CITY OF VALPARAISO, INDIANA

SPECIFICATIONS AND STANDARDS
FOR ACCEPTANCE OF
MUNICIPAL IMPROVEMENTS

Effective Date:

August 26, 1991

Prepared By

City of Valparaiso

Engineering Department

1991

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ORDINANCE NO. 40, 1991

AN ORDINANCE
PROVIDING STANDARDS FOR ACCEPTANCE
OF MUNICIPAL IMPROVEMENTS

WHEREAS, the Board of Public Works and Safety of Valparaiso, Indiana, is charged with the responsibility of accepting municipal improvements within its jurisdiction, and is charged with the duty and responsibility of maintaining said municipal improvements after acceptance, fixing standards therefore, and

WHEREAS, the Board of Public Works and Safety has recommended that the City Council adopt new and improved minimum standards for acceptance of municipal improvements for maintenance for said City:

NOW THEREFORE, BE IT ORDAINED by the Common Council of the City of Valparaiso, Indiana that a manual entitled "Specifications and Standards for Acceptance of Municipal Improvements" is hereby adopted as the minimum requirements for acceptance of municipal improvements for maintenance for the City of Valparaiso:

DAVID A. BUTTERFIELD, MAYOR

ATTEST:

SHARON EMERSON SWIHART
CLERK-TREASURER

SECTION 1 – GENERAL APPLICATION

On and after the effective date of this Ordinance, municipal improvements shall be accepted by the Board of Public Works and Safety for maintenance only when the minimum requirements of this Ordinance are met; provided however, that the specifications, standards, and requirements of Section II of this Ordinance shall not apply as follows:

> All improvements for which construction plans were approved by the Board of Public Works and Safety prior to the effective date of this Ordinance, shall be constructed in accordance with the approved plans, so long as the construction is completed and a request for acceptance has been submitted to the Board of Public Works and Safety, hereinafter referred to as the "Board", within two (2) years of the effective date of this Ordinance.

SECTION 2 – MINIMUM STANDARDS FOR MUNICIPAL IMPROVEMENTS

PART A – CONSTRUCTION PLANS

A1. General Provisions for Plan Approval

All improvements as designated and labeled upon a proposed plat, instrument of dedication, or construction plan shall be constructed in accordance with the following specifications and requirements.

a. Preparation of Plans

Plans for said improvements shall be prepared over the seal and signature of a Professional Engineer or Land Surveyor, as allowed by the rules and regulations as set out by the Indiana State Board of Registration for Professional Engineers and Land Surveyors.

b. Presentations of Plans for Approval

Three (3) sets of plans shall be submitted to the City Engineer for distribution and review by appropriate departments. The Board shall take action within thirty (30) days and notify the petitioner by letter of that action and, in the case of approval, return an approved set of plans to the petitioner. Seven (7) sets of the final plans, in the approved form, shall be submitted for designation as the "approved plans".

c. Conditions

Prior to Board approval of construction plans for public improvements, the subdivider shall file a written schedule with the Board of a program of progressive development.

The Board shall not approve the construction plans unless it is accompanied by a certificate of the City Engineer stating that either:

1. The owner/developer has posted satisfactory security to the City of Valparaiso in an amount approved by the City Engineer and equal to the cost of providing all improvements in the subdivision and specifying the time for completion of the improvements and installations; or
2. The subdivider has filed two (2) copies of a signed statement with the City Plan Commission, authorizing the Building Commissioner to withhold the issuance of building permits as required under the Zoning Ordinance for any or all land or structures within the subdivided area until acceptance of the public improvements by the Board for the subject area.

No construction plans for public improvements shall be approved by the Board unless they are accompanied by utility acknowledgement and approval of all indicated utility easement locations and widths by all utilities servicing the area.

A2. Starting Construction

a. Work shall not be started until plans have been approved by the Board. (**AN APPROVED SET OF PLANS SHALL BE ON THE JOB SITE AT ALL TIMES.)**

b. Notice shall be given to the City Engineer twenty-four (24) hours in advance of the start of construction. Where construction has ceased for thirty (30) days, renotification is required. Required inspection during construction for various phases of improvement are as outlined in Section 3 of this Ordinance.

c. Notice shall be given to all utilities in advance of the start of construction in accordance with the State Law.

d. The Board shall not be obligated to accept any work started prior to approval of plans in accordance with paragraph A1 of this Section, including notification and inspection as outlined herein. Should a request for acceptance of such work be made, the criteria and requirements for acceptance shall be those in force and effect on the date of the request, except as spelled out in Section 1 of this Ordinance. Any remedial work determined to be necessary for acceptance by the Board shall be done at the developer's expense.

A3. Governing Specifications

Unless otherwise provided by this Ordinance or the specifications for the specific project, the latest revision of the following documentation shall apply to all work performed and materials specified for use in all improvements:

--Indiana Department of Transportation Standard Specifications and supplements, hereinafter referred to as the "Standards Specifications".

--American Association of the State Highway and Transportation Officials Policy on Geometric Design of Highways and Streets.

--The Indiana Manual on Uniform Traffic Control Devices.

--The City of Valparaiso Master Plan.

--The City of Valparaiso Master Drainage Plan

--The City of Valparaiso Thoroughfare Plan

--The City of Valparaiso Floodplain Ordinance

--The City of Valparaiso Municipal Code

--The City of Valparaiso Erosion Control Ordinance

--Great Lakes – Upper Mississippi River Board of State Sanitary Engineers Recommended Standards for Sewer Works hereinafter referred to as "Ten States Standards".

Copies of these documents are on file in the City Engineer's Office.

A4. Length of Plan Approval Validity

In the event construction of the improvement is not initiated within one (1) year and work completed within three (3) years after the approval of construction plans, such plans shall be presented to the Board for re-review and action.

PART B – MINIMUM STANDARDS FOR STREET DESIGN

B1-A. Designation of Street Classification

The designation of street classification shall be approved by the Board of Public Works and Safety in accordance with definitions as specified herein.

a. Primary Arterial Streets

All streets designated as Primary Arterial Streets in the Official Thoroughfare Plan shall have controlled access and shall be constructed on right-of-way acquired for such purpose as a joint effort between the City of Valparaiso and any other appropriate governmental agency. Property owners and/or land developers shall be required to construct streets and dedicate right-of-way meeting Collector Street Standards. Required construction and dedication in excess of Collector Street Standards shall be paid for by the appropriate governmental agency.

b. Secondary Arterial Streets

All streets designated as Secondary Arterial Streets in the Official Thoroughfare Plan shall be controlled access and shall be constructed on right-of-way acquired for such purpose as a joint effort between the developer, property owners, the City of Valparaiso and any other appropriate governmental agency. Property owners and/or land developers shall be required to construct streets and dedicate right-of-way meeting Collector Street Standards. Required construction and dedication in excess of Collector Street Standards shall be paid for by the appropriate governmental agency.

c. Collector Streets and/or Frontage Roads

1. All streets designated as Collector Streets and/or Frontage Roads in the Official Thoroughfare Plan, lying entirely within land owned by the developer, shall be constructed by the developer in accordance with plans approved by the City of Valparaiso.

2. All streets designated as Collector Streets and/or Frontage Roads in the Official Thoroughfare Plan lying only partially within land owned by the developer shall be constructed as a joint effort between the City of Valparaiso, the developer, and the owners of the adjacent land according to plans approved by the City of Valparaiso. The property owners and/or land developers shall be required to construct streets and dedicate right-of-way meeting collector Street Standards for streets and/or Frontage Road Standards for frontage roads.

   The City of Valparaiso shall cooperate in every way to encourage the complete construction of streets located only partially on a developer's land.

This will include right-of-way dedication, necessary grading and construction of street pavements.

d. Local Streets

All streets not designated as Collector, Frontage Road or Arterial in the Official Thoroughfare Plan shall be considered Local Streets. Property owners and/or land developers shall be required to construct streets and dedicate right-of-way meeting Local Street Standards in accordance with plans approved by the City of Valparaiso.

B1-B. Heavy Use Pavements

Notwithstanding the requirements of subpart B1-A above, any new or existing street pavement expected to carry regular and/or repeated heavy truck traffic related to any new use of an existing or new property, shall be designed and constructed or upgraded to a condition sufficient to carry the expected loadings.

B2. Pavement Width and Length

a. The minimum width of residential local street pavement, including concrete curb and gutter, shall be thirty (30) feet. The maximum total length of dead-end street shall be six hundred (600) feet as measured from the intersection of centerlines of the nearest through street intersection and the center of the cul-de-sac. (Refer to Standard Plan B-01)

b. The minimum width of residential collector street pavement, including concrete curb and gutter, shall be thirty-six (36) feet. (Refer to Standard Plan B-02)

c. The minimum width of a street within an area zoned non-residential or multi-family (3 units or greater) shall be thirty-six (36) feet back to back of curbs. (Refer to Standard Plan B-02)

d. The minimum width of frontage road shall be twenty-four (24) feet of pavement width and four (4) foot aggregate shoulders on each side. (Refer to Standard Plan B-03)

e. All permanent dead-end streets shall be terminated by cul-de-sacs. The minimum radius of cul-de-sacs on local streets and the minimum radius of curb entering and leaving the turn-around area shall be as shown on Standard Plans B-04 and B-05. Temporary dead-end streets may be permitted in cases where the street logically will be extended beyond the limits of the plat but are not as yet constructed beyond the plat limits. An adequate turn-around, as shown on Standard Plan B-06, along with the necessary easement shall be provided for such temporary dead-end streets, which extend greater than one lot deep. Paving of the turn-around may be delayed in one year intervals through application to the Board.

B3. Minimum Right-of-Way

The greater of the following shall be the minimum right-of-way required for the appropriate designation:

a. Local Streets – fifty (50) feet, sixty (60) feet radius from center of cul-de-sac,

b. Collector Streets, streets in non-residential areas, and streets in R-3 zoned areas – sixty (60) feet,

c. Frontage Roads – forty (40) feet,

d. Divided streets and one-way streets – as determined by the Board, or

e. The right-of-way as set forth for future use in the Official Thoroughfare Plan for Valparaiso, Indiana

B4. Normal Crown

The pavement crown for all streets shall be computed at a rate of one quarter (1/4) inch per foot.

B5. Grades

a. Maximum Grades

1. Primary and secondary thoroughfares – as determined by the Board.

2. Collector streets – six (6) percent.

3. Commercial and industrial streets – sic (6) percent.

4. Local streets – eight (8) percent.

5. Cul-de-sacs within the turning area – three (3) percent.

6. Within two hundred (200) feet of a street intersection – four (4) percent.

b. Minimum Grades

The minimum grade of all streets shall be five-tenths (0.5) percent.

B6. Minimum Stopping Sight Distant

a. Collector Streets – two hundred forty (240) feet

b. Local Streets – one hundred fifty (150) feet.

c. All other streets – as determined by the Board.

B7. Street Alignment

a. The minimum lengths of vertical curves shall be as shown in Standard Plans B-07 and B-08.

b. Vertical curve shall be considered at all intersections of grade. The maximum grade change without a vertical curve shall be based on comfort and as shown in Standard Plan B-07 and B-08. At intersections, the break-in grade may be four (4) percent maximum conforming to the crown of the cross street.

c. The minimum centerline radius for a horizontal curve shall be as follows:

1. Collector – three hundred (300) feet.

2. Local – one hundred fifty (150) feet.

3. All other streets –as determined by the Board.

d. The minimum tangent between reversed curves shall be fifty (50) feet.

B8. Intersections

a. An intersection shall have three (3) or more street approaches whose centerlines intersect in a common point.

b. Street Curbs at intersections shall have the greater of the following as a minimum radius:

1. Between two local streets – twenty (20) feet,

2. One or more streets classified as a Collector Street – thirty (30) feet, or

3. One or more streets classified as an Arterial street – forty (40) feet.

c. Street intersections shall be as nearly at right angles as possible, and no intersection shall be at an angle of less than seventy-five (75) degrees.

d. Street jogs with centerline offsets of less than one hundred fifty (150) feet shall not be permitted on Collector or higher rated streets.

e. Intersections of Local and Collector streets with thoroughfares shall be in accordance with a design specified by the Board.

f. No fence, wall, hedge, or shrub planting which obstructs sight lines shall be placed or permitted to remain on any corner lot at the intersection of a Collector street and Local street within the triangular area formed by the street property lines and a line connecting points twenty-five (25) feet from the intersection of the property lines extended.

g. No fence, wall, hedge, or shrub planting which obstructs sight lines shall be placed or permitted to remain on any corner lot at the intersections of two (2) Local streets or at the intersections of a street with an alley within the triangle area formed by the street property lines or alley property line and a line connecting points fifteen (15) feet from said intersection of the property lines extended. No trees shall be permitted to remain within such triangles unless the foliage line is maintained at sufficient height to prevent obstruction of such sight lines.

h. Trees and utility poles shall not be placed within the public right-of-way within fifty (50) feet of the centerlines of street intersections.

B9. <u>Sidewalks</u>

a. Concrete sidewalks shall be required in all developments and subdivisions.

b. Plans for sidewalk alignment and grade shall be in accordance with Standard Plans B-09 and B-10.

c. The minimum width of sidewalks shall be five (5) feet unless otherwise determined by the City Engineer.

d. The desirable location of sidewalks shall be a maximum of six (6) inches from the right-of-way line. See Standard Plans B-01 and B-02.

e. Where driveway crosses over sidewalk, concrete sidewalk shall run through as shown on Standard Plans B-09 and B-10.

f. Provisions shall be made for handicap access at all street intersections. (Refer to Standard Plans B-11 thru B-13)

PART C –MINIMUM STANDARDS FOR STREET CONSTRUCTION

C1. Subgrade Preparation

Description: This work shall consist of the construction of that part of the roadbed below the grade intended to receive the base or surfacing material.

Construction Requirements: The upper six (6) inches of the subgrade shall be compacted in accordance with Section 207 of the Standard Specifications to at least ninety-five (95) percent of the maximum dry density as determined by the provisions of AASHTO 99, as modified according to Standard Specification Subsection 203.24.

During subgrade preparation and after its completion, adequate drainage shall be provided at all times to prevent water from standing on the subgrade.

Unless otherwise provided, the roadbed below the subgrade shall be so constructed that it will have, as nearly as possible, uniform density throughout. In both cuts and fills, it shall be rolled with approved compacting equipment capable of providing a smooth, even subgrade surface. In areas not accessible to the roller or other equipment, the required compaction shall be obtained with mechanical tamps or vibrators. In any case, the upper six (6) inches shall comply with density requirements of the contract immediately prior to placing the material thereon.

All soft, yielding, or other unsuitable material, which cannot be compacted satisfactorily, shall be removed if corrective measures are not effective. All rock encountered shall be removed or broken off at least six (6) inches below the subgrade surface.

Any holes or depressions resulting from the removal of unsuitable material shall be filled with satisfactory material and compacted to conform with the surrounding subgrade surface.

Aggregate or paving material shall not be placed before the subgrade is checked and approved and at no time when the subgrade is frozen of muddy.

No hauling shall be done or equipment moved over the subgrade when its condition is such that undue distortion results, unless the subgrade is protected with adequate plank runways, mats, or other satisfactory means.

The condition of the subgrade, as finally and acceptably prepared shall prevail at the time any paving material is placed thereon and a sufficient length kept so conditioned that paving operations will not be delayed.

C2. Rigid Pavement Thickness

a. Minimum Thickness of Concrete Pavement

Designed in accordance with American Concrete Institute or equivalent methods, but not less than:

1. Local Streets – six (6) inches, (Refer to Standard Plan C-01)

2. Collector streets, Multi-family (3 units or greater) and non-residential areas - seven and one-half (7 ½) inches (Refer to Standard Plan C-01)

3. All other streets - as determined by the Board.

b. Construction Methods

1. Concrete pavement shall be reinforced with wire mesh and be constructed in accordance with Section 501 of the Standard Specification, except as provided below.

2. Materials shall comply with Section 901 and subsections 903.01, 903.02, 909.01, 911.01, 911.03, and 912.01 of the Standard Specifications. Concrete shall be machine finished except on widened portions, intersections, or other places where hand finishing will be permitted if authorized by the City Engineer.

3. Conditioning of subgrade shall be in accordance with Section 501.07 of the Standards Specification.

4. All joints shall be constructed in accordance with Section 501.14 of the Standard Specifications, except:

a. Weakened plane or dummy transverse contraction joints shall be placed not to exceed twenty (20) feet spacing. Transverse contraction joints may be either formed or sawed dummy groove, ribbon or premolded strip type. (Refer to Standard Plan C-02) One of the above named joints shall be placed at every catch basin and manhole in line of pavement. The location of manholes, etc. in the pavement shall determine the exact location of joints. (Refer to Standard Plans C-03 and C-04) All joints must extend throughout side strips and curbs to full width of pavement. (Refer to Standard Plan C-05)

b. Expansion joints with approved dowel bar assembly shall be placed at street intersections and where shown on the plans. (Refer to Standard Plan C-05)

c. Whenever the width between forms of the pavement under construction is greater than fifteen (15) feet, longitudinal joints

shall be constructed so as to divide the pavement into strips not to exceed thirteen (13) feet each. (Refer to Standard Plan C-06)

d. Finishing machines or vibrating strike-boards of design other than as specified in the Standard Specifications will be permitted only if work of equal quality as set out in these specification is obtained in the opinion of the City Engineer.

e. Curing with approved impervious membrane or sealing compounds will be permitted if authorized by the City Engineer.

f. All concrete shall have seven (7) percent air entrainment.

C3. Full Depth Asphalt Pavement

a. Minimum Thickness of Hot Asphalt or Hot Asphalt Emulsion

1. Local Street – seven and one-half (7 ½) inches, (Refer to Standard Plan C-07)

2. Collector Streets, streets in multi-family (3 units or greater) areas and non-residential areas – nine (9) inches, (Refer to standard Plan C-07)

3. All other streets – as determined by the Board

b. Materials and Methods of Construction

1. Materials shall comply with Subsections 901.01, 902.02, 902.03, 902.04, 903.01, 903.02, Sections 408 and 409 of the Standard Specifications.

2. Hot asphalt emulsion and hot asphalt concrete pavements shall be constructed in accordance with Sections 402 and 403, respectively, of the Standard Specifications. These pavements shall consist of a one and one-half (1 ½) inch wearing surface and the rest of the total asphalt section, as described in C3(a), shall be base placed in four (4) inch maximum compacted lifts. The hot asphalt emulsion surface shall be Type III mixture and base shall be either No. 4, No. 5, or No. 53B mixture. The hot asphalt concrete surface shall be Type "B" mixture, and base shall be either No. 4, No. 5, or No. 53B mixture. Construction joints in the same plane shall not be located within fifty (50) feet of a joint in the preceding lift.

C4. Compacted Aggregate Base and Bituminous Surface

a. Minimum Thickness Pavement using Compacted Aggregate Base and Hot Mix Asphalt (HMA). (Refer to Standard Plan C-08)

1. Local Streets: Installation (per manufacturer' specs) of Tensar TX5 (or approved punched and drawn equivalent) geogrid over shaped, compacted, and approved subgrade; ten (10) inches of compacted aggregate (#53) base; two and one-half (2 ½) inches of bituminous binder (#8); one and one-quarter (1 ½) inches of Bituminous surface (#11).

2. Collector streets: Installation (per manufacturer's specs) of Tensar TX 5 (or approved punched and drawn equivalent) geogrid over shaped, compacted, and approved subgrade; twelve (12) inches of compacted aggregate (#53) base placed in two lifts; three (3) inches of bituminous binder (#8); one and one quarter (1 ½) inches of Bituminous surface (#11).

3. All other streets as determined by the Board.

An asphalt emulsion tack (AET) coat is required to be applied to the binder prior to placing the surface course.

When an existing Collector or Arterial Street is widened to meet the pavement width standards the existing pavement shall be milled to the centerline and the surface course for the widened pavement shall be placed over the new binder and existing milled pavement from the edge of the gutter to said centerline. The intent is to provide a smooth, uniform finished surface for the widened half street pavement. Note that wedging of rutted areas in the existing pavement may be required before the surface course is placed.

C5. Heavy Use Pavements

Notwithstanding the requirements of subsections C2, C3, and C4 above, any new or existing street in, or servicing, an M1 or M2 zoning district and/or any manufacturing, warehousing or other use as determined by the Board of Public Works and Safety, and/or expected to carry heavy truck traffic related to any new use of an existing or new property, shall be designed and constructed or upgraded to a condition sufficient to carry the expected loadings.

The design of the required pavement construction and/or upgrade shall be performed by an Indiana Professional Engineer and shall be based on existing soil conditions, existing pavement conditions if any, and expected loadings and frequency of loadings. Said design shall be subject to the approval of the Board of Public Works and Safety.

C6. Other Paving Materials

Upon application to the Board, with supporting data from field tests, permission may be granted by the Board to use other paving materials or a different combination of base and

bituminous that have shown satisfactory performance. One (1) inch of bituminous base can be substituted for two (2) inches of compacted aggregate base upon approval of the City Engineer. In no case shall the thickness of compacted aggregate base be less than six (6) inches.

C7. Alternate Pavement Thickness

a. Upon application to the Board with supporting data from field tests, alternate or lesser pavement thicknesses than those set forth may be approved.

b. Based upon experience in the vicinity of a proposed street with supporting data from field tests, the Board may require pavement thickness greater than the minimums specified.

C8. Curb And Gutter

a. Curb and gutter shall be required for all streets, with the exception of frontage roads.

b. The shape of the curb and gutter and the intersection crossdrains shall be in accordance with the Standard Plans C-09 thru C-11.

c. Construction requirements shall comply with Subsection 605.04 of the Standard Specifications.

d. Materials and conditioning of subgrade shall be in accordance with the provisions of Part C, Subsection C1.

C9. Sidewalk

a. Sidewalks shall be a minimum of four (4) inch thickness.

b. Sidewalks at driveways shall be a minimum of five (5) inch thickness reinforced with 6x6-10/10 mesh.

c. Materials shall comply with Subsections 604.02, 604.03, and Section 501 of the Standard Specifications and as shown on Standard Plans B-09 and B-10.

C10. Pathways

a. Multi-use pathways shall be installed where shown on the officially adopted pathways master plan.

b. All pathways shall be constructed of concrete unless otherwise permitted by the City Engineer.

c. The pathway shall be constructed of four (4) inches Portland Cement Concrete Pavement (PCCP) on four (4) inches of Compacted Aggregate, No. 53, Base.

d. When crossing driveways, the pathway shall be carried through the drive at minimum thickness of six (6) inches Portland Cement Concrete Pavement (PCCP) on six (6) inches of Compacted Aggregate, No. 53, Base.

e. The minimum width shall be eight (8) feet.

f. Control joints shall be saw-cut to a depth of one (1) inch, every six (6) feet, with expansion joints installed every forty-eight (48) feet.

C11. <u>Parkway</u>

a. The parkway (area between the curb and the sidewalk) shall be constructed in accordance with the Standard Drawings, B-01 and B-02.

b. The materials shall comply with Subsections 913.01, 913.03, 913.04, and 913.05 of the Standard Specifications.

PART D-BRIDGES

D1. Plans and Design

a. Plans for bridges or structures having clear spans of twenty (20) feet or greater shall be reviewed separately from the street plans. Construction may be separate or combined with the adjacent street at the discretion of the developer.

b. In order for the Board to review plans for a bridge crossing a waterway of any size, copies of acceptance of the waterway opening by the various other governmental agencies having jurisdiction over stream crossings at the time of design shall be submitted along with plans.

c. The bridge shall be designed to meet the criteria set forth in the AASHTO Standard Specifications for Highway Bridges in effect at the time of design and shall be designed for HS-20 loading. This design must be completed by a Registered Structural Engineer.

D2. Construction

a. In the event that construction of the bridge is not initiated within one (10) year and work completed within three (3) years after the approval of construction plans, such plans shall be presented to the Board for re-review and certain design features may be required to be changed due to changes in the design criteria.

b. All plans for construction of bridges must have prior approval by the County Engineer.

PART E – ENTRANCES TO AND FROM PUBLIC HIGHWAYS AND AND PRIVATE PROPERTY

E1. Definitions

The following words and phrases shall have the meaning ascribed to them in this Section when used in this part of this Ordinance.

a. Approach: That part of an entrance to a site which lies within the public right-of-way and adjoins the driveway to the traveled way. This includes tapers for recovery lanes, deceleration, speed change, turning movements or other purposes supplementary to the access and through traffic movement.

b. Class I – Residential Approach: A means by which a street is connected to R-1 or R-2 zoned facility and is primarily used by the owner or occupant of the premises. (Refer to Standard Plan E-01).

c. Class II – Commercial Approach: A means by which a street is connected to public or private property, which is zoned for R-3, R-4, Commercial, or Industrial use. (Refer t Standard Plans E-02 thru E-06).

d. Driveway: Every way or place not in the right-of-way of any public highway/street and is used for vehicular traffic movement.

e. Entrance: The connecting line of the driveway and the approach.

f. Site: An area consisting of one or more contiguous lots or parts of lots, which is to be used as one consolidated area.

E2. Driveway widths

All driveway widths shall be in accordance with Standard Plan Section E.

E3. Regulations

a. Encroachment Upon Right-of-Way:

No portion of any approach shall encroach upon an intersecting street or highway right-of-way within a distance of twenty (20) feet from the point of intersection of said right-of-way lines. Additionally, approaches near intersections must be located outside of the edge of pavement radius if said radius is fifty-five (55) feet or less. Regard for site distances, ease of turning and through traffic movement must be considered.

No portion of any approach shall encroach upon an intersecting alley right-of-way within a distance of the (10) feet from the point of intersection of said right-of-way lines.

b. Distance from Adjacent Property:

No Class I approach shall be less than three (3) feet from adjacent property as measured along the right-of-way line.

No Class II approach shall be less than ten (10) feet from adjacent property as measured along the right-of-way line.

No approach shall be constructed where any part of it extends in front of adjacent property. Where an undue hardship exists in meeting the minimum requirements, the applicant may submit written approval by the adjoining property owner(s) agreeing to allow applicant to reduce the minimum approach setbacks. The City Engineer may reduce such requirement as deemed appropriate.

c. Drainage:

Provisions shall be made so that the drainage from the property shall be contained therein at the entrance. No approach shall interfere with the drainage of the street or roadway nor with the cross-section of the roadway.

d. Number of Entrances Permitted:

One entrance shall be allowed per street frontage. In the event that a second entrance is required to accommodate the traffic to and from the property, a request shall be submitted in writing to the City Engineer noting any hardships and/or requirements, along with traffic patterns. Approval by the City Engineer shall be required.

e. Line of Visibility:

All entrances and approaches shall be located as to provide adequate sight distance in both directions along the roadway for safe access without interfering with the traffic on the roadway.

f. Change of Entrance:

No entrance or approach shall be altered, relocated or remodeled prior to meeting the requirements of the “Manual on Proper Right of Way Cuts”.

g. Type of Pavement Required:

The approach shall be constructed in accordance with Section II, Part C and Standard Plan B-09.

h. Parking Area Adjacent to Alley or Sidewalk:

When the parking or driving area of a property is adjacent to a sidewalk or an alley, a suitable non-mountable barrier must be constructed to prevent encroachment. Design of said barrier must be reviewed and approved by the City Engineer.

i. Angle of Drive or Approach:

The angle of any drive or approach shall be 90° to the centerline of roadway unless otherwise approved by the City Engineer.

j. Approach to Loading Dock

For access to a loading dock, sufficient distance between the dock and the sidewalk or right-of-way must be provided to prevent encroachment while parked or maneuvering.

k. Distance Between Approaches

The desirable distance between any two approaches shall be:

Class I & Class I	6 feet
Class II & Class II	20 feet
Class II & Class I	13 feet

The approaches shall be so constructed to show clear definition between them.

PART F – STREET EXCAVATION REPAIR

F1. Description

WHEREAS, the Board of Public Works and Safety deems it necessary to establish a firm policy for the backfilling of excavation and replacement of pavement disturbed as a result of making an opening or excavation in any street, these specifications are set forth and the compliance therewith shall be a requirement of obtaining a permit for said opening or excavation as set forth in the Municipal Code. It shall be the obligation of any person, firm, or corporation obtaining a permit for an opening or excavation in the public right-of-way to backfill the excavation and replace the pavement as set forth in these specifications. (Refer to Standard Plan Section F).

F2. Backfill

All excavations under pavement or within five (5) feet of edge of pavement and other conditions as indicated on Standard Plan Section F shall be backfilled with clean granular material meeting the requirements of Section 211 of the Standard Specifications. Each layer shall be compacted to at least 95% of the maximum dry density as determined by AASHTO T99, as modified according to Standard Specification Subsection 203.24. Special care shall be taken in filling around sewers, water pipes, gas lines, etc. to keep the earth at the same height on both sides to avoid shifting of the pipe line. No removed paving materials or debris shall be used in backfilling the excavation unless approved by the Board. Excavations not under a pavement may be backfilled with material removed from the excavation.

F3. Pavement Replacement

All pavement shall be replaced with a type of construction equal to or better than that which is removed and as approved by the City Engineer. All cuts in pavements shall be first outlined with a saw cut not less than 1 1/2 inches deep.

F4. Concrete or Brick Pavements

Concrete used in the replacement of concrete or brick pavements not presently surfaced with an asphaltic material shall consist of 6-Bag Concrete with 7% air entrainment. Slump shall not exceed three (3) inches. Coarse aggregate shall be limestone or blast furnace slag. No natural gravel aggregate will be allowed. Brick pavement will be replaced with eight (8) inches of concrete except in some residential streets where the City Engineer may require the brick to be replaced. Where concrete that has an asphaltic concrete surface is replaced, 6-Bag Concrete shall be used and the concrete shall be finished flush with the surface of the existing concrete and the asphaltic surface replaced.

F5. Hot Asphaltic Concrete, Sheet Asphalt, Emulsified Asphalt, Chip Seals and Oil Mat Pavements

All asphaltic and oil type pavements shall be replaced with a hot asphaltic concrete surface conforming to the Standard Specifications for Hot Asphaltic Concrete Base, Binder and Surface of these prevailing Specifications. The thickness of the pavement shall be equal to that which existed, but not less than three (3) inches. Not less than eleven (11) inches of Coarse Aggregate Class A or B, Size No. 53 shall be placed under any asphaltic concrete patch unless a concrete base is necessary. Asphalt placed over a concrete patch shall be cut back six (6) inches around the concrete patch so that the two joints are offset.

F6. Temporary Patch

If it is not possible due to weather conditions for the contractor to replace the pavement within fourteen (14) days following completion of the work, a coarse aggregate base eight (8) inches thick and a cold asphaltic surface shall be applied and maintained as a temporary patch until permanent repairs can be made. In no case shall a temporary patch be maintained more than six (6) months before permanent repairs are made.

PART G – DRAINAGE

G1. Conformance with Master Plan

Storm drainage plans for a specific area or improvement shall conform to the Master Drainage Plan. In the case of a subdivision, the conceptual storm drainage plan shall be reviewed and approved by the City Engineer before primary plat approval is granted by the Planning Commission.

Any drainage plans which propose to direct storm drainage onto lands or waterways under the jurisdiction of other governmental agencies will also be subject to approval from the appropriate agency.

G2. Culverts

a. The locations and sizes of culverts shall be determined at the time construction plans are prepared for the entire subdivision or project. In no case shall culverts be less than twelve (12) inches in diameter**.**

b. Pipe end sections or concrete headwalls shall be used at the ends of all driveway culverts. See Standard Plans G-01 and G-02**.**

G3. Storm Drainage

a. Projects directing surface water directly into a regulated drain shall receive approval from the County Drainage Board.

b. Storm drainage and surface water installations, including roof downspouts and foundation footing drains, shall not be connected to or allowed to empty into the sanitary sewer systems.

c. Surface water from a paved area of more than thirty-five hundred (3500) square feet shall not be discharged onto an existing or proposed street or alley except in a controlled manner approved by the Board. (**NOTE:** Drainage Ordinance requires not more than 5000 square feet of roof and pavement be discharged without "control").

d. All storm sewers shall be constructed of one of the following materials:

Name	Standard	Joint
Reinforced Concrete Sewer Pipe	ASTM C-76	ASTM C443
Reinforced Concrete Elliptical Sewer Pipe	ASTM C-507	

PVC Schedule 35 (up to 15")	ASTM D-3034	ASTM D-3212
PVC Corrugated with Smooth interior (up to 15")	ASTM F-794	ASTM D-3212
High Density Poly-Ethelyne	ASTM D-1248	ASTM D-3212

Other materials may be used if specifically approved by the Board.

G4. Drainage Design Criteria

Quantity of Runoff

The estimated storm runoff or design discharge for drainage areas less than ten (10) acres in size may be determined by the Rational Method.

The estimated storm runoff or design discharge for drainage areas over ten (10) acres in size shall be determined in accordance with the Soil Conservation Service Technical Release Number 55 (SCS TR-55).

a. Rational Method

1. The equation is Q=CiA

where Q = rate of runoff or discharge, in cfs.
C = weighted runoff coefficient, expressing the ratio of rate of runoff to rate of rainfall
i = average intensity of rainfall (for a selected storm frequency and duration equal to the time of concentration) in inches per hour
A = drainage area tributary to point under design in acres

2. Runoff Coefficient

The runoff coefficient for defined surfaces and uses shall be as follows:

Character of Surface	Runoff Coefficients
Pavement	
Asphaltic and Concrete	0.9
Brick	0.8
Roofs	0.8

Lawns, sandy soil	
flat, 2 percent	0.10
average, 2 to 7 percent	0.15
steep, 7 percent	0.4

In areas for which development plans have not been prepared, the following runoff coefficients for various zoning classifications shall be:

Zoning Classification	Runoff Coefficients
Business, Industrial and Commercial	0.85
Schools	0.6
Multi-family residential R-3	0.7
Multi-family residential R-2	0.55
Single-family residential	0.4
Parks and Open Space	0.3
Unimproved Areas	0.25

3. Intensity of Rainfall (Rational Method only)

   The design rainfall intensity is dependent upon the frequency of recurrence of the expected storm and the duration of a storm. These values are shown on Standard Plans G-17 thru G-19.

b. Soil Conservation Service Method TR-55

1. SCS Runoff Equation

$$Q = (P-Ia)^2 / [(P-Ia) + S]$$

Where

Q = runoff (in.)
P = rainfall (in.)
S = potential maximum retention after runoff begins (in.)
Ia = initial abstraction (in.)

Ia = 0.25

2. SCS Curve Number

S = 1000/CN - 10

Where

CN = Curve Number

The following values are to be used for Curve Number in SCS runoff calculations

Cover Description	Curve Numbers for Hydrological soil group			
Cover Type & Condition	A	B	C	D
Open Space				
Poor Condition (grass<50%)	68	79	86	89
Fair Condition	49	69	79	84
Good Condition (grass>75%)	39	61	74	80
Paved Parking Lots, roofs, etc	98	98	98	98
Streets, curbed	98	98	98	98
Streets, ditched	83	89	92	93
Undeveloped Areas by Zoning				
Commercial	89	92	94	95
Industrial	81	88	91	93
Residential by Average Lot				
1/8 acre	77	85	90	92
1/4acre	61	75	83	87
1/3 acre	57	72	81	86
1/2 acre	54	70	80	85
1 acre	51	68	79	84
2 acres	46	65	77	82

c. Other Methods

Any other methods must be approved by the City Engineer.

G5. Minimum Design Standards – Street Drainage

a. Maximum Spacing of Collection Points

Storm water runoff shall not be carried in streets for a distance of more than six hundred (600) feet. The City Engineer's Office may require additional collection

points, if deemed necessary. Inlets, curb turnouts or other types of runoff collection methods shall be so located as to intercept the flow within the distance specified. (See Standard Plan G-03).

b. Minimum Design Frequency of Recurrence

1. Maximum overflow provided:

   For streets where an overflow is provided so water depth at the gutterline does not exceed six (6) inches prior to overflowing, the collection system shall be designed to carry at least that storm water runoff which can be expected from a storm having a frequency of two (2) years.

2. Minimum overflow provided:

   For streets where there is no overflow or bypass provided as outlined above, the collection system shall be designed to carry at least that storm water runoff which can be expected from a storm having a frequency of ten (10) years. In no case shall water be allowed to become more than eighteen (18) inches deep at the gutterline in any street prior to overflow.

c. Miscellaneous Drain Design Standards

1. Drainage Structures

   A catch basin or other approved type of debris retainer shall be located so as to intercept debris collected by the drainage system. Such debris retainer shall have a minimum sump depth below the sewer invert of three (3) feet. (See Standard Plans G-04 thru G-06).

2. MinimumVelocities

   The minimum velocities used in designing storm sewers shall be two (2) feet per second when flowing full.

3. Manning's "n"

   The following values for Manning's "n" shall be used for calculating flow capacity.

Material	Manning's "n"
Ditch, maintained	0.030
Ditch, not maintained	0.05-0.1
Concrete Pipe	0.013
PVC	0.011

HDPE	0.010

4. Casting Lids and Inlets

   The acceptable castings, lids, and inlets are shown in Standard Plan G-07.

d. Underdrains

The use of underdrains to reduce the accumulations of sub-surface water shall be required at all depressed areas. Such underdrains shall meet the requirements of Standard Plan G-08 and G-09.

e. Detention Basins

Detention basins shall be designed and constructed as required by the Board to control the rate of runoff from a given area. Detention basins shall be designed to control the runoff for a minimum storm recurrence frequency of one hundred (100) years. The design storm shall have a Soil Conservation Service Technical Release Number 55 Type II distribution.

The outlet from the detention basin shall be designed to carry no more than the storm water runoff rate from the given area in its natural unimproved condition based on a storm with a two (2) year recurrence interval. The outlet discharge from post-development conditions shall be designed not to exceed the downstream flows from pre-development conditions. (See Standard Plan G-10 for stand pipe detail). **NOTE:** Where detention basins discharge into low capacity or sensitive drainage courses (as determined by the City Engineer) a basin discharge shall not exceed the two (2) year pre-development runoff rate.

Parking areas may be used for the purposes of detention of storm water runoff. Maximum depth of detention on a parking area shall be six (6) inches. The owner/developer shall make written acknowledgement to the Board of the use of parking area for detention.

Detention basins must discharge to defined water course.
The owner's/developer's engineer shall certify to the Board of Public Works and Safety that the water elevation of the detention basin at peak storage, carried horizontally, shall not create objectionable flooding upstream or downstream from the detention basin. The engineer shall submit any substantiating materials requested by the Board of Public Works and Safety.

The owner/developer shall provide a means for emergency overflow in case of failure of outlet structure. This emergency overflow shall meet the approval of the Board.

f. Drainage Structure Schedule

Storm drainage plans shall include a structure schedule indicating structure number, referenced to the plan and profile, function, style (ie: flat-top or standard cone), pipe sizes for inlet and outlet pipes, invert elevations of pipes, casting brand and type, grate or lid type, location and any necessary remarks. Such drainage schedule shall meet the requirements of Standard Plan G-11 or approved equal.

G6. Minimum Design Standards – Lot Drainage

a. Minimum Lot Grade

1. Primary Lot

The primary lot is that portion of the lot between the rear face of the residence or building and the frontage road.

The minimum grades permissible in the primary lot are as follows:

a. surface grades – 2% recommended, 1% minimum

b. lot line swale grades – 2% recommended, 1% minimum

c. cross lot swale grades – 1% recommended, 0.5% minimum

2. Secondary Lot

The secondary lot is that portion of the lot between the rear face of the residence or building and the rear property line.

The minimum grades permissible in the secondary lot are as follows:

a. surface grades – 1.5% recommended, 1.0% minimum

b. lot line swale grades – 1% recommended, 0.5% minimum

c. cross lot swale grades – 1% recommended, 0.5% minimum

d. surface grades over septic fields – 2% recommended, 1% minimum

b. Common Swales

A common swale is one that serves as a drainage course carrying the runoff from two (2) or more lots or properties. (Side lot line swales may be excepted from this requirement).

The minimum top width for a common swale shall be ten (10) feet and the minimum depth shall be nine (9) inches. (See Standard Plan G-12)

All common swales shall be seeded or sodded and protected with an easement dedicated to the proper authority for the swale's maintenance and repair.

c. Minimum Design Frequency of Recurrence and Runoff Coefficients

Minimum design frequencies for lot drainage shall correspond to those used for the drainage design on the streets serving those lots. The finish grade of the ground surrounding the residence or building on the lot shall be no less than eighteen (18) inches above the top of curb on the street side of the building and eighteen (18) inches above the flowline of a major drainage swale on the swale side of the house. For purposes of this Ordinance the flowline of a major drainage swale shall be considered to be a minimum of twelve (12) inches above the bottom of the swale.

The requirement for minimum grade above top to curb at a building may be waived by the City Engineer if such requirement necessitates substantial fill and the lot grading insures that all surface water flows around building.

d. Typical Lot Grading Configurations

Typical lot grading shall be as shown on Standard Plan G-13 thru G-16.

PART H - SEWERAGE FACILITIES

H1. Design Requirements

All sanitary sewers, sewage pumping stations, and sewage treatment facilities shall be designed in accordance with the latest revision of the ”Ten States Standards”. Said standards are hereby incorporated into this Ordinance by reference. Two (2) copies of this material are on file in the office of the City Engineer.

H2. Pipe and Joint Material

All sanitary sewers shall be constructed of one of the following materials and meet the corresponding ASTM specifications:

Name	Standard	Joint
Reinforced Concrete Sewer Pipe Class III, IV, V	ASTM C-76	ASTM C-443
Ductile Iron Pipe	ASTM C-151	AWWA C-111
PVC (up to 15” diameter) **(Preferred)**	ASTM D-3034 (for SDR 35)	ASTM D-3212

Other materials may be substituted if approved by the Board of Public Works and Safety.

H3. Pipe Laying and Backfill

Pipe laying and backfill shall be performed in accordance with ASTM C12-19 and according to this Code. The sewer connection pipe shall be bedded in approved material as shown on Standard Plan H-01. No backfill shall be placed until the work has been inspected.

H4. Joints

All joints shall be connected as specified under the appropriate ASTM as shown above. All joints and connections shall be made gastight and watertight and conform to the infiltration and exfiltration requirements as state below.

H5. Infiltration – Exfiltration

All sewer connections and appurtenances shall meet the following requirements:

50 gallons per inch diameter of pipe per mile of pipe in a 24 hour testing period

If the Sewer Superintendent has reason to believe that the sewer connection may not pass the infiltration/exfiltration requirement, he shall order said sewer connection tested. Said test shall be performed by a certified independent testing firm at the sole expense of the permit applicant.

H6. Inspection Manholes

All industries and other establishments, which are covered under the City of Valparaiso Pre-Treatment Ordinance (Section 105 of the Municipal Code), shall be required to construct an inspection manhole as required by said Ordinance. Inspection manholes shall be constructed similar to manholes covered by this Ordinance. The inspection manhole shall conform to Standard Plan H-02 and H-03.

H7. Plans and Specifications Required

The applicant shall submit all pertinent plans and specifications required for review. Failure to submit plans and specifications or submittal of plans and specification which fail to meet the requirement as set out in this Ordinance will be grounds for the rejection of the permit.

H8. Appurtenances – Manholes

All sanitary sewer manholes shall be designed with provisions for sewer pipe to be continued through manholes by means of standard fittings (ie: bends, wyes, tees). Inverts shall be concrete poured around pipe and/or fittings and sloped from edge of manhole to centerline of pipe or fittings. The top of the pipe or fitting shall then be removed in a manner which provides smooth transition through manholes. Manholes with pre-cast invert may be used with prior approval from the Sewer Superintendent. All castings shall be installed flush to the ground. (Refer to Standard Plans H-02 thru H-04)

H9. Miscellaneous Items

All other items pertinent to the project shall be covered in the Standard Plans.

H10. Testing

All manufactured material used in the project shall meet all testing requirements of the applicable ASTM Standard.

Certification of compliance for said materials does not preclude further testing by the City Engineer. The City Engineer reserves the right to reject any material, which by his inspection does not fulfill these Specifications.

Standard Tests Required:

1. Deflection Test for flexible pipe only.
2. Low Pressure Air Test
3. Vacuum Testing of manholes prior to backfilling
4. Television Inspection prior to final acceptances

Infiltration and exfiltration test shall be the responsibility of the Contractor. In the event of failure, the Contractor shall be fully responsible for correction of the problem and retesting of the facility.

All tests to be witnessed by a City inspector.

H11. Location

All sanitary sewer lines shall be placed under the pavement or designed in such a manner so as not to interface with other utilities and provide easy access to all manholes.

H12. Connection to Public Sewer

The sewer connection shall be connected to the sewer main with a wye connection. Under normal circumstances, no building service sewer shall be connected directly to a manhole.

When a properly installed wye connection is not available in the public sewer, the applicant shall, at his expense, install a wye connection in the public sewer. The wye shall be installed in accordance to the directions given to the applicant by the Sewer Superintendent.

For main lines 12” or more in diameter, an approved pipe saddle may be installed for the purpose of connection to the public sewer. Said pipe saddle shall have prior approval from the Sewer Superintendent.

The invert of the building service sewer at the point of connection shall be at the same or at a higher elevation than the invert of the main line.

H13. Roof and Paved Areas

From and after the effective date of this Ordinance no newly constructed gutter, downspout, roof drain, foundation drain, or off-street parking area drain shall be connected with or permitted to drain into the sanitary sewer system of the City. Whenever it becomes necessary to rebuild, repair, or replace any drain existing prior to

the enactment of this Ordinance, the same shall be rebuilt, repaired, or replaced in such a manner that it will no longer be connected with or flow into the sanitary sewer system of the City. Said sewer system includes combined sewers and separate sanitary systems.

H14. Clean Outs

All new sewer connections shall be required to have a sewer clean out at a point five (5) feet from the structure's foundation. If the sewer connection is over one hundred (100) feet in length a second clean out shall be necessary located midway from the structure and the sewer main. Sewer connections shall have a maximum distance of one hundred (100) feet between clean outs. If a sewer connection requires a bend, a clean out shall be required at the bend. No bend shall be made at ninety (90) degrees; a curved bend (2-45 degree) is acceptable. The clean out is to conform to Standard Plan H-05.

H15. Size and Slope Requirements

The size and slope of the sewer connection shall be subject to approval by the City, but in no event shall the sewer connection be less than six (6) inches in diameter. The slope of the 6" sewer connection shall not be less than 1/8 inch per foot (1 foot per 100 feet). (Refer to Standard Plan H-01)

H16. Footing Tiles

In no case shall footing tiles, perimeter tiles, downspouts, roof drains, or any other pipes which drain ground water, subsurface water, or surface (run off) water, be connected to the sewer connection. Water, which is collected from these types of drains, must be discharged in such a way as not to drain into a sanitary sewer or combined sewer.

H17. Grease, Oil, and Sand Interceptors

Grease, oil, or sand interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight and equipped with easily removable watertight covers. The interceptor shall be located outside the structure in a location, which may be inspected by the Sewer Superintendent. The interceptor shall have a liquid capacity of a minimum of 1000 gallons. The interceptor shall be so placed in the sewer connection so as to have no restroom facilities flowing into it. The grease and oil interceptor shall be properly baffled to trap grease and oil inside the interceptor. All interceptors shall conform to the requirements shown on Standard Plans H-06 and H-07.

H18. Sewer Connection Abandonment

The applicant shall take appropriate steps to abandon a sewer connection no longer needed. The abandonment procedure shall be done in the presence of the Sewer Superintendent. The abandonment shall be done in such a way as to keep soil, construction debris, and other foreign matter out of the sewer system. As much of the

abandoned sewer connection shall be removed as possible. The Sewer Superintendent shall approve in the field the amount of abandoned sewer connection to be removed. The remaining abandoned sewer shall be plugged with a permanent watertight plug.

H19. Ductile Iron Pipe Required

Any part of the building service sewer that is located within ten (10) feet of a water service pipe shall be constructed of ductile iron pipe. Ductile iron pipe may be required by the Sewer Superintendent where the building service sewer is subject to damage by tree roots. The building service sewer need not be of ductile iron pipe when the service is located four (4) feet or more below the elevation of the water service line.

If the building service sewer is to be installed in filled or unstable ground, it shall be of ductile iron pipe; except that non-metallic material may be accepted if laid on a suitable concrete bed or cradle as approved by the Sewer Superintendent.

H20. Miscellaneous Requirements

a. No building service sewer shall be laid parallel to or within three (3) feet of any bearing wall, which might thereby be weakened.

b. Whenever possible the building service sewer shall be brought to the building at an elevation below the basement floor.

c. The building service sewer shall be laid at a depth, which will afford protection from frost.

d. The building service sewer shall be laid at uniform grade and in straight alignment in so far as possible.

e. Minimum requirements for service connections shall begin at a point five (5) feet from the building structure.

***See Attached Sanitary Sewer Specifications**

PART I – STREET NAME SIGNS

I1. Location

Street name signs shall be installed on one (1) post at each street intersection to be located on the Northeast corner thereof, whenever possible, and on the parkway between the street and sidewalk at a point approximately six (6) inches from the sidewalk.

Location of street name signs shall be indicated on construction drawings.

I2. Material and Installations

Street name signs shall conform with Standard Plan I-01 and I-02 and shall be approved by the Board. Installation shall be performed by the Street Department at the expense of the contractor. The street name sign shall be installed before any Certificate of Occupancy is issued.

PART J – STANDARD PLANS

J1. Variance to Minimum Standards

Upon written application to the Board of Public Works and Safety with supporting reasons and data, a variance from the requirements of this Section, based upon good engineering judgment, may be granted by the Board. This variance, if granted, shall apply only to the particular improvements between the specified limits named in the application.

J2. Incorporation by Reference

Attached hereto, incorporated herein by reference, are Standard Plans showing details of practices and design for portions of municipal improvements for which acceptance may be requested of the Board of Public Works and Safety. These Standard Plans are hereby declared to be the Official Standard Plans for the City of Valparaiso, Indiana, for the purpose of achieving uniformity of construction methods, materials, and appearances. Said Standard Plans must be followed in construction of applicable portions of municipal improvements to be accepted by the Board unless written permission for deviation there from is given by the Board. The various applicable Standard Plans with their effective dates shall be listed on all construction plans submitted for approval to the Board.

J3. Revisions, Deletions, and Additions to Standard Plans

The Board of Public Works and Safety is hereby granted the power of authority to revise the Standard Plans to delete any of them and/or to adopt new Standard Plans when, in the Board's judgment, such revisions, deletions, or additions shall be necessary or helpful in order to give guidance to developers and to achieve the purpose of this Ordinance. Any new or revised Standard Plan adopted after the effective date of this Ordinance shall become effective on the date stated thereon which shall be a minimum of thirty (30) days after its approval by the Board.

SECTION 3 – INSPECTIONS AND ACCEPTANCE

PART A – GENERAL REQUIREMENTS FOR INSPECTIONS

A1. Inspector

The inspector shall have written authorization from the City Engineer.

A2. Procedure

All improvements shall be inspected periodically throughout the course of construction by an authorized inspector. A log shall be kept on all inspections and shall be kept on file at the City Engineer's Office.

a. All construction pertaining to streets, curbs, gutters, sanitary sewers, storm sewers, and bridges shall correspond to the following procedure.

1. Notification

Notice shall be given by the developer/owner to the City Engineer's Office twenty-four (24) hours in advance of desired inspection. If, due to weather conditions or other reasons, inspection is not required after notification is given, notice shall be given to the City Engineer's office that such inspection is not required. If the next step in construction does not take place within three (3) days after said inspection, a re-inspection shall be required. Should the required notification not be given, the developer/owner shall be in violation of this Ordinance and costly delays may occur. If the inspector is not able to inspect the project at the required time, this shall be indicated on the inspector's log and the inspection shall be rescheduled.

The developer/owner shall not continue on to the next phase of construction until each required inspection has been made and found in conformance.

2. On-Site Inspection

The inspector shall visit the inspection site with an authorized representative of the developer/owner. The inspector shall make his inspection and record all pertinent information. Upon the end of inspection, the inspector shall sign the inspection sheet and the developer's or owner's representative shall countersign the inspection sheet. In case the developer's or owner's representative is not present for inspection, this fact will be noted on the inspection sheet.

b. All construction pertaining to sidewalks, driveways, swales, and detention ponds shall correspond to the following procedure.

1. Notification

   Notice shall be given by the developer/owner to the City Engineer's Office that construction shall take place in a specified period of time.
2. On-Site Inspection

   The inspector shall periodically inspect the improvements and record all pertinent information in his log.

A3. Inspection

Inspection of the following improvements shall be required: Street Subgrade, Street Base, Street Surface, Sanitary and Storm Sewers, (and appurtenances) Detention Ponds, Swales, Curb, Curb and Gutter, Sidewalk, Bridges, and their respective forms.

All construction shall be inspected to insure that the Standards found in Section 2 of this Ordinance have been met. The inspection shall consist of observations and tests done under the supervision of the inspector.

Tests shall be made as determined by the City Engineer and shall be Standard ASTM methods.

A4. Record Filing

All inspection logs shall be written on standard forms as adopted by the Board of Public Works and Safety and kept on file at the office of the City Engineer. The developer/owner shall receive copies of all inspection reports as soon as the City Engineer or designee co-signs those reports.

A5. Street Excavation Inspection

The contractor shall follow the requirements as set out by Ordinance No.41, 1989, Section 92-Excavations, and follow the instructions as set out by Form No. 5501, revised in 1987, when excavating in any city street, alley, right-of-way, or public easements. The contractor shall apply for the excavation permit at least twenty-four (24) hours in advance of starting work. The contractor shall have a copy of the permit at the job site during work operations.

The inspector shall periodically inspect street excavation sites throughout the City. The inspector shall inspect to insure that the requirements of Section II, Part F of the Ordinance have been met and to insure the validity of the statements on the permit. The Street Commissioner or his designee shall also be empowered as Street Excavation Inspectors.

A6. Inspection Fees

The developer/owner shall at the time of building permit application pay the inspection fee for the improvements with a subdivision with final plat approval subsequent to July 22, 1974.

Fee: $1.00 per lineal front foot.

The developer/owner shall at the time of Board of Public Works and Safety approval of the public improvements plan, pay all inspection fees for improvements not constructed as part of a subdivision.

Fee: $.60 per lineal foot of dedicated street, and
$.50 per lineal foot of dedicated sanitary sewer, and
$.50 per lineal foot of dedicated storm sewer

PART B – ACCEPTANCE

B1. Acceptance Request

Upon completion of construction, the developer/owner, or his authorized representative, shall make written application to the City Engineer for acceptance of the municipal improvements. Said application shall include the construction costs/values of the various improvements proposed for acceptance. The costs/values shall be provided in a form determined by the Board of Public Works and Safety.

B2. Acceptance of Construction

Upon statement of satisfactory completion and recommendation of acceptance by the City Engineer, and acknowledgement of receipt of As-Built drawings for the public improvement construction, the Board of Public Works and Safety shall take appropriate action to accept the public improvements for maintenance.

Prior to acceptance, the Board shall determine that a maintenance bond meeting the requirements of this Ordinance has been posted with said Board.

SECTION 4 – APPEAL FROM ADMINISTRATION ACTION

Any person or firm affected by the exercise of any discretionary authority delegated by this Ordinance to any official of the City of Valparaiso, Indiana, and who objects to the decision made or action taken by such official shall be entitled to a hearing before the Board of Public Works and Safety upon such objection. The person or firm desiring such hearing shall file a written statement of his objections with the City Clerk-Treasurer who shall call the same to the attention of the Board. The Board shall hold such hearing within thirty (30) days after the objections are filed with the City Clerk-Treasurer and the person or firm making the objections shall be given notice of the time, place, and date of said hearing at least ten (10) days before the hearing time. The person or firm objecting may waive the ten (10) day notice provision to facilitate the hearing process. After hearing testimony of the objector and the official who made the decision or took the action objected to, the Board may confirm, revise, or modify and confirm as revised or modified the decision or action of the official in any manner consistent with the discretionary authority herein delegated by this Ordinance to that official.

SECTION 5 – APPLICABILITY

This Ordinance shall apply to public improvements and their appurtenances, which are under the control and jurisdiction of the Board of Public Works and Safety for the purpose of maintenance.

This Ordinance shall also apply to private improvements, which are under the control and jurisdiction of the Board of Public Works and Safety for the purpose of proper construction practices.

SECTION 6 – SEVERABILITY

If any Section, Subsection, Paragraph, Subparagraph, Clause, Phrase, Word, Provision, or Portion of this Ordinance shall be held unconstitutional or invalid by any court of competent jurisdiction, such holding or decision shall not affect or impair the validity of this Ordinance as a whole or any part thereof, other than the Section, Subsection, Paragraph, Subparagraph, Clause, Phrase, Word, Provision, or Portion so held to be unconstitutional or invalid.

SECTION 7 – REPEALER

This Ordinance shall repeal all Sections of the Municipal Code, Master Plan, and Zoning Ordinance that are in conflict herewith

SECTION 8 – EFFECTIVE DATE

This Ordinance shall be in full force and effect immediately upon its passage by the Common Council of the City of Valparaiso, Indiana, approval by the Mayor of said City and compliance with all laws pertaining thereto.

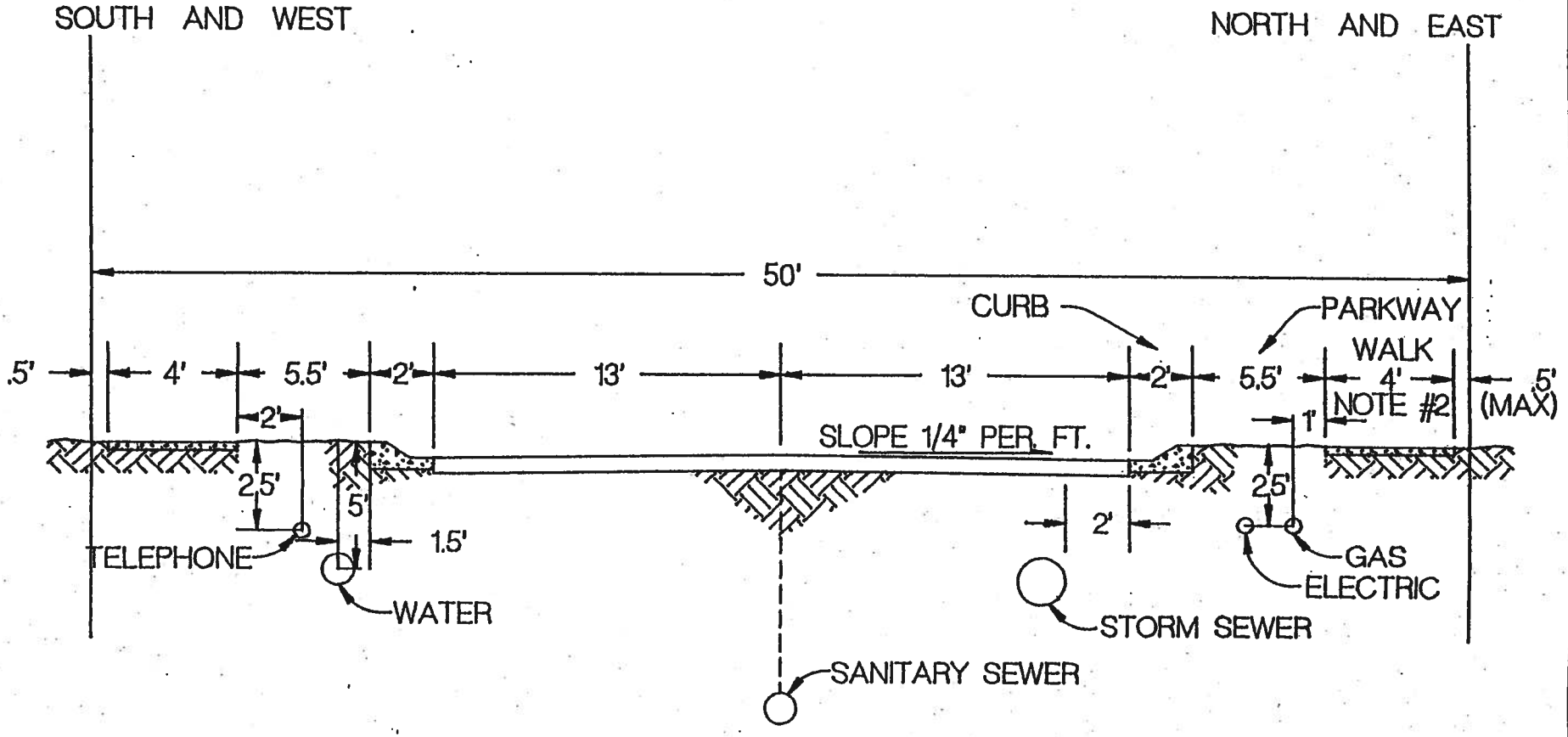
SUMMARY TABLE

Minimum Standards for Street Design

	Local	Collector
Minimum Pavement Width	30’	36’
Minimum Right-of-Way	50’	60’
Minimum Curb Cul-de-sac Radius	50’	n/a
Cul-de-sac Right–of-Way Radius	60’	n/a
Normal Crown (Slope Per Foot)	¼”	¼”
Maximum Grades	8%	6%
Minimum Grades	.5%	.5%
Design Speeds	20/mph	35/mph
“Operating” Speeds	20/mph	30/mph
Stopping Sight Distances	150’	150’
Maximum Algebraic Difference Where Vertical Curve Not Needed	See Standard Plan B-07 & 08	
Minimum Length of Vertical Curve	See Standard Plan B-07 & 08	
Minimum Radius Horizontal Curve	150’	300’
Minimum Tangent Between Reversed Curves	50’	50’
Minimum Curb Radius at Intersection	20’	30’
Minimum Angle of Intersection	75°	75°
Minimum Street Jog	n/a	150’
Minimum Width of Sidewalks	4’	4’
Minimum Width of Drives	10’	10’
Minimum Rigid Pavement Thickness	6” RC	7 ½” RC
Full Depth Asphalt Minimum Pavement Thickness	7 ½ “	9”
Minimum Flexible Pavement Thickness (Compacted Aggregate Base)*	10”, 2 ½” 1 ¼”	12”, 3”, 1 ¼”
Curb & Gutter Width (Straight Back)	2’	2’
Sidewalk Thickness	4” PCC	4” PCC
Sidewalk Thickness at Driveways	5” RC	5” RC

*Requires Tensar BX 1200 geogrid over shaped and compacted subgrade prior to placement of compacted aggregate base.

NO.	BY	DATE	REVISION



NOTE #1:
~~WHERE AT ALL POSSIBLE, ELECTRIC AND TELEPHONE SHALL BE LOCATED IN BACK YARD EASEMENTS~~

NOTE #2:
SLOPE 1/4" PER. FT.

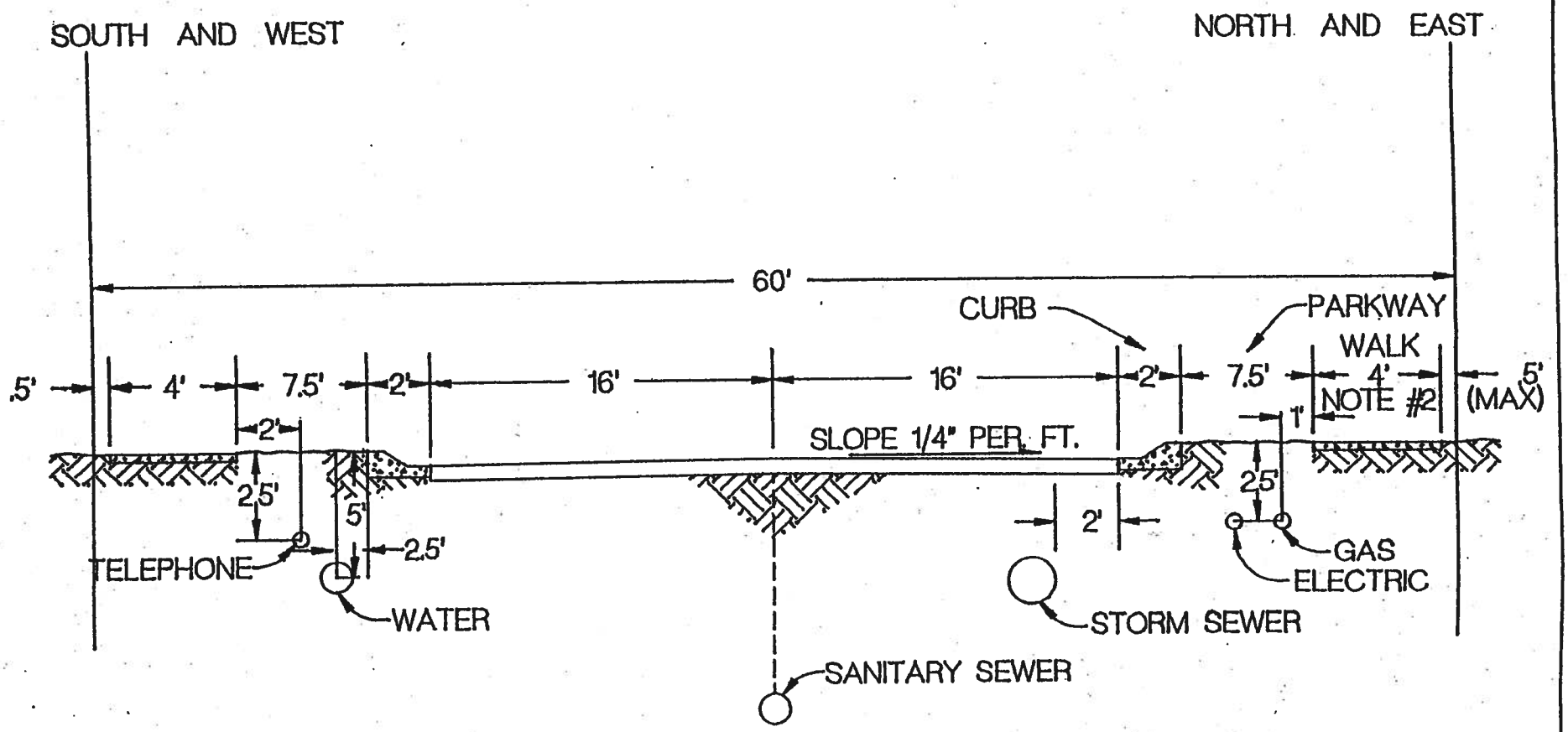
LOCAL STREET

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE:
DR
APPROVED:

NO.
01

NO.	BY	DATE	REVISION



NOTE #1:
~~WHERE AT ALL POSSIBLE, ELECTRIC AND TELEPHONE SHALL BE LOCATED IN BACK YARD EASEMENTS~~

NOTE #2:
SLOPE 1/4" PER. FT.

COLLECTOR STREET

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE:
DR:
APPROVED:

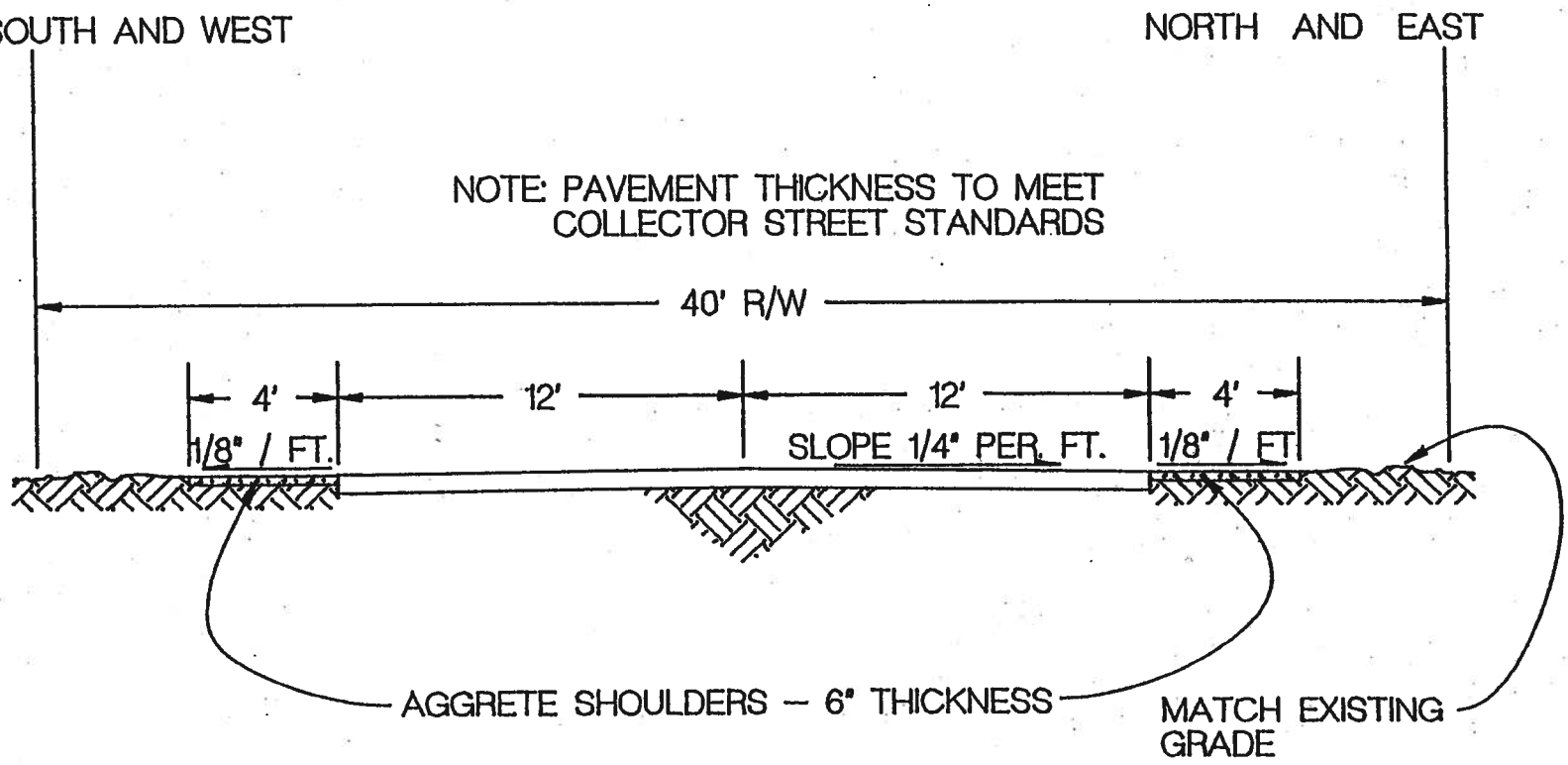
NO. B 02

NO.	BY	DATE	REVISION

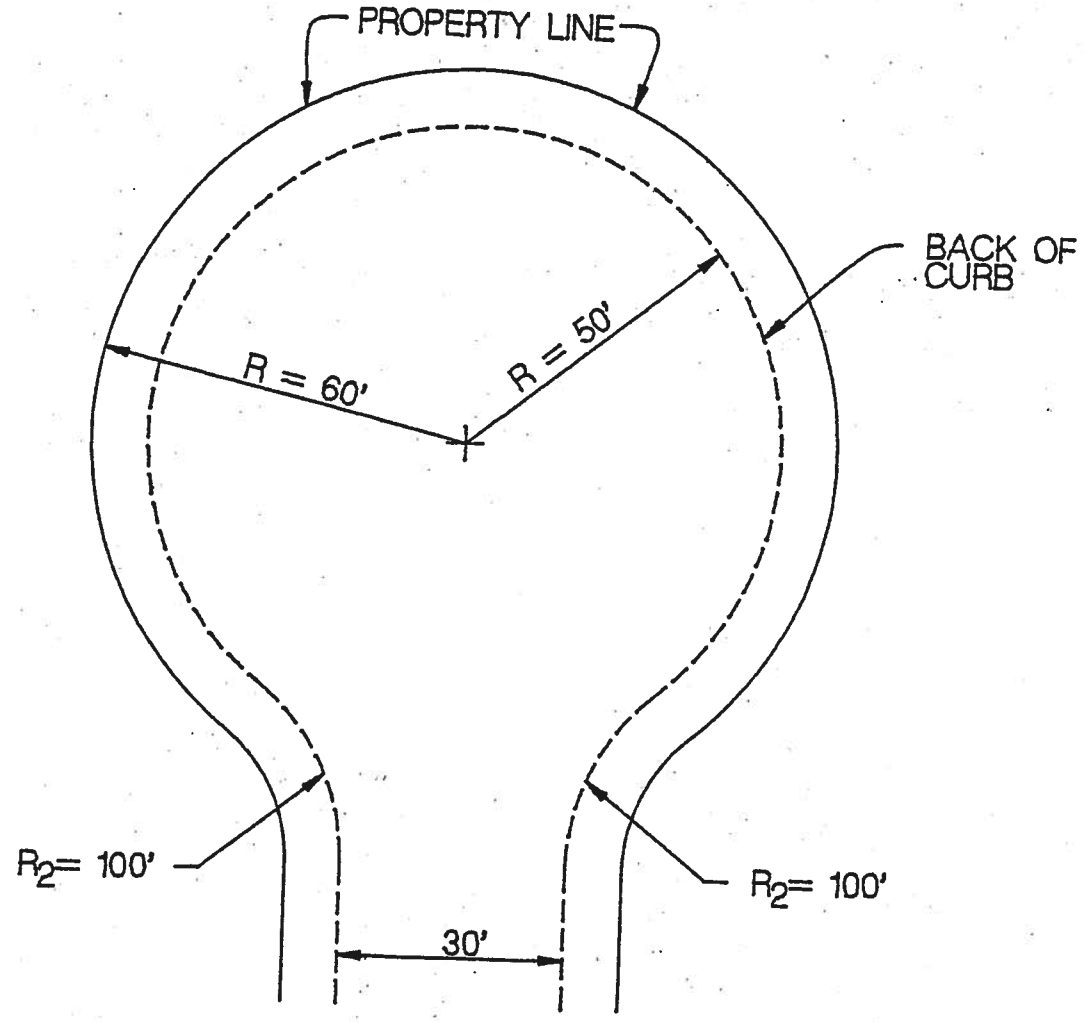
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE:
DR.
APPROVED:

NO. B-03

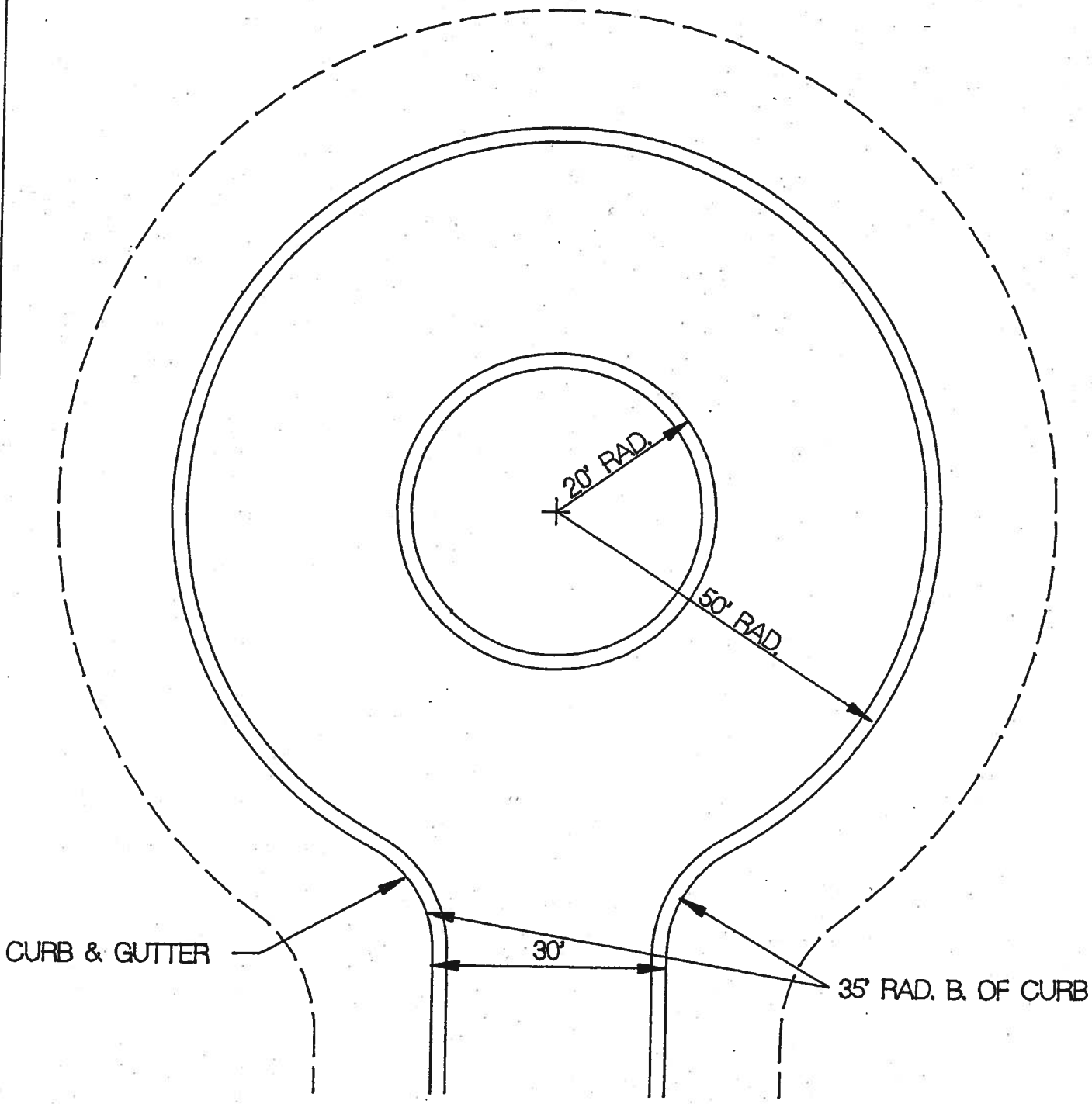


FRONTAGE ROAD



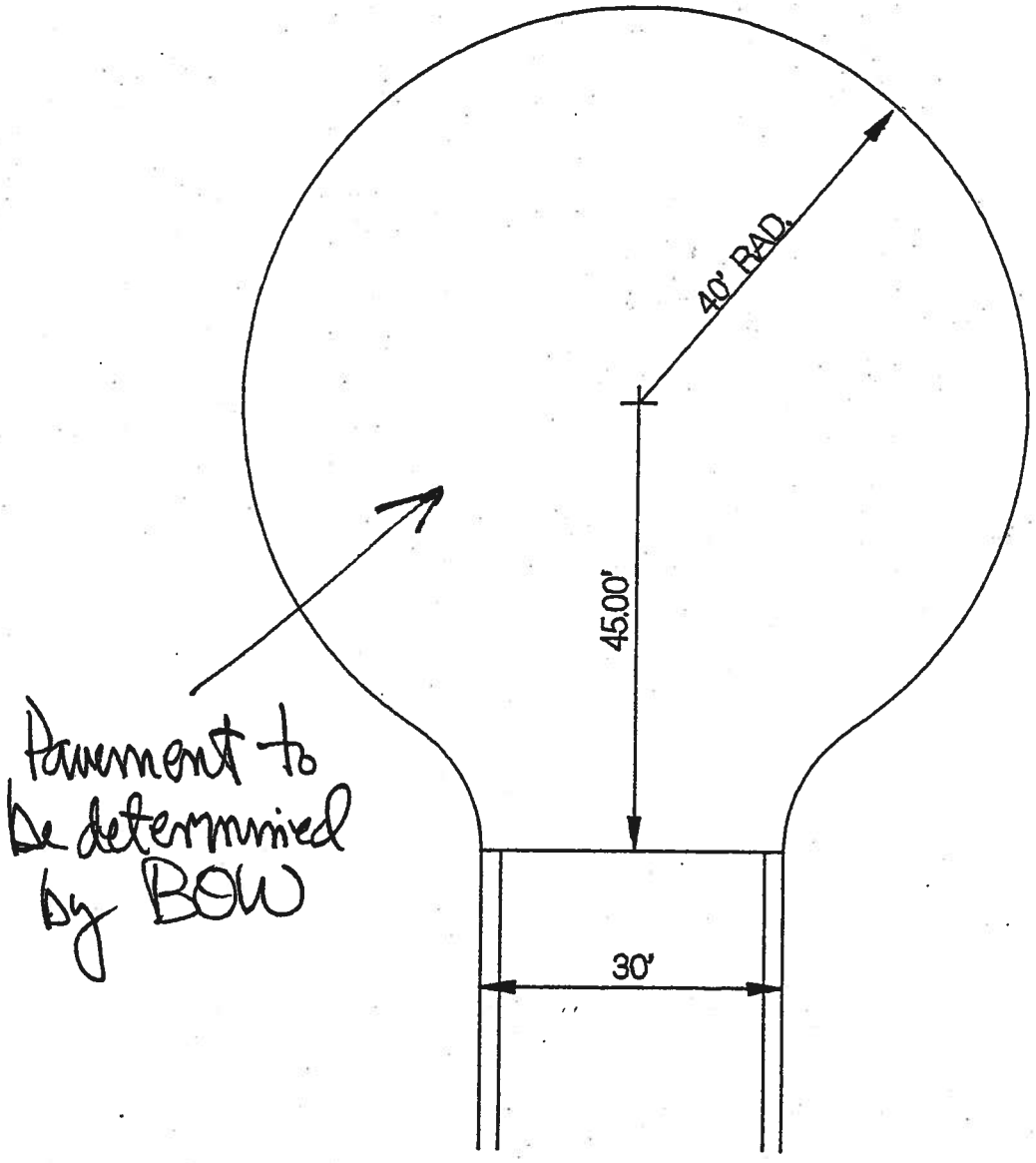
CUL–DE–SAC

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 04
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



CULDESAC WITH ISLAND (TYPICAL)

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 05
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



TEMPORARY TURN – AROUND

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 06
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

ALGEBRAIC DIFFERANCE IN GRADE	D.S.=20m.p.h. K = 10	D.S.=30m.p.h. K = 30	D.S.=35m.p.h. K = 40
0.5			20
1.0		30	40
1.5		45	60
2.0	20	60	80
2.5	25	75	100
3.0	30	90	120
3.5	35	105	140
4.0	40	120	160
4.5	45	135	180
5.0	50	150	200
5.5	55	165	220
6.0	60	180	240
6.5	65	195	260
7.0	70	210	280
7.5	75	225	300
8.0	80	240	320
8.5	85	255	340
9.0	90	270	360
9.5	95	285	380
10.0	100	300	400
10.5	105	315	420
11.0	110	330	440
11.5	115	345	460
12.0	120	360	480

CREST VERTICAL CURVE MINIMUM LENGTH

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 07
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	

ALGEBRAIC DIFFERANCE IN GRADE	D.S.=20m.p.h. K = 20	D.S.=30m.p.h. K = 40	D.S.=35m.p.h. K = 50
0.5		20	25
1.0	20	40	50
1.5	30	60	75
2.0	40	80	100
2.5	50	100	125
3.0	60	120	150
3.5	70	140	175
4.0	80	160	200
4.5	90	180	225
5.0	100	200	250
5.5	110	220	275
6.0	120	240	300
6.5	130	260	325
7.0	140	280	350
7.5	150	300	375
8.0	160	320	400
8.5	170	340	425
9.0	180	360	450
9.5	190	380	475
10.0	200	400	500
10.5	210	420	525
11.0	220	440	550
11.5	230	460	575
12.0	240	480	600

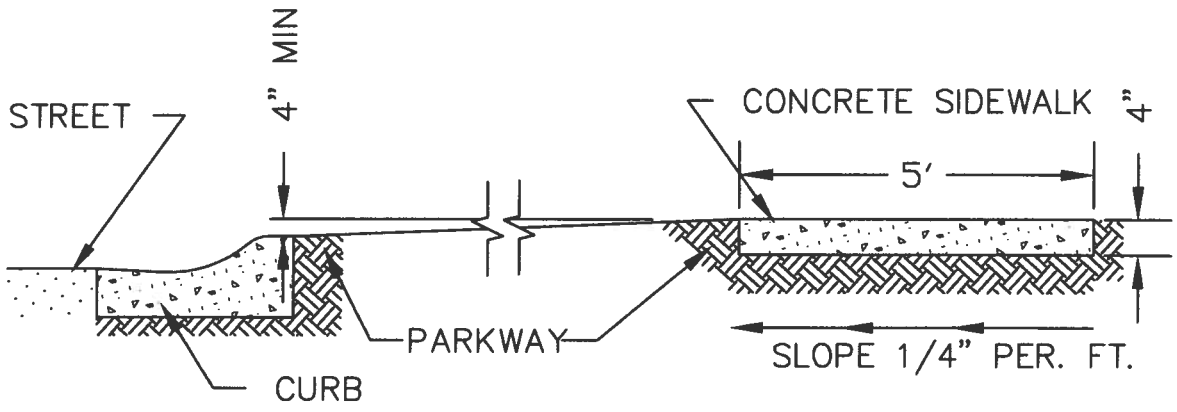
SAG VERTICAL CURVE
MINIMUM LENGTH

NO.	BY	DATE	REVISION

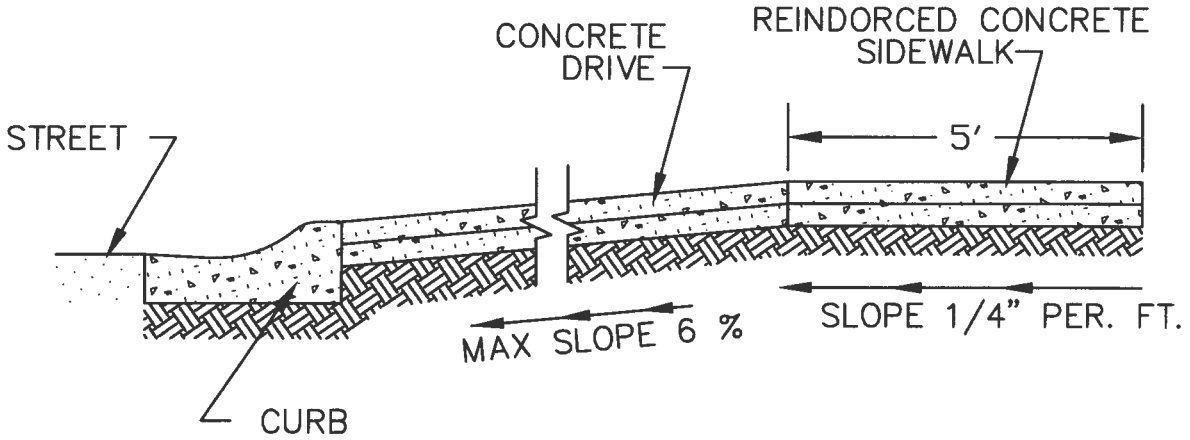
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. B 08



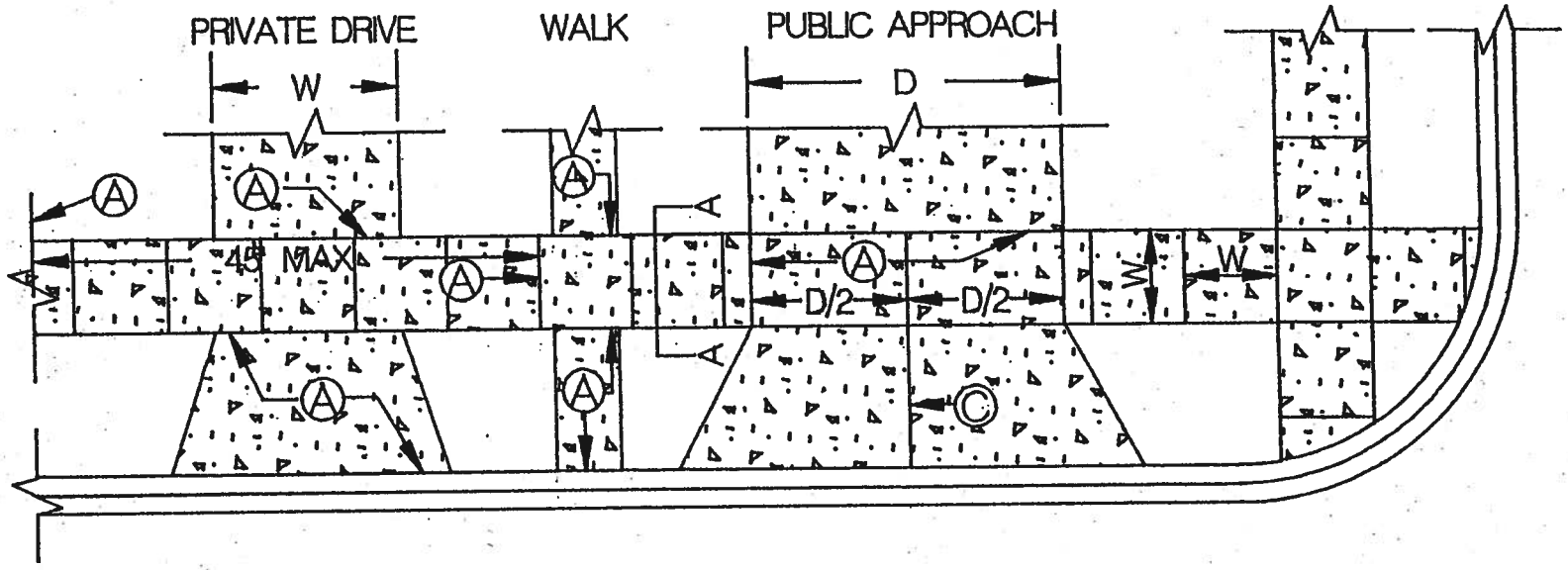
TYPICAL SIDEWALK



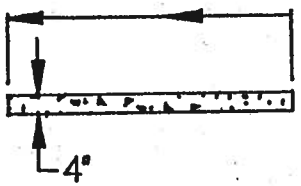
NOTE: Note: Sand compacted to a 4" min. depth below sidewalk.
DRIVEWAY AND SIDEWALK AT DRIVEWAY – 5" CONC. WITH REINFORCED MESH – 6" x 6"–10/10; OR 6" CONC.

TYPICAL SIDEWALK AT DRIVEWAY

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO.
		03/01	Sand note added.		B
		03/12	Minimum width revised to 5'	ENGINEER'S DEPARTMENT	09
				DATE: DR: APPROVED:	



SLOPE 1/4" PER FT.



SECTION A – A

LEGEND

Ⓐ EXPANSION JOINT–FULL DEPTH

Ⓒ CONTRACTION JOINT

W WIDTH

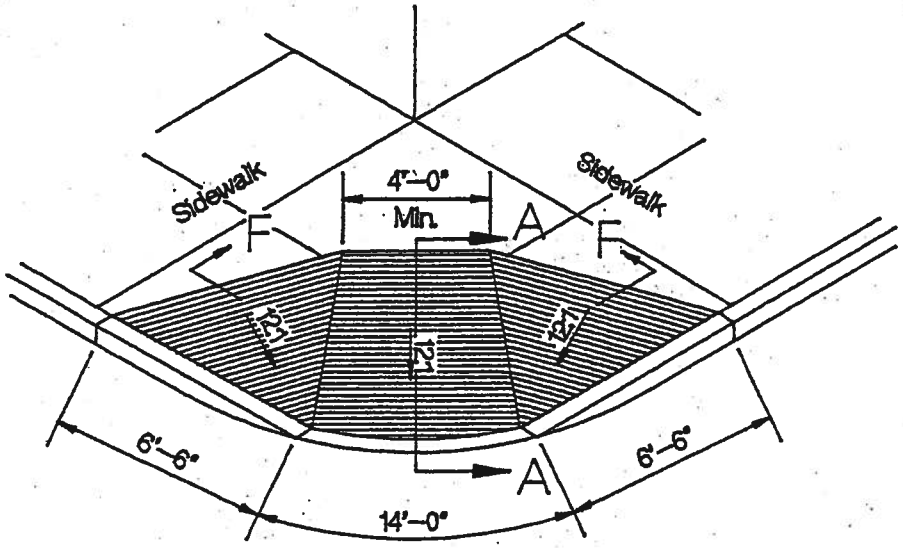
RESIDENTIAL SIDEWALK & APPROACH

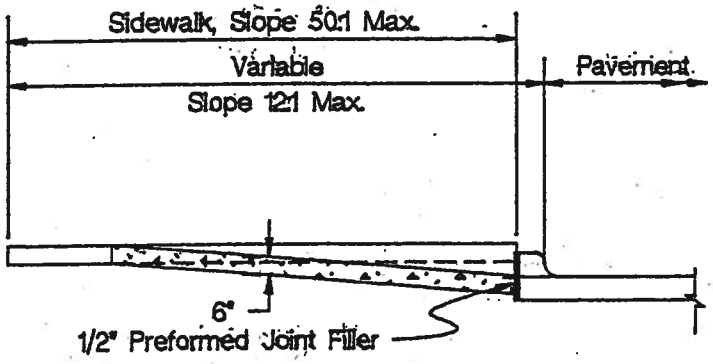
NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

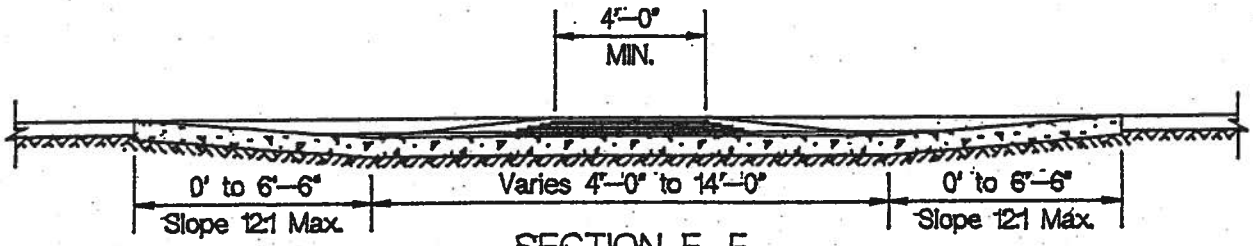
ENGINEER'S DEPARTMENT
DR.
APPROVED:
DATE:

NO. B 10





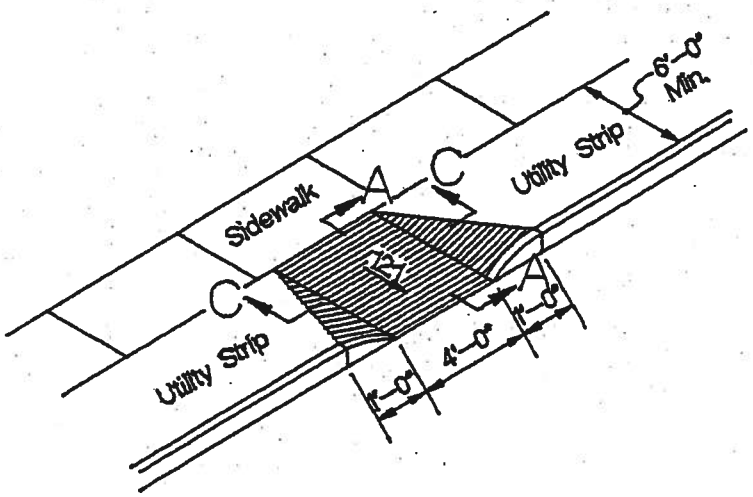
SECTION A–A

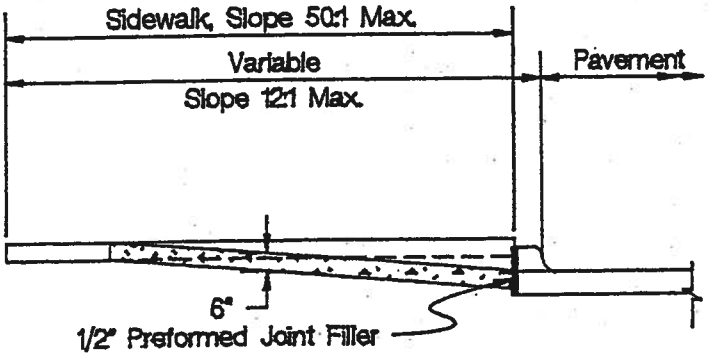


SECTION F–F

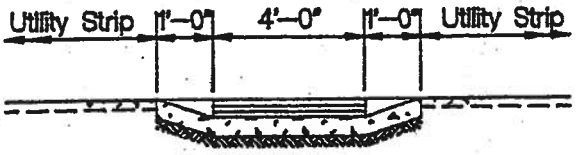
HANDICAP RAMP
TYPE "A"

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 11
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	





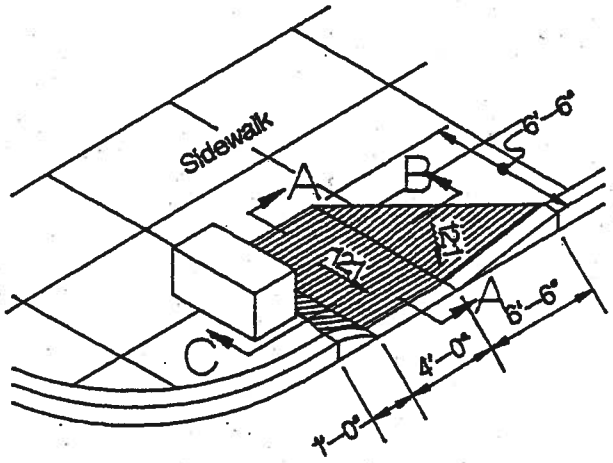
SECTION A–A

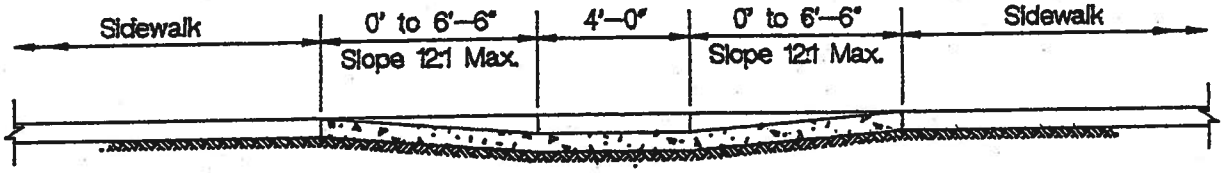


SECTION C–C

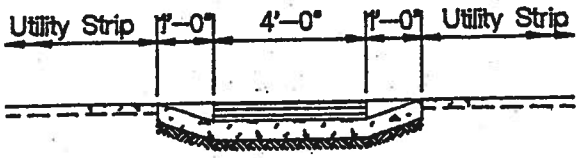
HANDICAP RAMP
TYPE "B"

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 12
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

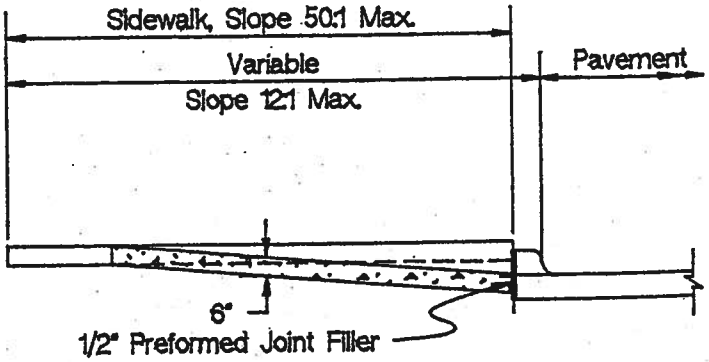




SECTION B–B



SECTION C–C



SECTION A–A

HANDICAP RAMP
TYPE "C"

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. B 13
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

CITY of VALPARAISO
INDIANA
website: www.ci.valparaiso.in.us
email: vstreet@netnitco.net
Anthony R. Shivley
Superintendent of
STREETS & SANITATION
406 Don Hovey Drive, Valparaiso, IN 46383
TELEPHONE 219-462-4612 ext. 25
FAX 219-464-2063

DESIGN MEMORANDUM

TO:	ALL CITY PERSONNEL, CONSULTANTS, DEVELOPERS, BUILDERS, & CONTRACTORS
FROM:	ANTHONY R. SHIVLEY, SUPT OF STREETS AND SANITATION
SUBJECT:	SIDEWALK CURB RAMPS
DATE:	2/28/2003
SUPERSEDES:	ALL PREVIOUS STANDARDS AND SPECIFICATIONS FOR ADA CURB RAMPS
EFFECTIVE:	SEPTEMBER 16, 2003

PLEASE NOTE: All development plans must be certified by an engineer that they meet or exceed the latest revisions of all Federal, State, and Local laws and regulations as required by the American with Disabilities Act.

Curb ramps and other provisions for the physically impaired are required on all projects involving the provision of curbs and sidewalks at all pedestrian crosswalks. A pedestrian crosswalk is defined as the portion of a street ordinarily included within the prolongation or connections of lateral lines of sidewalks at intersections. It also includes any portion of a highway or street distinctly indicated as a crossing for pedestrians by lines or other markings on the surface.

A curb ramp provides a sloped area within a public sidewalk that allows pedestrians to accomplish a change from sidewalk level to street level. A curb ramp typically includes the ramp and flared sides and specific surface treatments, but does not include the landings at the top and bottom of the ramp.

A. Location

When determining the need for a curb ramp, the designer should consider the following:

1. For each project except signing, pavement marking, roadway lighting, and preventative maintenance paving, curb ramps are to be constructed at all crosswalks which extend from a paved sidewalk in an intersection. They are to be provided on all intersections corners with sidewalks. At T-intersections, the designer should ensure that curb ramps are located on the side opposite the minor intersecting road if a sidewalk is present or is to be provided. For a 4R or new construction project, curb ramps should be provided along all sidewalk corridors, e.g., at alleys and drives.

2. There should be full continuity of use throughout; i.e., opposing ramps should always be provided even if part of the sidewalk is outside the project limits.

3. Curb ramps should be located or protected to prevent their obstruction by parked vehicles.

4. Curb ramps should be located directly opposite one another for each crosswalk, and should be placed within the crosswalk lines.

5. A diagonal curb ramp should be wholly contained within the crosswalk lines, including any flared sides. There should be at least 1.2 m (4 ft) between the gutter line and the corner of the two intersecting crosswalk lines as delineated within the intersection pavement area. See Figure 03-01A for an illustration of these criteria.

6. The curb ramp and associated landings should not be compromised by other highway features (e.g., guardrail, catch basins, utility poles, signs, etc.). The ramp should be designed such that turning or maneuvering is not required on the ramp surface.

7. Curb ramps are required at all curbed intersections with connecting sidewalks. However, a Level One waiver of the Americans with Disabilities Act requirements request may be approved for locations where there are valid reasons to restrict or prohibit all pedestrian access.

8. The normal gutter flow line should be maintained through the curb ramp area. Appropriate drainage structures should be placed as needed to intercept the flow prior to the curb ramp area. Positive drainage should be provided to carry water away from the intersection of the curb ramp and the gutter line, thus minimizing the depth of any flow across the crosswalk.

B. Pedestrian Signal Controls

If a pedestrian crosswalk and curb ramp are present at an intersection with a traffic signal that has pedestrian detectors (pushbuttons), the following will apply:

1. Location. Controls should be located as close as practical to the curb ramp and, to the maximum extent feasible, should permit operation from a level area immediately adjacent to the controls. Controls should be placed so as not to create an obstruction to the curb ramp.

2. Surface. A sidewalk area of 1.2 m by 1.2 m (4 ft by 4 ft) should be provided to allow a forward or parallel approach to the controls. In a restricted area, such sidewalk area may be reduced to 0.9 m by 0.9 m (3 ft by 3 ft).

C. Detectable Warning Devices

Most sidewalk curb ramps are to include detectable warning devices. These consist of a standardized surface feature to warn people with vision impairments that they are approaching a street or driveway. The color and texture of these devices contrast visually with adjoining surfaces. Details and explanations are shown in the INDOT *Standard Drawings* and *Standard Specifications*, respecively.

D. Types of Sidewalk Curb Ramps

Details for placement of curb ramps are shown on the INDOT *Standard Drawings*. Figure 03-01A is an illustration showing appropriate locations for all curb ramp types. Determining which curb ramp is most appropriate depends on the exact conditions of the site. Curb ramps are categorized below by their structural design and how they are positioned to the sidewalk or street.

1. Perpendicular Curb Ramp. This curb ramp is perpendicular to the curb and requires a wide enough sidewalk to provide a 12:1 running slope. The length of the ramp depends on the height of the curb where the ramp is to be located. Details of a ramp with an integral curb, and of a ramp with a separate curb are shown on the INDOT *Standard Drawings*. A landing should be provided at the top of the ramp. If site infeasibility precludes construction as shown on the INDOT *Standard Drawings*, the level landing width my be decreased from 1200 mm to 900 mm (48 in. to 36 in.), and the running slope may be increased to 10:1 for a maximum 150 mm (6 in.) rise. If it is not possible to provide a level landing, a perpendicular curb ramp should not be specified. New construction should always provide adequate right of way for a perpendicular curb ramp. See the INDOT *Standard Drawings* for improved access to a perpendicular curb ramp.

   A perpendicular curb ramp is the preferred curb ramp design. The standard perpendicular curb ramps are as follows:

   a. Type A. This type should be specified where a curb ramp is required entirely within the pedestrian walkway.

   b. Type C. This type should be specified where a curb ramp is required outside the pedestrian walkway, in the utility or planting strip.

   c. Type D. This type should be specified where a curb ramp is required near an obstruction which can not be removed.

2. Diagonal Curb Ramp. A diagonal curb ramp is a single curb ramp that is located at the apex of the corner at an intersection, and serves two intersecting crossing directions. Since the ramp is diagonal to the path of travel, it is only accessible if level landing or maneuvering spaces are

provided at both the top and bottom of the ramp. If creating a level landing is too difficult or a 1200 mm (48 in.) clear space cannot be provided, a diagonal curb ramp should not be considered. If site infeasibility precludes construction as shown on the INDOT *Standard Drawings*, the landing width may be decreased from 1200 mm to 900 mm (48 in. to 36 in.) and the running slope may be increased to 10:1 for a maximum 150 mm (6 in.) rise. Diagonal curb ramps should not be used in new construction. The standard diagonal curb ramps are as follows:

a. Type B. This type should be specified where a curb ramp is required entirely within the pedestrian walkway, and the corner radius is greater than 3 m (10 ft). At the bottom of the ramp, the perimeter length is 2.4 m (8 ft), regardless of the corner radius.

b. Type E. This type should be specified where a curb ramp is required outside the pedestrian walkway, in the utility or planting strip, and an obstruction which cannot be removed is present. This type should be specified where the corner radius is less than 7.5 m (25 ft).

3. Parallel Curb Ramp. A parallel curb ramp has two ramps leading down towards a center level landing at the bottom between both ramps and has level landings at the top of each ramp. A parallel curb ramp may be specified for a narrow sidewalk, steep terrain, or at locations with a high curb, as the ramp can easily be lengthened to reduce the grades. A parallel curb ramp should not be installed where it is possible to install two perpendicular curb ramps. A wall or curb may be required along the back edge of the ramp as shown on the INDOT *Standard Drawings*. The designer should show details for such wall or curb on the plans and include a unique special provision. The standard parallel curb ramps are as follows:

a. Type F. This type should be specified where the corner radius is less than 7.5 m (25 ft).

b. Type K. This type should be specified at a mid-block location. It may be used where the sidewalk is adjacent to the curb or where the sidewalk is separated from the curb by a buffer strip.

4. Depressed-Corners Curb Ramp. Depressed corners gradually lower the level of the sidewalk to meet the grade of the street or driveway. Depressed corners are often designed as an expanded diagonal curb ramp that extends around the entire corner at an intersection. This curb ramp should be specified at a corner where the sidewalk is in one direction only. This design should not be used in new construction. The standard depressed-corners curb ramps are as follows:

a. Type G. This type should be specified where a curb ramp is required outside the pedestrian walkway, in the utility or planting strip, and the sidewalk is separated from the curb.

b. Type H. This type should be specified where a curb ramp is required entirely within the pedestrian walkway.

5. Median Curb Ramp, Type L. This type should be specified where a raised median of 2.4 m (8 ft) or greater width obstructs the crosswalk. Where the median width is less than 2.4 m (8 ft), a detail should be shown on the plans.

6. Deleted Curb Ramp Types. Where curb ramp type J has been specified, type A should be specified instead. Curb ramp types M, N, and O also should no longer be specified as their details have been deleted from the INDOT *Standard Drawings*.

E. Selection

The following provides several suggestions for selecting the appropriate curb ramp.

1. Crosswalk Markings and Stop Lines. The placement of curb ramps affects the placement of pedestrian crosswalk and vehicle stop lines. Conversely, the location of existing crosswalk and stop lines affect the placement of curb ramps. Some of the crosswalk-line constraints are shown in Figure 03-01A and in the INDOT *Standard Drawings*. The Indiana and Federal *Manuals on Uniform Traffic Control Devices* contain additional constraints on crosswalk- and stop-line placement.

2. Obstructions. It is desirable to move the obstruction wherever practical. Where it is not practical to move the obstruction, the direction of traffic relative to the placement of the curb ramp should be considered. It is important that drivers can see the physically impaired person using the curb ramp. Where obstructions are present, such as signal controller boxes, planters, signal pole bases, etc., a curb ramp type D or E may be used. No obstruction should be permitted within the paved flared sides of a curb ramp.

3. Sidewalk and Buffer Strip Widths. The INDOT *Standard Drawings* show minimum sidewalk widths and buffer strip widths. These minimum widths are intended for new construction and reconstruction. Curb ramp types F and K may be used where an existing sidewalk cannot be widened to the minimum width.

4. Diagonal Curb Ramps. The usage of diagonal curb ramp types B, E, and F should be avoided wherever practical. It is preferable to use another type of curb ramp or combination of ramps rather than to use a diagonal curb ramp. Curb ramp types B, E, or F should only be specified if a field investigation warrants their use for alterations affecting existing sidewalks. Specific constraints for crosswalk markings and stop line placement are shown in the INDOT *Standard Drawings*.

5. Best Practices. The following should be considered.

   a. A level maneuvering area or landing should be provided at the top of each curb ramp.

b. The ramp slope should be perpendicular to the curb, at 7.1 ± 1.2%, with a maximum of 8.33%. Details regarding curb ramp slopes are shown in Figure 03-01B.

c. The ramp and gutter cross slope should be 2%.

F. Curb Ramp Lengths and Slopes

Curb ramps should be designed with a maximum slope of 12:1, or 8.33%. See Figure 03-01C to determine the length of a curb ramp which is perpendicular to the curb. The figure assumes a 2% sidewalk cross slope and a level longitudinal grade.

Change In Elevation, mm	Ramp Length, m	Change In Elevation, in.	Ramp Length, ft.
100	1.6	4	5.25
125	2.0	5	6.50
150	2.4	6	8.00
175	2.8	7	9.25
200	3.2	8	10.50"

LENGTHS OF PERPENDICULAR CURB RAMPS

Figure 03-01C

For a curb ramp which is not perpendicular to the curb, the following formula should be used to determine its length. The formula assumes a 2% sidewalk cross slope and a level longitudinal grade.

Metric: $$L_{CR} = \frac{h}{\cos\theta(G_R - G_S)}$$ English: $$L_{CR} = \frac{h}{12\cos\theta(G_R - G_S)}$$

Where:

L_{CR} = Curb ramp length, m (ft)

H = Change in elevation, m (in.)

G_R = Curb ramp grade, % / 100

G_S = Sidewalk cross grade, % / 100

è = Angle to which the curb ramp is out of perpendicular to the curb

F. Algebraic Difference Between Curb Ramp and Gutter Slopes

The algebraic difference between a curb ramp slope and the gutter or pavement slope should be less than 11%. If this is not possible, a 0.6-m (2-ft) wide level strip should be provided between the grades. See the INDOT *Standard Drawings*.

$$\Delta G = |G_R - G_G|$$

Where:

ΔG = Algebraic grade difference, %

G_R = Ramp grade, %

G_G = Gutter grade, %

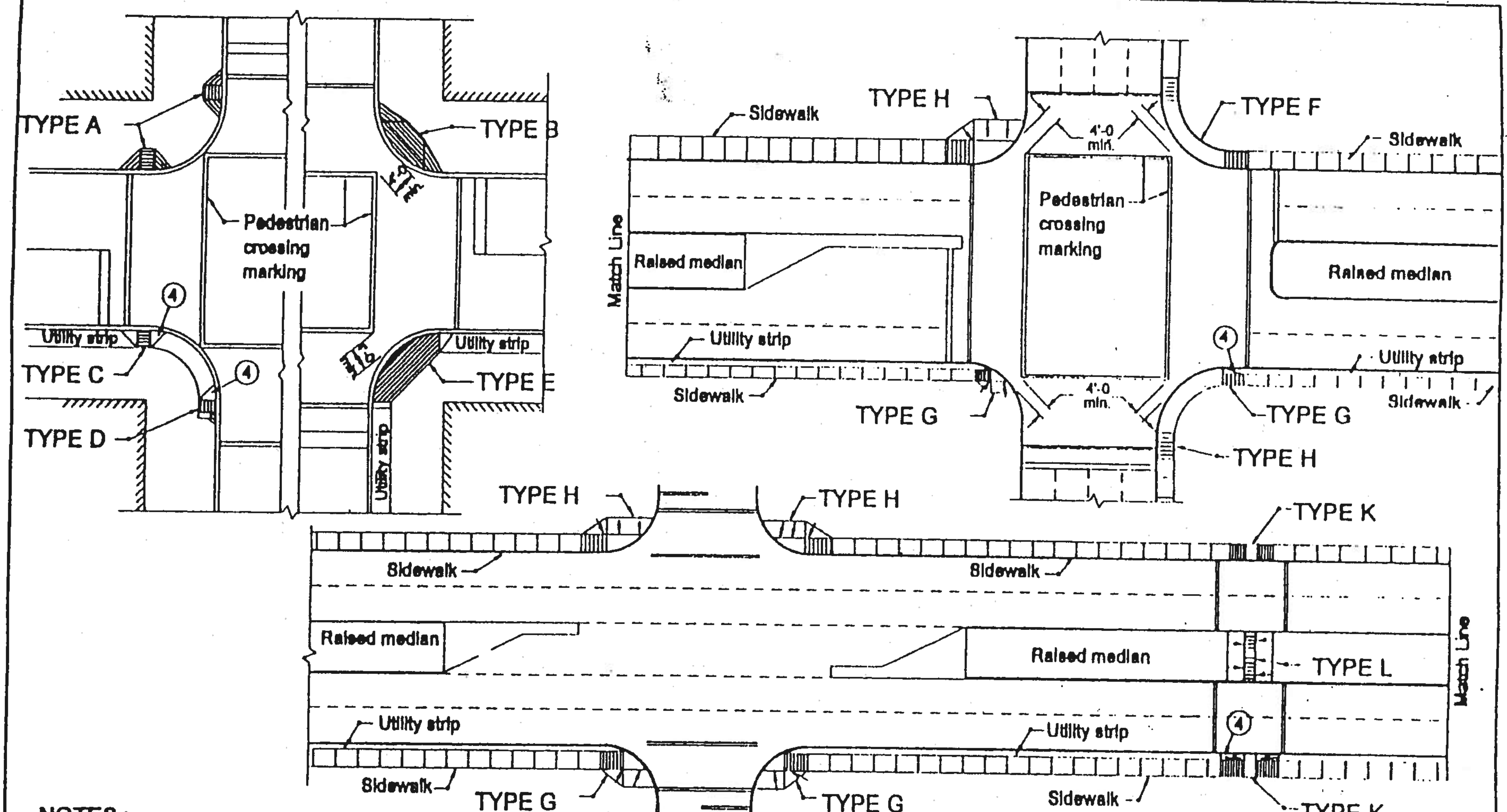
$|G_R - G_G|$ = Absolute value of grade difference, %

A level strip is required if $\Delta G \geq 11\%$.

G. Pay Limits, Quantities, and Pay Items

The pay unit remains square meter (square yard). The pay limits for curb ramps are shown on the INDOT *Standard Drawings*. Quantities for curb or curb and gutter within the curb ramp limits should be incorporated into the project's appropriate curb or curb-and-gutter quantities. Quantities for sidewalk required outside the curb ramp pay limits, including those for additional landing area, should be incorporated into the project concrete sidewalk quantities. If flared sides are sod instead of concrete, such sodding should be incorporated into the project sodding quantities.

The pay item names for curb ramps are unchanged. The pay items for curb ramp types J, M, N, and O have been obsoleted.



NOTES :

1. The curb ramp type includes the ramp and flared sides as indicated by the hatched lines on the details. A top level landing for every curb ramp shall be provided.
2. For details of sidewalk curb types see Standard Drawings E 604-SWCR-03 to -11.
3. The curb ramps shall be placed within the marked crosswalk area.

(4) Flared side of sidewalk curb ramp next to utility strip shall be sodded.

5. See Standard Drawings E 604-SWCR-02 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION

LOCATION PLAN FOR SIDEWALK CURB RAMPS

SEPTEMBER 2003

STANDARD DRAWING NO. E 604-SWCR-01

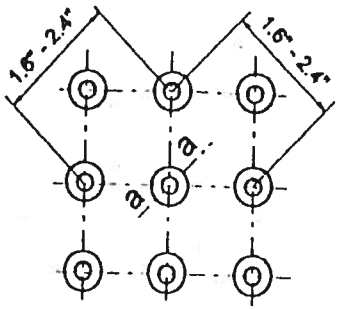
/s/ Anthony L. Uremovich 9-02-03

/s/ Richard L. Smutzer 9-02-03

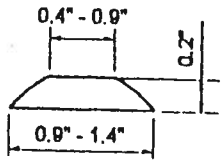
DESIGN STANDARDS ENGINEER

GENERAL NOTES :

1. These dimensions are based on a 6 in. curb height. They shall be proportionally adjusted for other curb heights.
2. Where site infeasibility precludes construction to the width shown, such width may be decreased to a minimum of 3'-0.
3. The bottom edge of the curb ramp shall be flush with the edge of adjacent pavement and gutter line.
4. Landing areas at the top of curb ramps shall have maximum cross slope of 50 : 1 in any direction. When site infeasibility precludes a landing slope of 50 : 1 in any direction, the slope perpendicular to the curb face shall not exceed 50 :1.
5. If site infeasibility precludes construction to the width shown, the landing width may be decreased to 3'-0 minimum. The running slope of the curb ramp may be steepened to a maximum of 10 : 1 for a maximum 6 in. rise.
6. Drainage inlets should be located uphill from curb ramps to prevent puddles at the path of travel.
7. See Standard Drawing E 604-SWCR-12 for improved access on narrow sidewalks.
8. Algebraic difference in grade between the base of curb ramp and the gutter shall be limited to less than 11%. If it is not practical, a 2'-0 wide level strip shall be provided. See detail sketch.

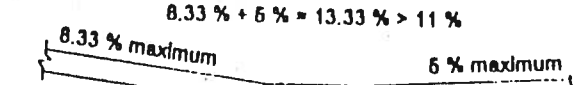


Square pattern



Section a-a

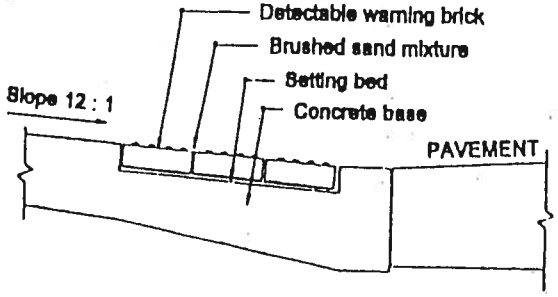
TRUNCATED DOMES USED IN DETECTABLE WARNINGS



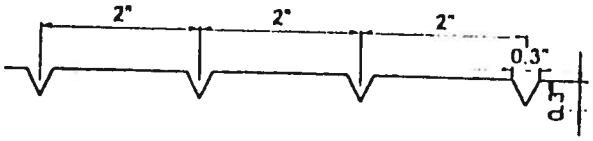
Provide 2'-0 level strip if algebraic difference exceeds 11%

Provide curb as required, may be monolithic with level strip.

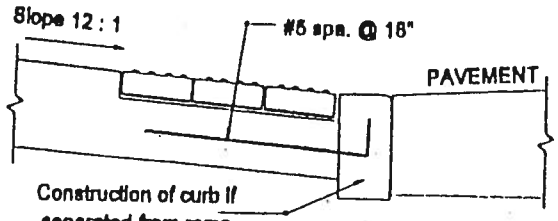
CHANGE OF GRADE



BRICK SURFACE CONSTRUCTION



DETAIL OF RAMP GROOVES



#5 x 2'-0

ALTERNATE CURB CONSTRUCTION

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMPS GENERAL NOTES & DETAILS

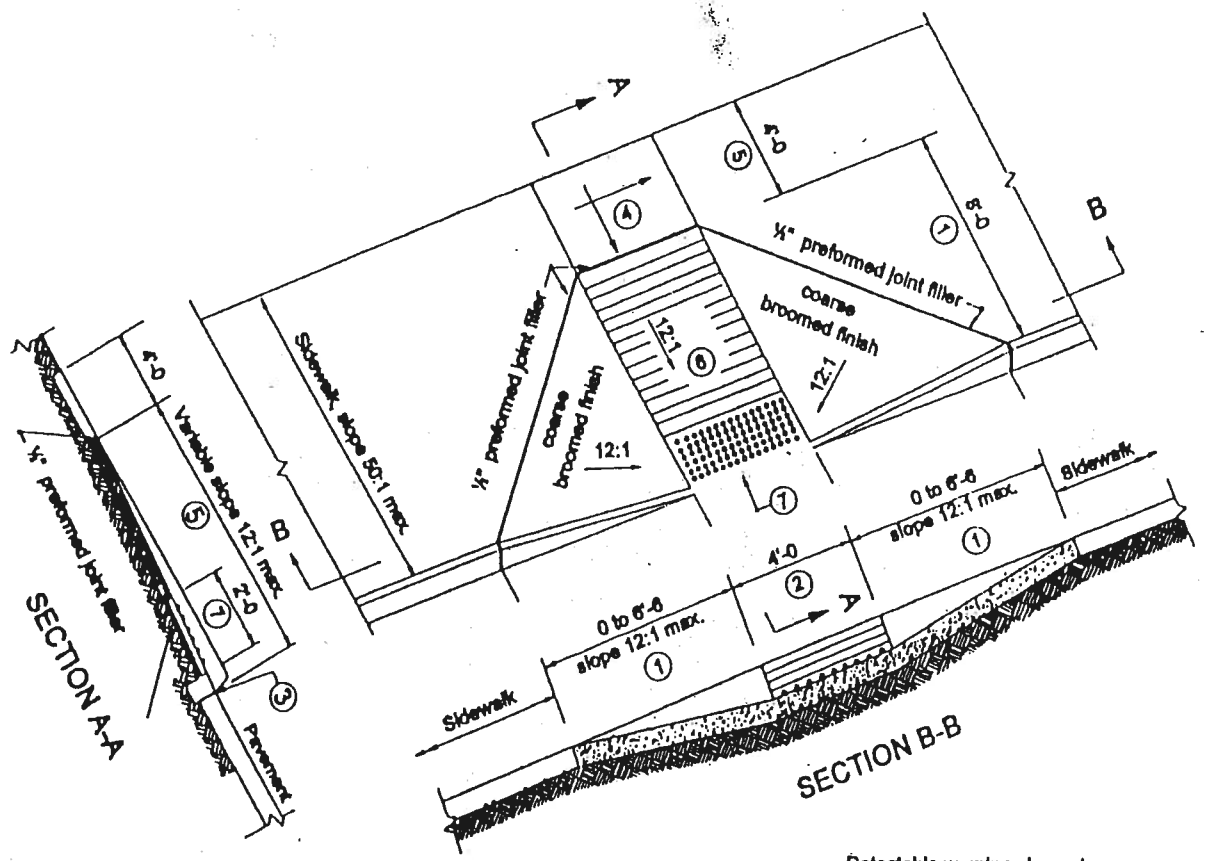
SEPTEMBER 2003

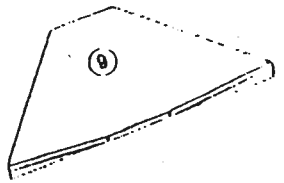
STANDARD DRAWING NO. E 604-SWCR-02

ANTHONY L. URGOVICH REGISTERED NO. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER — DATE 9/26/03

CHIEF HIGHWAY ENGINEER — DATE 9/27/03





NOTES :

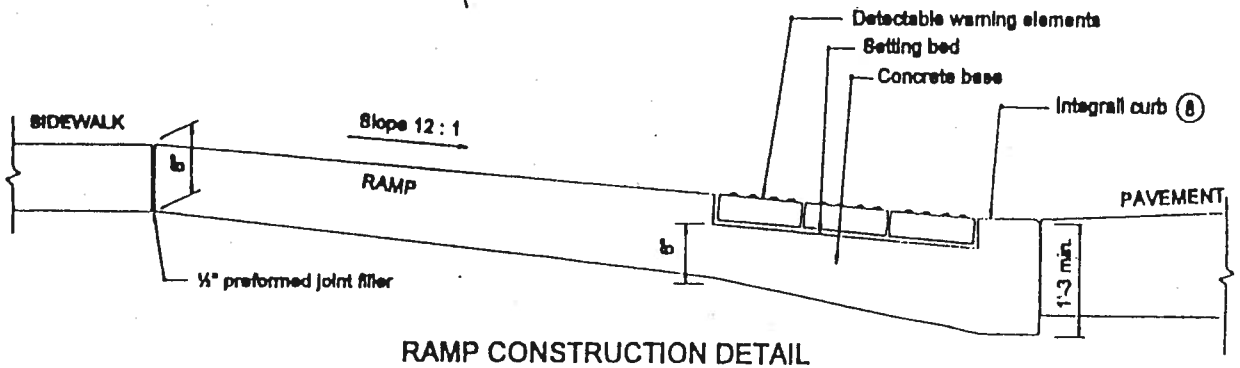
(6) See Standard Drawing E 604-SWCR-02 for groove details.

(7) See Standard Drawing E 604-SWCR-02 for details of the detectable warning.

(8) See Standard Drawing E 604-SWCR-02 for alternate curb construction.

(9) Indicated area denotes pay limits.

10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.



RAMP CONSTRUCTION DETAIL

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMP TYPE A

SEPTEMBER 2003

STANDARD DRAWING NO. E 604-SWCR-03

ANTHONY L. URENTO — REGISTERED — No. 18095 — STATE OF INDIANA — PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Anthony L. Urento — 9 OF 03 — DATE

DESIGN STANDARDS ENGINEER

/s/ Richard L. Sumner — 9 OF 03 — DATE

DESIGN STANDARDS ENGINEER

NOTES :

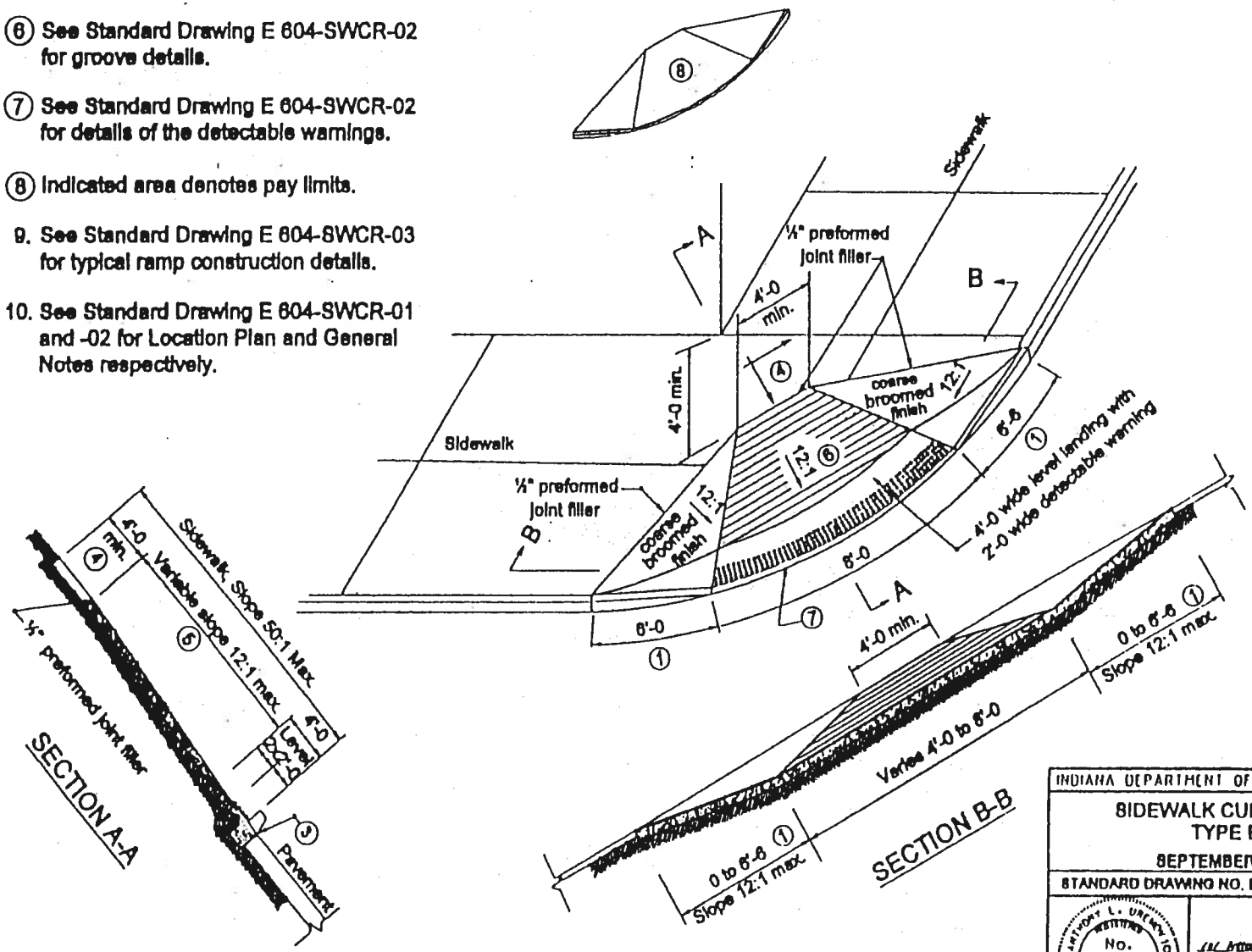
⑥ See Standard Drawing E 604-SWCR-02 for groove details.

⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.

⑧ Indicated area denotes pay limits.

9. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.

10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

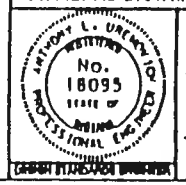


INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMP
TYPE B

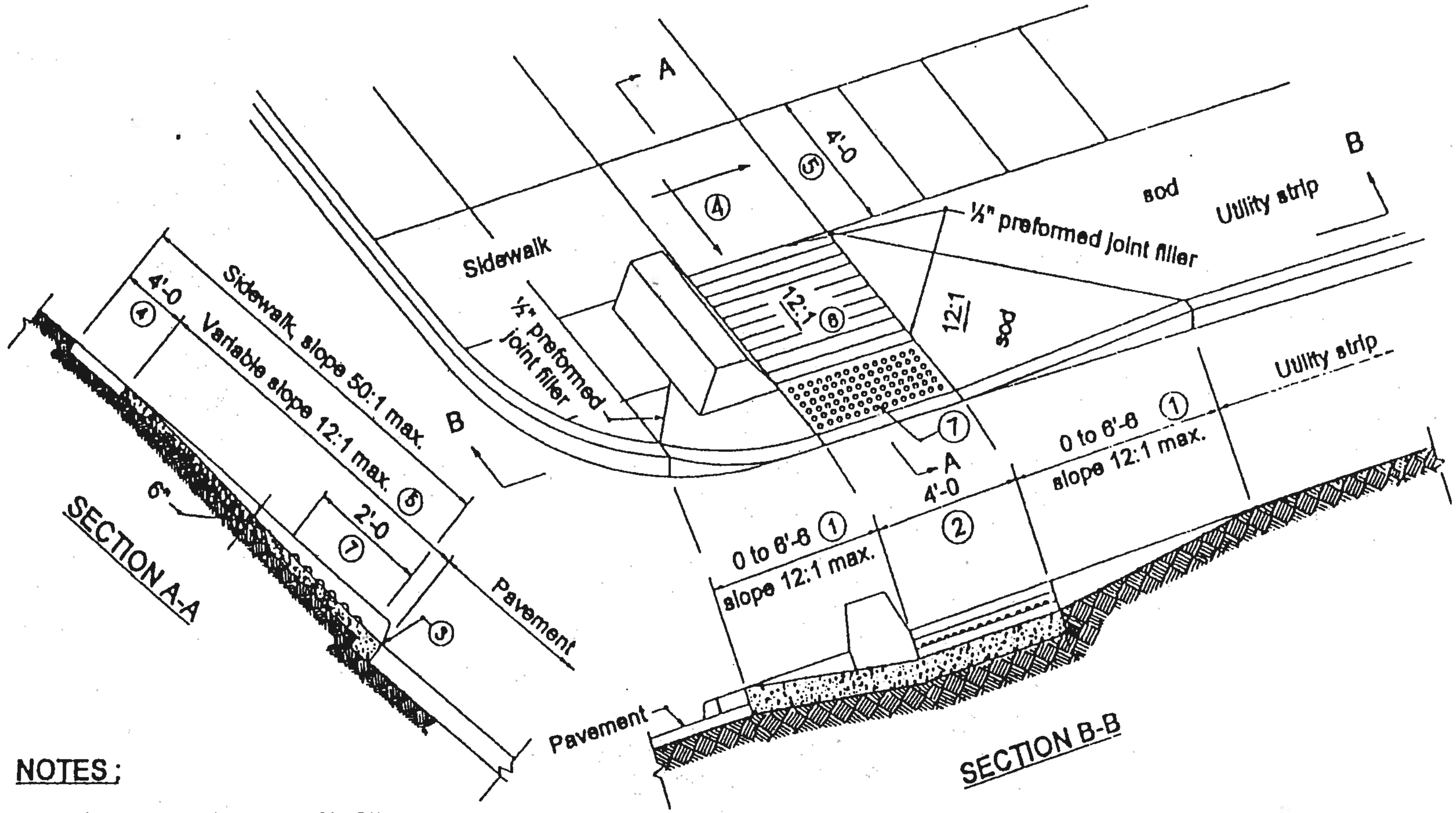
SEPTEMBER 2003

STANDARD DRAWING NO. E 604-SWCR-04



/s/ Anthony L. Uricchio 9 OCT 03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard L. Sumpter 9 OCT 03
CHIEF TECHNOLOGY OFFICER DATE

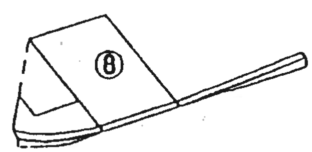


NOTES ;

⑥ See Standard Drawing E 604-SWCR-02 for groove details.

⑦ See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.

⑧ Indicated area denotes pay limits.



9. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.

10. See Standard Drawing E 604-SWCR-01 and -02 for Plan Location and General Notes respectively.

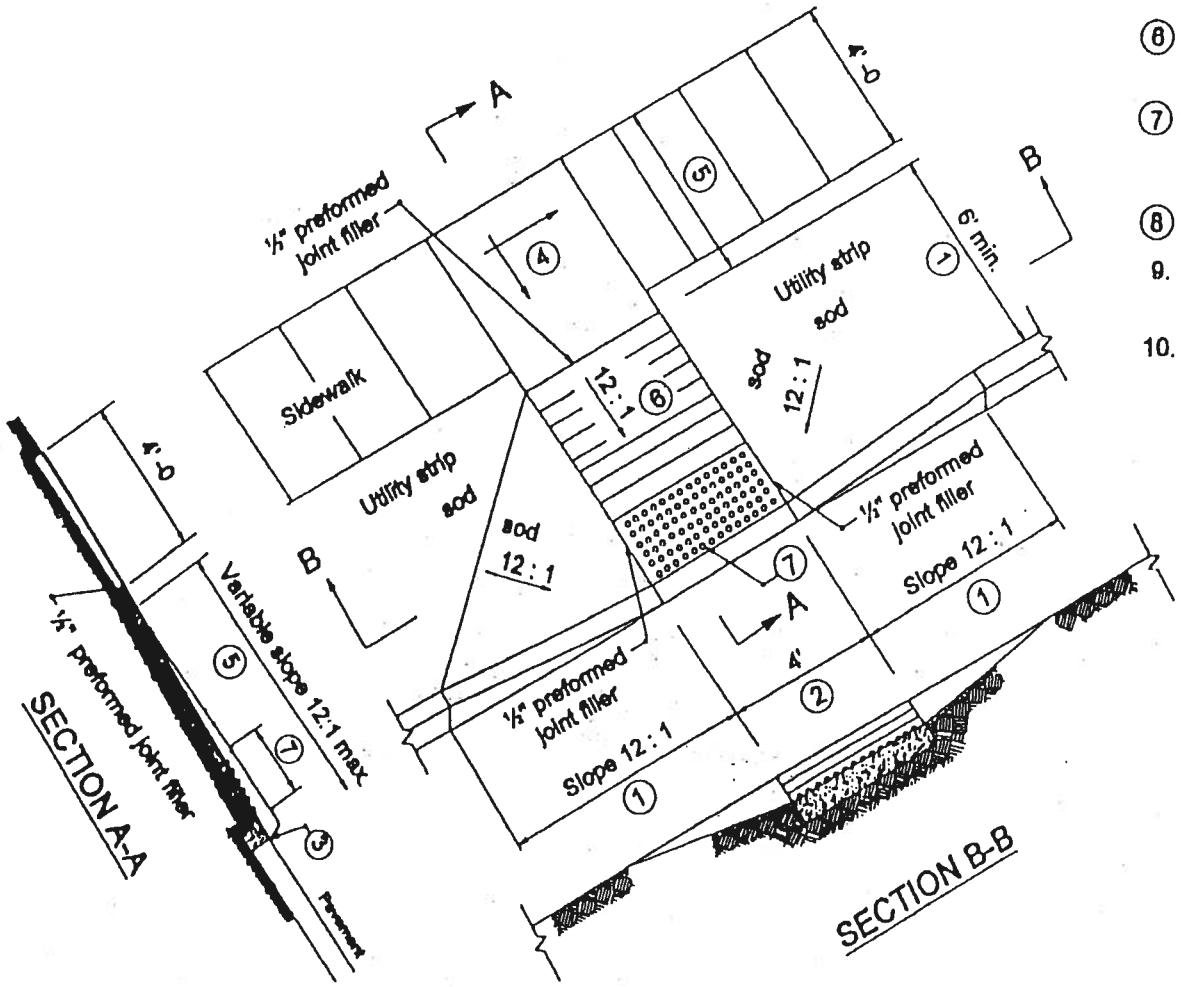
INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK RAMP CURB TYPE D

SEPTEMBER 2003

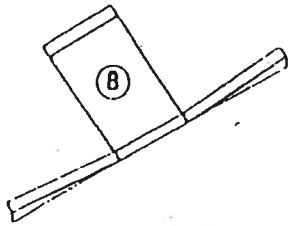
STANDARD DRAWING NO. E 604-SWCR-06

No. 18095



NOTES :

6. See Standard Drawing E 604-SWCR-02 for groove details.
7. See Standard Drawing E 604-SWCR-02 for details of the detectable warning surface.
8. Indicated area denotes pay limits.
9. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.
10. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.



INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMPS TYPE C

SEPTEMBER 2003

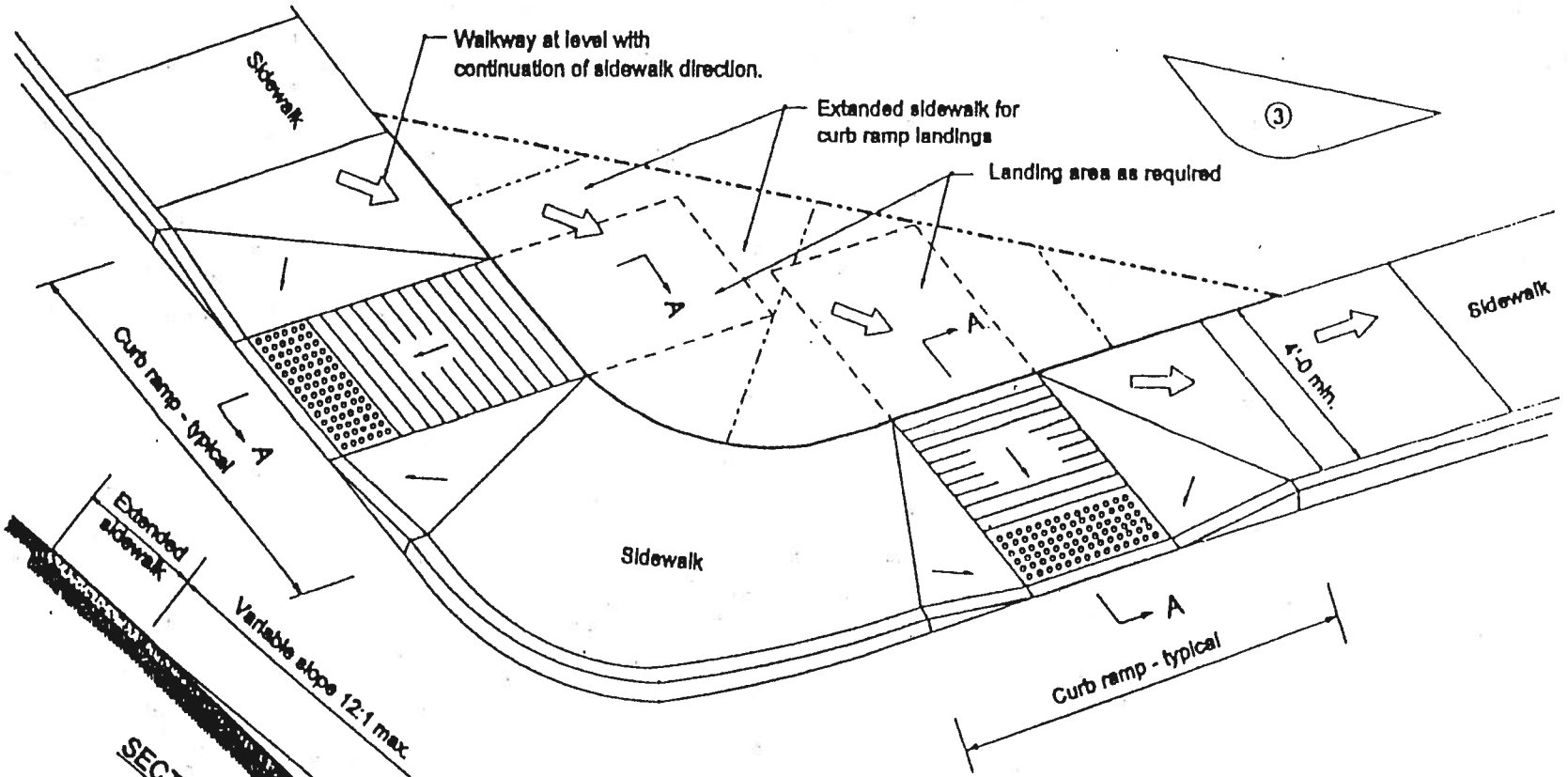
STANDARD DRAWING NO. E 604-SWCR-06

ANTHONY L. URENOVICH — REGISTERED — No. 18095 — STATE OF INDIANA — PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Anthony L. Urenovich — 9 OCT 03 — DATE

/s/ Richard L. Sumpter — 9 OCT 03 — DATE



NOTES;

1. Additional right-of-way to widen sidewalks if applicable to improve accessibility on narrow sidewalks.
2. See Standard Drawing E 604-SWCR-02 and -03 to -11 for General Notes and typical curb ramps details respectively.

③ Indicated area denotes additional pay limits for improved access.

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMP'S IMPROVED ACCESS

SEPTEMBER 2003

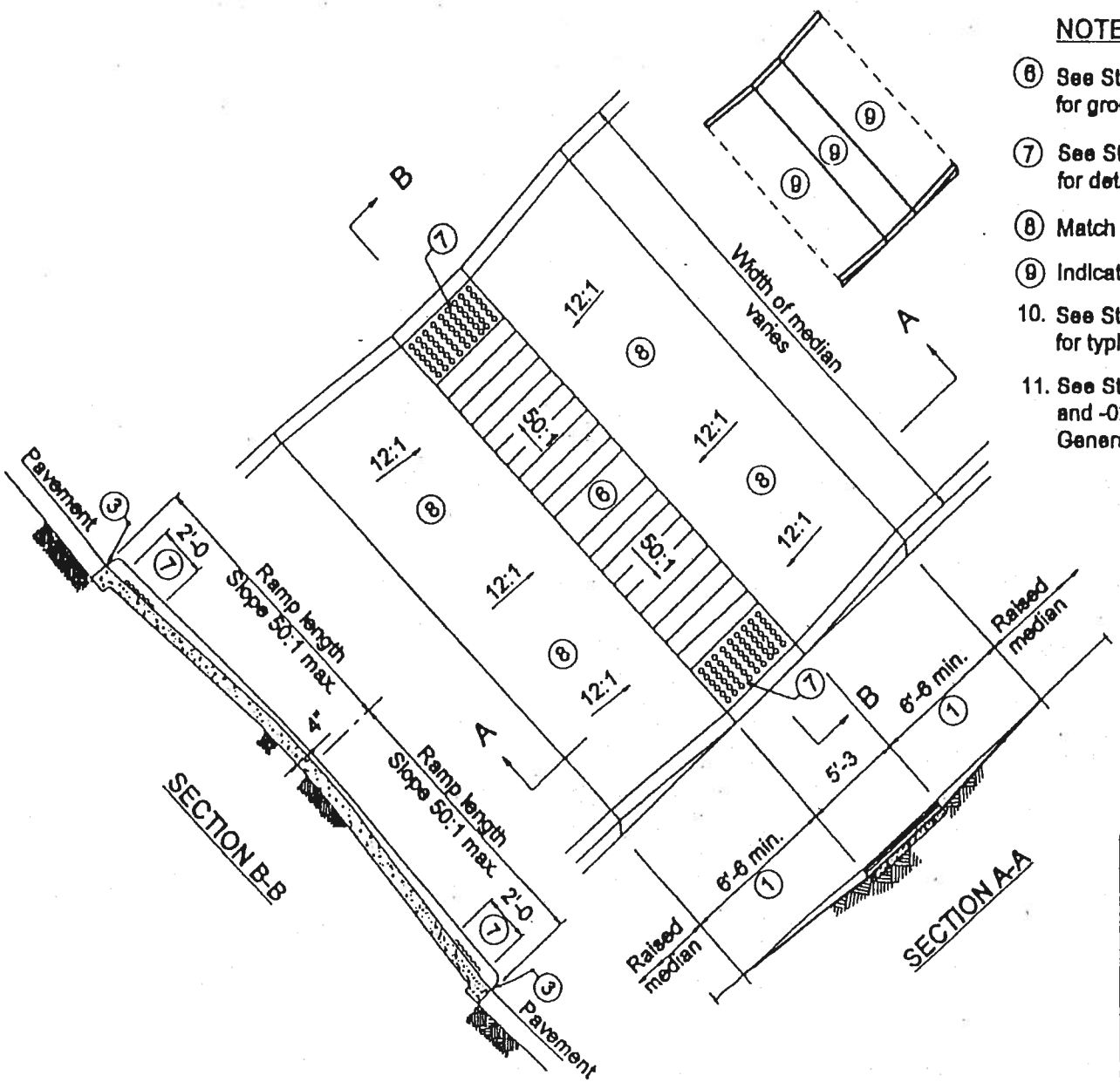
STANDARD DRAWING NO. E 604-SWCR-12

ANTHONY L. DIRKSEN REGISTERED NO. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Anthony L. Dirksen 9 01 03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Snyder 9 01 03
CHIEF HIGHWAY ENGINEER DATE



NOTES :

(6) See Standard Drawing E 604-SWCR-02 for groove details.

(7) See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.

(8) Match material in place.

(9) Indicated area denotes pay limits.

10. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.

11. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMPS
TYPE L

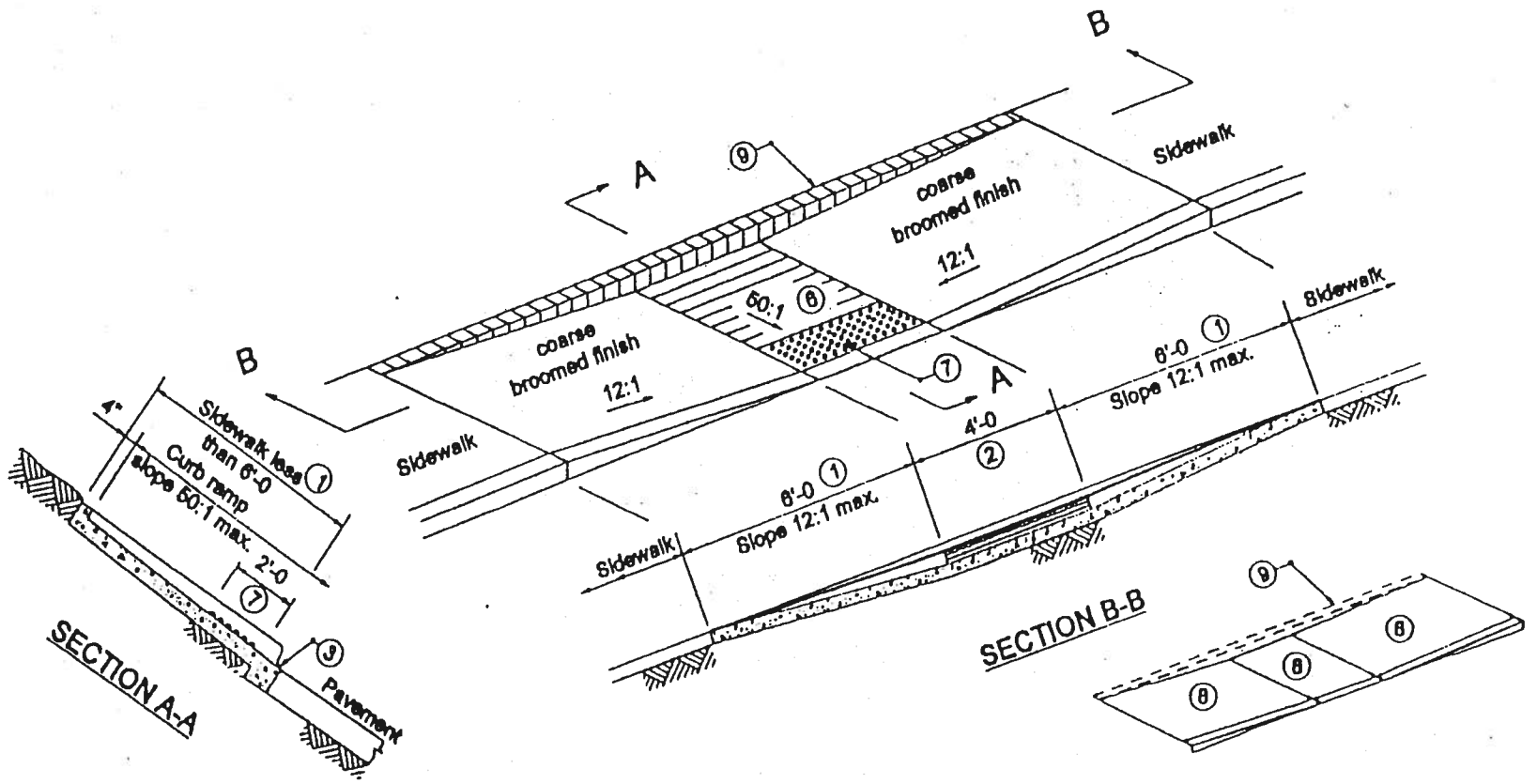
SEPTEMBER 2003

STANDARD DRAWING NO. E 604-SWCR-11

ANTHONY L. UREMOVICH REGISTERED NO. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER — DATE 9-05-03

CHIEF HIGHWAY ENGINEER — DATE 9-05-03



NOTES :

6. See Standard Drawing E 604-SWCR-02 for groove details.
7. See Standard Drawing E 604-SWCR-02 for details of detectable warnings surface.
8. Indicated area denotes pay limits
9. Curb optional. Shall be used when necessary based on field conditions.
10. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.
11. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMP TYPE K

SEPTEMBER 2003

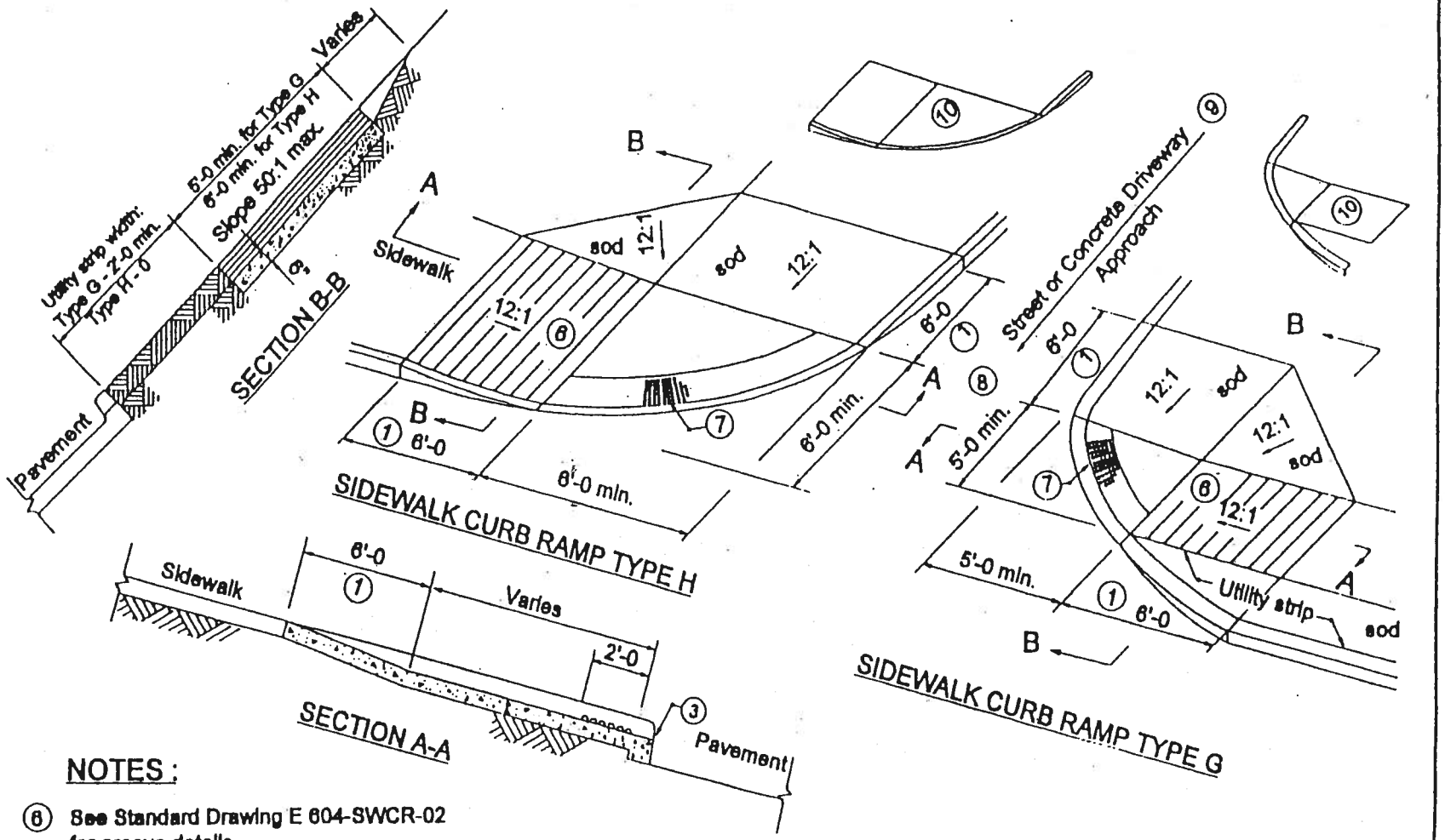
STANDARD DRAWING NO. E 604-SWCR-10

ANTHONY L. LINEWAY No. 18095 STATE OF INDIANA REGISTERED PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Anthony L. Lineway 9 05 03
DESIGN STANDARDS ENGINEER DATE

/s/ Michael R. Smith 9 05 03
CHIEF HIGHWAY ENGINEER DATE



NOTES :

(6) See Standard Drawing E 604-SWCR-02 for groove details.

(7) See Standard Drawings E 604-SWCR-02 for details of the detectable warning surface.

(8) Sidewalk across approach shall be sloped at 50:1 maximum transversely.

(9) In case of concrete driveway there will be no curbs. This side shall be adjusted accordingly.

(10) Indicated area denotes pay limits.

11. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.

12. See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB'S RAMP'S TYPE G AND TYPE H

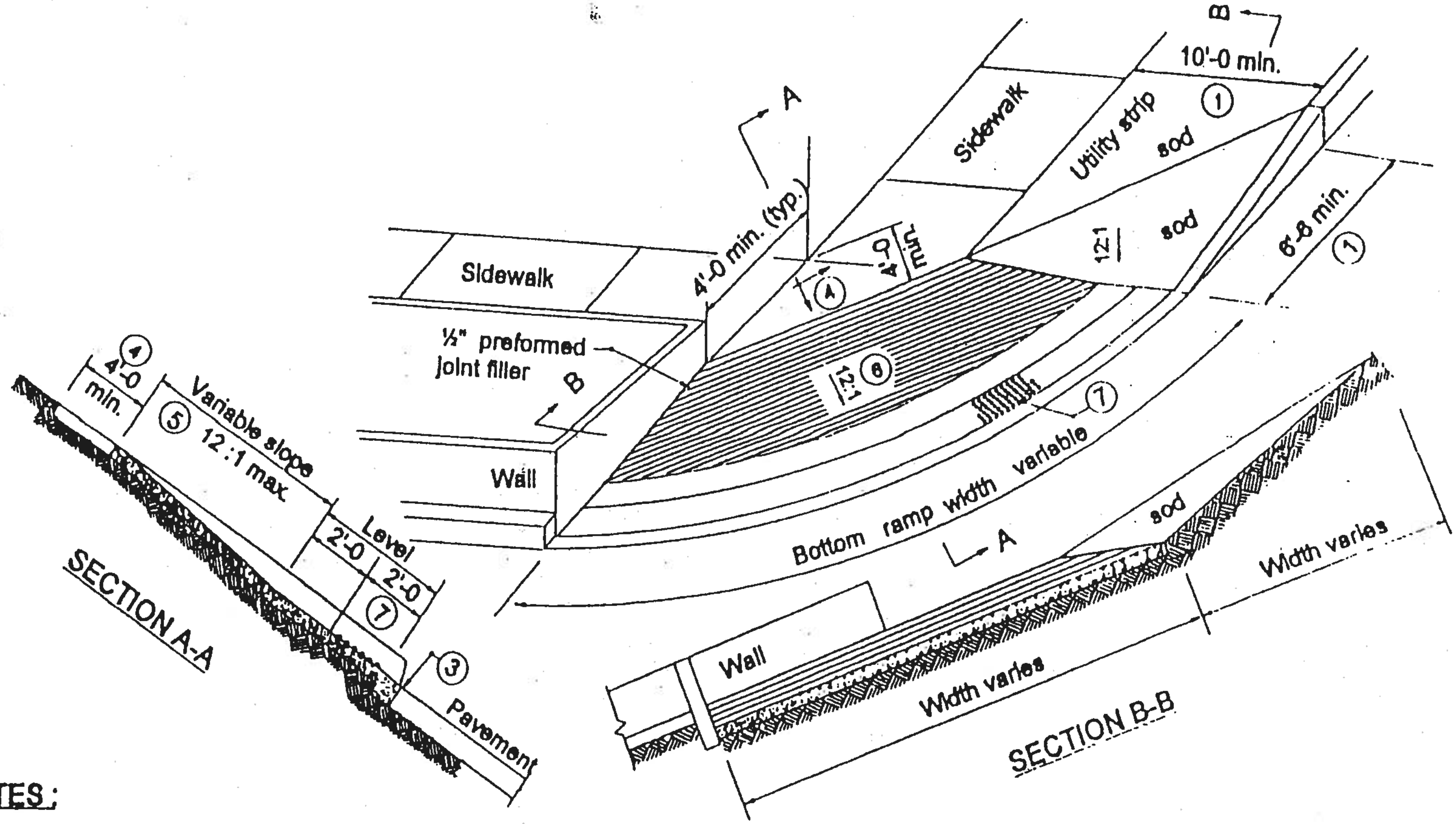
SEPTEMBER 2003

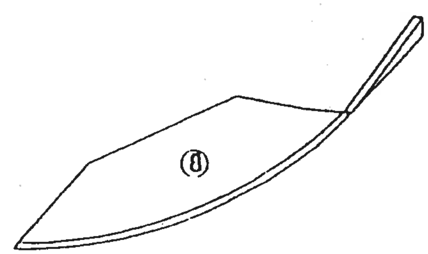
STANDARD DRAWING NO. E 604-SWCR-09

ANTHONY L. URLOCH — REGISTERED — NO. 18095 — STATE OF INDIANA — PROFESSIONAL ENGINEER

DESIGN ENGINEER — 9 OF 03 — DATE

CHIEF HIGHWAY ENGINEER — 9 OF 03 — DATE





NOTES ;

⑥ See Standard Drawing E 604-SWCR-02 for groove details.

⑦ See Standard Drawing E 604-SWCR-02 for details of detectable warning surface.

⑧ Indicated area denotes pay limits.

9. See Standard Drawing E 604-SWCR-03 for typical ramp construction details.

10. See Standard Drawing E 604-SWCR-01 and -02 for Plan Location and General Notes respectively.

INDIANA DEPARTMENT OF TRANSPORTATION
SIDEWALK CURB RAMPS TYPE E SEPTEMBER 2003
STANDARD DRAWING NO. E 604-SWCR-07

Anthony L. Uremovich, Registered No. 18095, State of Indiana, Professional Engineer

/s/ Anthony L. Uremovich — 9/02/03 — Design Standards Engineer — Date

/s/ Richard K. Smutzer — 9/02/03 — Chief Highway Engineer — Date

NOTES :

(6) See Standard Drawing E 604-SWCR-02 for groove details.

(7) See Standard Drawing E 604-SWCR-02 for details of the detectable warnings.

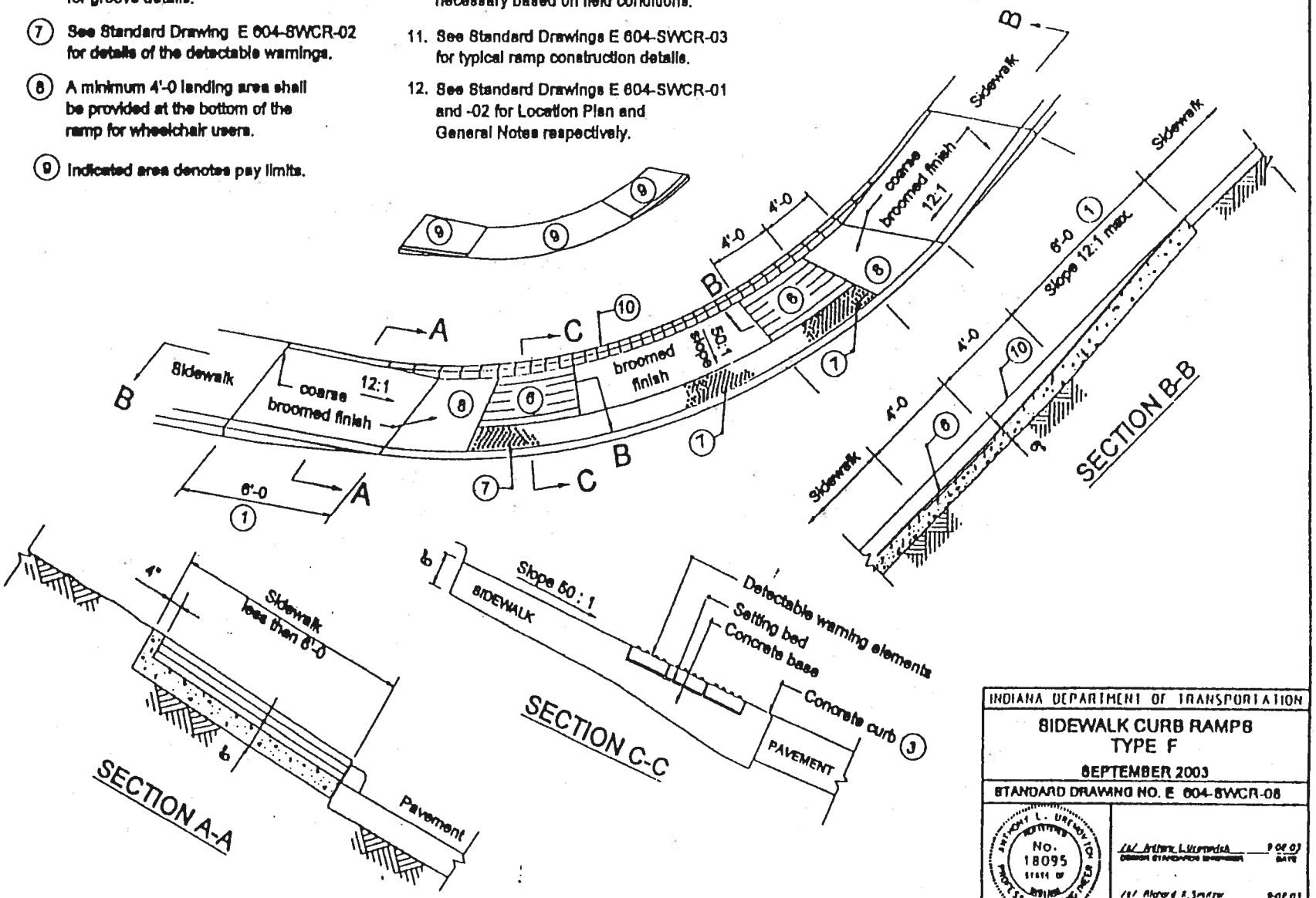
(8) A minimum 4'-0 landing area shall be provided at the bottom of the ramp for wheelchair users.

(9) Indicated area denotes pay limits.

(10) Curb or wall shall be used when necessary based on field conditions.

11. See Standard Drawings E 604-SWCR-03 for typical ramp construction details.

12. See Standard Drawings E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.



INDIANA DEPARTMENT OF TRANSPORTATION

SIDEWALK CURB RAMPS TYPE F

SEPTEMBER 2003

STANDARD DRAWING NO. E 604-SWCR-08

ANTHONY L. GREGOVICH No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

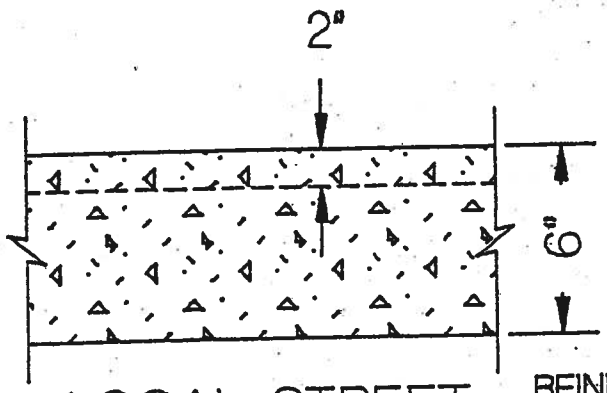
DESIGN STANDARDS ENGINEER

/s/ Anthony L. Gregovich 9 OF 03 DATE

DESIGN STANDARDS ENGINEER

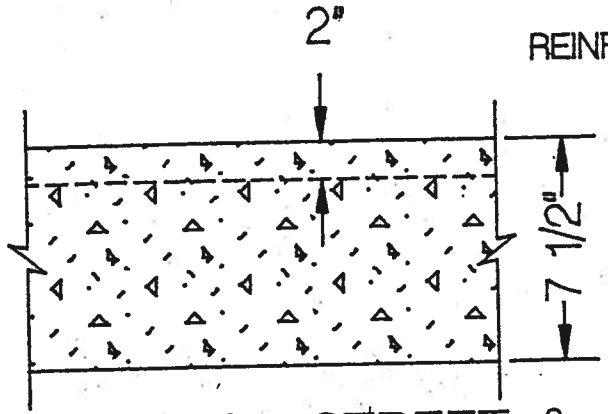
/s/ Richard K. Smith 9 OF 03 DATE

CHIEF HIGHWAY ENGINEER



LOCAL STREET

REINFORCEMENT MESH
6" x 6" 6/6



REINFORCEMENT MESH
6" x 6" 6/6

COLLECTOR STREET &
MULTI-FAMILY (THREE UNITS OR GREATER)
AND NON RESIDENTIAL AREAS

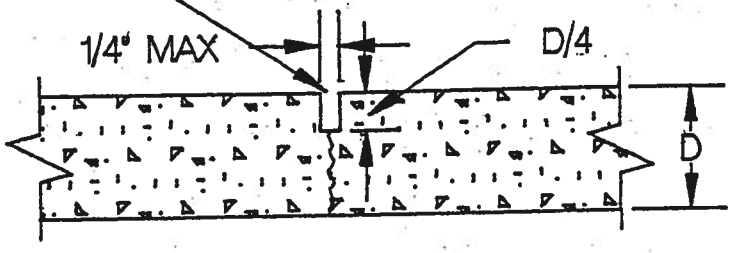
NOTE:
ALL OTHER STREETS TO BE DETERMINED
BY BOARD OF PUBLIC WORKS & SAFETY

STREET CROSS-SECTION CONCRETE

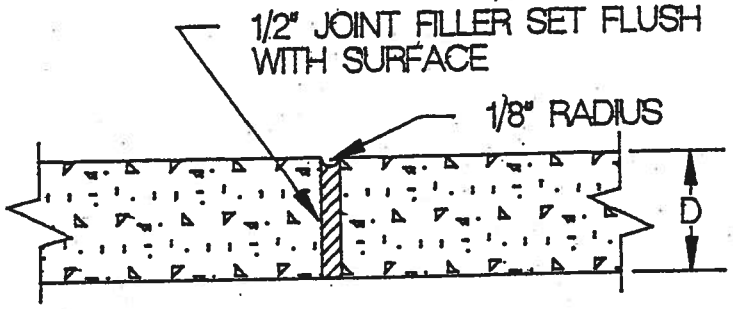
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C 01
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

SAWCUT TO BE SEALED WITH APPROVED BITUMINOUS MATERIAL OR INSERT, SET FLUSH WITH SURFACE.

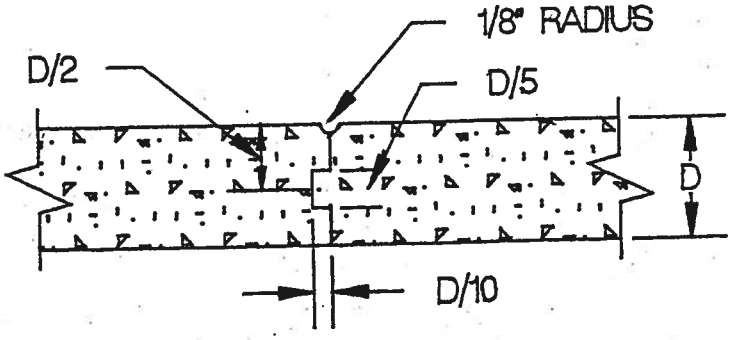
TYPE C



TYPE E



TYPE K



KEYWAY MUST BE AS DETAILED

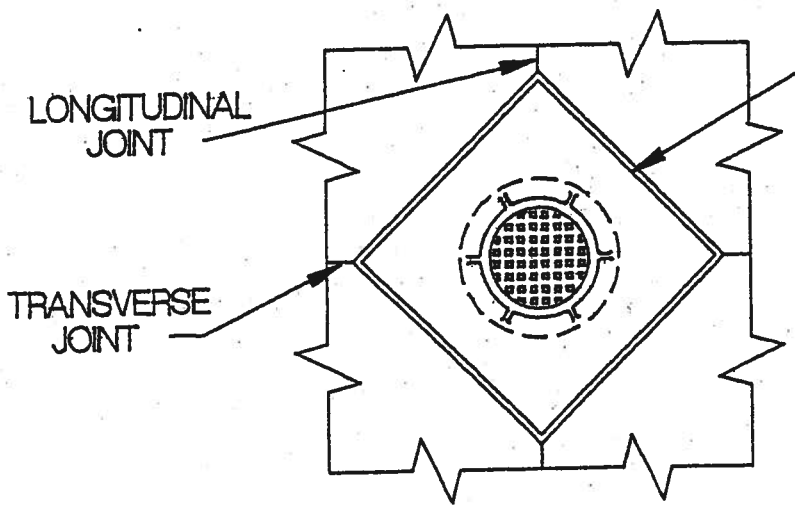
JOINT DETAILS

NO.	BY	DATE	REVISION

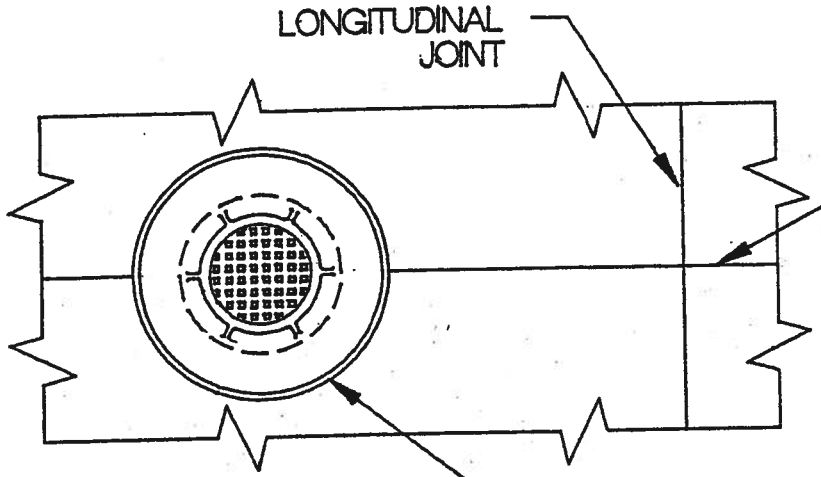
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. C 02



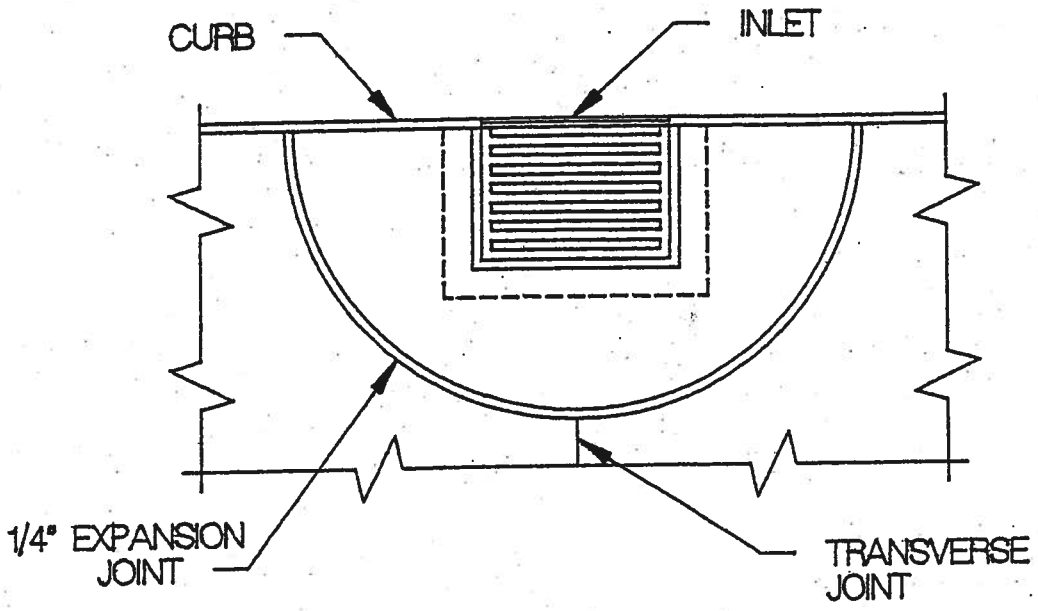
NOTE:
AT JUNCTION OF LONGITUDINAL AND TRANSVERSE JOINT.

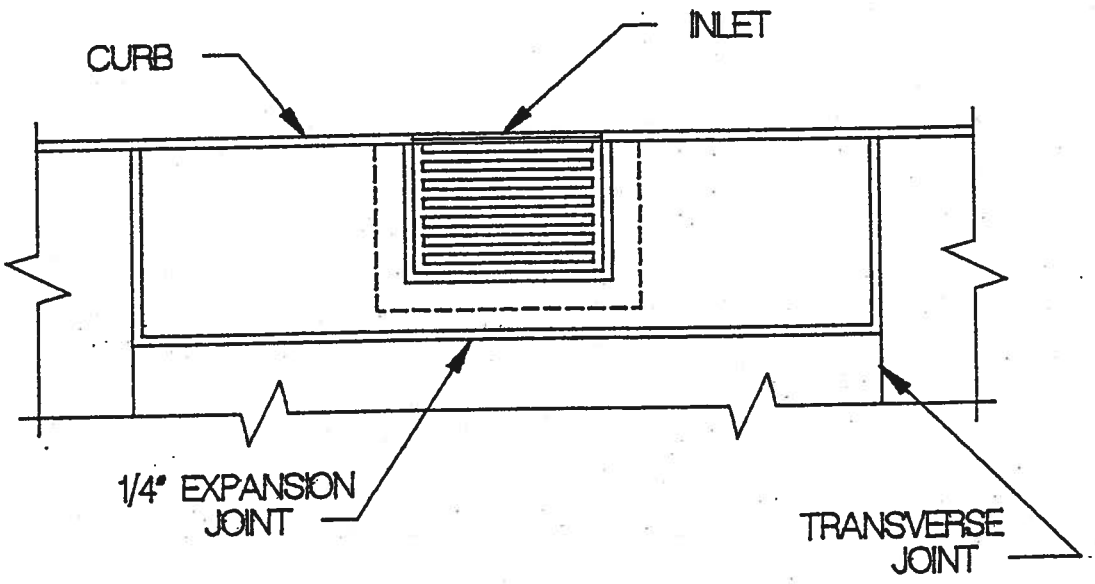


NOTE:
AWAY FROM LONGITUDINAL JOINT

STRUCTURE JOINT PLAN – MANHOLE BOXOUTS

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	03





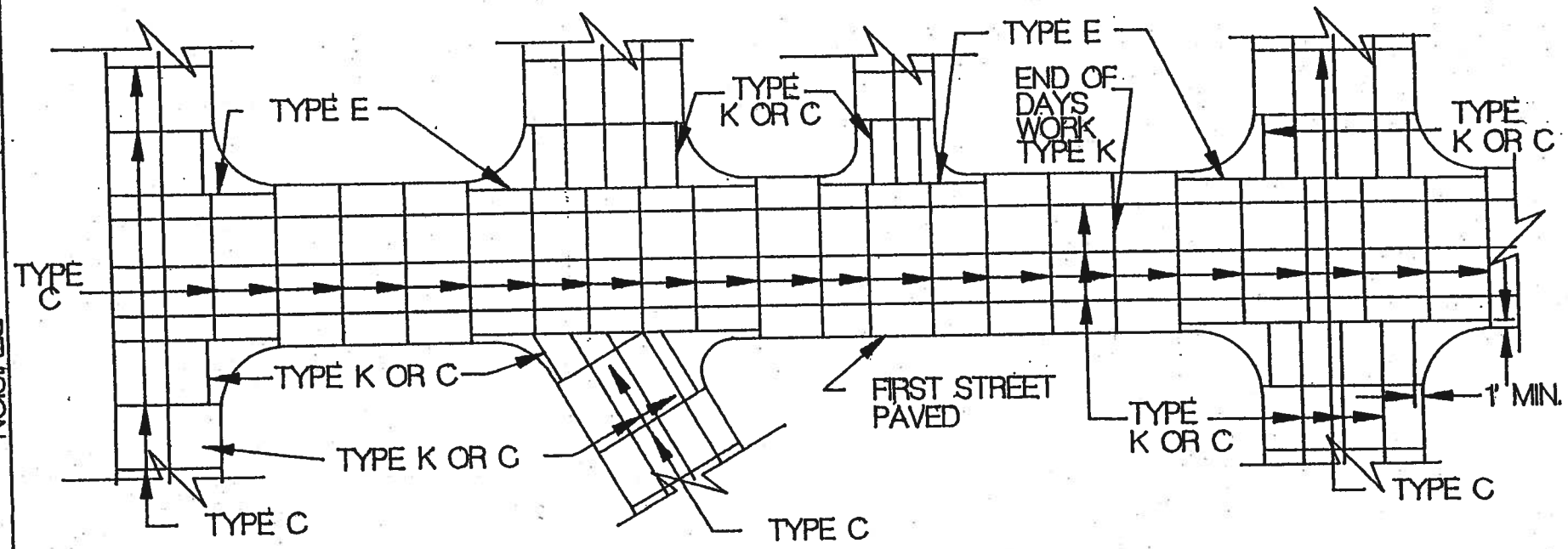
CATCH BASIN BOXOUTS – MANHOLE BOXOUTS

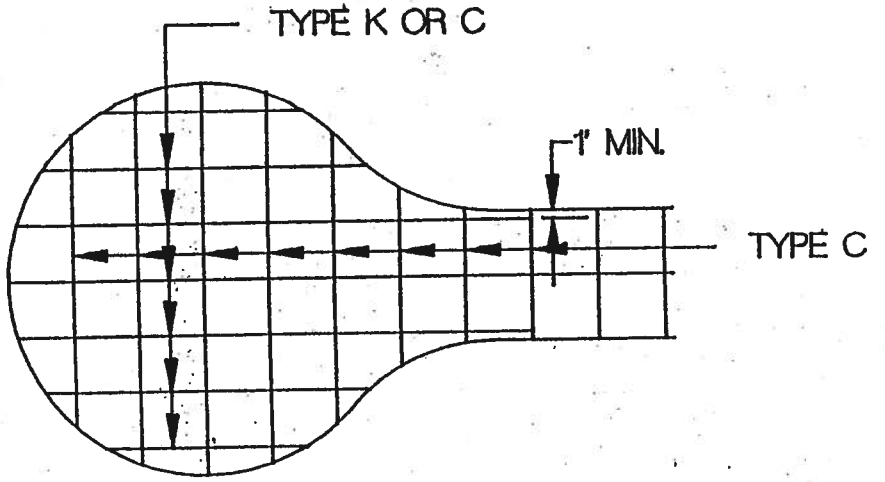
NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. C 04





MAX. TRANSVERSE JOINT SPACING:
12 FT.(4 IN. SLABS)
15 FT.(5 IN. SLABS)
20 FT.(6 IN. SLABS & GREATER)

MAX. LONGITUDINAL JOINT SPACING
13 FT.

CONCRETE PAVEMENT—PLAN OF JOINT LOCATION

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DR.
DATE:

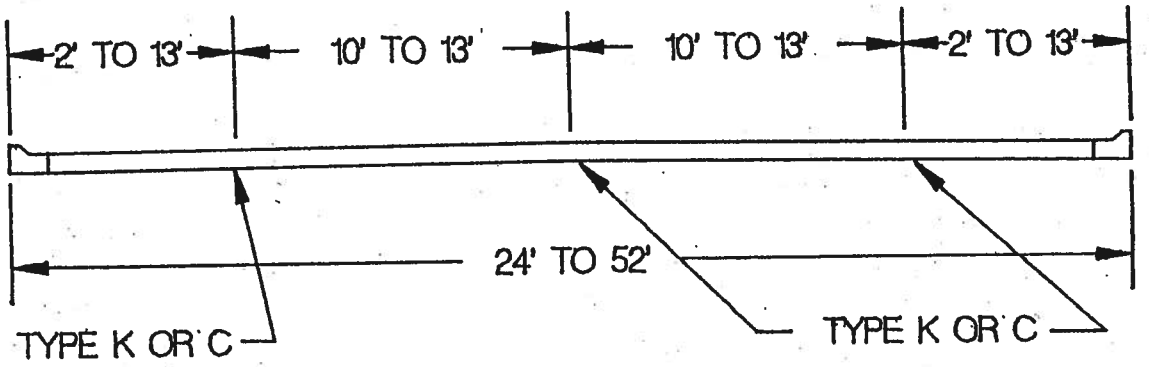
NO. C 05

NO.	BY	DATE	REVISION

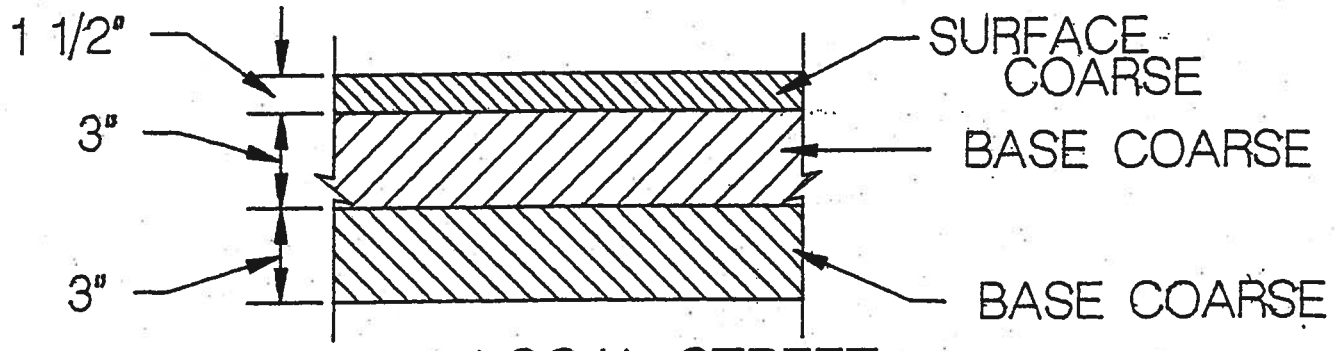
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DATE:
DR:

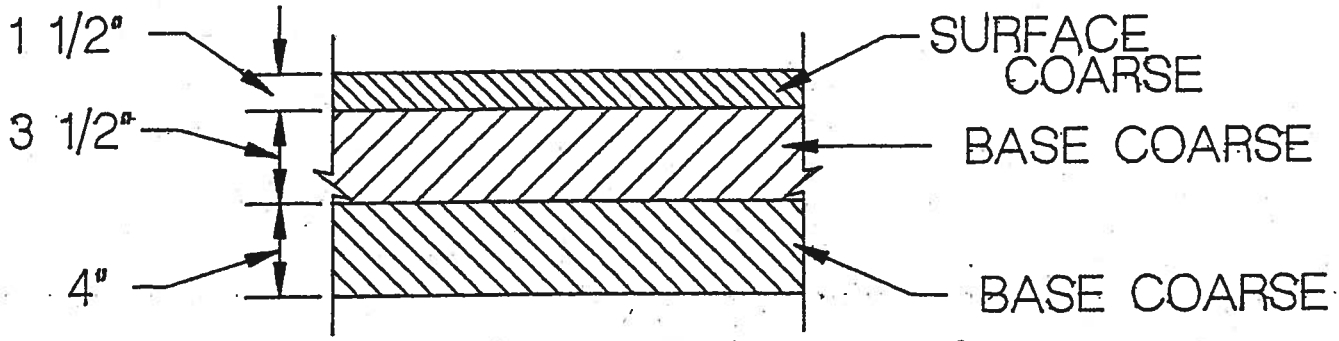
NO. 06



PAVEMENT SECTION – JOINT LOCATION



LOCAL STREET

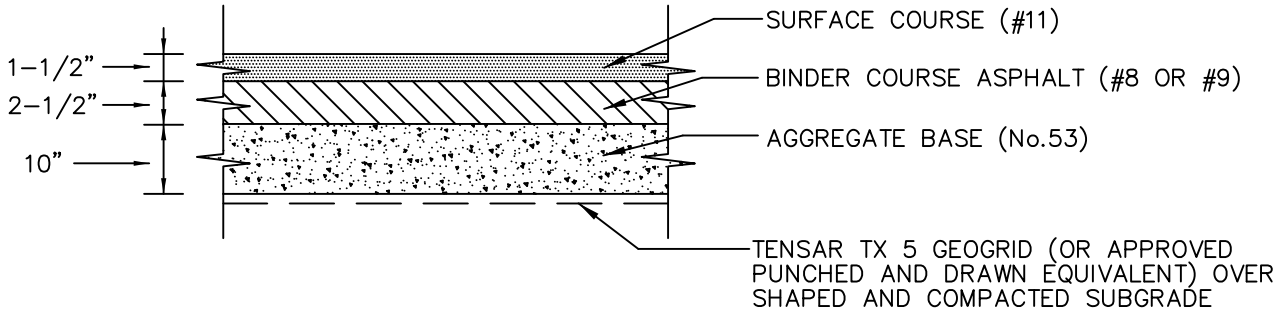


COLLECTOR STREET &
MULTI–FAMILY (3 UNITS OR GREATER)
AND NON RESIDENTIAL AREAS

NOTE:
ALL OTHER STREETS TO BE DETERMINED
BY BOARD OF PUBLIC WORKS & SAFETY

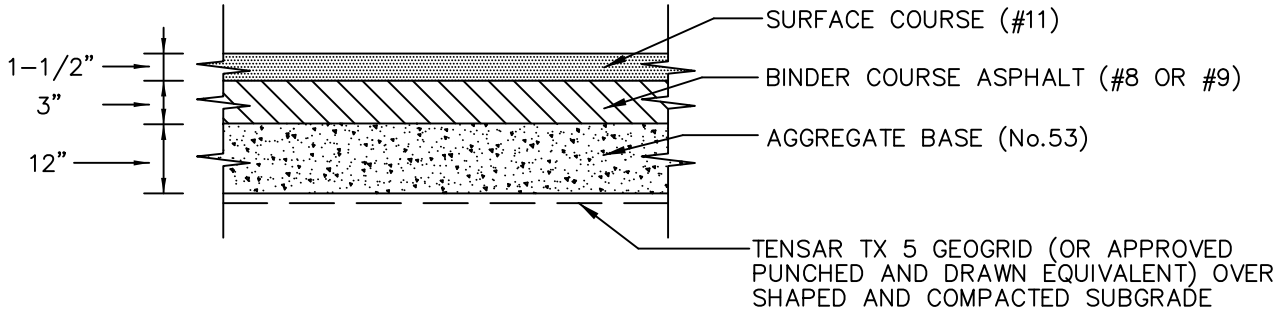
STREET CROSS–SECTION
FULL DEPTH ASPHALT

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C 07
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



LOCAL STREET – TYPICAL SECTION

NOT TO SCALE



COLLECTOR STREET – TYPICAL SECTION

NOT TO SCALE

NOTE:
ALL OTHER STREETS TO BE DETERMINED BY BOARD OF PUBLIC WORKS & SAFETY

STREET CROSS–SECTION – AGGREGATE BASE AND BITUMINOUS SURFACE

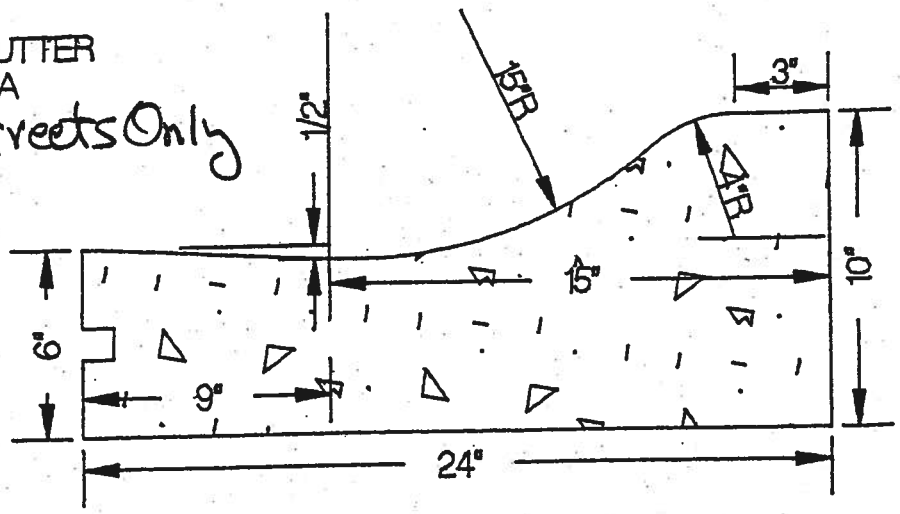
NO.	BY	DATE	REVISION
		6/9/11	GEOGRID
		5/26/17	ASPHALT SURFACE THICKNESS

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

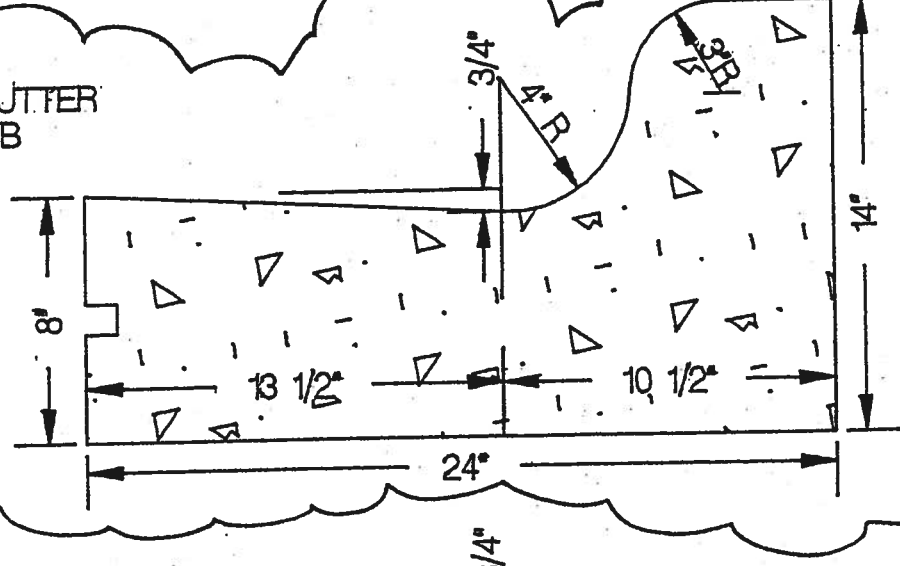
NO. C 08

CURB & GUTTER
TYPE A
Local Streets Only

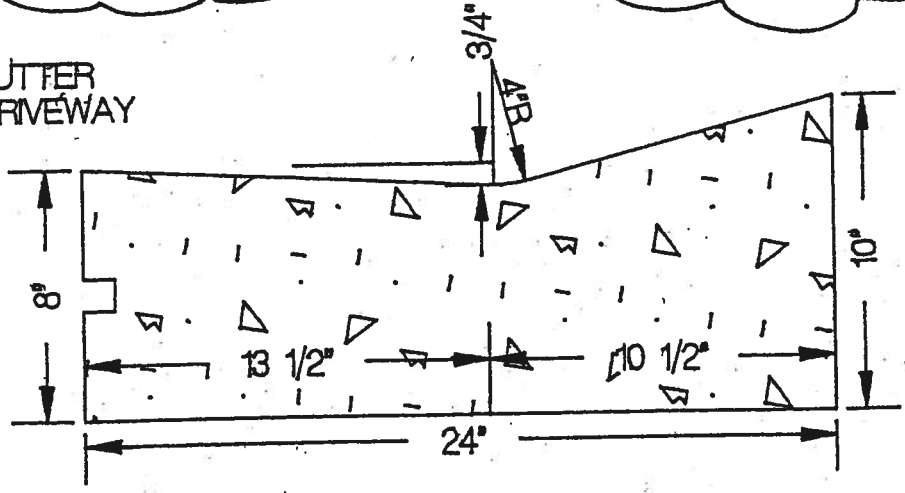


CURB & GUTTER
TYPE B

Preferred wherever possible



CURB & GUTTER
TYPE B AT DRIVEWAY

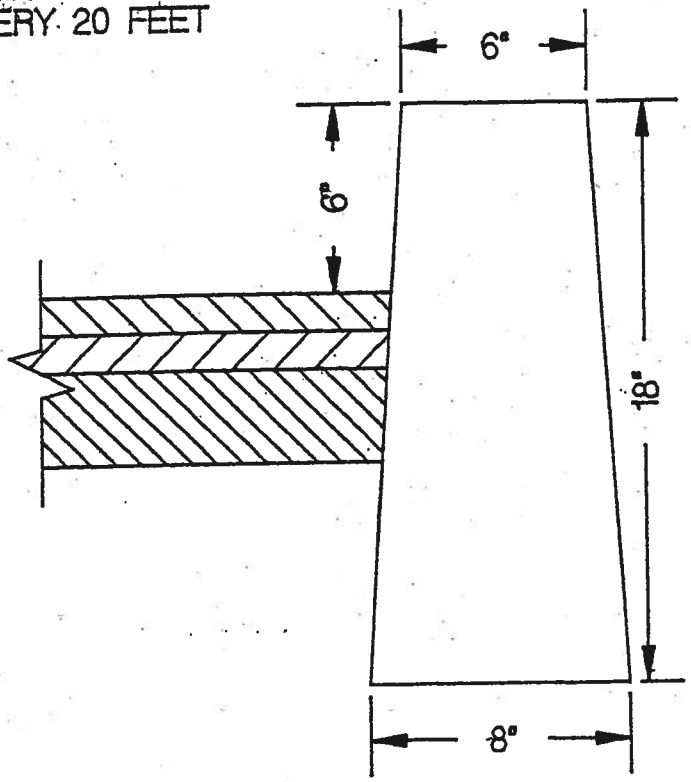


CURB STANDARDS

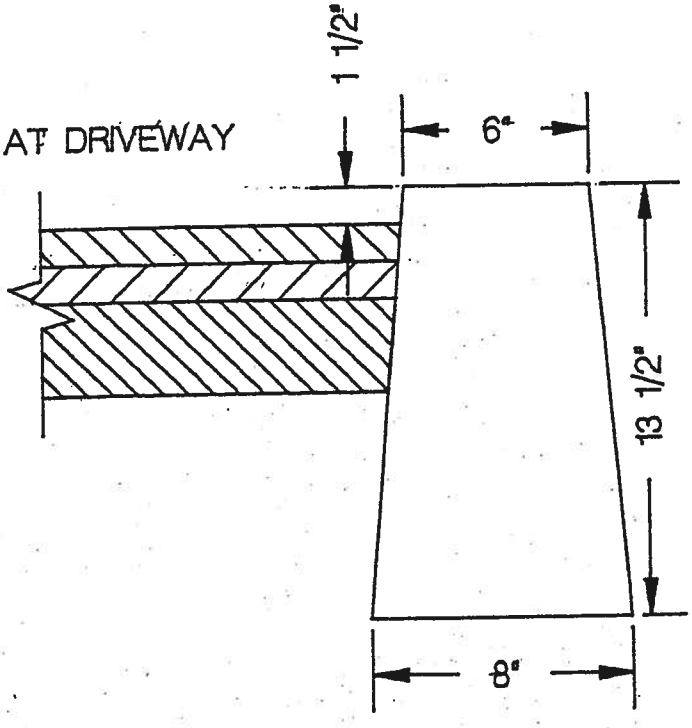
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C 05
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

TRANSVERSE CONSTRUCTION
JOINT REQUIRED EVERY 20 FEET

CURB



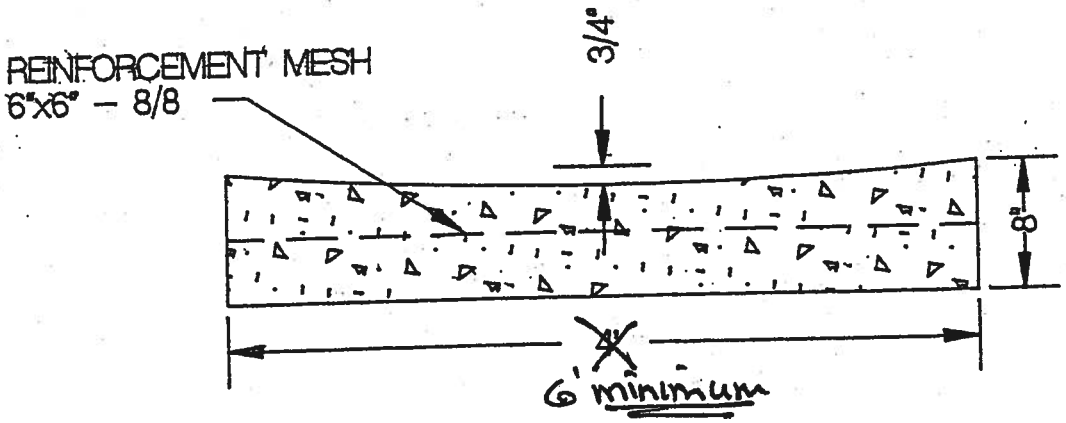
CURB AT DRIVEWAY



CURB STANDARDS

Use requires special permission for public streets

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C 10
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



TRANSVERSE CONSTRUCTION JOINT REQUIRED EVERY 20 FEET

CROSS – DRAIN

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. C 11
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	

NO.	BY	DATE	REVISION

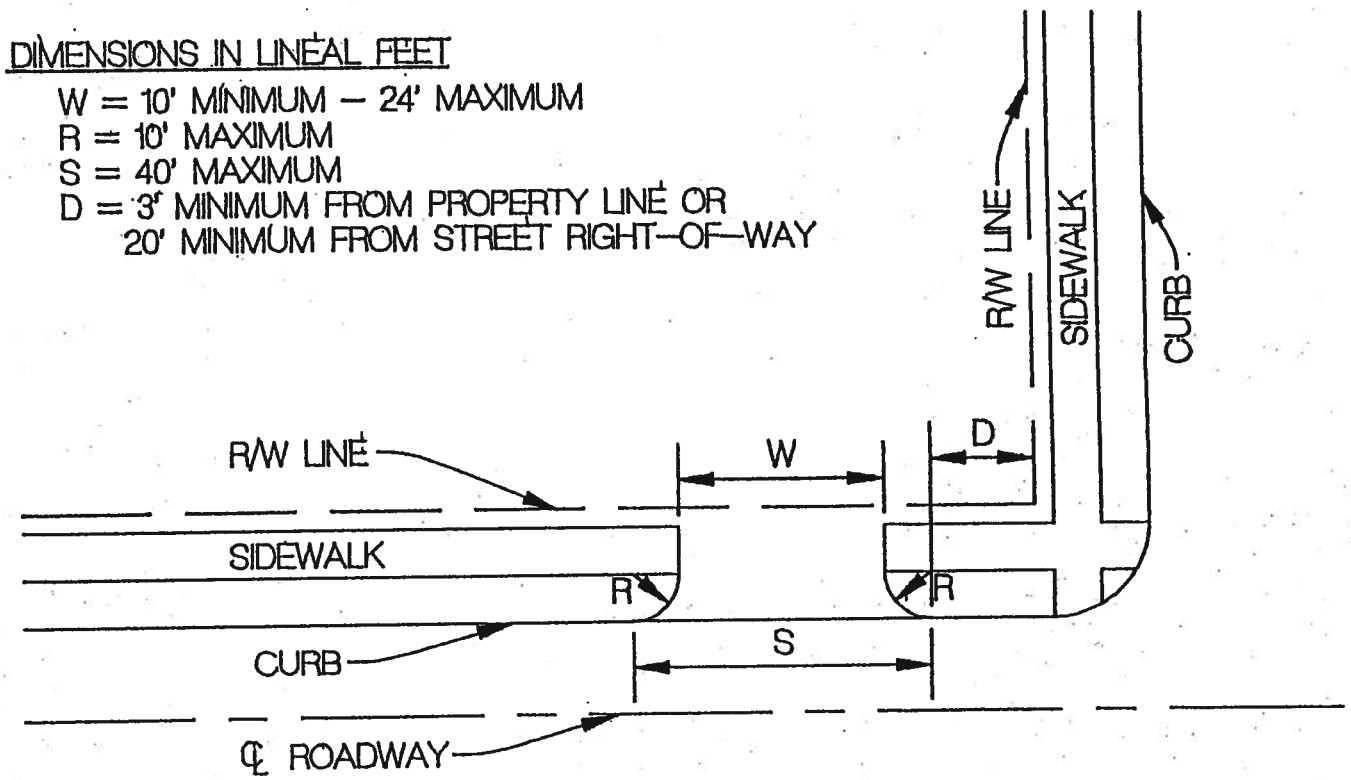
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DR APPROVED:
DATE:

NO. C-01

DIMENSIONS IN LINEAL FEET

W = 10' MINIMUM – 24' MAXIMUM
R = 10' MAXIMUM
S = 40' MAXIMUM
D = 3' MINIMUM FROM PROPERTY LINE OR
20' MINIMUM FROM STREET RIGHT–OF–WAY



NOTE:
DRIVEWAY APPROACH TO BE CONSTRUCTED AT SAME DEPTH REQUIREMENTS AS PROPOSED UNDER STREET SECTIONS C – 01, C – 07 AND C – 08

TYPICAL
CLASS – I RESIDENTIAL

DIMENSIONS IN LINEAR FEET

A = 50' OR 25 % OF FRONTAGE WHICHEVER GREATER

D = 20' MINIMUM

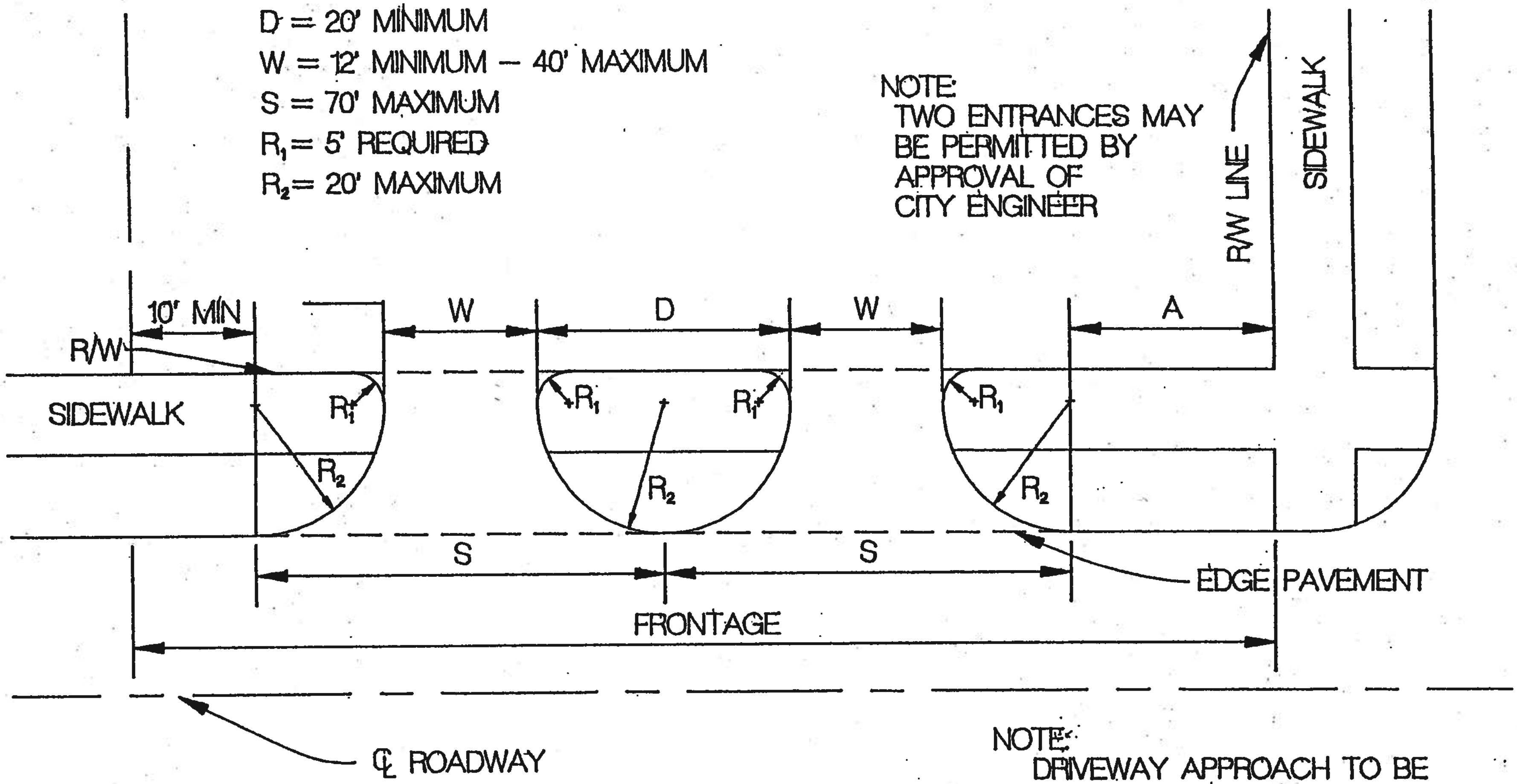
W = 12' MINIMUM — 40' MAXIMUM

S = 70' MAXIMUM

R_1 = 5' REQUIRED

R_2 = 20' MAXIMUM

NOTE:
TWO ENTRANCES MAY BE PERMITTED BY APPROVAL OF CITY ENGINEER



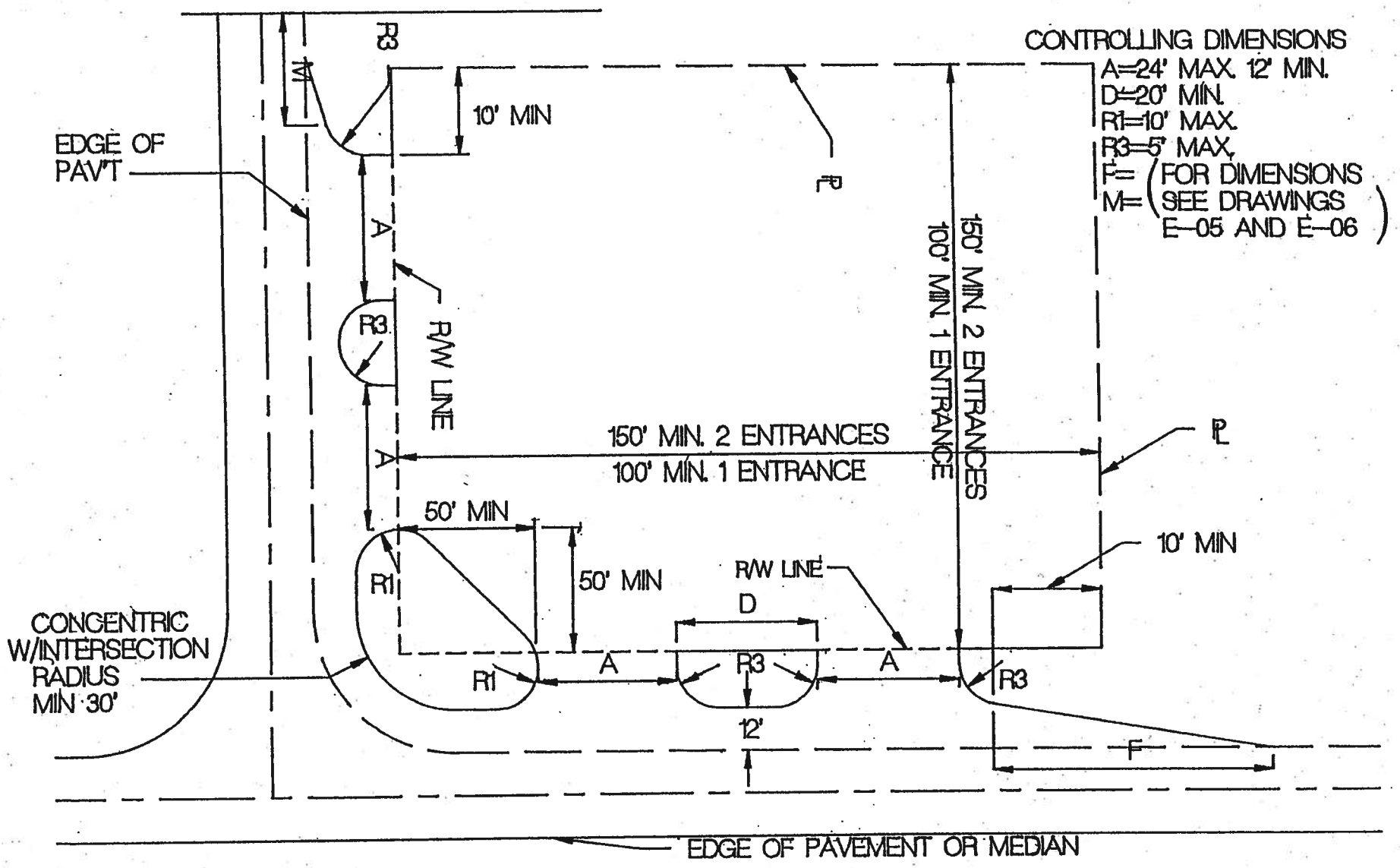
NOTE:
DRIVEWAY APPROACH TO BE CONSTRUCTED AT SAME DEPTH REQUIREMENTS AS PROPOSED UNDER STREET SECTIONS C — 01, C — 07 AND C — 08

TYPICAL
CLASS — II COMMERCIAL

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA
ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. E 02



CURBED SECTION

TYPICAL CLASS II GASOLINE SERVICE STATION

NOTE:
DRIVEWAY APPROACH TO BE CONSTRUCTED AT SAME DEPTH REQUIREMENTS AS PROPOSED UNDER STREET SECTIONS C-01, C-07, AND C-08

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE:
DR.
APPROVED:

NO. 03

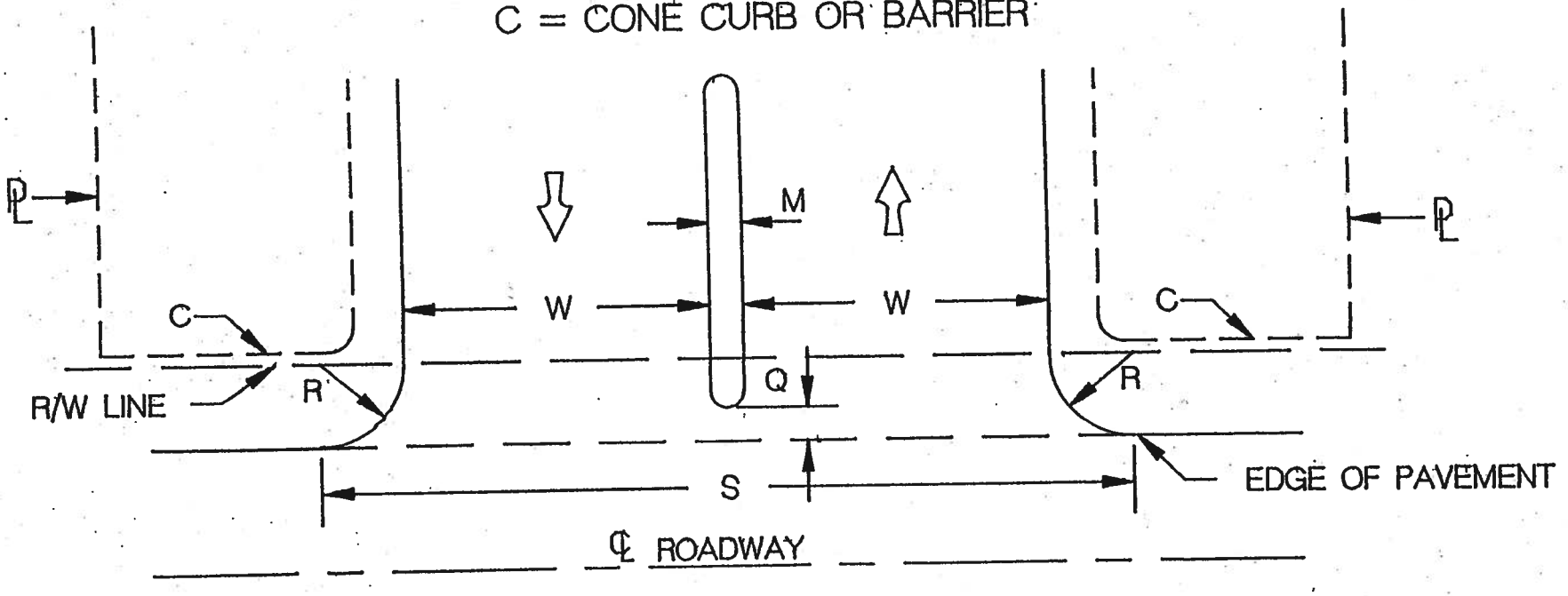
NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DATE:

NO. IT-04

DIMENSIONS IN LINEAR FEET
W = 24' MAXIMUM – 12' MINIMUM
S = 96' MAXIMUM; 2W + 2R + M
R = 20' MAXIMUM
M = 8' MAXIMUM – 4' MINIMUM
Q = 3' REQUIRED
C = CONE CURB OR BARRIER



NOTE:
DISTANCE FROM PROPERTY LINES CONTROLLED BY STANDARD PLAN E–03

TYPICAL CLASS II DIVIDED ENTRANCE

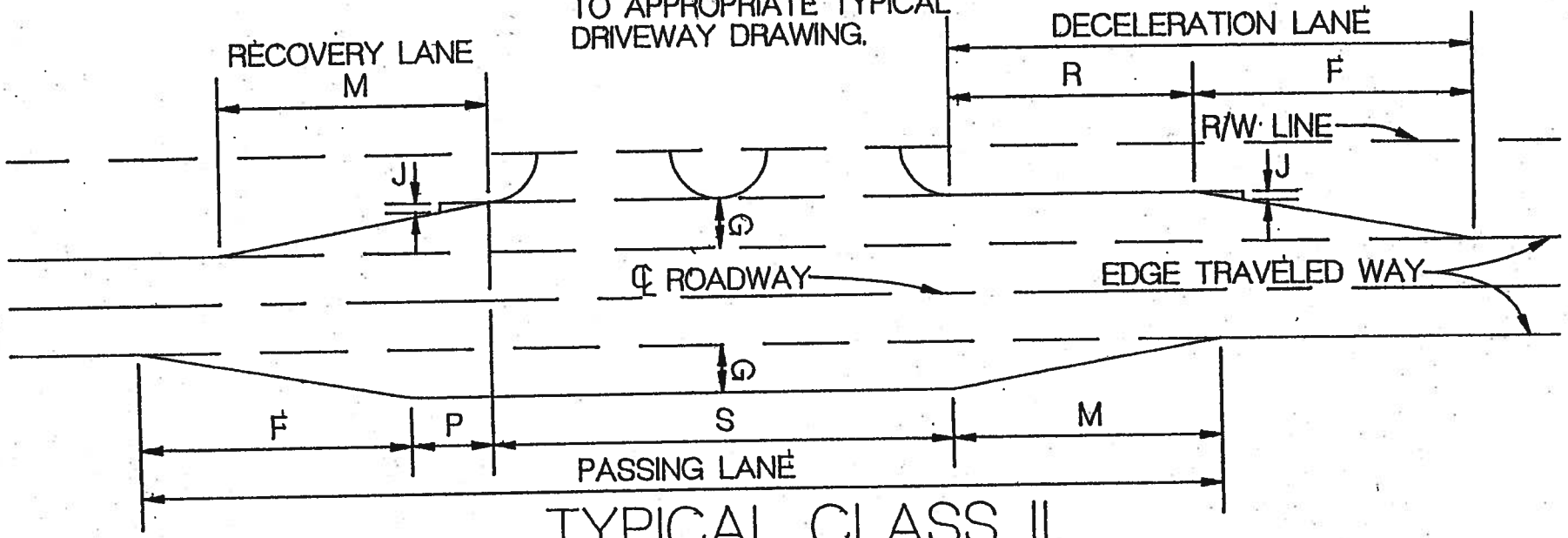
NOTE:
DRIVEWAY APPROACH TO BE CONSTRUCTED AT SAME DEPTH REQUIREMENTS AS PROPOSED UNDER STREET SECTIONS C–01, C–07, AND C–08

NO.	BY	DATE	REVISION

CONTROLING DIMENSIONS (ft.)						
	POSTED SPEED LIMIT					
DIMENSION	30–35	35–40	40–45	45–50	50–60	65
F	120	150	190	250	300	330
G	12	12	12	12	12	12
M	144	144	144	144	144	144
P	20	20	50	50	75	75
R	150	175	200	250	300	370
S	Refer to appropriate driveway drawing					

NOTE:
RECOVERY AND DECELERATION LANES REQUIRED IF ROADWAY IS CLASSIFIED PRIMARY OR SECONDARY ARTERIAL.

NOTE:
FOR DRIVEWAY DETAILS REFER TO APPROPRIATE TYPICAL DRIVEWAY DRAWING.



TYPICAL CLASS II APPROACH PAVEMENT
(UN – DIVIDED HIGHWAY)

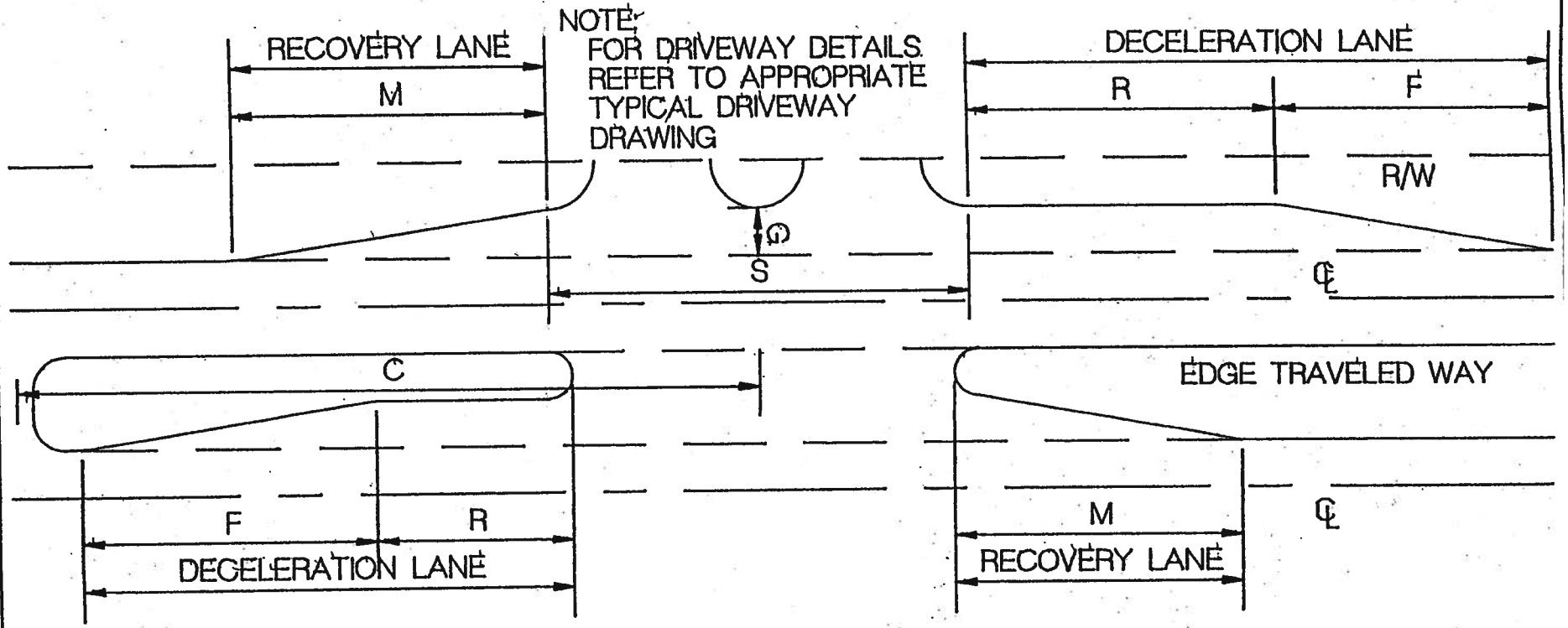
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DATE:
DR:

NO.

NO.	BY	DATE	REVISION

CONTROLING DIMENSIONS (ft.)						
	POSTED SPEED LIMIT					
DIMENSION	30–35	35–40	40–45	45–50	50–60	65
F	120	150	190	250	300	330
G	12	12	12	12	12	12
M	144	144	144	144	144	144
C	400	500	600	900	1100	1300
R	150	175	200	250	300	375
S	Refer to appropriate driveway drawing					

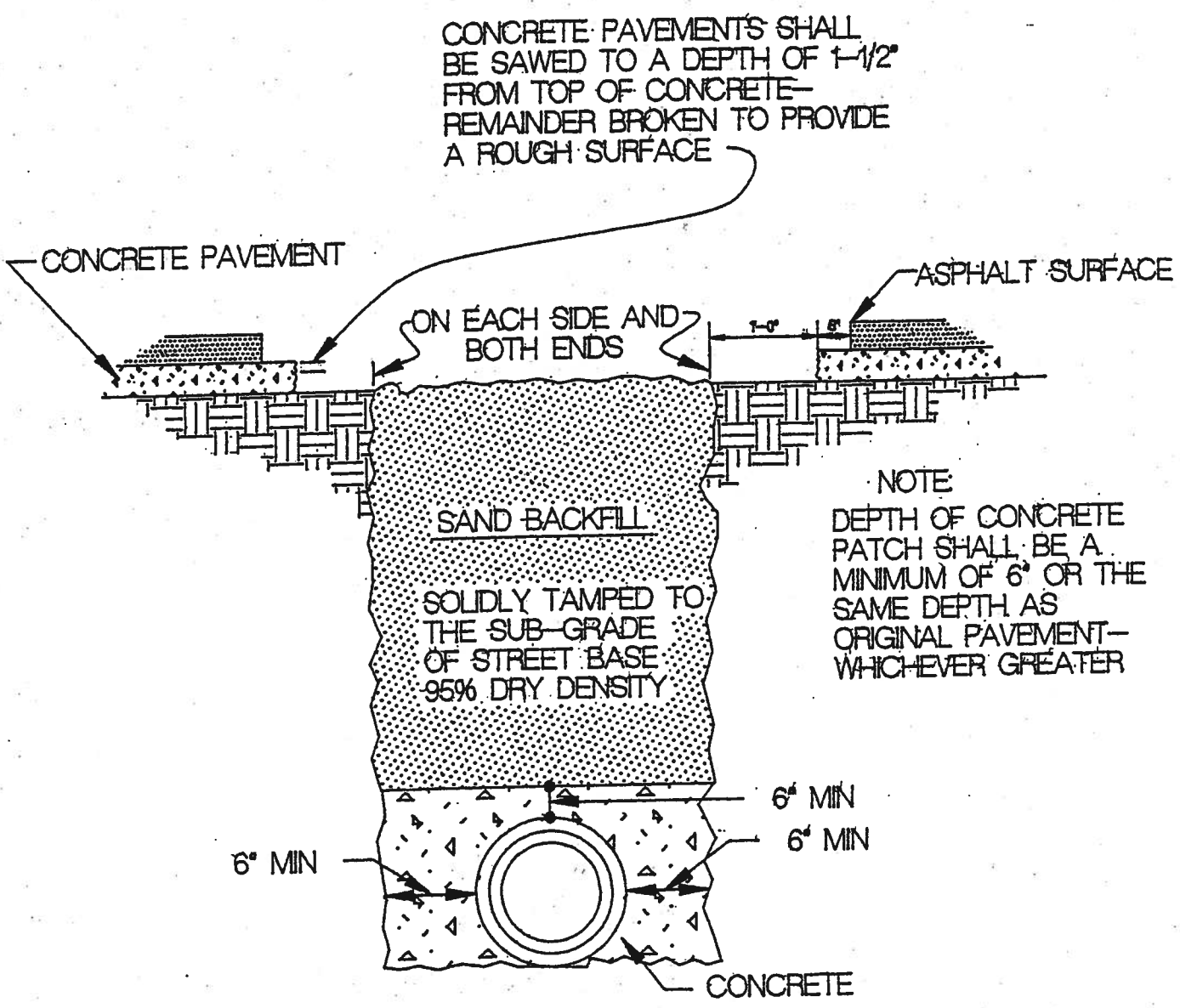


TYPICAL CLASS II APPROACH PAVEMENT
(DIVIDED HIGHWAY)

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DATE:

NO. 06 T



REPAIRS TO PAVEMENT CUTS OR TRENCHES
FOR UTILITY PURPOSES
BACKFILLING OF TRENCHES IN PAVED STREETS

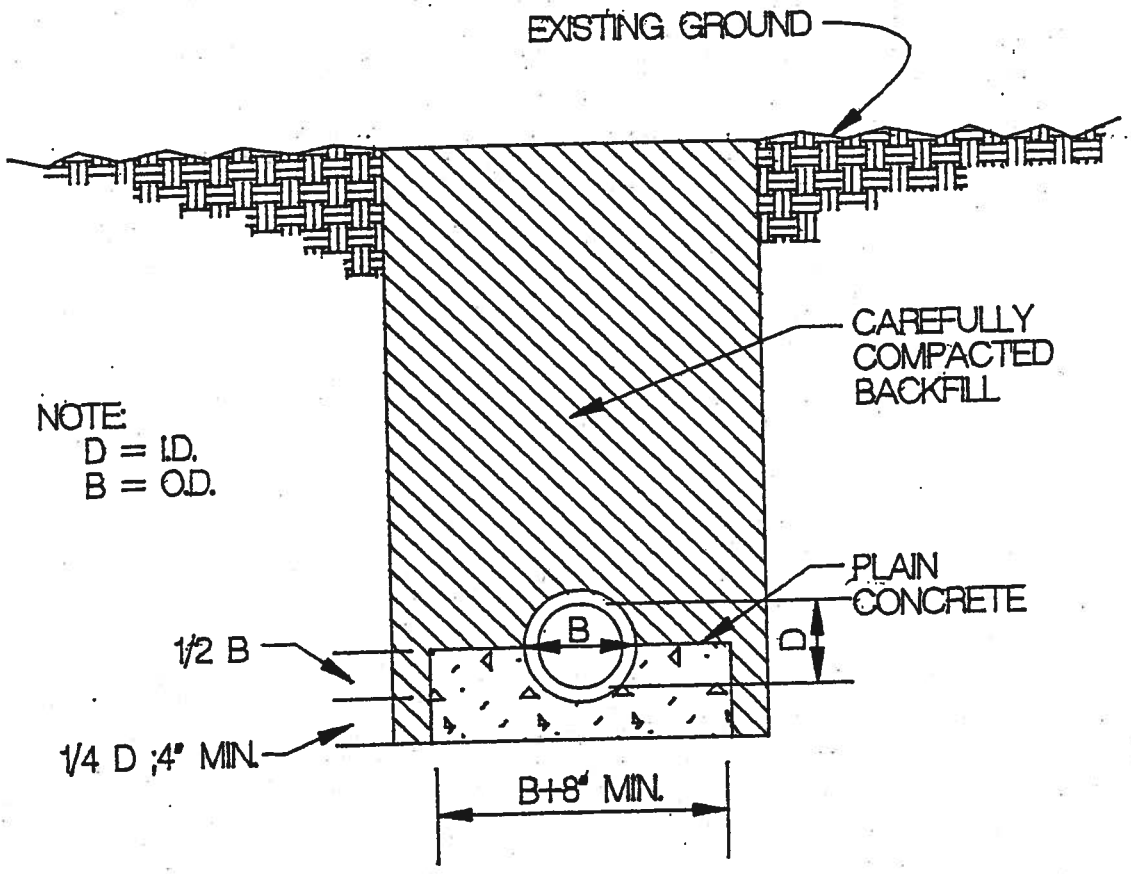
TRENCH REQUIREMENTS
PARTIAL CONCRETE ENCASEMENT
WITH SHAPED BEDDING

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO.
				ENGINEER'S DEPARTMENT	F 01
				DATE: DR: SK APPROVED:	

NOTE:

MAXIMUM TRENCH WIDTHS SHOWN ON PLANS ARE MEASURED AT POINT 6 INCHES ABOVE TOP OF PIPE.

COMPACTED GRANULAR MATERIAL SHALL CONSIST OF WELL –GRADED CRUSHED STONE, CRUSHED GRAVEL, WELL –GRADED GRAVEL MEETING THE REQUIREMENTS OF A.S.T.M. DESIGNATION C33 GRADATION 67 (3/4 INCH TO NO. 4)



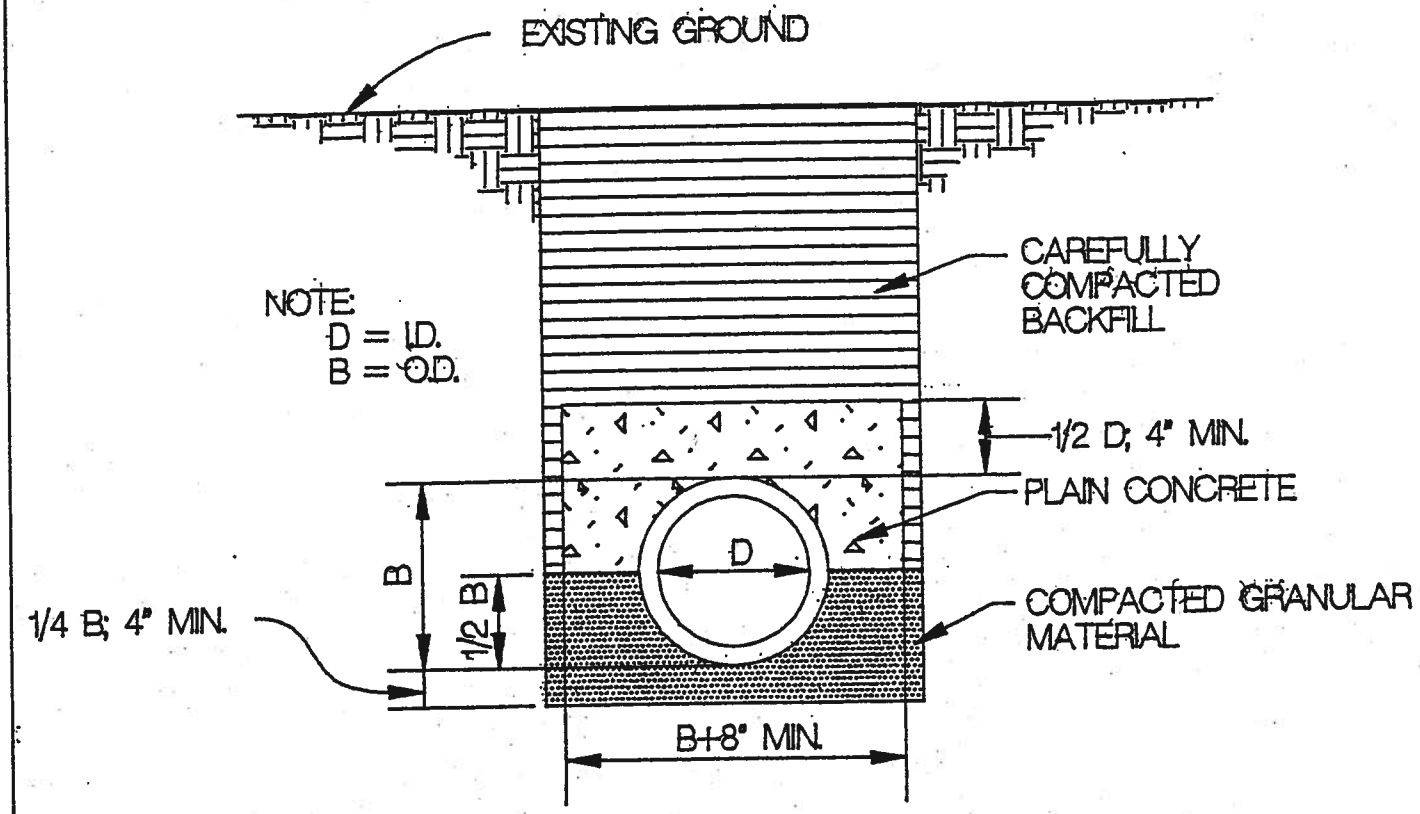
CONCRETE CRADLE CLASS A

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 02
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	

NOTE:

MAXIMUM TRENCH WIDTHS SHOWN ON PLANS ARE MEASURED AT POINT 6 INCHES ABOVE TOP OF PIPE.

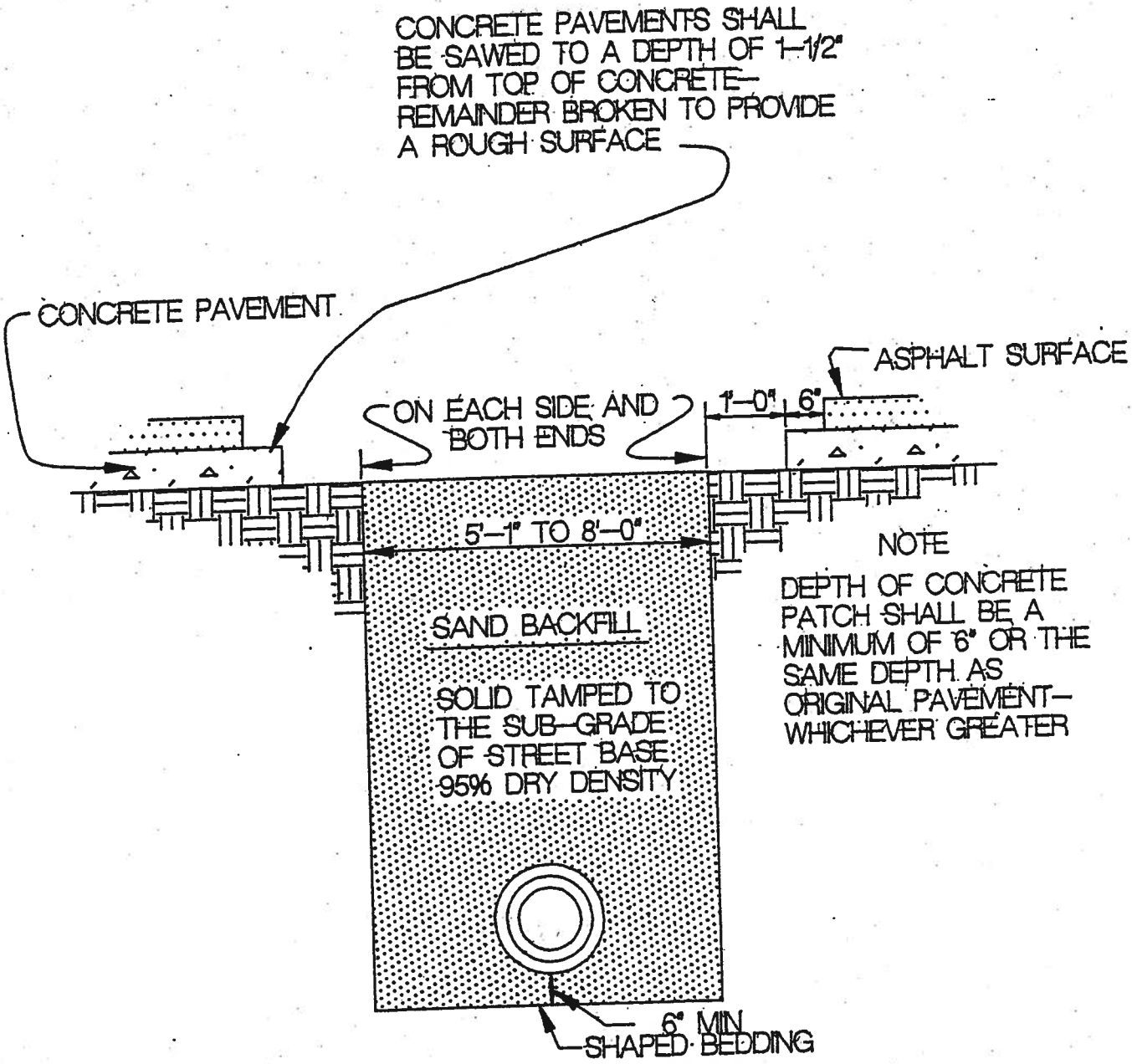
COMPACTED GRANULAR MATERIAL SHALL CONSIST OF WELL –GRADED CRUSHED STONE, CRUSHED GRAVEL, WELL –GRADED GRAVEL MEETING THE REQUIREMENTS OF A.S.T.M. DESIGNATION C33 GRADATION 67 (3/4 INCH TO NO. 4)



CONCRETE ARCH

CLASS A

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 03
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	



REPAIRS TO PAVEMENT CUTS OR TRENCHES
FOR UTILITY PURPOSES
BACKFILLING OF TRENCHES IN PAVED STREETS

TRENCH REQUIREMENTS WITH SHAPED BEDDING

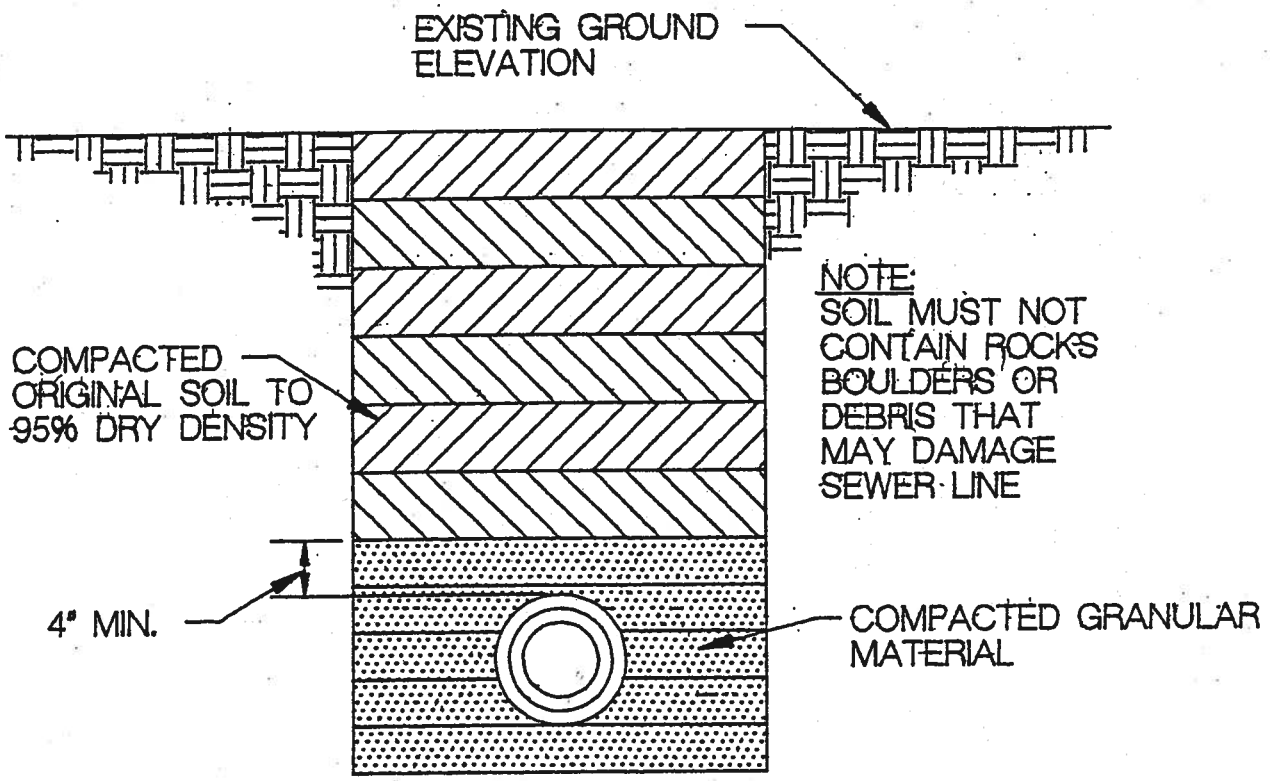
NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: SK APPROVED:

NO. F 04

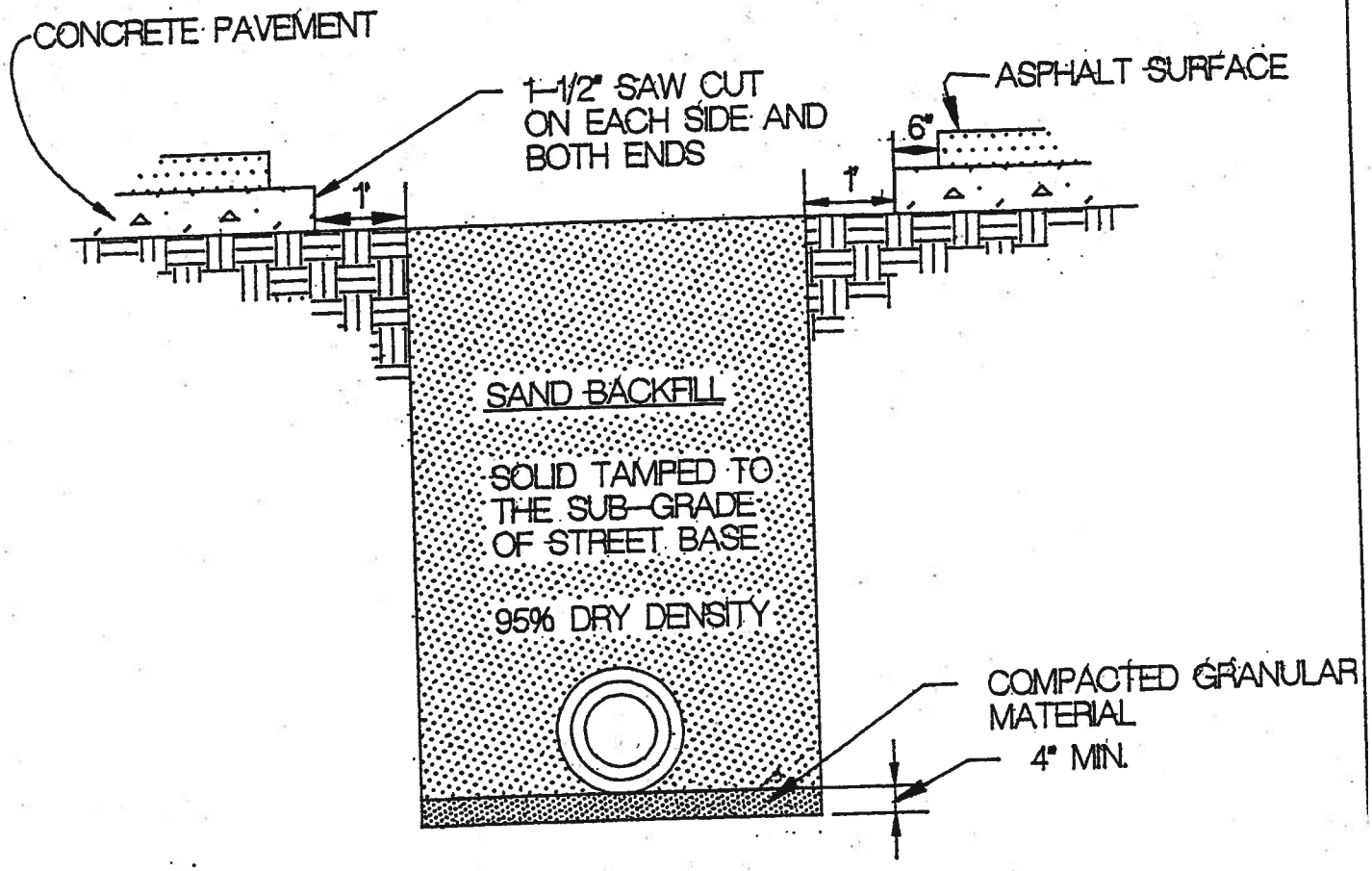
NOTE:
COMPACTED GRANULAR MATERIAL SHALL CONSIST OF WELL-GRADED CRUSHED STONE, CRUSHED GRAVEL, WELL-GRADED GRAVEL MEETING THE REQUIREMENTS OF A.S.T.M. DESIGNATION C33 GRADATION 67 (3/4 INCH TO NO. 4).



TRENCH REQUIREMENTS COMPACTED ORIGINAL SOILS WITH COMPACTED GRANULAR MATERIAL

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 05
				ENGINEER'S DEPARTMENT	
				DATE: DR: SK APPROVED:	

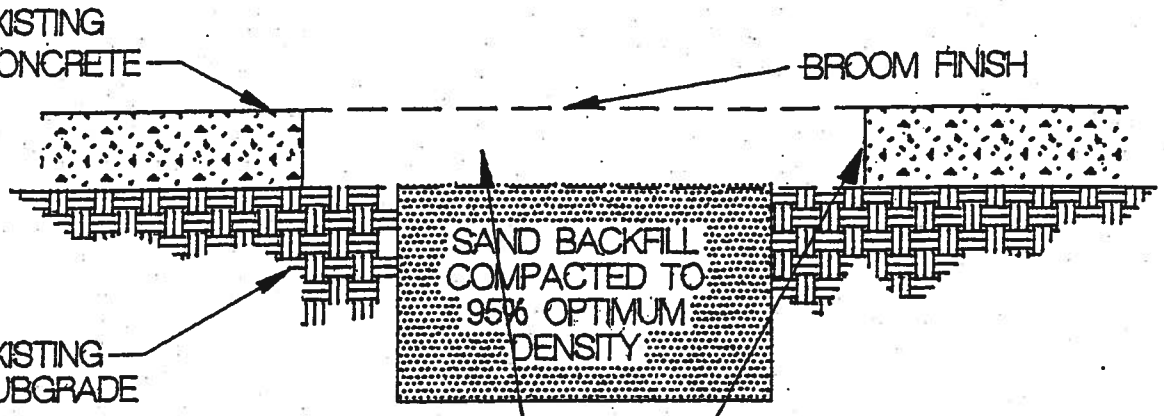
NOTE:
COMPACTED GRANULAR MATERIAL SHALL CONSIST OF WELL-GRADED CRUSHED STONE, CRUSHED GRAVEL, WELL-GRADED GRAVEL MEETING THE REQUIREMENTS OF A.S.T.M. DESIGNATION C33 GRADATION 67 (3/4 INCH TO NO. 4).



REPAIRS TO PAVEMENT CUTS OR TRENCHES
FOR UTILITY PURPOSES
BACKFILLING OF TRENCHES IN PAVED STREETS

TRENCH REQUIREMENTS

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 06
				ENGINEER'S DEPARTMENT DATE: DR. SK APPROVED:	

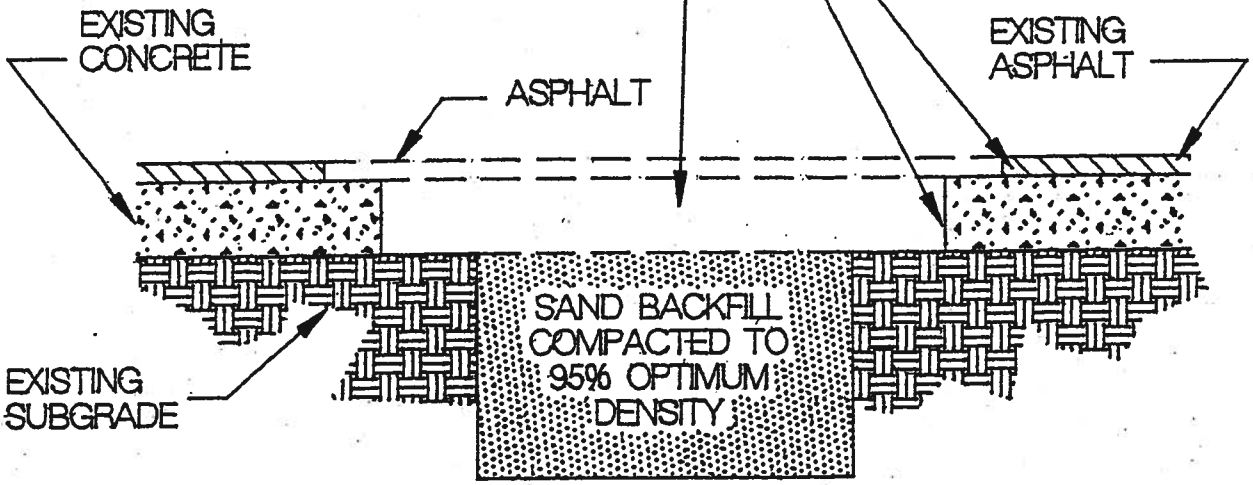


STREET CUT 1
CONCRETE

NOTE :

CONCRETE – 6 BAG MIX
REINFORCEMENT MESH REQUIRED
7" DEPTH FOR LOCAL STREETS
8" DEPTH FOR COLLECTOR STREETS
9" DEPTH FOR ARTERIAL STREETS

TO BE SAWED
1/4 DEPTH OF PAVEMENT

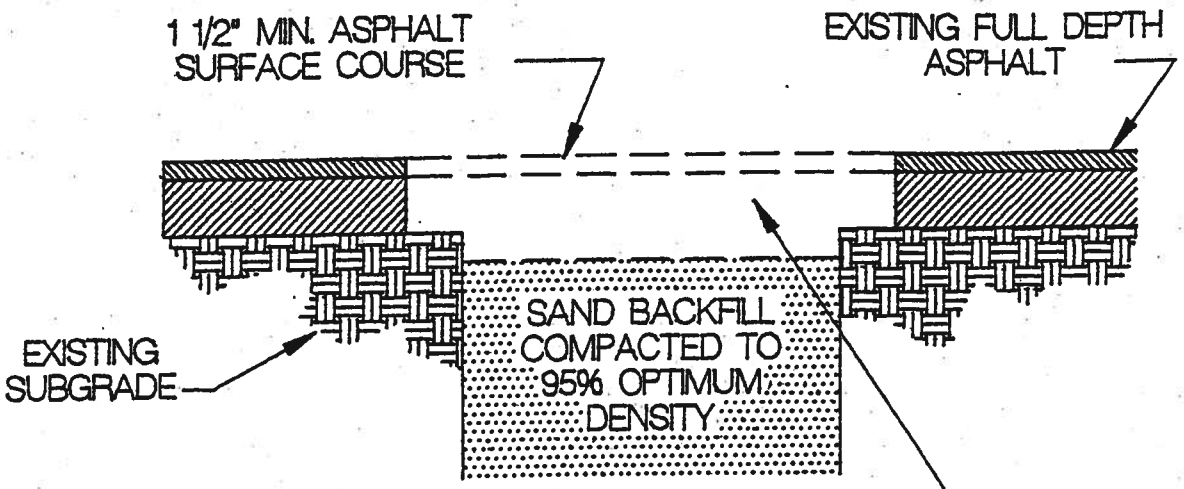


NOTE :

PATCHED AREA CLOSED TO TRAFFIC FOR 7 DAYS AFTER PLACEMENT

STREET CUT 2
ASPHALT OVER CONCRETE

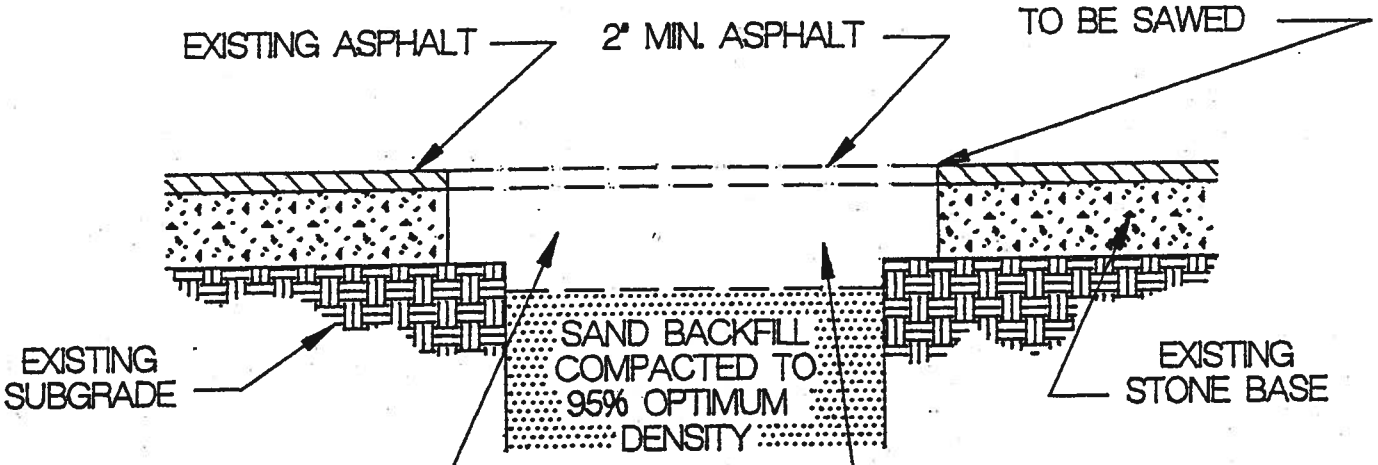
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 07
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



NOTE :
ASPHALT BASE
5" DEPTH FOR LOCAL STREETS
7" DEPTH FOR COLLECTOR STREETS
9" DEPTH FOR ARTERIAL STREETS

STREET CUT 3

FULL DEPTH ASPHALT

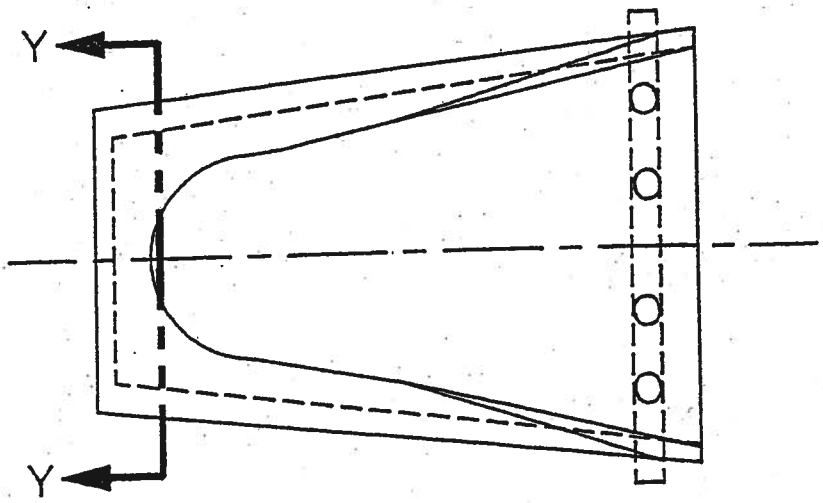


STREET CUT 4
ASPHALT OVER STONE

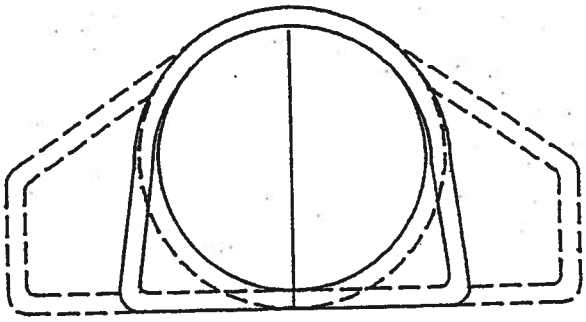
NOTE :
STONE BASE
11" DEPTH FOR LOCAL STREETS
15" DEPTH FOR COLLECTOR STREETS
18" DEPTH FOR ARTERIAL STREETS

STONE BASE
IND. #-53 COMPACTED TO 95% OPTIMUM DENSITY

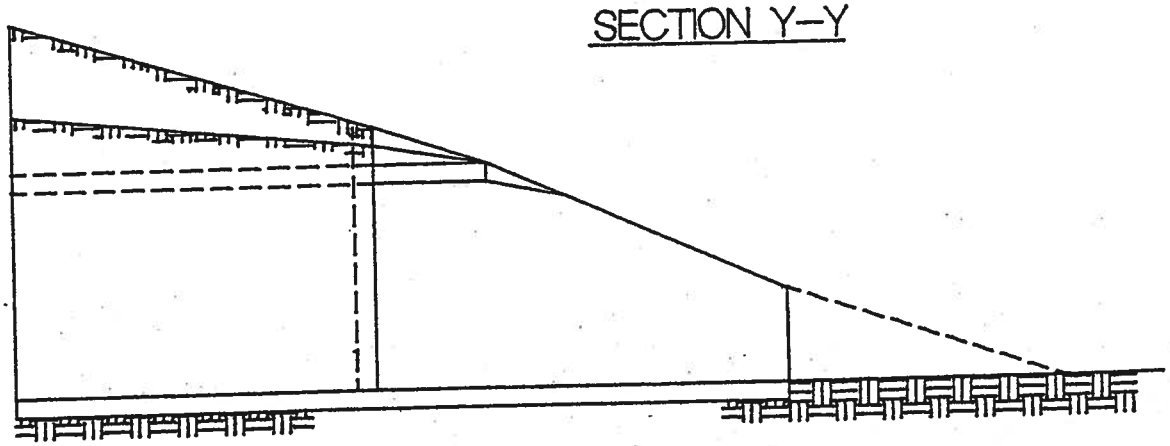
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. F 08
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



PLAN VIEW



SECTION Y–Y



PROFILE

NOTE: FOR DETAILS SEE STANDARD PLAN NO. ME2 INDOT STANDARDS

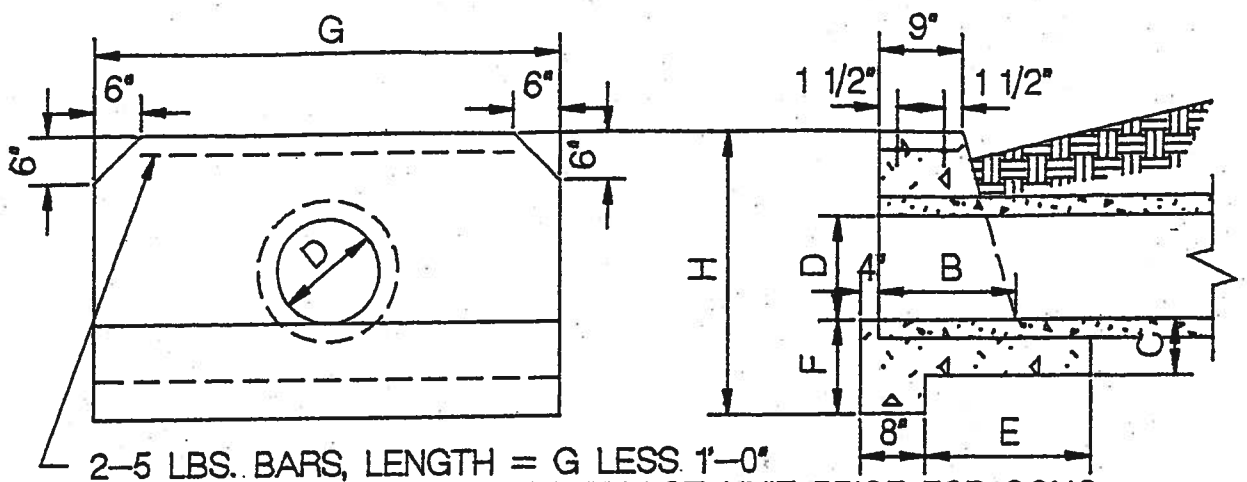
END SECTION

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. G 01



2–5 LBS. BARS, LENGTH = G LESS 1'–0"
TO BE INCLUDED IN THE CONTRACT UNIT PRICE FOR CONC.

CIRCULAR PIPE CULVERTS							
D	H	C	F	E	B	G	CU. YDS. CONC. 2 HEADWALLS
12"	3'–3"	1'–0"	1'–6"	1'–2"	1'–2"	4'–6"	1.28
15"	3'–5.5"	1'–0"	1'–6"	1'–3"	1'–3"	5'–6"	1.71
18"	3'–9"	1'–1"	1'–7"	1'–4"	1'–4"	6'–6"	2.29
24"	4'–5"	1'–2"	1'–8"	1'–6"	1'–6"	8'–6"	3.75
30"	5'–1"	1'–3"	1'–9"	1'–7"	1'–7.5"	11'–0"	5.78
36"	5'–10"	1'–5"	1'–11"	1'–8.5"	1'–9"	12'–9"	8.12

C.S. PIPE ARCH								
PIPE		H	C	F	E	B	G	CU. YDS. CONC. 2 HEADWALLS
SPAN	RISE							
18"	11"	3'–3"	1'–0"	1'–6"	1'–2"	1'–2"	5'–0"	1.41
22"	13"	3'–6"	1'–0"	1'–6"	1'–3"	1'–3"	6'–2"	1.93
25"	16"	3'–8"	1'–0"	1'–6"	1'–3"	1'–3"	7'–0"	2.28
29"	18"	3'–10"	1'–0"	1'–6"	1'–4"	1'–4"	8'–6"	2.99
36"	22"	4'–3"	1'–0"	1'–6"	1'–5"	1'–5"	10'–4"	4.12
43"	27"	5'–0"	1'–3"	1'–9"	1'–7"	1'–6.5"	12'–0"	6.09

REINF. ELLIPTICAL CONC. PIPE								
PIPE		H	C	F	E	B	G	CU. YDS. CONC. 2 HEADWALLS
SPAN	RISE							
23"	14"	3'–6"	1'–0"	1'–6"	1'–3"	1'–3"	6'–2"	1.93
30"	19"	3'–10"	1'–0"	1'–6"	1'–4"	1'–4"	8'–6"	2.99
34"	22"	4'–3"	1'–0"	1'–6"	1'–5"	1'–5"	9'–6"	3.78
36"	24"	4'–3"	1'–0"	1'–6"	1'–5"	1'–5"	10'–4"	4.12
42"	27"	5'–0"	1'–3"	1'–9"	1'–6"	1'–6"	11'–9"	5.81

PIPE CULVERT HEADWALLS – I.S.H.C

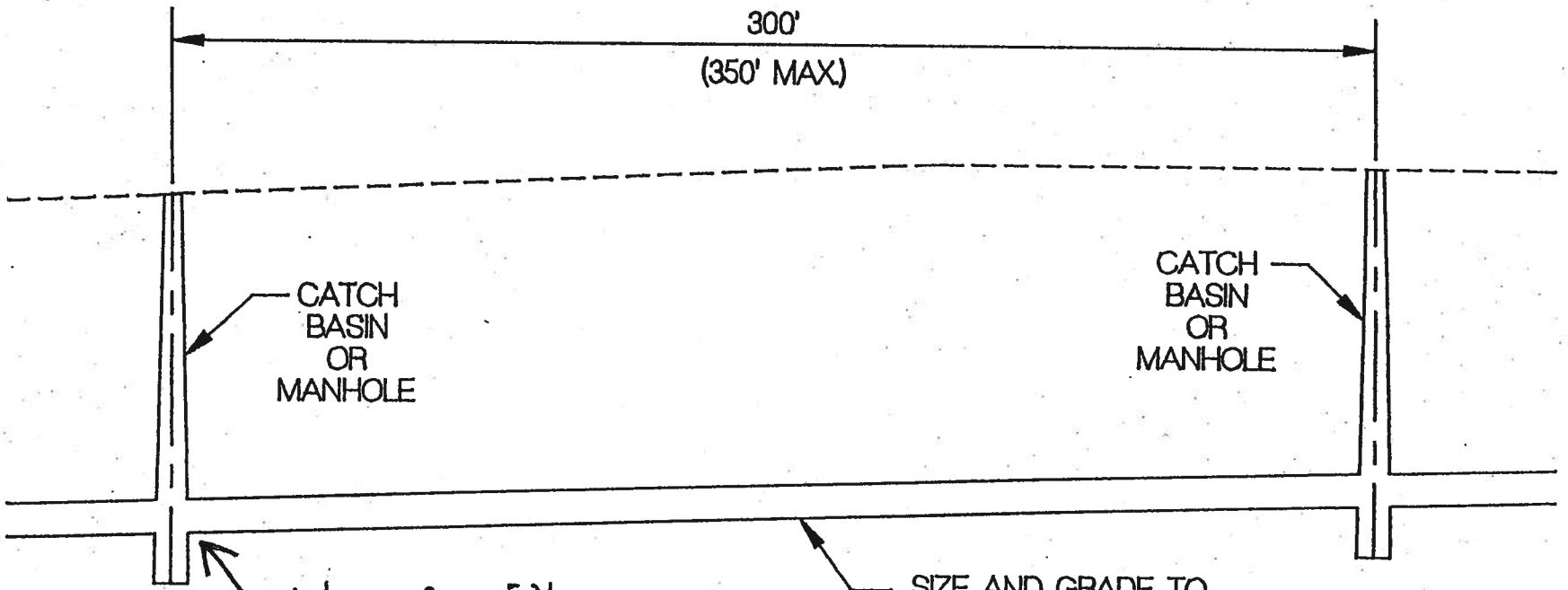
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 02
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

NO.	BY	DATE	REVISION

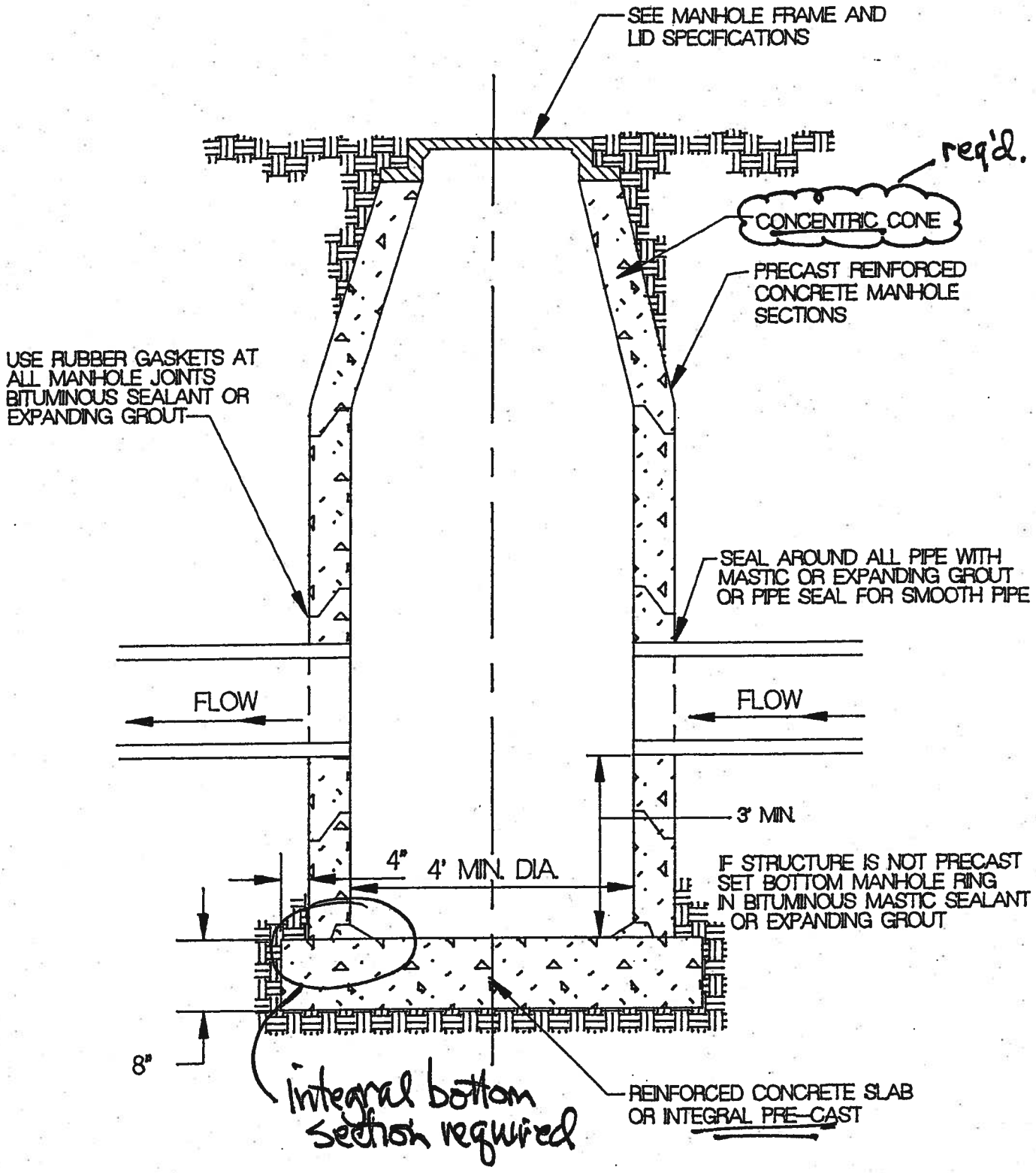
BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:
DATE:

NO. G 03



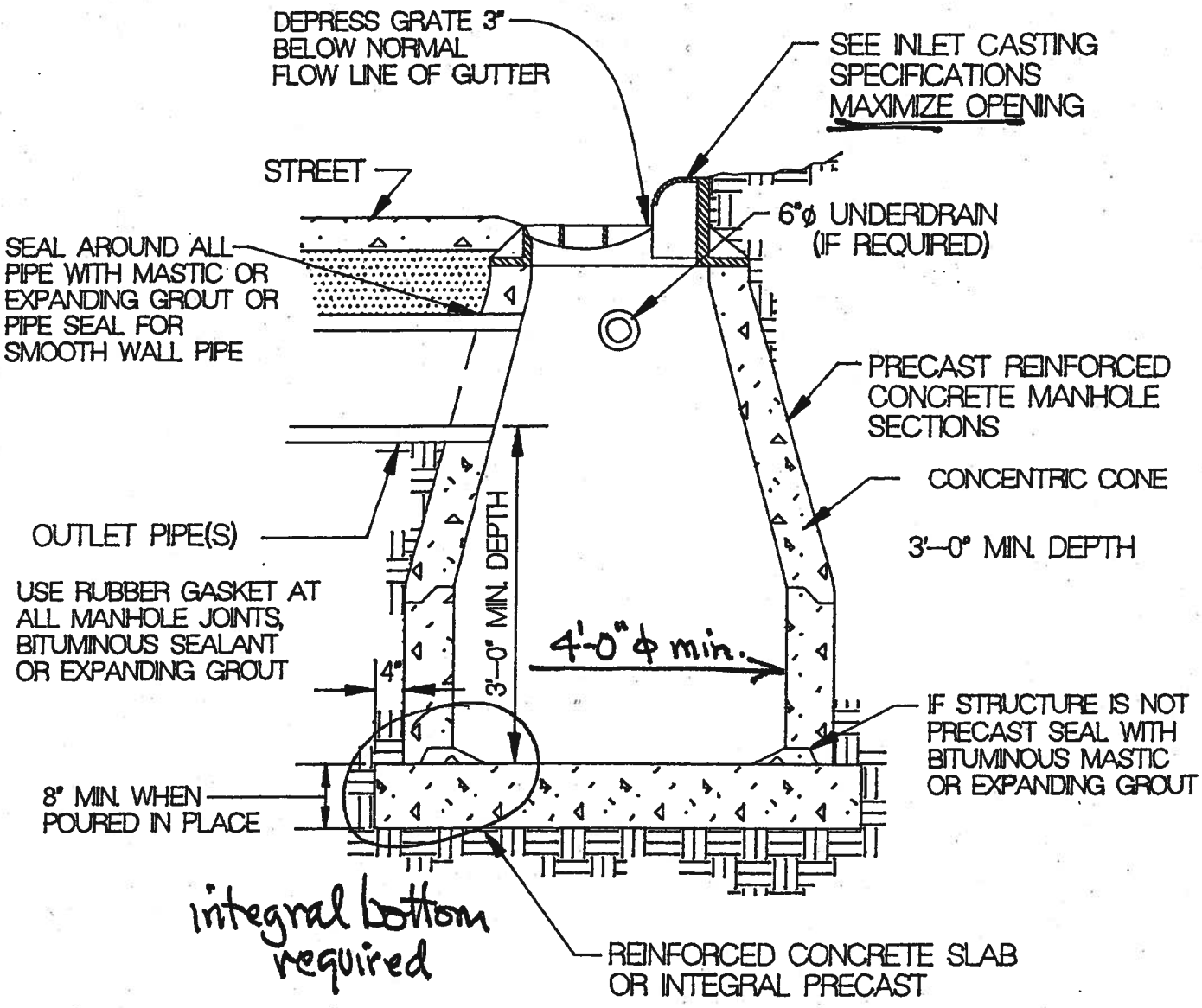
TYPICAL PROFILE OF STORM SEWER



CATCH – BASIN DETAIL

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 04
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	

Note: On flat-top structures, extend pipes towards the casting opening for access re: cleaning.

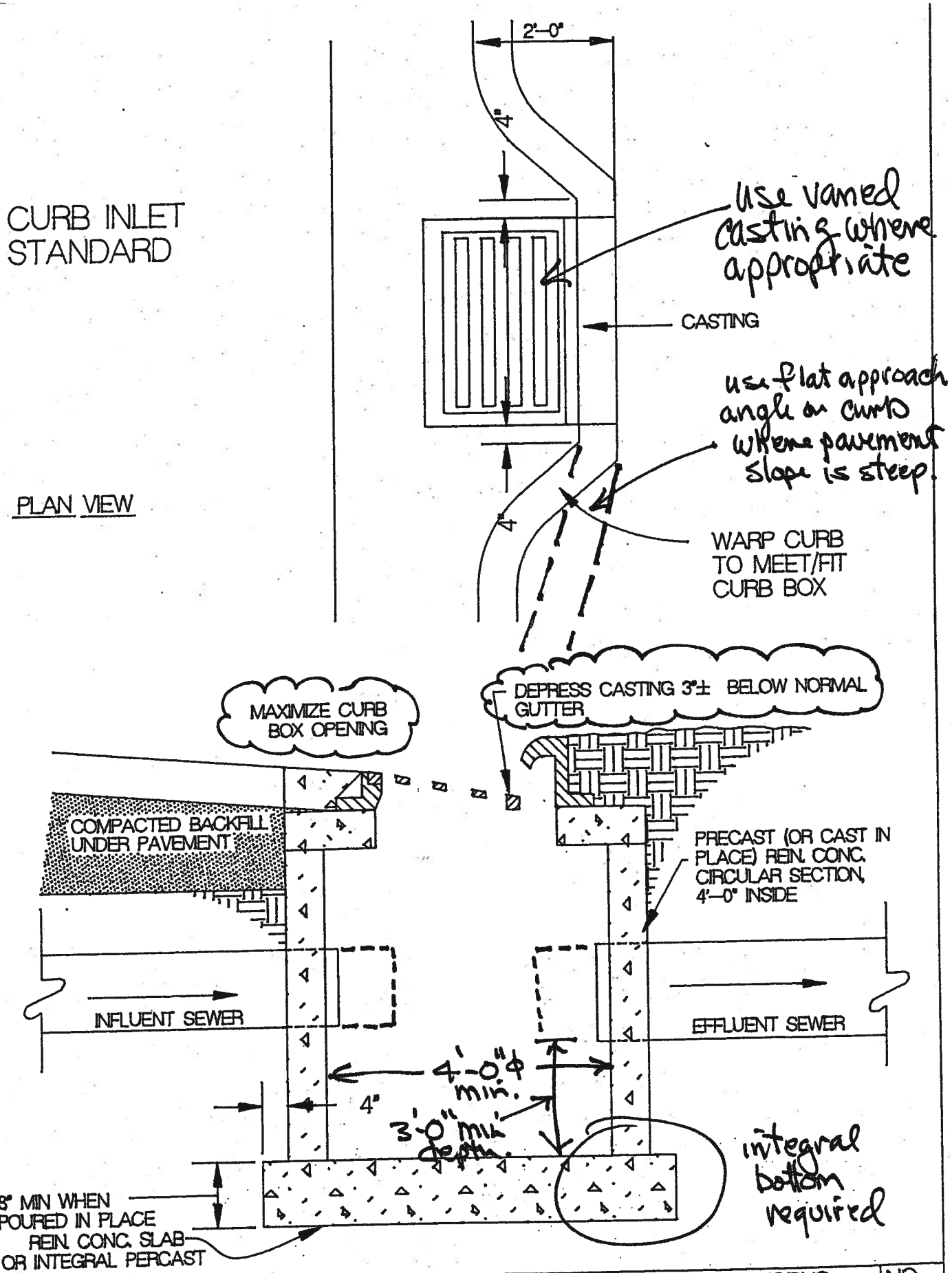


SECTION

CATCH BASIN/INLET DETAIL

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 05
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	

CURB INLET STANDARD



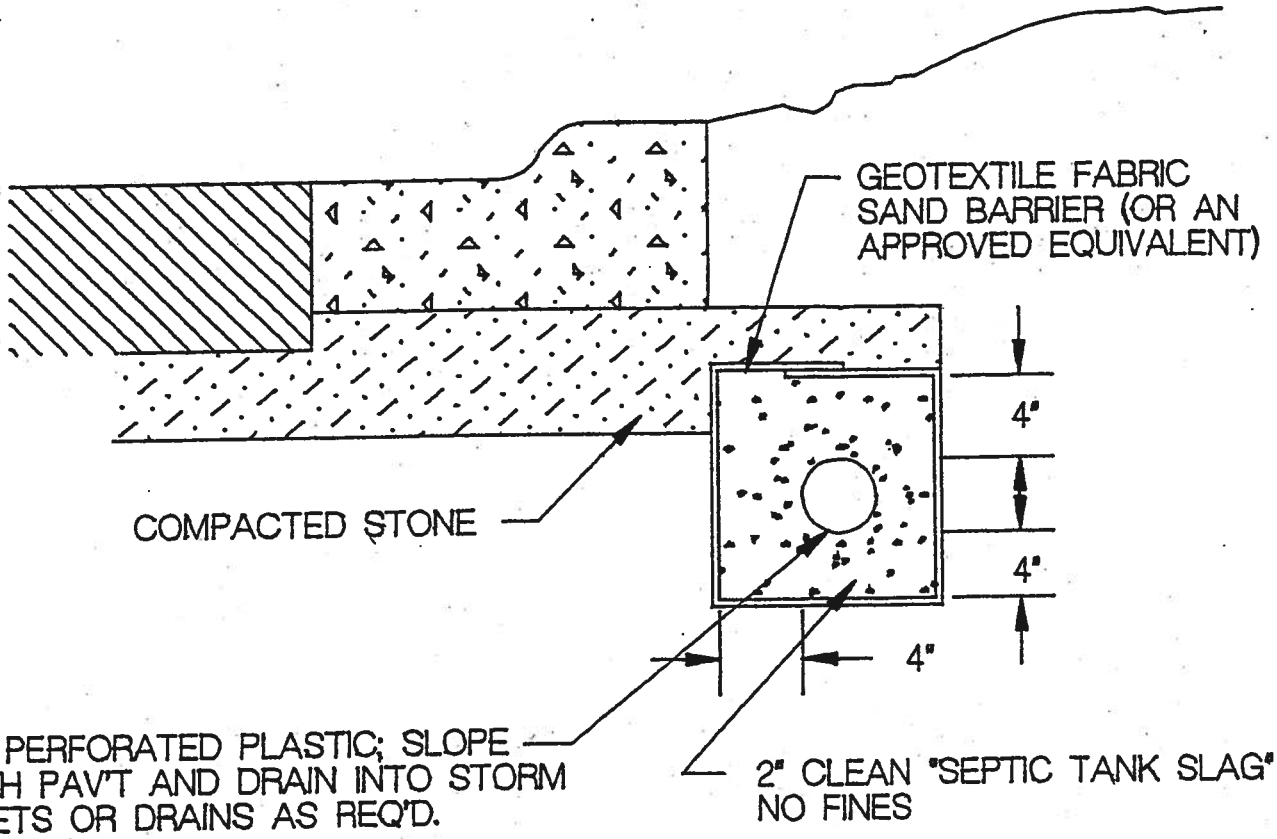
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 06
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	

CITY OF VALPARAISO STANDARD CASTINGS

The castings identified herein are those required for use on structures that will be owned and/or maintained by the City of Valparaiso Utilites. No other castings are permitted without the consent of the Superintendent of the Collections Department.

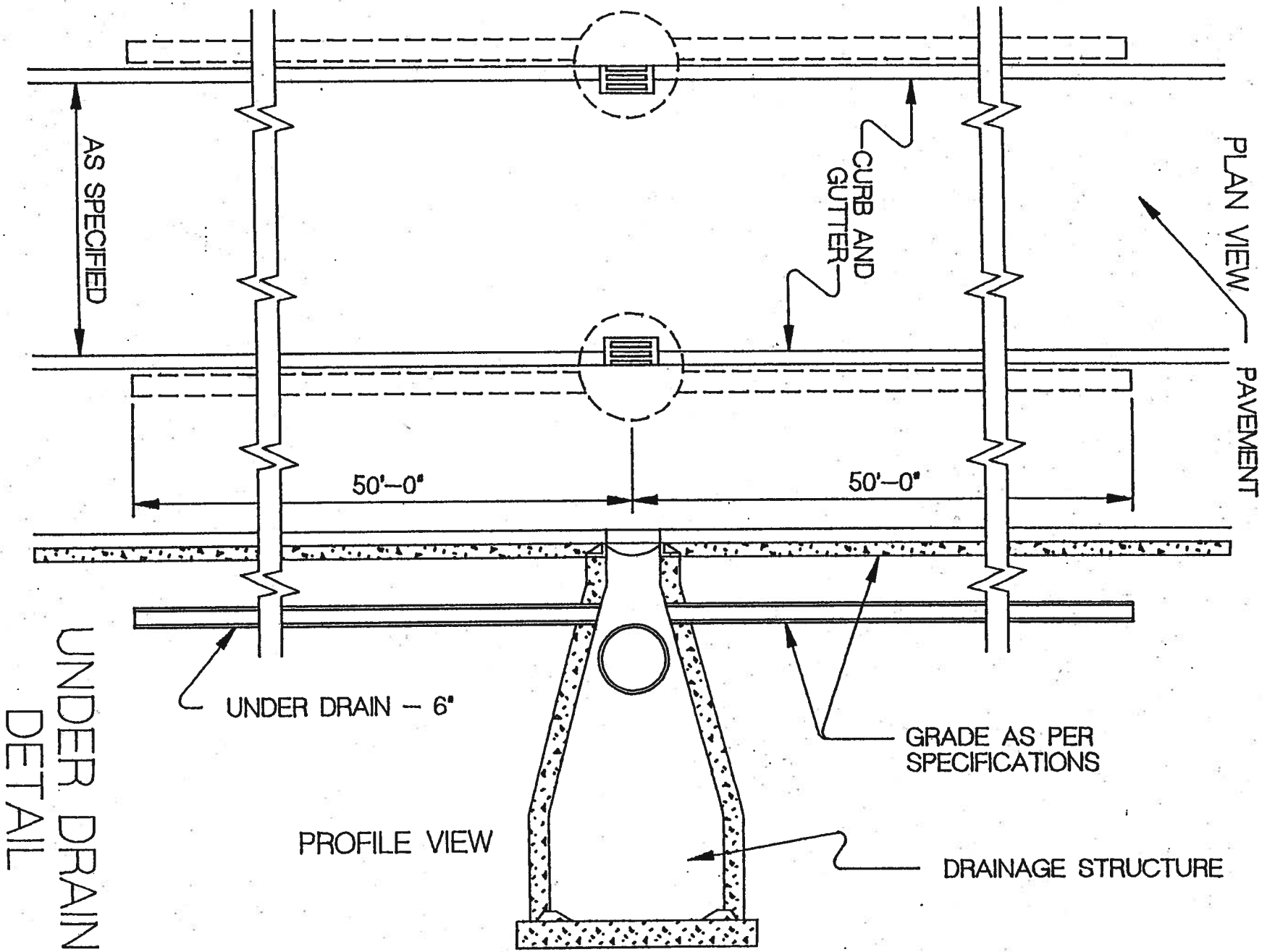
STRUCTURE	NEENAH	EAST JORDAN	COMMENTS
CURB INLETS	R-3246, C grate R-3246, V grate R-3275 R-3295-2, L grate	7030, T4, M2 grate 7030, T1, M4 or M6 7000, T1, M1 or M2 7031, T4, M4 or M6	Standard casting, use in sag conditions (1) Standard casting, use in directional flow conditions (1) (1) Requires flat top structure with full opening Permitted only with small contributing areas Double casting, requires special structure. In sag place grates opposite directions.
CATCH BASINS or STORM MANHOLES	R-2502, C or D grate R-2504, C or D grate	1022-3, A 1022-3, M1 or M2 1051, A 1051, M1 or M2	Heavy duty lid only, "STORM" on lid Heavy duty lid only Heavy duty lid only, "STORM" on lid Heavy duty lid only
BEEHIVE INLETS	R-2510-A R-2563	1125, 02 grate	
DITCH GRATES	R-4341-A R-4342	6488 6489	Use for heavy duty applications Use for light duty (residential) applications
SANITARY MANHOLES	R-1712 R-1772	1022-3, A 1050, A 1051, A 1037, A	Heavy duty lid only, gasketed, "SANITARY" on lid Heavy duty lid only, gasketed, "SANITARY" on lid Heavy duty lid only, gasketed, "SANITARY" on lid Extra heavy duty lid only, gasketed, "SANITARY" on lid

Revised July 16, 2008



SECTION
UNDER DRAIN
use in all street low points

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 08
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	



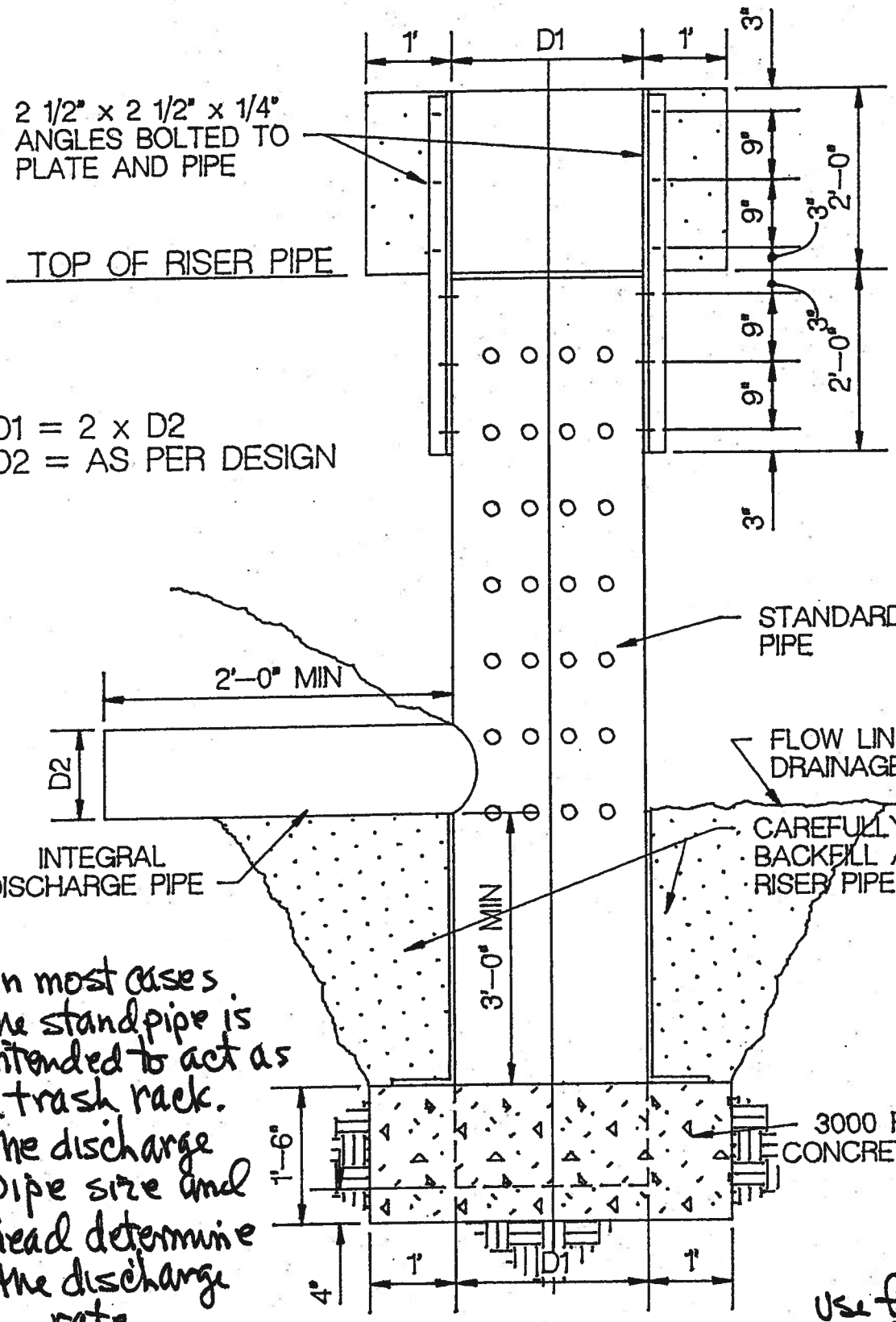
UNDER DRAIN DETAIL

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DR:
APPROVED:
DATE:

NO. G 09



In most cases the standpipe is intended to act as a trash rack. The discharge pipe size and head determine the discharge rate.

STANDPIPE DETAIL

Use for privately maintained basins only

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. G 10

DRAINAGE STRUCTURE SCHEDULE

DRAINAGE STRUCTURE			DESIGN		NEENAH CASTING		
NO.	FUNCTION	STYLE	ITEM	ELEV.	NO.	LID	REMARKS
1001	End Section	Metal	21" ϕ NW	749.50	—	—	
1002	Inlet/ Catch Basin	Flat–Top	Grate 21" ϕ SE 21" ϕ N	753.99 749.90 749.90	R–3246	a	Large Opening Required In Slab
1003	Inlet/ Catch Basin	Flat–Top	21" ϕ NW 21" ϕ NW 21" ϕ NW	749.50 749.50 749.50	—	—	
1004	End Section	Metal	21" ϕ NW	749.50	—	—	
1005	End Section	Metal	21" ϕ NW	749.50	—	—	
1006	End Section	Metal	21" ϕ NW	749.50	—	—	
2001	End Section	Metal	21" ϕ NW	749.50	—	—	
2002	End Section	Metal	21" ϕ NW	749.50	—	—	
3001	End Section	Metal	21" ϕ NW	749.50	—	—	

THIS SCHEDULE IS PROVIDED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR AND SUPPLIER AND SHOULD BE VERIFIED WITH THE CONSTRUCTION DRAWINGS BEFORE STRUCTURES ARE ORDERED.

EXAMPLE
DRAINAGE STRUCTURE SCHEDULE

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. G 11

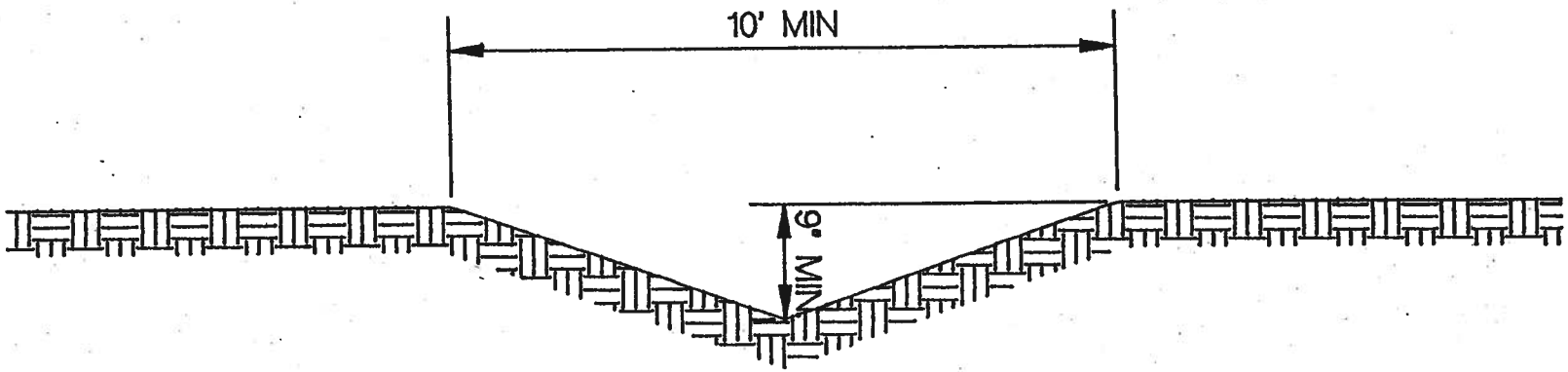
NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
APPROVED:

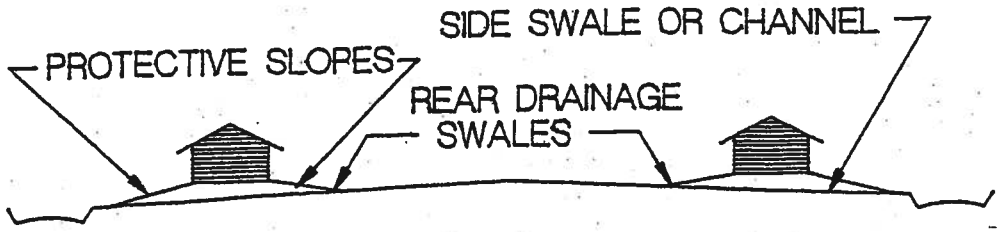
DATE:

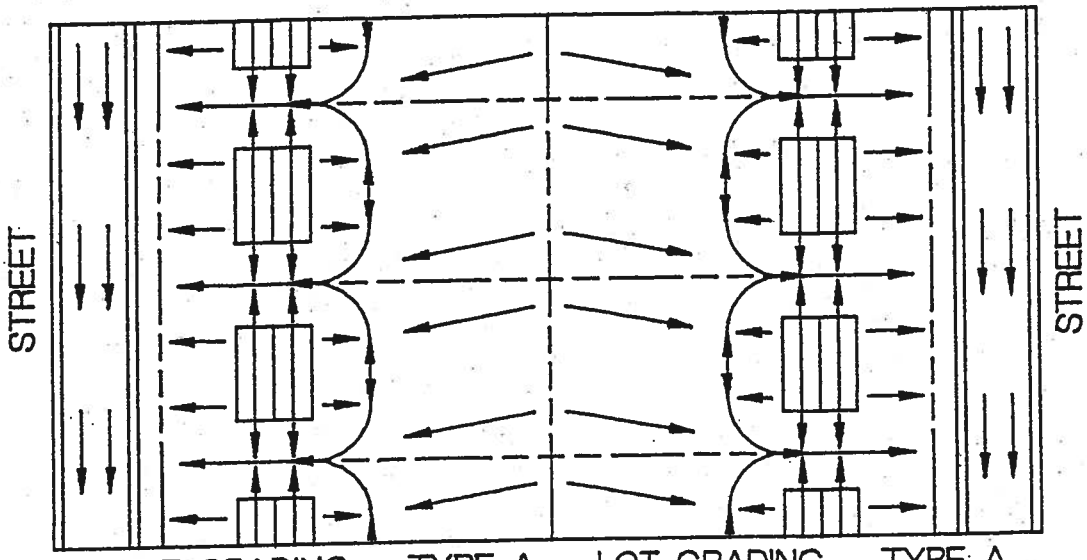
NO. G 12



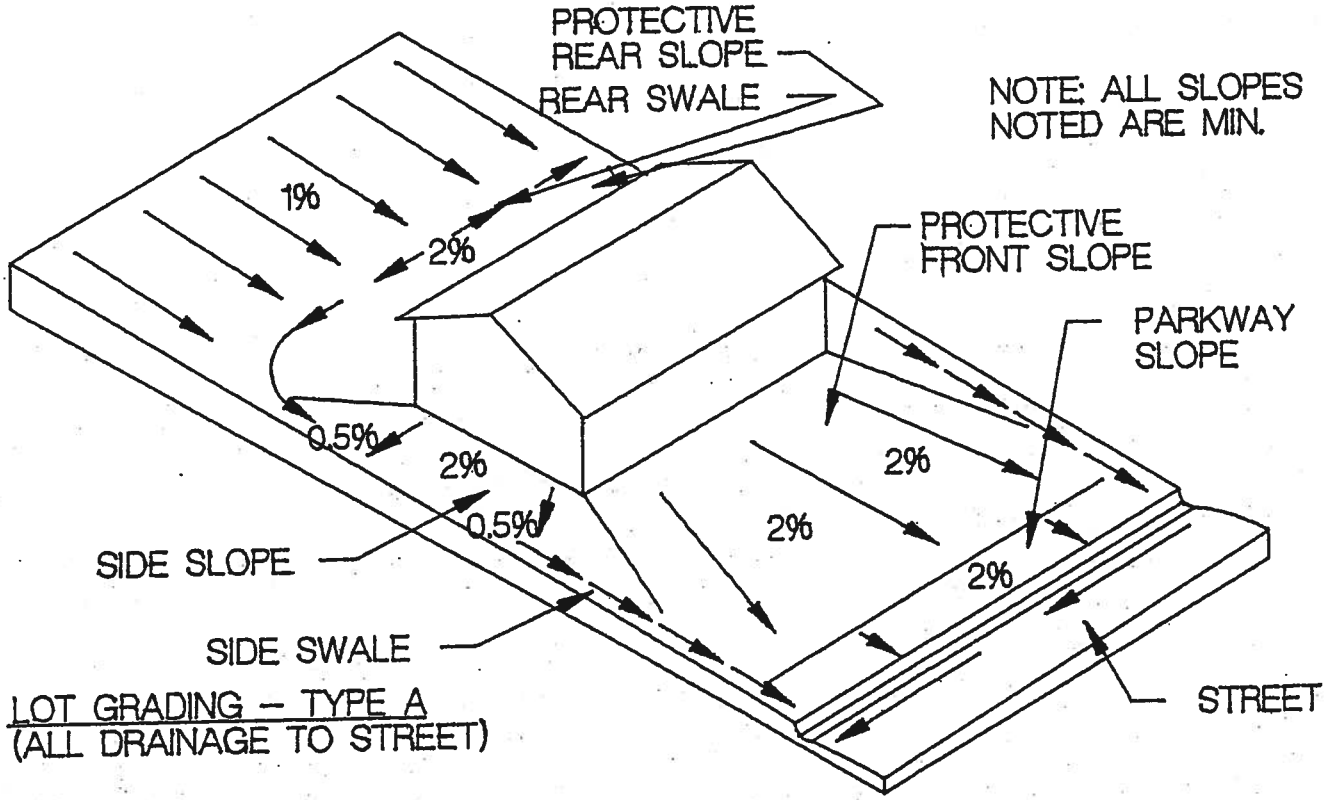
GRADE – 1% RECOMMENDED, 0.5% MINIMUM

COMMON SWALE





LOT GRADING – TYPE A LOT GRADING – TYPE A

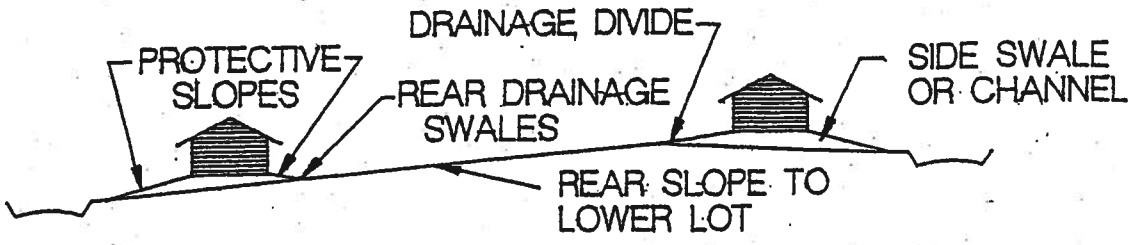


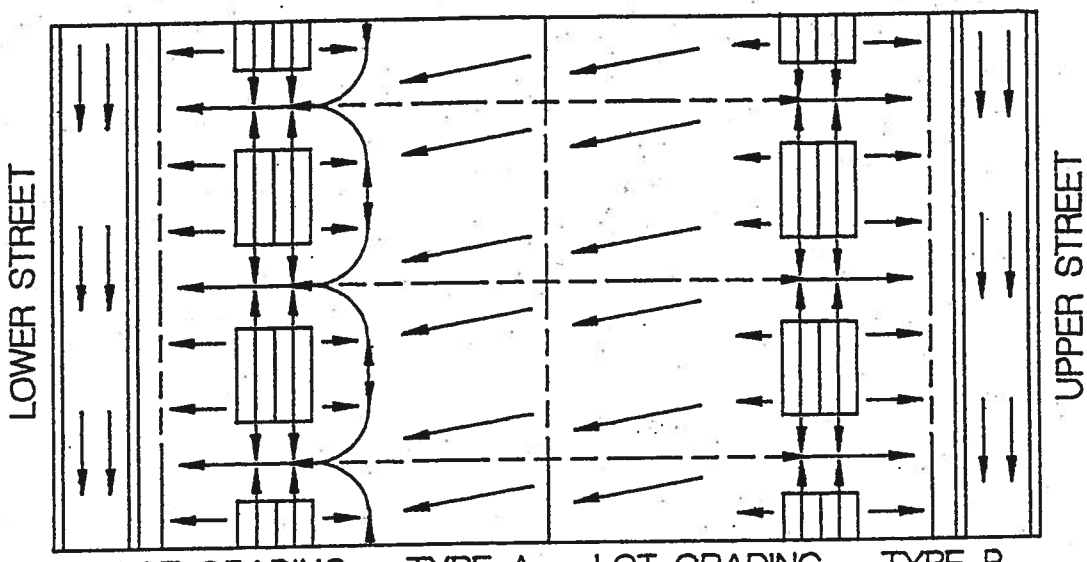
NOTE: ALL SLOPES NOTED ARE MIN.

LOT GRADING – TYPE A
(ALL DRAINAGE TO STREET)

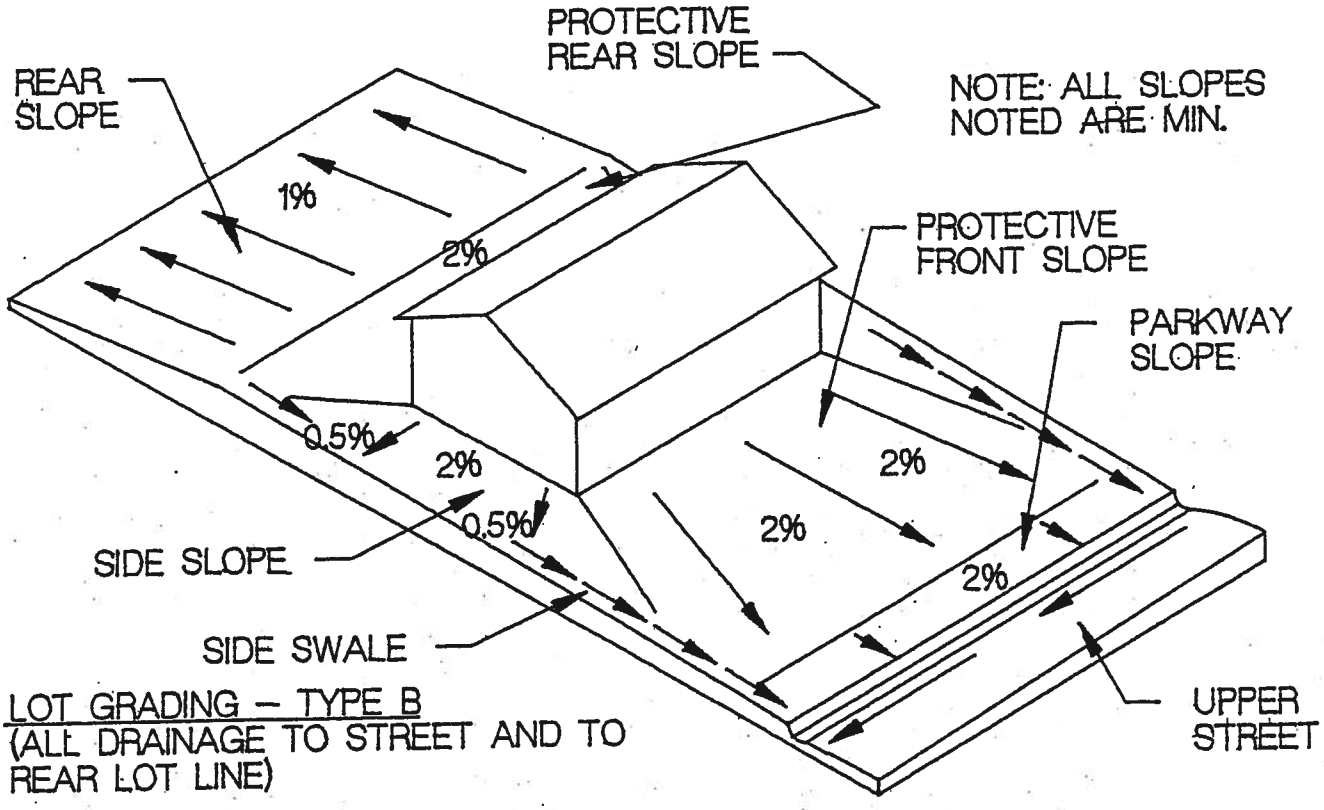
EXAMPLE: BLOCK GRADING TYPE 1
RIDGE ALONG REAR LOT LINES

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 13
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	





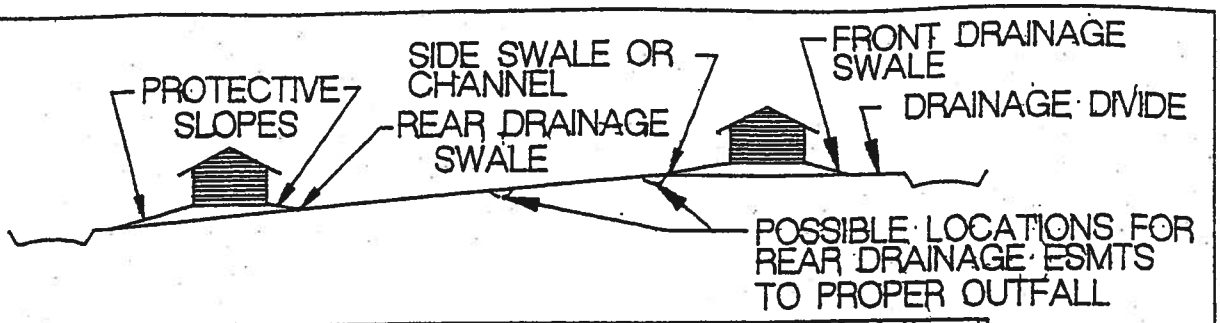
LOT GRADING – TYPE A LOT GRADING – TYPE B

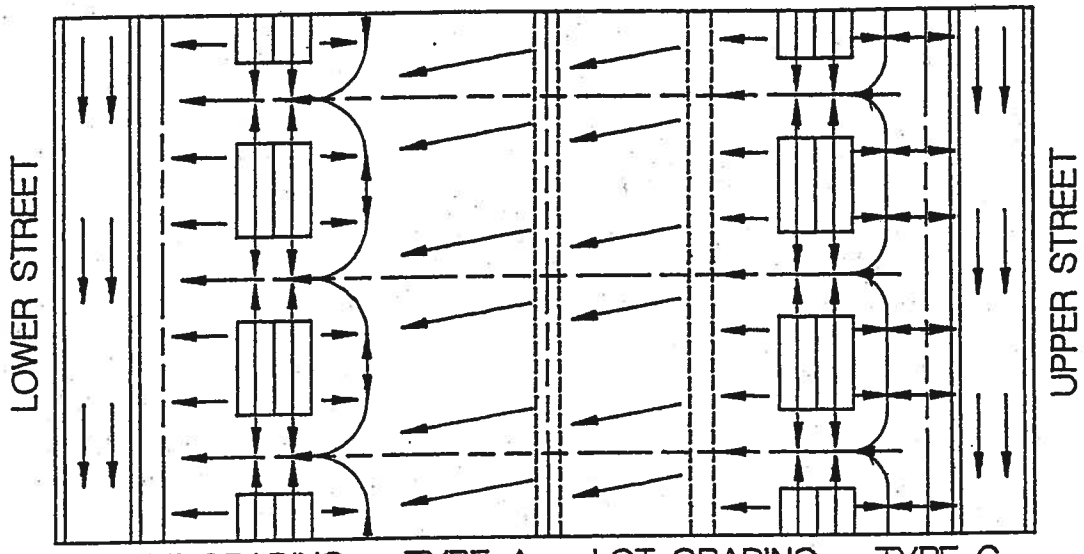


LOT GRADING – TYPE B
(ALL DRAINAGE TO STREET AND TO REAR LOT LINE)

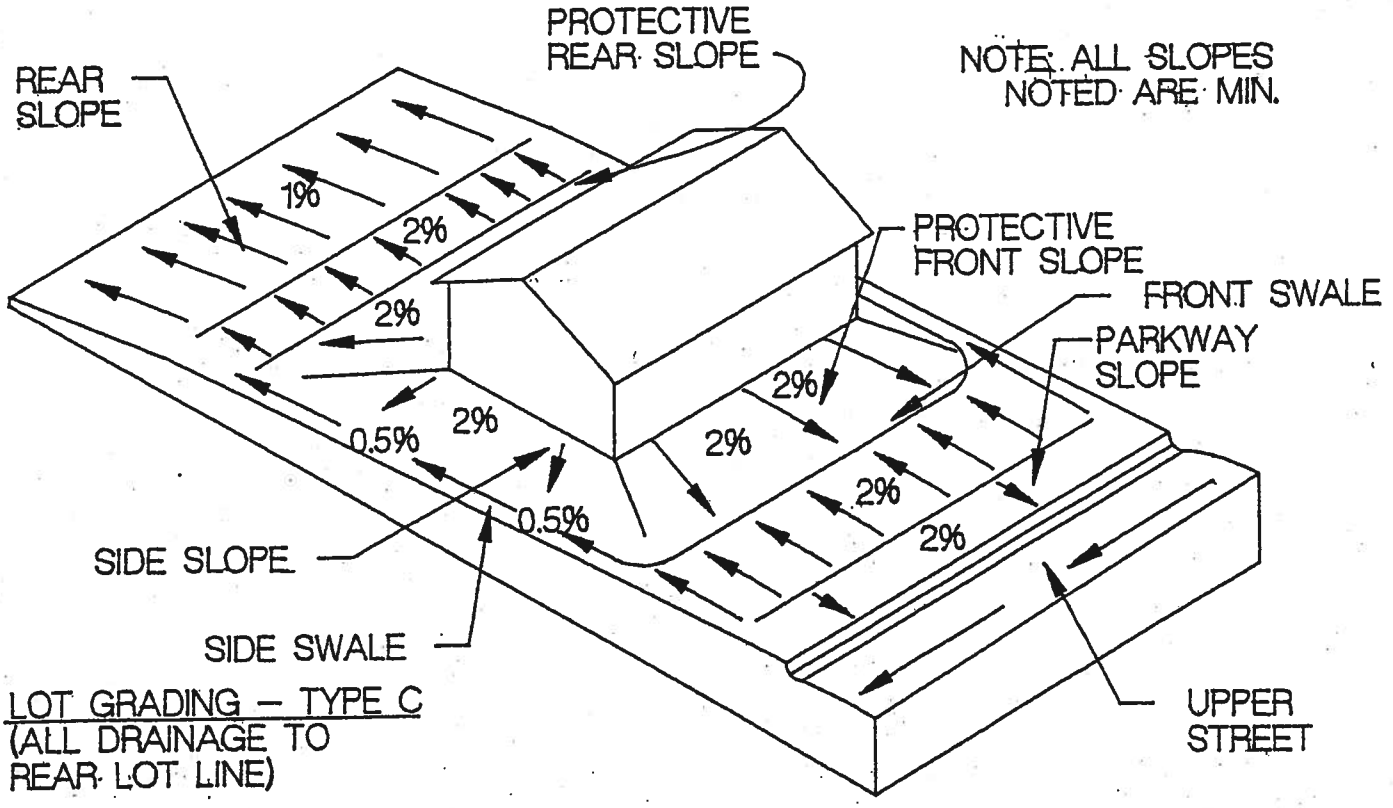
EXAMPLE: BLOCK GRADING TYPE 2 GENTLE CROSS SLOPE

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 14
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	





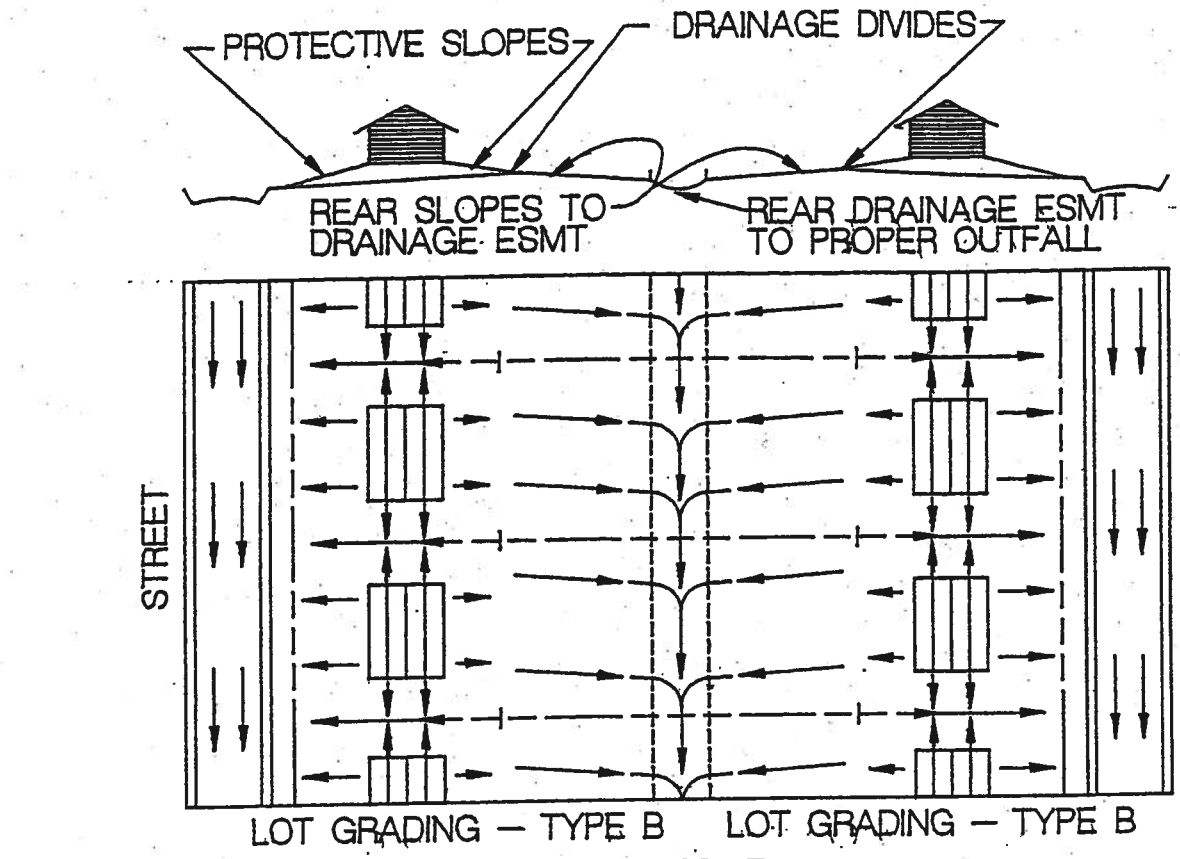
LOT GRADING – TYPE A LOT GRADING – TYPE C

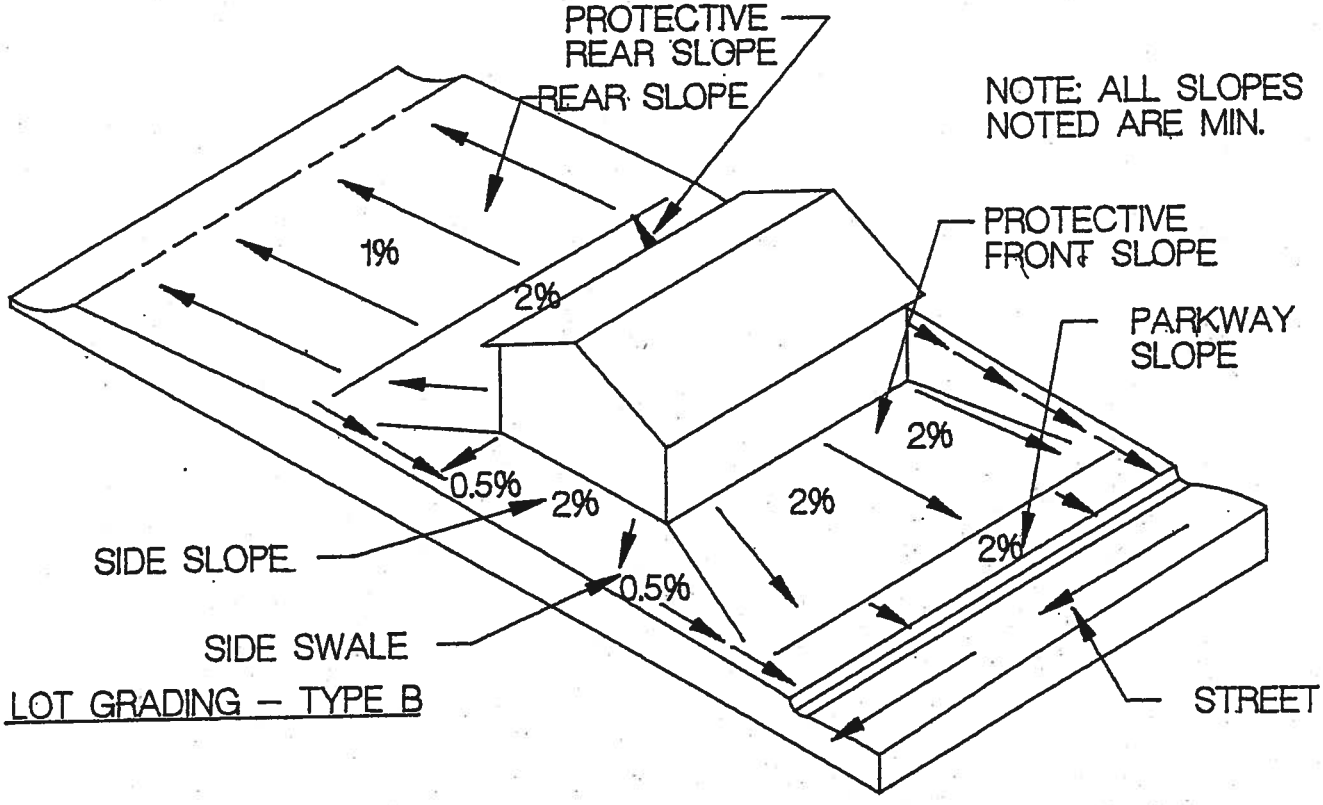


LOT GRADING – TYPE C
(ALL DRAINAGE TO REAR LOT LINE)

EXAMPLE: BLOCK GRADING TYPE 3 STEEP CROSS–SLOPE

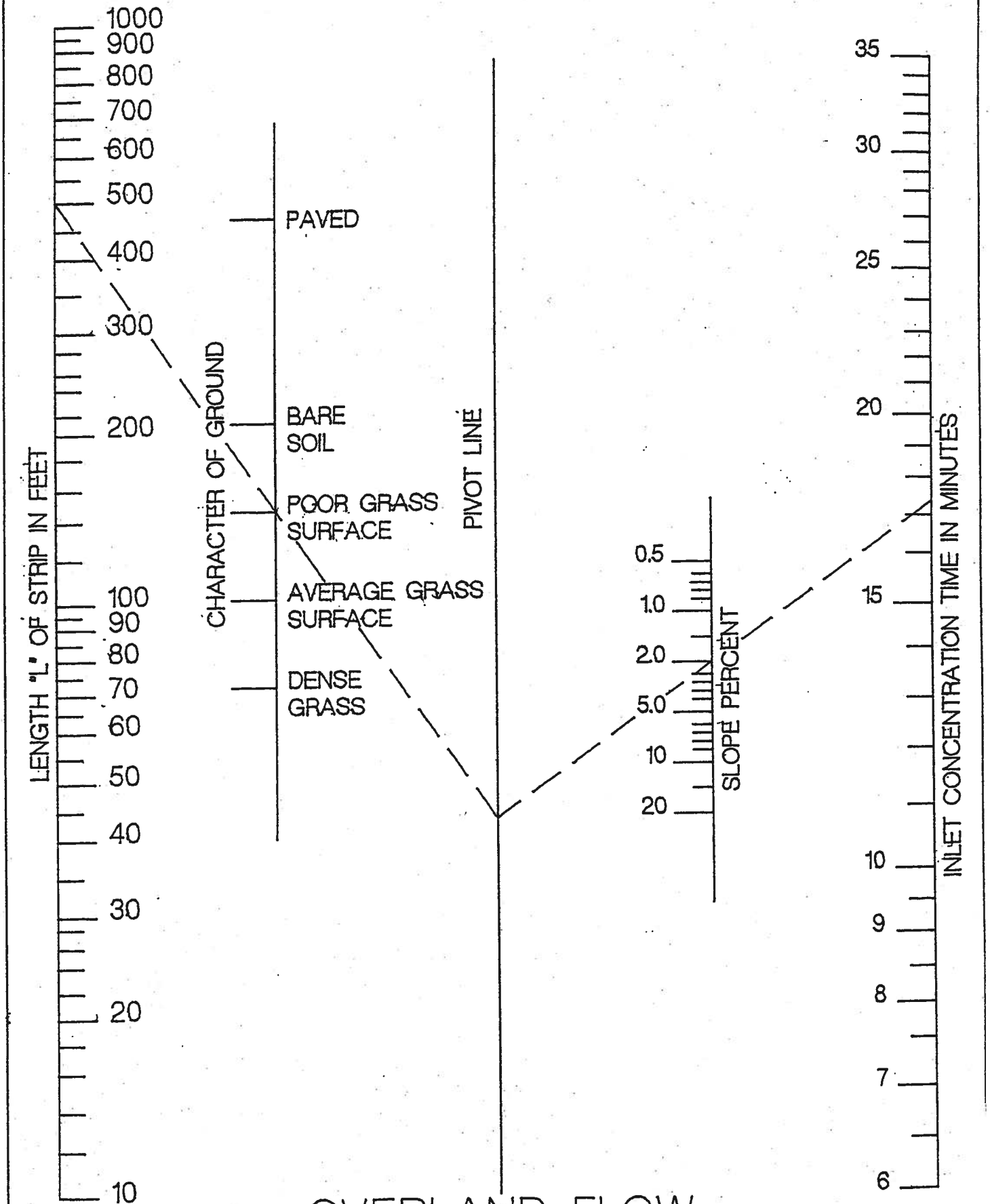
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 15
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	





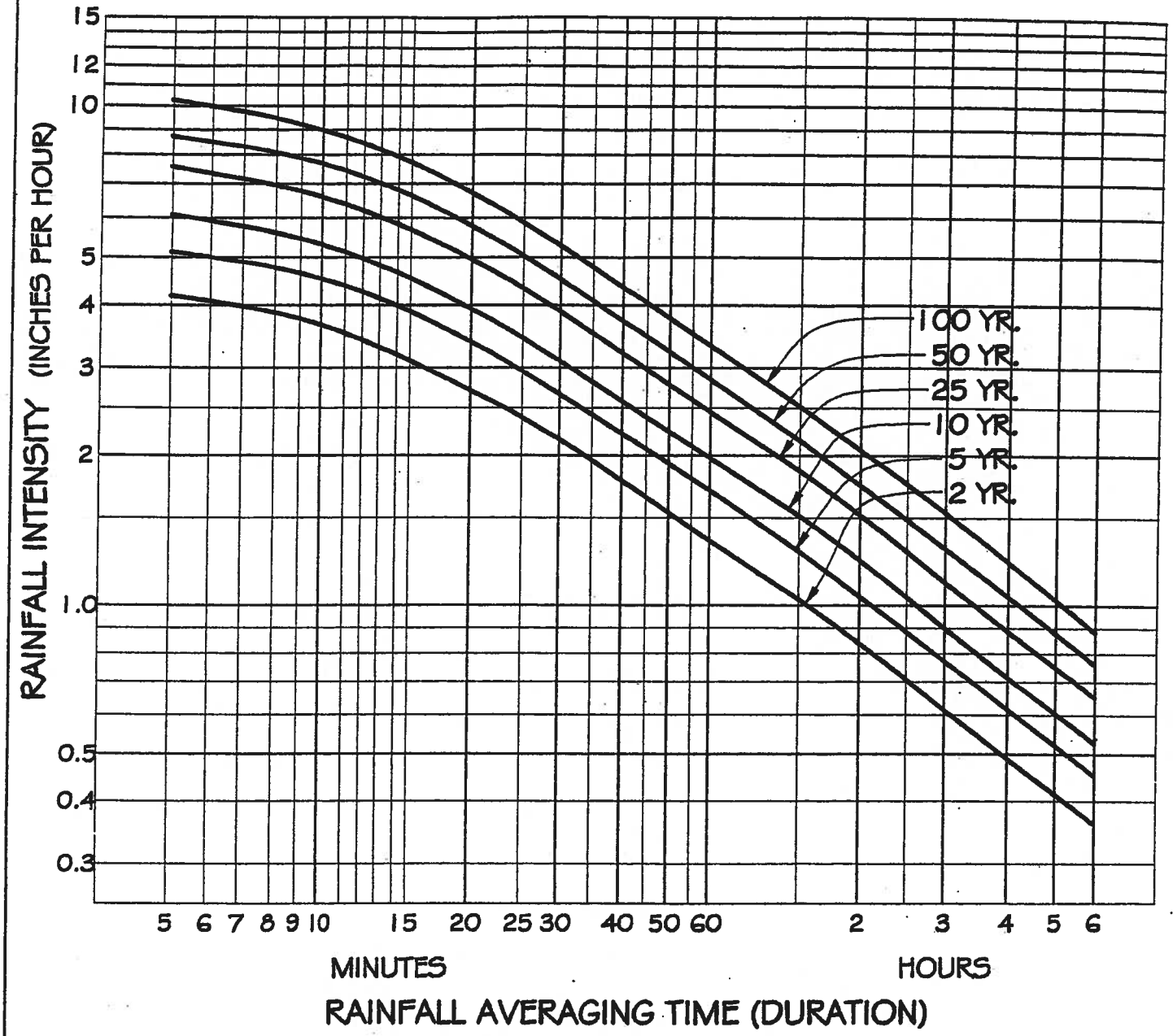
EXAMPLE: BLOCK GRADING TYPE 4
VALLEY ALONG REAR LOT LINES

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 16
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	



OVERLAND FLOW

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. G 17
				ENGINEER'S DEPARTMENT	
				DATE: DR: APPROVED:	



APRIL 1999

DATA USED IN THE GENERATION OF THESE CURVES OBTAINED FROM "RAINFALL FREQUENCY ATLAS OF THE MIDWEST", BY FLOYD A. HUFF AND JAMES R. ANGEL, 1992, MIDWESTERN CLIMATE CENTER AND ILLINOIS STATE WATER SURVEY.

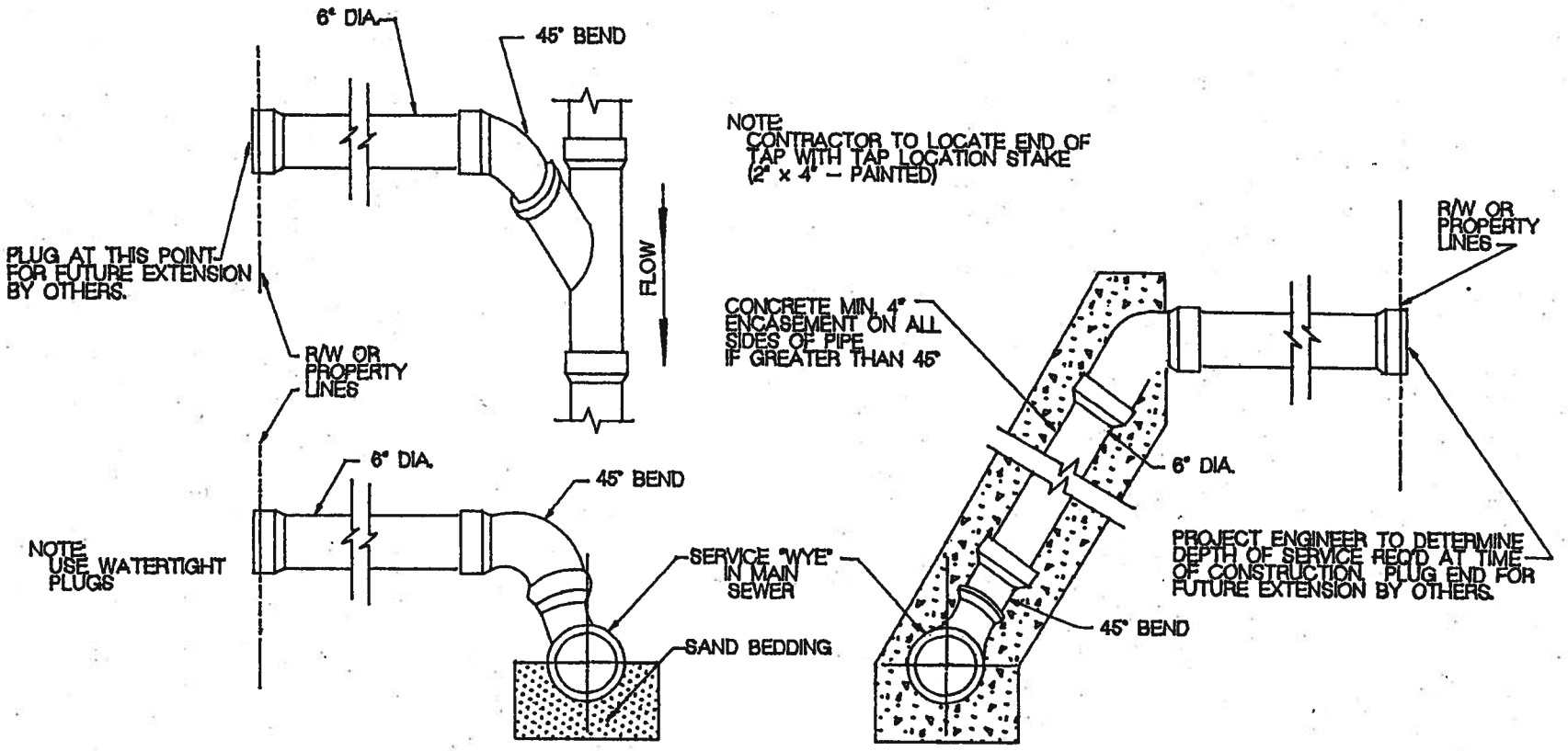
CITY OF VALPARAISO - STANDARD DETAILS	NO.
RAINFALL INTENSITY CURVES FOR VALPARAISO IN	X5

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE:
DR
APPROVED:

NO. H-01

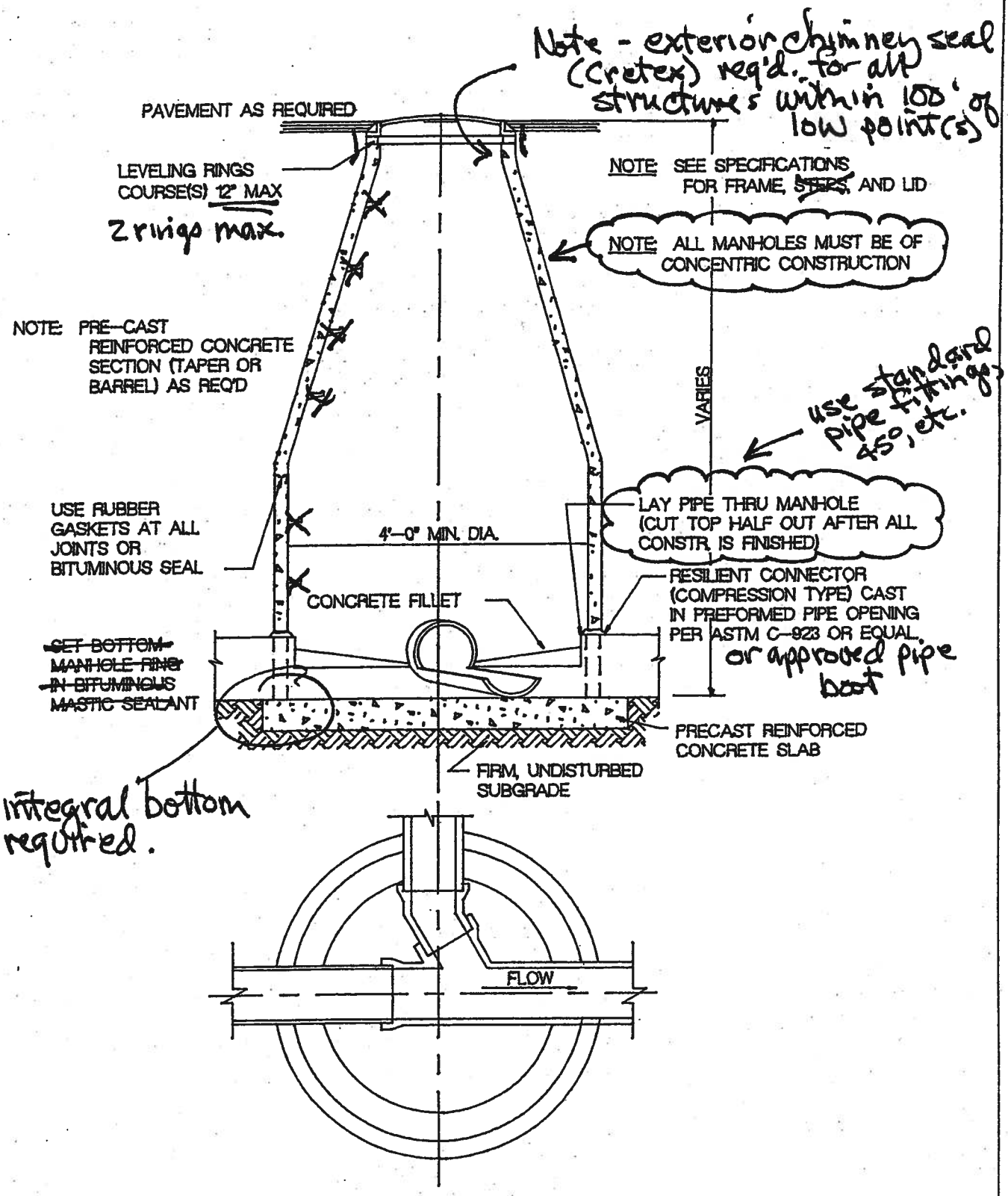


STANDARD CONNECTION

DEEP CONNECTION

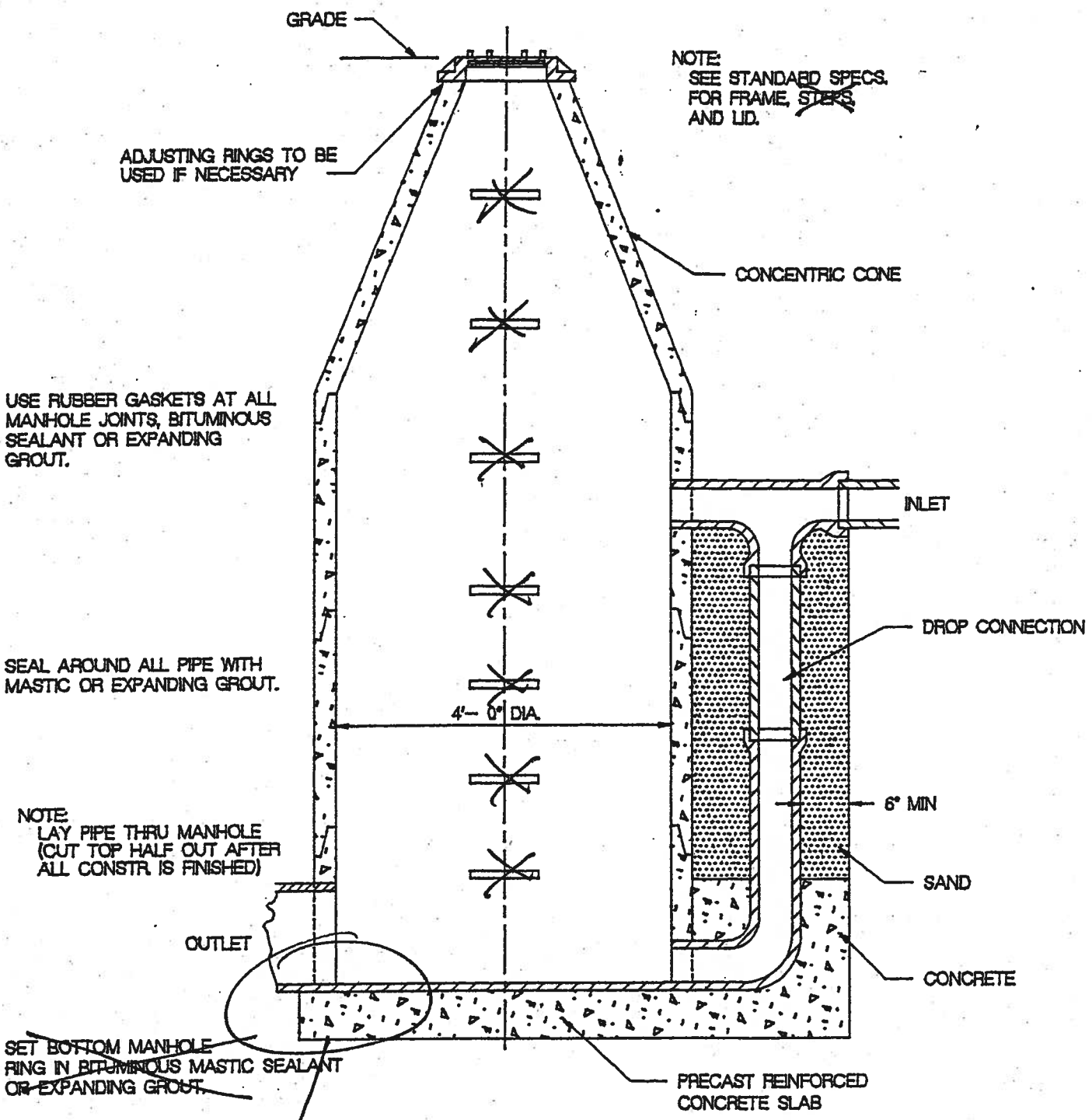
NOTE:
A SERVICE CONNECTION TO EXISTING SEWER LINE WITH A DIAMETER OF 12" OR GREATER AN APPROVED SADDLE SHALL BE USED.

SANITARY SERVICE CONNECTION DETAIL



STANDARD SANITARY MANHOLE DETAIL

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. H 02
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



STANDARD SANITARY DROP MANHOLE

Integral bottom required

See notes on Standard Manhole Detail

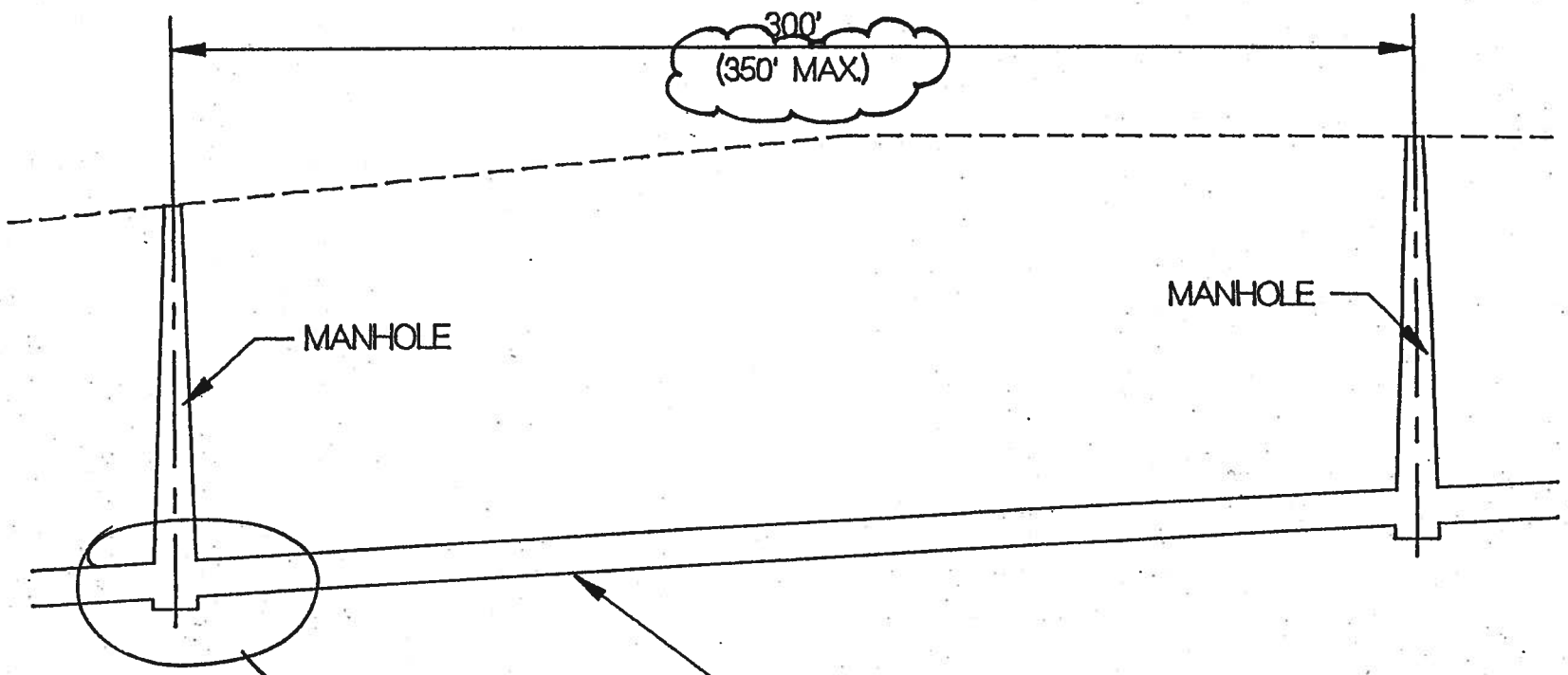
NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. H 03
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE
DR.
APPROVED:

NO. 01



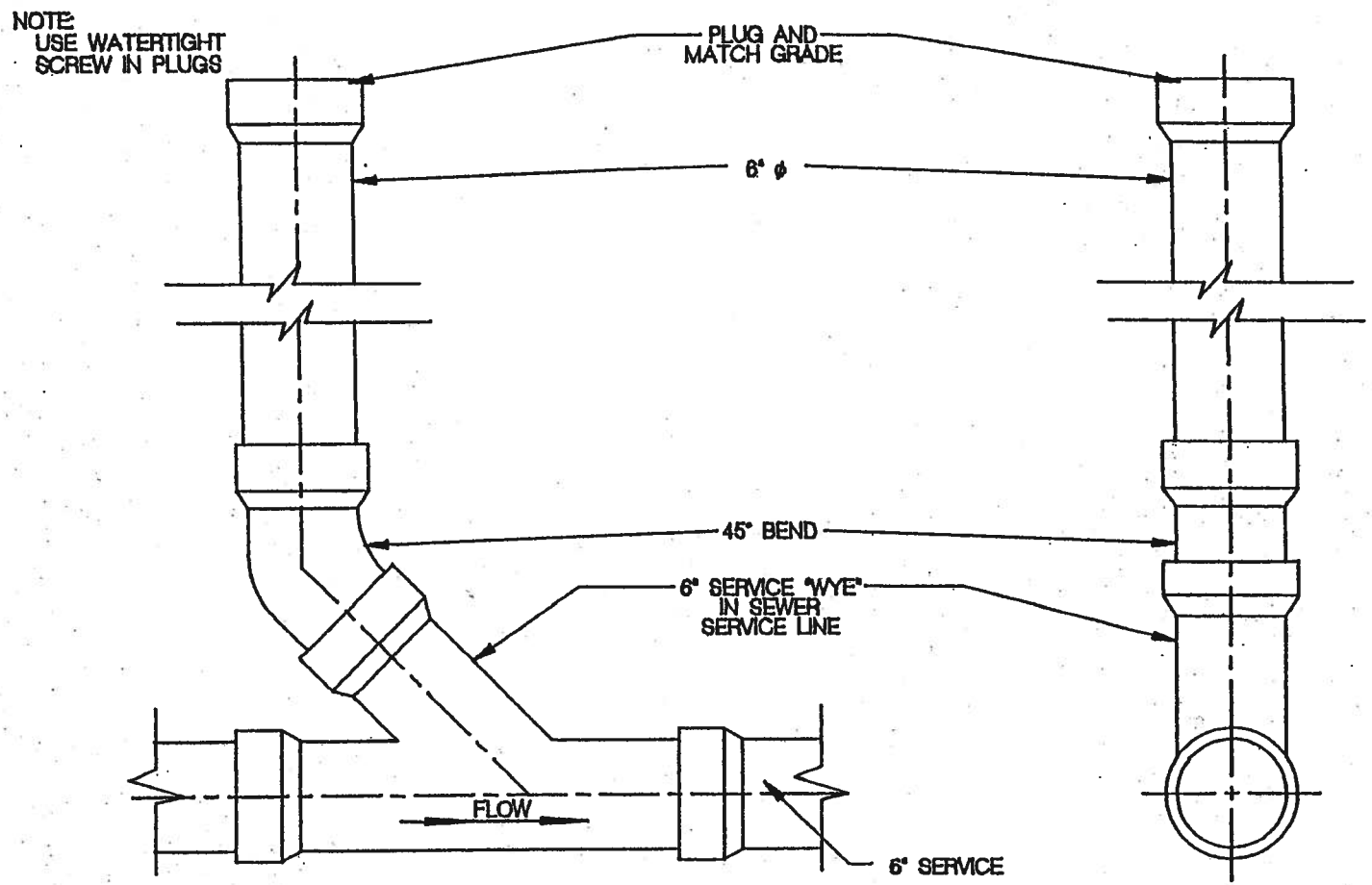
TYPICAL PROFILE OF SANITARY SEWER

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

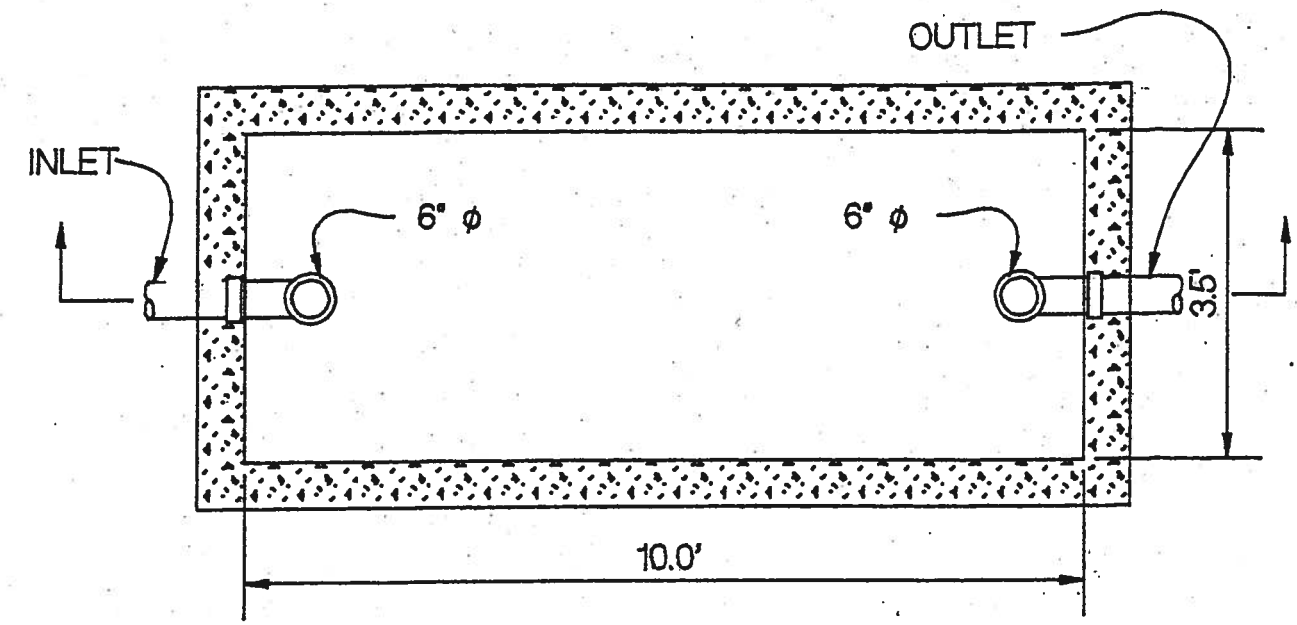
ENGINEER'S DEPARTMENT
APPROVED:
DATE:

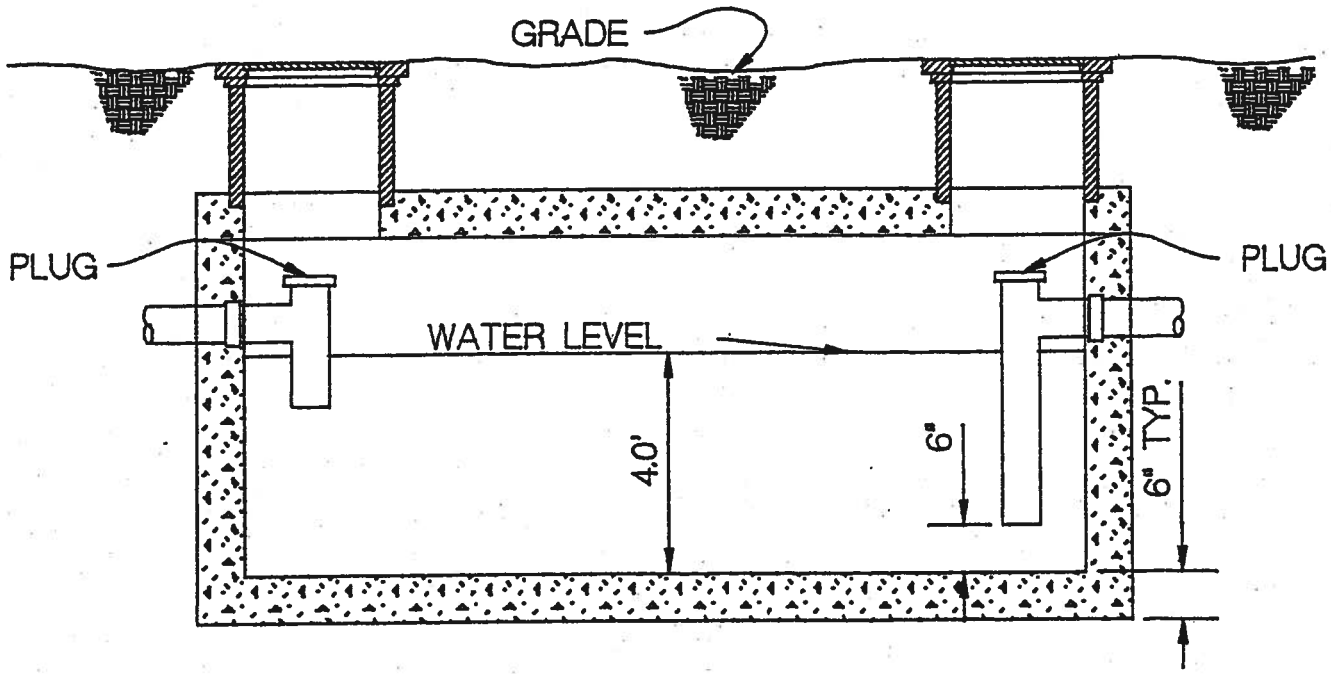
NO.



CLEAN – OUT REQ'D 5' FROM STRUCTURE AND AT
100' INTERVALS ALONG SEWER SERVICE AS MEASURED
FROM SEWER MAIN

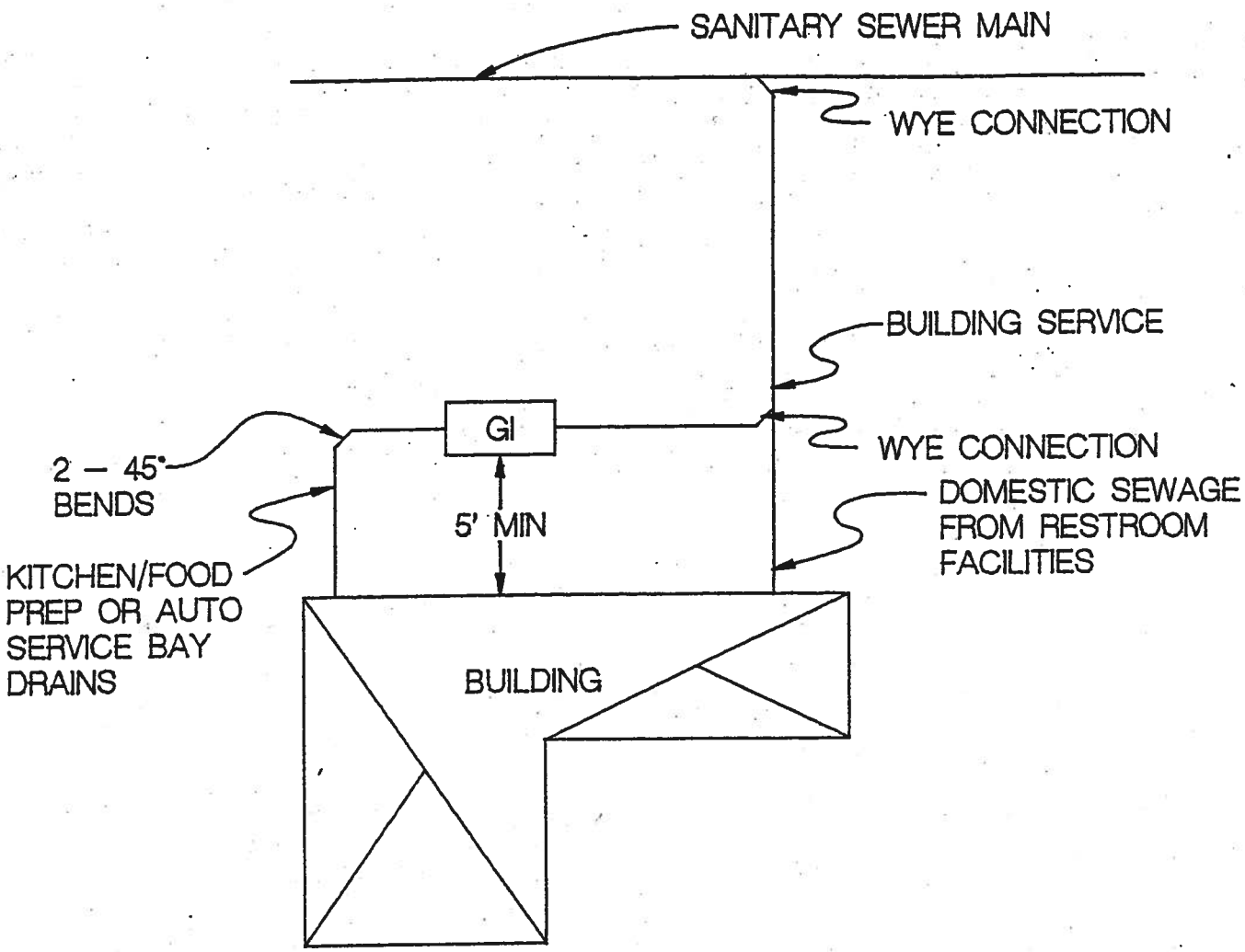
SANITARY SEWER CLEAN – OUT DETAIL





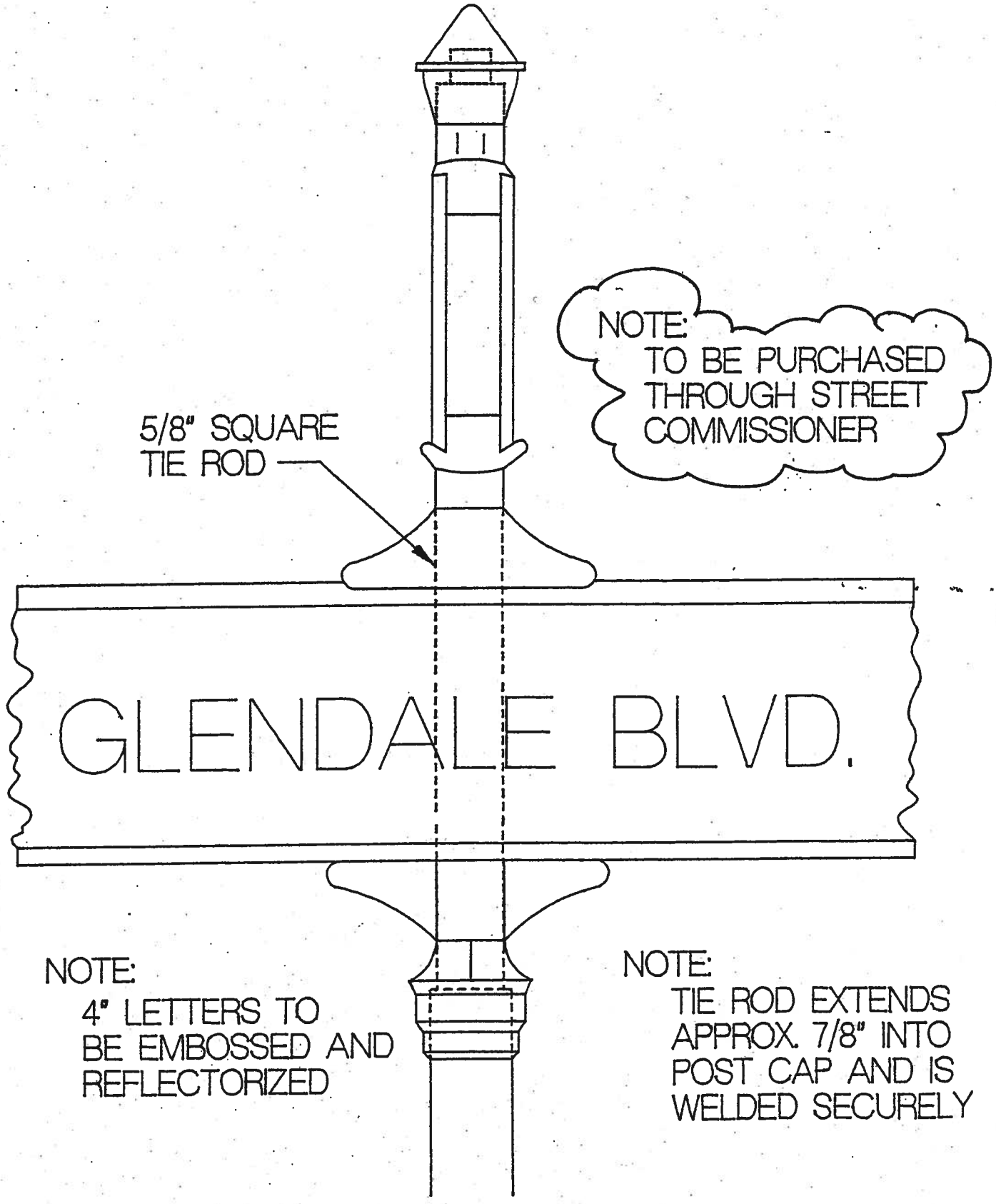
GREASE INTERCEPTOR 1000 GAL.

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. H 06
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



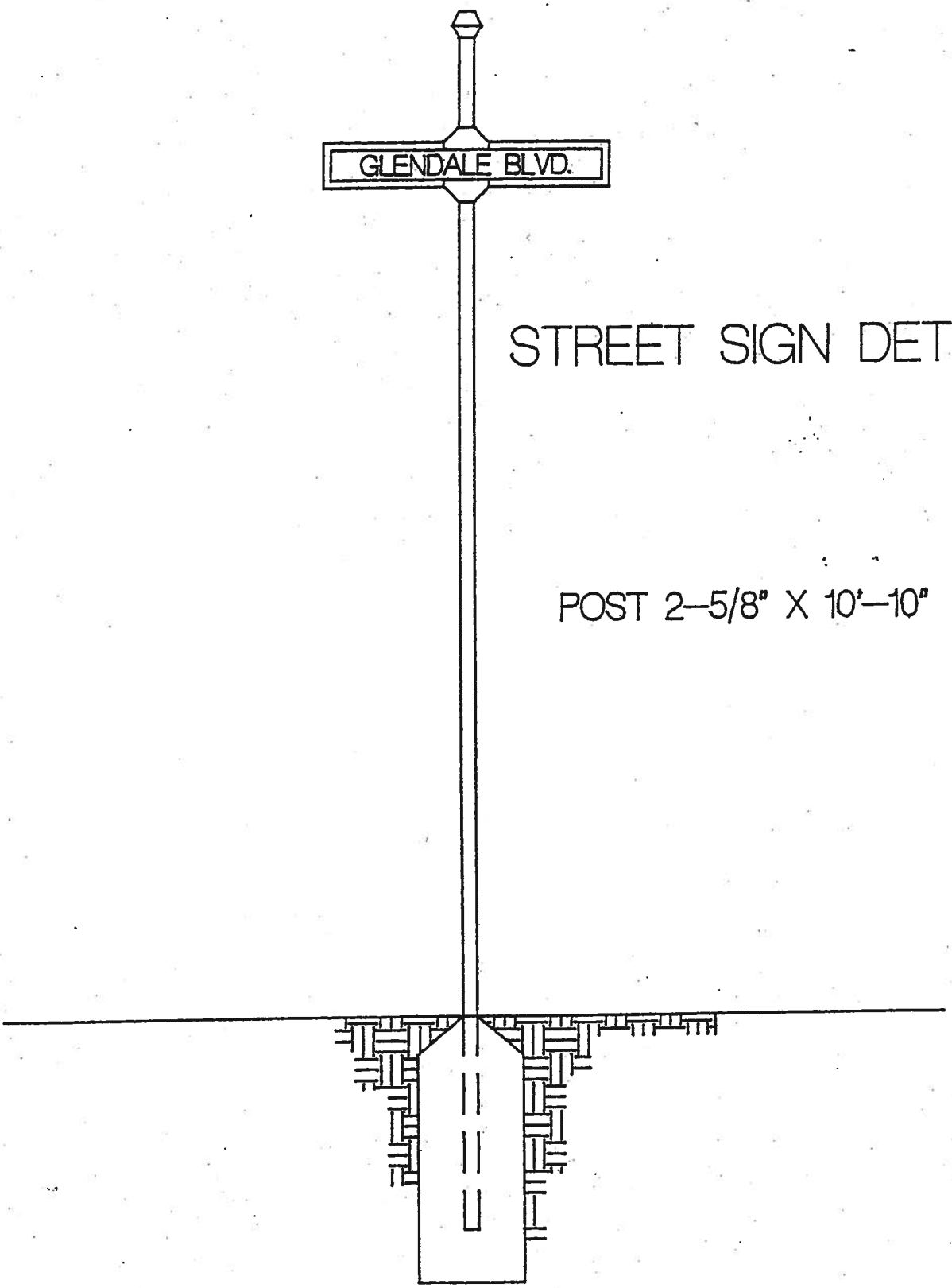
GREASE INTERCEPTOR LOCATION

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. H 07
				ENGINEER'S DEPARTMENT DATE: DR: APPROVED:	



STREET SIGN

NO.	BY	DATE	REVISION	BOARD OF PUBLIC WORKS VALPARAISO, INDIANA	NO. 1
				ENGINEER'S DEPARTMENT DATE: DR: SK APPROVED:	01



STREET SIGN DETAIL

POST 2–5/8" X 10'–10"

NO.	BY	DATE	REVISION

BOARD OF PUBLIC WORKS
VALPARAISO, INDIANA

ENGINEER'S DEPARTMENT
DATE: DR: APPROVED:

NO. 1
02