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# **Village of Pleasant Hill, Ohio**

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## ***SUBDIVISION REGULATIONS CONSTRUCTION STANDARDS AND DRAWINGS DESIGN CRITERIA***

**FANNING  HOWEY**

**CIVIL ENGINEERING DIVISION**

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## Subdivision Regulations

## Subdivision Regulations

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**1111.00**  
**General Provisions**

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## **1111.00 GENERAL PROVISIONS**

### **1111.01 Title**

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

### **1111.02 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 Comprehensive 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 Ordinance.
- 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 sub-dividers.
- G.** Protection against floodplain encroachment and possible future flood damage.
- H.** To protect and provide for the public health, safety and general welfare of the citizens.
- I.** To guide public and private policy and action in order to provide adequate and efficient transportation, water, sewerage and other public requirements and facilities.

### **1111.03 Planning Commission**

**A. Establishment** - There is hereby established a Planning Commission for the Village as per the Village Charter.

### **1111.04 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.

### **1111.05 Relation to Other Laws**

The provisions of these regulations shall supplement any and all laws of the State of Ohio, ordinances of the Village, 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 OEPA the most restrictive or that imposing the higher standards shall govern.

**1111.06 Interpretation and Separability**

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.

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 reminder of these Regulations even without any such part; provision or application.

**1111.07 Amendment**

These Regulations may be amended, after meeting requirements as specified in the Ohio administrative code, Village Charter and Ordinances of Council.



## **1112.00 Definitions**

|                                 |                               |
|---------------------------------|-------------------------------|
| Alley                           | Parcel                        |
| Board of Public Affairs (B.P.A) | Pedestrian Walkway            |
| Block                           | Performance Surety            |
| Building Line                   | Planning Commission           |
| Community Facilities            | Plat                          |
| Comprehensive Development Plan  | Protective Covenant           |
| Construction Drawings           | Public Reservation            |
| Corner Lot                      | Public Utility                |
| Cul-de-sac                      | Re-plats/Vacation Plats       |
| Dead-end Street                 | Right-of-Way                  |
| Dedication                      | Setback Line                  |
| Developer                       | Sketch Plan                   |
| Development                     | Street                        |
| Development Area                | Sub-divider                   |
| Easement                        | Subdivision                   |
| Engineer                        | Surveyor                      |
| Final Plat                      | Thoroughfares Street, or Road |
| Improvements                    | Variance                      |
| Inspect, Inspection             | Vicinity Map                  |
| Lot                             | Village                       |
| Lot Area                        | Zoning Officer                |
| Lot Line                        | Zoning Ordinance              |
| Maintenance Surety              |                               |
| Minor Subdivision               |                               |
| Monuments                       |                               |

## **1112.00 DEFINITIONS**

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)**

**BOARD OF PUBLIC AFFAIRS (B.P.A.)** – the village's governing body for all utilities within the village which include public water, sanitary sewer and storm sewer.

**BLOCK** - A unit of property entirely surrounded by public highways and streets, railroad rights-of-way, waterways, or other barriers, or combination thereof.

### **Building LINE (See Setback Line)**

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

**COMPREHENSIVE 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.

**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 Design Criteria and Construction Standards and Drawings.

### **CORNER LOT (See Lot)**

### **CUL-DE-SAC (See Thoroughfare)**

**DEAD-END STREET (See Thoroughfare)**

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

**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 Administrative Code.

**FINAL PLAT (See Plat)**

**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 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.

**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.

**LOT LINE**

- A. Front - A street right-of-way line forming the boundary of a lot.
- B. Rear -The lot line that is most distant from, and is, or is most parallel with, the front lot line if a rear lot line is less than 15 feet long, or if the lot comes to a point at the rear, the rear lot line shall be a line at least 15 feet, lying wholly within the lot, parallel to the front lot line.
- C. Side - A lot line which is neither a front lot line nor a rear lot line.

**MAINTENANCE SURETY** - A surety by a sub-divider or developer with the Village for the amount of ten percent (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.

**PARCEL** - A piece of land that cannot 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** - An agreement by a sub-divider 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 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. Protective covenants are the responsibility of the subdivision as per recorded plat.

**PUBLIC RESERVATION** - 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, electric, Village, 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.

**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.

**SKETCH PLAN** - An informal plan or sketch showing the existing features of a site and its surroundings and the general layout of a proposed sub-division that can be presented to the Planning Commission for informal discussions.

**STREET (See Thoroughfare)**

**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 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 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 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 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 Administrative Code.

**THOROUGHFARE, STREET, OR ROAD** - The full width between property lines bounding every public way of whatever nature, with a part thereof to be used for vehicular traffic and designated as follows:

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 volume of traffic, usually on a continuous route.

C. Collector Street - 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.

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.

**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.

**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 Village in order to better locate and orient the area in question .

**VILLAGE** – The word Village pertains to the Village of Pleasant Hill as it is now and in the future. The word Village implies the Municipality of Pleasant Hill.

**ZONING OFFICER** - The Planning Commission, Town Council, or Village Engineer as appointed by the Town Council designated to review plans and construction documents for village zoning compliance.

**ZONING ORDINANCE** - The Zoning Ordinance for the Village which regulates the use of land by districts or zones and as the same may be amended or supplemented.

**1113.00**  
**Minor Subdivision**

|         |  |
|---------|--|
| 1113.01 | Minor Subdivision Conditions                 |
| 1113.02 | Submission for Approval of Minor Subdivision |
| 1113.03 | Minor Subdivision Plat Contents              |
| 1113.04 | Supplementary Information                    |
| 1113.05 | Approval of a Minor Subdivision              |

## **SECTION 1113.00 MINOR SUBDIVISION**

### **1113.01 Minor Subdivision Conditions**

Subdivision proposals may, at the discretion of the Zoning Officer, be processed as a "minor subdivision" when the following conditions exist:

- 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 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.

### **1113.02 Submission for Approval of a Minor Subdivision**

The sub-divider shall prepare and submit three copies of the minor subdivision plat to the Village Manager. 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 Section 1124.04 Schedule of Fees) and all plats are provided to the Zoning Officer.

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 the Village platting regulations.

### **1113.03 Minor Subdivision Plat Contents**

The minor subdivision plat shall contain the following information:

- A.** Name of the sub-divider;
- 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.** Abutting streets.
- E.** Existing buildings, septic facilities, and wells, if applicable.
- F.** 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 and its owner and size, a north arrow, and the professional surveyor's signature and seal.



**G.** 100-year floodplain elevations and delineation's.

**H.** Approval signature line with date for Planning Commission and County Engineer.

**1113.04 Supplementary Information**

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

**A.** Lot grading and drainage plan, illustrating a plan for the handling of surface and subsurface drainage, showing proposed finished grade elevations, the type, size, location and outlet of all existing and proposed drainage systems, swales, easements, water and sanitary sewer services, and the proposed ground cover.

**B.** Spot elevations.

**C.** Other information as deemed necessary by the Planning Commission or Zoning Officer in order to create building sites and promote the public health, safety and welfare.

**1113.05 Approval of a Minor Subdivision**

The Planning Commission or Zoning Officer shall approve or disapprove the minor subdivision within 30 days after it has been officially and properly submitted. If approval is granted under these conditions it shall be signed and dated as approved. Must be filed with the Miami County Tax Map Office or County Recorder.

If the proposed minor subdivision is disapproved, the sub-divider shall be notified in writing stating the grounds for disapproval.

**1115.00**  
**Preliminary Plat**

|         |   |
|---------|---|
| 1115.01 | Intent                                      |
| 1115.02 | Submission for Preliminary Plat<br>Approval |
| 1115.03 | Preliminary Plat Form                       |
| 1115.04 | Preliminary Plat Contents                   |
| 1115.05 | Approval of Preliminary Plat                |
| 1115.06 | Preliminary Plat Approval Period            |

## **SECTION 1115.00 PRELIMINARY PLAT (Major Subdivision)**

### **1115.01 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 of the state. Approval of the preliminary plat, in effect, provides a "concept approval" of the subdivision proposal.

### **1115.02 Submission for Preliminary Plat Approval**

The sub-divider shall prepare and submit seven (7) copies of the preliminary plat of the proposed subdivision and the construction plans along with a completed preliminary plat checklist with remarks. These copies will be distributed to the Planning Commission, Town council and Board of Public Affairs.

A. The preliminary plat shall be considered officially filed on the day it is received and properly noted and shall be so dated.

B. The preliminary plat shall not be considered properly submitted until all applicable fees are paid by the developer (see Section 1124.04 Schedule of Fees).

C. All plats and plans are provided to the Planning Commission and /or Zoning Officer.

D. The sub-divider shall provide a copy of the preliminary plat to the local utility companies.

### **1115.03 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 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'.

### **1115.04 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 and date line for the Planning Commission Chairman.
10. Stamp and signature of the Professional Surveyor.

**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. Topographic map of such proposed subdivision shall be submitted with the no return preliminary plat, showing 1-5 foot contour intervals for all land within and 50 feet adjacent to the subject site.
6. Current zoning classification of the tract and adjoining properties.
7. The vicinity map shown on the preliminary plat.

**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 and/or square feet).
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 proposed 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, that will be incorporated and recorded with the final plat.
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.
4. All plans must be certified by a registered Professional Engineer.

#### **1115.05 Approval of Preliminary Plat**

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

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 Comprehensive 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 Zoning Officer 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 Manager and/or 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 30 days after filing unless such time is extended by agreement with the sub-divider. When a preliminary plat has been approved by the Planning Commission, the chairman shall sign and date all copies and return one to the sub-divider.

Approval of the preliminary plat is revocable, and shall not authorize the subdivider to record the plat in the office of the Recorder nor to proceed with the construction of the improvements, unless approval is granted by the Planning Commission and Village Council for a specific phase of the project.

#### **1115.06 Preliminary Plat Approval Period**

The approval of the preliminary plat shall be effective for a maximum period of 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. The terms under which the approval is granted will not be affected by changes to these Regulations during the maximum period of 12 months.

## SECTION 1115.07 PRELIMINARY PLAT CHECKLIST

SUBDIVISION \_\_\_\_\_

DATE \_\_\_\_\_

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

| ü |    | DESCRIPTION  |
|---|----|--|
|   | 1  | Fees Paid  |
|   | 2  | 7 copies of plat (1"=100' or larger)   |
|   | 3  | Name of Subdivision  |
|   | 4  | Location of property in reference to adjoining property  |
|   | 5  | Location by township, section and range  |
|   | 6  | Names of adjoining property owners or developers   |
|   | 7  | Name of adjoining subdivision  |
|   | 8  | Location and names of adjoining streets  |
|   | 9  | Location (if applicable) of corporation line   |
|   | 10 | Location and dimensions of all boundary lines (feet and decimal)   |
|   | 11 | Vicinity map   |
|   | 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, bridges, etc.   |
|   | 15 | Location, 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 of reservation |
|   | 17 | Date of plat   |
|   | 18 | Scale of plat  |
|   | 19 | North arrow  |
|   | 20 | Date from which the location, bearing, and length of all lines can be determined and reproduced on the ground  |

## SECTION 1115.07 PRELIMINARY PLAT CHECKLIST

SUBDIVISION \_\_\_\_\_

DATE \_\_\_\_\_

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

| Ü |    | DESCRIPTION   |
|---|----|---|
|   | 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 dimensioning of lots including lot areas (square feet)  |
|   | 25 | Front setback lines   |
|   | 26 | Preliminary drainage plan including proposed storm water detention location   |
|   | 27 | General location and size of all water, sanitary, and storm water lines   |
|   | 28 | Topography at the same scale with contour interval of 1'.   |
|   | 29 | Other specifications and references required by the local government.<br>Construction standards and specification including a site grading plan for the entire subdivision. |
|   | 30 | Title of property, name and address of owner and signature of surveyor  |
|   | 31 | Date including revision dates   |
|   | 32 | Notation of approval, signature line for Planning Commission Chairman   |
|   | 33 | Name and address of sub-divider and/or developer  |
|   | 34 | Copy of protective covenants  |
|   | 35 | Indication of any developmental phasing or staged development timing  |
|   | 36 | Meets zoning requirements (i.e. minimum frontage, setbacks, area, etc.)   |
|   | 37 | Conformance with major street plan  |
|   | 38 | No flood hazards  |
|   | 39 | Right-of-way widths meet minimum criteria   |
|   | 40 | Avoidance with multiple intersections   |
|   | 41 | Length of blocks meet minimum criteria  |
|   | 42 | Submit plans to the utility companies   |
|   | 43 | Location and size of all proposed and existing utilities, water main, telephone, electric, gas, street lighting, etc. within or adjacent to the subject tract.              |



[illegible]

[illegible]

**1116.00**  
**Final Plat (Major Subdivision)**

|         |  |
|---------|--|
| 1116.01 | Final Plat Required                      |
| 1116.02 | Submission for Approval of<br>Final Plat |
| 1116.03 | Final Plat Form                          |
| 1116.04 | Final Plat Contents                      |
| 1116.05 | Supplementary Information                |
| 1116.06 | Approval of Final Plat                   |
| 1116.07 | Recording of Final Plat                  |
| 1116.08 | Final Plat Checklist                     |

## **SECTION 1116.00 FINAL PLAT (Major Subdivision)**

### **1116.01 Final Plat Required**

The Sub-divider, 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 sub-divider 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.

### **1116.02 Submission for Approval of Final Plat**

The Subdivider shall prepare and submit the following:

- A.** Seven copies of the final plat of the proposed subdivision.
- B.** Three copies of construction drawings related to the improvements to be constructed in the proposed subdivision.
- C.** Two 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.)

All final plats, construction drawings and supporting documents shall meet all Design Criteria and Construction Standards and Drawings established by the Village, the B.P.A., the Zoning Code of the Village of Pleasant Hill, 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 1124.04) and until all plans, supporting documents, and materials are provided to the Village Manager.

### **1116.03 Final Plat Form**

The final plat shall be clearly legibly drawn on reproducible mylar. The size of the plat shall be 18" x 24" or 24" x 36". The plat of a subdivision containing 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 circled, underlined or highlighted in some way.

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 Design Criteria. The plans shall consist of the required improvements stated in these Regulations.

#### **1116.04 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 Village), 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 sub-dividers, 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 set back lines. Street names shall be approved by the Planning Commission.

**F.** Radii, internal angles, points of curvature, tangent bearings, lengths of arcs, 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 all private and public utility easements shall be illustrated on the plat.

**H.** All lots accurately dimensioned in feet and hundredths with lot numbers, acreage, and square footage. 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. Re-platted 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 or referenced on the final plat.

**L.** Certification shall contain the following:

1. The total acres being subdivided;
2. Current ownership;
3. Deed reference; and
4. Zoning

**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, shall be indicated by the following statement on the plat tracing: "Easements as 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.

Any section lines, corporation limits, township and county lines shall be accurately documented and located on the plat and their names lettered thereon.

**O.** 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.

**P.** Approval signature and date lines shall be provided for President of Council, Mayor, Clerk of Council, Planning Commission Chairman and County Engineer.

#### **1116.05 Supplementary Information**

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

**A.** If a zoning change is involved, certification from the Village Manager 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 bond or other surety has been furnished assuring installation and initial maintenance of the required improvements.

**C.** In flood prone areas the sub-divider 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 used 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 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 Mayor (or Council President) signature shall be provided on approved construction plans to verify compliance with the applicable specifications and the requirements of the Regulations.

#### **1116.06 Approval of Final Plat**

The Planning Commission shall approve or disapprove the final plat within 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 sub-divider. If disapproved, the sub-divider shall make the necessary corrections and resubmit the final plat within 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 sub-divider.

#### **1116.07 Recording of the 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 sub-divider 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 60 days after the date of final approval. The sub-divider shall furnish the Village with the original recorded plat, when returned by the County Recorder.

**1116.08 FINAL PLAT CHECKLIST**

SUBDIVISION \_\_\_\_\_

DATE \_\_\_\_\_

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

| ü |    | DESCRIPTION   | REMARKS |
|---|----|---|---------|
|   | 1  | Fees Paid   |         |
|   | 2  | 7 copies of plat (1"=100' or larger)  |         |
|   | 3  | Three copies of construction drawings which include profiles showing existing and proposed elevations along centerlines of all streets, stationing, location, size, and invert elevations of all existing and proposed sanitary sewers and stormwater sewers and structures |         |
|   | 4  | Two copies of engineers estimate  |         |
|   | 5  | One copy of storm sewer calculations, storm detention calculations, 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.   |         |
|   | 13 | Name and address of the sub-dividers  |         |
|   | 14 | Name and address of professional engineer   |         |
|   | 15 | Name and address of owner and developer   |         |
|   | 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.  |         |



**1116.08 FINAL PLAT CHECKLIST**

SUBDIVISION \_\_\_\_\_

DATE \_\_\_\_\_

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

| Ü |    | DESCRIPTION   | REMARKS |
|---|----|---|---------|
|   | 20 | Radii, internal angles, points of curvature, tangent bearings, chord length and bearings, lengths of arcs of all applicable streets within the plat area.   |         |
|   | 21 | The exact dimensions and uses of easements shall be illustrated on the plat.  |         |
|   | 22 | All lots accurately dimensioned in feet and hundredths with lot numbers, acreage, and square footage.   |         |
|   | 23 | Re-platted lots shall illustrate old lot numbers and lot lines dotted or otherwise marked 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 restriction and covenants shall be shown on the final plat  |         |
|   | 26 | Acknowledgement 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 representative 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 line 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 ODOT for approval as required   |         |
|   | 33 | Submitted within 12 months of preliminary approval  |         |
|   | 34 | Conforms to preliminary plat and incorporated suggested changes   |         |
|   | 35 | Street Names  |         |
|   | 36 | Size of lots meet minimum requirements  |         |
|   | 37 | Setback lines meet minimum requirements   |         |
|   | 38 | Corner lot size appropriate   |         |

## 1116.08 FINAL PLAT CHECKLIST

SUBDIVISION \_\_\_\_\_

DATE \_\_\_\_\_

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

| ü |    | DESCRIPTION   | REMARKS |
|---|----|---|---------|
|   | 39 | Sufficient easements for utilities or open drainage |         |
|   | 40 | Approval signature and date lines.                  |         |
|   | 41 | Designation of lots for multiple housing            |         |

**1117.00**  
**Assurance for Completion and**  
**Maintenance of Improvements**

|         |   |
|---------|---|
| 1117.01 | Improvements and Performance<br>Surety                  |
| 1117.02 | Inspection of Improvements                              |
| 1117.03 | Maintenance of Improvements                             |
| 1117.04 | Deferral or Waiver of Required<br>Improvements          |
| 1117.05 | Procedure in Case of Failure to<br>Complete Improvement |
| 1117.06 | Procedure in Case of Default                            |
| 1117.07 | Issuance of Zoning Certificates                         |

## **SECTION 1117.00 ASSURANCE FOR COMPLETION AND MAINTENANCE OF IMPROVEMENTS**

### **1117.01 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 sub-divider shall provide performance surety.

**A. Performance Surety** - To get a final plat signed by the Mayor and Clerk before improvements, the sub-divider 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 Law Director) equal to the cost of construction of such improvements as shown on the plans, and based on a detailed, itemized estimate approved by the Village Manager or Engineer. The estimate shall reflect consideration of prevailing wage requirements.

The performance bond, 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 sub-divider, 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 Regulations. Before said bond is accepted it shall be approved by the Village Law Director. Whenever a cash deposit (certified check) is made, the same shall be made out to the Village.

**B. 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 bond or cash deposit, is not completed within 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 2 years.

**C. 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.

### **1117.02 Inspection of Improvements**

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

The sub-divider 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 sub-divider from full responsibility of required improvements to the Village Construction Standards and Drawings and to the satisfaction of the Village. See the Village Design Criteria for inspection requirements. The Village will require improvement inspection fees (see Section 1124.04 Schedule of Fees).

### **1117.03 Maintenance of Improvements**

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 sub-divider shall post with the Village a maintenance surety in the amount of ten percent (10%) of the performance surety and in a form as approved by the Village Law Director.

No public improvements shall be approved until the sub-divider has posted an approved maintenance surety, and this maintenance surety will extend for 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 receives record drawings as outlined in the Village Design Criteria of construction plans, including all utilities (i.e. sanitary, sewers, storm sewers, gas, water). 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 (see Schedule of Fees – Section 1124.04) and have completed all maintenance punch list items.

#### **1117.04 Deferral or Waiver of Required Improvements**

The Planning Commission 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 Administrator and Council to the Village prior to signing of the final subdivision plat.

#### **1117.05 Procedure in Case of Failure to Complete Improvement**

The sub-divider 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 sub-divider's contract with the Village, and the sub-divider has failed to establish reasonable cause for such delay to the satisfaction of the Planning Commission and thereby to receive an extension of time.

**B.** The sub-divider has not constructed the required public improvements in accordance with the minimum standards specified in these Regulations, and the sub-divider 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.

#### **1117.06 Procedure in Case of Default**

The sub-divider 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 1117.01 Improvements and Performance Surety or when the required public improvements are not in accordance with the "as-built" plans submitted by the sub-divider 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 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.

**1117.07 Issuance of Zoning Certificates**

As determined by the Zoning Officer, Zoning Certificates will be issued when the extent of the street improvements are completed with curb and street being installed. However, the sub-divider is responsible for any damage to improvements.

**1123.00**  
**Requirements for Construction**  
**Improvements and Design**

|         |   |
|---------|---|
| 1123.01 | General Statement   |
| 1123.02 | Conformity to Development Plans and Zoning                  |
| 1123.03 | Suitability of Land   |
| 1123.04 | Street Improvements   |
| 1123.05 | Street Signs and Street Names                               |
| 1123.06 | Special Street Types  |
| 1123.07 | Streets for Commercial Subdivisions                         |
| 1123.08 | Streets for Industrial Subdivisions                         |
| 1123.09 | Easements   |
| 1123.10 | Sidewalks   |
| 1123.11 | Blocks  |
| 1123.12 | Lots  |
| 1123.13 | Survey Monuments  |
| 1123.14 | Street and Walkway Lighting                                 |
| 1193.15 | Water Supply Improvements                                   |
| 1123.16 | Sanitary Sewer Improvements                                 |
| 1123.17 | Drainage Improvements                                       |
| 1123.18 | Culverts and Bridges  |
| 1123.19 | Electric, Gas, Cable Television, and Telephone Improvements |
| 1123.20 | Over-Sized, Over-Depth and Off-Site Improvements            |
| 1193.21 | Cost of Over-Sized and Over-Depth Improvements              |
| 1123.22 | Extension to Boundaries                                     |
| 1123.23 | Off-Site Extensions   |
| 1123.24 | Non-Annexed Subdivisions                                    |
| 1123.25 | Record Drawings   |

## **SECTION 1123.00 REQUIREMENTS FOR CONSTRUCTION OF IMPROVEMENTS AND DESIGN**

### **1123.01 General Statement**

The Regulations contained in this section and the Village 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 Design Criteria and Construction Standards and Drawings are met.

### **1123.02 Conformity to Development Plans and Zoning**

The arrangements, character, width, and location of all arterial and collector thoroughfares or extensions thereof shall conform with the adopted Village Comprehensive Development Plan. Lack of a Comprehensive 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 Design Criteria and Construction Standards and Drawings. In addition, no final plat shall be approved if in conflict with an existing zoning ordinance.

### **1123.03 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 sub-divider for solving the problems that will be created by the development of the land.

### **1123.04 Street Improvements**

The arrangements, character, extent, width, grade, construction, and location of all streets shall conform to the Comprehensive Development Plan of the Village, and shall conform to the Village 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 sub-divider 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 Comprehensive Development Plan.

The sub-divider 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 Design Criteria and Construction



Standards and Drawings. Existing streets shall be improved so that they meet the above standards including storm drainage. The sub-divider shall pay the full construction cost for 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.

Right-of-way for through street(s) must be incorporated in the development to extend to adjacent areas of potential future development.

All street widths shall conform to the Village 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.

#### **1123.05 Street Signs and Street Names**

**A.** Standard street name signs and other traffic control signs shall be provided and erected by the Developer.

**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.** Whenever a new street is constructed along the approximate alignment or extension of an existing street, its name shall be the same as that of the existing one.

**D.** 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.

**E.** House numbers shall be assigned in accordance with the current house numbering system in effect in the Village. House numbers to be assigned by the Village or governing body with jurisdiction.

#### **1123.06 Special Street Types**

The following requirements shall apply to special street types:

**A.** Permanent dead-end streets shall not be permitted. Temporary dead-end streets shall be permitted only as part of a continuing street plan. A temporary turnaround satisfactory to the Planning Commission may be required to be 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. The use of Cul-De-Sac streets are discouraged and will not be approved unless the site warrants the design of such.

D. Alleys shall not be approved.

#### **1123.07 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 Design Criteria and Construction Standards and Drawings.

#### **1123.08 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 Design Criteria and Construction Standards and Drawings.

#### **1123.09 Easements**

A. Utility Easements: Public utility easements at least 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, sanitary structures, or any combination of the foregoing, and at least 20 feet total width where sanitary sewer or waterlines will be placed. Where deemed necessary by the Planning Commission, an additional easement width shall be provided.

B. Watercourses: The sub-divider 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 with an access easement, acceptable to the Planning Commission. These are not to be used for public preservation areas.

#### **1123.10 Sidewalks**

Sidewalks shall be required on both sides of all streets in all residential subdivisions.

All sidewalks shall be constructed in accordance with the Village Design Criteria and Construction Standards and Drawings. The developer who constructs a sidewalk is responsible for curb-ramps at intersections and any sidewalk located on a public access that may be dedicated to the Village at a later time. Property owners will be required to install sidewalks on individual properties within 1 year of finalized building construction (occupation of the building).

### **1123.11 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 the section and to the street design criteria established in the Village 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 2 tiers of lots, except where unusual topography or other exceptional physical circumstances exists.

**E.** Where blocks are over 900 feet in length, a pedestrian 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 5 feet from each lot through the tier of 2 lots for pedestrian access to school, playgrounds, or other facilities. A sidewalk shall be constructed by the developer. The width for a sidewalk shall conform to the Village 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.

### **1123.12 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 sites.

**G.** No lot shall have an average depth which is more than 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.** Whenever a sub-divider or developer proposes a re-subdivision of a plat previously recorded in the Office of the Recorder in the court house 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 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.

**I.** In the case of vacation of lots, or parts of lots, in the Village previously recorded in the office of the Recorder in the court house 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.

**J.** When a preliminary plat is submitted, all lots shall have the front setback lines clearly marked on them.

#### **1123.13 Survey Monuments**

A survey shall be made by a registered surveyor and shall conform to the "Minimum Standards for Boundary Surveys in the State of Ohio (ORC 4733-37).

Permanent markers shall be set at all exterior subdivision boundary corners and intersections of change, at the point of curvature and 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 permanent markers 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 permanent markers 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 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 permanent marker is changed.

Boundary lines shall be monument 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" (ORC 4733-37).

#### **1123.14 Street and Walkway Lighting**

The sub-divider is responsible for all equipment, labor and materials for the complete installation of street lights, including trenching, conduit, wiring, and backfilling. The sub-divider shall provide the layout of street lighting with a maximum spacing of 300 feet on one side. At a minimum, lights

shall be located at each entrance to the development and street intersection within the development. The sub-divider shall submit shop drawings for street lights for approval by the planning commission and village council. The planning commission or village council reserve the right to increase the amount of lighting required within the development. Street lights shall be completed prior to the village accepting the developed plat.

#### **1123.15 Water Supply Improvements**

The sub-divider 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 be approved by the Ohio Environmental Protection Agency and conform to the standards and specifications established in the Village Design Criteria and Construction Standards and Drawings. Review and approval by the Village B.P.A. is required before the final plat can be approved. Refer to the village's current public water rules and regulations for requirements.

#### **1123.16 Sanitary Sewer Improvements**

The sub-divider 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 of the Ohio Environmental Protection Agency and conform with the standards and specifications of the Village Design Criteria and Construction Standards and Drawings. No individual septic systems or combined sanitary and storm sewers shall be allowed. Review and approval by the Village B.P.A. is required before the final plat can be approved. Refer to the village's current public water rules and regulations for requirements.

#### **1123.17 Drainage Improvements and Top Soil Protection**

The sub-divider shall construct all necessary facilities including underground pipe, inlets, catch basins, open drainage ditches, and detention basins as approved by the Village, 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 Village Design Criteria and the Village Construction Standards and Drawings. 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 Design Criteria for inspection and ownership of detention basins.

All lots shall be laid out and graded to provide positive drainage away from buildings and shall be designed to assure adequate protection from the concentration of storm water run-off on adjacent property. No storm drainage, including drain tile around basements, shall be permitted to discharge into any sanitary facility.

No top soil shall be removed from the site or used as spoil. Top soil moved during the course of construction shall be redistributed so as to provide general coverage on all areas of the subdivision and shall be stabilized on slopes of 12% or over as shown on the final grading plan. Where seeding is required, rye grass is prohibited; a grass seed indigenous to the climatic and physical conditions of the site shall be used.

### **1123.18 Culverts and Bridges**

Where natural drainage channels intersect any street right-of-way, it shall be the responsibility of the sub-divider 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. Headwalls are required.
- B.** Driveway culverts shall be as approved in accordance with the Village 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 Design Criteria and Construction Standards and Drawings.

### **1123.19 Electric, Gas, Cable Television, and Telephone Improvements**

- A.** Electric, cable television, gas, and telephone service shall be provided within each subdivision. 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 sub-divider.
- 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 5 feet of either sanitary sewer, water main or storm sewer.

### **1123.20 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.

### **1123.21 Cost of Over-Sized and Over-Depth Improvements**

The sub-divider 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 Sub-divider'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 sub-divider 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 sub-divider 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 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 sub-divider 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 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, 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 owners required responsibility needed to meet the dimensional standards for roadways, as shown on the Village Comprehensive 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. (Ref 1123.10 for Sidewalks)

#### **1123.22 Extension to Boundaries**

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

#### **1123.23 Off-Site Extensions**

If streets or utilities are not available at the boundary of a proposed subdivision, the sub-divider 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 sub-dividers of adjoining land and become the property of the Village.

#### **1123.24 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 comply with these Regulations, the Village 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 Recorder.

#### **1123.25 Record Drawings**

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

#### **1123.26 Trees**

No trees are allowed within the right-of-way.

**1124.00**  
**Miscellaneous Provisions**

|         |                                  |
|---------|----------------------------------|
| 1124.01 | Recording of Plat                |
| 1124.02 | Revision of Plat After Approval  |
| 1124.03 | Sale of Land Within Subdivisions |
| 1124.04 | Schedule of Fees                 |
| 1124.05 | Penalties                        |
| 1124.06 | Variances                        |
| 1124.07 | Appeal                           |



## **1124.00 MISCELLANEOUS PROVISIONS**

### **1124.01 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.

### **1124.02 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.

### **1124 .03 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.

### **1124.04 Schedule of Fees**

The Village Council establishes the following schedule of fees:

Contact the Fiscal Officer for the Village of Pleasant Hill for the current fee schedule. Phone number 937-676-3321

The schedule of fees, which will be available upon request, 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.

### **1124.05 Penalties**

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

Contact the Fiscal Officer for the Village of Pleasant Hill for the current penalty for violating these regulations Phone number 937-676-3321

#### **1124.06 Variances**

The following Regulations shall govern the granting or variances:

**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 by the Board of Zoning Appeals 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 ordinance, if such exists.

**B.** In granting variances or modifications, the Board of Zoning Appeals may require such conditions as will, in its judgment, secure substantially the objective of the standards or requirements so varied or modified.

#### **1124.07 Appeal**

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

# Construction Standards And Drawings

**ROADWAYS - 300**

(GRAY SECTION)

|  |        |
|--|--------|
| STREET CLASSIFICATIONS &<br>RECOMMENDED STANDARD<br>STREET DIMENSIONS    | 300-I  |
| TYPICAL SECTIONS & ASPHALT<br>PAVEMENT COMPOSITION                       | 300-2  |
| TYPICAL SECTIONS & CONCRETE<br>PAVEMENT COMPOSITION                      | 300-3  |
| STREET DESIGN STANDARDS  | 300-4  |
| ACCESS CONTROL STANDARDS<br>TEMPORARY DEAD END STREETS                   | 300-5  |
| CONCRETE CURB DETAILS  | 300-6  |
| RESIDENTIAL DRIVE APPROACH   | 300-7  |
| COMMERCIAL AND INDUSTRIAL<br>DRIVE APPROACH                              | 300-8  |
| CURB RAMPS   | 300-9  |
| CONCRETE SIDEWALK DETAIL   | 300-10 |
| GUIDELINES FOR REPLACEMENT OF<br>SIDEWALK, CURB & GUTTER,<br>& DRIVEWAYS | 300-II |
| MISCELLANEOUS ROADWAY NOTES  | 300-12 |
| PUBLIC RIGHT-OF-WAY OPENING<br>& EXCAVATION                              | 300-13 |
| TRAFFIC CONTROL DEVICES<br>STATIONARY OPERATIONS<br>IN ONE LANE          | 300-14 |

**STORM DRAINAGE - 600**

(YELLOW SECTION)

|                        |        |
|------------------------|--------|
| CURB INLET DETAIL      | 600-I  |
| TYPE 2-2-B CATCH BASIN | 600-2  |
| TYPE 2-3-B CATCH BASIN | 600-3  |
| YARD DRAIN             | 600-4  |
| STORM MANHOLE DETAIL   | 600-5  |
| FULL HEIGHT HEADWALL   | 600-6  |
| HALF HEIGHT HEADWALL   | 600-7  |
| EROSION CONTROL NOTES  | 600-8  |
| EROSION CONTROL NOTES  | 600-9  |
| EROSION CONTROL NOTES  | 600-10 |
| EROSION CONTROL NOTES  | 600-II |

**WATER DISTRIBUTION - 800**

(BLUE SECTION)

|                                   |       |
|-----------------------------------|-------|
| FIRE HYDRANT DETAIL               | 800-I |
| CONCRETE THRUST<br>BLOCK DETAIL   | 800-2 |
| CONCRETE BLOCKING DETAIL          | 800-3 |
| WATER NOTES                       | 800-4 |
| WATER NOTES                       | 800-5 |
| WATER MAIN<br>SERVICE CONNECTIONS | 800-6 |
| BACKFILL TRENCH DETAIL            | 800-7 |
| BORING DETAIL                     | 800-8 |
| CONCRETE ENCASEMENT               | 800-9 |

**DETAIL**

|   |        |
|---|--------|
| DEAD END LINE DETAIL                        | 800-10 |
| MISCELLANEOUS WATER<br>DISTRIBUTION DETAILS | 800-II |

**SANITARY SEWER - 900**

(GREEN SECTION)

|   |        |
|---|--------|
| SANITARY MANHOLE DETAIL                 | 900-I  |
| INSIDE SANITARY<br>DROP MANHOLE         | 900-2  |
| OUTSIDE SANITARY<br>DROP MANHOLE        | 900-3  |
| LIFT STATION DETAIL                     | 900-4  |
| CONCRETE BLOCKING<br>FOR FORCEMAINS     | 900-5  |
| FORCE MAIN<br>CLEANOUT DETAIL           | 900-6  |
| BACKFILL TRENCH DETAILS                 | 900-7  |
| MISCELLANEOUS SANITARY<br>SEWER DETAILS | 900-8  |
| BUILDING CONNECTION                     | 900-9  |
| SANITARY SEWER<br>TESTING NOTES         | 900-10 |
| MISCELLANEOUS SANITARY<br>SEWER NOTES   | 900-II |

DFF

SGS

**ROADWAYS**

**DIVISION 300**

## **STREET FUNCTIONAL CLASSIFICATIONS**

THE VILLAGE WILL PROVIDE THE CLASSIFICATION OF ALL STREETS PRIOR TO DESIGN AND CONSTRUCTION. THE CLASSIFICATIONS ARE AS FOLLOWS:

### **1. ARTERIAL**

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

### **2. COLLECTOR**

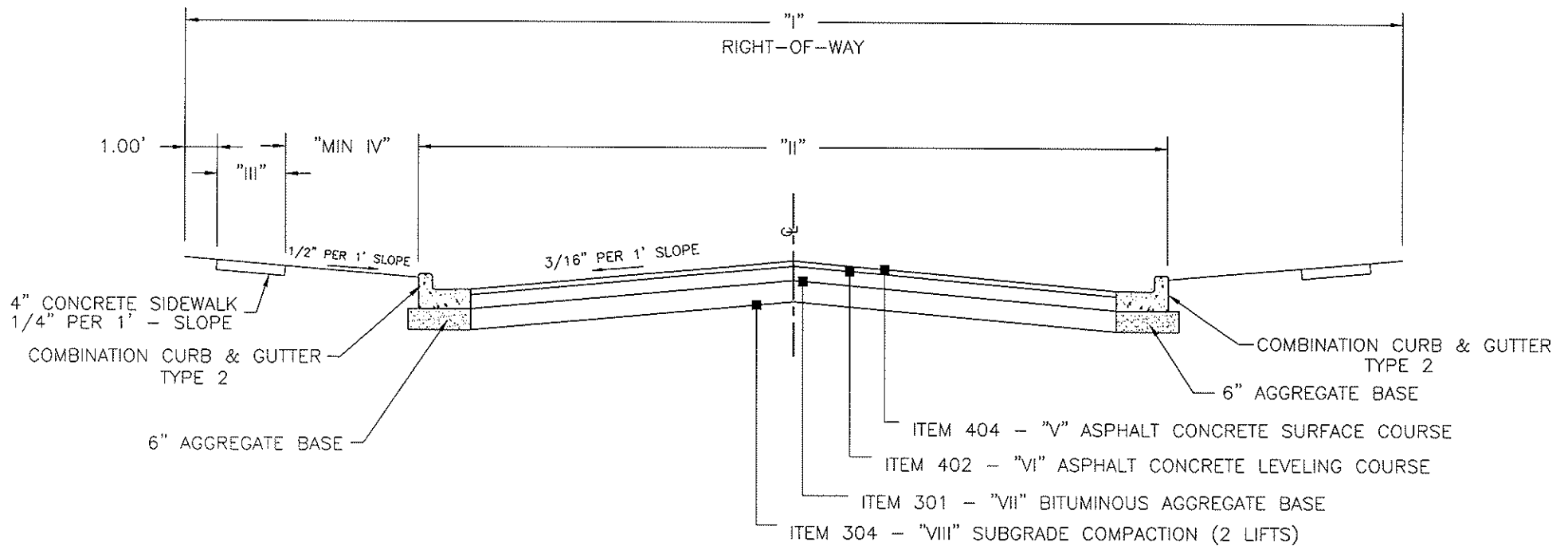
STREET DESIGNED TO CONDUCT TRAFFIC FROM LOCAL STREETS TO ARTERIALS. COLLECTOR HAS A FURTHER BREAKDOWN OF COLLECTOR—RESIDENTIAL AND COLLECTOR—INDUSTRIAL AND COMMERCIAL.

### **3. LOCAL/RESIDENTIAL**

A STREET DESIGNED TO PROVIDE ACCESS TO ABUTTING PROPERTY AND DISCOURAGE THROUGH TRAFFIC.

| <b>DESIRED MINIMUM STANDARDS</b> |                    |  |                                      |                              |
|----------------------------------|--------------------|--|--------------------------------------|------------------------------|
| STREET FUNCTIONAL CLASSIFICATION | RIGHT-OF-WAY WIDTH | BACK TO BACK CURB — PARKING BOTH SIDES | BACK TO BACK CURB — PARKING ONE SIDE | BACK TO BACK CURB NO PARKING |
|                                  | (L.F.)             | (L.F.)                                 | (L.F.)                               | (L.F.)                       |
| ARTERIAL                         | 80                 | 57                                     | 50                                   | 45                           |
| COLLECTOR — RES.                 | 60                 | 36                                     | 36                                   | 36                           |
| COLLECTOR — IND. AND COMM.       | 60                 | 41                                     | 36                                   | 36                           |
| LOCAL                            | 54                 | 36                                     | 36                                   | 32                           |



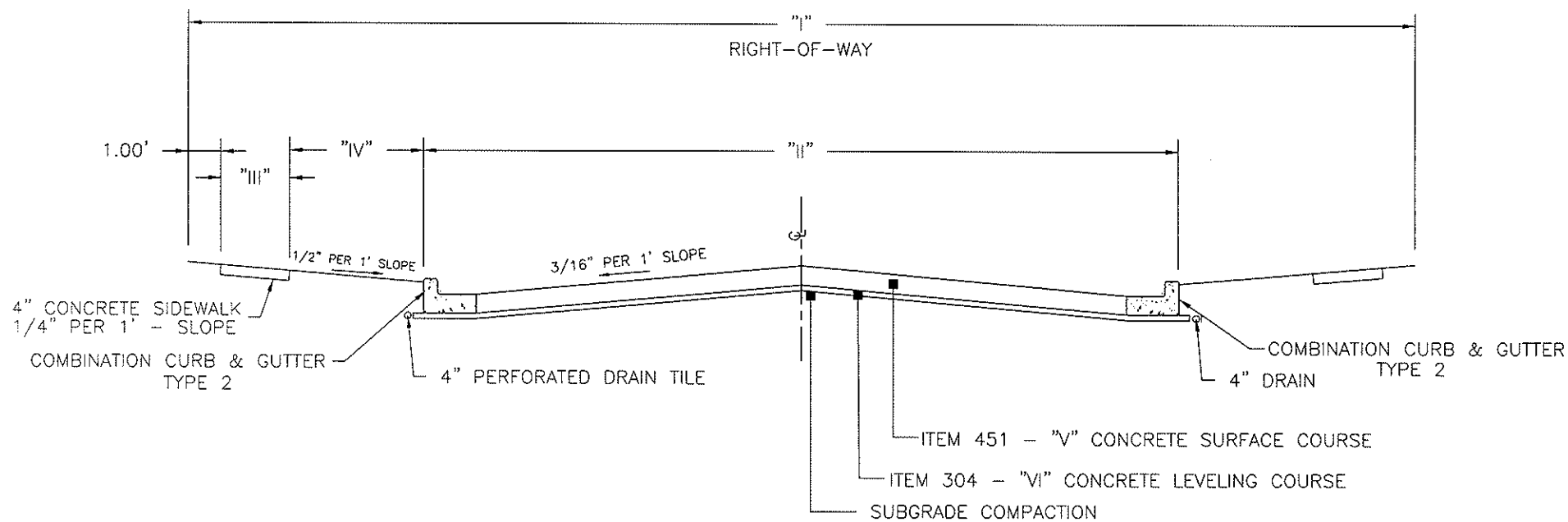


### MINIMUM STANDARDS

| ITEM | DESCRIPTION     | ARTERIAL   | COLLECTOR    |             | LOCAL      |
|------|-----------------|------------|--------------|-------------|------------|
|      |                 |            | COMM. & IND. | RESIDENTIAL |            |
| I    | RIGHT-OF-WAY    | 80'        | 60'          | 60'         | 50'        |
| II   | B\B CURB        | 57'        | 41'          | 36'         | 36'        |
| III  | SIDEWALK WIDTH  | 4'         | 4'           | 4'          | 4'         |
| IV   | CURB LAWN WIDTH | 3'         | 3'           | 3'          | 3'         |
| V    | ITEM 404        | 1-1/4"     | 1-1/4"       | 1-1/4"      | 1-1/4"     |
| VI   | ITEM 402        | 1-3/4"     | 1-3/4"       | 2-3/4"      | 2-3/4"     |
| VII  | ITEM 301        | 7"         | 7"           | -           | -          |
| VIII | ITEM 304        | 2-3" LIFTS | 2-3" LIFTS   | 2-4" LIFTS  | 2-4" LIFTS |

### NOTES

1. ALL WORK TO CONFORM TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS LATEST REVISION UNLESS OTHERWISE SPECIFIED.
2. ITEM 407 TACK COAT, SHALL BE REQUIRED WHEN 10 DAYS HAVE ELAPSED BETWEEN BITUMINOUS PAVEMENT LIFTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. APPLICATION RATE IS .10 GALLON PER SQUARE YARD.
3. ALL BUTT JOINTS SHALL BE SEALED WITH PG64-22 WITHIN 24 HOURS AFTER PLACEMENT OF ITEM 404.
4. STANDARD DIMENSIONS FOR (II) B\B CURB AND (IV) APRON WIDTH ASSUME PARKING ON BOTH SIDES.
5. SIDEWALK OF 4' WIDTH MAY BE APPROVED BY THE VILLAGE ON ARTERIAL AND COMMERCIAL, AND INDUSTRIAL COLLECTORS.
6. THE 1.00' SPACE BEHIND THE SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS (50' R/W).

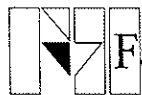


#### NOTES

1. ALL WORK TO CONFORM TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS LATEST REVISION UNLESS OTHERWISE SPECIFIED.
2. STANDARD DIMENSIONS FOR (II) B\B CURB AND (IV) APRON WIDTH ASSUME PARKING ON BOTH SIDES.
3. SIDEWALK OF 4' WIDTH MAY BE APPROVED BY THE VILLAGE ON ARTERIAL AND COMMERCIAL, AND INDUSTRIAL COLLECTORS.
4. ITEM 451 IS TO BE A MINIMUM OF 7" WITHIN 75' OF ALL INTERSECTIONS, MEASURED FROM THE INTERSECTION OF THE CENTERLINES.

#### MINIMUM STANDARDS

| ITEM | DESCRIPTION     | ARTERIAL | COLLECTOR    |             | LOCAL |
|------|-----------------|----------|--------------|-------------|-------|
|      |                 |          | COMM. & IND. | RESIDENTIAL |       |
| I    | RIGHT-OF-WAY    | 80'      | 60'          | 60'         | 54'   |
| II   | B\B CURB        | 57'      | 41'          | 36'         | 36'   |
| III  | SIDEWALK WIDTH  | 4'       | 4'           | 4'          | 4'    |
| IV   | CURB LAWN WIDTH | 3'       | 4'           | 4'          | 4'    |
| V    | ITEM 451        | 8"       | 7"           | 7"          | 6"    |
| VI   | ITEM 304        | 4"       | 4"           | 4"          | 4"    |



**Fanning/Howey**  
Civil Engineering Division  
Engineers Surveyors Consultants

DATE: January 25, 2005

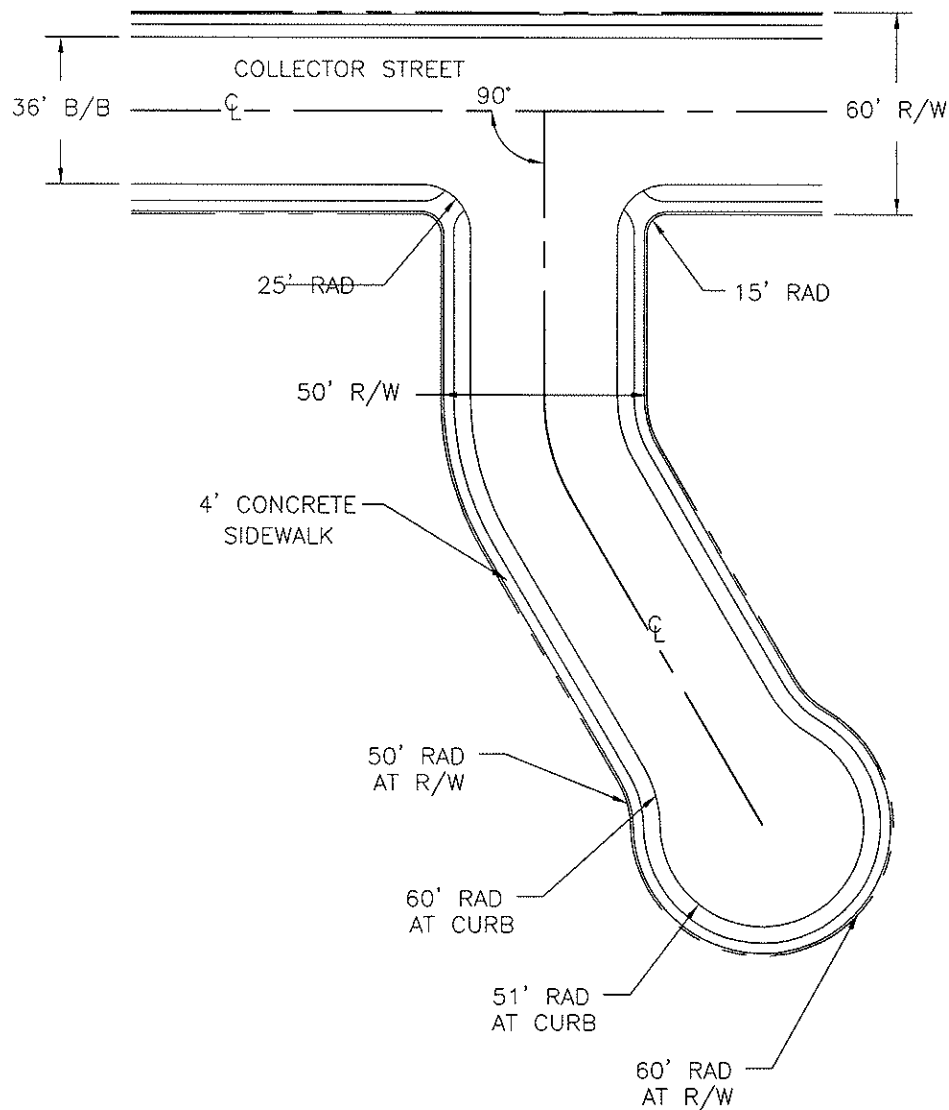
#### TYPICAL SECTIONS AND CONCRETE PAVEMENT COMPOSITION

**VILLAGE OF  
PLEASANT HILL**

PAGE No.  
300-3



# TYPICAL STREET AND CUL-DE-SAC PLAN



## STREET DESIGN STANDARDS

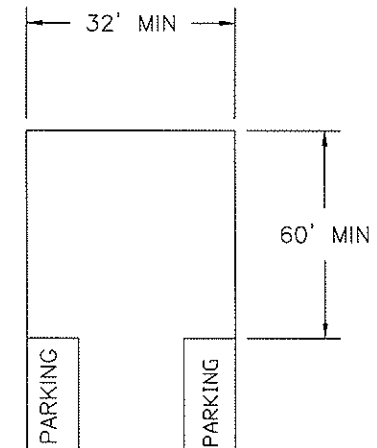
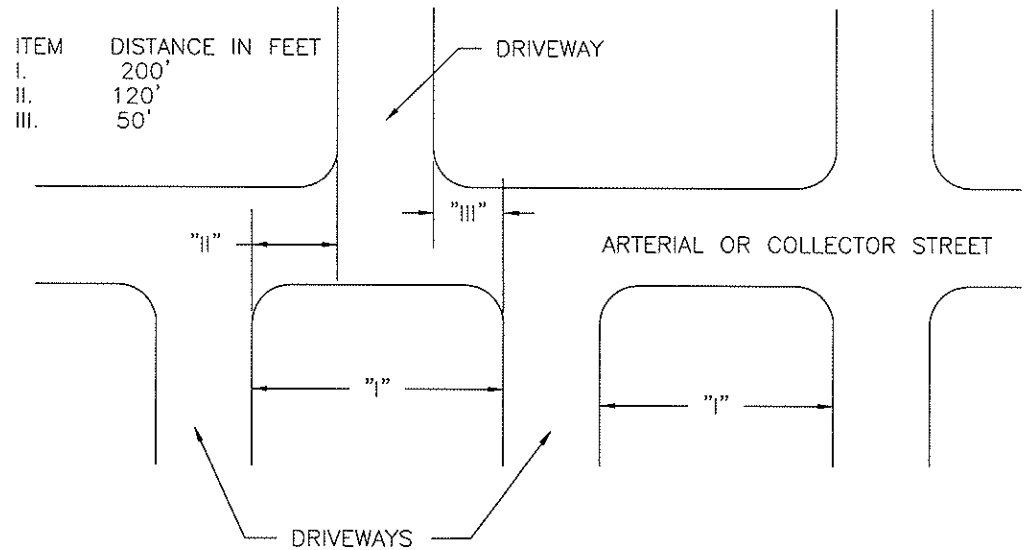
|   | 25 MPH<br>LOCAL<br>(THRU ST) | 35 MPH<br>COLLECTOR | 45 MPH<br>ARTERIAL |
|---|------------------------------|---------------------|--------------------|
| MINIMUM CENTERLINE GRADES   | 0.40%                        | 0.40%               | 0.40%              |
| MAXIMUM CENTERLINE GRADES   | 10%                          | 7%                  | 4%                 |
| MINIMUM LENGTH OF VERTICAL<br>CURVE (SEE NOTE 3).   | 25 FT.                       | 50 FT.              | 100 FT.            |
| MINIMUM CENTERLINE RADIUS   | 250 FT.                      | 400 FT.             | 600 FT.            |
| MINIMUM LENGTH TANGENT<br>BETWEEN CURVES  | 50 FT.                       | 50 FT.              | 100 FT.            |
| MINIMUM BACK OF CURB RADIUS   | 25 FT.                       | 25 FT.              | 50 FT.             |
| MINIMUM HORIZONTAL VISIBILITY   | 150 FT.                      | 250 FT.             | 400 FT.            |
| MINIMUM STOPPING SIGHT<br>DISTANCE (MEASURED FROM<br>3.5' EYE-LEVEL TO 6"<br>OBJECT HEIGHT) | 150 FT.                      | 250 FT.             | 400 FT.            |
| MAXIMUM CENTERLINE GRADE WITHIN<br>100' OF AN INTERSECTION                                  | 3%                           | 3%                  | 3%                 |
| RIGHT-OF-WAY WIDTH  | 50 FT.                       | 60 FT.              | 80 FT.             |
| MINIMUM PAVEMENT WIDTH<br>BACK TO BACK OF CURB  | 36 FT.                       | 36/41 FT.           | 57 FT.             |

1. THESE ARE MINIMUM DESIGN STANDARDS AND MAY BE REQUIRED TO BE INCREASED TO COMPLY WITH THE VILLAGE OFFICIAL THOROUGHFARE PLAN.
2. THE MAXIMUM LENGTH FOR CUL-DE-SAC STREET SHALL BE 600' CENTER OF STREET TO CENTER OF CUL-DE-SAC UNLESS AUTHORIZED BY VILLAGE PLANNING COMMISSION.
3. MINIMUM LENGTH OF VERTICAL CURVE CAN BE REDUCED OR ELIMINATED TO ALLOW FOR PROPER DRAINAGE, WITH APPROVAL OF THE VILLAGE.
4. CUL-DE-SAC STREETS ARE TO BE AVOIDED IF POSSIBLE AND MAY NOT BE PERMITTED BY THE VILLAGE PLANNING COMMISSION.

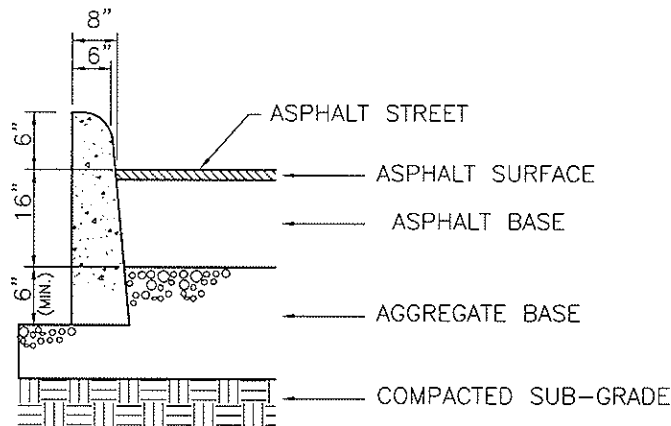
# ACCESS CONTROL STANDARDS

1. ACCESS CONTROL AS SHOWN ON THIS SHEET SHALL APPLY TO INDUSTRIAL AND COMMERCIAL DRIVEWAYS OR NEW LOCAL STREETS ON ARTERIAL OR COLLECTOR STREETS WITHIN THE VILLAGE.
2. THE DISTANCE BETWEEN ASSESS POINTS IS MEASURED TO THE NEAREST CURB OR EDGE LINE.
3. NO MORE THAN ONE ACCESS POINT (UNLESS THERE IS A SEPARATE ENTRANCE AND EXIT ACCESS) PER COMMERCIAL IS PERMITTED WITH THE EXCEPTION THAT AN ACCESS POINT ON EACH ROADWAY OF A CORNER PROPERTY IS PERMITTED AND PROPERTIES WITH FRONTAGE EXCEEDING 300' MAY BE PERMITTED IF THE NEED IS CLEARLY SHOWN FOR MORE THAN ONE DRIVEWAY WITH A MAXIMUM OF TWO.
4. THE DISTANCE BETWEEN INDUSTRIAL AND COMMERCIAL DRIVEWAYS ON LOCAL STREETS MUST BE 100' OR GREATER.
5. THE MINIMUM SPACING BETWEEN A COMMERCIAL DRIVEWAY AND/OR STREET WHICH INTERSECTS AN ARTERIAL OR COLLECTOR STREET SHALL BE 200'. THIS DISTANCE SHALL BE MEASURED FROM THE POINT FORMED BY THE INTERSECTION OF THE EXTENDED CURB LINES OF EACH DRIVEWAY OR STREET.
6. DRIVEWAYS OR MINOR STREETS SHALL BE DIRECTLY OPPOSITE OR SHALL BE OFFSET BY THE DIMENSIONS SHOWN ON THIS PAGE.
7. DRIVEWAYWAY OPENING WIDTHS SHALL ADHERE TO THE VILLAGE CONSTRUCTION STANDARDS AND DRAWINGS.
8. IN SPECIAL OR UNIQUE SITUATIONS WHERE STRICT APPLICATION OF THESE STANDARDS WOULD CAUSE UNDUE HARDSHIP UPON THE PROPERTY OWNER. THE VILLAGE BOARD OF APPEALS MAY GRANT A VARIANCE TO SAID STANDARDS.
9. DRIVEWAY OPENINGS SHALL BE AT LEAST 40' FROM INTERSECTION OF LOCAL STREETS.
10. AN ACCESS POINT MUST BE A MINIMUM OF 20' FROM THE ADJACENT PROPERTY LINE, UNLESS A SHARED DRIVEWAY IS UTILIZED.
11. ALL DEFINITIONS SHALL BE AS PER THE OHIO MANUAL OF UNIFORM TRAFFIC DEVICES LATEST.
12. ALL DRIVEWAYS AND LOCAL STREET ACCESS POINTS TO COLLECTOR AND ARTERIAL STREETS MUST BE APPROVED BY THE VILLAGE.

MINIMUM SPACING  
OF ACCESS POINTS.



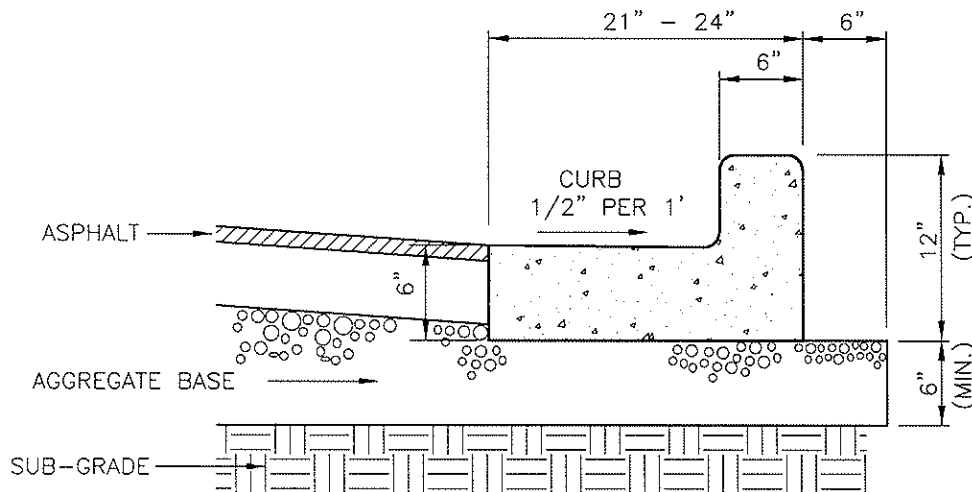
## TEMPORARY DEAD-END STREETS



#### NOTES

1. USE WHERE INDICATED ON PLANS
2. 1/4" PREMOLDED EXPANSION JOINTS SHALL BE CONSTRUCTED HOWEVER, THE MAXIMUM SPACING SHALL NOT EXCEED 100'

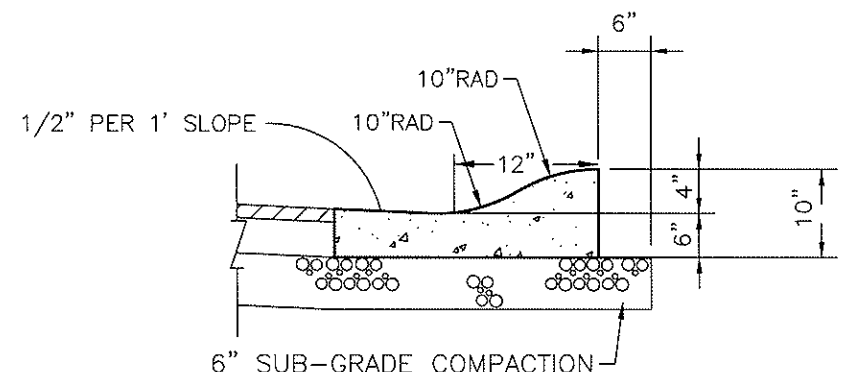
#### BARRIER CURB DETAIL



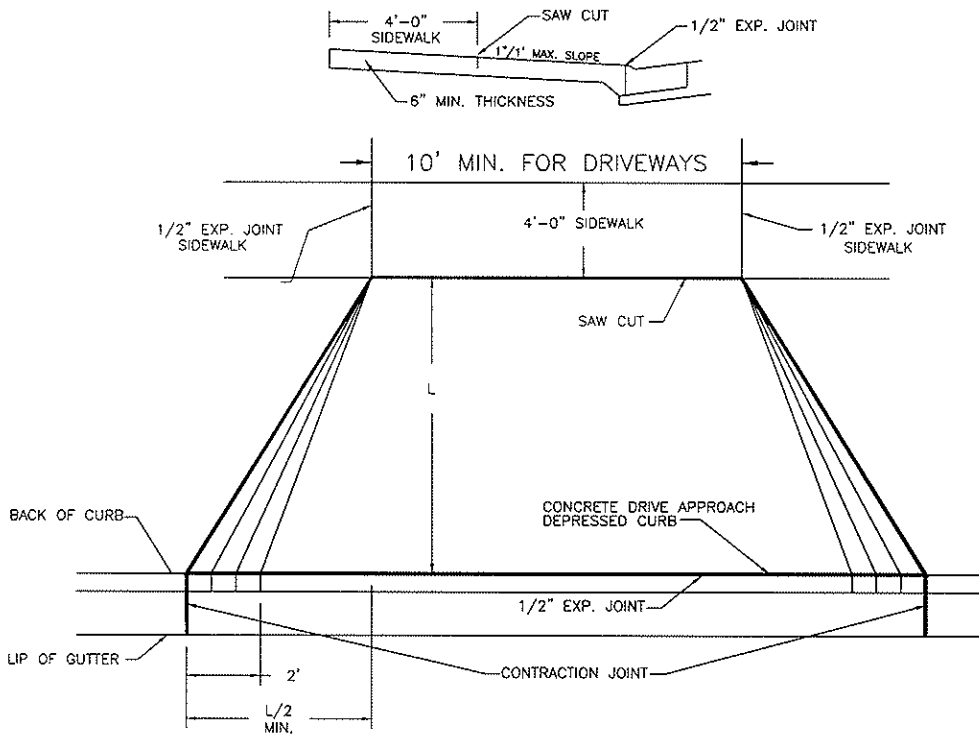
#### CURB & GUTTER DETAIL

#### NOTES

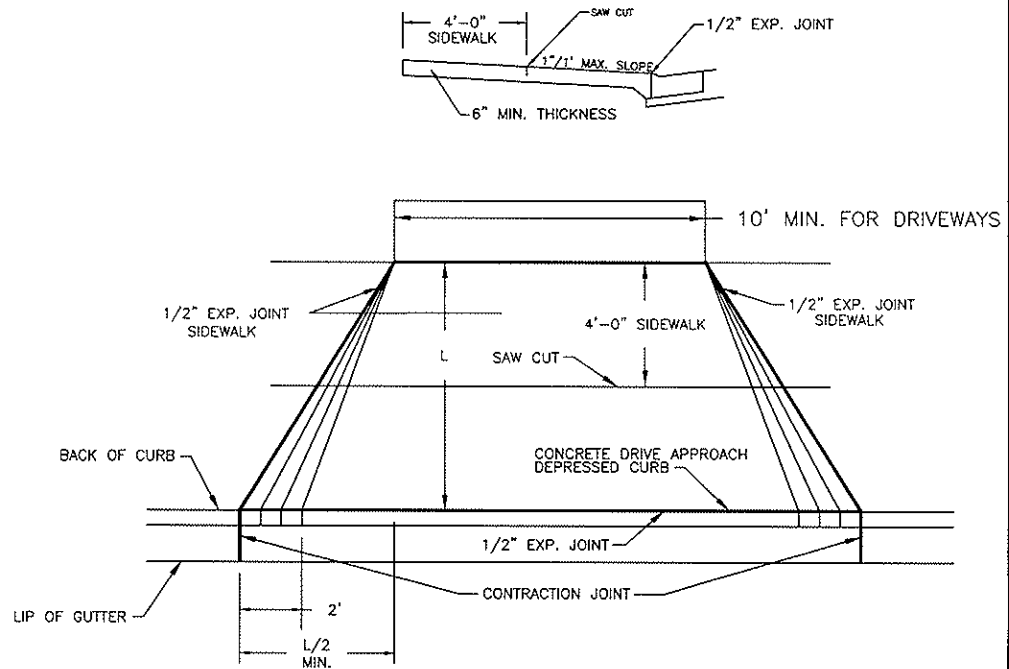
1. CONCRETE AND WORK SHALL MEET THE REQUIREMENT SET FORTH IN ODOT ITEM 609 CURBING.
2. CURBING SHALL HAVE CONTRACTION JOINTS EVERY 10'.
3. MINIMUM OF 6" OF ODOT 304 SHALL BE PLACED UNDER CURBING.
4. CURBING SHALL BE BACKFILLED IMMEDIATELY AFTER FORMS ARE REMOVED OR AS SOON AS PRACTICAL WHEN SLIP FORMING PRIOR TO OTHER CONSTRUCTION OPERATIONS.
5. PROVIDE BROOM FINISH AND EDGING TO ALL EXPOSED SURFACES.
6. APPLY WHITE PIGMENTED CURBING COMPOUND ON ALL SURFACES INCLUDING BACK IMMEDIATELY AFTER FINISHING SURFACES. ANY OTHER METHOD OR TYPE OF CURING COMPOUND MUST BE PREAPPROVED.
7. CONCRETE SHALL CONTAIN 6% +/- 1% OF TOTAL AIR.
8. TYPE 6 CURBS ARE FOR USE AROUND MEDIAN SECTION.
9. FOR CONCRETE STREETS, MINIMUM FLOW LINE SLOPE OF PERFORATED PIPE IS 0.003 FT/FT TO OUTLET.
10. CURB, SHALL BE BLOCKED OUT A MINIMUM OF 5' ON EACH SIDE OF A NEW CATCH BASIN INSTALLED.
11. UNDERDRAIN, IF REQUIRED, TO BE INSTALLED PRIOR TO CURB INSTALLATION.
12. UNDERDRAIN MAYBE USED FOR SUMP PUMP DRAINS WITH A MANUFACTURED TEE, WHEN NO OTHER STORM OUTLET IS AVAILABLE AS DETERMINED BY THE VILLAGE. IN NO CASE SHALL DOWNSPOUTS BE TIED INTO THE UNDERDRAIN.
13. CURB & GUTTER TO BE 24" UNLESS MATCHING EXISTING CONDITIONS. IN NO CASE CAN CURB AND GUTTER BE LESS THAN 21".
14. DEPRESSED CURB TO BE 1.5" ABOVE GUTTER LINE.



#### COMBINATION ROLL CURB AND GUTTER



**TREE LAWNS OF MORE THAN 6'-0"**



**TREE LAWNS OF LESS THAN 6'-0"**

## NOTES

1. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST-IN-PLACE CONCRETE.
2. DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICALLY WITH CURB.
3. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY, TRANSVERSELY AND AT TAPERS.
4. EXPANSION MATERIAL SHALL BE 1/2" PREMOLDED.
5. MINIMUM 4" OF GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES.
6. PROVIDE BROOM FINISH AND EDGE TO ALL EXPOSED SURFACES.

7. 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.

8. 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 THE STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.

9. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 650 LB/CY) CEMENT. PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.

10. CONCRETE SHALL CONTAIN 6% +/- 1% OF TOTAL AIR.

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



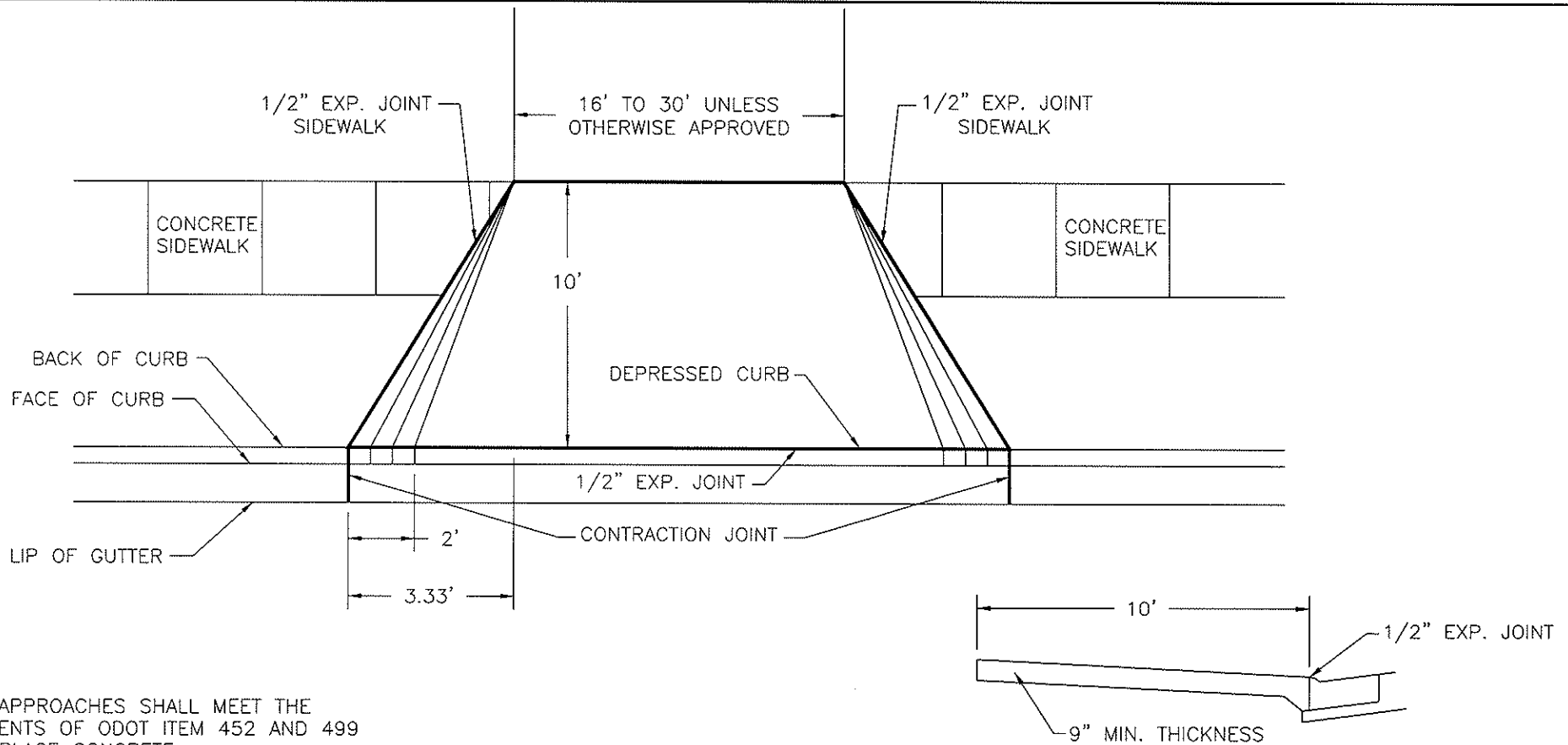
**Fanning/Howey**  
Civil Engineering Division  
Engineers Surveyors Consultants

DATE: JANUARY 25, 2005

## RESIDENTIAL DRIVE APPROACH

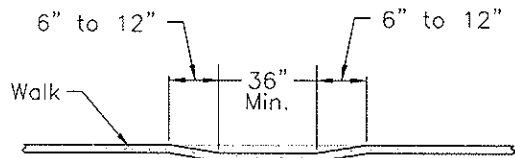
**VILLAGE OF  
PLEASANT HILL**

PAGE No.  
300-7

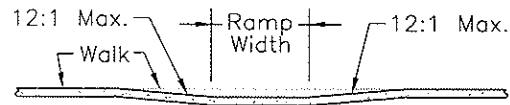


## NOTES

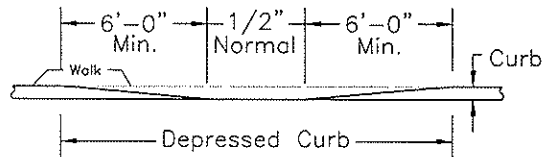
1. DRIVE APPROACHES SHALL MEET THE REQUIREMENTS OF ODOT ITEM 452 AND 499 CAST-IN-PLACE CONCRETE.
2. DRIVE APPROACHES SHALL NOT BE POURED MONOLITHICALLY WITH CURB.
3. MAXIMUM JOINT SPACING SHALL BE 10' LONGITUDINALLY, TRANSVERSELY AND AT TAPERS.
4. EXPANSION MATERIAL SHALL BE 1/2" PREMOLDED.
5. 6" OF GRAVEL SHALL BE PLACED UNDER DRIVE APPROACHES.
6. PROVIDE BROOM FINISH AND EDGE TO ALL EXPOSED SURFACES.
7. 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.
8. 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 THE STANDARD DRAWINGS FOR CONSTRUCTION JOINTS.
9. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 650 LB/CY) CEMENT. PROPORTION OPTIONS 1 AND 2 NOT ALLOWED.
10. CONCRETE SHALL CONTAIN 6% +/- 1% OF TOTAL AIR.
11. IF CURB IS REMOVED AND REPLACED DURING DRIVEWAY CONSTRUCTION, JOINTS BETWEEN EXISTING AND NEW CURB ARE TO BE 1/2" EXPANSION JOINTS.



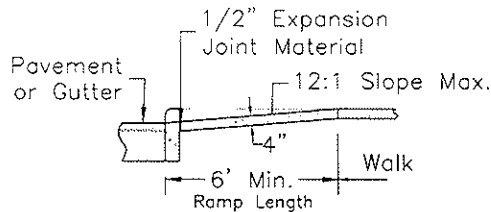
**SECTION D-D**



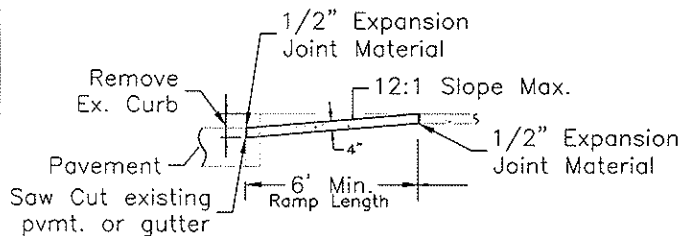
**SECTION C-C**



**VIEW B-B**



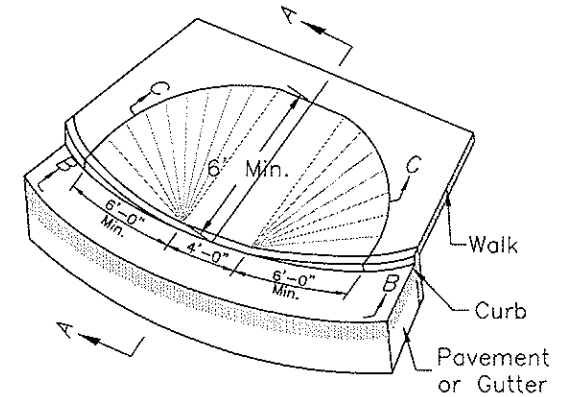
**SECTION A-A  
NORMAL DETAIL**



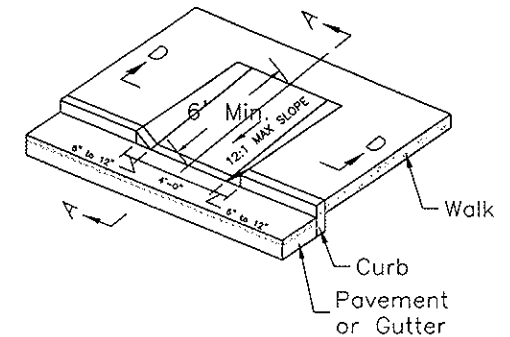
**SECTION A-A  
EXISTING WALK DETAIL**

## NOTES

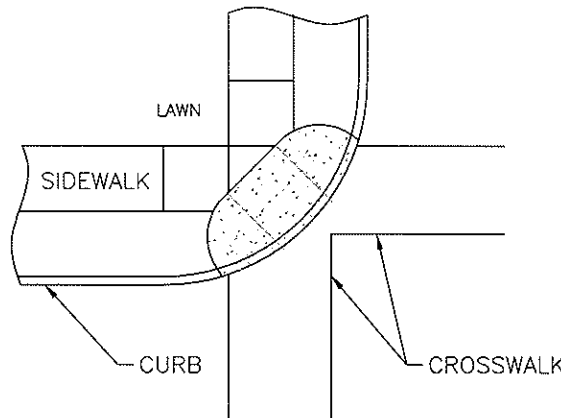
1. VILLAGE TO SPECIFY TYPE I OR TYPE II CURB RAMP.
2. ANY COMBINATION OF SIDE SLOPES ON OPPOSITE SIDES OF A RAMP MAY BE USED TO BEST FIT THE SITE CONDITIONS.
3. THE MINIMUM RAMP LENGTH IS 5' FROM BACK OF A 6" CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.
4. WALK THICKNESS IN THE RAMP SLOPES SHALL BE 4" MINIMUM OR THICKER AS NECESSARY TO MATCH ADJACENT WALK THICKNESS.
5. CURB RAMPS SHALL MEET AND BE FINISHED TO A.D.A. STANDARDS.
6. CURB RAMPS SHALL MEET THE REQUIREMENTS OF ODOT ITEM 608 UNLESS OTHERWISE SPECIFIED WITHIN.
7. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 650 LB/CY CEMENT). PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.
8. CONCRETE SHALL CONTAIN 6% +/- 1% OF TOTAL AIR.



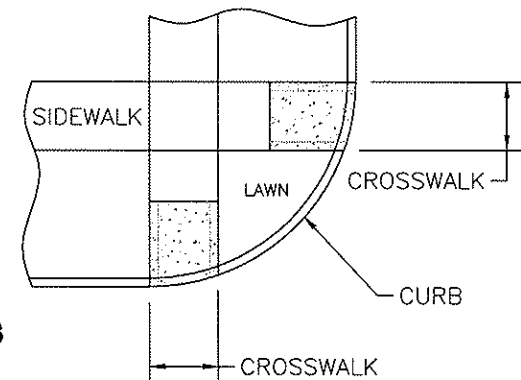
**CURB RAMP TYPE I**



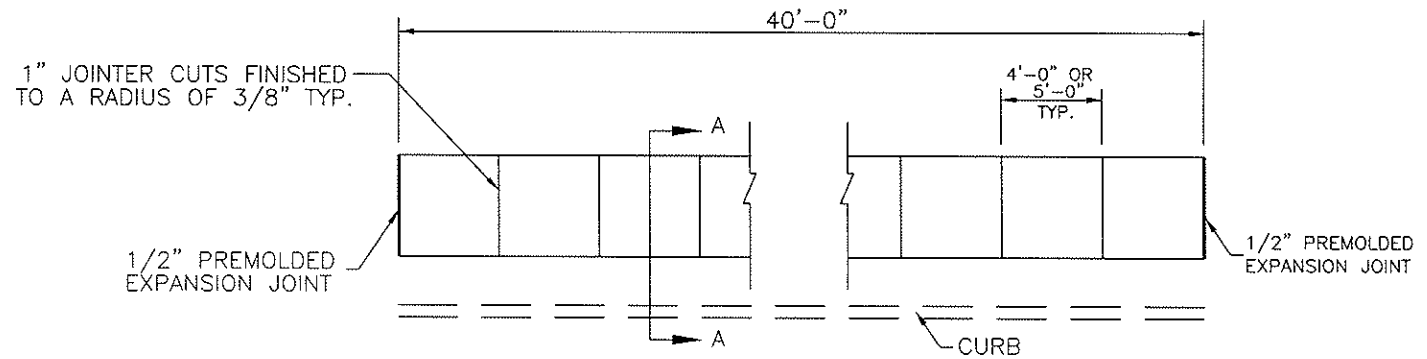
**CURB RAMP TYPE II**



**TYPICAL CURB RAMPS**



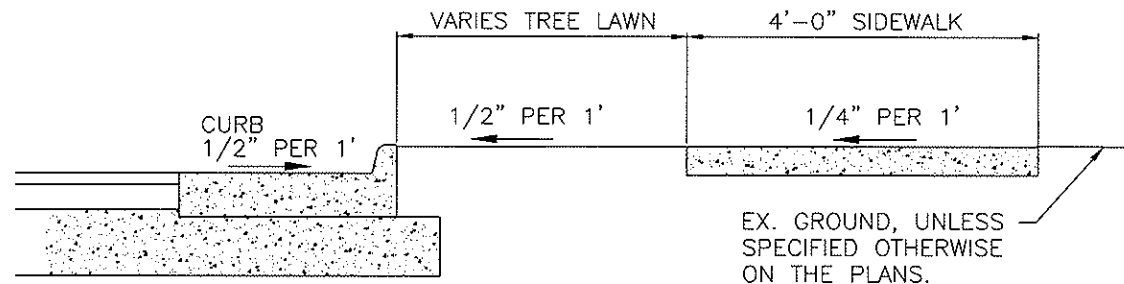
EXPANSION JOINT  
REQUIRED AT THE END OF EACH POUR, AT EACH SIDE OF A TREE, DRIVEWAY,  
PROPERTY LINE, OR ANY FIXED STRUCTURE, MAXIMUM SPACING BETWEEN EXPANSION  
JOINTS SHALL NOT EXCEED 100 FEET.



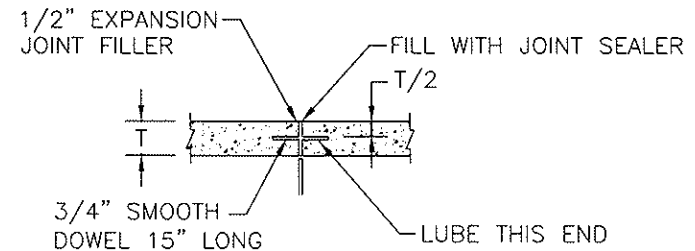
### CONCRETE SIDEWALK DETAIL

### NOTES

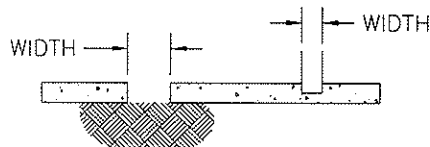
1. WALK TO BE POURED ON UNDISTURBED EARTH OR COMPACTED GRANULAR BEDDING.
2. PROVIDE BROOM FINISH TO ALL EXPOSED SURFACE.
3. CONCRETE SHALL CONFORM TO ODOT ITEM 499 CONCRETE. CONCRETE WORK SHALL CONFORM TO ODOT ITEM 608, UNLESS OTHERWISE SPECIFIED WITHIN.
4. PROVIDE EDGING AROUND ALL EXPOSED SURFACES.
5. USE WHITE PIGMENTED CURING COMPOUND IMMEDIATELY AFTER FINISHING SURFACES. ANY OTHER METHOD OR TYPE OF CURING COMPOUND MUST BE PREAPPROVED.
6. WHEN RENOVATING EXISTING STREETS, THE SIDEWALKS SHALL BE REPLACED TO CONFORM WITH THE ODOT CONSTRUCTION STANDARDS AND DRAWINGS.
7. CONCRETE SHALL BE ODOT CLASS C (4000 PSI, 650 LB/CY CEMENT) PROPORTIONING OPTIONS 1 AND 2 NOT ALLOWED.
8. CONCRETE SHALL CONTAIN 6% +/- 1% OF TOTAL AIR.



### SECTION A-A



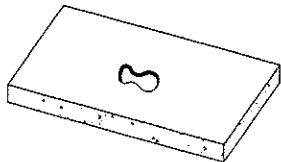
### EXPANSION JOINT DETAIL



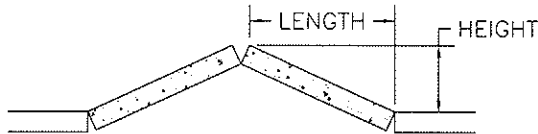
**① OPENING**  
—MAXIMUM WIDTH



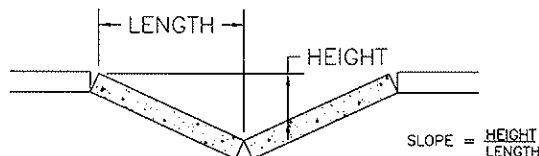
**② STEP HUMP**  
—MAXIMUM HEIGHT



**③ DEPRESSIONS**  
—2 S.F. PER BLOCK



**④ HUMP**  
—MAXIMUM SLOPE



**⑤ SUNKEN SECTION**  
—MAXIMUM SLOPE

## SIDEWALK DEFICIENCIES

1. ANY BLOCK HAVING A CRACK OR CRACKS IN IT MORE THAN 3/4" WIDE OR IN EXCESS OF 5 L.F. IN ONE BLOCK.
2. ADJOINING BLOCKS OR PORTIONS THEREOF WHOSE EDGES DIFFER VERTICALLY BY MORE THAN 1/2".
3. BLOCKS HAVING DEPRESSIONS, REVERSE CROSS-SLOPE (SLOPING AWAY FROM THE STREET) OR BELOW CURB GRADE SO AS TO IMPOUND MUD OR WATER.
4. BLOCKS HAVING A CROSS-SLOPE IN EXCESS OF 1/2" VERTICAL PER 1' HORIZONTAL EXCLUDING DRIVEWAYS.
5. CELLAR DOORS OR OTHER COVERS THAT ARE NOT FLUSH WITH THE SIDEWALK, HAVE A SMOOTH SURFACE, OR ARE STRUCTURALLY UNSAFE.
6. GRATING THAT HAS OPENING MEASURING MORE THAN 3/4", PROJECT ABOVE THE SIDEWALK, OR ARE STRUCTURALLY UNSAFE.
7. BLOCKS HAVING EXCESSIVE SPAULING CONSISTING OF OVER 30% OF A PARTICULAR BLOCK.

## GENERAL NOTES

1. 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 VILLAGE TO DO SO.
2. THE CONTRACTOR MUST CALL THE VILLAGE 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 MAN ON THE JOB, THE CONTRACTOR IS REQUIRED TO CALL AND CANCEL THE INSPECTION.
3. THE CONTRACTOR IS CAUTIONED AGAINST ORDERING CONCRETE BEFORE THE INSPECTION IS MADE DUE TO POSSIBLE CORRECTION OF FORMS OR GRADE.
4. THE CONTRACTOR SHALL PROVIDE PROTECTION AND TRAFFIC CONTROL BARRICADED, 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.
5. THE CONTRACTOR WILL BE RESPONSIBLE FOR AN IMMEDIATE REMOVAL AND CLEAN UP OF ALL EXCAVATED MATERIAL. NO EXCAVATED MATERIAL SHALL BE STORED ON THE PAVEMENT.
6. ALL SIDEWALK SHALL BE REPLACED ON STREET RECONSTRUCTION PROJECTS TO MEET THESE CONSTRUCTION STANDARDS AND DRAWINGS.
7. BRICK, STONE, & SANDSTONE SIDEWALKS ARE PROHIBITED AS PRIMARY SIDEWALK.



## GENERAL

1. FAILURE TO COMPLY WITH THE CONSTRUCTION STANDARDS AND DRAWINGS AND DESIGN CRITERIA MAY BE CONSIDERED A VIOLATION OF THE VILLAGE'S BUILDING CODE OR SUBDIVISION REGULATIONS. PENALTIES MAY BE ASSESSED ACCORDING TO THE SEVERITY OF THE VIOLATION.

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

3. NONPUBLIC CONSTRUCTION IMPROVEMENTS AFFECTING THE EXISTING CONDITION, PERFORMANCE AND LIFE CYCLE OF VILLAGE STREETS, ALLEYS, OR RIGHT-OF-WAY SHALL BE RESTORED TO THE REQUIREMENTS AND SATISFACTION OF THE VILLAGE ADMINISTRATOR. ALL VILLAGE INFRASTRUCTURE SHALL BE ADEQUATELY RESTORED ACCORDING TO APPLICABLE STANDARDS AND DETAILS.

4. ALL NEW SUBDIVISIONS AND DEVELOPMENTS SHALL BE PROVIDED WITH PUBLIC SIDEWALKS ON BOTH SIDES OF STREETS IN ACCORDANCE WITH VILLAGE STANDARDS.

5. CURB CUTS FOR ALL NEW AND RECONSTRUCTED DRIVEWAYS SHALL CONFORM TO VILLAGE STANDARDS. ALL NEW DRIVEWAY APPROACHES SHALL BE CONSTRUCTED OF OR CONCRETE AND SUBJECT TO ALL VILLAGE REQUIREMENTS.

6. NO VILLAGE STREET'S OR ALLEY'S SHALL BE CLOSED UNLESS THE VILLAGE IS NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF A NON-EMERGENCY SITUATION. ADVANCED PUBLIC NOTIFICATION AND PUBLISHING SHALL BE A MINIMUM OF 24 HOURS.

## PAVEMENT REPLACEMENT

1. IMMEDIATELY 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 OR 307. THE SURFACE SHALL BE MAINTAINED FLUSH WITH THE EXISTING STREET.

2. PERMANENT PAVEMENT REPLACEMENT SHALL EQUAL OR EXCEED THE EXISTING PAVEMENT AND PREPARED BY THE VILLAGE.

3. 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.

4. 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.

## TRAFFIC CONTROL

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

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

## CURB STAKING AND ROADWAY

1. LINE AND GRADE EVERY 50' ON A CONVENIENT OFFSET WITH TACKED HUBS.

## PAVEMENT (ASPHALT)

1. 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 SPECIFICATION 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.

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

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

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

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

6. ASPHALT CEMENT SHALL BE USED NEXT TO THE LIP OF GUTTER PRIOR TO THE FINAL ASPHALT LIFT BEING PLACED.

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

8. NO ASPHALT SHALL BE PLACED OVER EXCAVATED TRENCHES UNLESS TRENCHES HAVE BEEN COMPACTED.

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

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

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

12. 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.

13. 325°F IS THE MAXIMUM TEMPERATURE ASPHALT MATERIAL IS TO BE MIXED.

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

## NOTES

1. THE VILLAGE MUST BE NOTIFIED BEFORE ANYONE CAN PERFORM ANY WORK ON OR WITHIN A PUBLIC RIGHT-OF-WAY. (STREET, ALLEY, ETC.). NOTIFICATION IS REQUIRED FOR ANY TUNNEL, SIDEWALK, OPENING OR EXCAVATION UNDER OR IN THE RIGHT-OF-WAY PUBLIC GROUNDS.

2. THE NOTIFICATION WILL BE COMPLETED BY THE PERSON OR FIRM PLANNING THE WORK WITHIN THE RIGHT-OF-WAY. ALL APPROVALS MUST BE OBTAINED BEFORE ANY WORK IS STARTED. 72 WORKING HOUR LEAD TIME IS RECOMMENDED.

3. THE APPLICANT SHALL HAVE SUFFICIENT BARRICADES, WARNING SIGNS, AND LIGHTS DURING THE ENTIRE PERIOD THAT THE WORK IS BEING PERFORMED AND SHALL ADHERE TO APPLICABLE SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

4. ALL UTILITIES ARE REQUIRED TO OBTAIN APPROVAL.

5. THE EXISTING PAVEMENT SHALL BE NEATLY CUT PRIOR TO EXCAVATION. ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE JOB SITE. THE APPLICANT IS RESPONSIBLE FOR ALL PAVEMENT DAMAGED OUTSIDE THE TRENCH AREA.

6. BACKFILLING SHALL BE IN ACCORDANCE WITH VILLAGE'S SPECIFICATIONS.

7. ALL EXCAVATIONS OR TRENCH EDGES UNDER OR WITHIN 5' OF PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS SHALL EITHER BE BACKFILLED WITH LOW STRENGTH MORTAR BACKFILL ODOT ITEM 613, TYPE 1 ONLY OR BACKFILLED WITH ODOT 603 TYPE 1 OR TYPE 2 GRANULAR MATERIAL, COMPACTED IN 6" LAYERS. A DENSITY TEST OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAY BE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE VILLAGE.

8. ALL EXCAVATION OR TRENCH EDGES NOT UNDER OR WITHIN 5' OF PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS CAN BE COMPACTED EXISTING NATIVE MATERIAL IN 12" MAXIMUM LIFTS OR AS APPROVED BY THE VILLAGE.

9. ALL DISTURBED AREAS MUST BE RETURNED TO AS GOOD OR BETTER CONDITION. ALL REPAIRS MUST MEET VILLAGE SPECIFICATIONS. THE VILLAGE MUST INSPECT AND APPROVE ALL REPAIRS.

10. COLD PATCH SHALL BE PLACED TO 1 1/2" + THICKNESS OVER BACKFILLED TRENCH WITHIN ONE WORKING DAY AFTER THE BACKFILL HAS BEEN COMPACTED UNLESS THE ASPHALT PAVEMENT PLACED IMMEDIATELY AND REMOVED PRIOR TO PERMANENT PAVEMENT REPLACEMENT.

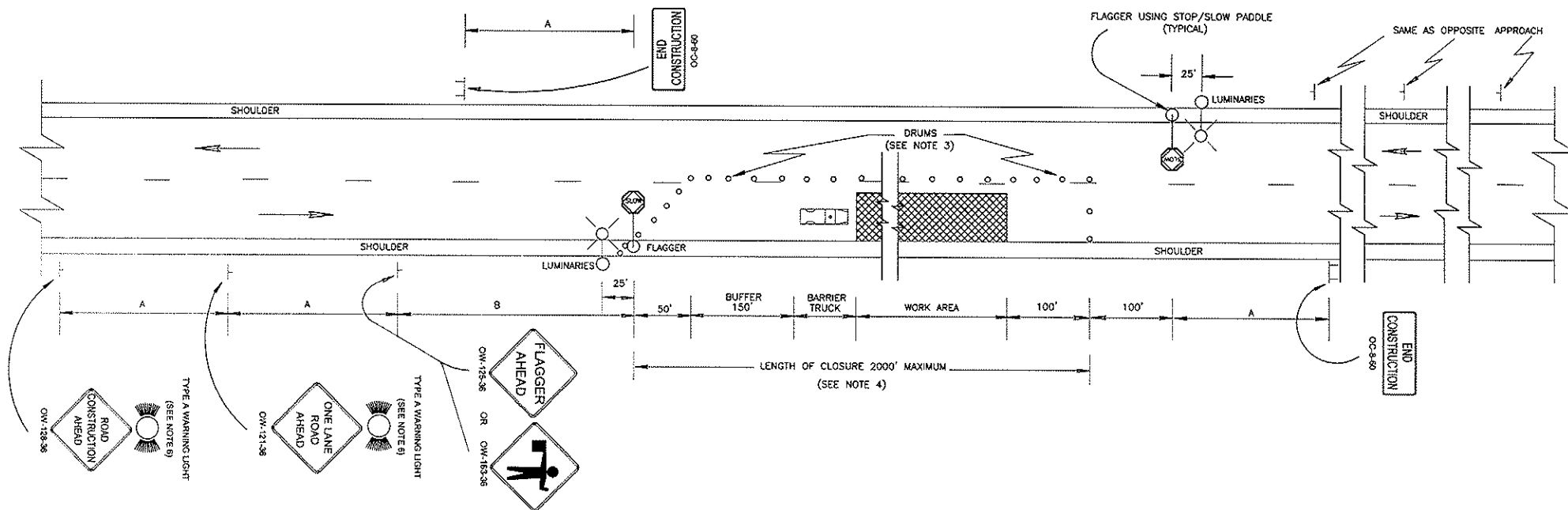
11. EFFORTS SHALL BE MADE TO MINIMIZE ALL DISTURBANCE TO TREES OR THIN ROOTS. EXTENSIVE EXCAVATION CAUSING DAMAGE TO TREES WILL RESULT IN THE REMOVAL AND REPLACEMENT OF, BY THE CONTRACTOR. THE REPLACEMENT SHALL BE AS PER THE VILLAGE.

12. FOR CLOSURE OF ARTERIALS OR BUSY COLLECTORS THE VILLAGE RESERVES THE OPPORTUNITY TO DIRECT CONTRACTOR TO CLOSE STREET DURING OFF-PEAK TRAFFIC HOURS. CLOSURE MAY OCCUR AT NIGHT OR ON WEEKENDS. CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL ASSOCIATED WITH ROAD CLOSURE.

13. AN ASPHALT EMULSION, OR CRACK SEALANT, WITH ASPHALT GRADE SS-1 OR CSS-S SHALL BE APPLIED TO THE PERIMETER OF ALL PAYMENT CUTS AFTER RESTORATION IS COMPLETED.

14. PAVEMENT THICKNESS TO BE RESTORED SHALL BE ACCORDING TO VILLAGE STANDARDS OR EQUAL TO THE EXISTING THICKNESS, WHICHEVER IS GREATER.

15. IN THE EVENT THAT AFTER NOTIFICATION FROM THE VILLAGE, THE CONTRACTOR FAILS TO CORRECT PROBLEMS ASSOCIATED WITH POOR TRENCH MAINTENANCE, THE VILLAGE RESERVES EXCLUSIVE RIGHT TO CORRECT TRENCH PROBLEMS AND BILL THE ASSOCIATED COSTS.



### GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT. THE DISTANCES SHOWN ARE MINIMUMS. DISTANCE B MAY ALSO BE INCREASED, PRIOR TO IMPLEMENTATION OF THE CLOSURE OR AFTER IT IS IN EFFECT, AS DIRECTED BY THE ENGINEER FOR SUCH OCCURRENCES AS LONG TRAFFIC BACKUPS.
2. FLAGGERS, ONE FOR EACH DIRECTION SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS A ONE LANE OPERATION IS IN EFFECT. THE FLAGGERS SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES.
3. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER ALONG THE CLOSURE. DRUMS ON THE ADVANCE TAPER SHALL BE SPACED AT 10' CENTER TO CENTER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES MAY BE SUBSTITUTED FOR DRUMS FOR DAY-TIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER.
4. SEVERAL SMALL WORK AREAS CLOSE TOGETHER SHALL BE COMBINED INTO ONE WORK ZONE. HOWEVER, THE CLOSURE SHALL NOT BE MORE THAN 2000 FEET LONG UNLESS APPROVED BY THE ENGINEER. THE MINIMUM LENGTH BETWEEN CLOSURES SHALL BE 2000 FEET. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED IN ANY ONE WORK ZONE.
5. THE BARRIER TRUCK SHOWN AT THE BEGINNING OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS BARRIER TRUCK SHALL BE REMOVED FROM THE PAVEMENT WHEN WORKERS ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE BARRIER TRUCK SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360° ROTATION OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF ONE-QUARTER MILE.
6. THE TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" (OW-128) AND THE "ONE LANE ROAD AHEAD" (OW-121) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
7. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.
8. ADEQUATE AREA ILLUMINATION OF EACH FLAGGER STATION SHALL BE PROVIDED AT NIGHT BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO ONE FLAGGER STATION FOR EACH DIRECTION OF TRAFFIC AS SHOWN ABOVE. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE A MINIMUM OF 27 FEET ABOVE THE PAVEMENT AND MOUNTED ON A SUPPORT OF ADEQUATE STRENGTH TO PROVIDE A SATISFACTORY INSTALLATION. THE OVERHEAD CONDUCTOR CLEARANCE SHALL BE A MINIMUM OF 18 FEET ABOVE THE PAVEMENT. THE LUMINAIRES ARM SHALL BE OF SUFFICIENT LENGTH TO EXTEND TO THE EDGE OF THE PAVEMENT. POLES SHALL BE ERECTED A MINIMUM OF 5.5' BEHIND FACE OF GUARDRAIL WHERE EXISTING, OR 12' FROM THE EDGE OF PAVEMENT. WHERE POSSIBLE LOCATE BEHIND DITCH. LIGHTING MATERIAL SHALL COMPLY WITH SPECIFICATION 713.
9. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND MAJOR DRIVES AS NECESSARY TO PREVENT WRONG WAY MOVEMENTS AND TO KEEP VEHICLES OFF OF NEW PAVEMENT NOT READY FOR TRAFFIC. THE METHOD OF CONTROL SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

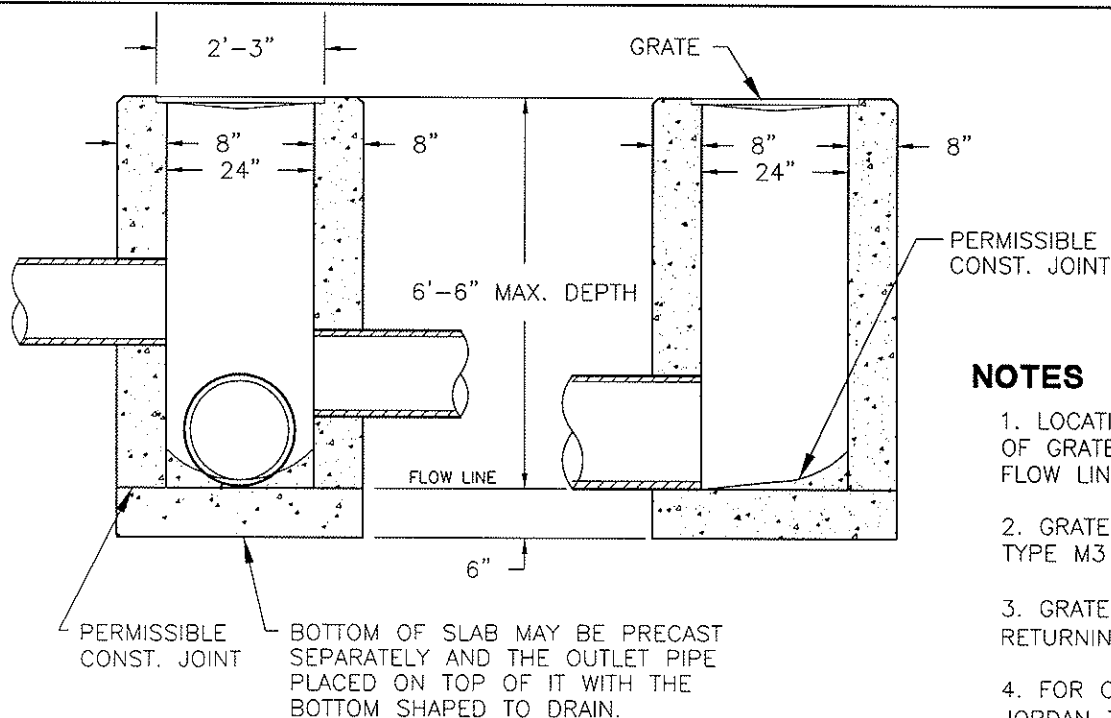
| MINIMUM DISTANCE | A   | B   |
|------------------|-----|-----|
| URBAN            | 200 | 200 |
| RURAL            | 500 | 500 |

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCIDENTAL TO THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

**STORM DRAINAGE**

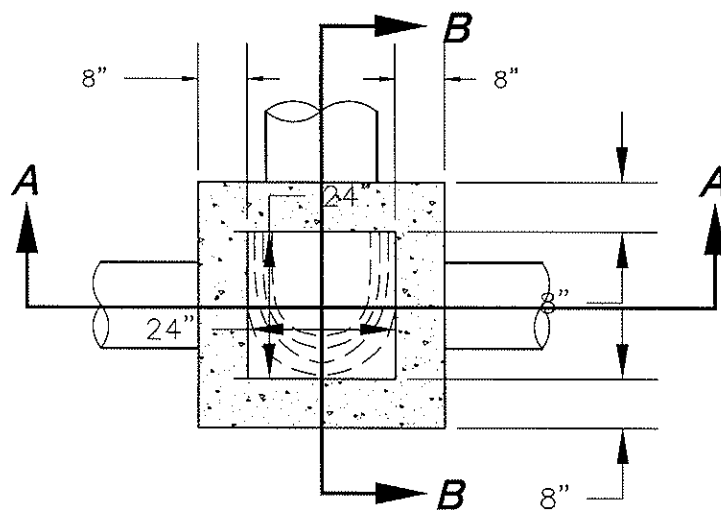
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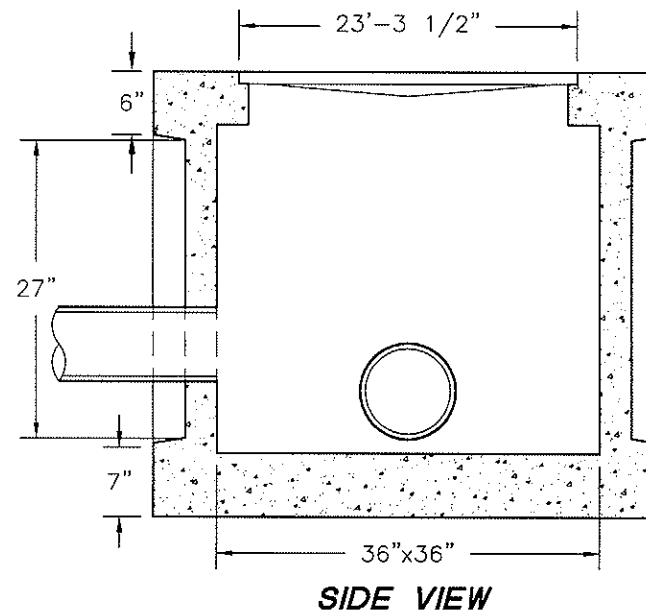
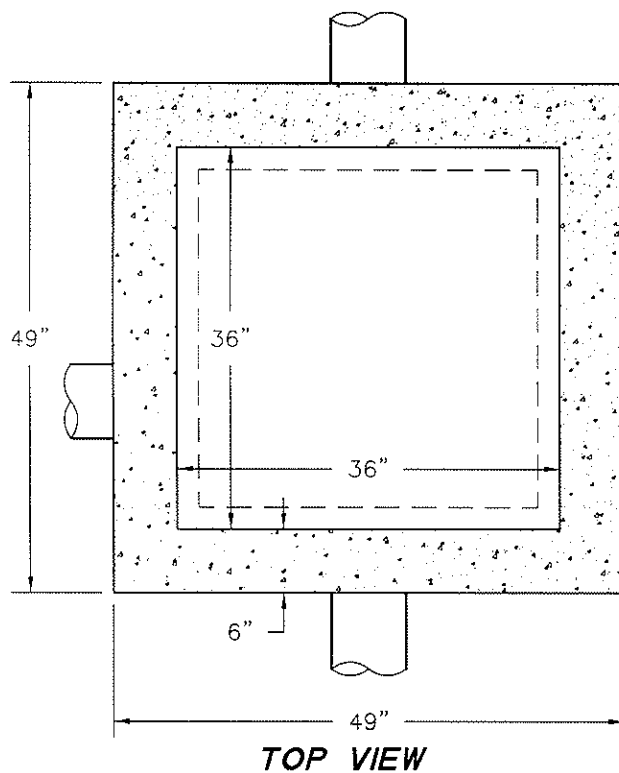
**SECTION A-A**

**SECTION B-B**



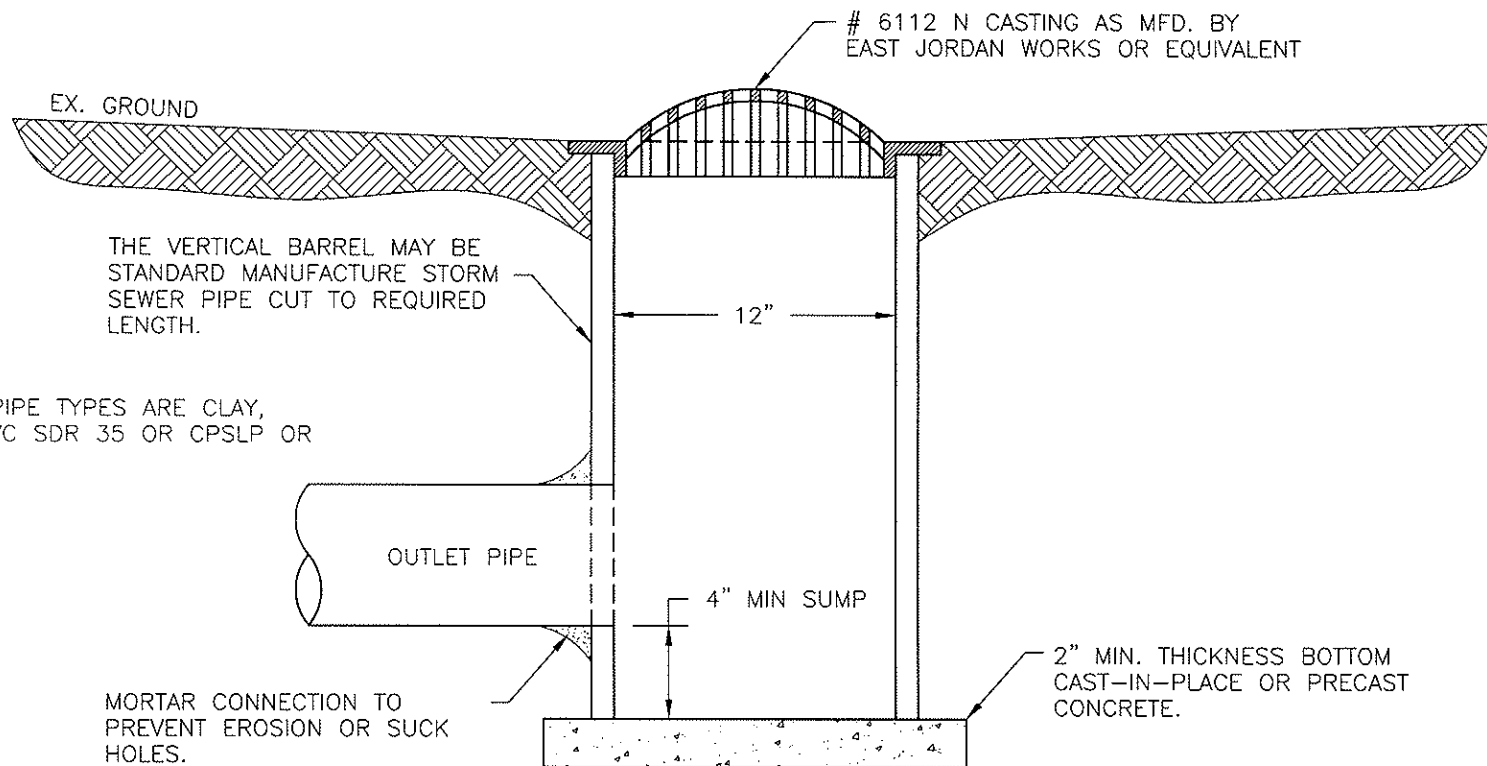
## NOTES

1. LOCATION AND ELEVATIONS WHEN GIVEN ON THE PLANS ARE TOP BACK OF GRATE. WHEN SIDE OPENINGS ARE PROVIDED, ELEVATION SHALL BE THE FLOW LINE OF THE SIDE INLET.
2. GRATE FOR NONPAVED AREA SHALL BE EAST JORDAN IRON WORKS 5110 TYPE M3 OR NEENAH CATALOG NO. R-4859-C OR EQUIVALENT.
3. GRATE ELEVATION TO BE PLACED 4" TO 6" BELOW NORMAL DITCH RETURNING TO NORMAL 10' EACH SIDE OF BASIN.
4. FOR COMBINATION CURB AND GUTTER. THE CASTING SHALL BE EAST JORDAN 7030 TYPE T4 OR NEENAH (3" RADIUS) R-3246-1 OR EQUIVALENT.
5. FOR COMBINATION ROLL CURB AND GUTTER. THE CASTING SHALL BE NEENAH R-3501-N OR EQUIVALENT.
6. CONCRETE, CAST-IN-PLACE, TO BE CLASS C. ALL PRECAST CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6 +/- 2% AIR VOID CONTENT IN THE HARDENED CONCRETE AND BE MARKED WITH CATCH BASIN NUMBER. OPENINGS FOR PIPES SHALL BE O.D. +2" WHEN FABRICATED OR FIELD CUT.
7. 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.
8. 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.
9. CARE SHALL BE TAKEN WHEN CONNECTING TO AN EXISTING CATCH BASIN TO KEEP OPENING AS MINIMAL AS 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.

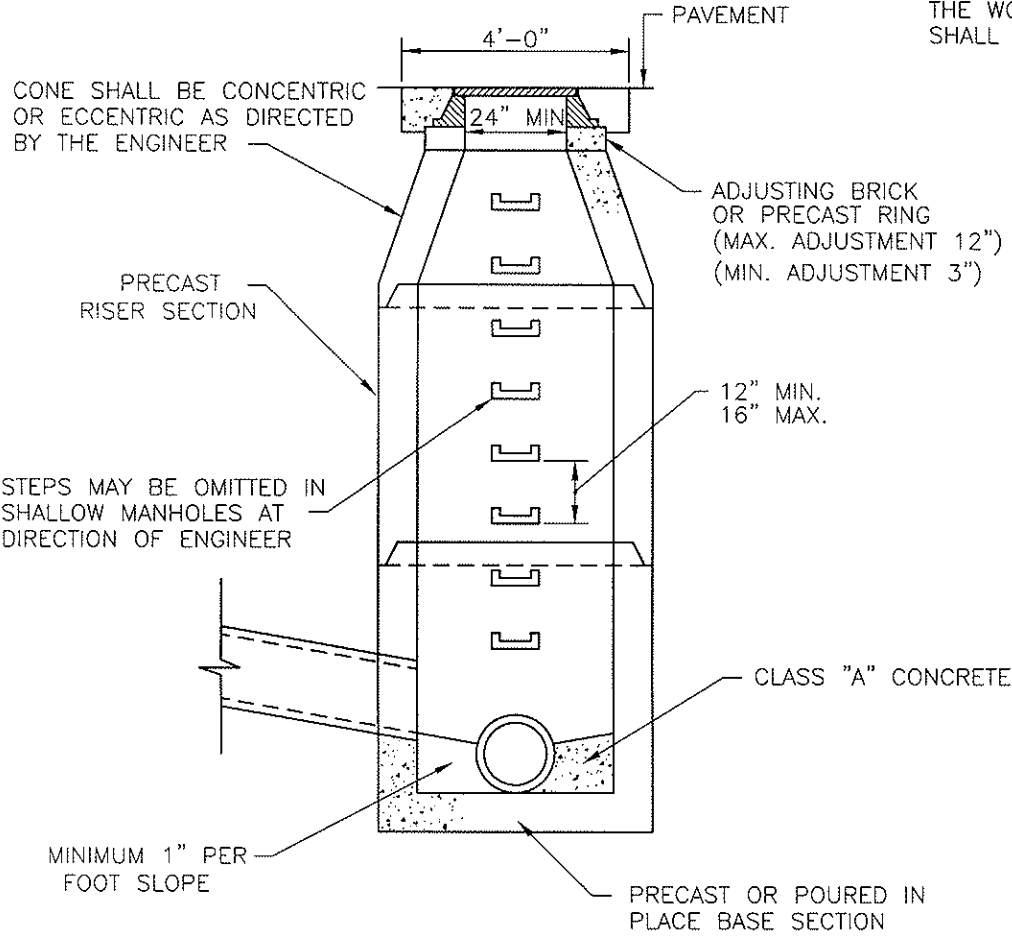


### NOTES

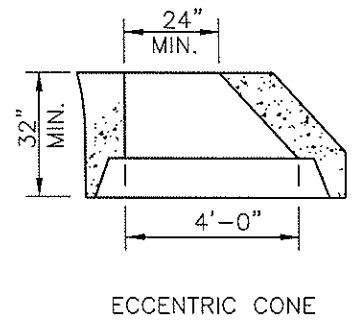
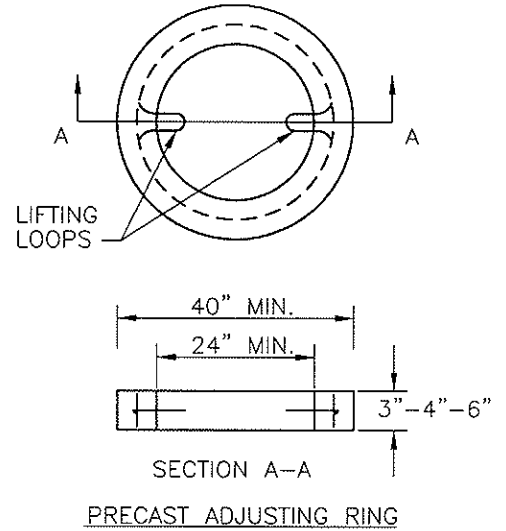
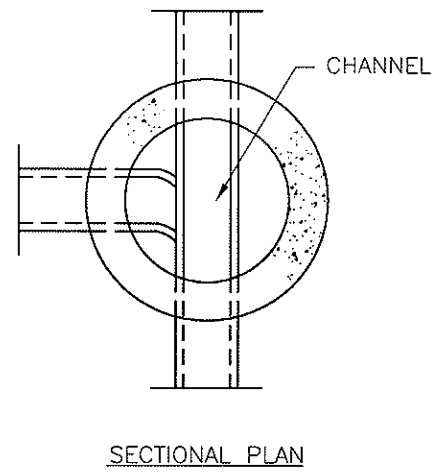
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4. FOR COMBINATION ROLL CURB AND GUTTER. THE CASTING SHALL BE NEENAH R-3501-N OR EQUIVALENT.
5. PRECAST CONSTRUCTION PERMITTED EXCEPT FOR THE APRON AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH 6+/-2% AIR VOID CONTENT IN THE HARDED CONCRETE.
6. 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.
7. DROP FLOW LINE 1/2" WITHIN BLOCKOUT OF COMBINED CURB AND GUTTER WHILE KEEPING LIP OF GUTTER CONSISTENT WITH TOP OF CURB.

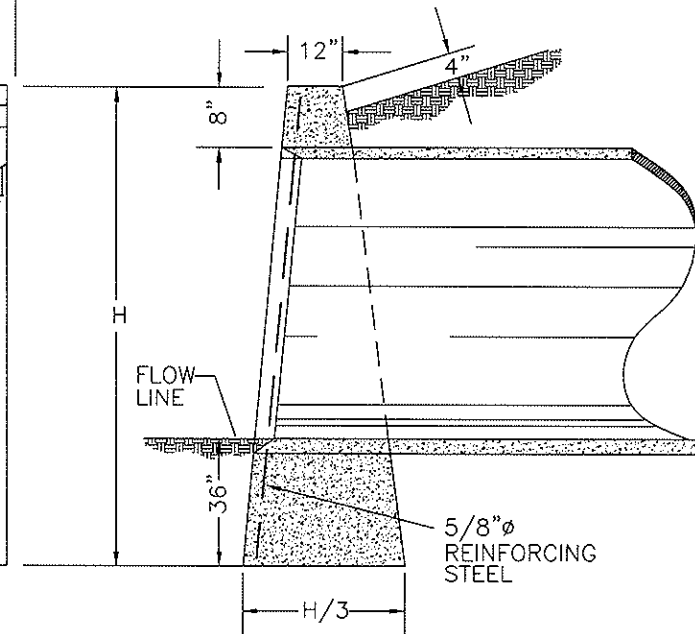
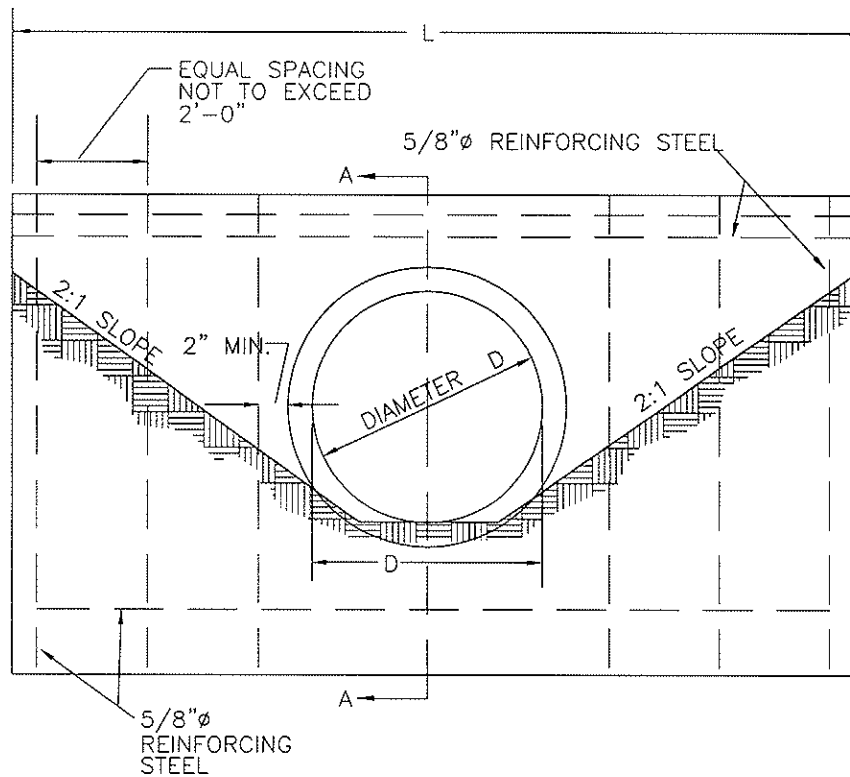






NOTE:  
THE WORDS "STORM SEWER"  
SHALL BE CAST ON THE LID





SECTION A-A

| DIMENSIONS |        |        | QUANTITIES<br>ONE HEADWALL |                            |
|------------|--------|--------|----------------------------|----------------------------|
| DIAMETER   | H      | L      | CONCRETE<br>CU. YDS.       | REINFORCING<br>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                        |



**Fanning/Howey**  
Civil Engineering Division  
Engineers Surveyors Consultants

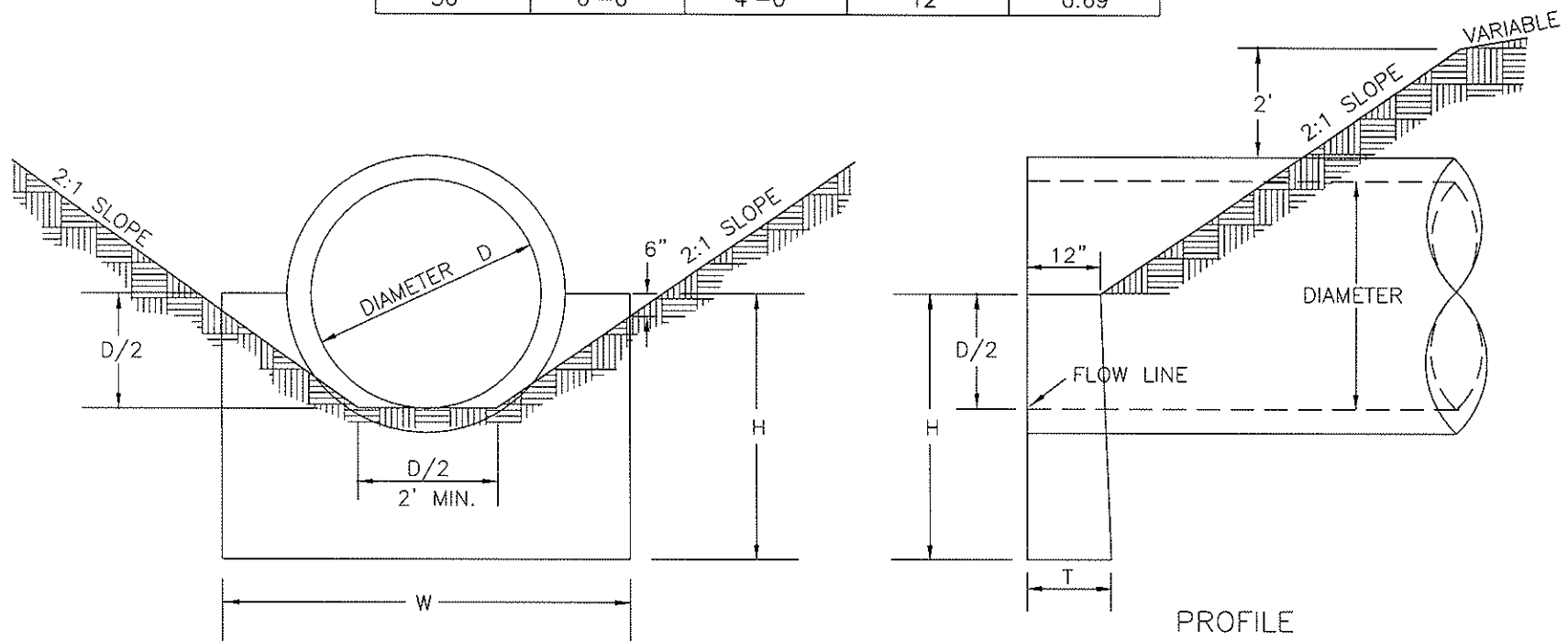
DATE: JANUARY 25, 2005

## FULL-HEIGHT HEADWALL

**VILLAGE OF  
PLEASANT HILL**

PAGE No.  
600-6

| HEADWALL FOR<br>CIRCULAR PIPE |       |       |     |                      |
|-------------------------------|-------|-------|-----|----------------------|
| D                             | W     | H     | T   | CONCRETE<br>CU. YDS. |
| 12"                           | 2'-0" | 3'-0" | 12" | 0.20                 |
| 15"                           | 2'-6" | 3'-2" | 12" | 0.25                 |
| 18"                           | 3'-0" | 3'-3" | 12" | 0.31                 |
| 21"                           | 3'-6" | 3'-4" | 12" | 0.37                 |
| 24"                           | 4'-0" | 3'-6" | 12" | 0.43                 |
| 36"                           | 6'-0" | 4'-0" | 12" | 0.69                 |



## **SEDIMENT & EROSION CONTROL GENERAL NOTES**

THE CONTRACTOR SHALL IMPLEMENT SOIL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION TO MEET THE STANDARDS AND SPECIFICATIONS OF THE STATE OF OHIO AND THEY ARE TO REMAIN IN EFFECT UNTIL AREAS ARE PERMANENTLY STABILIZED.

THE CONTRACTOR SHALL PLACE STRAW BALES OR SILT FENCE IN CONJUNCTION WITH DANDY BAGS OVER GRATES FOR EROSION CONTROL IMMEDIATELY AFTER CONSTRUCTION OF CATCH BASINS.

THE CONTRACTOR SHALL MAKE DAILY INSPECTIONS OF THE SITE TO INSURE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES AND WILL IMMEDIATELY MAKE NECESSARY REPAIRS IN ACCORDANCE WITH THE MAINTENANCE SCHEDULE SHOWN ON THIS PLAN.

IT MAY BECOME NECESSARY TO REMOVE PORTIONS OF THE BARRIER DURING CONSTRUCTION TO FACILITATE THE GRADING OPERATIONS IN CERTAIN AREAS. HOWEVER, THE BARRIER SHALL BE IN PLACE IN THE EVENING OR DURING ANY INCLEMENT WEATHER.

EROSION AND ANY SEDIMENTATION FROM THE WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT IN ANY OFF-SITE DRAINAGE COURSE, WHETHER NATURAL OR MAN-MADE.

ALL EARTH CHANGES SHALL BE CONSTRUCTED AND COMPLETED IN SUCH A MANNER TO LIMIT THE EXPOSED AREA OF ANY DISTURBED LAND FOR THE SHORTEST PERIOD OF TIME.

ALL CONSTRUCTION TRAFFIC SHALL ENTER AND LEAVE BY THE DESIGNATED ENTRANCE. THIS ENTRANCE SHALL BE CONSTRUCTED OF CRUSHED STONE TO HELP FREE TIRES OF SOIL WHEN LEAVING THE SITE. THE CONTRACTOR SHALL INSTRUCT ALL VEHICLES TO CLEAN SOIL, MISCELLANEOUS DEBRIS, OR OTHER MATERIAL SPILLED, DUMPED OR OTHERWISE DEPOSITED ON PUBLIC STREETS, HIGHWAYS, SIDEWALKS OR OTHER PUBLIC THOROUGHFARES DURING TRANSIT TO AND FROM THE SITE.

THE CONTRACTOR SHALL INSTALL TEMPORARY EROSION AND SEDIMENTATION DEVICES AS SHOWN AND REQUIRED BY THESE PLANS. THESE DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED UNTIL PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER EARTH CHANGES HAVE BEEN ACCOMPLISHED.

CATCH BASINS LOCATED IN THE STREET OR NEAR THE SITE WILL BE PROTECTED TO PREVENT SEDIMENTATION FROM ENTERING FACILITY. THE COVERS SHALL BE CHECKED PERIODICALLY AND CLEANED WHENEVER THEY FAIL TO FILTER RUNOFF.

WHERE APPLICABLE, THE DETENTION BASIN SHALL BE USED AS A TEMPORARY SEDIMENTATION BASIN. THE CONTRACTOR SHALL INSTALL A TEMPORARY PIPE SPILLWAY AT THE OUTLET. ALL SURFACE RUNOFF FROM THE PROJECT AREAS SHALL BE DIRECTED BY TEMPORARY DRAINAGE SWALES TO THE BASINS. AT THE COMPLETION OF CONSTRUCTION WHEN ALL DISTURBED AREAS HAVE BEEN STABILIZED THE BASINS SHALL BE CAREFULLY DRAINED WITHOUT DISTURBING THE SETTLED SILT, AND THEN GRADED AND SODDED TO CONFORM TO THE SITE GRADING PLAN.

THE LIMITS OF SEEDING AND MULCHING ARE AS SHOWN WITHIN THE PLAN. SEEDING HAS BEEN ASSUMED TO 5' OUTSIDE THE WORK LIMITS OR RIGHT-OF-WAY WHICHEVER IS GREATER. ALL AREAS NOT DESIGNATED TO BE SEEDED SHALL REMAIN UNDER NATURAL GROUND COVER. THOSE AREAS DISTURBED OUTSIDE THE SEEDING LIMITS SHALL BE SEEDED AND MULCHED AT THE CONTRACTOR'S EXPENSE.

THE CONTRACTOR SHALL MAINTAIN A BUFFER STRIP AS DESIGNATED ON THE PLAN TO PREVENT SEDIMENT FROM LEAVING SITE. THIS STRIP SHALL BE MAINTAINED AT ALL TIMES AND NO SOIL SHALL BE PLACED ON THIS STRIP.

ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO OR IN CONJUNCTION WITH, THE START OF EXCAVATION AND ARE TO REMAIN IN EFFECT UNTIL AREAS ARE STABILIZED. FIELD ADJUSTMENTS WITH RESPECT TO LOCATION AND DIMENSIONS MAY BE MADE BY THE ENGINEER AS REQUIRED.

FILTER BARRIERS CONSIST OF EITHER STRAW BALE FILTERS OR FILTER FABRIC AS SHOWN HEREIN.

## **SEQUENCE OF SEDIMENT & EROSION CONTROL OPERATIONS**

- A) STRIP TOPSOIL AND UNUSABLE MATERIAL.
- B) INSTALL GRAVEL ACCESS DRIVE AND PERIMETER FILTER (TOPSOIL BERM AND/OR FILTER BARRIER).
- C) INSTALL SANITARY SEWER AND WATERMAIN.
- D) CONSTRUCT STORM DRAIN. DURING CONSTRUCTION OF STORM DRAINS THE ENDS OF ALL OPEN PIPES SHALL BE PROTECTED BY FILTER BARRIERS OR OTHER APPROVED MEANS.
  - 1) UPON BACKFILL OF STORM STRUCTURES, FILTER BARRIERS SHALL BE PLACED.
  - 2) CONSTRUCT TEMPORARY SWALES TO DRAINAGE STRUCTURES.
  - 3) WHEN FILTER BARRIERS ARE REMOVED FROM AROUND PAVEMENT CATCH BASINS TO ALLOW FOR STRIPPING, GRADING, AND PAVING. STORM STRUCTURES SHALL BE PROTECTED FROM ERODING EARTH AND SEDIMENT AT ALL TIMES.
- E) CONSTRUCTION FOUNDATIONS, ERECT STRUCTURES AND APPURTENANCES.
- F) EXECUTIVE GRADING AND FILLING OPERATIONS AROUND BUILDINGS AND IN YARD AREAS.
- G) EXCAVATE FOR PARKING AND ROADWAYS. IF PLACEMENT OF AGGREGATE BASE LAGS BEHIND THE FINAL SUB-BASE GRADING BY MORE THAN FIVE DAYS, SUB-BASE SHALL BE SCARIFIED PERPENDICULAR TO THE SLOPE TO PREVENT EROSION.
- H) UPON COMPLETION OF PAVING, THE AREA AROUND PAVEMENT SHALL BE PROTECTED FROM EROSION BY AN APPROVED METHOD CONSISTENT WITH THE GROWING SEASON.
- I) ANY REMAINING EXPOSED AREAS SHALL BE SEEDED AND MULCHED OR SODDED WITHIN 30 DAYS OF FINAL GRADING.

## **MAINTENANCE**

STRAW BALE AND OR SILT FENCE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.

CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, SILT FENCE, END RUNS, AND UNDERCUTTING BENEATH BALES OR SILT FENCE.

NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.

SEDIMENT DEPOSIT SHOULD BE REMOVED AFTER EACH RAINFALL. THEY MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

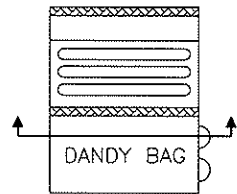
## MAINTENANCE

SILT FENCES AND BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

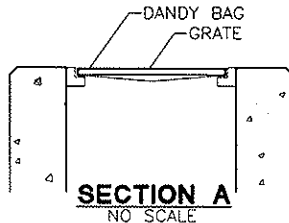
SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER IS STILL NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE PREPARED AND SEEDED.



TO BE USED ON ALL STRUCTURES



INSTALLATION: STAND GRATE ON END, PLACE DANDY BAG, OVER GRATE, FLIP GRATE OVER SO THAT OPEN END IS UP, PULL UP SLACK, TUCK FLAP IN. BE SURE END OF GRATE IS COMPLETELY COVERED BY FLAP OR DANDY BAG WILL NOT FIT PROPERLY. HOLDING HANDLES, CAREFULLY PLACE DANDY BAG WITH GRATE INSERTED INTO CATCH BASIN FRAME SO THAT RED DOT ON THE TOP OF THE DANDY BAG IS VISIBLE.

MAINTENANCE: AFTER SILT HAS DRIED, REMOVE IT FROM THE SURFACE OF DANDY BAG WITH BROOM.

## SPECIFICATIONS FOR SEEDING & MULCHING

| SEED TYPE                              | SEEDING RATES                    | PER 1000 SQ. FT.                              | PER ACRE                                       |
|--|----------------------------------|---|--|
| TALL FESCUE<br>&<br>ANNUAL<br>RYEGRASS | MARCH 1<br>TO<br>SEPTEMBER 15    | 2 POUNDS<br>&<br>1/2 POUNDS                   | 80 POUNDS<br>&<br>20 POUNDS                    |
| SMALL<br>GRAIN<br>STRAW                |                                  | 100 POUNDS OR<br>2 OR 3 BALES                 | 2 TON OR<br>50 BALES                           |
| FERTILIZER                             |                                  | 25 POUNDS OF<br>12-12-12 OR THE<br>EQUIVALENT | 100 POUNDS OF<br>12-12-12 OR THE<br>EQUIVALENT |
| TEMPORARY SEEDING                      |                                  |   |  |
| RYE<br>OR<br>WHEAT                     | SEPTEMBER 15<br>TO<br>OCTOBER 30 | 3 POUNDS                                      | 2 BUSHELS                                      |
| SOIL PROTECTION                        |                                  |   |  |
| SMALL<br>GRAIN<br>STRAW<br>MULCH       | OCTOBER 30<br>TO<br>MARCH 1      | 2 TO 3 BALES                                  | 2 TONS   |

## CONSTRUCTION ENTRANCE

STONE SIZE - No. 2 (2-1/2" TO 1-1/2") OR ITS EQUIVALENT.

LENGTH - AS EFFECTIVE, BUT NOT LESS THAN 50 FEET.

THICKNESS - NOT LESS THAN EIGHT (8) INCHES.

WIDTH - NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.

WASHING - WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS OR OTHER APPROVED METHODS.

MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

## SEDIMENT & EROSION CONTROL 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 THE FOLLOWING STANDARDS:

THING OF SEDIMENT--TAPPING 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 DAYS FROM THE START OF GRUBBING. THEY SHALL CONTINUE TO FUNCTION UNTIL THE UPSLOPE DEVELOPMENT AREA IS RESTABLIZED.

STABILIZATION OF STRIPPED AREA. STRIPPED AREAS SHALL HAVE SOIL STABILIZATION APPLIED WITHIN SEVEN DAYS IF THEY ARE TO REMAIN DORMANT FOR MORE THAN FORTY-FIVE DAYS. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE, AND SHALL ALSO BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE, BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN FORTY-FIVE DAYS.

SEDIMENT BARRIER. STREET FLOW RUNOFF FROM STRIPPED AREAS SHALL BE FILTERED OR DIVERTED TO A SETTLING FACILITY.

STORM SEWER INLET PROTECTION. ALL STORM SEWER INLETS WHICH ACCEPT WATER RUNOFF FROM THE DEVELOPMENT AREA SHALL BE PROTECTED SO THAT SEDIMENT--LADEN WATER 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.

WORKING IN OR CROSSING STREAMS:

A. STREAMS INCLUDING BED AND BANKS SHALL BE DESTABILIZED IMMEDIATELY AFTER IN--CHANNEL WORK IS COMPLETED, INTERRUPTED, OR STOPPED.

TO THE EXTENT PRACTICAL, 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.

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.

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 VILLAGE ADMINISTRATOR AND, WHEN APPLICABLE, THE U.S. ARMY CORPS OF ENGINEERS, FOR SUCH PURPOSES AS, BUT NOT LIMITED TO CONSTRUCTION BRIDGES, CULVERTS, AND EROSION CONTROL STRUCTURES.

B. UNSTABLE SOILS PRONE TO SLIPPING OR LANDSLIDING 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.

CUT AND FILL SLOPES. CUT AND FILL SLOPES SHALL BE 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.

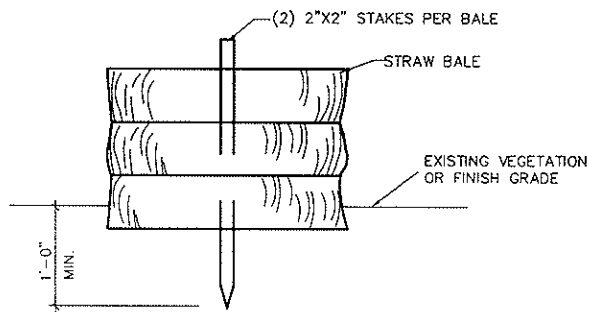
STABILIZATION OF OUTFALLS AND CHANNELS. OUTFALLS AND CONSTRUCTION OF MODIFIED CHANNELS SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND THE EXPECTED VELOCITY OF FLOW FROM A POST--DEVELOPMENT, TEN--YEAR FREQUENCY STORM WITHOUT ERODING.

ESTABLISHMENT OF PERMANENT VEGETATION. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL GROUND COVER IS ACHIEVED WHICH, IN THE OPINION OF THE APPROVING AGENCY, PROVIDES ADEQUATE COVER AND IS MATURE ENOUGH TO CONTROL SOIL EROSION SATISFACTORILY AND TO SURVIVE ADVERSE WEATHER CONDITIONS.

DISPOSITION OF TEMPORARY PRACTICES. ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE DISPOSED OF WITHIN THIRTY 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.

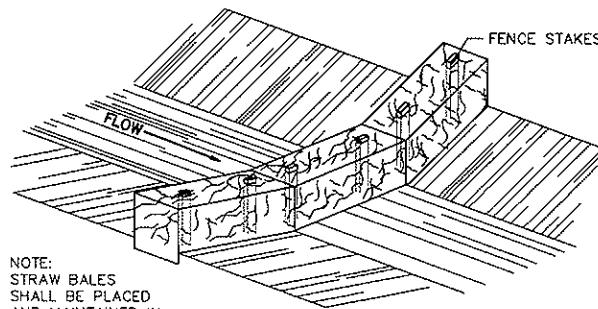
MAINTENANCE. ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE DESIGNED AND CONSTRUCTED TO MINIMIZE MAINTENANCE REQUIREMENTS. THEY SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. THE PERSON OR ENTITY RESPONSIBLE FOR THE CONTINUED MAINTENANCE OF PERMANENT EROSION CONTROLS SHALL BE IDENTIFIED TO THE SATISFACTION OF THE PLAN--APPROVING AUTHORITY AND IDENTIFIED BY THE SUBDIVIDER'S AGREEMENT.

THE COST FOR TEMPORARY CHANNELS, SEDIMENT DAMS AND OTHER APPURTENANT EARTH MOVING OPERATIONS SHALL BE INCLUDED IN THE PRICE BID FOR EARTHWORK.



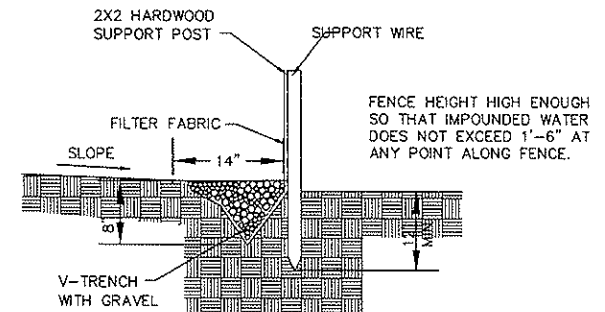
THE NUMBER OF SIDES OF THE FILTER MAY VARY DEPENDING UPON THE LOCATION AND TYPE OF INTAKE STRUCTURE.  
PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED TO INSURE THAT THE STRAW BALE FILTER AT INLETS OPERATES EFFICIENTLY.  
TYP. DETAIL AROUND ALL INLETS. ALL INLETS ARE TO BE WRAPPED IN SAME MATERIAL AS IS USED TO CONSTRUCT SILT FENCE.

### STRAW BALE CROSS SECTION



NOTE:  
STRAW BALES SHALL BE PLACED AND MAINTAINED IN SWALE SO TO PREVENT SILT AND DEBRIS FROM ENTERING INTO DOWNSTREAM DRAINAGE FACILITIES DURING CONSTRUCTION. THEY SHALL REMAIN IN PLACE UNTIL ADEQUATE VEGETATION IS ESTABLISHED WITHIN THE SITE. SUCH STRAW BALES SHALL BE FIRMLY SECURED TO THE GROUND WITH FENCE STAKES.

### STRAW BALE DETAIL



### SILT FENCE DETAIL

### SEDIMENT FENCE DETAIL

SILT FENCES. THIS SEDIMENT BARRIER UTILIZES STANDARD STRENGTH OR EXTRA STRENGTH SYNTHETIC FILTER FABRICS. IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED.

THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES (HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE TO THE STRUCTURE.

THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM 6-INCH OVERLAYS AND SECURELY SEALED.

WHEN STANDARD STRENGTH FILTER FABRIC IS USED A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT, FENCE POST SPACING SHALL NOT EXCEED 6 FEET.

A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FORM THE BARRIER.

THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.

WHEN EXTRA STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED IN SUCH A CASE THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS.

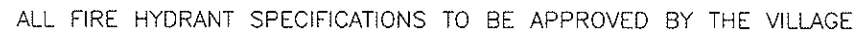
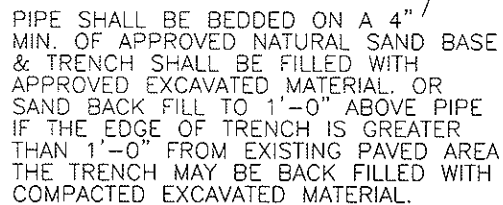
THE TRENCH SHALL BE BACKFILLED AND SOIL COMPACTED OVER THE FILTER FABRIC.

SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

**WATER DISTRIBUTION**

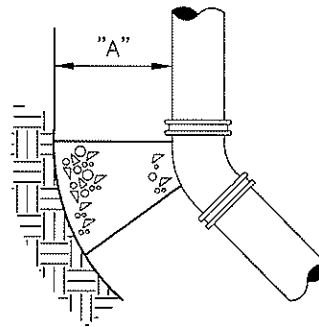
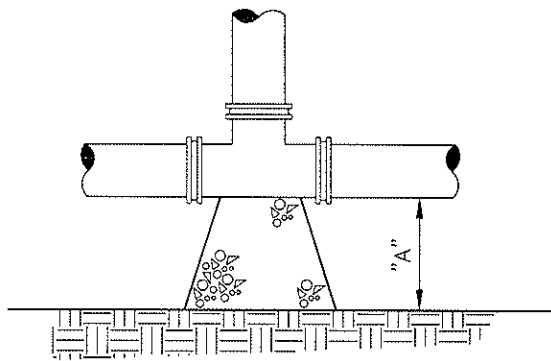
**DIVISION 800**





RESILIENT WEDGE GATE VALVE  
MUELLER / FORD OR EQUAL  
NON RISING STEM  
OPEN LEFT  
2" SQUARE NUT  
RATED 200 PSI SHELL TEST 400PSI  
AWWA C502

MUELLER OR EQUAL  
5" PUMPER  
2-2.5" NOZZLES  
6" M. J. INLET  
5.25" OPENING  
BURY - VARIES  
AWWA C502



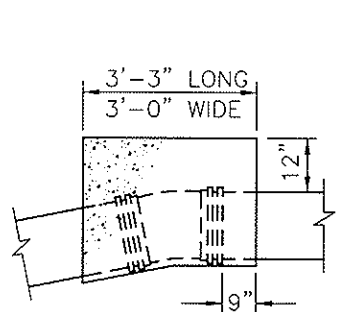
ELBOWS

| ELBOWS              |             |              |      |         |         |
|---------------------|-------------|--------------|------|---------|---------|
| PIPE DIA.<br>INCHES | "A"<br>FEET | BEARING AREA |      |         |         |
|                     |             | 90°          | 45°  | 22-1/2° | 11-1/4° |
| 4                   | 1.5         | 2.1          | 1.1  | 0.6     | 0.3     |
| 6                   | 2.0         | 4.1          | 2.2  | 1.1     | 0.6     |
| 8                   | 2.0         | 6.8          | 3.7  | 1.9     | 0.9     |
| 10                  | 2.5         | 10.1         | 5.5  | 2.8     | 1.4     |
| 12                  | 3.0         | 14.1         | 7.6  | 3.9     | 2.0     |
| 16                  | 3.0         | 24.2         | 13.0 | 6.7     | 3.3     |
| 18                  | 3.0         | 30.0         | 16.3 | 8.3     | 4.2     |
| 20                  | 3.0         | 36.8         | 19.9 | 10.1    | 5.1     |

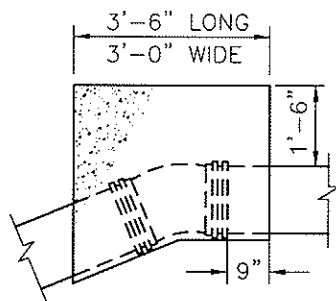
### TEST, PLUGS & HYDRANTS

1. THRUST BLOCK SHALL BE  $f_c=2500$  PSI @ 28 DAYS (SEE SPECIFICATIONS SECTION 03300)
2. ALL THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.
3. BOLTS, FITTINGS & JOINTS SHALL BE KEPT CLEAR OF CONCRETE.
4. A BEARING CAPACITY OF 2000# PER FOOT IS UTILIZED IN DETERMINING THE MINIMUM "BEARING AREAS" IN THE ABOVE TABLES.
5. THE CROSS SECTION OF THE THRUST BLOCKS SHALL BE SQUARE.

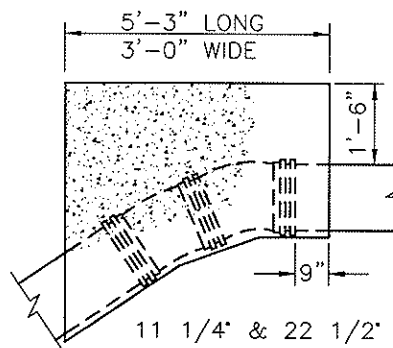
| TEES, PLUGS & HYDRANTS |             |                             |
|------------------------|-------------|-----------------------------|
| PIPE DIA.<br>INCHES    | "A"<br>FEET | BEARING AREA<br>SQUARE FEET |
| 4                      | 2.0         | 1.5                         |
| 6                      | 2.0         | 2.9                         |
| 8                      | 2.5         | 4.8                         |
| 10                     | 2.5         | 7.1                         |
| 12                     | 3.0         | 10.0                        |
| 16                     | 3.0         | 17.1                        |
| 18                     | 3.5         | 21.0                        |
| 20                     | 4.0         | 26.0                        |



11 1/4° BEND



22 1/2° BEND

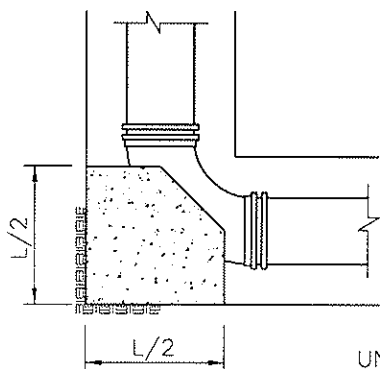


11 1/4° & 22 1/2°

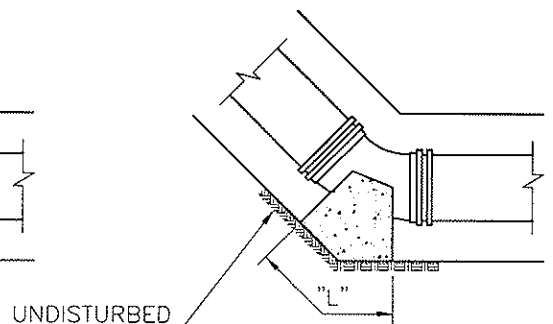
### CONCRETE BLOCKING FOR VERTICAL BENDS

1. CLASS "A" CONCRETE TO BE USED FOR ALL BLOCKING

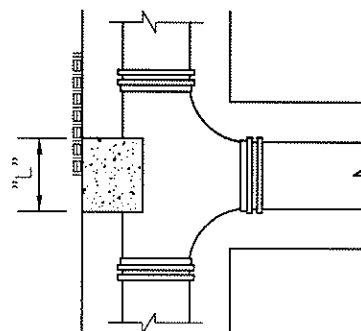
2. TIED OR RESTRAINED JOINTS MAY BE USED IN LIEU OF CONCRETE BLOCKING AT THE DIRECTION OF THE ENGINEER.



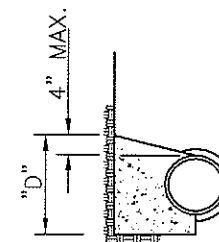
90° BENDS



BENDS LESS THAN 90°



TEES



TYPICAL SECTION

### CONCRETE BLOCKING FOR HORIZONTAL BENDS

| SIZE OF PIPE | BENDS          |     |         |     |     |     |     |     |
|--------------|----------------|-----|---------|-----|-----|-----|-----|-----|
|              | 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" |

| RUN        | TEES       |     |     |     |     |     |     |     |
|------------|------------|-----|-----|-----|-----|-----|-----|-----|
|            | BRANCH     |     |     |     |     |     |     |     |
|            | 3", 4", 6" |     | 8"  |     | 12" |     | 16" |     |
|            | L          | D   | L   | D   | L   | D   | L   | D   |
| 3", 4", 6" | 16"        | 7"  |     |     |     |     |     |     |
| 8"         | 14"        | 8"  | 18" | 12" |     |     |     |     |
| 12"        | 9"         | 12" | 18" | 12" | 24" | 18" |     |     |
| 16"        | 8"         | 16" | 14" | 16" | 28" | 16" | 30" | 26" |

## SPECIFICATIONS

ALL MATERIAL AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE VILLAGE STANDARDS AND SPECIFICATION. WATERLINES SHALL BE INSTALLED, TESTED AND STERILIZED UNDER THE DIRECT SUPERVISION OF THE VILLAGE. NO DEVIATION FROM THESE SPECIFICATIONS WILL BE PERMITTED. DETAIL SPECIFICATIONS MAY BE OBTAINED FROM THE VILLAGE. EXCEPT AS MODIFIED BY THESE PLANS AND BY THE DETAIL SPECIFICATIONS PERTAINING THERETO, ALL WORK ON THIS PROJECT SHALL BE GOVERNED BY THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION. CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 1997 AND BY SUCH SUPPLEMENTAL STATE SPECIFICATIONS AS MAY BE IN EFFECT 14 CALENDAR DAYS PRIOR TO THE AWARD OF THIS PROJECT. IN THE AFORESAID SPECIFICATIONS, THE WORD "STATE", "DIRECTOR", AND "ENGINEER" SHALL BE HELD TO MEAN THE VILLAGE OR HIS REPRESENTATIVE. THE SPECIFICATIONS OF THE AMERICAN NATIONAL STANDARDS INSTITUTE(ANSI), AMERICAN WATER WORKS ASSOCIATION (AWWA) AND THE AMERICAN SOCIETY OF TESTING AND MATERIALS(ASTM) HEREIN REFERRED TO, UNLESS OTHERWISE NOTED, SHALL BE THE LATEST SPECIFICATIONS OF THE RESPECTIVE ORGANIZATIONS. ALL MATERIAL SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA. COPIES OF SUPPLIERS INVOICES SHALL BE SUBMITTED TO THE ENGINEER.

## WATER SUPPLY PIPE

ALL WATER MAINS SHALL BE PVC CONFORMING WITH AWWA C-900 DR 18. PIPE MAY BE EITHER OF THE MECHANICAL OR SLIP JOINT TYPE.

## VALVE BOXES

HYDRANT BRANCH VALVES ARE TO BE ENCLOSED IN A STANDARD VALVE BOX. VALVE BOXES SHALL BE OF THE BUFFALO THREE PIECE SCREW TYPE, WITH A 5 1/4 INCH SHAFT; LIMITED TO THE FOLLOWING:

BUFFALO PIPE AND FOUNDRY COMPANY NO. B5001

ALABAMA PIPE COMPANY NO. H10357

CLOW CORPORATION NO. F2450

WITH CAST IRON FULL FLANGED RING, OR APPROVED EQUAL. (SEE 800-11 FOR DETAILS).

## GATE VALVES

GATE VALVES SHALL BE CAST IRON BODIED, BRONZE MOUNTED DOUBLE DISC WITH PARALLEL SEATS, OR RESILIENT SEAT, CORROSION-RESISTANT, 200 POUND WORKING PRESSURE, NON-RISING STEM TYPE INTENDED FOR USE IN VERTICAL SETTINGS. GATE VALVES, 12" OR SMALLER, SHALL BE LIMITED TO VALVES MADE BY RENNSELEAR, MUELLER, KENNEDY, U.S. VALVE OR AMERICAN VALVE COMPANIES AWWA C-500 OR AWWA C-509 (RESILIENT SEAT) AS APPROVED BY THE VILLAGE.

VALVES ARE TO OPEN BY TURNING LEFT, OR COUNTERCLOCKWISE, AND SHALL BE FURNISHED WITH A 2 INCH SQUARE OPERATING NUT WITH THE DIRECTION INDICATED BY A CLEARLY VISIBLE ARROW CAST INTO THE VALVE.

## FIRE HYDRANTS

HYDRANTS SHALL BE THE MANUFACTURER'S LATEST AND BEST DESIGN, HOWEVER, THE ONLY ACCEPTABLE MODELS WILL BE THOSE IN MASS PRODUCTION A MINIMUM OF FIVE (5) YEARS. ALL HYDRANTS SHALL CONFORM TO THE LATEST AWWA STANDARD SPECIFICATION C-502.

HYDRANTS SHALL BE OF THE 5 1/4 INCH VALVE OPENING COMPRESSION TYPE, OPENING AGAINST AND CLOSING WITH THE WATER PRESSURE, OPENING BY TURNING THE OPERATING NUT TO THE LEFT, COUNTERCLOCKWISE DIRECTIONS. HYDRANTS TO BE USED IN THE VILLAGE DISTRIBUTION SYSTEM SHALL BE LIMITED TO THE FOLLOWING (MEETING AWWA C-502):

DEVELOPER TO CONFIRM WITH VILLAGE UTILITY DEPARTMENT ON TYPE OF HYDRANT

ALL REQUIRED THREAD SIZES SHALL BE OF THE SAME SIZE AND TYPE USED IN VILLAGE SYSTEM.

HYDRANT REPLACEMENT PARTS, INCLUDING EXTENSIONS, CAPS, NOZZLES AND ALL EXTERNAL PARTS SHALL BE OF SAME MANUFACTURER AS HYDRANT. CONTRACTOR SHALL SUPPLY COPIES OF INVOICES OF REPLACEMENT PARTS. CAPS SHALL HAVE GASKETS AND BE SECURED TO THE HYDRANT BY HOT-DIPPED, WELDED, GALVANIZED CHAINS OF 3/16 " DIAMETER.

ALL HYDRANTS TO BE FIELD PAINTED WITH MACHINERY ENAMEL TO MATCH EXISTING COLORS WITHIN THE VILLAGE.

ALL PAINT TO BE SUPPLIED BY THE CONTRACTOR/DEVELOPER.

SPACING OF HYDRANTS NOT TO EXCEED 350' & PLACED ON PROPERTY LINES WHENEVER POSSIBLE.

## PROTECTION AND PAINTING

ALL IRON PARTS OF VALVES AND ACCESSORIES SHALL BE PAINTED BEFORE LEAVING THE SHOP WITH TWO COATS OF ACCEPTABLE HIGH GRADE BITUMINOUS PAINT. THE VALVES SHALL BE PROTECTED AT ALL TIMES FROM RUST OR DAMAGES, BOTH BEFORE AND AFTER INSTALLATION, UNTIL THE COMPLETION OF THE CONTRACT.

## TAPPING VALVES

TAPPING SLEEVES AND VALVES AND 3/4 INCH CHLORINATION TAPS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. ALL EXCAVATION AND BACKFILL WILL BE PERFORMED BY THE CONTRACTOR.

## INSTALLATION

THE PIPE SHALL BE LAID ON A PROPERLY SHAPED AND FIRM, GRANULAR BEDDING MEETING REQUIREMENTS OF ITEM 310.02 OF THE 1967 SPECIFICATIONS, OHIO DEPARTMENT OF HIGHWAYS WHERE CONDITIONS WARRANT, UNSUITABLE MATERIAL SHALL BE REMOVED AND GRANULAR MATERIAL CONFORMING TO THE SPECIFICATION SHALL BE USED FOR BEDDING.

ALL PIPE AND APPURTENANCES SHALL BE INSTALLED TRUE TO LINE, GRADE, AND LOCATION; WITH JOINTS CENTERED, SPIGOTS HOME; PROPER SUPPORT AND RESTRAINT PROVIDED; AND ALL VALVE STEMS PLUMB. CARE SHALL BE USED TO LAY THE PIPE SO THAT IT IS SUPPORTED BY THE FULL LENGTH OF THE BARREL.

THE PIPE SHALL HAVE APPROXIMATELY 5' OF COVER. WHERE CONFLICTS OCCUR WITH OTHER UTILITIES A MINIMUM OF 18 INCH VERTICAL SEPARATION IS REQUIRED. WHERE SPECIAL CONDITIONS WARRANT, THE DEPTH OF COVER MAY BE CHANGED.

## BACKFILLING

ALL TRENCHES AND EXCAVATIONS SHALL BE BACKFILLED IMMEDIATELY AFTER PIPE IS LAID THEREIN. NO MATERIAL SHALL BE USED FOR BACKFILLING THAT CONTAINS STONES, ROCKS OR PIECES OF MASONRY, FROZEN EARTH, DEBRIS OR EARTH WITH AN EXCEPTIONALLY HIGH VOID CONTENT. TRENCHES OUTSIDE THE LIMITS OF 5 FEET FROM THE BACK OF THE CURB SHALL BE BACKFILLED WITH THOROUGHLY TAMPED GRANULAR MATERIAL A MINIMUM OF 12 INCHES ABOVE THE TOP OF THE PIPE. THE REMAINDER OF THE TRENCH MAY BE FILLED WITH EXCAVATED MATERIAL, INSOFAR AS IT IS OF SUITABLE CHARACTER.

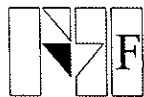
TRENCHES WITHIN 5 FEET OF EDGE OF PAVEMENT OR BACK OF CURB SHALL BE BACKFILLED WITH THOROUGHLY TAMPED GRANULAR MATERIAL TO THE PAVEMENT SUBGRADE. GRANULAR BACKFILL SHALL CONFORM TO THE GRADATION REQUIREMENTS OF ITEM 310.02 OF THE 1967 O.D.O.T. SPECIFICATIONS (MAXIMUM DRY DENSITY EXCEEDING 105 LBS./CU.FT. AND COMPACTION TO 98% OF THE STANDARD PROCTOR TEST) OR ITEM 603.08 OF THE CURRENT ODOT SPECIFICATIONS. BACKFILL UNDER PAVEMENT AREAS SHALL MEET CURRENT O.D.O.T. SPECIFICATIONS (603.08, TYPE "B") WITH THE RESTRICTION THAT MATERIAL SHALL BE ITEM 304 OR ITEM 310.02.

## STERILIZATION

THE CONTRACTOR SHALL CHLORINATE ALL PIPE LINES, AND THIS SHALL BE DONE PRIOR TO PRESSURE TESTING UNLESS OTHERWISE DIRECTED BY VILLAGE. DISINFECTION SHALL MEET OR EXCEED AWWA C-651.

## PRESSURE TESTING

THE CONTRACTOR SHALL MAKE PRESSURE AND LEAKAGE TESTS OF ALL PIPES LINES UNLESS OTHERWISE DIRECTED BY THE VILLAGE. PRESSURE TESTS SHALL BE MADE IN ALL PIPE LINES OR VALVED SECTIONS THEREOF AS DIRECTED BY VILLAGE. THE CONTRACTOR SHALL FURNISH THE PUMP, PIPE CONNECTIONS, TAPS, GAUGES AND ALL OTHER APPARATUS FOR MAKING THE TEST. BEFORE TESTING OF THE MAIN, THE CONTRACTOR SHALL FLUSH THE MAIN UNDER THE VILLAGE'S SUPERVISION TO EXPEL ANY WATER, DIRT, CHLORINE, ETC. IN COMPLIANCE WITH AWWA C-600.



**Fanning/Howey**  
Civil Engineering Division  
Engineers Surveyors Consultants

DATE: JANUARY 25, 2005

## **WATER NOTES**

**VILLAGE OF  
PLEASANT HILL**

PAGE No.  
800-4

## CONSTRUCTION STAKING

CONSTRUCTION STAKING FOR WATERLINES SHALL BE PERFORMED BY A LICENSED SURVEYOR AT CONTRACTOR EXPENSE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROJECT AND PRESERVE THE CONSTRUCTION STAKES AND TO VERIFY THEIR CORRECTNESS PRIOR TO LAYING PIPE. SUBDIVISION CONTROL POINTS WILL BE SET BY THE CONSULTING ENGINEER.

## EXISTING SURVEY POINTS

SURVEY MONUMENTS, BENCH MARKS AND EXISTING POINTS DAMAGED OR DISTURBED BY CONSTRUCTION SHALL BE REPLACED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE. SHOULD THE CONTRACTOR FAIL TO PROPERLY REPLACE THESE POINTS, THE VILLAGE ENGINEER SHALL REPLACE THEM AT THE CONTRACTOR'S EXPENSE AFTER THREE WEEKS NOTICE.

## SAFETY REQUIREMENTS

THE CONTRACTOR SHALL AT ALL TIMES FOLLOW ALL STATE AND LOCAL SAFETY REQUIREMENTS DURING CONSTRUCTION OF THIS PROJECT. SPECIAL CARE SHALL BE TAKEN DURING ALL TRENCHING OPERATIONS. SHEETING AND BRACING, CRIBBING, ETC., MUST BE INSTALLED AS REQUIRED BY THE ENGINEER TO PROVIDE MAXIMUM SAFETY TO THE CONTRACTOR'S WORKERS IN FULL COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS.

## INSURANCE

NO CONTRACTOR OR SUBCONTRACTOR SHALL START ANY WORK UNTIL THE APPROVED CERTIFICATE OF LIABILITY INSURANCE IS FILED WITH VILLAGE NAMING VILLAGE AS THE INSURED.

## OHIO E.P.A. REQUIREMENTS

THE OHIO ENVIRONMENTAL PROTECTION AGENCY REQUIRES A CONFORMANCE TO THE 1991 EDITION OF "RECOMMENDED STANDARDS." THIS STANDARD SHALL BE EQUALLED OR EXCEEDED FOR WATERLINES. SPECIAL ATTENTION SHALL BE GIVEN TO THE FOLLOWING SECTIONS OF PART 8:

- 8.0.1. MATERIAL CONFORM TO AWWA STANDARDS
- 8.1.2. MINIMUM 6" DIAMETER FIRE PROTECTION
- 8.5.3. MINIMUM 5' GROUND COVER
- 8.5.5. PRESSURE TESTING AWWA C-600\*
- 8.5.6. DISINFECTION AWWA C-651\*
- 8.6.2. 10' HORIZONTAL SEPARATION WATER MAIN/SEWER
- 8.6.3. 18" VERTICAL SEPARATION WATER MAIN/SEWER
- 8.6.6. NO ENTRY AND/OR CONTACT WITH SEWER MANHOLE

NOTE: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THIS TEST PROPERLY AND THE RESPONSIBILITY FOR AN ADEQUATE SUPERVISION AND APPROVAL RESTS WITH THE APPROPRIATE GOVERNMENTAL AGENCY. ANY DEVIATION FROM THE ABOVE WILL NOT BE PERMITTED UNLESS SPECIFICALLY INCLUDED IN THE GENERAL NOTES OR OTHERWISE SHOWN ON THESE PLANS. IN CASES WHERE ONE AND/OR MORE OF THE ABOVE MENTIONED OHIO E.P.A. STANDARDS FALL SHORT OF THE VILLAGE STANDARDS, THE LATTER SHALL GOVERN.

## OBSTRUCTIONS IN RIGHT-OF-WAY

THE CONTRACTOR SHALL NOT REMOVE ANY MAIL BOXES, PAPER BOXES, PRIVATE LIGHT POSTS, SIGNS, UTILITY MARKERS, TREES, SHRUBBERY, FENCE, GUARDRAIL OR OTHER OBSTRUCTIONS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS AND REQUEST THAT THE PROPERTY OWNER REMOVE FENCES, SHRUBS, BUSHES, LIGHT-POSTS, PRIVATE SIGNS AND ORNAMENTAL LANDSCAPING WHICH INCLUDES BUT IS NOT LIMITED TO RAILROAD TIES, STATUES, BRICK OR STONE, WASH STONE, WOOD CHIPS, ETC. FROM THE PUBLIC RIGHT-OF-WAY.

IF THE OWNER OF SAID OBSTRUCTION DOES NOT REMOVE OR RELOCATE SAID OBSTRUCTION WITHIN A REASONABLE TIME (10 DAYS MAXIMUM) THE CONTRACTOR SHALL REMOVE THE OBSTRUCTION AND PLACE IT AT THE DIRECTION OF THE ENGINEER. IF MAILBOXES CANNOT BE IMMEDIATELY REPLACED, THE CONTRACTOR SHALL PROVIDE FOR TEMPORARY MAIL SERVICE. PAYMENT FOR THIS WORK SHALL BE INCLUDED WITH THE UNIT PRICE BID FOR THE PERTINENT CONDUIT ITEM.

## PERMIT REQUIREMENTS

THE CONTRACTOR SHALL OBTAIN ALL REQUIRED WORK PERMITS. COPIES OF PERMITS SHALL BE SUBMITTED TO THE VILLAGE PRIOR TO CONSTRUCTION.

## REVIEW OF DRAINAGE FACILITIES

BEFORE ANY WORK IS STARTED ON THE PROJECT, AND AGAIN BEFORE FINAL ACCEPTANCE BY THE VILLAGE, AND THE CONTRACTOR SHALL MAKE AN INSPECTION OF THE EXISTING SEWERS WITHIN THE PROJECT LIMITS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTIONS SHALL BE KEPT IN WRITING BY THE VILLAGE. ALL NEW CONDUITS, INLETS, CATCH BASINS AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTABLE BY THE VILLAGE. ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE-MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE VILLAGE. PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PERTINENT CONDUIT ITEMS OF THE CONTRACT.

## STORM SEWER REPLACEMENT

ANY STORM SEWER REPLACEMENT IS TO BE EITHER ITEM 706.02, REINFORCED CONCRETE CIRCULAR PIPE WITH "O" RING JOINTS, ITEM 706.11 OR POLYVINYL (PVC) A.S.T.M. D-3034, SRD 35.

## RESTRAINED JOINTS

RESTRAINED LENGTHS FOR BENDS SHALL BE USED ON ALL FITTINGS ON EACH SIDE OF BEND. RESTRAINED LENGTHS FOR TEES SHALL BE ON THE BRANCHES OF THE TEE. SITUATIONS NOT LISTED ON THIS TABLE (IE REDUCERS, TEES W/SMALLER BRANCH DIAMETERS & VERTICAL BENDS NOT LISTED) SHALL BE AS APPROVED BY THE VILLAGE. PLEASE NOTE: POLYWRAP REQUIRES ADDITIONAL RESTRAINT DUE TO A LOWER FRICTION LOSS. (FOOTAGE SHOWN IN PARENTHESIS IS RESTRAINT FOR POLYWRAP PIPE.)

| C-900<br>HORIZONTAL LENGTH TO BE RESTRAINED (FEET) AT 150 PSI |           |         |         |         |         |         |
|---|-----------|---------|---------|---------|---------|---------|
| D   | O         | H       |         |         |         |         |
|   |           | 5       | 6       | 7       | 8       | 10      |
| 10  | 90        | 23 (27) | 19 (23) | 17 (20) | 15 (17) | 12 (14) |
|   | 45        | 10 (11) | 8 (9)   | 7 (8)   | 6 (7)   | 5 (6)   |
|   | 45 (VERT) | 20 (28) | 17 (24) | 14 (21) | 13 (18) | 10 (15) |
|   | 22.5      | 5 (7)   | 4 (5)   | 3 (4)   | 3 (3)   | 2 (3)   |
|   | 11.25     | 2 (3)   | 2 (2)   | 2 (2)   | 1 (2)   | 1 (1)   |
| TEE OR DEAD END   |           | 48 (69) | 41 (58) | 35 (50) | 31 (44) | 25 (36) |

O = BEND ANGLE IN DEGREES      H = DEPTH OF COVER (FT)  
D = NOMINAL DIAMETER (IN)



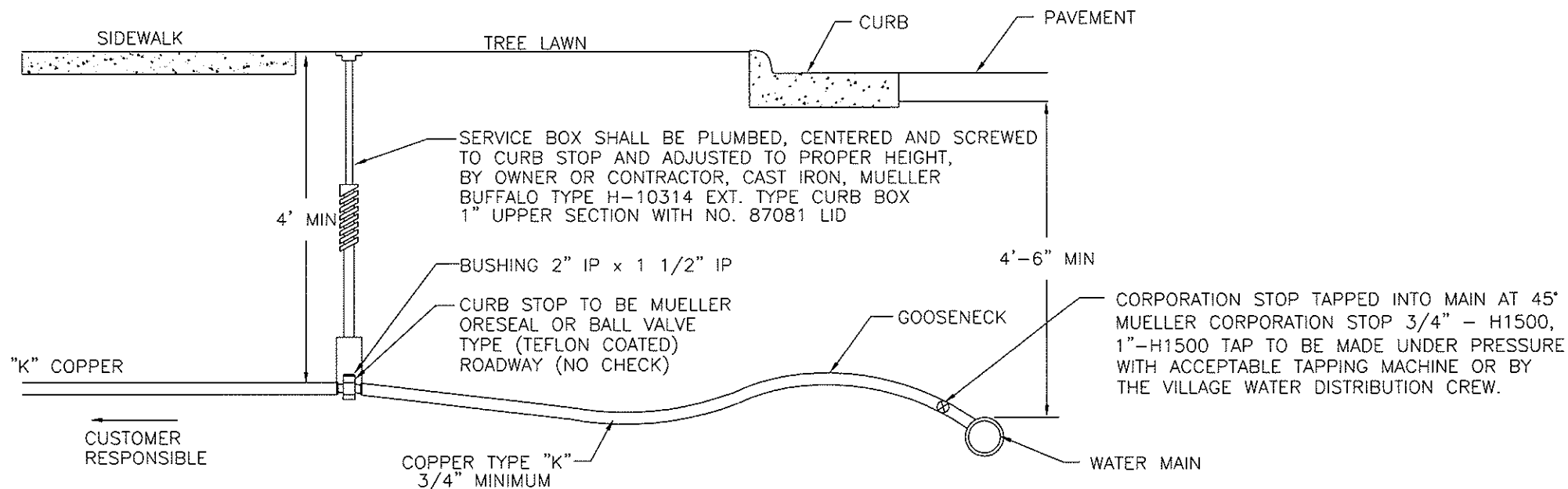
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Engineers Surveyors Consultants

DATE: JANUARY 25, 2005

## WATER NOTES

**VILLAGE OF  
PLEASANT HILL**

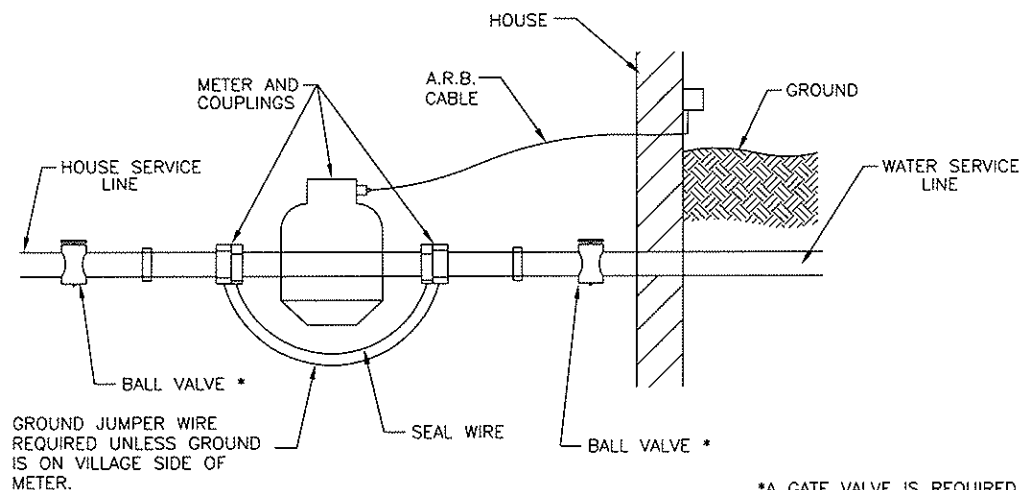
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800-5



## WATER MAIN SERVICE CONNECTION

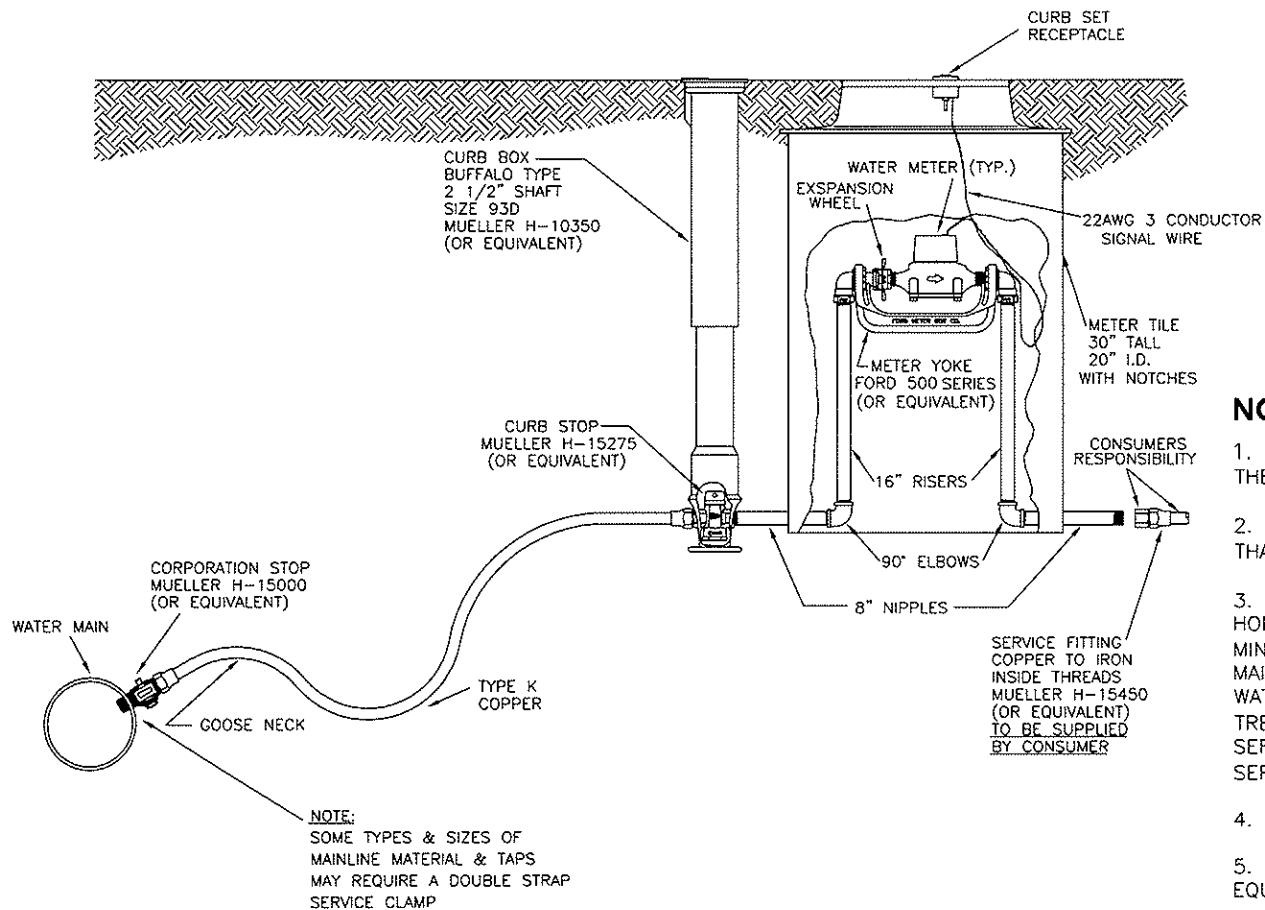
## NOTES

1. WATER SERVICE SHALL BE SEAMLESS COPPER, TYPE K, MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION WW-T-799.
2. 1" SERVICE SHALL BE INSTALLED WHERE BUILDINGS ARE MORE THAN 120' FROM WATERMAIN OR WHERE REQUIRED BY PLANS.
3. 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 AT LEAST 18" BELOW INVERT OF WATER SERVICE, AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'-0".
4. METER UNIT TO BE PURCHASED FROM THE VILLAGE.
5. CORPORATION STOP AND CURB STOP ARE TO BE MUELLER OR EQUIVALENT.
6. ALL OTHER FITTINGS ARE TO BE BRASS OR BY VILLAGE ORDERS.
7. LOCATE WATER METER AS CLOSE TO ELECTRIC METER AS POSSIBLE.
8. SEE VILLAGE'S RULES & REGULATIONS FOR PUBLIC WATER SYSTEM FACILITIES FOR FURTHER DETAILS.



## INSIDE WATER METER

\*A GATE VALVE IS REQUIRED ON EACH SIDE OF 1 1/2" AND LARGER SERVICE LINES.



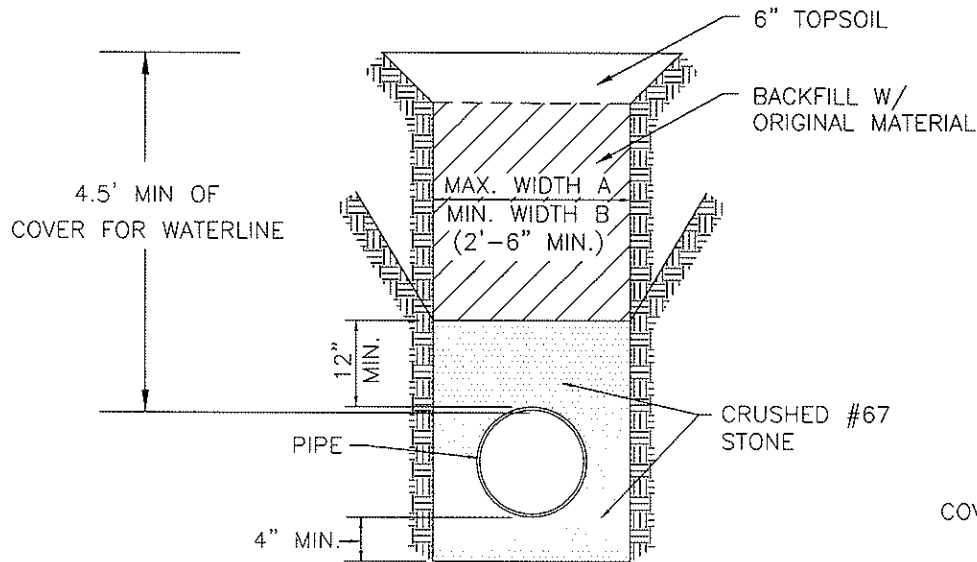
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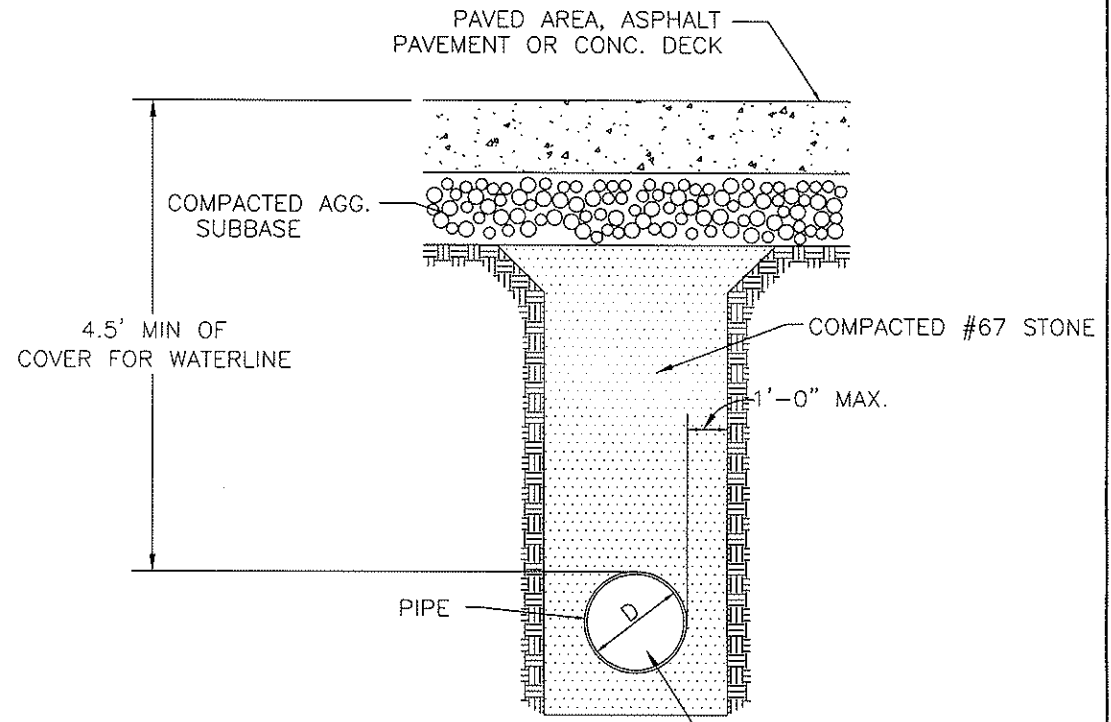
## WATER MAIN SERVICE CONNECTION

N.T.S

| PIPE SIZE       | A       | B       |
|-----------------|---------|---------|
| UP TO 33"       | D + 16" | D + 12" |
| 36" AND GREATER | D + 24" | D + 12" |



**BACKFILL TRENCH DETAIL**



NOTE:

ALL CONSTRUCTION WITHIN 4' OF THE PAVEMENT  
SHALL REQUIRE GRANULAR MATERIAL COMPACTED  
IN A SUITABLE MANNER.

PIPE SHALL BE LAID ON  
4" MIN. OF APPROVED  
NATURAL SAND BASE &  
TRENCH SHALL BE  
FILLED WITH APPROVED  
EXCAVATED MATERIAL.

**PAVED AREA TRENCH DETAIL**

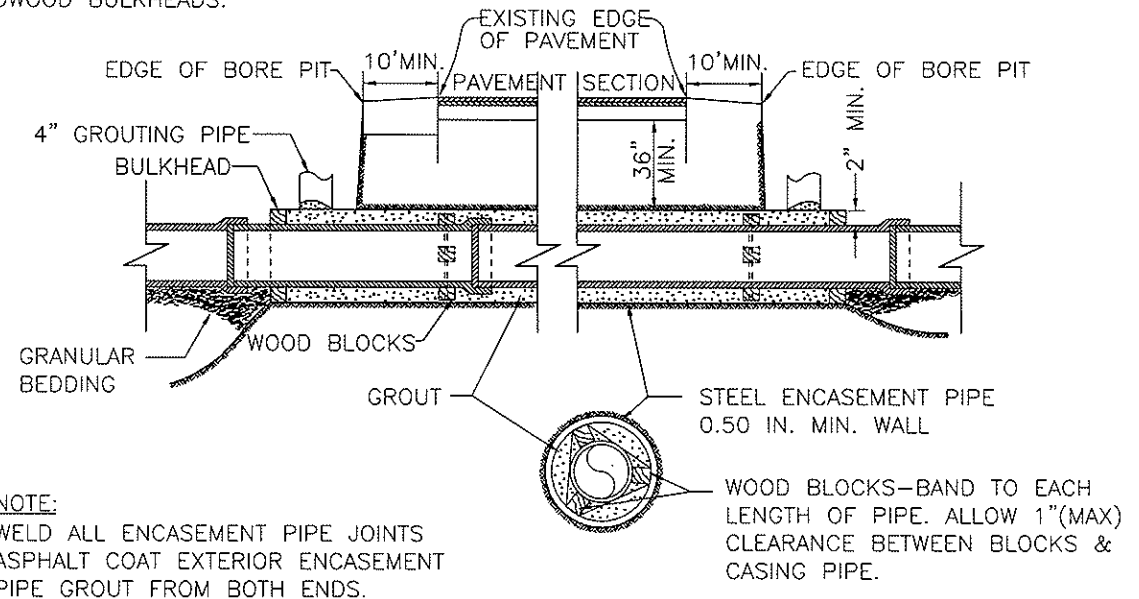


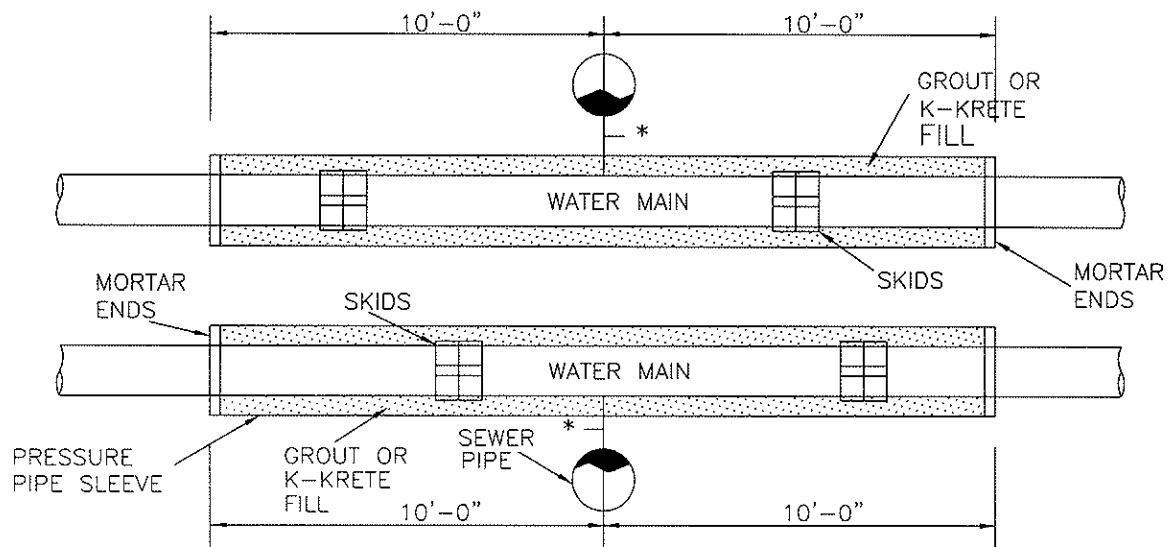
## BORING NOTES

WHERE REQUIRED THE WATER SUPPLY LINE SHALL BE INSTALLED WITHIN STEEL ENCASEMENT PIPE. THE ENCASEMENT PIPE SHALL BE WELDED STEEL PIPE, OR ODOT APPROVED EQUAL, AND SHALL BE ASPHALT COATED ON THE OUTSIDE. THE ENCASEMENT PIPE SHALL HAVE A MINIMUM TENSILE STRENGTH OF 60,000 P.S.I., A MINIMUM YIELD STRENGTH OF 35,000 P.S.I., AND A MINIMUM WALL THICKNESS OF 0.50 INCH. THE MINIMUM DIAMETER OF ENCASEMENT PIPE SHALL BE THE OUTSIDE DIAMETER OF THE BELL + FOUR(4) INCHES, OR AS DIRECTED BY THE ENGINEER.

THE ENCASEMENT PIPE SHALL BE INSTALLED BY BORING AND JACKING AND IN-SUCH A MANNER SO AS TO ALLOW THE PIPE TO BE LAID AT THE PROPER GRADE. WHEN DIRECTED BY THE VILLAGE, THIS OPERATION SHALL BE CONTINUOUS (AROUND THE CLOCK UNTIL COMPLETE) AND CONDUCTED SO AS NOT TO INTERFERE WITH, INTERRUPT OR ENDANGER THE OPERATION OF TRAFFIC NOR DAMAGE, DESTROY, OR ENDANGER THE INTEGRITY OF THE ROADWAY FACILITIES. THE ENDS OF THE ENCASEMENT SHALL BE TERMINATED OUTSIDE EXISTING/PROPOSED PAVEMENT SECTIONS.

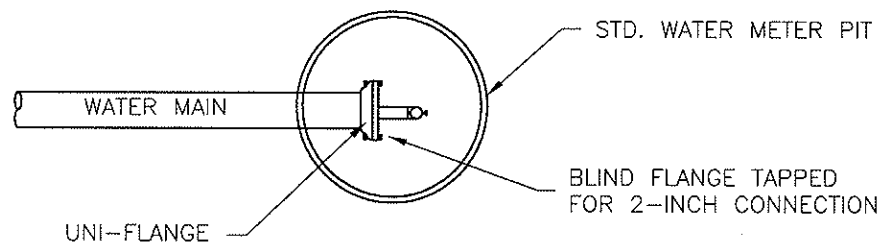
UPON COMPLETION OF THE PIPE INSTALLATION THE AREA BETWEEN THE PIPE AND THE ENCASEMENT PIPE SHALL BE COMPLETELY FILLED WITH A SAND AND CEMENT MIXTURE OR GROUT AS REQUIRED BY THE ENGINEER. CARE SHALL BE TAKEN TO INSURE THAT THE PIPE DOES NOT SHIFT WITHIN THE ENCASEMENT PIPE. IF REQUIRED, THE END OF THE ENCASEMENT PIPE SHALL BE SEALED WITH 2 INCH THICK REDWOOD BULKHEADS.





SIDE VIEW

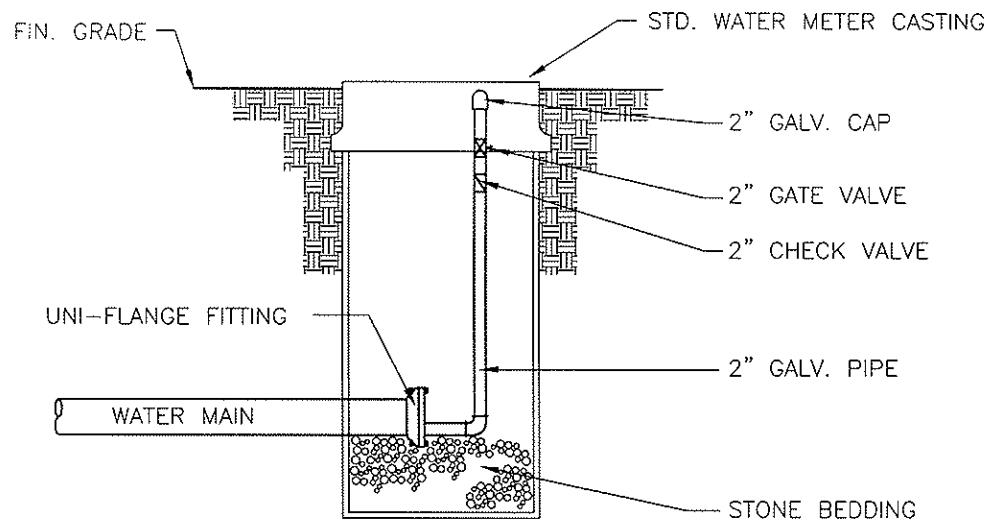
WHERE (\*) IS LESS THAN 18". A PRESSURE PIPE SLEEVE ON THE WATERLINE IS REQUIRED. WHEN DIVERTING THE WATER MAIN OR PROVIDING SLEEVING, ONE LENGTH OF WATER PIPE IS TO BE LOCATED SO THAT BOTH JOINTS WILL BE AS FAR AWAY FROM THE SEWER AS POSSIBLE.



**PLAN VIEW**

NOTES:

1) IN A DEAD END SITUATION THE VILLAGE MAY REQUIRE A FIRE HYDRANT BE INSTALLED IN LIEU OF THIS DETAIL.



**CROSS-SECTION**



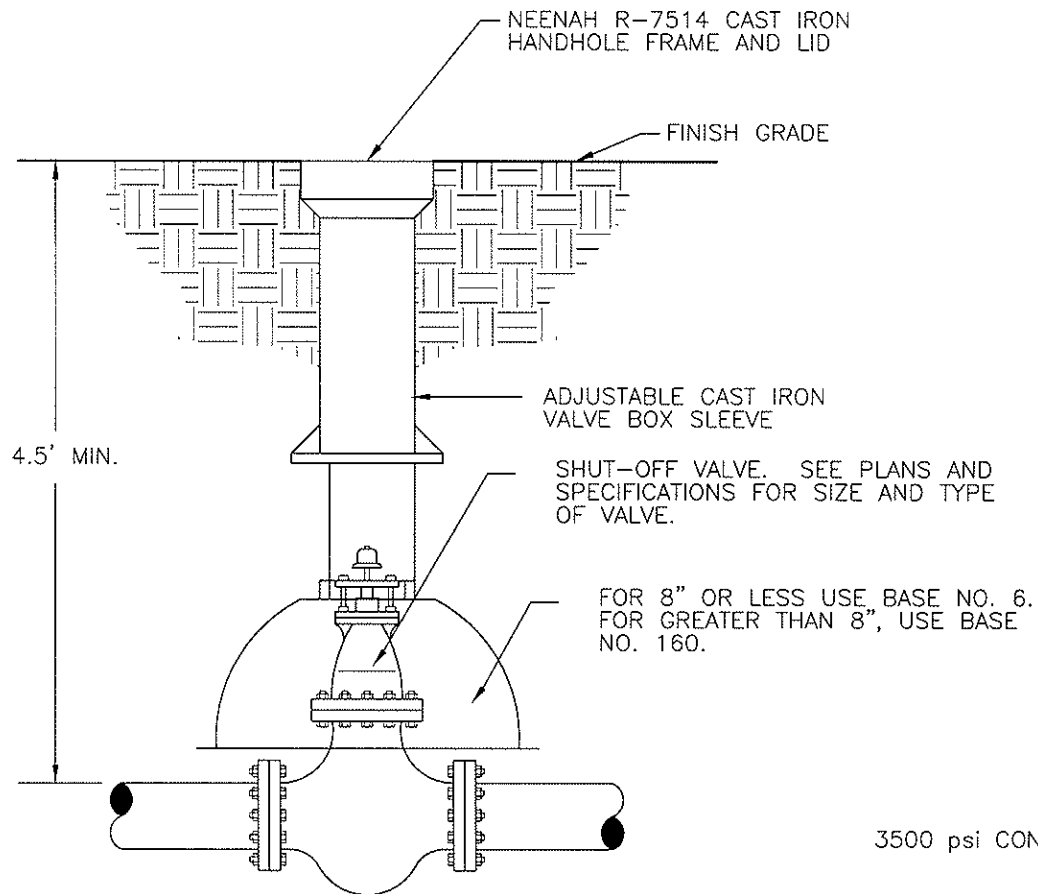
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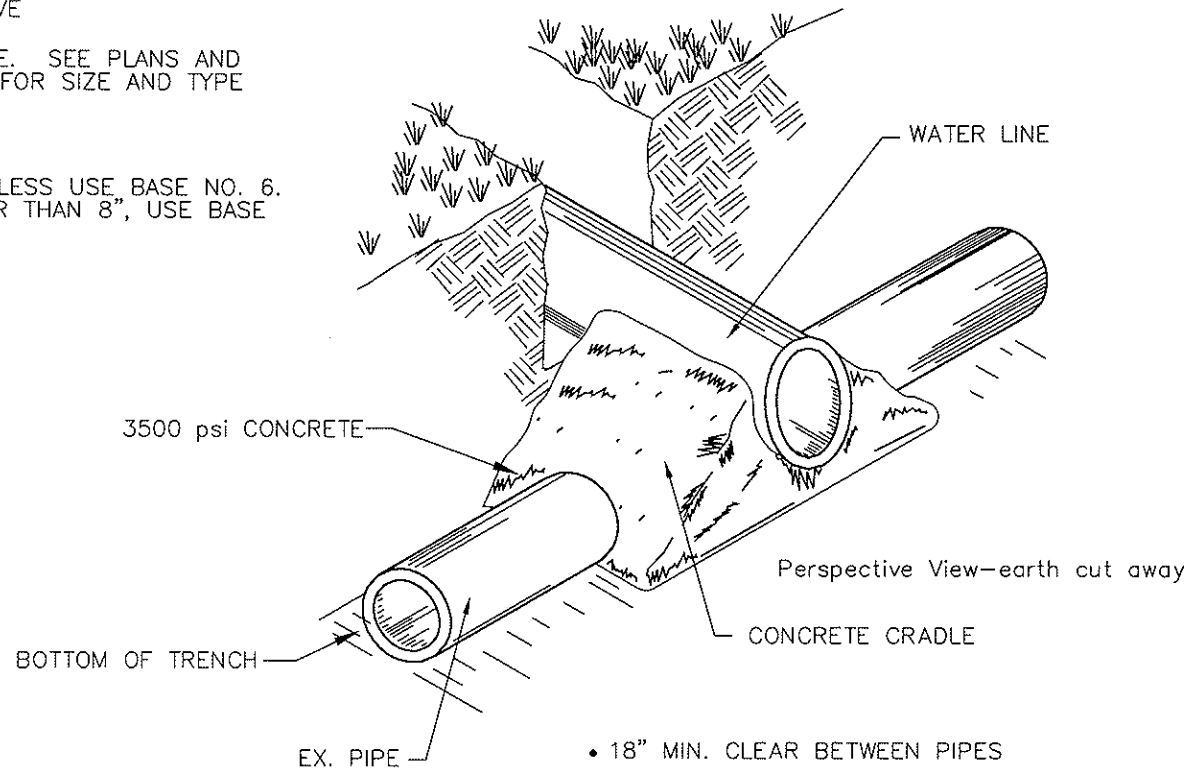
**DEAD END LINE  
DETAIL**

**VILLAGE OF  
PLEASANT HILL**

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**VALVE BOX DETAIL**



**WATER LINE CROSSING DETAIL**



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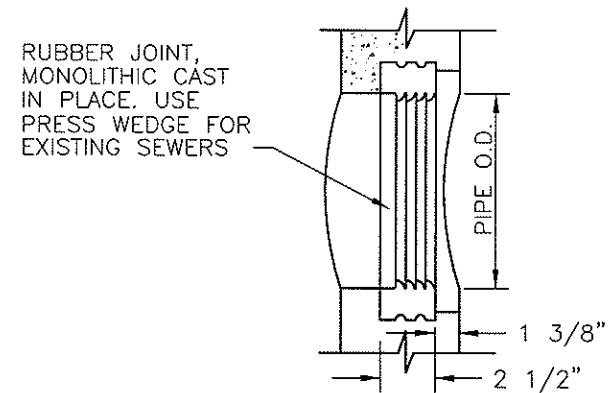
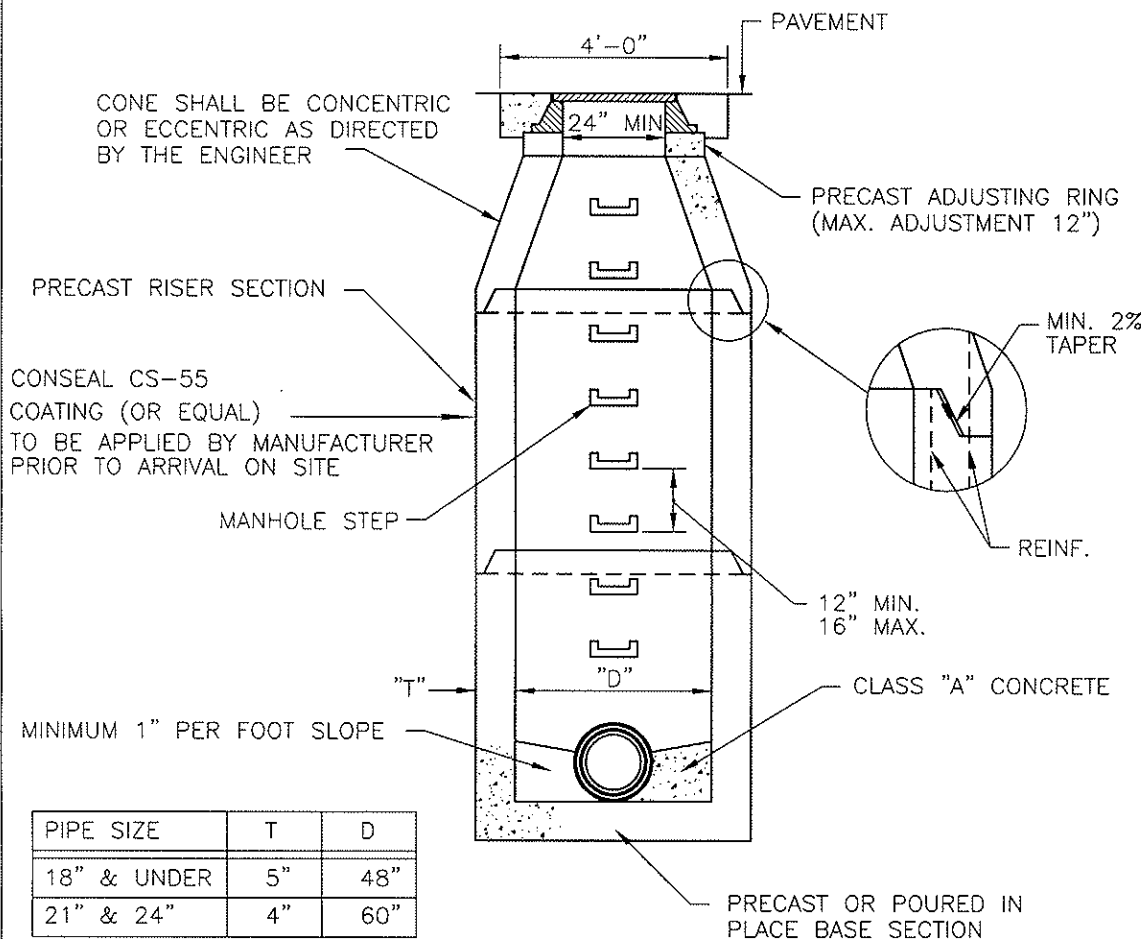
**MISCELLANEOUS WATER DISTRIBUTION  
DETAILS**

**VILLAGE OF  
PLEASANT HILL**

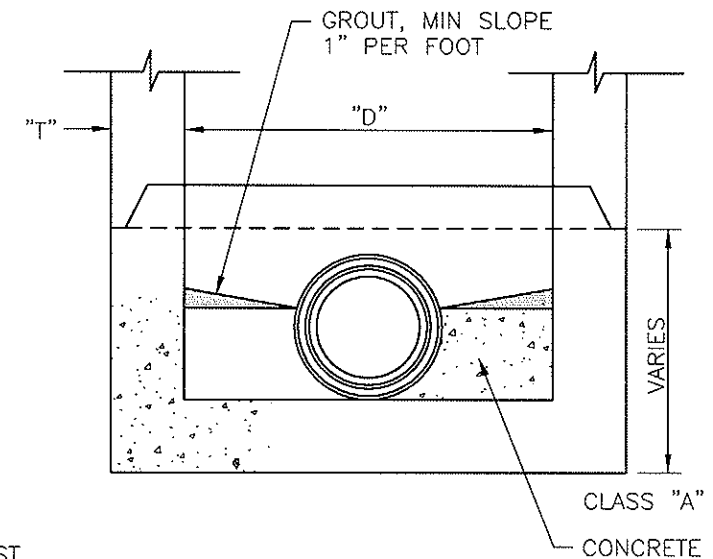
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800-11

**SANITARY SEWER**

**DIVISION 900**



**CORE & SEAL BOOT**



**PRECAST BASE SECTION**

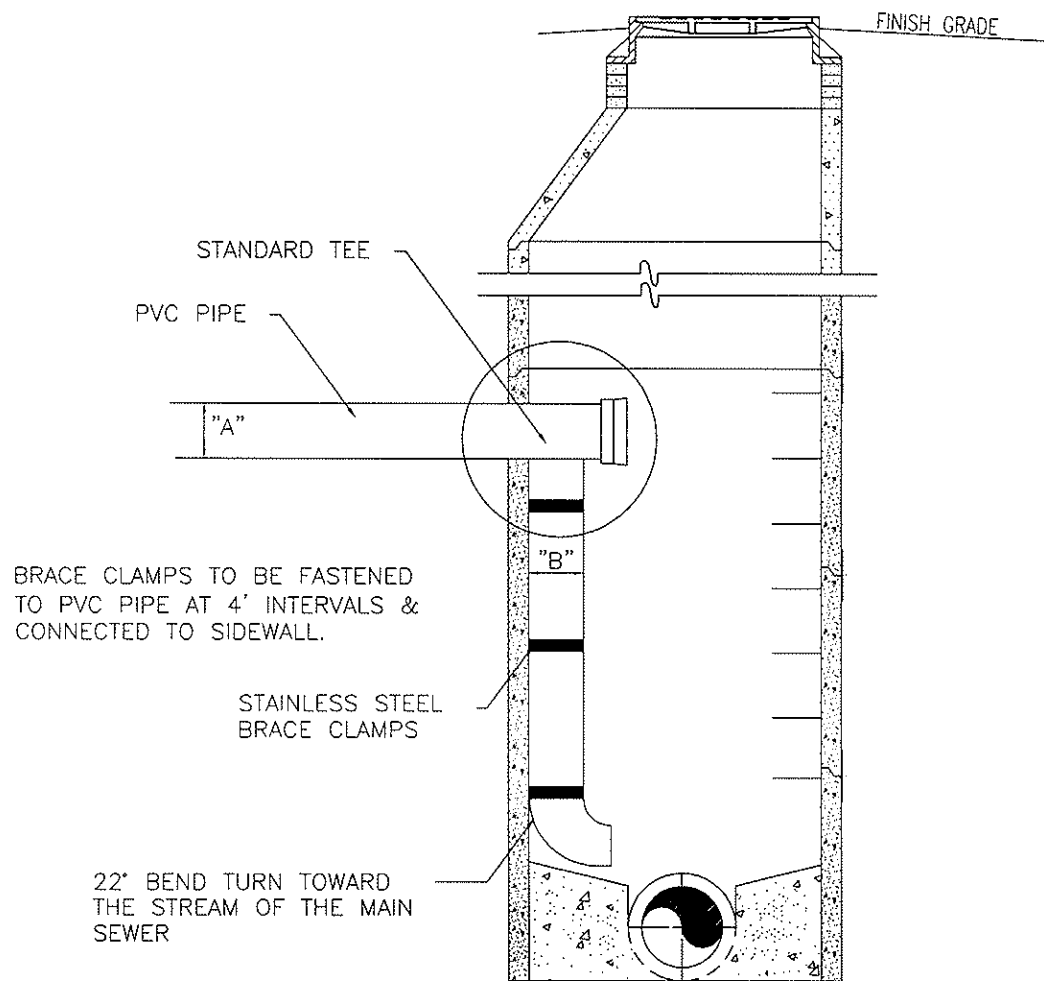
**NOTES:**

THE WORDS "SANITARY SEWER" SHALL BE CAST ON THE LID

THE FLEXIBLE JOINTS SHOWN FOR PIPES 24" AND UNDER SHALL BE THE EQUAL OF "PRESS WEDGE II" AS MANUFACTURED BY PRESS SEAL GASKET CORPORATION OR "LINK SEAL" AS MANUFACTURED BY THE THUNDERLINE CORPORATION.

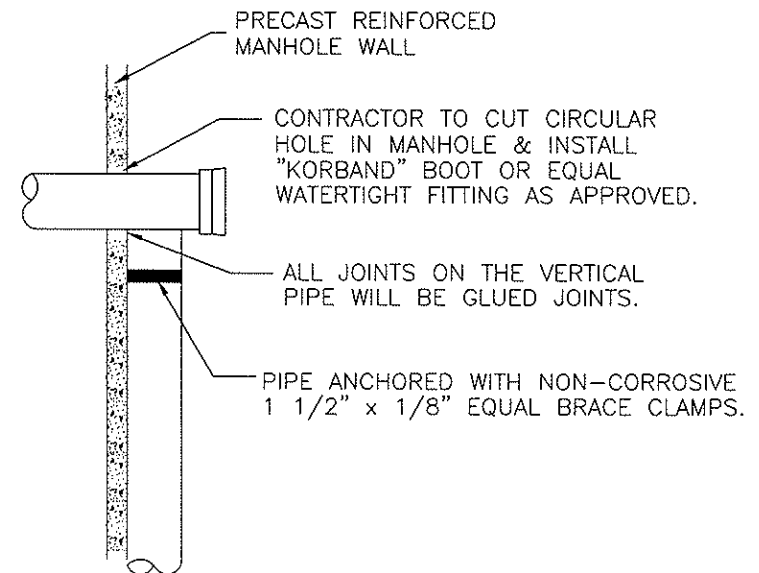
CONNECTIONS BETWEEN PRECAST MANHOLE SECTIONS AND PIPES ON SANITARY SEWERS MAY BE SEALED WITH RESILIENT CONNECTORS CONFORMING TO ASTM C923.

CORE & SEAL BOOT TO BE USED WHERE PLASTIC PIPE IS CONNECTED TO SANITARY MANHOLE.



NOTES:

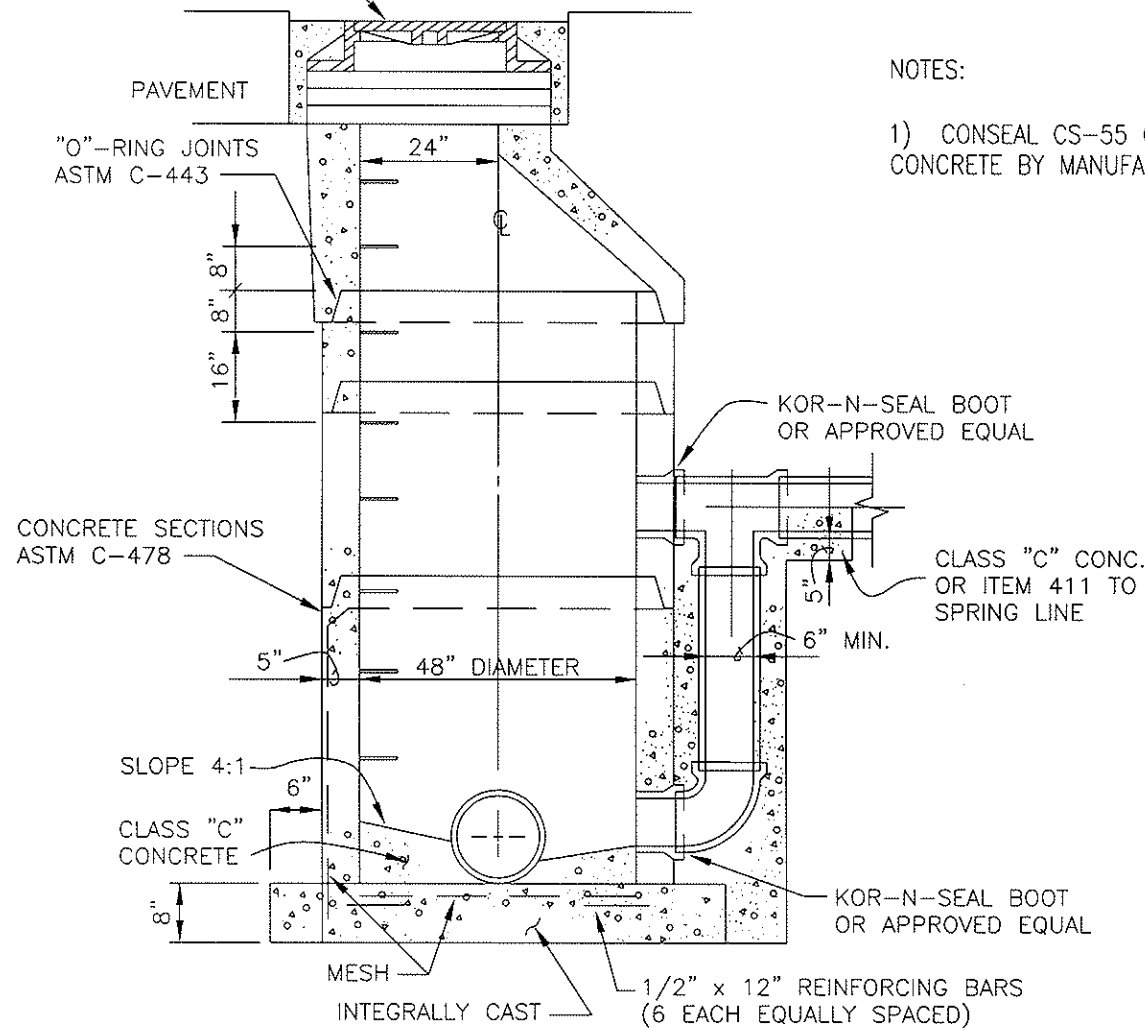
- 1) CONSEAL CS-55 COATING OR EQUAL TO BE APPLIED TO EXTERIOR OF CONCRETE BY MANUFACTURER PRIOR TO ARRIVAL ON SITE.



NOTE: GLUE FITTINGS OR PREMIUM FITTINGS MUST BE USED ON ALL DROPS.

| "A"          | "B" |
|--------------|-----|
| 8", 10", 12" | 8"  |
| 15", 18"     | 10" |
| 21", 24"     | 12" |

EAST JORDAN 1051-Z1 OR  
NEENAH R-1769-A W/SELF  
SEALING LID (OR EQUAL)



NOTES:

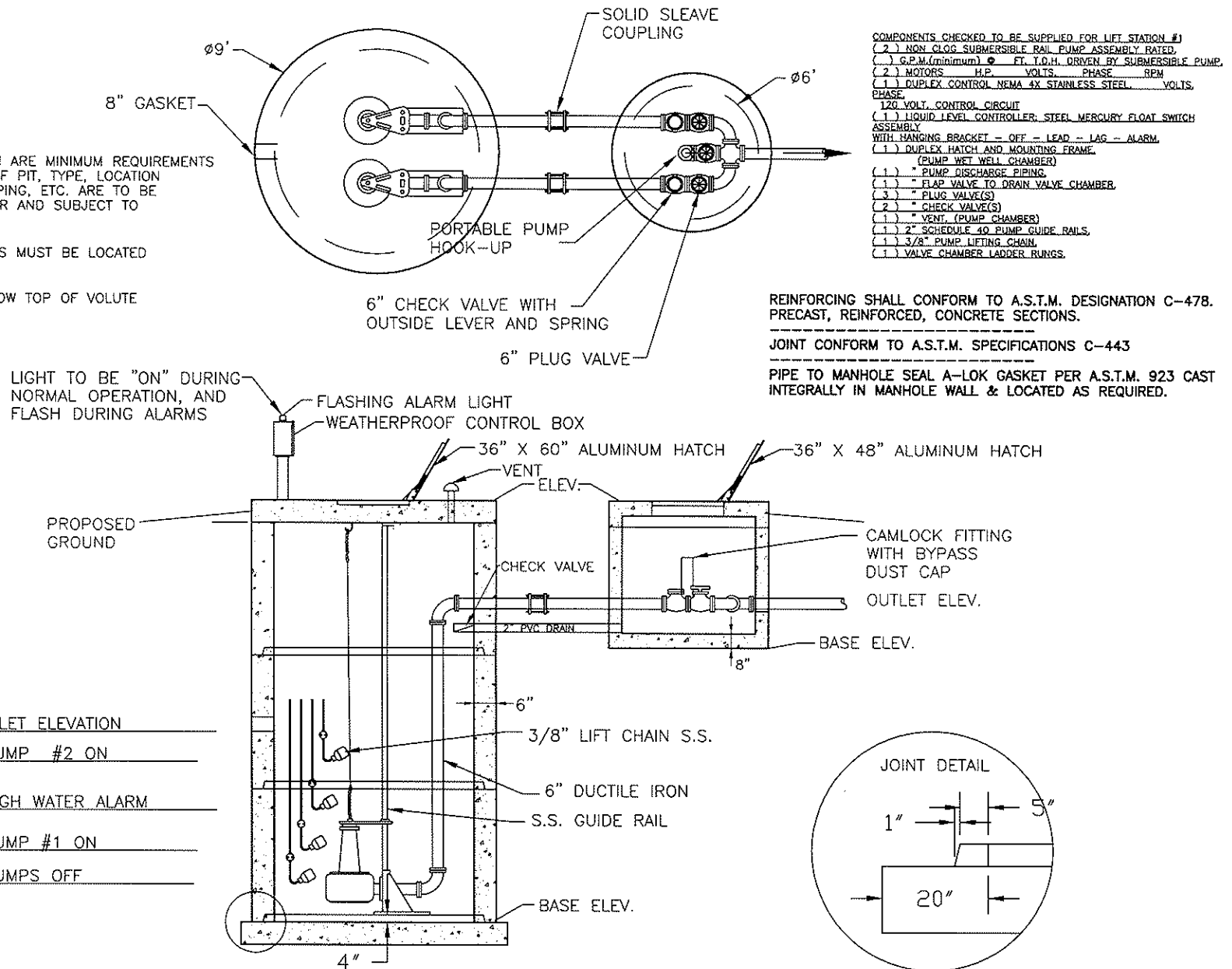
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SANITARY SEWER PRECAST MANHOLE  
MAXIMUM PIPE SIZE 36 INCH



NOTES:

1. CONFIGURATION AND DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS ONLY. ALL DETAILS, INCLUDING SIZING OF PIT, TYPE, LOCATION AND ARRANGEMENTS OF VALVES AND PIPING, ETC. ARE TO BE SPECIFIED BY THE CONSULTING ENGINEER AND SUBJECT TO HIS APPROVAL.
2. JUNCTION BOXES FOR THE PUMP CABLES MUST BE LOCATED ABOVE THE FLOOD ELEVATION.
3. MIN. LIQUID LEVEL MUST NOT FALL BELOW TOP OF VOLUTE



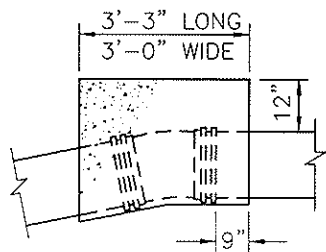
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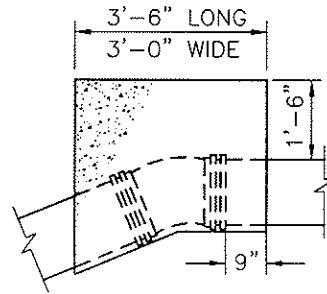
## LIFT STATION DETAIL

**VILLAGE OF  
PLEASANT HILL**

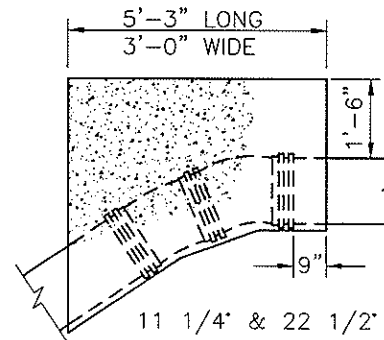
PAGE No.  
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11 1/4° BEND



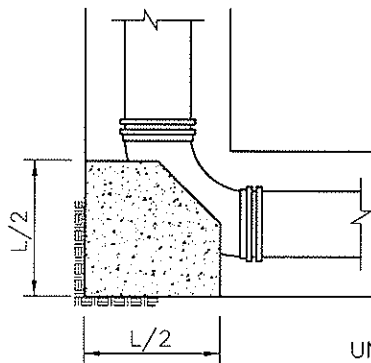
22 1/2° BEND



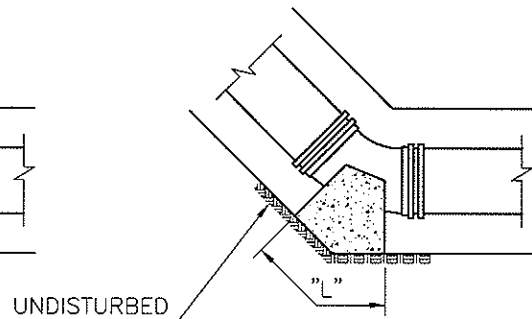
11 1/4° & 22 1/2°

1. CLASS "A" CONCRETE TO BE USED FOR ALL BLOCKING
2. TIED OR RESTRAINED JOINTS MAY BE USED IN LIEU OF CONCRETE BLOCKING AT THE DIRECTION OF THE ENGINEER.

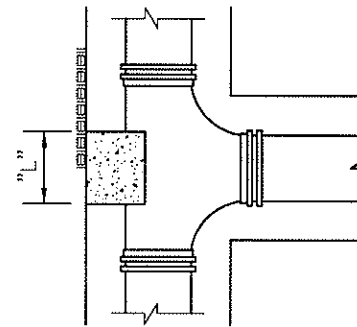
### CONCRETE BLOCKING FOR VERTICAL BENDS



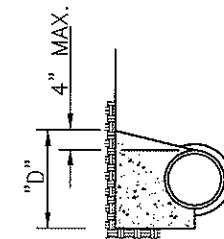
90° BENDS



BENDS LESS THAN 90°



TEES

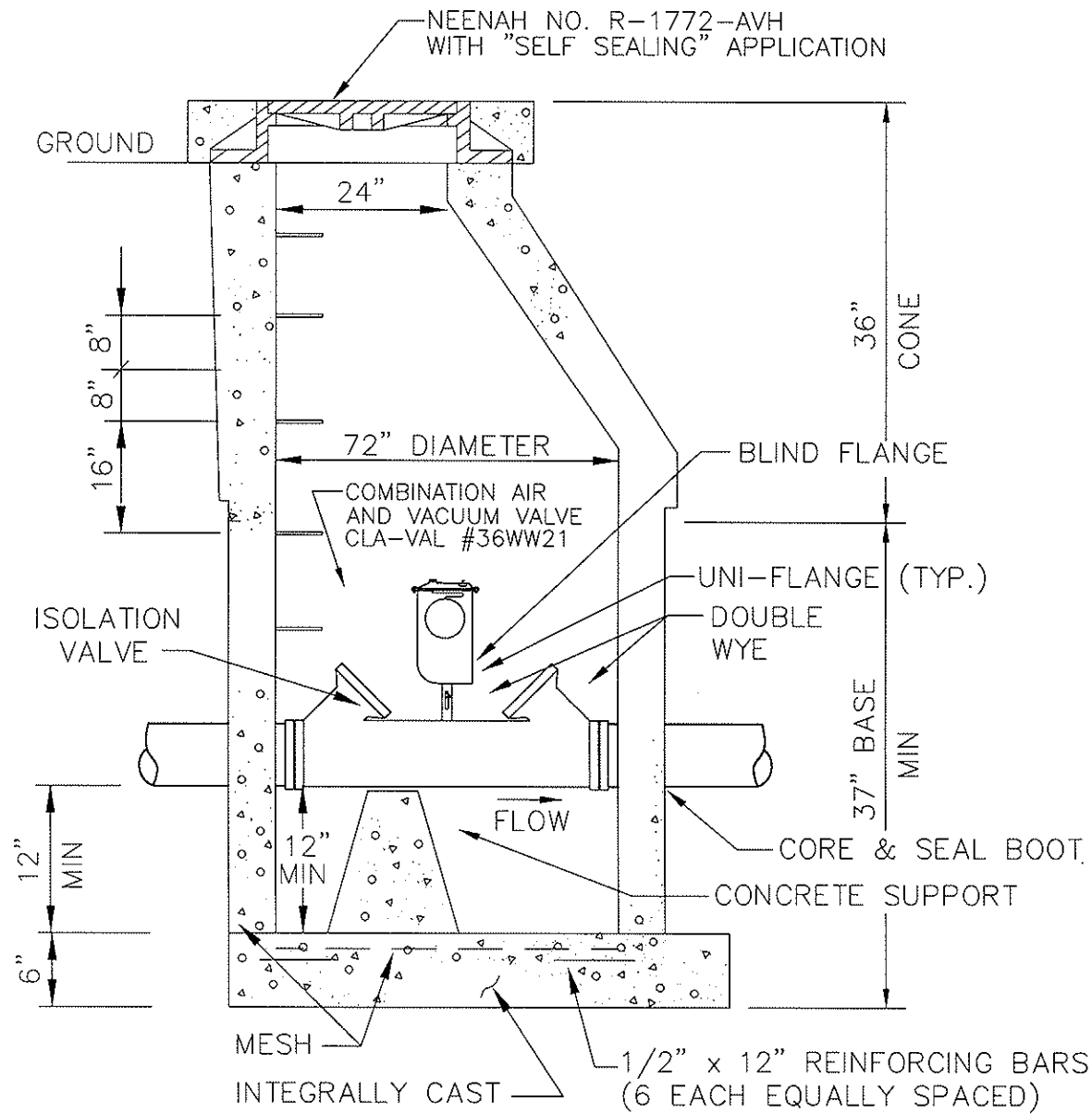


TYPICAL SECTION

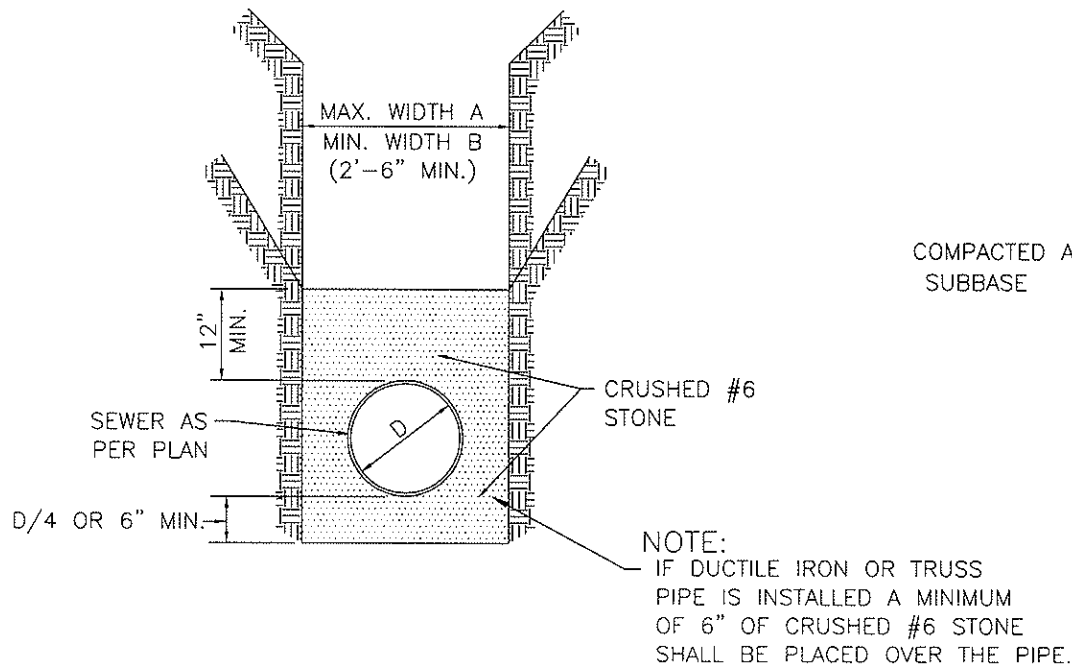
### CONCRETE BLOCKING FOR HORIZONTAL BENDS

| SIZE OF PIPE | BENDS          |     |         |     |     |     |     |     |
|--------------|----------------|-----|---------|-----|-----|-----|-----|-----|
|              | 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" |

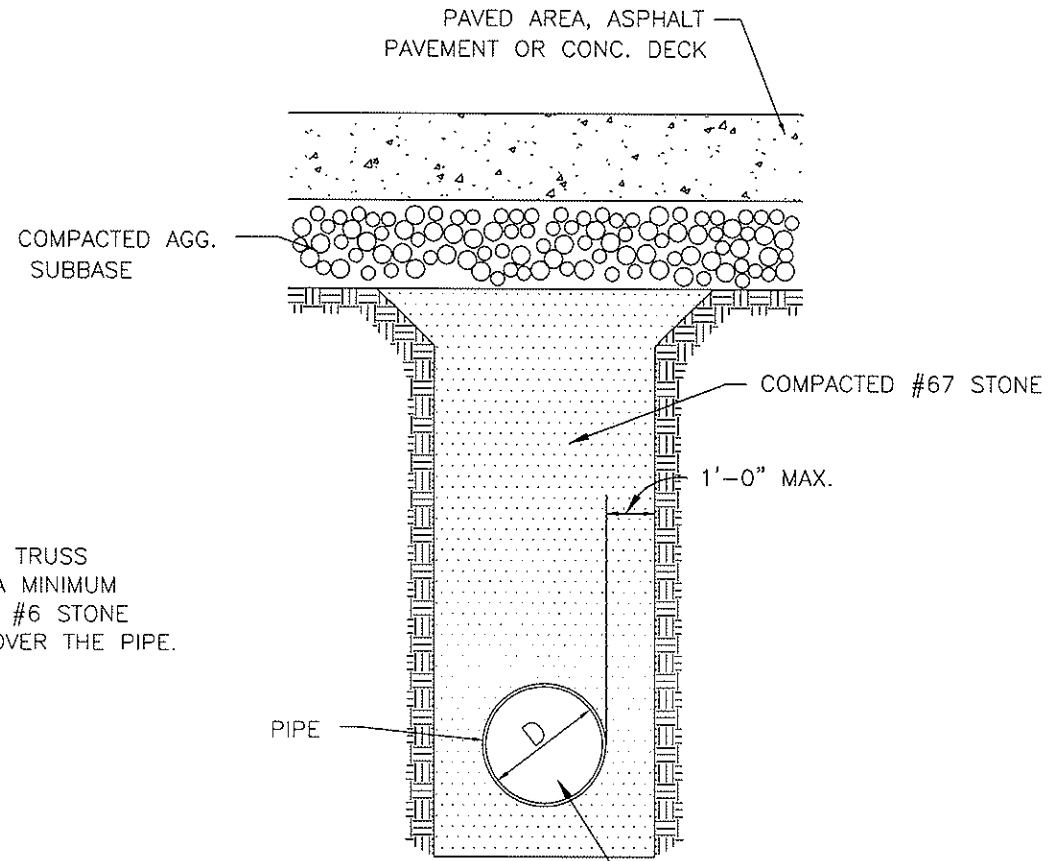
| RUN      | TEES     |     |     |     |     |     |     |     |
|----------|----------|-----|-----|-----|-----|-----|-----|-----|
|          | BRANCH   |     |     |     |     |     |     |     |
|          | 3",4",6" |     | 8"  |     | 12" |     | 16" |     |
|          | L        | D   | L   | D   | L   | D   | L   | D   |
| 3",4",6" | 16"      | 7"  |     |     |     |     |     |     |
| 8"       | 14"      | 8"  | 18" | 12" |     |     |     |     |
| 12"      | 9"       | 12" | 18" | 12" | 24" | 18" |     |     |
| 16"      | 8"       | 16" | 14" | 16" | 28" | 16" | 30" | 26" |



| PIPE SIZE       | A       | B       |
|-----------------|---------|---------|
| UP TO 33"       | D + 16" | D + 12" |
| 36" AND GREATER | D + 24" | D + 12" |



### TRENCH & BEDDING DETAIL



### PAVED AREA TRENCH DETAIL



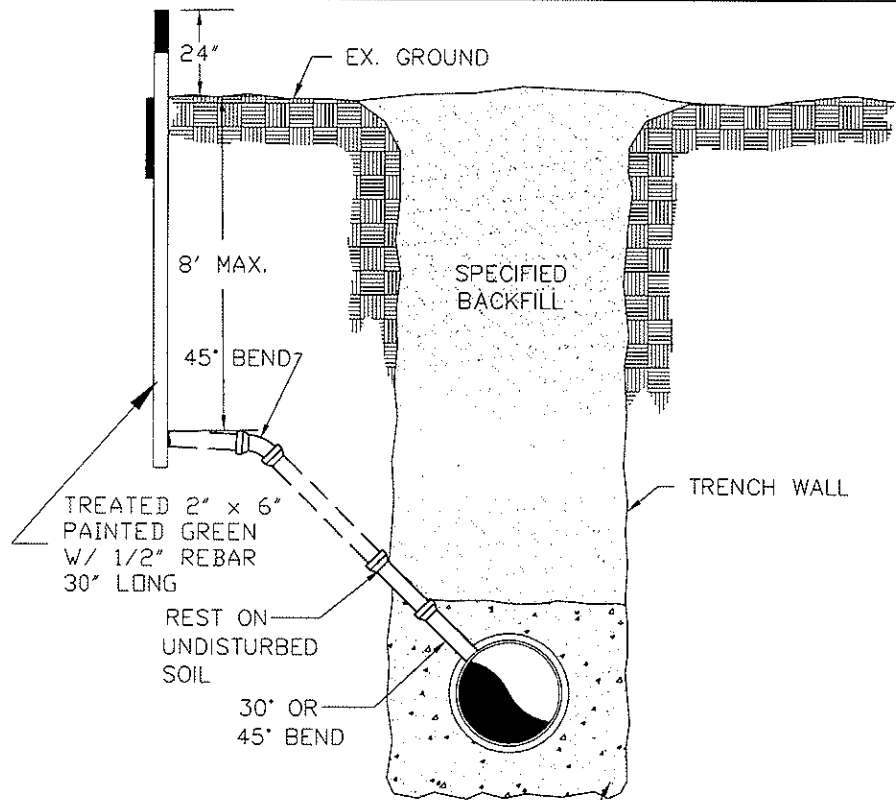
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### BACKFILL TRENCH DETAILS

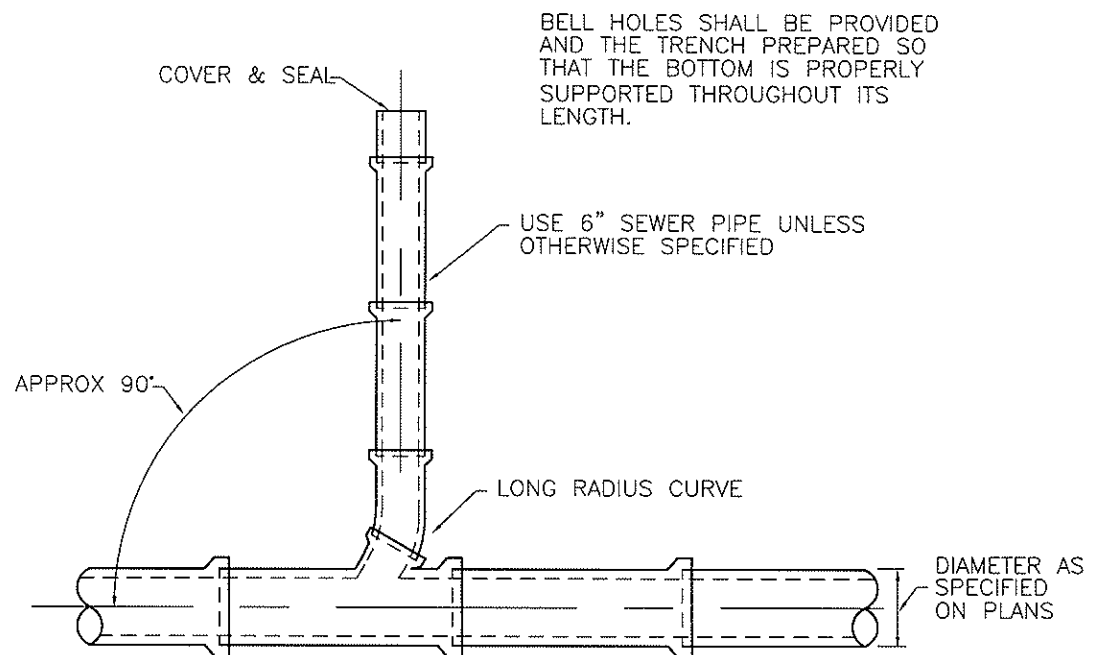
**VILLAGE OF  
PLEASANT HILL**

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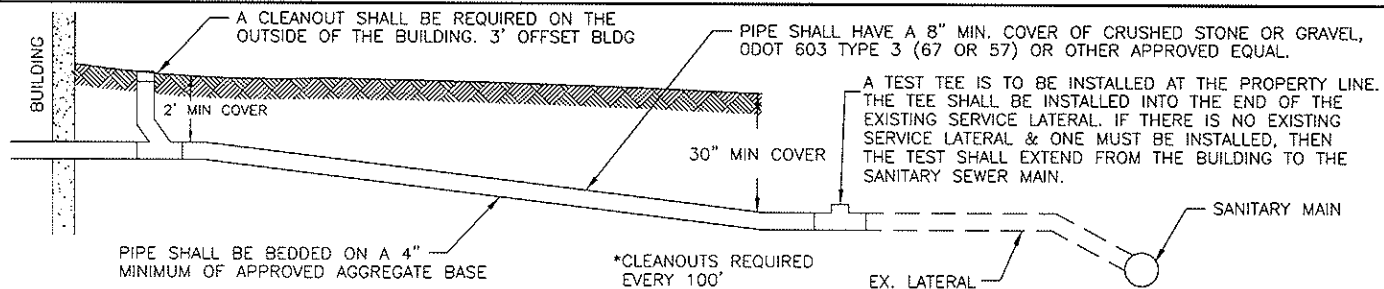
60" OF 45° WYE TO BE ENCASED IN CLASS II CONCRETE A MINIMUM OF 6" FROM BELL OF PIPE, AND 18" EACH WAY ALONG LINE OF SEWER FROM CENTER OF WYE.

### SERVICE CONNECTION DETAIL



\* SEAL MUST BE ABLE TO PASS AIR PRESSURE TESTS REQUIRED FOR SEWER MAIN

### WYE & LATERAL DETAIL



## NOTES

1. SEPTIC TANKS, WHEN ABANDONED, SHALL BE DEWATERED AND PROPERLY FILLED WITH GRANULAR MATERIALS WITH ALL TILES BEING PLUGGED WITH CONCRETE.
2. ROOF DOWNSPOUTS, EXTERIOR FOUNDATIONS DRAINS, AREAWAY DRAINS OR OTHER SURFACE RUNOFF OR GROUNDWATER SHALL NOT BE CONNECTED TO THE SANITARY SEWER MAIN.
3. ANY INDIVIDUAL OR FIRM INSTALLING SEWER CONNECTIONS SHALL BE LICENSED BY THE VILLAGE.
4. BEFORE BEGINNING WORK, A SEWER TAP PERMIT MUST BE OBTAINED.
5. 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.
6. WATER SERVICES SHALL BE A MINIMUM OF 10' MEASURED HORIZONTALLY FROM THE SEWER SERVICE AND SHALL BE A MINIMUM OF 18" VERTICAL SEPARATION WHERE THE WATER SERVICE CROSSES THE SEWER MAIN.

## PIPE

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

## INSPECTION

1. A TAP INSPECTION SHALL BE REQUIRED ON ALL NEW BUILDING CONNECTIONS AND ALSO REPLACEMENT OF EXISTING BUILDING CONNECTIONS.
2. 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.
3. 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.
4. 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.
5. 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 TOO GREAT TO ALLOW THE MAIN TO BE CUT. ALWAYS COMPLETELY ENCASE CONNECTIONS AT ANY DEPTH 12' AND OVER AS APPROVED BY THE VILLAGE.

## TESTING

1. THE OUTSIDE PLUMBER SHALL BE RESPONSIBLE FOR THE TESTING FROM THE CONNECTION TO THE EXISTING SERVICE LATERAL TO THE CLEANOUT.
2. ALL NEW BUILDING CONNECTIONS SHALL BE BY AIR WITH 4 PSI PRESSURE.

3. THE SEWER TEST SHALL BE FROM THE CLEANOUT TO THE PROPERTY LINE CONNECTION OR TO THE MAIN SEWER, WHICHEVER IS APPLICABLE.

4. WHEN A SUBSTANTIAL AMOUNT OF AN EXISTING LATERAL IS REPLACED, THE NEW PORTION OF THE LATERAL SHALL REQUIRE A TEST UNLESS OTHERWISE APPROVED.

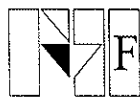
## MISC.

1. STREET EXCAVATION REQUIRES A STREET OPENING PERMIT.

2. BASEMENTS WITH A FLOOR DRAIN TO BE CONNECTED TO THE SANITARY SEWER.

## PIPE LAYING

1. THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATER TIGHT PLUG TO THE APPROVAL OF THE VILLAGE BEFORE THE CONTRACTOR LEAVES THE WORK SITE FOR THE NIGHT.
2. THE JOINING OF PIPE WITH CONCRETE SHALL NOT BE ACCEPTED. USE FERNCO COUPLINGS OR EQUAL.
3. 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.
4. 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.
5. THE BUILDING CONNECTION LINE SHALL BE LAID IN STRAIGHT LINE AS POSSIBLE.
6. ANY TWO FAMILY RESIDENCE THAT HAS AN EXISTING 4" LATERAL AVAILABLE TO THE LOT SHALL BE REQUIRED TO SEPARATE THE 4" COMMON LATERAL INTO INDIVIDUAL LATERALS, WITH CLEANOUTS ON THE OUTSIDE OF THE BUILDING UNLESS OTHERWISE APPROVED.
7. ALL NEW CONSTRUCTION SHALL HAVE SANITARY LATERALS INSTALLED.



**Fanning/Howey**  
Civil Engineering Division  
Engineers Surveyors Consultants

DATE: JANUARY 25, 2005

## BUILDING CONNECTION DETAIL

**VILLAGE OF  
PLEASANT HILL**

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## LOW PRESSURE AIR TEST

1. 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 AIR INLET CONNECTIONS 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.

2. 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.

## SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN-SEC)

| PIPE DIA. | 100 FT. | 150 FT. | 200 FT. | 250 FT. | 300 FT. |
|-----------|---------|---------|---------|---------|---------|
| 4"        | 1:53    | 1:53    | 1:53    | 1:53    | 1:53    |
| 6"        | 2:50    | 2:50    | 2:50    | 2:50    | 2:50    |
| 8"        | 3:47    | 3:47    | 3:47    | 3:47    | 3:48    |
| 10"       | 4:43    | 4:43    | 4:43    | 4:57    | 5:56    |
| 12"       | 5:40    | 5:40    | 5:42    | 7:08    | 8:33    |
| 15"       | 7:05    | 7:05    | 8:54    | 11:08   | 13:21   |
| 18"       | 8:30    | 9:37    | 12:49   | 16:01   | 19:41   |
| 21"       | 9:55    | 13:05   | 17:27   | 21:49   | 26:11   |
| 24"       | 11:24   | 17:57   | 22:48   | 28:30   | 34:11   |

## DEFLECTION TEST

1. DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE PIPE OTHER THAN SERVICE LATERALS. 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.

2. 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.

3. 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-2122 STANDARD TEST METHOD OF DETERMINING DIMENSIONS OF THERMOPLASTIC PIPE AND FITTINGS. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.

### DIAMETER, INCHES

| DEPTH (FT.) | 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

## 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 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.

\* ALL SANITARY SEWER TESTING IS THE RESPONSIBILITY OF THE CONTRACTOR.

## NOTES

1. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE VILLAGE UNLESS 2 WORKING DAY'S NOTICE OF COMMENCING WORK IS GIVEN TO THE VILLAGE.
2. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR DEVELOPMENT 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.
3. ROOF DRAINS, FOUNDATION DRAINS, SUMP PUMPS, AND OTHER CLEAR WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.
4. WHEN SEWER CONSTRUCTION BEGINS, THE SEWER AT THE EXISTING MANHOLE, IF SMALLER OR EQUAL TO 12", SHALL BE PLUGGED BY HAVING A POLYETHYLENE BAG PLACED INTO THE SEWER PIPE APPROXIMATELY 6" AND THEN POUR CONCRETE INTO AND AROUND THE SEWER PIPE AS DIRECTED BY THE VILLAGE, SIZED LARGER THAN 12" WILL BE PLUGGED BY OTHER APPROVED METHODS. NO PLUGS SHALL BE REMOVED UNTIL CONSTRUCTION IS COMPLETED AND THEN ONLY AS DIRECTED BY THE VILLAGE.
5. CONSTRUCTION OF SANITARY SEWER SHALL INCLUDE THE VILLAGE DYE TESTING AS DETERMINED BY THE VILLAGE OF ALL PIPES TO BE CONNECTED TO THE NEW SEWER PRIOR TO BACKFILLING.
6. WHEN A CASTING OR OTHER PUBLIC PROPERTY IS ABANDONED IT REMAINS VILLAGE PROPERTY.
7. NEW SEWERS MUST HAVE EPA APPROVAL.

## EXCAVATION AND PIPE LAYING

1. 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.
2. LASER SHALL BE USED UNLESS OTHERWISE APPROVED.

## UTILITY STAKING

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

## TESTING

1. 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.
2. SEE SANITARY TESTING NOTES.
3. BEFORE FINAL ACCEPTANCE BY THE VILLAGE AND 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.

## PIPE

1. ALL PIPE AND SPECIALS SHALL BE PVC SDR-35 UNLESS OTHERWISE APPROVED BY THE VILLAGE. MINIMUM DIAMETER OF PIPE SHALL BE 8".
2. DUCTILE IRON PIPE WILL BE USED IN STREAM CROSSINGS AND WHERE MINIMUM SEPARATION CAN NOT BE MAINTAINED.
3. 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.

## HOUSE CONNECTIONS

1. NO SERVICE LINE SHALL BE ALLOWED TO CONNECT DIRECTLY INTO A MANHOLE, SUBJECT TO APPROVAL BY THE VILLAGE IN SPECIFIC CLASS.
2. THE ENDS OF ALL SERVICE LINES TO TEES SHALL BE ACCURATELY LOCATED, MAPPED, AND GIVEN TO THE VILLAGE WITHIN 15 DAYS AFTER INSTALLATION.
3. 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 EXPENSE, A HYDRAULIC SEWER CLEANER WHICH WILL PRODUCE LARGE VOLUMES OF WATER TO CHECK THE LATERAL.
4. A PERMIT TO OPEN INTO, ALTER, OR DISTURB ANY PUBLIC SEWER MUST BE OBTAINED.
5. ALL ABANDONED SEWER LATERALS SHALL BE CAPPED AT THE OWNERS EXPENSE.

### FLEXIBLE PIPES

POLYVINYL CHLORIDE

DUCTILE IRON

### MATERIAL SPECIFICATIONS

ASTM D-3034 (SDR-35)  
PIPE STIFFNESS = 46 PSI

ANSI A-21.51 &  
AWWA C-151

### JOINT SPECIFICATIONS

ELASTOMERIC GASKET  
ASTM D-3212

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.



# Design Criteria

## Design Criteria

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DESIGN CRITERIA  
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## **FOREWORD**

This manual has been prepared to aid engineers and developers in the preparation of development plans and engineering design and to inform interested persons of the procedures and standards for the Village. It is also intended to be used during reconstruction or replacement of existing facilities or utility construction within the Village right-of-way. 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 strongly recommends that any development constructed within close proximity of the Village be designed and constructed to these standards. This will help ensure that, if the development is incorporated into the Village, the development will be accepted by the Village without additional upgrades. If a development or residence is annexed, all streets and utilities must be brought up to Village Standards at the Developer/Owner's or homeowner's expense. Furthermore, if a development 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 Specification.

The Village, at their discretion, may request that infrastructure and utility facilities in any particular development be installed to accommodate future expansion within the Village. If this is requested, the Village will evaluate the Developer's eligibility to be compensated for the cost difference to oversize particular infrastructure items per the Subdivision Regulations of the Village.

## REFERENCES

The Village 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.

- 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

**100.00**  
**General Provisions**

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| 100.01 | General                               |
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## **100.00 GENERAL PROVISIONS**

### **100.01 General**

- A. The Design Criteria and Construction Standards and Drawings along with 100% surety and 10% maintenance surety shall apply to all public improvement construction projects that will eventually be taken over by the Village. The 100% performance surety and 10% maintenance surety shall follow the regulations in the Village 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's Subdivision Regulations and this document. The work shall be done under Village 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 more restrictive shall always apply as determined by the Village.
- E. Upon request of the Developer 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/Owner's responsibility to arrange the preconstruction meeting. The Village reserves the right to refuse issuance of a Zoning Certificate without completion of a pre-construction 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.

#### **C. INSPECTIONS**

- 1. 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 administrative officials at least twenty-four (24) hours before each phase of the improvements is ready for inspection. Contact the Village office for all inspections.

Inspections shall be at a minimum as follows:

- a. Sanitary Sewer
  - 1. Sanitary pipe and manhole installation

2. Lateral location and inspection of all sewers
  3. Proper backfill installation
  4. Air test sanitary lines
  5. Vacuum test manholes
  6. Deflection test on PVC sewers
- b. Water Main
1. Pipe installation
  2. Hydrant installation
  3. Valve installation
  4. Service installation
  5. Proper backfill installation
  6. Restraining glands and/or blocking installation
  7. Pressure test
  8. Disinfection
- c. Storm Sewer
1. Manhole and Catch Basin installation
  2. Storm sewer pipe installation
  3. Field tile connections
  4. Proper backfill installation
  5. Headwall installation
- d. Roadway
1. Street excavation operations
  2. Subgrade preparation
  3. Subgrade undercutting
  4. Subbase installation
  5. Curbing installation
  6. Sidewalk and approach installation
  7. Asphalt installation
2. The absence or presence of an inspector during construction shall not relieve the Developer/Owner or contractor from full responsibility of compliance with plans, specifications, and Village requirements.
  3. 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/Owner. The Developer/Owner's Engineer and the Developer/Owner's Contractor will be present.

#### F. UTILITY COORDINATION



Coordination of utility locations such as electric, gas, telephone, and cable television shall be the responsibility of the Contractor, Developer, or Owner.

## CONSTRUCTION INSPECTION

PROJECT \_\_\_\_\_

DATE \_\_\_\_\_ INSPECTOR \_\_\_\_\_

This list could vary depending upon the types of construction included in the project. A typical list would require a 48-hour notice for inspections at the following points:

| ✓<br>A   | DESCRIPTION<br>PRIOR TO INSPECTION  | REMARKS |
|----------|---|---------|
|          | Review plans, special provisions, construction & materials manual & specifications that apply to your assigned duties.                    |         |
|          | Discuss your responsibility & authority with the project engineer.  |         |
|          | Discuss notification, changes, connections, delays, rejections, and tolerances.   |         |
| <b>B</b> | <b>PRE-CONSTRUCTION CONFERENCE</b>  |         |
|          | Attendees:<br>Village Manager/Village Engineer, Developer/Owner, his Contractor, his Engineer, and representatives from Utility Companies |         |
|          | Discuss phasing & schedules   |         |
|          | Discuss materials   |         |
|          | Discuss coordination  |         |
|          | Discuss safety (public & job)   |         |
|          | Discuss responsibilities  |         |
| <b>C</b> | <b>SANITARY SEWER &amp; LATERALS TO R/W</b>   |         |
|          | Check pipe type & quality   |         |
|          | Trench condition  |         |
|          | Bedding   |         |
|          | Proper initial backfill   |         |
|          | Proper backfill   |         |
|          | Prohibit ground water from entering sanitary  |         |
|          | Straight alignment & joints   |         |
|          | Wye installation & location   |         |
|          | Air test, mainline & laterals   |         |
|          | Mandrel test on PVC   |         |
| <b>D</b> | <b>SANITARY MANHOLE</b>   |         |
|          | Check type & condition  |         |
|          | Steps condition & alignment   |         |
|          | Cone type & condition   |         |
|          | Raisers recast/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 properly finish grade   |         |
|          | Chimney Seal  |         |

| ✓        | DESCRIPTION  | REMARKS |
|----------|--|---------|
| <b>E</b> | <b>WATER MAIN</b>  |         |
|          | Type & condition   |         |
|          | Valve, type & condition  |         |
|          | Hydrant, type & condition  |         |
|          | Trench condition   |         |
|          | Pipe alignment & joints  |         |
|          | Air release valves   |         |
|          | Isolation Valve installation & location  |         |
|          | Hydrant assembly 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:<br>Corp Stop<br>K-Copper<br>Curb Stop<br>Meter Set<br>Compacted Granular Backfill<br>Proper Backflow Prevention<br>Backflow Prevention Devices |         |
| <b>F</b> | <b>STORM SEWER</b>   |         |
|          | Check pipe type size & quality   |         |
|          | Check catch basin & grate type size & quality  |         |
|          | Check manhole type size & quality  |         |
|          | Trench condition   |         |
|          | Bedding  |         |
|          | Proper initial backfill  |         |
|          | Proper backfill, compacted granular under or near roadway  |         |
|          | Straight alignment & joint sealing   |         |
|          | 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  |         |
| <b>G</b> | <b>ROADWAY</b>   |         |
|          | 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  |         |

| ✓        | DESCRIPTION   | REMARKS |
|----------|---|---------|
|          | Density test, if soft   |         |
|          | Protect subgrade from being rutted or damaged<br>(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<br>temperature range of mix & compensation) |         |
|          | Proper distribution & roller  |         |
|          | Proper prime coat   |         |
|          | Lay in proper layer   |         |
|          | Watch joints & lapps  |         |
|          | Seal against concrete curbs, etc.   |         |
|          | Measure elevation & cross slope   |         |
|          | Keep traffic off for 24 hours if possible   |         |
| <b>H</b> | <b>FIXED STRUCTURES, CURBS, SIDEWALK, HEADWALL,<br/>ETC.</b>                                      |         |
|          | 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<br>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   |         |
| <b>I</b> | <b>MISCELLANEOUS</b>  |         |
|          | 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  |         |

| ✓ | DESCRIPTION                       | REMARKS |
|---|-----------------------------------|---------|
|   | 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" bond, signed and approved by a registered engineer shall be made for all new streets, utilities and other improvements to be constructed in any development in the Village. Said drawings are to be approved by the Village before any construction may begin and before the plat of said development may be recorded.
2. Submission of plans shall comply with Planning Commission regulations and the Village's Subdivision Regulations and Zoning Ordinance.

#### **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. Development name
4. Sheet title
5. Date
6. Revision block
7. Drawn by
8. Checked by

#### **C. REQUIRED PLAN LAYOUT**

1. Title Sheet
2. Final Plat
3. Schematic Plan
4. Typical Sections
5. General Notes
6. General Details
7. Site Grading and Erosion Control Plan
8. Erosion Control Details
9. Miscellaneous Details (example: Pump Station, Intersection Plan)
10. Plan and Profile (1" = 20' horizontal 1" = 5' vertical)
11. Cross-sections (1" = 5" horizontal, 1" = 5' vertical)
12. Detention Basin 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 with signatures
  - 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 existing and proposed right-of-way, property lines and roadway, lot numbers, street names, 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, (street number, stationing, description, etc.)
  - f. North arrow and scale.
  - g. Benchmarks and locations
  - h. Centerline stationing
  - i. Overall plan view of the development depicting the layout of the proposed sanitary sewer and drainage network. Plans should include all manholes, pipes, other structures, and the plan and profile sheet on which they are located.
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 Standard Drawings.
  - b. Modified Village Standard Drawings shall be redrawn for approval.
7. SITE GRADING PLAN AND EROSION CONTROL

Site Grading Plan

- a. A final site grading plan must be included with the construction drawings and approved by the Village.
- b. Propose 1' 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' contours.
- b. Proposed storm manholes, catch basins, pipes, etc., labeled and numbered.
- c. Concentrated flows.
- d. Property lines and right-of-way, lot numbers and property 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 and scale.
- l. 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 Village Standard Drawings.

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

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

#### 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 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 and curbs, etc.
- b. Show all existing pavements, headwalls, piers, utilities, mailboxes, trees, etc. (existing infrastructure may be shown in lighter text and no less than 80% shading).
- 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' (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 b/c 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) show 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 callout.
- s. Show all existing features within 50' of right-of-way.
- t. Proposed electric, telephone, gas, cable locations and easements.
- u. Proposed light pole layout and electric feed.
- 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' (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, 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 of 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 and offset above items.

- d. Proposed meter pit location.
- e. Indicate the testing requirements for fire protection and water services.

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 of 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 of proposed sanitary manholes and cleanouts.

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' 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 elevations.
- f. Cross-section at each drive and intersection roadway.

12 DETENTION BASIN PLAN AND DETAILS

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

13 OFF-SITE UTILITIES PLAN AND PROFILE

Refer to Plan and Profile.

## CONSTRUCTION PLANS CHECKLIST

PROJECT \_\_\_\_\_ DATE \_\_\_\_\_

| ✓ | DESCRIPTION  | REMARKS |
|---|--|---------|
|   | <b>C. REQUIRED PLAN LAYOUT ORDER</b>   |         |
|   | Title Sheet  |         |
|   | Final Plan   |         |
|   | 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 Plan and Details   |         |
|   | Off-Site Utilities Plan and Profile<br>(1" = 20' horizontal, 1" = 5' vertical) |         |
|   | <b>GENERAL</b>   |         |
|   | 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 developments  |         |
|   | Repair of pavements  |         |
|   | Streets for industrial development   |         |
|   | 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                            |         |

| ✓        | DESCRIPTION  | REMARKS |
|----------|--|---------|
|          | Other utilities  |         |
|          | Underground utilities  |         |
| <b>1</b> | <b>TITLE SHEET</b>   |         |
|          | Title of Project, Village, County, Township, and 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   |         |
| <b>2</b> | <b>FINAL PLAT</b>  |         |
|          | Copy of approved final plat  |         |
|          | See Subdivision Regulations  |         |
| <b>3</b> | <b>SCHEMATIC PLAN – LARGE SCALE LAYOUT OF THE SITE</b>   |         |
|          | At a measurable scale to show the whole site on one sheet (max. scale 1" = 100').  |         |
|          | Show existing and proposed right-of-way, property lines and roadway, lot numbers, street names, 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, (street number, stationing, description, etc.).   |         |
|          | North arrow and scale.   |         |
|          | Benchmarks and locations   |         |
|          | Centerline stationing.   |         |
|          | Overall plan view of the development depicting the layout of the proposed sanitary sewer and drainage network. Plans should include all manholes, pipes, other structures, and the plan and profile sheet on which they are located. |         |
| <b>4</b> | <b>TYPICAL SECTIONS</b>  |         |
|          | 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.  |         |
| <b>5</b> | <b>GENERAL NOTES</b>   |         |
|          | All notes necessary for construction which are not defined clearly elsewhere within the plans.   |         |
| <b>6</b> | <b>GENERAL DETAILS</b>   |         |
|          | All details necessary for construction which are not represented by Village Standard Drawings.   |         |
|          | Modified Village Standard Drawings shall be redrawn for approval.  |         |
| <b>7</b> | <b>SITE GRADING PLAN AND EROSION CONTROL</b>   |         |
|          | A final site grading plan must be included with the construction drawings and approved by the Village.   |         |

| ✓          | DESCRIPTION   | REMARKS |
|------------|---|---------|
|            | Proposed 1' 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' contours  |         |
|            | Proposed storm manholes, catch basins, pipes, etc., labeled and numbered.   |         |
|            | Concentrated flows.   |         |
|            | Property lines and right-of-way, lot numbers and property 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')  |         |
| <b>8</b>   | <b>EROSION CONTROL DETAILS</b>  |         |
|            | Any details necessary for construction which are not represented by the Village Standard Drawings.  |         |
| <b>9</b>   | <b>MISC. DETAILS (e.g. pump station, intersection plan etc.)</b>  |         |
|            | Plans shall include a detailed drawing with all proper labeling and dimensioning.   |         |
| <b>10</b>  | <b>PLAN AND PROFILE</b>   |         |
|            | 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 datum.  |         |
|            | Plan and profile sheets are required for all off-site utility extensions.   |         |
| <b>10A</b> | <b>GENERAL – PLAN</b>   |         |
|            | Show all proposed lots, streets, and curbs, etc.  |         |
|            | Show all existing pavements, headwalls, piers, utilities, mailboxes, trees, etc. (existing infrastructure may be shown in lighter text and no less than 80% shading).   |         |
|            | 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' (south to north and west to east where possible).  |         |
|            | Easements for utilities and storm drainage.   |         |
|            | Lot numbers, dimensions, and frontage   |         |
|            | Curb radius at intersections with b/c elevations at quarter points (if not covered in separate intersection detail).  |         |
|            |   |         |

| ✓               | DESCRIPTION  | REMARKS |
|-----------------|--|---------|
|                 | Curve data: radius, delta, chord length, chord bearing, arc length, station of PC, PT, PCC, PI, PRC.   |         |
|                 | Sheet reference.   |         |
|                 | Plat section lines (boundary lines) show 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 widths call out.  |         |
|                 | Show all existing features within 50' of right-of-way.   |         |
|                 | 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.  |         |
| <b>10B</b>      | <b>GENERAL - PROFILE</b>   |         |
|                 | 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' (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, length).   |         |
| <b>10C</b>      | <b>STORM SEWER – PLAN</b>  |         |
|                 | Show and station, with offsets, the proposed storm sewers: manholes, laterals, catch basins, headwalls, etc.   |         |
|                 | Label each pipe size and type.   |         |
| <b>EPA Appr</b> | Number of proposed storm manholes and catch basins.  |         |
| <b>10D</b>      | <b>STORM SEWER – PROFILE</b>   |         |
|                 | Show length of span, size, grade, and class and/or type of proposed pipe.  |         |
|                 | Label existing pipe size and type.   |         |
|                 | Label existing and proposed mainline 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.   |         |
| <b>10E</b>      | <b>WATER – PLAN</b>  |         |
|                 | Show and station, with offsets, the proposed waterline, laterals, deflection points, hydrants, valves, etc.  |         |
|                 | Label pipe size, tees, crosses, etc.   |         |
|                 | Station and offset above items.  |         |
|                 | Proposed meter pit location.   |         |
| <b>EPA Appr</b> | Indicated the testing requirements for fire protection and water services.   |         |
| <b>10F</b>      | <b>WATER – PROFILE</b>   |         |
|                 | Show length, size, depth, and class and/or type of pipe.   |         |
|                 | Show deflection points.  |         |

|                 |   |                |
|-----------------|---|----------------|
| ✓               | <b>DESCRIPTION</b>  | <b>REMARKS</b> |
|                 | Show stations and any critical elevations for above items.  |                |
|                 | Label minimum coverage of water main.   |                |
| <b>10G</b>      | <b>SANITARY SEWER – PLAN</b>  |                |
|                 | Show sanitary sewers, manholes, laterals, cleanouts, etc. with station and offset labeled.                          |                |
|                 | Label each pipe size.   |                |
| <b>EPA Appr</b> | Number of proposed sanitary manholes and cleanouts.   |                |
| <b>10H</b>      | <b>SANITARY SEWER – PROFILE</b>   |                |
|                 | 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 of proposed sanitary manholes and cleanouts.   |                |
| <b>11</b>       | <b>CROSS-SECTIONS</b>   |                |
|                 | Cross-sections shall be at a scale of 1" = 5' horizontal, 1" = 5' vertical.   |                |
|                 | Cross-sections shall be every 50' 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.   |                |
| <b>12</b>       | <b>DETENTION BASIN</b>  |                |
|                 | Detailed site plan including inlet and outlet elevations, top of bank elevations and emergency overflow elevations. |                |
| <b>13</b>       | <b>OFF-SITE</b>   |                |
|                 | Refer to Sheet Number 10 Plan and Profile.  |                |

#### **100.04 Record Drawings Requirements**

##### **A. RECORD DRAWINGS REQUIREMENTS**

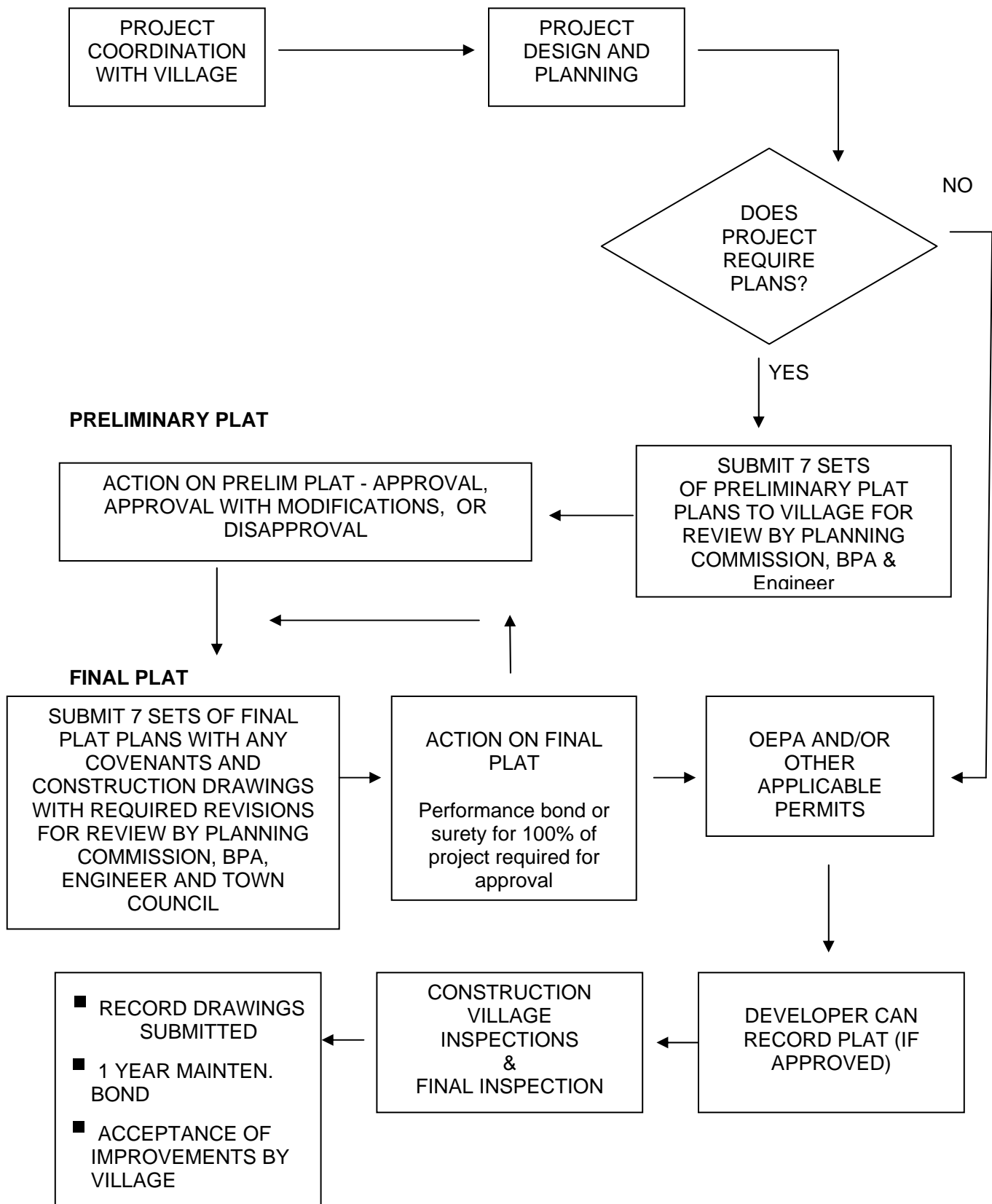
1. At the completion of construction, the original tracings shall be revised as necessary to provide "Record Drawings". This work shall be done by the Developer/Owner's Engineer, who was responsible for setting grades and staking for improvements. The "Record Drawings" shall include the following information:
  - 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 and inverts and lateral locations
    4. Curb, gutter and centerline elevations at locations where they are ended for future roadway extensions.
  - c. The location of any additional improvements, construction as additions, or changes to the approved plans, such as tapping sleeves, blind taps, joint clamps, or any other field change item.
  - d. The original tracings and a copy of the revised computer drawings transferable to disks shall become the property of the Village. Drawings to be easily converted into autocad format.

#### **100.05 Penalties**

Failure to comply with the Village's Design Criteria and Construction Standards and Drawings shall result in penalties assessed according to the severity and frequency of individual offenses and per the requirements defined in the Village's Subdivision Regulations and Zoning Ordinance.



## 100.06 Plat Review and Approval Process



**Definitions**

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

## **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 Standards Institute

#### **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.

#### **COMBINED SEWER**

A sewer intended to receive both wastewater and storm or surface water.

#### **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 portability.

#### **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 design 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 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 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 storm sewer pipe into a continuous sewer line using various types of jointing materials with various types of pipe formation.

**JURISDICTION**

Any governmental entity, such as town, city, 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.

**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.

**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 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.

**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 required for water to flow from the hydrologically remote point of a basin to the outlet or collection point being analyzed. The time of concentration is the maximum time for water to travel through the watershed, which is not always the maximum distance from the outlet to any point in the watershed. The time of concentration for all drainage design of areas larger than 20 acres should be computed using the TR-55 method. A sample calculation sheet is provided in Figure 6.1. For smaller areas, Figure 6.3 may be used.

**WATER RESOURCE**

Any natural or unnatural body of water, swale, ditch, conduit, pond, lake, etc. that receives or transports storm water runoff.



**300.00**  
**Roadways**

300.01                      General

## **300.00      ROADWAYS**

### **300.01   General**

All street design and layout shall follow the Village Construction Standards and Drawings, the Ohio Department of Transportation (ODOT) Location and Design Manual, Volume One, Roadway Design, latest version, and AASHTO. The most restrictive shall apply as determined by the Village Engineering Department. These criteria cover design factors and provide guidelines for evaluations of plans and specifications by the Village department 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**

|        |  |
|--------|--|
| 600.01 | General  |
| 600.02 | Storm Sewer and Inlet Grate Design                               |
| 600.03 | Minimum Diameter   |
| 600.04 | Minimum Cover  |
| 600.05 | Minimum Slope  |
| 600.06 | Minimum Velocity   |
| 600.07 | Maximum Velocity   |
| 600.08 | Maximum Headwater  |
| 600.09 | Manholes   |
| 600.10 | Manhole Minimum Diameter   |
| 600.11 | Catch Basins   |
| 600.12 | Basis of Culvert Design  |
| 600.13 | Open Drainage Ditches  |
| 600.14 | Channel Protection   |
| 600.15 | Storm Water Detention Basin/<br>Retention Pond Size Requirements |
| 600.16 | Detention Basin/Retention<br>Pond Guidelines                     |
| 600.17 | Site Grading   |
| 600.18 | Runoff from Upstream Drainage Areas                              |
| 600.19 | Runoff from Contiguous Properties                                |
| 600.20 | Soil Sediment Pollution<br>Control Regulations                   |

## **600.00 STORM DRAINAGE**

### **600.01 General**

The following Design Criteria are summarized herein to established 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 Village department 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 20 acres. The U.S. Department of Agriculture, Engineering Division of the Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release No. 55, June 1986 or most current edition or more commonly referred to as TR-55 is the preferred method for estimating storm run-off for areas greater than 20 acres.

The post development peak rate of runoff shall not exceed that of the pre-development stage for the 1-year frequency 24 hour storm. The detention volume shall be calculated using the 100 year storm event.

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 10-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 (see table 6.1)

i = Intensity of rainfall, in inches per hour (see table 6.2 Intensity Zone D)

A = Drainage area, in acres

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 foot

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

The design of storm sewers in the Village 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 sub areas 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 400' standard 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.

**TABLE 6.1**  
**RUNOFF COEFFICIENT – C**

**Predominant Lane 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.

**Table 6.2**

The Rainfall Intensity-Duration-Frequency curves are based upon data obtained from the United States Weather Service Technical Paper No. 40 Rainfall Frequency Atlas of The United States.

Federal Highway Administration Hydraulic Engineering Circular No. 12 Appendix A offers a methodology for converting I-D-F data points to an equation of the general form:

$$i = \frac{a}{(t + b)^c}$$

Where: i = rainfall intensity (inches/hour)  
t = time of concentration (minutes)  
a = constant  
b = constant  
c = constant

Using the above referenced methodology the curves in Figure 1101-2 can be expressed using the above general equation utilizing the constants shown below.

| Intensity Zone<br>(Figure 1101-3) | Frequency (Years) | Constant "a" | Constant "b" | Constant "c" |
|-----------------------------------|-------------------|--------------|--------------|--------------|
| A                                 | 2                 | 44.150       | 8.900        | 0.835        |
|                                   | 5                 | 150.271      | 18.400       | 1.062        |
|                                   | 10                | 70.474       | 10.200       | 0.874        |
|                                   | 25                | 96.280       | 11.100       | 0.899        |
|                                   | 50                | 51.622       | 5.100        | 0.747        |
|                                   | 100               | 85.930       | 8.000        | 0.834        |
| B                                 | 2                 | 104.596      | 25.099       | 1.015        |
|                                   | 5                 | 81.276       | 18.800       | 0.855        |
|                                   | 10                | 275.649      | 29.499       | 1.070        |
|                                   | 25                | 294.909      | 28.099       | 1.044        |
|                                   | 50                | 117.148      | 16.700       | 0.849        |
|                                   | 100               | 293.888      | 26.699       | 1.000        |
| C                                 | 2                 | 64.387       | 14.300       | 0.896        |
|                                   | 5                 | 184.940      | 21.699       | 1.075        |
|                                   | 10                | 83.828       | 12.500       | 0.887        |
|                                   | 25                | 58.733       | 7.400        | 0.771        |
|                                   | 50                | 79.945       | 9.300        | 0.818        |
|                                   | 100               | 196.039      | 16.300       | 0.978        |
| D                                 | 2                 | 85.568       | 16.500       | 0.950        |
|                                   | 5                 | 118.822      | 18.700       | 0.969        |
|                                   | 10                | 112.172      | 16.800       | 0.923        |
|                                   | 25                | 198.920      | 19.300       | 1.004        |
|                                   | 50                | 206.025      | 19.600       | 0.990        |
|                                   | 100               | 355.551      | 23.199       | 1.076        |

#### **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. 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 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 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 400 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 street and roadway culverts shall be the Ohio Department of Transportation's Location and Design Manual, Volume Two, Drainage Design.

Hydraulic analysis of culverts may also be performed utilizing Hydraulic Design Series No. 5, Hydraulic Design of Highway Culverts, Federal Highway Administration and Computer Program HY-8.

Design shall be based on a 25-year storm for full flow capacity and an overtopping capacity of at least a 100-year storm.

Culvert flow type must be determined for each culvert design. There are two (2) types of culvert flow: Inlet Control and Outlet Control. This must be determined to help ensure proper culvert design.

Maximum allowable headwater shall be 1 foot below the low edge of the pavement. However, the designer should generally limit the maximum 100-year headwater depth to twice the diameter or rise of the culvert.

Tailwater conditions shall also be analyzed for all culverts. In some locations, a high tailwater will control the operation of the culvert. This condition can greatly effect the capacity and headwater of the culvert and shall be checked to help determine upstream design storm, storm water elevations.

### **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**

| <b>CHANNEL MATERIAL</b>                | <b>n</b> |
|--|----------|
| 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 certain outlets for storm water runoff in the Village may be 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 reaction 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.

Normal 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 1-year storm under pre-developed 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 20 acres. The Tr-55 Method shall be used for all areas greater than 20 acres.
- B. The release rate from on-site detention shall not be greater than the storm runoff created pre-developed site during a one year frequency storm. Consideration may be given for different intensity and coefficient based on the situation. If runoff from off-site acreage flows through the detention basin, storage volume should be calculated using Figure 6.5 for the on-site area only. After the volume has been calculated, the allowable outflow rate should be calculated using the acreage of the entire area draining across the site.
- 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, "Consumption Worksheet for Detention Storage Using Rational Method", for less than 20 acres.

**Figure 6.5**

COMPUTATION WORKSHEET FOR DETENTION STORAGE USING THE  
RATIONAL METHOD (less than 20 acres)

Project \_\_\_\_\_

Designer \_\_\_\_\_

Determination of Allowable Outflow \_\_\_\_\_

Watershed Area (A) \_\_\_\_\_ acres

Allowable Outflow Rate (O) \_\_\_\_\_ cfs

| Storm<br>Duration<br>t<br>(hrs) | Post<br>Developed<br>C | Rainfall<br>Intensity<br>i (100 yr)<br>(inches/hr) | Post Inflow<br>Rate<br>(100 Year)<br>I(t)<br>(CiA)<br>(cfs) | Pre Allowable<br>Outflow Rate<br>(1 year)<br>O<br>(cfs) | Storage Rate<br>I(t) - O<br>(cfs) | Required<br>Storage<br>[I(t)-O]t/12<br>(acre-ft) |
|---------------------------------|------------------------|--|---|---|-----------------------------------|--|
| 0.17                            |                        | 8.210  |   |   |                                   |  |
| 0.33                            |                        | 6.180  |   |   |                                   |  |
| 0.50                            |                        | 4.940  |   |   |                                   |  |
| 0.67                            |                        | 4.110  |   |   |                                   |  |
| 0.83                            |                        | 3.510  |   |   |                                   |  |
| 1.00                            |                        | 3.050  |   |   |                                   |  |
| 1.50                            |                        | 2.190  |   |   |                                   |  |
| 2.00                            |                        | 1.700  |   |   |                                   |  |
| 3.00                            |                        | 1.170  |   |   |                                   |  |
|                                 |                        |  |   |   |                                   |  |

## **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 0.5 percent. An acceptable alternative to a concrete low flow channel will 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 4 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 a least one-half acre. The lake area should be an average depth of 6 feet to inhibit weed and insect growth, and should have no extension shallow area. 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 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 34 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 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 6 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 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 provide 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 preformed 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 the 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 a variance from the Subdivision Regulations approved by Village Council.
2. Owners will be responsible for routine maintenance of the development detention basin located on their lots. Grass mowing, ornamental landscaping, and fencing are considered routine maintenance. No activity which will interrupt the operation of the detention basin will be allowed. No accessory erosion control and fixed structures such as piping, manholes, and inlets. This statement shall be added to each deed of transfer.

#### **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 2 ½ 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 2 ½ 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 or 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 Runoff from Upstream Drainage Areas**

The runoff from drainage areas upstream of the proposed development or improvements 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.

#### **600.19 Runoff from 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.



## **600.20 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-distributing 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 persons 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 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 stormwater 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 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. Southing 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 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.

## COMPUTATION FOR STORM SEWER DESIGN

**PROJECT:**

**DATE:**

**SHEET #** \_\_\_\_\_

[illegible]

## COMPUTATION FOR STORM SEWER DESIGN

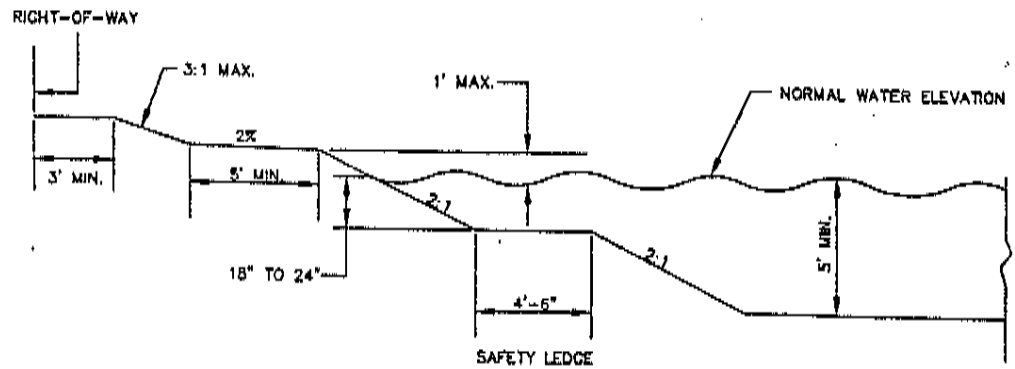
SHEET # \_\_\_\_\_

[illegible]

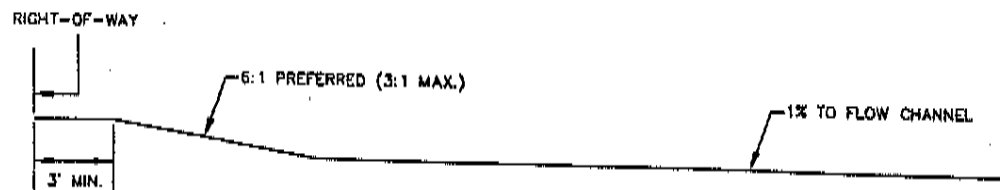
Figure 6.6

# SLOPE DESIGN FOR STORM WATER STORAGE FACILITIES

## RETENTION POND



## DETENTION BASIN OR DRY BASIN



LOW FLOW CHANNEL—PAVED .5% GRADE

ALTERNATE—UNDERDRAINS WITH SOD IN LOW FLOW CHANNEL 1% GRADE

AS-BUILTS ARE REQUIRED.

**800.00**  
**Water Distribution**

|        |                     |
|--------|---------------------|
| 800.01 | General             |
| 800.02 | Basis of Design     |
| 800.03 | Minimum Pressure    |
| 800.04 | Maximum Velocity    |
| 800.05 | Water Mains         |
| 800.06 | Water Service Lines |
| 800.07 | Meter Installation  |
| 800.08 | Backflow Prevention |

## **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. [Refer to the Rules & Regulations for Public Water System Facilities for the Village of Pleasant Hill. The latest revision is dated February 1999. Obtain copies of these regulations from the Board of Public Affairs.](#)

These criteria cover design factors and provide guidelines for evaluation of plans and specifications by the Village departments having jurisdiction over the review of plans and specifications. These design criteria are also intended to conform to the standard drawings for water systems. All improvements to the water distribution system shall be coordinated with the Village Board of Public Affairs and the Superintendent of the Water Treatment Plant.

### **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. Selection of a roughness coefficient shall be coordinated through the Village Engineering Department.

### **800.03 Minimum Pressure**

The minimum desirable 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=130. The minimum size of water mains shall be 8-inch diameter. Dead-ending mains shall be minimized by looping of all mains. In the event the Village permits a dead-end, they should be provided with a fire hydrant for flushing purposes.

The minimum depth of water mains shall be 42 inches from the top of the pipe to the finished grade elevation. The maximum depth of water mains shall be 60 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 5 inches, but shall be no larger than the water main. For all 3/4 inch services, a corporation stop shall be installed on the main at a 45 degree angle above horizontal. For services larger than 2 inches, a tapping sleeve and valve must be installed.

**TABLE 8.1**

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

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

#### **800.07 Meter Installation**

Refer to the Rules & Regulations for Public Water System Facilities for the Village of Pleasant Hill dated July 1997.

**TABLE 8.2**

**METER SIZE FOR COMMERCIAL-INDUSTRIAL APPLICATIONS**

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

#### **800.08 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 construction and installation. These devices shall be tested and inspected annually under the supervision of the Water Superintendent or his designee and paid for by the owner of the property. These devices shall be repaired or replaced if they do not meet the testing requirements. An annual report shall be submitted by a licensed plumber in the State of Ohio to the Village detailing the testing procedures and results.

Refer to the Rules & Regulations for Public Water System Facilities for the Village of Pleasant Hill last dated February 1999 for further information. Obtain copies of these regulations from the Board of Public Affairs.

**900.00**  
**Sanitary Sewers**

|        |                                   |
|--------|-----------------------------------|
| 900.01 | General                           |
| 900.02 | Basis of Design                   |
| 900.03 | Maximum Depth of Flow             |
| 900.04 | Average Daily Flow                |
| 900.05 | Population Density                |
| 900.06 | Peak Design Flow                  |
| 900.07 | Minimum Velocity                  |
| 900.08 | Maximum Velocity                  |
| 900.09 | Minimum Grades                    |
| 900.10 | Sanitary Sewers                   |
| 900.11 | House Laterals                    |
| 900.12 | Invert Drop in Manhole            |
| 900.13 | Illegal Connections               |
| 900.14 | Horizontal Separation             |
| 900.15 | Vertical Separation               |
| 900.16 | Crossing Utilities                |
| 900.17 | Parallel Installation             |
| 900.18 | Manholes                          |
| 900.19 | Manhole Minimum Diameter          |
| 900.20 | Manhole Water Tightness           |
| 900.21 | Flow Channel                      |
| 900.22 | Drop Manholes                     |
| 900.23 | Test Inspection                   |
| 900.24 | Railroad and Highway<br>Crossings |
| 900.25 | Stream Crossings                  |
| 900.26 | Sewage Pumping Stations           |
| 900.27 | Force Mains                       |

## **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 Village departments 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 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. This includes normal infiltration.

### **900.05 Population Density**

The average household consists of four (4) persons. Therefore, for design purposes, there would be four (4) capital 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 ration 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**

### **AVERAGE DAILY FLOW (ADF)**

| <u>WASTEWATER SOURCE</u>                | <u>GALLONS<br/>PER DAY</u> | <u>LITERS<br/>PER DAY</u> |
|---|----------------------------|---------------------------|
| Airports                                |                            |                           |
| Per Employee                            | 20                         | 76                        |
| Per Passenger                           | 5                          | 19                        |
| Apartment                               |                            |                           |
| 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 hours) 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<br>(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<br>(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<br>(not incl. Showers or cafeteria) – per pupil             | 10                 | 38                 |
| High and Junior High<br>(not incl. Showers or cafeteria)<br>-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<br>(without food service or laundries)                |                    |                    |
| -per area of floor space   | 0.2 per<br>sq. ft. | 8 per<br>sq. meter |
| Stores   |                    |                    |
| Per toilet per shift   | 400                | 1,516              |

|  |                                 |       |
|--|---------------------------------|-------|
| Swimming Pool<br>(average with hot water shower)<br>-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<br>At Service Station                          | Consult District Office of OEPA |       |
| Travel Trailer Parks and Camps<br>-Per trailer or tent space                   | 125                             | 474   |
| Vacation Cottage<br>-Per person  | 50                              | 189   |
| Youth and Recreation Camps<br>-Per Person                                      | 50                              | 189   |



#### **900.07 Minimum Velocity**

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

#### **900.08 Maximum Velocity**

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

#### **900.09 Minimum Grades**

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

**TABLE 9.1**

**REQUIRED MINIMUM SLOPE**

**Based on "n" Value of 0.013  
Sewer Size – 8 through 36 inches**

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

#### **900.10 Sanitary Sewers**

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

Four-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. In multi-tenant buildings, individual services shall be provided to a common pipe, then to the main. Individual 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 is 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, 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 recommended 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. All manhole exteriors to be coated with CS-55 by Con Seal (or equal). 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 manhole shall be at least 3 inches (75 mm) above the top of the base slab so that the sewer flow channel may be installed and shaped. The flow channel through 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 connection is not practical. Inside drop connection to be used only with the approval of the Village. Minimum diameter for inside drop shall be 5 feet inside the diameter. 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 local authority having jurisdiction and in compliance with the Village Construction Standards and Drawings. The size of the casing pipe shall be at least four (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 stream bed 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 stream bed and sufficiently removed therefrom to provide for future possible stream widening and to prevent pollution by siltation during construction.

###### **3. Structures**

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

###### **4. Alignment**

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

##### **B. CONSTRUCTION**

###### **1. Materials**

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

## 2. Siltation and Erosion

Construction methods that will minimize siltation and erosion shall be employed. The design engineer shall include in the project specifications the method(s) to be employed in the construction of sewers in or near streams. Such methods shall provide adequate control of siltation and erosion by limiting unnecessary excavation, disturbing or uprooting trees and vegetation, dumping of soil or debris, or pumping silt-laden water into the stream. Specifications shall require that cleanup, grading, seeding, and planting or restoration of all work areas shall begin immediately. Exposed areas shall not remain unprotected for more than seven (7) 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. Ohio Environmental Protection Agency's latest requirements.
- c. Village Design Criteria and Standard Construction Drawings.
- d. All other applicable codes and regulations.
- e. Building permits will not be issued until all required pump station are operational and start-up has been completed.

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 flood plain obstructions shall be followed.

3. Grit

No individual residence or common residence grinder pumps will be permitted. Gravity sewers out letting into a common pump station will be required.

#### **B. PUMP STATION TYPE AND 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.

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. 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 shall be constructed of precast 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.
  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 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.

c. Vent

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

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.

#### 10. Generator Back-up

1. A stand-alone diesel powered generator with automatic transfer switch to be provided for each lift station.
2. Generator to work with the telemetry panel to notify alternate power source being used.

### **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 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.