYMENT, THE CONTRACTOR WILL SUPPLY THE VILLAGE WITH PASSING VHS TAPE OR CD AND WRITTEN LOG OF THE ENTIRE NEW SYSTEM. THIS TAPE MUST SHOW THE LOCATION OF ALL LATERALS, THEIR CLOCK POSITIONS AND DISTANCE FROM THE MANHOLE. THE TAPE MUST ALSO SHOW A SYSTEM CLEAR OF ANY BENDS, BELLIES, LEAKS, PIPE IMPERFECTIONS, DEBRIS OR ANY CONDITIONS NOT SPECIFICALLY SHOWN ON THE PLANS. THE CONTRACTOR MUST ALSO SUPPLY A WRITTEN COPY OF ALL LATERAL LOCATIONS. ANY SEWER JETTING OR OTHER CLEANING ASSOCIATED WITH A PASSING VHS TAPE IS THE RESPONSIBILITY OF THE CONTRACTOR.

THE VILLAGE SHALL REQUIRE THE USE OF A PAN AND TILT TYPE CAMERA TO REVIEW ALL LATERAL CONNECTIONS ON SEWER MAIN REPLACEMENT PROJECTS.

THE ABOVE PROCEDURES WILL BE AT THE CONTRACTOR'S EXPENSE.

THE VILLAGE RESERVES THE RIGHT TO A FINAL TELEVISING OF THE SEWER SYSTEM AT THE VILLAGE'S EXPENSE BEFORE THE PROJECT IS FINALIZED.

MANHOLE VACUUM TEST

ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED USING THE FOLLOWING PROCEDURES FROM ASTM C–1244.

A. PREPARATION OF THE MANHOLE

1. ALL LIFT HOLES SHALL BE PLUGGED.

2. ALL PIPES ENTERING THE MANHOLE SHALL BE TEMPORARILY PLUGGED TAKING CARE TO SECURELY BRACE THE PIPES AND PLUGS TO PREVENT THEM FROM BEING DRAWN INTO THE MANHOLE.

B. PROCEDURE

1. THE FIRST HEAD SHALL BE PLACED AT THE TOP OF THE MANHOLE IN THE CASTING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. A VACUUM OF 10" OF MERCURY (4.9 PSI) SHALL BE DRAWN ON THE MANHOLE, THE VALVE ON THE VACUUM LINE OF THE TEST HEAD CLOSED, AND THE VACUUM PUMP SHUT OFF. THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9" OF MERCURY (4.4 PSI).

3. THE MANHOLE SHALL PASS IF THE TIME FOR THE VACUUM READING TO DROP FROM 10" OF MERCURY (4.9 PSI) TO 9" OF MERCURY (4.4 PSI) MEETS OR EXCEEDS THE VALUES INDICATED ON THE TABLE.

4. IF THE MANHOLE FAILS THE INITIAL TEST, NECESSARY REPAIRS SHALL BE MADE BY AN APPROVED METHOD. THE MANHOLE SHALL THEN BE RETESTED UNTIL A SATISFACTORY TEST IS OBTAINED.

DEPTH (FT.)	DIAMETER, INCHES 48	60	72
	TIME, SECONDS		
8 OR LESS	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS

VILLAGE OF FORT RECOVERY

CHOICE ONE ENGINEERING

SANITARY SEWER TESTING NOTES

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NOTES

A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE VILLAGE UNLESS 2 WORKING DAY'S NOTICE OF COMMENCING WORK IS GIVEN TO THE VILLAGE.

B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE VILLAGE.

C. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMPS, AND OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.

D. WHEN A SEWER IS TO BE EXTENDED AT THE DOWNSTREAM MANHOLE OR FIRST MANHOLE IN THE NEW LINE, IT SHALL BE PLUGGED BEFORE CONSTRUCTION BEGINS. IF THE SEWER IS SMALLER OR EQUAL TO 12" DIAMETER, IT SHALL BE PLUGGED BY PLACING A POLY–ETHELYNE BAG APPROXIMATELY 6" INTO THE SEWER PIPE AND POURING CONCRETE INTO AND AROUND THE SEWER PIPE AS DIRECTED BY THE VILLAGE. SIZES LARGER THAN 12" WILL BE PLUGGED BY OTHER APPROVED METHODS. NO PLUGS SHALL BE REMOVED UNTIL CONSTRUCTION IS COMPLETED AND SOIL IS STABILIZED AND THEN ONLY AS DIRECTED BY THE VILLAGE.

E. CONSTRUCTION OF SANITARY SEWERS SHALL INCLUDE THE VILLAGE DYE TESTING AS DETERMINED BY THE VILLAGE OF ALL PIPES TO BE CONNECTED TO THE NEW SEWER PRIOR TO BACKFILLING.

F. WHEN A CASTING OR OTHER PUBLIC PROPERTY IS ABANDONED IT REMAINS VILLAGE PROPERTY.

G. NEW SEWERS MUST HAVE EPA PLAN APPROVAL.

EXCAVATION AND PIPE LAYING

A. THE LAYING OF THE PIPE SHALL COMMENCE AT THE LOWEST POINT, WITH THE BELL END LAID UPGRADE. THE PIPE SHALL BE CENTERED IN THE TRENCH AND ALL PIPE SHALL BE LAID WITH ENDS ABUTTING AND TRUE TO LINE AND GRADE.

B. LASER SHALL BE USED UNLESS OTHERWISE APPROVED.

UTILITY STAKING

A. LASER METHOD – OFFSET AND GRADE AT EACH MANHOLE. OFFSET AND GRADE 50' AND 100' OUT FROM EACH MANHOLE UNLESS OTHERWISE APPROVED.

TESTING

A. BEFORE ANY SEWER LINE IS PLACED INTO SERVICE OR ACCEPTED BY THE VILLAGE, IT SHALL BE SUBJECTED TO AND PASS LOW PRESSURE AIR TEST. EACH RUN BETWEEN MANHOLES, WITH ALL SERVICE LATERALS STUBBED INTO PROPERTY LINES, SHALL BE TESTED BEFORE BEING ACCEPTED. THE CONTRACTOR OR DEVELOPER SHALL FURNISH ALL EQUIPMENT AND MATERIAL NECESSARY TO CONDUCT THIS TEST. THE TRENCH SHALL BE COMPLETELY BACKFILLED BEFORE TESTING.

B. SEE SANITARY TESTING NOTES.

C. BEFORE FINAL ACCEPTANCE BY THE VILLAGE AND BEFORE ANY SERVICE LINE IS PUT INTO USE, ALL SANITARY SEWERS AND MANHOLES SHALL BE THOROUGHLY CLEANED OF ALL FOREIGN MATTER BY USE OF A SEWER–JET, OR EQUAL, TYPE OF EQUIPMENT.

HOUSE CONNECTIONS

A. NO SERVICE LINE SHALL BE ALLOWED TO CONNECT DIRECTLY INTO A MANHOLE, SUBJECT TO APPROVAL BY THE VILLAGE IN SPECIFIC CASES.

B. THE ENDS OF ALL SERVICE LINES OR TEES SHALL BE ACCURATELY LOCATED, MAPPED, AND GIVEN TO THE VILLAGE WITHIN 15 DAYS AFTER INSTALLATION.

C. BEFORE MAKING A CONNECTION TO AN EXISTING SEWER TAP OR SEWER LATERAL, THE CONTRACTOR SHALL CHECK THE EXISTING PIPE BY UTILIZING A SEWER EEL, STRAP, OR SEWER ROD TO SEE THAT THE EXISTING PIPE IS CONNECTED TO THE MAIN SEWER. IF NECESSARY, THE VILLAGE WILL PROVIDE, AT THE CONTRACTOR'S EXPENSE, A HYDRAULIC SEWER CLEANER WHICH WILL PRODUCE LARGE VOLUMES OF WATER TO CHECK THE LATERAL.

D. LATERALS FROM THE MAIN TO THE PROPERTY LINE SHALL BE 4" MINIMUM WITH CLEANOUT AT THE PROPERTY LINE.

E. A PERMIT TO OPEN INTO, ALTER, OR DISTURB ANY PUBLIC SEWER MUST BE OBTAINED.

F. ALL ABANDONED SEWER LATERALS SHALL BE CAPPED AT THE OWNER'S EXPENSE.

PIPE

A. ALL PIPE AND SPECIALS SHALL BE PVC SDR–35 UNLESS OTHERWISE APPROVED BY THE VILLAGE. MINIMUM DIAMETER OF PIPE SHALL BE 8".

B. DUCTILE IRON PIPE WILL BE USED IN STREAM CROSSINGS AND WHERE MAXIMUM SEPARATION CAN NOT BE MAINTAINED.

C. ALL JOINTS SHALL BE OF THE BELL AND SPIGOT TYPE, THE BELLS BEING FORMED INTEGRALLY WITH THE PIPE. THE BELL SHALL CONTAIN A FACTORY INSTALLED ELASTOMETRIC GASKET WHICH IS POSITIVELY RETAINED. NO SOLVENT CEMENT JOINTS WILL BE PERMITTED IN FIELD CONSTRUCTION EXCEPT AS SPECIFICALLY AUTHORIZED BY THE VILLAGE.

FLEXIBLE PIPES	MATERIAL SPECIFICATIONS	JOINT SPECIFICATIONS
POLYVINYL CHLORIDE	ASTM D–3034 (SDR–35) PIPE STIFFNESS = 46PSI	ELASTOMERIC GASKET ASTM D–3212
DUCTILE IRON	ANSI A–21.51 & AWWA C–151	ANSI A–21.11 & AWWA C–111

1. SDR = OUTSIDE DIAMETER DIVIDED BY WALL THICKNESS.

2. THE SPECIFICATIONS ABOVE SHALL BE THOSE MOST RECENTLY ADOPTED BY THE APPROPRIATE STANDARDS SETTING ORGANIZATIONS.

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CHOICE ONE ENGINEERING

MISCELLANEOUS SANITARY SEWER NOTES

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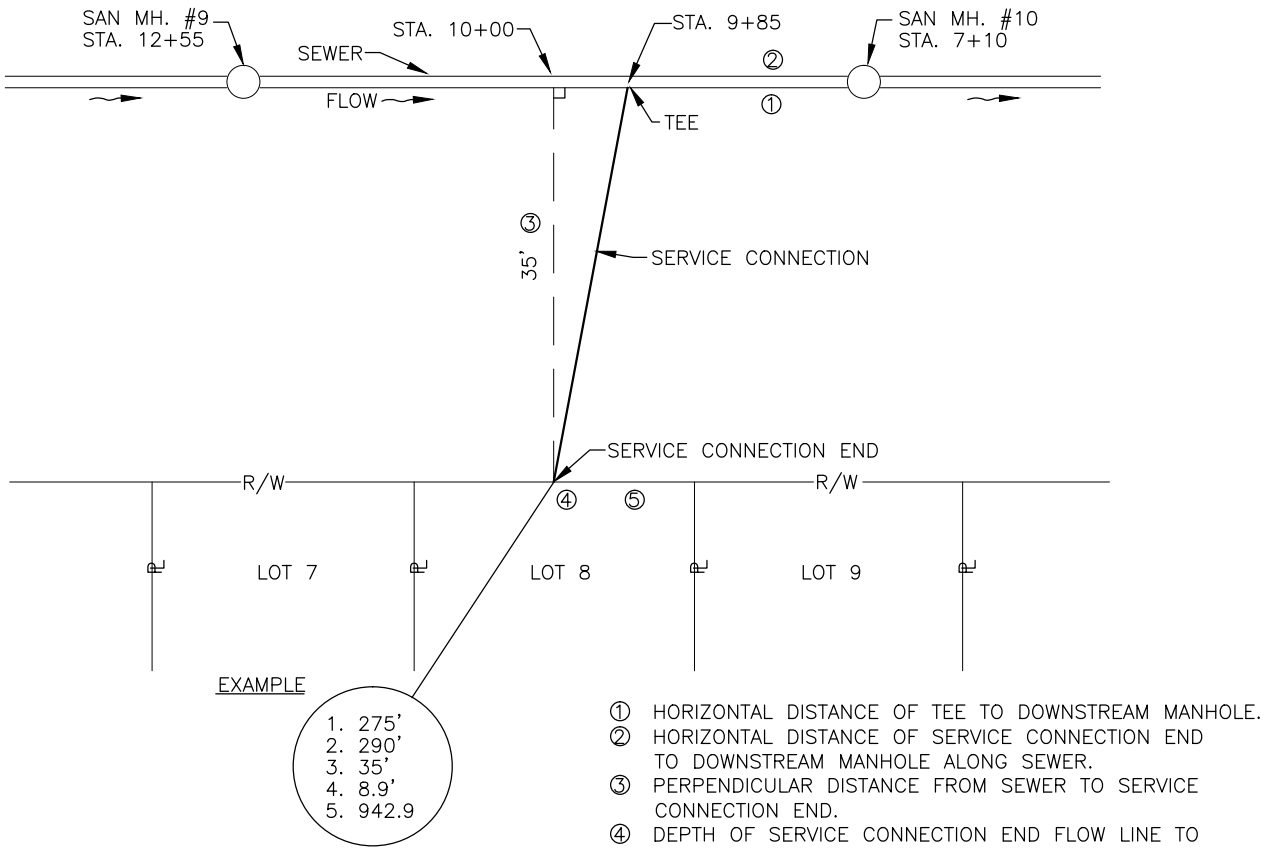
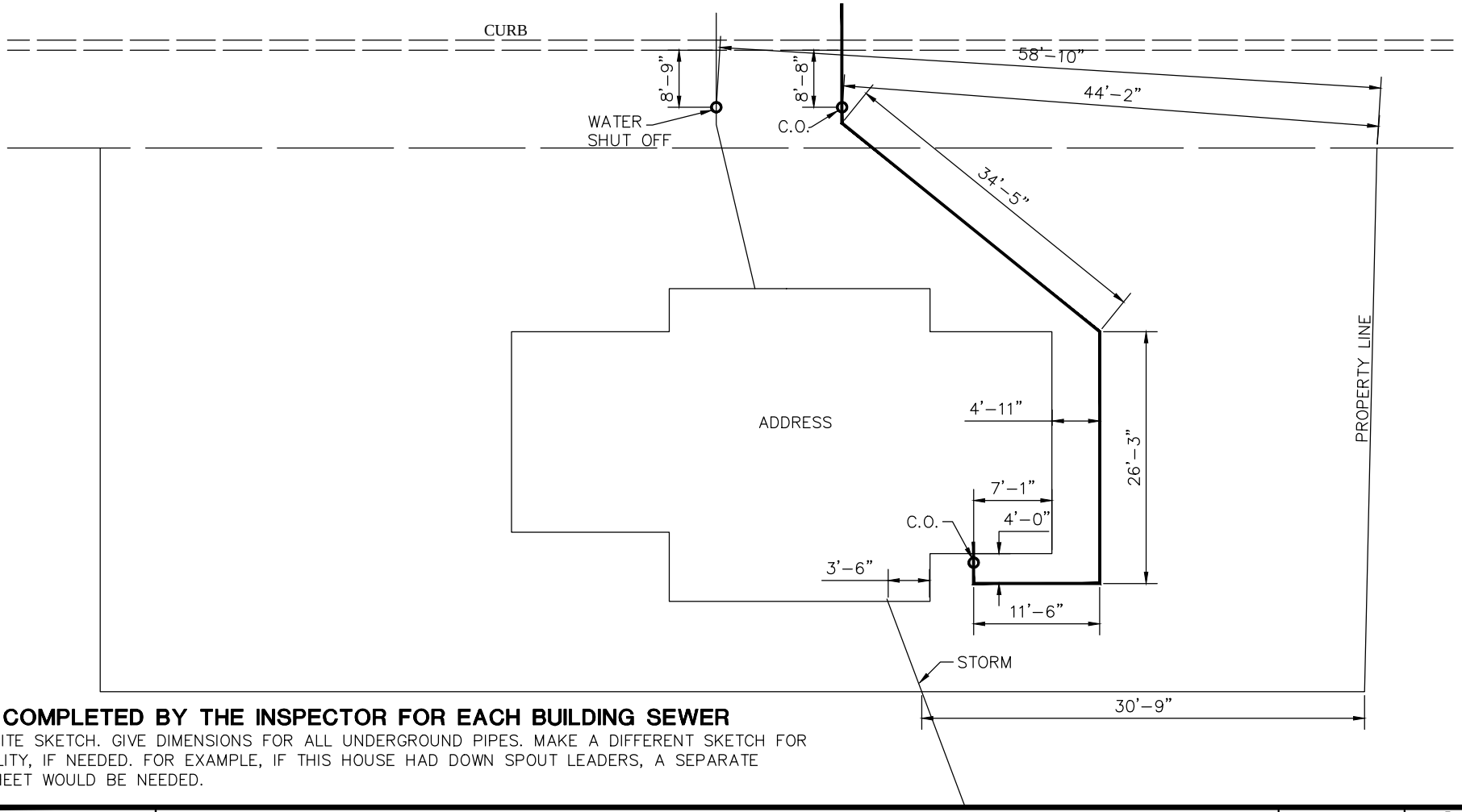


① HORIZONTAL DISTANCE OF TEE TO DOWNSTREAM MANHOLE.
② HORIZONTAL DISTANCE OF SERVICE CONNECTION END TO DOWNSTREAM MANHOLE ALONG SEWER.
③ PERPENDICULAR DISTANCE FROM SEWER TO SERVICE CONNECTION END.
④ DEPTH OF SERVICE CONNECTION END FLOW LINE TO ORIGINAL GROUND.
⑤ ELEVATION OF SERVICE CONNECTION END FLOW LINE.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	SERVICE CONNECTION LOCATION REFERENCE	REVISIONS:	DATE APPROVED: 04-21-2008 PAGE No. 900-13



TO BE COMPLETED BY THE INSPECTOR FOR EACH BUILDING SEWER

SAMPLE SITE SKETCH. GIVE DIMENSIONS FOR ALL UNDERGROUND PIPES. MAKE A DIFFERENT SKETCH FOR EACH UTILITY, IF NEEDED. FOR EXAMPLE, IF THIS HOUSE HAD DOWN SPOUT LEADERS, A SEPARATE STORM SHEET WOULD BE NEEDED.

VILLAGE OF FORT RECOVERY CHOICE ONE ENGINEERING	# SERVICE CONNECTION LOCATION REFERENCE (BUILDING IN PLACE)	REVISIONS:	DATE APPROVED: 04–21–2008 PAGE No. 900–14

SEWER TELEVISING STANDARDS

A. ALL SEWER TELEVISING CONTRACTORS SHALL BE CERTIFIED BY NASSCO FOR PIPELINE ASSESSMENT AND CERTIFICATION.

B. SANITARY TELEVISING WORK SHALL COMPLY WITH NASSCO STANDARDS.

C. ALL TELEVISING WORK SHALL BE PERFORMED IN COLOR WITH THE PROPER AMOUNT OF ILLUMINATION TO CLEARLY SHOW THE ENTIRE PIPE DIAMETER.

D. THE CAMERA SHALL BE OF THE PAN AND TILT TYPE.

E. THE TELEVISING CONTRACTOR SHALL USE A VHS TAPE TO RECORD THE ENTIRE TELEVISING PROCESS.

F. AT THE START OF THE TELEVISING PROCESS, THE TAPE SHALL RECORD THE FOLLOWING:

a. DATE/TIME
b. OPERATOR AND COMPANY NAME
c. SEWER PROJECT NAME
d. ADDRESS OR INTERSECTION OF MANHOLE WORKING ON
e. DIRECTION ON TELEVISING
f. COUNTER SETTING

G. THE TAPE MUST SHOW THE COUNTER RECORDING THROUGHOUT THE TELEVISING PROCESS.

H. THE TAPE SHALL SHOW THE CLOCK POSITION AND DISTANCE FROM THE MANHOLE FOR EACH LATERAL.

I. THE OPERATOR SHALL PAN EACH SEWER JOINT AND NOTE ANY DEFICIENCIES ON THE TAPE.

J. THE OPERATOR SHALL PAN AND TILT EACH LATERAL AND SHALL POSITION THE CAMERA TO LOOK UP EACH LATERAL CONNECTION.

K. AT NO TIME SHALL THE OPERATOR ALLOW THE CAMERA HEAD TO BE SUBMERGED.

L. THE OPERATOR SHALL NOTE ANY DEFICIENCIES ON THE MAIN SCREEN.

M. THE OPERATOR SHALL KEEP AN ACCURATE LOG CONSISTING OF THE FOLLOWING:

a. DIAGRAM OF SEWER FROM MANHOLE TO MANHOLE SHOWING DIRECTION OF FLOW.
b. SHALL NOTE ALL SEWER LATERALS WITH CLOCK POSITIONS AND DISTANCE FROM MANHOLES.
c. DEFICIENCIES IN THE SEWER PIPE INCLUDING BELLIES.
d. SPECIAL NOTES DESCRIBING AREAS OF CONCERN.
e. ANY DEFICIENCIES NOTED SHALL ACCOMPANY A DIGITAL PHOTO ATTACHED OR INCLUDED IN THE REPORT.

STANDARDS FOR BELLIES/DIPS IN SEWER MAINS

SANITARY SEWERS SHALL BE DECLARED AS "NOT APPROVED" IF BELLIES/DIPS IN THE MAIN LINE EXCEED THE FOLLOWING CRITERIA:

PIPE SIZES

SLOPE	8"	10"	12"	15"	18"	21"	24"	>27"
0.10%	2"	2.5"	3"	4"	4"	4"	4.5"	5"
0.12%	2"	2.5"	3"	4"	4"	4"	5"	5"
0.15%	2"	2.5"	3"	3.5"	3.5"	4"	4"	4"
0.22%	2"	2.5"	3"	3"	3.5"	3.5"	3.5"	4"
0.28%	2"	2"	2"	2"	2.5"	2.5"	3"	3"
0.40%	2"	2"	2"	2"	2"	2.5"	2.5"	2.5"
0.60%	1"	1"	1"	1"	1"	1"	1"	1"
1.00%	0"	0"	0"	0"	0"	0"	0"	0"

MAXIMUM ALLOWABLE BELLIES IN PIPE (INCHES)

SEWER TELEVISING PROCEDURES FOR NEW SEWER CONSTRUCTION

A. THE SANITARY SEWER SHALL BE COMPLETELY CLEAN AND FREE OF DEBRIS USING A HIGH PRESSURE JET RODDER CAPABLE OF SCOURING THE PIPE WALLS.

B. ALL DEBRIS SHALL BE VACUUMED OUT OF THE SEWER MAIN.

C. ONCE CLEANING HAS BEEN COMPLETED, THE CONTRACTOR SHALL RUN CLEAR WATER IN THE NEW SEWER MAIN TO FILL ANY POTENTIAL BELLIES IN THE LINE. THE CONTRACTOR SHALL CALCULATE THE VOLUME GALLON CAPACITY OF THE SEWER MAIN AND SHALL USE THAT MUCH WATER TO FILL POTENTIAL BELLIES/DIPS.

D. THE CONTRACTOR MAY RENT A WATER HYDRANT METER FROM THE VILLAGE TO PERFORM THIS TASK.

E. THE CONTRACTOR SHALL MAKE SURE THAT THERE IS NO FLOW EMANATING UPSTREAM. IF SO, THE CONTRACTOR SHALL STOP THIS FLOW DURING THE TELEVISING.

F. THE CONTRACTOR SHALL TELEVISE THE SEWER FOLLOWING THE TELEVISING STANDARDS.

SEWER TELEVISING PROCEDURES FOR SEWER RECONSTRUCTION PROJECTS

A. BEFORE COMMENCEMENT OF THE CLEANING PROCESS, THE TELEVISING CONTRACTOR SHALL NOTIFY ADJACENT AND AFFECTED PROPERTY OWNERS BY GOING DOOR-TO-DOOR AND NOTIFYING THEM OF THE POSSIBILITY OF SEWER BACKUP DURING THE CLEANING PROCESS.

B. THE SANITARY SEWER SHALL BE COMPLETELY CLEANED AND FREE OF DEBRIS USING A HIGH PRESSURE JET RODDER.

C. ALL DEBRIS SHALL BE VACUUMED OUT OF THE SEWER MAIN.

D. ONCE CLEANING HAS BEEN COMPLETED, THE CONTRACTOR SHALL BAG THE UPSTREAM MANHOLE AND PUMP THE SEWAGE FLOW DOWNSTREAM AND SHALL MAINTAIN PUMPING DURING THE TELEVISING PROCESS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWER FLOODING AS A RESULT OF THEIR ACTIVITIES.

E. AFTER THE PUMP BYPASS HAS BEEN ESTABLISHED, THE CONTRACTOR SHALL RUN CLEAR WATER IN THE RECONSTRUCTED SEWER MAIN TO FILL ANY POTENTIAL BELLIES IN THE LINE. THE CONTRACTOR SHALL CALCULATE THE VOLUME GALLON CAPACITY OF THE SEWER MAIN AND SHALL USE THAT MUCH WATER TO FILL POTENTIAL BELLIES/DIPS.

F. THE CONTRACTOR MAY RENT A WATER HYDRANT METER FROM THE VILLAGE TO PERFORM THIS TASK.

G. THE CONTRACTOR SHALL TELEVISE THE SEWER FOLLOWING THE TELEVISING STANDARDS.

PASSING SANITARY SEWERS

A. THE VILLAGE WILL NOT PASS OR ACCEPT THE SANITARY SEWER FOR FINAL PAYMENT WITHOUT HAVING A PASSING VHS TAPE AND LOG OF THE SANITARY SEWER TELEVISING FOLLOWING THE STANDARDS PREVIOUSLY DESCRIBED.

B. ALL TELEVISING WORK SHALL BE AT THE CONTRACTOR'S EXPENSE.

C. THE VILLAGE RESERVES THE RIGHT TO A FINAL RE-TELEVISING AT THE CONTRACTOR'S EXPENSE IF DEFICIENCIES ARE NOTED ON THE INITIAL TELEVISING WORK AND AFTER THE CONTRACTOR MAKES THE NECESSARY REPAIRS.

VILLAGE OF FORT RECOVERY

DESIGN CRITERIA

Prepared and Presented By:

CHOICE ONE ENGINEERING

440 E. Hoewisher Road
Sidney, OH 45365
(937) 497-0200
(937) 497-0300 Fax

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
General Provisions

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

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

	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-feet 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-feet 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

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

300.00 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

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

Predominant Land Use	
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
Surface Characteristics	
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)

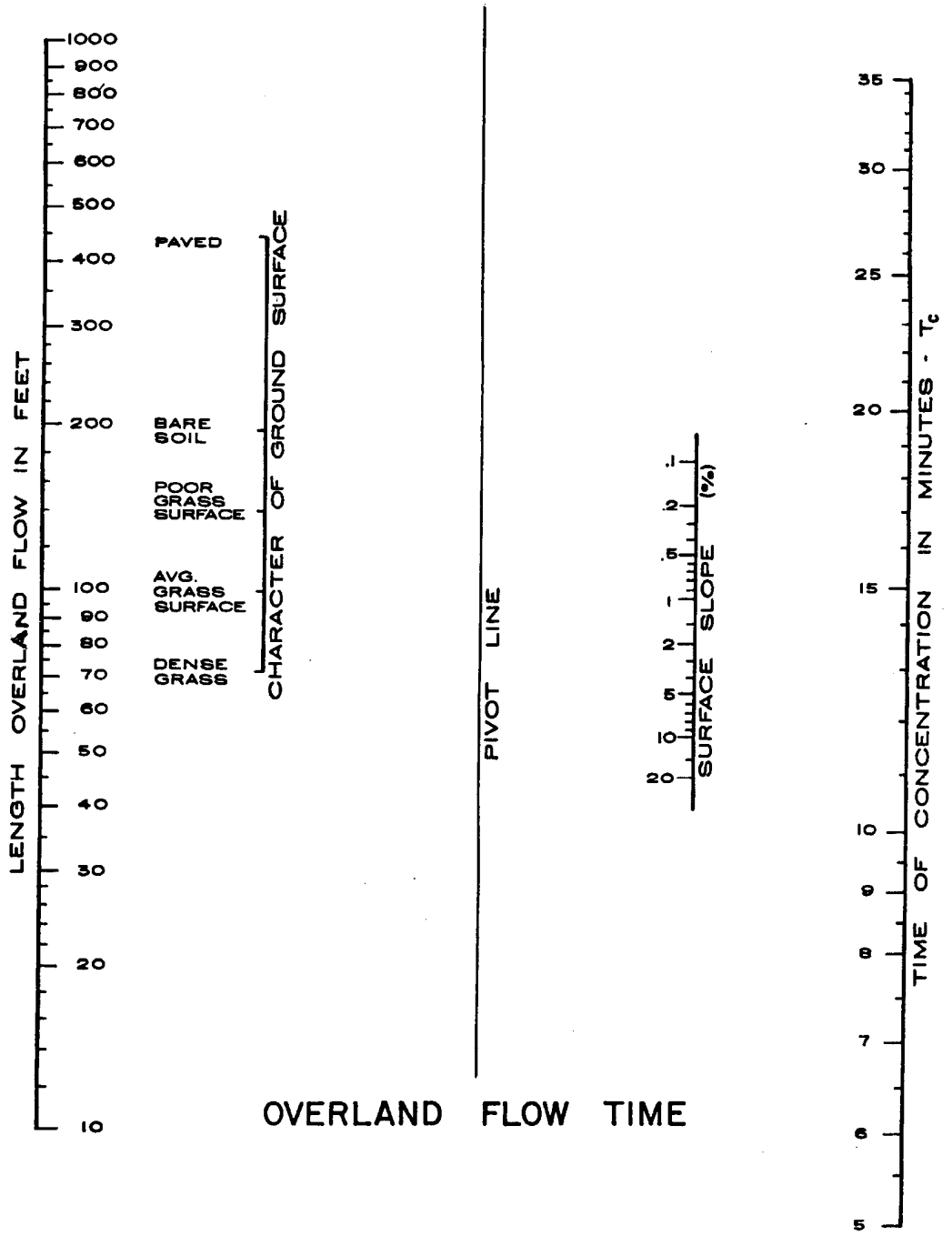


Figure 6.2
Time of Concentration Worksheet, Derived from TR-55
(to be utilized when overland flow is greater than 1,000 feet)

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≤ 300 ft for unpaved, L≤ 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		+		=	
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		+		=	
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		+		=	
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) ..... hr					

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.

Figure 6.4

COMPUTATION FOR STORM SEWER DESIGN

MANNING FORMULA: n _____ Project: _____ Date _____ Sheet No. _____

Manhole No.	Begin/ End Sta.	Δ "A"	"C"	Δ "CA"	Sum "CA"	Δ "T"	Sum "T"	"I" ___YR	"I" ___YR	"Q" Disch ____ YR	"Q" Disch ____ YR	"L" FT.	Slope Ft./Ft.	Pipe Dia. In.	"V" FPS	CAP CFS	Flow Line Elev. Inlet/ Outlet

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

CHANNEL MATERIAL	n
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 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.

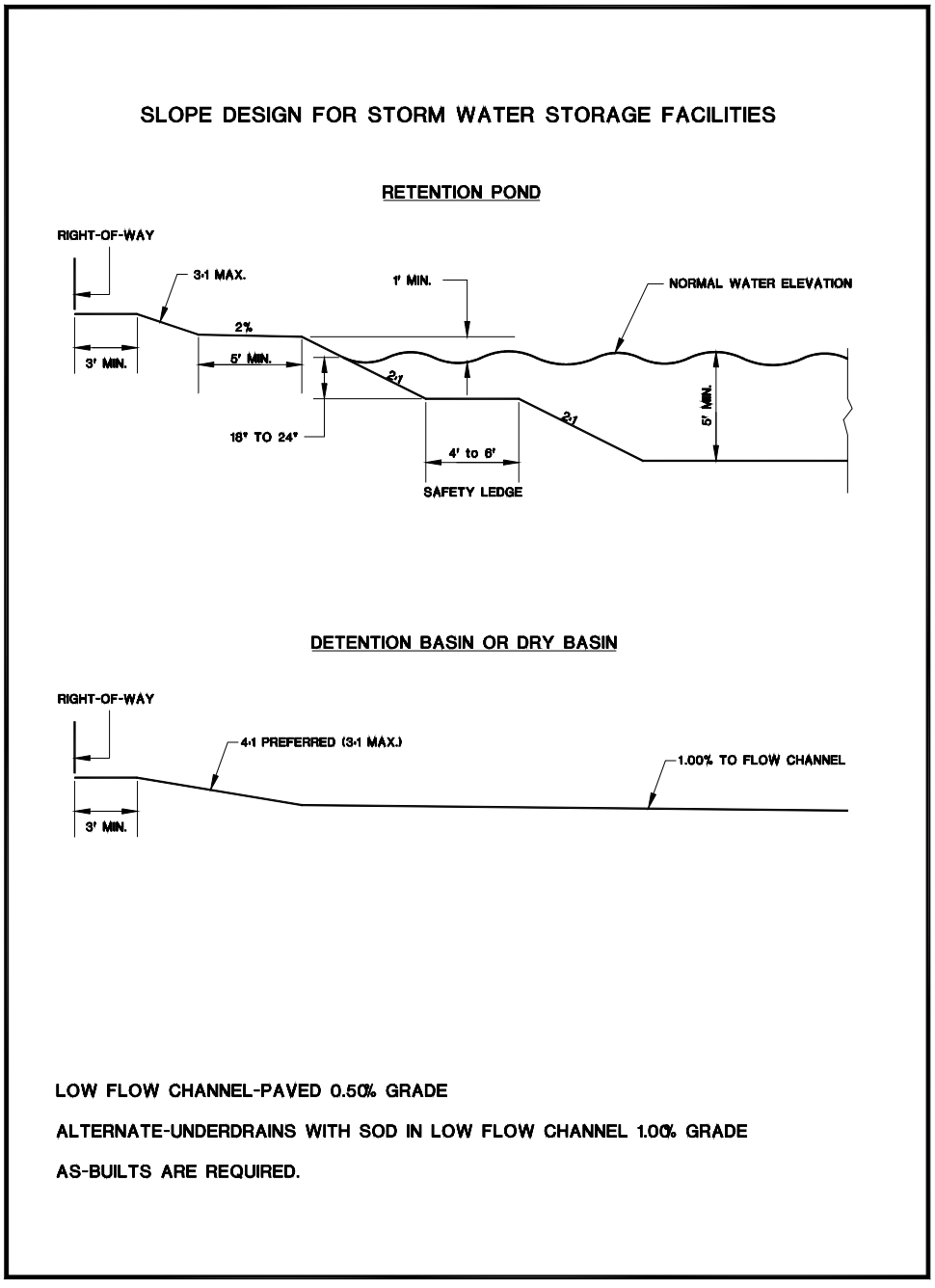
2. The Village may inspect all private detention basins and if problems exist, report these to the owner. The owner shall be given a reasonable amount of time to correct the problem, weather permitting.

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


SLOPE DESIGN FOR STORM WATER STORAGE FACILITIES
RETENTION POND
RIGHT-OF-WAY
3:1 MAX.
1' MIN.
NORMAL WATER ELEVATION
2%
3' MIN.
5' MIN.
2:1
2:1
5' MIN.
18" TO 24"
4' to 6'
SAFETY LEDGE
DETENTION BASIN OR DRY BASIN
RIGHT-OF-WAY
4:1 PREFERRED (3:1 MAX.)
1.00% TO FLOW CHANNEL
3' MIN.
LOW FLOW CHANNEL-PAVED 0.50% GRADE
ALTERNATE-UNDERDRAINS WITH SOD IN LOW FLOW CHANNEL 1.00% GRADE
AS-BUILTS ARE REQUIRED.

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.

800.00
Water Distribution

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

No. of Families	Service Size (inches)	Meter Size (inches)
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

Maximum Flow Demand (GPM)	Meter Size (inches)
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.

900.00
Sanitary Sewers

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)

WASTEWATER SOURCE	GALLONS PER DAY	LITERS PER DAY
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)	0.2 per	8 per
-per area of floor space	sq. ft.	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 <u>Minimum Velocity</u>

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

Sewer Size	Minimum Slope in Feet Per 100 Feet
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 maybe 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, course 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.