

City of Bettendorf Iowa
Supplemental Specifications to

SUDAS

Iowa Statewide Urban Design and Specifications
Adopted March 24, 2026

Bettendorf IOWA
a premier city

Public Works Department | 4403 Devils Glen Rd | Bettendorf, IA 52722
(563) 344-4055 | www.bettendorf.org

Supplemental Specifications :

DIVISION 1 – GENERAL CONDITIONS AND COVENANTS

Section 1020 – Proposal Requirements and Conditions

1.02 Contents of the Proposal Forms

A. DELETE and REPLACE with the following:

Each prospective bidder will be furnished with a link to the Jurisdiction’s bidding website containing the contract documents including the location and description of the proposed work, the approximate quantities of work to be performed for which bid prices are requested and the completion provisions. The contract documents will contain any special provisions that shall apply to the work to be performed.

1.03 Quantities and Unit Prices

C. DELETE and REPLACE with the following:

The proposal may have a lump sum item for mobilization. The bidder will indicate its bid price in dollars, and this will be the contract price for mobilization. If no pay item is included, mobilization shall be considered incidental, and the cost of which shall be included in other bid items.

1.05 Interpretation of the Contract Documents

DELETE and REPLACE with the following:

If any prospective bidder is in doubt as to the true meaning of any parts of the contract documents, the bidder may request an interpretation from the Engineer, through the Purchasing Division. Any interpretation of the contract documents will be made only by an addendum delivered through the Jurisdiction’s bidding website to each prospective bidder who received, or in the future requests, contract documents from the Jurisdiction.

1.06 Addendum

DELETE and REPLACE with the following:

Each bidder will receive a notice of addendum for any changes in the contract documents made prior to the time established for the receipt of bids. The notice will be delivered in the manner chosen by the Jurisdiction to the email address provided by the bidder with an acknowledgement of receipt required. Acknowledgement of the receipt of the addendum will be as provided on the Jurisdiction’s bidding website.

1.09 Preparation of the Proposal

A. DELETE and REPLACE with the following:

Proposal: The bidder shall execute all required documents as provided on the Jurisdiction’s bidding website.

B. DELETE.

1.11 Irregular and Nonresponsive Proposals

A. DELETE and REPLACE with the following :

Proposals will be considered irregular and may be rejected for any of the following reasons:

1. If submitted in any way other than through the Jurisdiction's bidding website;
2. If the bidder submits an obviously unbalanced bid. An unbalanced bid shall be defined as a bid containing lump sum prices or unit bid prices that do not reflect reasonable actual costs plus a reasonable proportionate share of the bidder's anticipated profit, overhead costs, and other indirect costs to complete that item;
3. If the proposal does not contain a unit price for each pay item listed, except in the case of authorized alternate pay items; or
4. If the bidder submits more than one proposal for the same work under the same or different names.

B. Proposals will be considered nonresponsive and shall be rejected for any of the following reasons:

4. DELETE.

1.12 Submission of the Proposal, Identity of Bidder and Bid Security

A. DELETE and REPLACE with the following:

Follow the instructions on the Jurisdiction's bidding website for submittal of the proposal.

1.13 Withdrawal or Revision of the Proposal Prior to Opening of Proposals

DELETE and REPLACE with the following:

Follow the instructions on the Jurisdiction's bidding website for withdrawal or revision of a submitted proposal prior to the time set for receiving proposals. Modifications or corrections to a proposal will not be accepted if the modifications or corrections render the bid security inadequate or if not accompanied by sufficient additional bid security.

1.14 Opening of Proposals

DELETE and REPLACE with the following:

The Jurisdiction's bidding website will unseal all submitted bids at the time set forth in the notice to bidders. A physical bid opening will not be held.

Section 1040 – Scope of Work

1.06 Increase or Decrease of Work

ADD the following:

- D. Contractor is responsible for notifying the Engineer of increased work that will accumulate additional cost. If cost is not agreed upon in advance of the work being completed, no additional payment will be made.

1.07 Change Orders

ADD the following:

- C. The Contractor shall not proceed with additional work until the Contractor and the Jurisdiction have agreed upon terms and approval has been given. All documentation needed for finalizing the change order, including final quantities, will be given to the Jurisdiction no later than 30 days after the change order work has been completed. Failure to do so will result in the Contractor's forfeiture of payment.

1.09 Changed Site Conditions

B. Compensation:

ADD the following:

- 3. No work that will require additional compensation will be completed prior to executing a change order covering that work.

Section 1070 – Legal Relations and Responsibility to the Public

PART 1 – LEGAL RELATIONS

1.03 Permits and Licenses

DELETE and REPLACE with the following:

The Contractor shall procure all necessary permits for the construction of the work and for temporary excavations, obstructions, enclosures, and street openings arising from the construction and completion of the work described in the contract documents. For Jurisdictional contracts, the cost for all required Jurisdictional permits and licenses will be waived by the Jurisdiction. The Contractor shall be responsible for all violations of the law for any case in connection with the construction of the work or caused by the obstruction of roads, streets, highways, railroads or sidewalks, and shall give all requisite notices to the Jurisdiction or other public authorities in connection therewith.

PART 2 – RESPONSIBILITIES TO THE PUBLIC

2.06 Traffic Control

A. ADD the following:

3. The Contractor shall be responsible for notifying surrounding neighbors of any road closures, as detailed in contract documents.
4. If Jurisdiction deems that more traffic control devices are necessary, the Contractor shall provide at no additional cost.
5. Remove barricades and signage that is no longer needed within 24 hours.

B. Closing Streets to Traffic:

2. DELETE and REPLACE with the following:

The Contractor shall notify the Engineer at least 72 hours in advance (excluding weekends) of closing any roads, streets, or public thoroughfares. No road or street shall be closed without prior approval from the Engineer.

ADD the following:

C. Restricting Parking:

1. The Contractor is responsible for furnishing, installing, maintaining and removing any necessary temporary “No Parking” signage. The following are minimum requirements for the signage and the Engineer may add additional:
 - a. Minimum 12 X 18 sign, red on white, with specific start/stop dates/times.
 - b. Signs to have the tow symbol visible.
 - c. Signs attached to either a 48" grabber with reflective stripes or bolted to the top panel of a type 1 barricade (weighted for wind) so that the sign sticks up above the top panel.

- d. Grabber cone, or similar, are to be placed approximately 20 feet apart along the curb line from end to end.
 - e. Place signs no less than 24 hours ahead of the no parking start time.
 - f. After complete setup, take time/date stamped video or pictures of the entire setup for verification/documentation.
 - g. Check the setup at least once every 24 hours.
2. If towing is needed, the Contractor will contact the Jurisdiction.

2.07 Protection of Aboveground and Underground Facilities

ADD the following:

- E. In an attempt to locate underground facilities through potholing, it is the Contractor's responsibility to properly backfill the area.
 1. If potholing within pavement, provide temporary patch by backfilling the core hole with gradation No. 11 aggregate to the bottom of the existing pavement and filling the remaining void to the top of pavement with a concrete mix or HMA mix, matching surrounding pavement and approved by the Engineer. Size of permanent replacement patch will be determined the Engineer.
 2. If potholing outside pavement, backfill with native soil and compact according to Section 3010 – Trench Excavation and Backfill. Seed and maintain until permanent growth is fully established.
 3. If potholing within sidewalks or pedestrian ramps, remove the affected panels and replace with class C concrete or class M, if approved by the Engineer.

Section 1080 – Prosecution and Progress

1.01 Subletting or Assignment of Contract

C. Subcontracts:

ADD the following:

3. If the Contractor removes a subcontractor for any reason, the Jurisdiction is not responsible for additional costs or schedule changes resulting from replacing the subcontractor.

END OF DIVISION

DIVISION 2 – EARTHWORK

Section 2010 – Earthwork, Subgrade and Subbase

PART 1 – GENERAL

1.03 Submittals

DELETE and REPLACE with the following:

Submit results of Modified Proctor and in-place density tests on compactions when required.

1.08 Measurement and Payment

D. Topsoil:

1. On-site Topsoil

a. Measurement:

DELETE and REPLACE with the following:

Measurement will be in cubic yards of topsoil stripped, salvaged, stockpiled and re-spread, and will be computed on the basis of a uniform finished thickness as specified.

3. Off-site Topsoil

a. Measurement:

DELETE and REPLACE with the following:

Measurement will be in square yards for furnishing, excavating, hauling and placing the material, and will be computed on the basis of a uniform 4-inch thickness, or as specified.

b. Payment:

DELETE and REPLACE with the following:

Payment will be at the unit price per square yard.

E. Class 10, Class 12 or Class 13 Excavation:

3. Includes, but not limited to:

e. ADD the following:

The Jurisdiction is responsible for compaction testing, unless otherwise specified in the contract documents. The Contractor will be responsible for payments associated with all retesting from failure of initial tests.

PART 2 – PRODUCTS

2.04 Foundation Materials

B. Granular Stabilization Materials:

ADD the following:

3. Any use of crushed concrete must be approved by the Engineer.

D. Subbase:

3. Modified Subbase

DELETE AND REPLACE with the following:

- b. The use of crushed concrete will not be allowed for modified subbase.

PART 3 – EXECUTION

3.03 Stripping, Salvaging and Spreading Topsoil

A. Stripping and Salvaging Topsoil

2. DELETE and REPLACE with the following:

Remove an adequate amount of topsoil from existing on-site topsoil to allow finish grading with a finished grade of a minimum 4 inches of salvaged or amended topsoil. The topsoil may be moved directly to an area where it is to be used, or may be stockpiled for future use.

C. Topsoil Spreading and Finish Grading

2. DELETE and REPLACE with the following:

Place topsoil at least 4 inches deep; smooth and finish grade according to the contract documents. If topsoil is being amended with compost, thoroughly blend compost with on-site topsoil at the rate specified in Section 2010, 2.01.

3.04 Embankment Construction

B. Site Preparation

ADD the following:

3. Embankments not to be built on frozen earth.

3.06 Subgrade Preparation

A. Uniform Composition:

4. DELETE and REPLACE with the following:

Construct to elevation and cross-section such that, after rolling, surface will be 0.1 feet to 0.2 feet above the required final subgrade elevation.

B. Final Subgrade:

DELETE and REPLACE with the following:

Complete final subgrade by excavation to grade by use of an automatically-controlled subgrade excavation machine. Final subgrade must be a uniformly planed surface without bumps or depressions.

3.08 Subbase

C. REMOVE this section.

3.09 Field Quality Control

B. Moisture Content and Density:

2. DELETE and REPLACE with the following:
Compact cohesive soils to no less than 90% of maximum Modified Proctor Density;
and cohesionless soils to no less than 70% of Relative Density.

C. Testing:

1. DELETE and REPLACE with the following:
Lab Test: Determine laboratory density of material according to ASTM D1557 or
AASHTO T-180 (Modified Proctor Density) or ASTM D4253 and ASTM D4254
(Maximum and Minimum Index Density for Cohesionless Soils). Provide at least one
analysis for each material type used unless provided by the Engineer.

END OF DIVISION

DIVISION 3 – TRENCH AND TRENCHLESS CONSTRUCTION

Section 3010 – Trench Excavation and Backfill

PART 1 – GENERAL

1.08 Measurement and Payment

B. Rock Excavation

1. DELETE and REPLACE with the following:

Measurement: Measurement will be by cubic yards of rock removed. The maximum allowable trench width as shown on Figures 3010.102, 3010.103 and 3010.104 will be utilized when determining the quantity. No additional compensation will be provided for over-excavation.

PART 2 – PRODUCTS

2.05 Stabilization (Foundation) Materials

- C. REMOVE this section

PART 3 – EXCAVATION

3.01 Trench Excavation

B. Final Trench Backfill

DELETE and REPLACE with the following:

Remove all topsoil and stockpile

3.05 Pipe Bedding and Backfill

E. Final Trench Backfill

5. DELETE and REPLACE with the following:

In areas to remain unpaved, terminate backfill material 4 inches below finished grade. Use topsoil for the final 4 inches above trench backfill material.

6. DELETE and REPLACE with the following:

Terminate backfill material 2 feet below subgrade elevation in areas to be paved.

END OF DIVISION

DIVISION 4 – SEWERS and DRAINS

Section 4010 – Sanitary Sewers

PART 1 – GENERAL

1.08 Measurement and Payment

E. Sanitary Sewer Service Stub

DELETE statement and REPLACE with the following statement:

The portion of the sanitary sewer service from the main to the property line or to the property side of the utility easement, whichever is further, or as specified in the contract documents (comply with Figure BETT4010.201).

F. Sanitary Sewer Service Stub

3. Includes:

DELETE statement and REPLACE with the following statement:

Unit price includes, but is not limited to, removal of existing pipe, trench excavation, furnishing new pipe and bedding material, furnishing and installing all necessary fittings, placing and compacting bedding and backfill material, connection back to existing service, compaction, testing and inspection.

PART 2 – PRODUCTS

2.01 Sanitary Sewer Gravity Mains

A. Solid Wall Polyvinyl Chloride Pipe (PVC) 8 inch to 15 inch

DELETE statement and REPLACE with the following statement:

1. Comply with ASTM D 3034, SDR 26.
2. Pipe stiffness per ASTM D 2412
 - a. SDR 26: Minimum pipe stiffness of 115 psi

DELETE:

- B. Solid Wall Polyvinyl Chloride Pipe (PVC) 18 inch to 27 inch
- C. Corrugated Polyvinyl Chloride Pipe (PVC) 8 inch to 36 inch
- D. Closed Profile Polyvinyl Chloride Pipe (PVC) 21 inch to 36 inch

G. Ductile Iron Pipe (DIP) 8 inch to 54 inch

3. General :

ADD the following:

- c. Minimum laying length of pipe shall be 18 feet.

2. Interior Linings:

DELETE statement and REPLACE with the following statement:

- b. Use linings specifically designed for sanitary sewer applications, such as cement lined. Other lining types may be allowed upon approval of the Engineer.

H. Vitrified Clay Pipe (VCP) 8 inch to 42 inch

ADD the following:

4. By approval of the Engineer only

DELETE:

- I. Double Walled Polypropylene Pipe 12 inch to 30 inch
- J. Triple Walled Polypropylene Pipe (30 inch to 36 inch)

2.02 Sanitary Sewer Force Mains

ADD the following:

G. Sanitary Sewer Gravity Main, Trenchless

1. Material shall be SDR-18 CERTA-LOC Pipe or Engineer approved equal.

2.04 Sanitary Sewer Services

- E. The use of any saddle wye or saddle tee must be approved by the Engineer.

PART 3 – EXECUTION

3.02 Gravity Sewer Installation

B. Trenched

DELETE statement and REPLACE with the following statement:

3. Lay pipe to design line and grade. Set field grades to invert of pipes. The use of a pipe laser is required.

3.06 Sanitary Sewer Service Stubs:

- C. DELETE statement and REPLACE with the following statement.

Install service stub from sewer main to the property line or to the property side of the utility easement, whichever is further, or as specified in the contract documents. Comply with Figure BETT4010.201

3.10 Sanitary Sewer Cleanout

ADD the following:

Unless approved by the Engineer, cleanouts are not allowed on sanitary sewer mains. Figure 4010.203 is only applicable to sanitary sewer services.

3.12 Conflicts

ADD the following:

E. Sewer Main Crossing Granular Envelope

Install a granular (Gradation 3) envelope where all sanitary and storm sewers cross. The area shall be the width of both trenches extending from the top of the lower pipe to the invert of the upper pipe.

FIGURES

REPLACE Figure 4010.201 with Figure **BETT4010.201**.

SECTION 4020 – Storm Sewers

PART 1 – MEASUREMENT AND PAYMENT

1.08 Storm Sewers

D. Removal of Storm Sewer:

1. DELETE and REPLACE with the following:
Measurement: Pipe removal will be measured in linear feet from end to end regardless of pipe size, unless specified in the contract documents.

PART 2 – PRODUCTS

2.02 Storm Sewers

A. Reinforced Concrete Pipe (RCP):

3. DELETE and REPLACE with the following:
Use rubber O-ring joints complying with ASTM C 443.

B. Reinforced Concrete Arch Pipe (RCAP):

3. DELETE and REPLACE with the following:
Use rubber O-ring joints complying with ASTM C 443.

C. Reinforced Concrete Elliptical Pipe (RCEP):

3. DELETE and REPLACE with the following:
Use rubber O-ring joints complying with ASTM C 443.

L. Polypropylene Pipe:

- DELETE and REPLACE with the following:
1. Comply with the following for 12 inch to 60 inch pipe:
 - a. Double walled pipe meeting ASTM F 2881.
 - b. Integral bell and spigot joint complying with ASTM D 3212 and ASTM F 477

2.05 Pipe Aprons

DELETE and REPLACE with the following:
All pipe aprons must be concrete. Supply concrete pipe aprons according to Figure BETT4030.222 and Figure BETT4030.223. All storm sewer connected to pipe aprons must be reinforced concrete pipe to the nearest structure. Tie apron and next joint with pipe connectors.

PART 3 – EXECUTION

3.02 Pipe Installation

A. General

2. DELETE and REPLACE with the following:
Begin at the lowest point in the line. Lay groove or bell end pointing upstream unless otherwise specified. The use of a pipe laser is required.

3.05 Pipe Jointing

E. Connections between Dissimilar Pipes:

Add the following:

3. The use of adapters or couplings shall only be allowed for repairs. For new construction, pipe of dissimilar materials will not be allowed between structures.

3.08 Conflicts

ADD the following:

D. Sewer Main Crossing Granular Envelope

Install a granular (Gradation 3) envelope where all sanitary and storm sewers cross. The area shall be the width of both trenches extending from the top of the lower pipe to the invert of the upper pipe.

SECTION 4030 – PIPE CULVERTS

PART 1 – GENERAL

1.08 Measurement and Payment

B. Pipe Aprons

3. DELETE and REPLACE with the following:
Includes: Unit price includes, but is not limited to, trench excavation; dewatering; furnishing and installing pipe apron, furnishing all reinforcing steel and concrete and installing pipe apron footing when required for concrete pipe; furnishing, placing, and compacting bedding and backfill material; pipe connectors and other appurtenances.

C. Footings for Concrete Pipe Aprons:

DELETE this section.

FIGURES

REPLACE Figure 4030.221 with Figure **BETT4030.221**

REPLACE Figure 4030.222 with Figure **BETT4030.222.**

REPLACE Figure 4030.223 with Figure **BETT4030.223.**

SECTION 4040 – SUBDRAINS AND FOOTING DRAIN COLLECTORS

PART 1 – GENERAL

1.08 Measurement and Payment

A. Subdrains:

3. DELETE and REPLACE with the following:

Includes: Unit price includes, but is not limited to, trench excavation, pipe, furnishing and placing bedding and backfill material, engineering fabric (when specified), connectors, elbows and tees. This item shall also include all outlets and connections to structures which will include, but is not limited to, pipe, non-shrink grout, coupling bands, and rodent guards for pipes 6 inches or smaller.

B. Footing Drain Collectors

3. DELETE and REPLACE with the following:

Includes: Unit price includes, but is not limited to, trench excavation, pipe, wyes, tap, fittings and furnishing and placing bedding and backfill material; This item shall also include all outlets and connections to structures which will include, but is not limited to, pipe, non-shrink grout, coupling bands, and rodent guards for pipes 6 inches or smaller.

D. Subdrain or Footing Drain Outlets and Connections:

DELETE this section.

PART 2 – PRODUCTS

2.01 Footing Drain Collectors

Add the following:

E. Corrugated Polyethylene Tubing and Fittings (Corrugated PE):

1. Comply with AASHTO M252, Type C, corrugated interior and exterior.
2. Use only fittings supplied or recommended by pipe manufacturer for soil tight service.
3. Slot or perforate according to AASHTO M252, Type CP.

PART 3 – EXECUTION

3.01 Subdrains

- A. Install Type 1 or Type 2 subdrain where specified in the contract documents. Comply with figure 4040.231.**

Add the following:

7. Install erosion barrier behind back of curb

FIGURES

REPLACE Figure 4040.231 with Figure **BETT4040.231**

ADD Figure **BETT4040.234**.

SECTION 4050 – PIPE REHABILITATION

PART 1 – GENERAL

1.07 Special Requirements

C. DELETE and REPLACE with the following:

Unless otherwise specified, the Contractor will coordinate the use of fire hydrants with Iowa American Water Company (IAWC). Portable water meters with proper backflow prevention devices are required for use of water from all fire hydrants. IAWC will supply the RPZ backflow preventer and the meter to the Contractor. The Contractor must also notify both the City of Bettendorf's Fire Department and IAWC as to the location of meters. The use of fire hydrants is restricted to authorized personnel only. IAWC must be present and given twenty four (24) hours' notice when meters are to be moved. Per IAWC, the Contractor may be responsible to install a protective locked box over the fire hydrant, RPZ valve and meter being used at all times during the course of the program. The Contractor shall be responsible for all coordination, deposits, permits and associated fees, rental charges and charges for the volume of water used.

1.08 Measurement and Payment

A. DELETE and REPLACE with the following:

Pipe lining:

1. Measurement: Each type and size of pipe lining will be measured in linear foot along the centerline of the pipe lining from center of manhole to center of manhole.
2. Payment: Payment will be made at the unit price per linear foot for each type and size of pipe lining.
3. Include: Unit price includes installation of the finished liner, including preparatory cleaning and televising of sewers, manhole cleaning, removal and disposal of all debris, bypass pumping, transportation of the flexible liner and resin impregnation system, sealing at manhole walls, leakage testing, CIPP sample testing and post-insertion televising, all in accordance with the liner manufacturer's recommendations and all costs associated with the public information and notification system as well as coordinating confined space entry and inspection with the Jurisdiction.

B. DELETE and REPLACE with the following:

Building Sewer Service Reconnection:

1. Measurement: Each active existing building sanitary sewer service reconnected to the pipe lining, including the services reconnected by excavating and reconnecting services or by trenchless reconnection methods, will be counted.
2. Payment: Payment will be made at the unit price for each reconnection.
3. Includes: Unit price includes, but is not limited to removal of internal obstructions and debris, identifying and re-establishing all live laterals, discerning between live

and abandoned laterals and all cost associated with the public information and notification program.

ADD the following:

D. Protruding Laterals, Cut:

1. Measurement: Each protruding lateral cut will be counted.
2. Payment: Payment will be made at the unit price for each protruding lateral that is cut.
3. Includes: Unit price includes cutting off obstructions and removal of any and all debris from the pipe.

E. Identify and Re-establish Live Laterals:

1. Measurement: Each re-established lateral will be counted.
2. Payment: Payment will be made at the unit price for each re-established lateral.
3. Includes: Unit price includes, but is not limited to, identifying which laterals are live prior to lining and re-establishing flow through the live laterals.

PART 2 – PRODUCTS

2.08 Pipe Repair Couplings for Spot Repairs by Pipe Replacement

C. Materials and Manufacturer :

ADD the following:

5. All repair couplings to have stainless steel shear rings.

PART 3 – EXECUTION

3.01 Examination

B. Video Inspection:

ADD the following:

3. Follow National Association of Sewer Service Companies (NASSCO) requirements.
4. Weekly updates of field issues and televised lines from the Contractor are required for pipe lining.

C. Service and Obstruction Location:

ADD the following:

3. The responsibility for re-establishing only live laterals, all live laterals, and **no** abandoned ones rests with the Contractor, regardless of any information in the plans or specifications.

3.03 Obstructions

ADD the following:

- D. Remotely cut off all protruding laterals to within one inch or less of the interior wall of the existing pipe using a robotic-type cutting device.

3.09 Cleanup and Closeout

ADD the following:

- D. Any damage to the sewer and/or surrounding surface caused by the opening of an abandoned sewer lateral shall be the responsibility of the Contractor to correct at their own expense.

SECTION 4060 – CLEANING, INSPECTION AND TESTING OF SEWERS

PART 1 – GENERAL

1.07 Special Requirements

DELETE and REPLACE with the following:

Comply with National Association of Sewer Service Companies (NASSCO) requirements for all televising.

PART 3 – EXECUTION

3.02 Video Inspection

A. General:

1. DELETE and REPLACE with the following:

For Jurisdiction projects, unless otherwise specified in the contract documents, conduct video inspection of all new, rehabilitated and lined sanitary and storm sewers after all backfill, compaction operations, paving and testing have been completed.

For private projects, the Jurisdiction will conduct video inspection after all backfill, compaction operations, paving and testing have been completed.

ADD the following:

5. If any section fails, requiring the removal of pavement, pavement removal limits will be at existing joints.

B. Inspection Procedure:

ADD the following:

6. Follow all NASSCO/PACP guidelines for pipe inspection

C. Inspection Reporting:

ADD the following:

1. Follow all NASSCO/PACP guidelines for inspection reporting.

END OF DIVISION

DIVISION 5 – WATER MAINS AND APPURTENANCES

Section 5010 – Pipe and Fittings

PART 1 – GENERAL

1.07 Special Requirements

DELETE and REPLACE with the following:

The Iowa American Water Standard Specifications for Water Main Construction, Current Edition,
supersedes SUDAS Section 5010.

Section 5020 – Valves, Fire Hydrants and Appurtenances

PART 1 – GENERAL

1.07 Special Requirements

DELETE and REPLACE with the following:

The Iowa American Water Standard Specifications for Water Main Construction, Current Edition,
supersedes SUDAS Section 5020.

Section 5030 – Testing and Disinfection

PART 1 – GENERAL

1.07 Special Requirements

DELETE and REPLACE with the following:

The Iowa American Water Standard Specifications for Water Main Construction, Current Edition,
supersedes SUDAS Section 5030.

END OF DIVISION

DIVISION 6 – STRUCTURES FOR SANITARY AND STORM SEWERS

Section 6010 – Structures for Sanitary and Storm Sewers

PART 1 – GENERAL

1.08 Measurement and Payment

D. Casting Extension Rings:

2. Payment

DELETE and REPLACE with the following:

Payment will be incidental to manholes, intakes, and manhole or intake adjustments.

H. Remove Manhole or Intake:

2. Remove Manhole

c. DELETE and REPLACE with the following

Includes: Unit price includes, but is not limited to, removal of structure and casting, plugging pipes and placing compacted fill to the planned finished grade.

3. Remove Intake

d. DELETE and REPLACE with the following

Includes: Unit price includes, but is not limited to, removal of structure and casting, plugging pipes and placing compacted fill to the planned finished grade.

PART 2 – PRODUCTS

2.07 Base

C. Intake:

DELETE and REPLACE with the following:

Use **cast-in-place** concrete base only. Precast will not be allowed unless approved by the Engineer prior to construction.

2.08 Pipe Connections

B. Non-Shrink Grout:

DELETE and REPLACE with the following:

Use must be approved by the Engineer.

D. Concrete Collar:

DELETE and REPLACE with the following:

Comply with Section 6010, 2.02 and 2.03. Use must be approved by the Engineer for sanitary sewer applications.

2.09 Manhole or Intake Adjustment Rings (Grade Rings)

A. Use of the following materials for grade adjustments of manhole or intake frame and cover assemblies:

1. DELETE and REPLACE with the following:
Reinforced Concrete Adjustment Rings: Comply with ASTM C 478. Provide rings free from cracks voids, and other defects. Rings to be tongue and groove, interlocking grade rings.
2. High Density Polyethylene Adjustment Rings: Comply with ASTM D 1248 for recycled plastic
 - e. ADD the following:
Use must be approved by the Engineer.
3. Expanded Polypropylene Adjustment Rings: Comply with ASTM D 4819 for expanded polypropylene when tested according to ASTM D 2375.
 - d. ADD the following:
Use must be approved by the Engineer.

2.10 Castings (Ring, Cover, Grate, and Extensions)

C. **Composite AASHTO M 306:**

5. ADD the following:
Use must be approved by the Engineer.

F. **Casting Types:**

1. Manholes:

ADD the following:

Use of Figure 6010.601 Type B and Type D by approval of the Engineer.

Use of Figure 6010.602 Type F by approval of the Engineer.

2. Intakes:

- b. DELETE and REPLACE with the following:

Storm sewer casting to include environmental symbols and/or messages such as "DUMP NO WASTE, DRAINS TO RIVER." If not on casting, stamp into boxout if allowed by the Engineer.

2.16 Drop Connection

B. **External:**

2. **Concrete Encasement:** Comply with Section 7010, 2.02.
DELETE this section

PART 3 – EXECUTION

3.01 General Requirements for Installation of Manholes and Intakes

B. Subgrade Preparation:

2. DELETE and REPLACE with the following:

Fill Sections: Compact to 90% of maximum Modified Proctor Density and hand grade to accurate elevation required to place subbase, or install stabilization material as directed by the Engineer.

D. Installation of Manhole or Intake Structure:

DELETE and REPLACE with the following:

Form walls and construction joints for cast-in-place intakes or install precast intake boxes to ensure intake lids are set to match the longitudinal slope of the adjacent street unless otherwise specified in the contract documents.

E. Pipes:

2. DELETE and REPLACE with the following:

Precast Storm Sewer Manholes or Intakes: Construct a concrete collar around the pipe according to Section 6010, 3.05.

F. Joint Sealant:

1. DELETE and REPLACE with the following:

Sanitary Sewer Manholes:

- a. Install rubber O-ring or profile gasket (precast structures).
- b. Apply bituminous jointing material or butyl sealant wrap to exterior of all sanitary sewer manhole joints only when directed by the Engineer.

I. Adjustment Ring(s):

3. DELETE and REPLACE with the following:

Construct manholes and intakes with the following adjustment ring stack heights:

- a. Minimum: 4 inches for new manholes and intakes. No minimum for rehabilitation projects.
- b. Maximum: 16 inches for new manholes and intakes; 24 inches for existing manholes and intakes.

K. Infiltration Barrier:

1. Internal or External Chimney Seal:

- f. ADD the following:
External chimney seal may only be used by approval of the Engineer.

L. Backfill and Compaction:

4. ADD the following:
Backfill intakes per figure BETT 4040.234

3.04 Adjustment of Existing Manhole or Intake

C. Major Adjustment (Adding, Removing or Modifying Riser or Cone Section):

4. DELETE and REPLACE the following:
Install new frame and cover or grate. Existing casting may be reinstalled when specified by the Engineer. Any existing casting not specified to be reused will become property of the Jurisdiction.
6. ADD the following:
Any adjustment that includes dissimilar sections shall use bituminous jointing material or butyl sealant in accordance with Section 6010, 3.01 F (1).

3.06 Drop Connection to Sanitary Sewer Manhole

A. Internal:

10. ADD the following:
Use only when approved by the Engineer

B. External:

3. Place concrete from the base of the manhole to the top of the elbow.
DELETE this section.

3.07 Removal of Manhole or Intake

- A. DELETE and REPLACE with the following:
Unless otherwise specified, remove the structure in its entirety.
- C. Fill remaining structure using flowable mortar:
DELETE this section.
- D. DELETE and REPLACE with the following:
Place compacted backfill as required for embankment or compacted backfill.

FIGURES:

Use of Figures 6010.304-6010.305 allowed only by approval of the Engineer.

REPLACE Figure 6010.307 with Figure **BETT6010.307**.

Use of Figures 6010.404-6010.405 allowed only by approval of the Engineer.

REPLACE Figure 6010.501 with Figure **BETT6010.501**

REPLACE Figure 6010.503 with Figure **BETT6010.503**

REPLACE Figure 6010.505 with Figure **BETT6010.505**

REPLACE Figure 6010.506 with Figure **BETT6010.506**

REPLACE Figure 6010.514 with Figure **BETT6010.514**

ADD Figure **BETT6010.520**

END OF DIVISION

DIVISION 7 – STREETS AND RELATED WORK

Section 7010 – Portland Cement Concrete Pavement

PART 1 – GENERAL

1.08 Measurement and Payment

- B. Air Content Deficiency:
 - DELETE this section
- I. PCC Pavement Samples and Testing:
 - DELETE this section

PART 2 – PRODUCTS

2.01 Materials

- G. Admixtures:
 - 3. DELETE and REPLACE with the following:
Accelerating admixtures: Product shall be non-chloride admixture.
- H. Bars:
 - DELETE and REPLACE with the following:
Comply with Iowa DOT Section 4151 for metallic tie bars and dowel bars or Iowa DOT Section 4156 for glass fiber reinforced polymer dowel bars. Use of glass fiber reinforced polymer dowel bars must be approved by the Engineer. Meet the tie bar requirements for bar mats. All metallic bars must be epoxy coated.
- J. Metal Keyways:
 - DELETE this section

2.02 Concrete Mixes

- A. Mix Design:
 - 1. DELETE and REPLACE with the following:
Unless otherwise specified by the Engineer, all paving mixes shall be C3WR-C15-S20
 - 3. ADD the following:
For all new arterial and collector streets, higher durability mixes (C-SUD or CV-SUD) shall be used unless otherwise specified by the City Engineer
- B. Consistency and Workability:
 - 2. Air Content:
 - a. DELETE and REPLACE with the following:
For machine-placed pavement, use a target air content of 7% with a tolerance of plus or minus 1% when measured on the grade just prior to consolidation, as determined by Iowa DOT Materials I.M. 318. The target air content may be adjusted by the Engineer based on random tests of the consolidated concrete

behind the paving machine. These additional tests will be used to consider the need for a target value change and will not be used in the acceptance decision.

b. DELETE and REPLACE with the following:

For hand-placed pavement, use a target content for hand finish of 6% with a tolerance of plus or minus 1% when measured on the grade and just prior to consolidation, as determined by Iowa DOT Materials I.M. 318.

PART 3 – EXECUTION

3.01 Equipment

C. Concrete Placement Equipment:

1. Consolidating and Finishing Equipment

b. DELETE and REPLACE with the following:

Hand methods utilizing air screeds and vibrating screeds may be used for short pavement runs no greater than 150 feet, cul-de-sacs, driveways, and some intersections.

4. Hand Finishing Equipment

DELETE and REPLACE with the following:

Provide all finishing tools necessary for proper finishing of the concrete including straightedges for checking and correcting finished concrete surfaces. Minimum 10 foot straight edge shall be used.

5. Forms

c. Rigid Forms

2) DELETE and REPLACE with the following:

Bracing, support, and staking must prevent deflection or movement of forms. All support pins must be installed for every piece of form.

3.02 Pavement Construction

B. Final Subgrade / Subbase Preparation:

1. General

b. DELETE and REPLACE with the following:

Trim the subbase to the final grade for placement of concrete. Concrete will not be allowed to be placed on subgrade

c. DELETE and REPLACE with the following:

Unless otherwise ordered by the Engineer, the subbase at time of placing concrete for concrete pavement, must be in a uniformly moist but not muddy condition to a depth of not less than 1 inch.

E. Bar and Reinforcement Placement:

1. Tie Bars:

- a. DELETE and REPLACE with the following:

Place bars prior to vibration. Bars must be supported by approved chairs or baskets, or method approved by the Engineer.

F. Concrete Pavement Placement:

1. DELETE and REPLACE with the following:

Use paving machine for all uniform width pavements 8 1/2 feet or more in width and 150 feet or more in length, unless alternate methods are approved by the Engineer. Screeds and laser guided screeds may be used on short pavement runs up to 150 feet.

9. Stringless Paving

- b. DELETE and REPLACE with the following:

Location and elevation of the finished slab should be verified against grade check hubs at 50 foot intervals and at critical locations, such as intakes and through intersections where grades may be flat. The Engineer may waive these requirements if experience has shown compliance with the design elevations

L. Joint Sealing:

- 1. Timing:**

- c. ADD the following:

Do not route, re-saw, clean or seal any joints that are less than 24 hours old.

N. Form Removal:

- 1. Timing:**

- a. DELETE and REPLACE with the following:

Remove forms after the initial set of the concrete has taken place, but no sooner than 12 hours after placement.

3.03 Pavement Protection

A. Weather Conditions:

- 1. Cold Weather**

b. Protection

- 1) DELETE and REPLACE with the following:

Shut down paving operations in time to comply with protection requirements outlined above. During cold weather, allow more time for finishing and protection. Perform all finishing and covering operations a minimum of 30 minutes prior to sunset. Temperature

restrictions and protection requirements may be modified by the Engineer.

2. Hot Weather

a. General

DELETE and REPLACE with the following:

- 1) During hot weather conditions, the Engineer may restrict concrete placement to early morning or evening hours.
- 2) During hot weather conditions, if at any time the temperature of the concrete reaches 85°F and/or ambient temperature reaches 90°F, the allowable time for concrete to be discharged onto the subbase will be 60 minutes. This will be measured from the time the material is batched at the plant.
- 3) Immediately apply an approved evaporation retarder to the concrete pavement and curbs or increase the surface cure application to 1.5 times the standard specified rate.
- 4) Take special precautions to ensure that the forms and subgrade are sufficiently moist or protected to avoid lowering the water content at the pavement/subgrade interface. In hot weather conditions, moisten the subgrade the evening before operations
- 5) Ensure that the time between placing and curing is minimized and eliminate delays.
- 6) Moisten concrete aggregates that are dry and absorptive
- 7) Use a fog spray to raise the relative humidity of the ambient air if there is a delay in immediately applying the curing compound.
- 8) Minimize solar heat by shading, wetting, or covering concrete chutes or other equipment that comes in contact with plastic concrete.

b. REMOVE this section in its entirety

c. REMOVE this section in its entirety

d. REMOVE this section in its entirety

B. Night Conditions:

DELETE and REPLACE with the following:

Perform all finishing and covering operations prior to 7 pm or 30 minutes prior to sunset, whichever is earlier. Do not commence construction until 7 am. Do not place or finish concrete under artificial light, unless approved by the Engineer

FIGURES

REPLACE Figure 7010.101 with Figure **BETT7010.101**

REPLACE Figure 7010.102 with Figure **BETT7010.102**

REPLACE Figure 7010.103 with Figure **BETT7010.103**

REPLACE Figure 7010.901 with Figure **BETT7010.901**

Section 7020 – Hot Mix Asphalt Pavement

PART 1 - GENERAL

1.08 Measurement and Payment

- I. Fixture Adjustment:
ADD the following:
Comply with corresponding utility requirements for adjusting other appurtenances.

PART 3 – EXECUTION

3.01 HMA Pavement

- A. Preparation of Pavement Foundation:
ADD the following:
Saw cut PCC curb, flag and all other headers to provide a clean vertical face.
Apply a tack coat before each HMA lift and on the vertical face of all headers.
- E. Fixtures in the Pavement Surface:
 - 3. ADD the following:
For smaller fixtures, boxout with a 2 foot by 2 foot concrete panel with 20 inch, epoxy-coated #4 bars.

FIGURES

REPLACE Figure 7020.201 with Figure **BETT7020.201**

Section 7030 – Sidewalks, Shared Use Paths and Driveways

PART 2 – PRODUCTS

2.01 Portland Cement Concrete

- A. DELETE and REPLACE with the following:

Use only Class C concrete with materials complying with Section 7010. Use coarse aggregate of Class 2 durability or better.

2.07 Detectable Warnings

DELETE and REPLACE with the following:

Use manufactured, cast-in-place, detectable warning panels with flanges / trusses, non-slip surface and raised truncated domes. Screw down warning panels will not be allowed. Comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for contrast and dimension requirements.

Acceptable color is Safety Yellow – Federal Standard #33538, or approved equal.

PART 3 – EXECUTION

3.04 PCC Sidewalks, Shared Use Paths and Driveways

C. Finishing

1. Shared Use Paths and Driveways:

ADD the following:

- c. Stamp driveway entrances in a neat, permanent and lasting manner with the year and the name of the person, firm or corporation who laid the driveway entrance. The name plate and location to be approved by the Engineer. If work is not properly stamped, the contractor shall remove the appropriate slab of sidewalk, re-pour it and stamp it.

2. Sidewalks:

ADD the following:

- g. Stamp sidewalks in a neat, permanent and lasting manner with the year and the name of the person, firm or corporation who laid the walk. The name plate to be approved by the Engineer. The walks to be stamped at each end of the property, as near the property line as is feasible, or at each end of any continuous stretch of walk exceeding 10 feet in length. Remove the appropriate slabs, re-pour and stamp if the work is not properly stamped.

F. Jointing

4. Isolation Joints:

- a. ADD the following:

Include an isolation joint at property lines.

3.07 Detectable Warning Installation

B. Brick Pavers:

DELETE.

3.10 Cleaning

ADD the following:

- D. Clean concrete and curing compound from detectable warning surfaces and remove protective plastic covering.

7040 – Pavement Rehabilitation

PART 1 – GENERAL

1.08 Measurement and Payment

G. Milling

3. Includes:

ADD the following:

Include edge sections that cannot be reached by the milling machine.

PART 3 – EXECUTION

3.01 General

B. DELETE.

C. ADD the following:

Partial width full depth patches by approval of the Engineer.

D. ADD the following:

Unless otherwise directed by the Engineer.

3.02 Full Depth Patching

A. Pavement Removal:

ADD the following:

3. If patching is due to trench work, remove at least 1 foot from edge of trench to edge of pavement.

C. Placing PCC Patches:

4. Placing, Consolidating and Finishing the Concrete:

a. DELETE and REPLACE with the following:

Moisten the subbase or subgrade.

g. ADD the following:

Broom or drag finish if adjacent pavement texture is non-existent.

3.05 Milling

ADD the following:

I. Thoroughly clean milled surface to allow the Engineer to properly mark out patching areas.

J. Saw cut milled edges to provide a clean vertical face along curblines and headers.

FIGURES

REPLACE Figure 7040.101 with Figure **BETT7040.101**

Section 7080 – Permeable Interlocking Pavers

PART 1 – GENERAL

1.07 Special Requirements

- B. Test Section:
DELETE.

FIGURES

REPLACE Figure 7080.101 with Figure **BETT7080.101**

END OF DIVISION

DIVISION 8 – TRAFFIC CONTROL

Section 8020 – Pavement Markings

PART 3 – EXECUTION

3.02 Construction

H. Removal of Pavement Markings:

2. Process:

d. DELETE and REPLACE with the following:

Removal of pavement markings may be performed by high pressure water blasting only. The use of other methods including vacuum blasting, vacuum dry grinding, wet grinding, or shot blasting must be approved by the engineer. Open abrasive blasting or dry grinding without containment is not allowed.

Section 8030 – Temporary Traffic Control

PART 3 – EXECUTION

1.08 Measurement and Payment

A. Temporary Traffic Control:

3. DELETE and REPLACE with the following:

Includes: Lump sum price includes, but is not limited to, installation, maintenance, and removal of temporary traffic control; total roadway closures with installation and removal of detour signing as shown in the contract documents; removal and reinstallation or covering of permanent traffic control devices that conflict with the temporary traffic control plan; monitoring and documenting traffic control conditions; and flaggers or automated flagger assistance devices (AFAD). When required in the contract documents, the following are also included in traffic control unless a separate bid item is provided: additional signage as required by the Engineer, portable dynamic message signs, temporary barrier rail, temporary flood lighting, and pilot cars.

Section 8040 – Traffic Signs and Posts

PART 1 – GENERAL

1.08 Measurement and Payment

C. Wood Posts:

2. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

D. Perforated Square Steel Tube Posts:

2. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

E. U-Shaped Rail Steel Posts:

2. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

F. Round Steel Posts:

2. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

G. Perforated Square Steel Tube Post Anchors:

2. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

H. Round Steel Post Anchors:

3. DELETE and REPLACE with the following:

Payment: Payment will be incidental to the Traffic Signs By Each pay item.

PART 2 – PRODUCTS

2.03 Posts

A. Wood Posts:

DELETE and REPLACE with the following:

Comply with Iowa DOT Section 4164.04 for treated 4 inch by 4 inch posts. Use of this item must be approved by the Engineer.

B. U-Shaped Rail Steel Posts:

DELETE and REPLACE with the following:

3.0 pounds per foot, conforming with ASTM A 499, Grade 60. Punch or drill 3/8 inch diameter holes on the centerline, spaced 1 inch on center, starting 1 inch from the top and extending to the bottom of the post. Use of this item must be approved by the Engineer.

D. U-Shaped Rail Steel Posts:

DELETE and REPLACE with the following:

Minimum 2 3/8 inch diameter round 16 gauge galvanized steel with 0.06 inch minimum wall thickness. Furnish anchors 2 3/8 inch diameter 12 gauge galvanized steel with 0.10 wall thickness. Use of this item must be approved by the Engineer.

END OF DIVISION

DIVISION 9 – SITE WORK AND LANDSCAPING

Section 9010 – Seeding

PART 1 – GENERAL

1.08 Conventional Seeding

DELETE and REPLACE with the following:

- A. Seeding, Fertilizing, and Mulching for Conventional Seeding:
 - 1. Measurement: Measurement will be in acres for each type of seed.
 - 2. Payment: Payment will be in unit price per acre for each type of seed.
 - 3. Includes: Unit price includes, but is not limited to, removal of rock and other debris from the area; repairing rills and washes; preparing the seedbed; furnishing and placing seed, including any treatment required; furnishing and placing fertilizer and mulch; and furnishing water and other care during the care period, unless these items are bid separately.

- D. Watering:

DELETE and REPLACE with the following:

 - 1. Watering will be considered incidental to all Seeding, Fertilizing and Mulching for Conventional Seeding, Hydraulic Seeding and Pneumatic Seeding.

Section 9020 – Sodding

PART 3 – EXECUTION

3.06 Maintenance

- B. Maintenance of sodded areas includes:

DELETE the following:

 - 3. Mowing

Section 9040 – Erosion and Sediment Control

PART 1 – GENERAL

1.08 Measurement and Payment

- D. Filter Socks:
 - 1. Installation:
 - c. DELETE and REPLACE with the following:

Includes: Unit price includes, but is not limited to, anchoring stakes and removal which includes, but is not limited to, restoration of the area to finished grade and off-site disposal of filter socks and accumulated sediment.

2. Removal:
DELETE this section.

F. Wattles:

1. Installation:
 - c. DELETE and REPLACE with the following:
Includes: Unit price includes, but is not limited to, anchoring stakes and removal which includes, but is not limited to, restoration of the area to finished grade and off-site disposal of wattle and accumulated sediment.
2. Removal:
DELETE this section.

N. Silt Fence or Silt Fence Ditch Check:

1. Installation:
 - c. DELETE and REPLACE with the following:
Includes: Unit price includes, but is not limited to, anchoring posts, removal of sediment which includes, but is not limited to, dewatering and removal and offsite disposal of accumulated sediment and removal which includes, but is not limited to, restoration of the area to finished grade and off-site disposal of fence, posts, and accumulated sediment
2. Removal of Sediment:
DELETE this section.
3. Removal of Device:
DELETE this section.

P. Dust Control:

1. Water for dust control:
 - a. DELETE and REPLACE with the following:
Measurement: Measurement will be per application which includes a sufficient quantity of material necessary to control the dust.
 - b. DELETE and REPLACE with the following:
Payment: Payment will be at the unit price per each application

T. Inlet Protection Device:

1. Installation:
 - c. DELETE and REPLACE with the following:
Includes: Unit price includes, but is not limited to, removal of the device upon completion of the project and maintenance which includes, but is not limited to, removal and off-site disposal of accumulated sediment.
2. Maintenance:

DELETE this section.

W. Linear Erosion Control:

1. Installation:

c. DELETE and REPLACE with the following:

Includes: Unit price includes, but is not limited to, anchoring posts and anchoring stakes and removal which includes, but is not limited to, restoration of the area to finished grade and off-site disposal of fence, filter socks, wattles, anchoring posts, anchoring stakes, and accumulated sediment.

2. Removal:

DELETE this section.

END OF DIVISION

DIVISION 11 – MISCELLANEOUS

Section 11010 – Construction Survey

PART 3 – EXECUTION

3.03 Construction Staking

C. Pipe Culverts:

4. ADD the following:

Provide grade sheets that include pipe type, slope, linear footage, invert elevation and any other relevant information.

D. Sanitary and Storm Sewers:

6. ADD the following:

Provide grade sheets that include pipe type, slope, linear footage, invert elevation and any other relevant information.

F. Paving:

2. Stringless Paving:

e. ADD the following:

Location and elevation of the finished slab should be verified against grade check hubs at 50 foot intervals and at critical locations, such as intakes and through intersections where grades may be flat. The Engineer may waive these requirements if experience has shown compliance with the design elevations

Section 11030 – Temporary Services During Construction

PART 1 – GENERAL

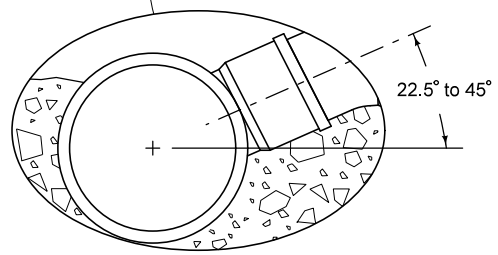
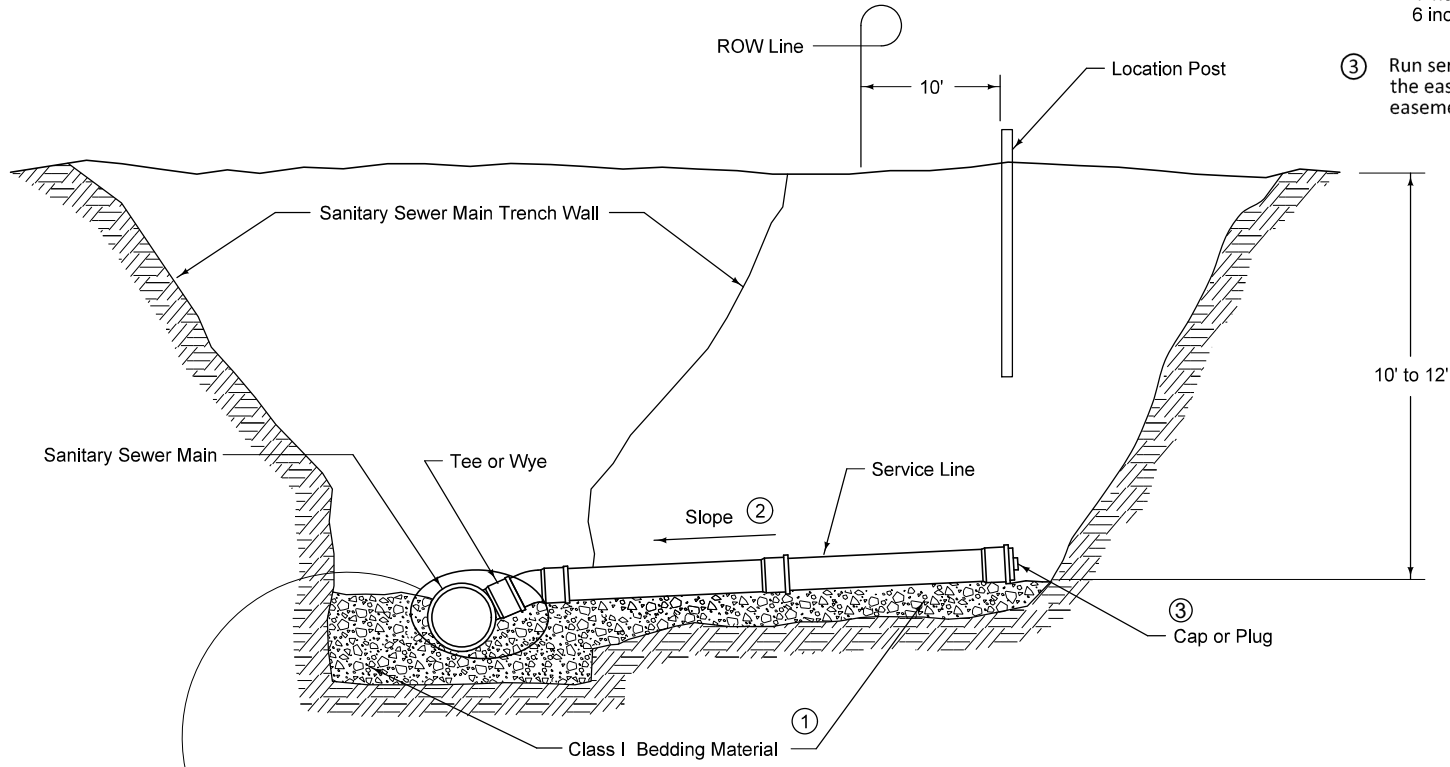
1.07 Special Requirements

A. ADD the following:

When the proposal form does not include a bid item for temporary services during construction, all costs incurred by the contractor for these items are incidental to other work and no separate payment will be made.

END OF DIVISION

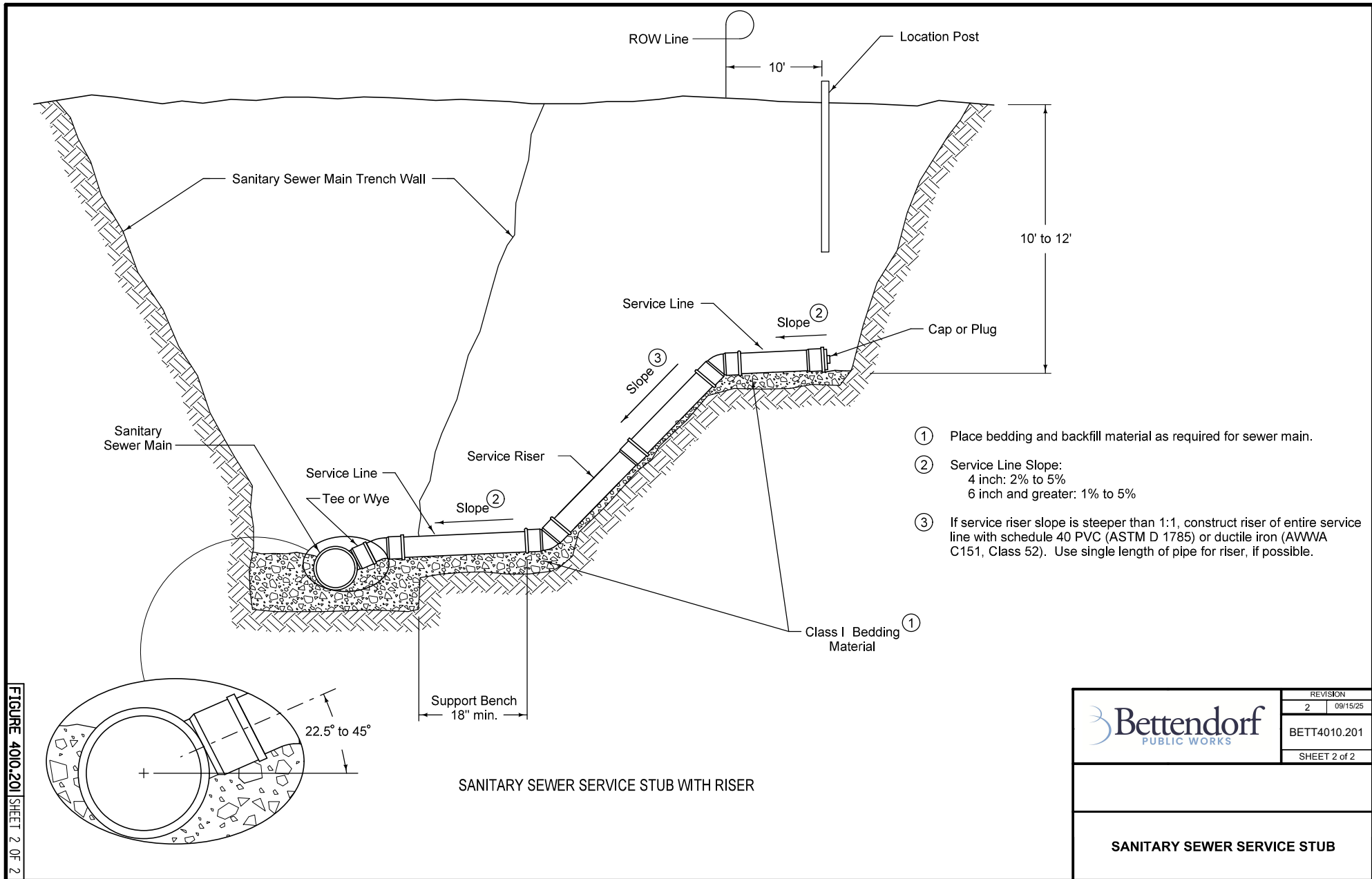
- ① Place bedding and backfill material as required for sewer main.
- ② Service Line Slope:
4 inch: 2% to 5%
6 inch and greater: 1% to 5%
- ③ Run service line to the property side of the easement or the property line if no easement exists.



SANITARY SEWER SERVICE STUB

FIGURE 400.201 SHEET 1 OF 2

	REVISION	
	2	09/15/25
	BETT4010.201	
SHEET 1 of 2		
SANITARY SEWER SERVICE STUB		

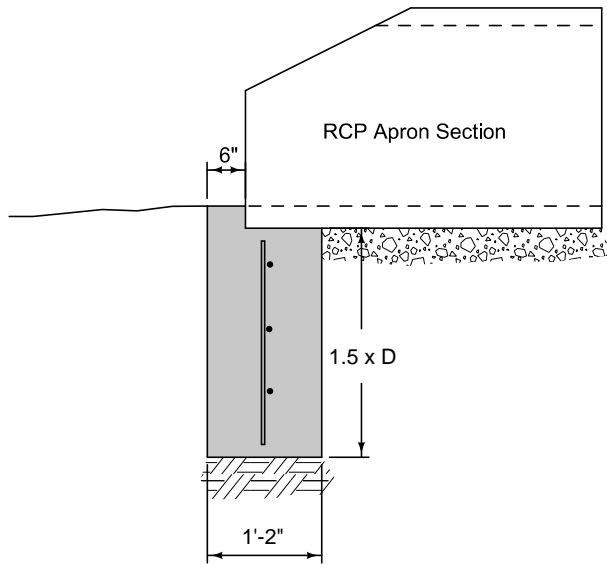


- ① Place bedding and backfill material as required for sewer main.
- ② Service Line Slope:
4 inch: 2% to 5%
6 inch and greater: 1% to 5%
- ③ If service riser slope is steeper than 1:1, construct riser of entire service line with schedule 40 PVC (ASTM D 1785) or ductile iron (AWWA C151, Class 52). Use single length of pipe for riser, if possible.

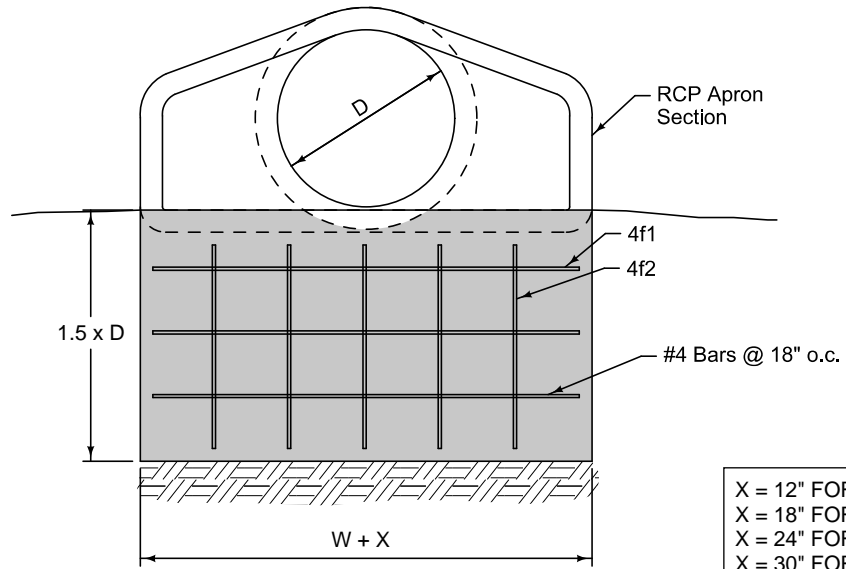
FIGURE 4010.201 SHEET 2 OF 2

	REVISION	
	2	09/15/25
	BETT4010.201	
SHEET 2 of 2		

SANITARY SEWER SERVICE STUB



TYPICAL SECTION



ELEVATION

X = 12" FOR 12" DIA TO 18" DIA
 X = 18" FOR 21" DIA TO 33" DIA
 X = 24" FOR 36" DIA TO 48" DIA
 X = 30" FOR GREATER THAN 48" DIA

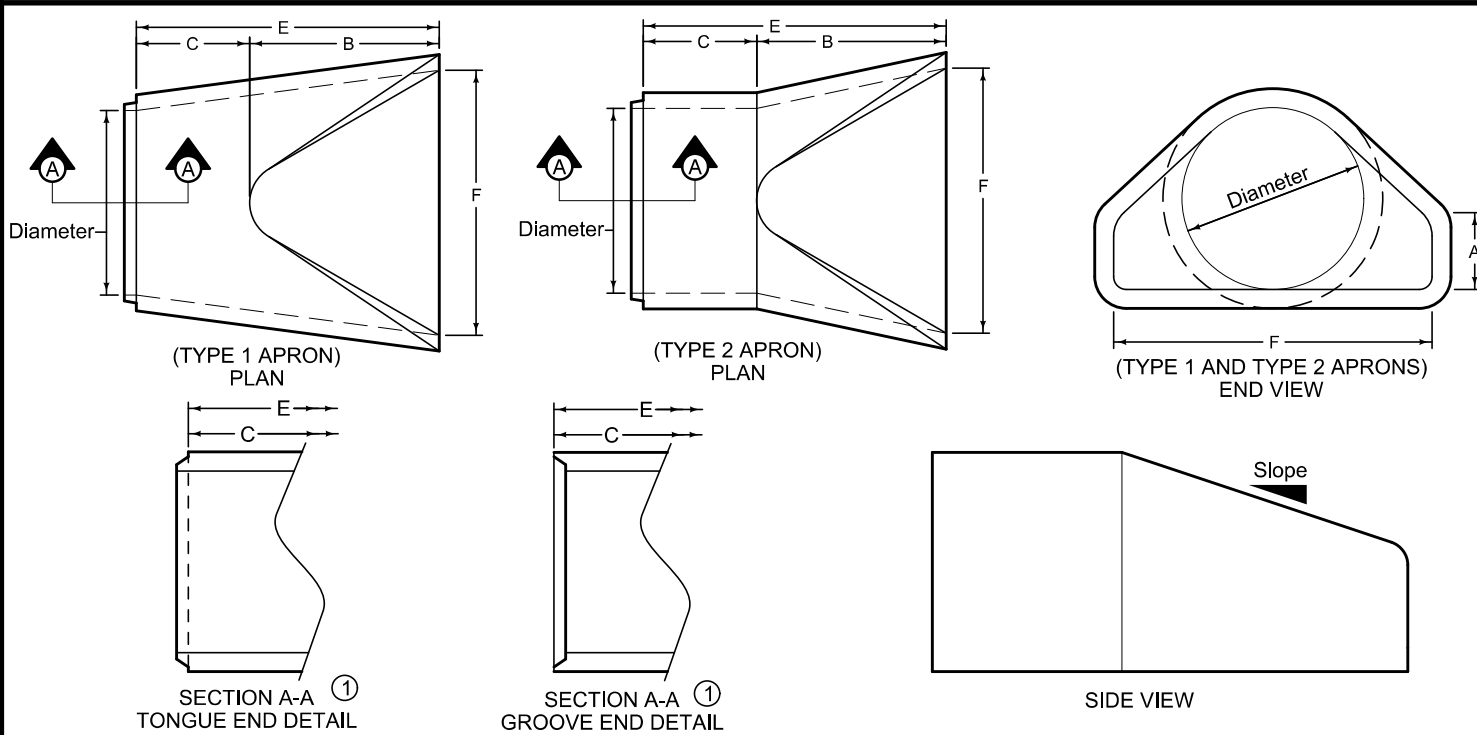
REINFORCING BAR LIST

D	W	Mark	Size	Length	Count
12"	2'-4"	4f1	4	3'-0"	3
		4f2	4	2'-6"	2
15"	2'-10 1/2"	4f1	4	3'-6 1/2"	3
		4f2	4	2'-6"	2
18"	3'-5"	4f1	4	4'-1"	3
		4f2	4	2'-6"	3
24"	4'-6"	4f1	4	5'-8"	3
		4f2	4	2'-6"	3
30"	5'-7"	4f1	4	6'-8"	3
		4f2	4	3'-3"	4
36"	6'-8"	4f1	4	8'-4"	3
		4f2	4	4'-0"	5
42"	7'-3"	4f1	4	8'-11"	3
		4f2	4	4'-9"	5

D	W	Mark	Size	Length	Count
48"	7'-10"	4f1	4	9'-6"	3
		4f2	4	5'-6"	6
54"	8'-5"	4f1	4	10'-7"	3
		4f2	4	6'-3"	6
60"	8'-11"	4f1	4	11'-1"	3
		4f2	4	7'-0"	6
66"	8'-11"	4f1	4	11'-1"	3
		4f2	4	7'-9"	6
72"	10'-0"	4f1	4	12'-2"	3
		4f2	4	8'-6"	7
78"	10'-7"	4f1	4	12'-9"	3
		4f2	4	9'-3"	7
84"	11'-1"	4f1	4	13'-3"	3
		4f2	4	10'-0"	8

FIGURE 4030.221 SHEET 1 OF 1

	REVISION	
	1	06/02/25
	BETT4030.221	
SHEET 1 of 1		
RCP APRON SECTION FOOTING		



Dimension 'E' shown is the minimum and is considered the design length. Adjust for any difference between the actual length of concrete apron installed and the length indicated below for the length of concrete culvert pipe furnished.

- ① Tongue end used on inlet end section. Groove end used on outlet end section.

NOTE:
Tie first two joints with pipe connectors.

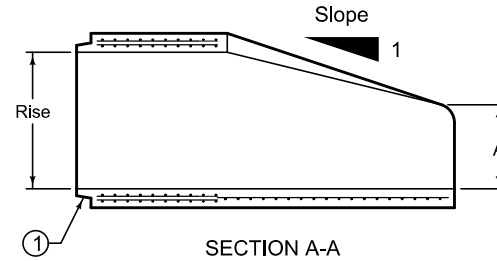
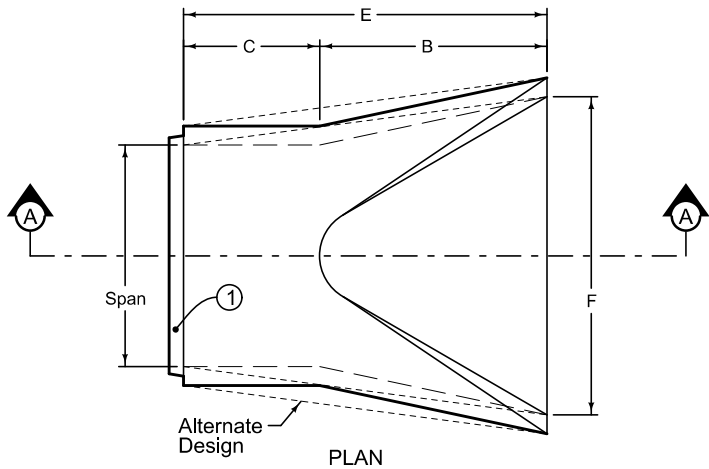
TYPE 1 APRONS						
DIAM.	SLOPE	A	B	MINIMUM		F
				C	E	
12"	2.4:1	4"	2'-0"	4'- $\frac{7}{8}$ "	6'- $\frac{7}{8}$ "	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0"	3'-1 $\frac{1}{2}$ "	6'-1 $\frac{1}{2}$ "	3'-5"
24"	2.5:1	9 $\frac{1}{2}$ "	3'-7 $\frac{1}{2}$ "	2'-6"	6'-1 $\frac{1}{2}$ "	4'-0"
27"	2.5:1	10 $\frac{1}{2}$ "	4'-1"	2'-0"	6'-1 $\frac{1}{2}$ "	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 $\frac{3}{4}$ "	6'-1 $\frac{3}{4}$ "	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.8:1	27"	5'-0"	3'-0"	8'-0"	7'-6"
60"	1.6:1	29 $\frac{1}{2}$ "	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.6:1	30"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.3:1	29 $\frac{1}{2}$ "	6'-9"	2'-6 $\frac{1}{2}$ "	9'-3 $\frac{1}{2}$ "	10'-0"

TYPE 2 APRONS						
DIAM.	SLOPE	A	B	MINIMUM		F
				C	E	
12"	2.4:1	4"	2'-0"	4'- $\frac{7}{8}$ "	6'- $\frac{7}{8}$ "	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0"	3'-1 $\frac{1}{2}$ "	6'-1 $\frac{1}{2}$ "	3'-5"
24"	2.5:1	9 $\frac{1}{2}$ "	3'-7 $\frac{1}{2}$ "	2'-6"	6'-1 $\frac{1}{2}$ "	4'-0"
27"	2.5:1	10 $\frac{1}{2}$ "	4'-1"	2'-0"	6'-1 $\frac{1}{2}$ "	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 $\frac{3}{4}$ "	6'-1 $\frac{3}{4}$ "	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.9:1	24 $\frac{1}{2}$ "	5'-5"	2'-7"	8'-0"	7'-6"
60"	1.4:1	24 $\frac{1}{2}$ "	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.4:1	24"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.5:1	23 $\frac{1}{2}$ "	7'-6 $\frac{1}{2}$ "	1'-9"	9'-3 $\frac{1}{2}$ "	10'-0"

FIGURE 4030.222 SHEET 1 OF 1

REVISION	
New	06/02/25
BETT4030.222	
SHEET 1 of 1	

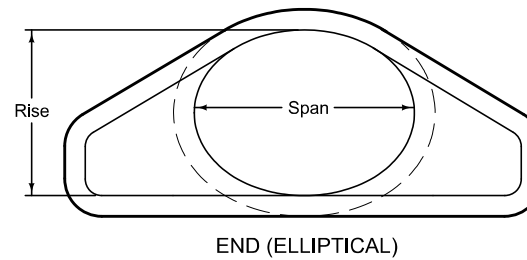
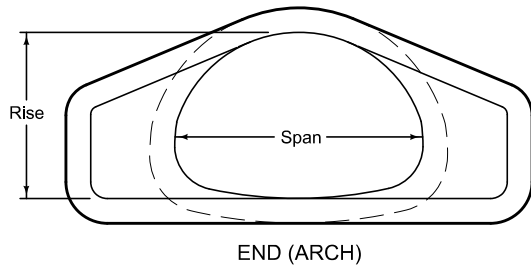
CIRCULAR CONCRETE APRONS



Dimension 'E' shown is the minimum and is considered the design length. Adjust for any difference between the actual length of concrete apron installed and the length indicated below for the length of concrete culvert pipe furnished.

① Tongue end used on inlet end section. Groove end used on outlet end section.

NOTE:
Tie first 2 joints with pipe connectors.



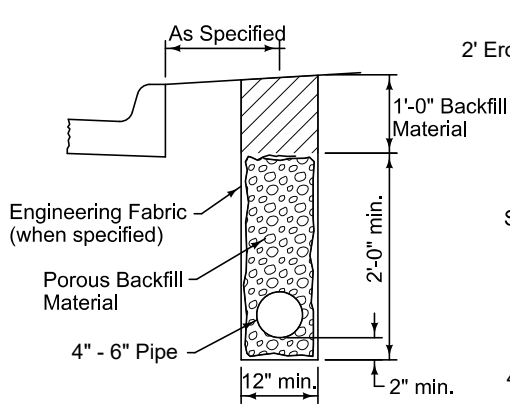
EQUIVALENT DIAMETER Inches	SLOPE	APPROXIMATE DIMENSIONS Inches				
		A	B	C	E	F
18	3:1	7	27	45	72	36
24	3:1	8 $\frac{1}{2}$	39	33	72	48
30	3:1	9 $\frac{1}{2}$	50	46	96	60
36	3:1	11 $\frac{3}{8}$	60	36	96	72
42	3:1	15 $\frac{3}{16}$	60	36	96	78
48	3:1	21	60	36	96	84
54	3:1	25 $\frac{1}{2}$	60	36	96	90
60	3:1	31	60	36	96	96
72	2:1	31	60	39	99	120
84	2:1	21 $\frac{3}{2}$	83	19	102	144

ARCH PIPE

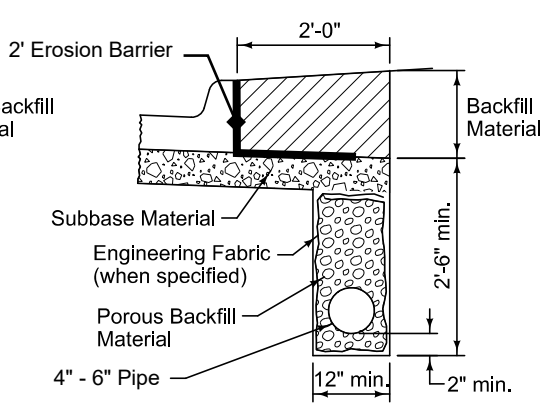
EQUIVALENT DIAMETER Inches	SLOPE	APPROXIMATE DIMENSIONS Inches				
		A	B	C	E	F
18	3:1	7 $\frac{1}{2}$	27	45	72	36
24	3:1	8 $\frac{3}{2}$	39	33	72	48
30	3:1	9 $\frac{1}{2}$	54	18	72	60
36	2.5 to 1	11 $\frac{1}{8}$	60	24	84	72
42	2.5 to 1	15 $\frac{3}{2}$	60	36	96	78
48	2.5 to 1	21	60	36	96	84
54	2.5 to 1	25 $\frac{1}{2}$	60	36	96	90
60	2.5 to 1	30	60	36	96	96
72	2.5 to 1	36	63	33	96	108
90	1.6 to 1	36 $\frac{1}{2}$	58	38	96	113

ELLIPTICAL PIPE

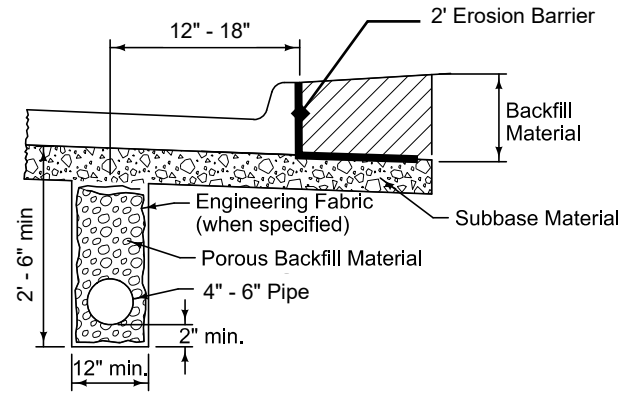
	REVISION	
	New	09/10/25
BETT4030.223		
SHEET 1 of 1		
ARCH AND ELLIPTICAL CONCRETE PIPE APRONS		



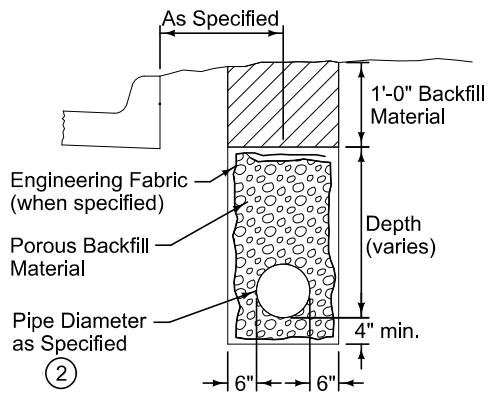
CASE A
TYPE 1



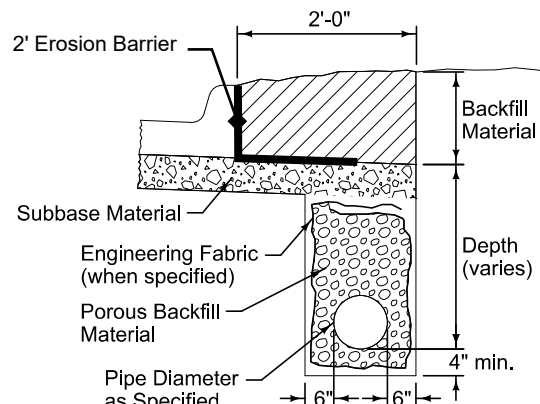
CASE B
TYPE 1



CASE C
TYPE 1



CASE D
TYPE 2



CASE E
TYPE 2

Type 1 installation is for longitudinal subdrain only. Type 2 installation is for combination subdrain/footing drain collectors.

② When concrete pipe is specified, wrap pipe joints with engineering fabric. Do not apply joint sealant. Comply with Figure 4020.211

	REVISION	
	1	09/10/25
	BETT4040.231	
SHEET 1 of 1		

Construct drop and overflow from ductile iron pipe of same diameter specified for sewer main. Provide mechanical joints for all ductile iron pipe and fittings.

- ① Place Class I bedding material, CLSM, flowable mortar, or concrete from top of elbow to bottom of sewer main.
- ② Encase elbow in concrete. 12 inches minimum on all sides.

NOTE: CONCRETE ENCASEMENT NOT NECESSARY WITH D.I.P.

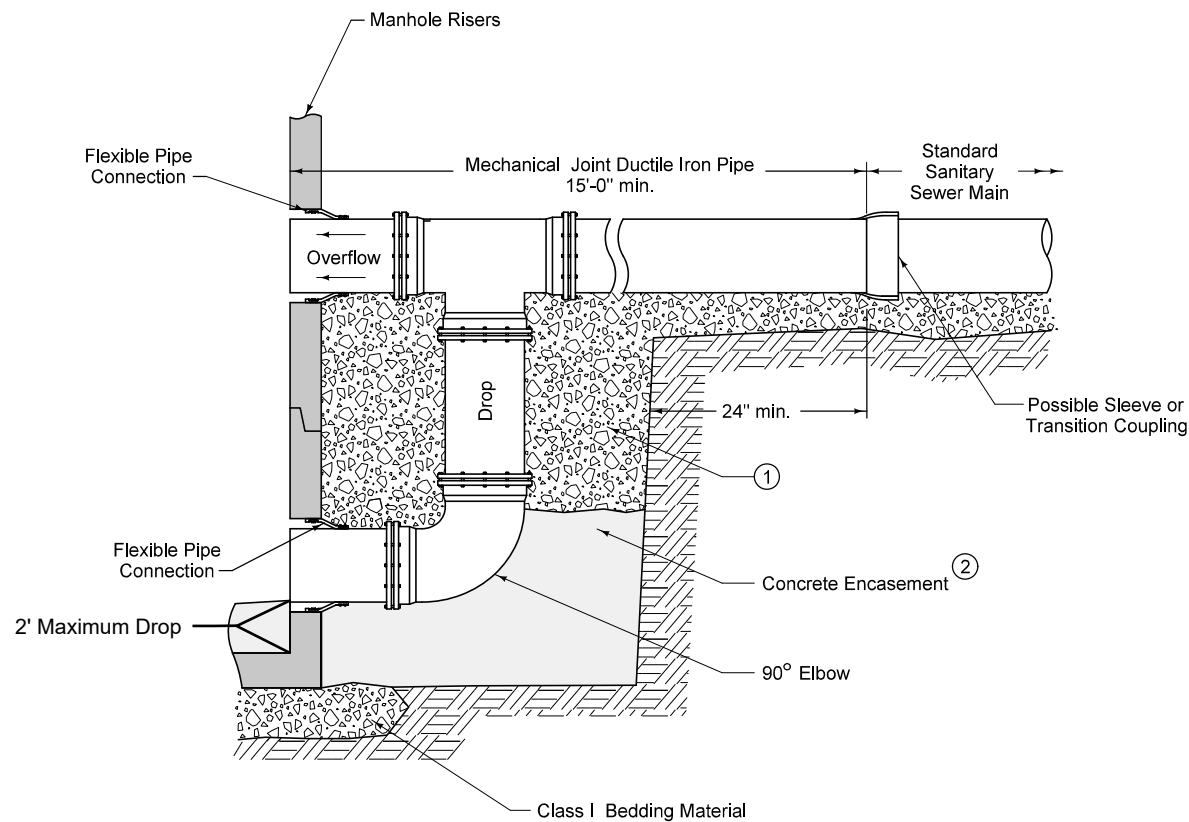
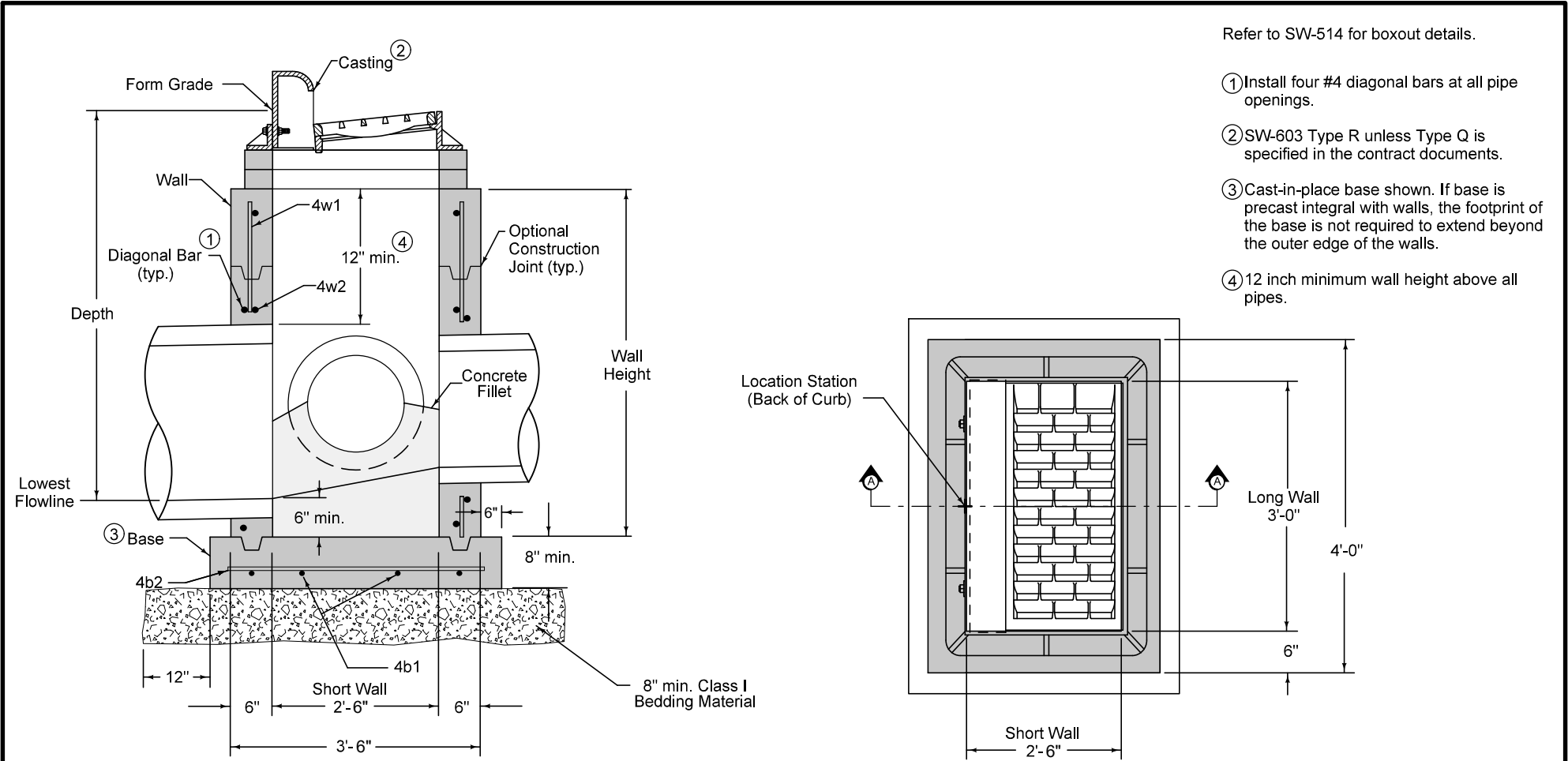


FIGURE 6010.307 SHEET 1 OF 1

	REVISION	
	1	05-22/25
STANDARD ROAD PLAN		BETT6010.307
		SHEET 1 of 1
REVISIONS:		
SUDAS DIRECTOR DESIGN METHODS ENGINEER		
EXTERNAL DROP CONNECTION FOR SANITARY SEWER MANHOLE		



Refer to SW-514 for boxout details.

- ① Install four #4 diagonal bars at all pipe openings.
- ② SW-603 Type R unless Type Q is specified in the contract documents.
- ③ Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ④ 12 inch minimum wall height above all pipes.

SECTION A-A

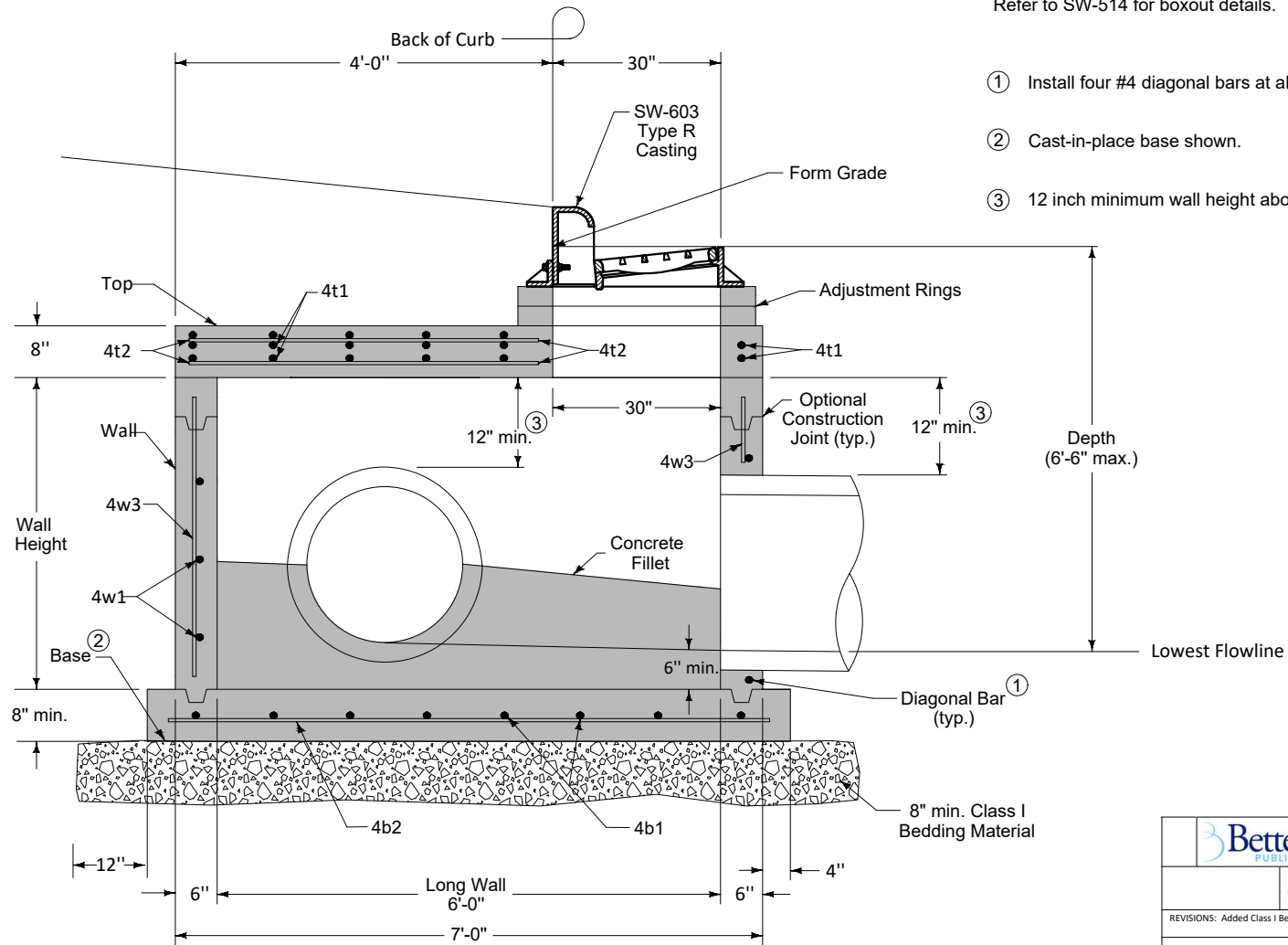
PLAN

REINFORCING BAR LIST						
Mark	Size	Location	Shape	Length	Count	Spacing
4w1	4	Walls	—	Wall Height minus 4"	14	12"
4w2	4	Long Walls	—	3'-8"	Varies	12"
4w3	4	Short Walls	—	3'-2"	Varies	12"
4b1	4	Base	—	4'-8"	4	10"
4b2	4	Base	—	4'-2"	5	10"

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	24"	30"

FIGURE 6010.501 SHEET 1 OF 1

	REVISION	
	1	05-23/25
STANDARD ROAD PLAN		BETT6010.501
		SHEET 1 of 1
REVISIONS:		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
SINGLE GRATE INTAKE		



Refer to SW-514 for boxout details.

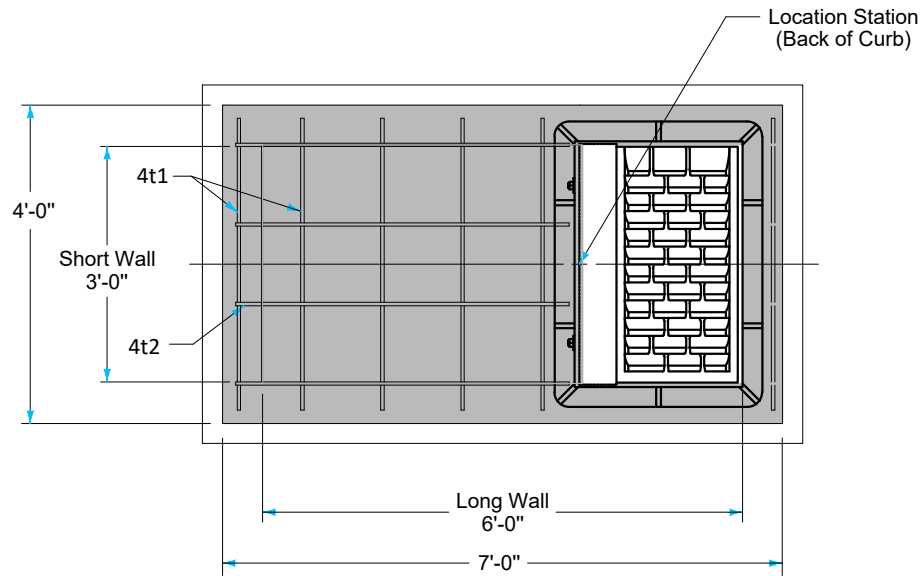
- ① Install four #4 diagonal bars at all pipe openings.
- ② Cast-in-place base shown.
- ③ 12 inch minimum wall height above all pipes.

TYPICAL SECTION

FIGURE 6010.503 SHEET 1 OF 2

	REVISION	
	1	05-23-25
	BETT6010.503	
STANDARD ROAD PLAN		
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
<p>SINGLE GRATE INTAKE</p> <p>SPECIAL</p>		

① Install four #4 diagonal bars at all pipe openings.



PLAN

REINFORCING BAR LIST

Mark	Size	Location	Shape	Count	Length	Spacing
4t1	4	Top	—	12	3'-8"	12"
4t2	4	Top	—	8	4'-2"	12"
4b1	4	Base	—	7	4'-2"	13"
4b2	4	Base	—	5	7'-2"	10"
4w1	4	Short Walls	—	Varies	3'-8"	12"
4w2	4	Long Walls	—	Varies	6'-8"	12"
4w3	4	Walls	—	18	Wall Height minus 4"	13"

MAXIMUM PIPE DIAMETERS

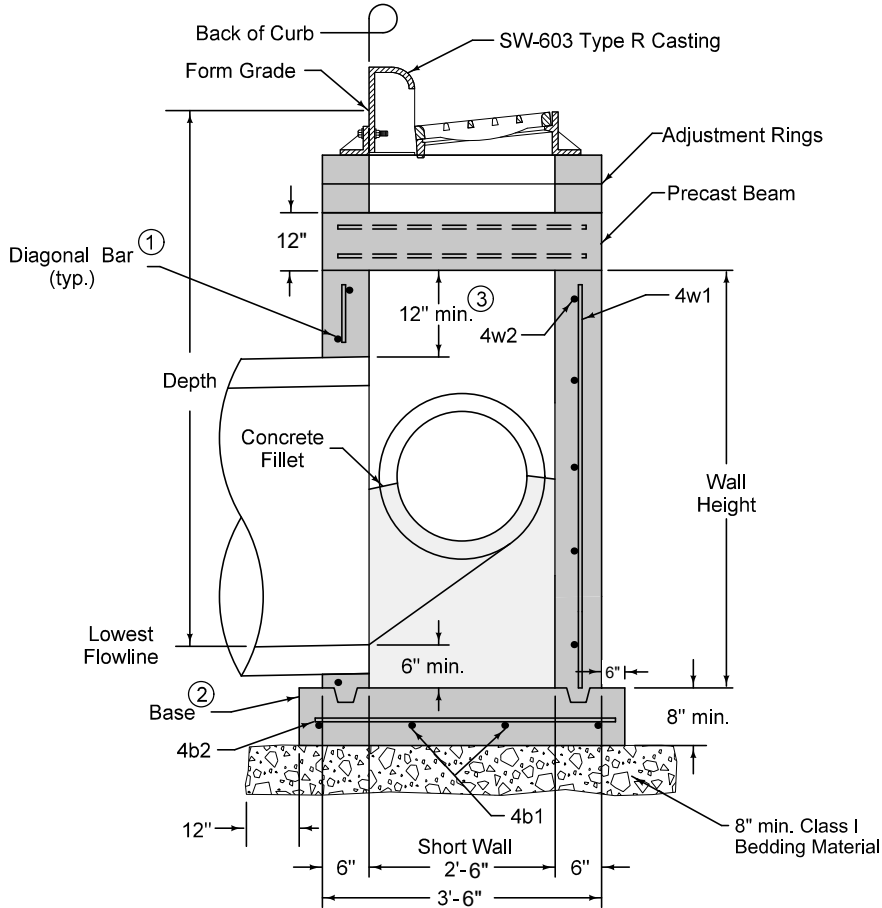
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	24"	30"
Long Wall	30"	36"

FIGURE 6010.503 SHEET 2 OF 2

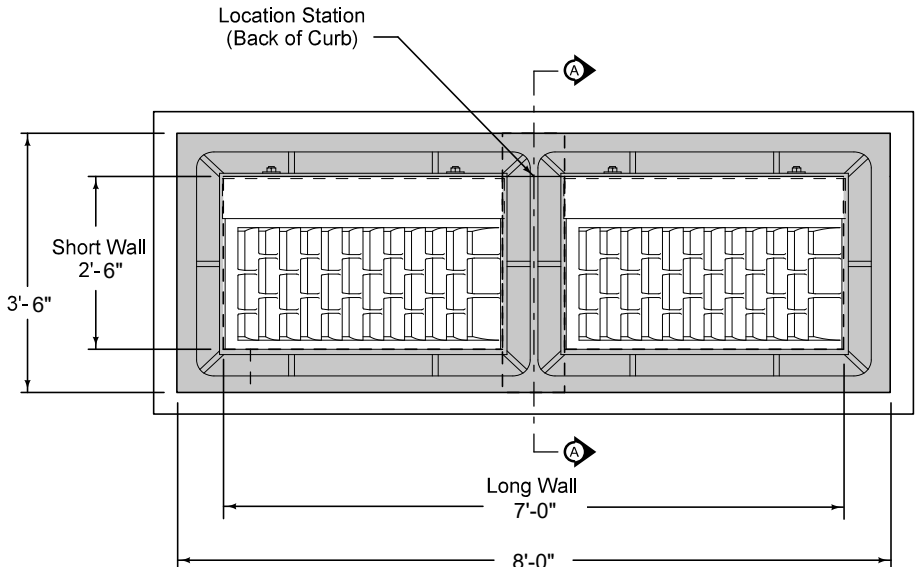
	REVISION	
	1	05-23-25
STANDARD ROAD PLAN		
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR DESIGN METHODS ENGINEER		
<p>SINGLE GRATE INTAKE SPECIAL</p>		

Refer to SW-514 for boxout details.

- ① Install four #4 diagonal bars at all pipe openings.
- ② Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ③ 12 inch minimum wall height above all pipes.



SECTION A-A

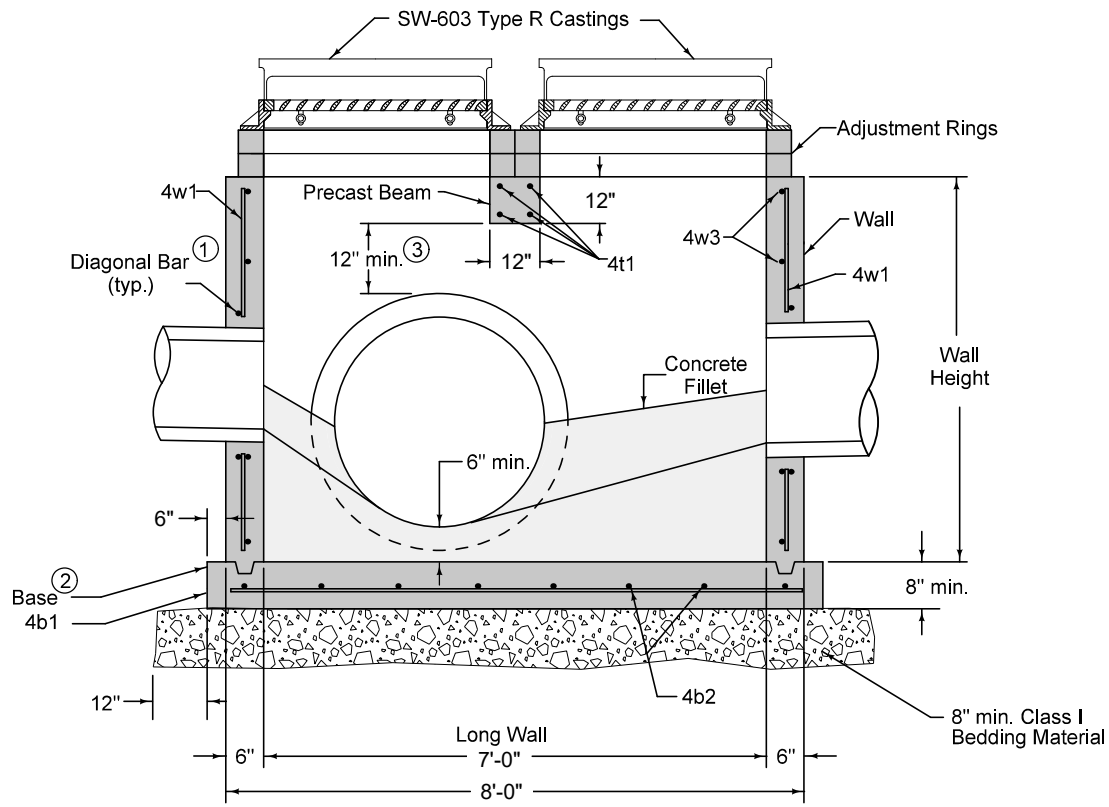


PLAN

FIGURE 6010.505 SHEET 1 OF 2

	STANDARD ROAD PLAN	REVISION 1 05-23/25
		BETT6010.505 SHEET 1 of 2
REVISIONS:		
SUDAS DIRECTOR	DESIGN METHODS ENGINEER	
DOUBLE GRATE INTAKE		

- ① Install four #4 diagonal bars at all pipe openings.
- ② Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ③ 12 inch minimum wall height above all pipes.



TYPICAL SECTION

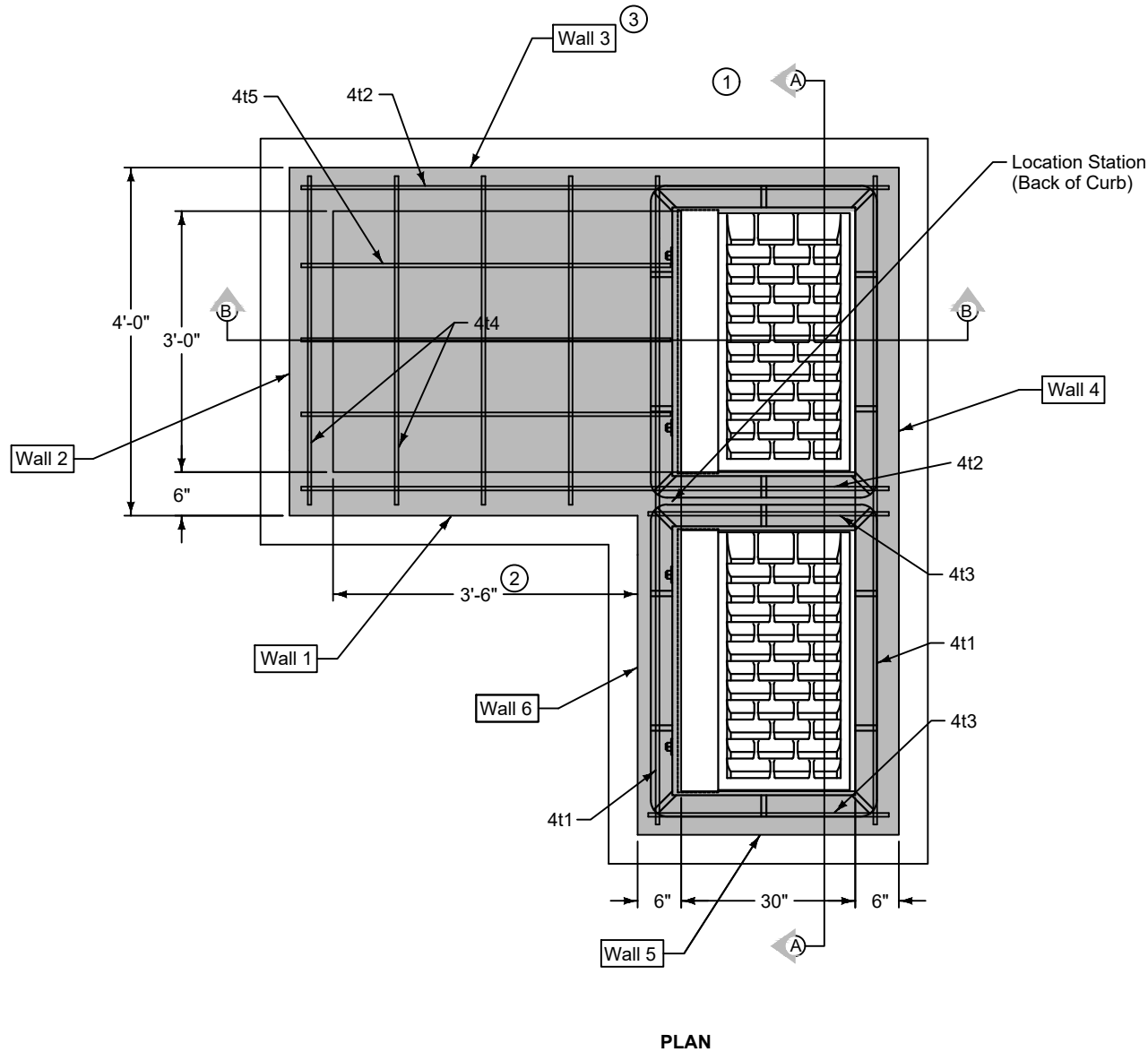
REINFORCING BAR LIST

Mark	Size	Location	Shape	Count	Length	Spacing
4t1	6	Beam	—	4	3'-2"	4"
4b1	4	Base	—	4	8'-6"	10"
4b2	4	Base	—	8	3'-8"	12"
4w1	4	Walls	—	20	Wall Height minus 4"	12"
4w2	4	Long Walls	—	Varies	7'-8"	12"
4w3	4	Short Walls	—	Varies	3'-2"	12"

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	18"	18"
Long Wall	60"	66"

FIGURE 6010.505 SHEET 2 OF 2

	REVISION	
	1	05-23/25
STANDARD ROAD PLAN		BETT6010.505
		SHEET 2 of 2
REVISIONS:		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
DOUBLE GRATE INTAKE		



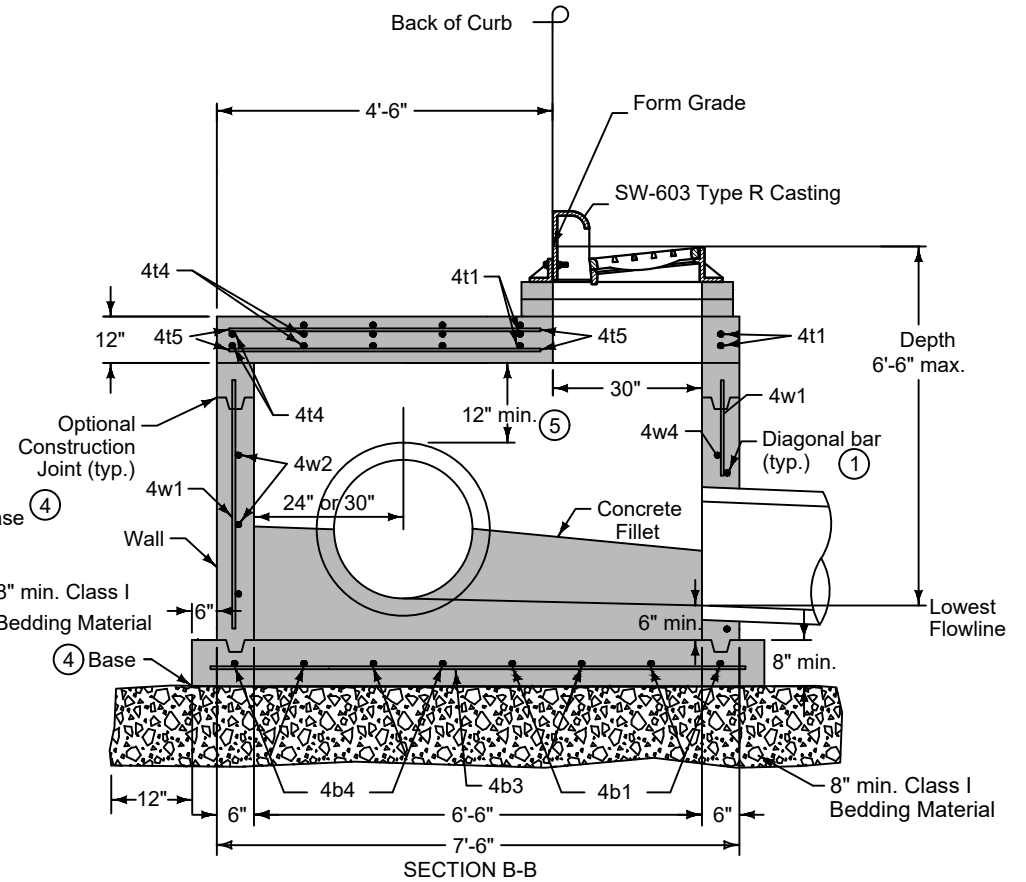
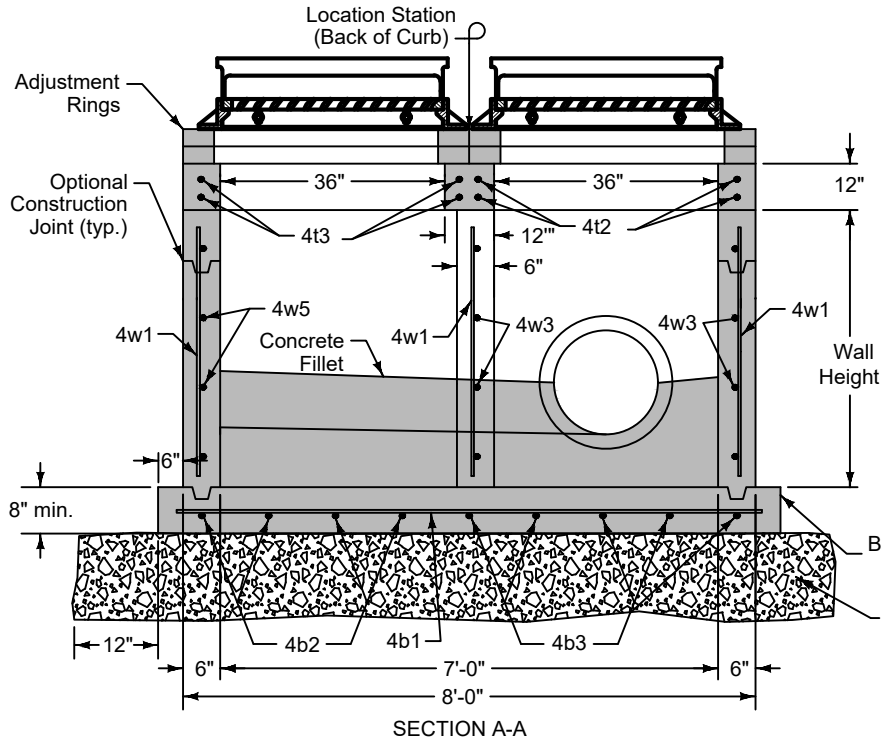
Maximum pipe diameters are set based on maximum structure depth of 6 feet-6 inches and the objective of placement of the centerline of the pipe on the centerline of the manhole opening for maintenance purposes.

Refer to SW-514 for boxout details.

- ① Install four #4 diagonal bars at manhole opening and at all pipe openings.
- ② If Wall 1 is widened to 4 feet, the maximum pipe diameter can be increased to 36 inches.
- ③ If Wall 1 is widened to 4 feet, the maximum pipe diameter in Wall 3 can be increased to 42 inches.

MAXIMUM PIPE DIAMETERS	
Wall	Max. Dia.
1	30" ②
2	24"
3	36" ③
4	42"

	REVISION	
	1	05-28-25
STANDARD ROAD PLAN		BETT6010.506
		SHEET 1 of 2
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
DOUBLE GRATE INTAKE SPECIAL		



REINFORCING BAR LIST

Mark	Size	Location	Shape	Count	Length	Spacing
4t1	4	Top	—	4	7'-8"	See Detail
4t2	4	Top	—	4	7'-2"	See Detail
4t3	4	Top	—	4	3'-2"	See Detail
4t4	4	Top	—	8	3'-8"	12"
4t5	4	Top	—	6	4'-2"	12"
4b1	4	Base	—	4	8'-8"	12"
4b2	4	Base	—	4	3'-2"	12"
4b3	4	Base	—	5	8'-2"	12"
4b4	4	Base	—	4	4'-2"	12"
4w1	4	Walls	—	29	Wall Height minus 4"	12"
4w2	4	Wall 2	—	Varies	3'-8"	12"
4w3	4	Walls 1 and 3	—	Varies	7'-2"	12"
4w4	4	Wall 4	—	Varies	8'-8"	12"
4w5	4	Wall 5	—	Varies	3'-2"	12"
4w6	4	Wall 6	—	Varies	3'-10"	12"

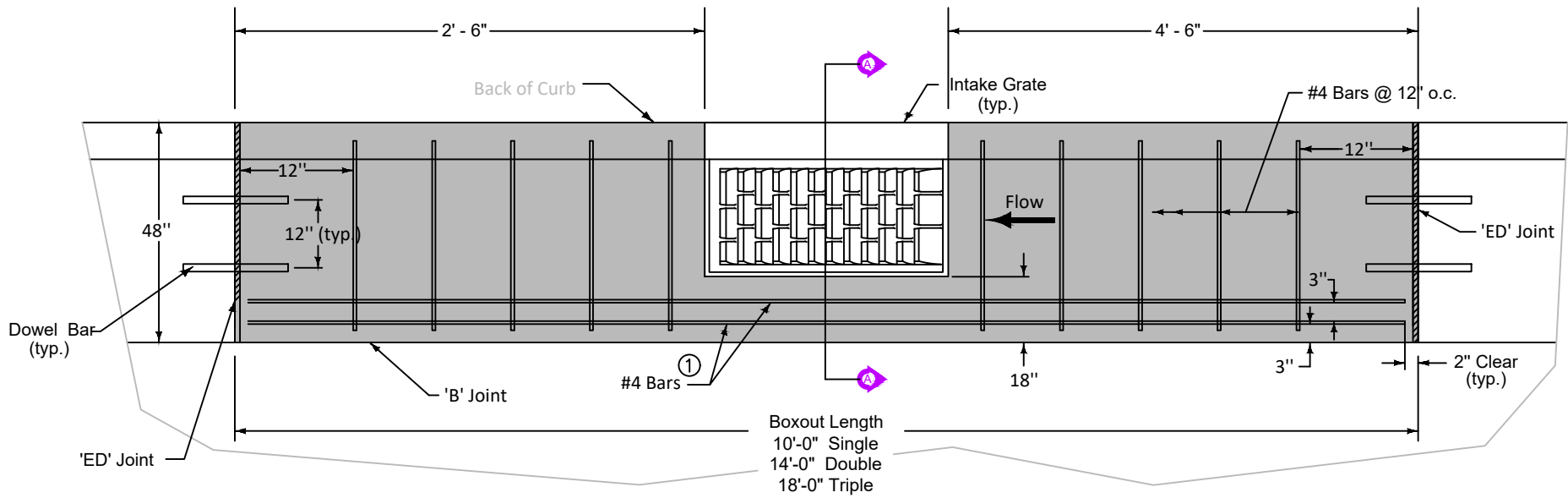
- ① Install four #4 diagonal bars at all pipe openings.
- ④ Cast-in-place base shown.
- ⑤ 12 inch minimum wall height above all pipes.

FIGURE 6010.506

SHEET 2 OF 2

	REVISION	
	1	05-28-25
STANDARD ROAD PLAN		BETT6010.506
		SHEET 2 of 2
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
DOUBLE GRATE INTAKE SPECIAL		

Intakes shall be centered when in a sump condition



BOXOUT IN PCC PAVEMENT AND PCC BASE WITH HMA OVERLAY

Transverse joint spacing on new concrete pavement is controlled by the intake boxout. Adjust adjacent joint spacing as required to accommodate boxouts.

For retrofit intakes, match existing concrete pavement joints. Stop any transverse pavement joints that do not conform to the minimum spacing requirements at the edge of the boxout.

Contractor may add 2" to depth of pavement in lieu of steel reinforcement.

- ① Center bars vertically within slab.

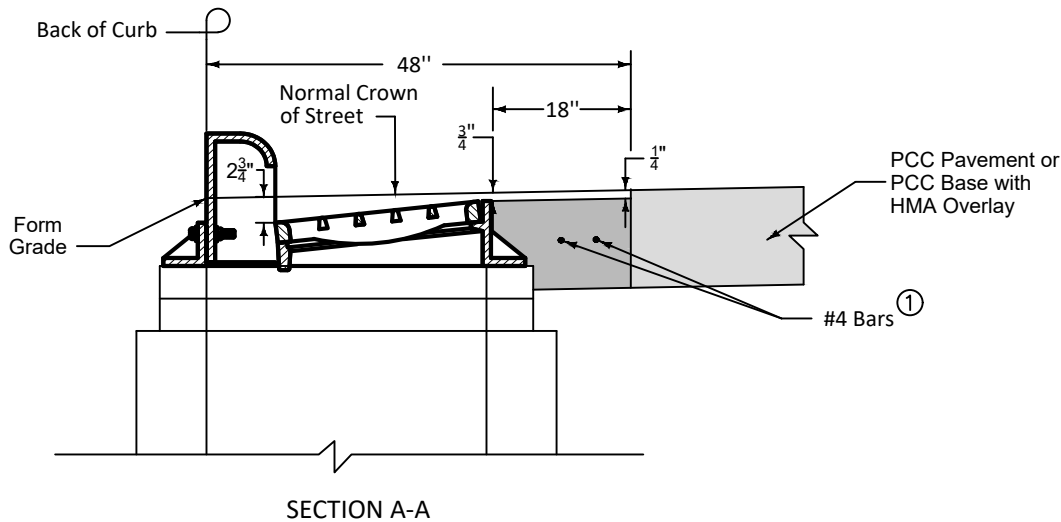
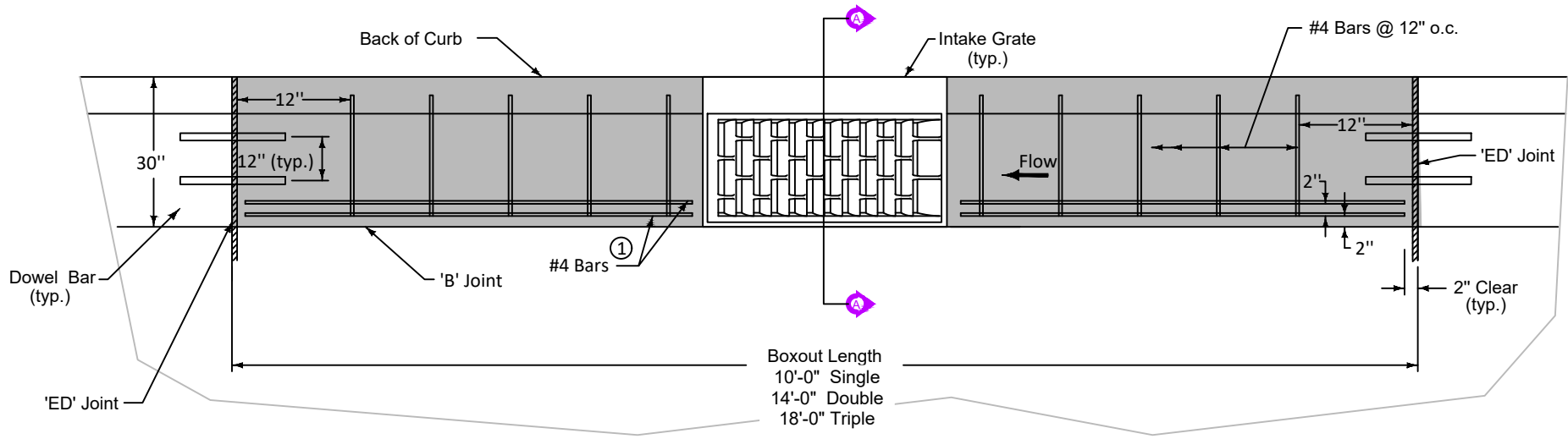
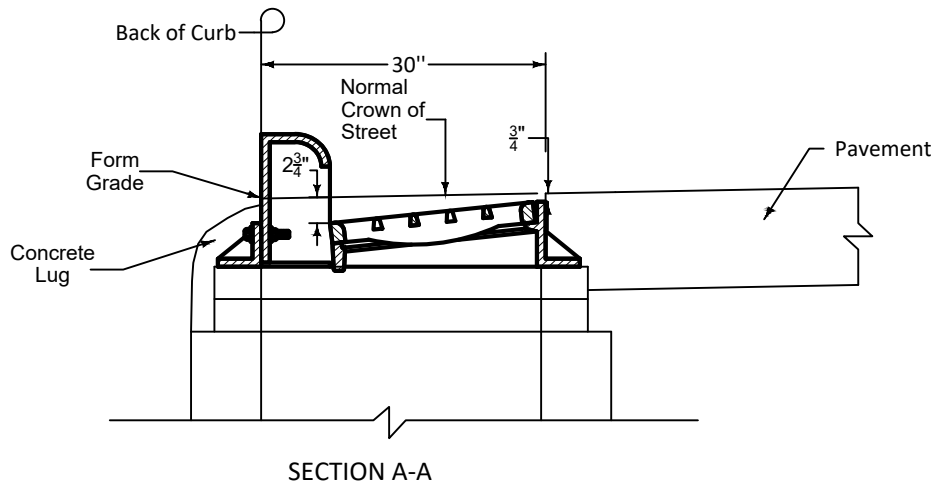


FIGURE BETT6010.514 SHEET 1 OF 2

	REVISION	
	1	05-28-25
STANDARD ROAD PLAN		BETT6010.514
		SHEET 1 of 2
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
BOXOUT FOR GRATE INTAKES		



BOXOUT IN PCC CURB AND GUTTER



① Center bars vertically within slab.

FIGURE BETT6010.514 SHEET 2 OF 2

	REVISION	
	1	05-28-25
STANDARD ROAD PLAN		BETT6010.514
		SHEET 2 of 2
REVISIONS: Added Class I Bedding Material.		
SUDAS DIRECTOR		DESIGN METHODS ENGINEER
BOXOUT FOR GRATE INTAKES		

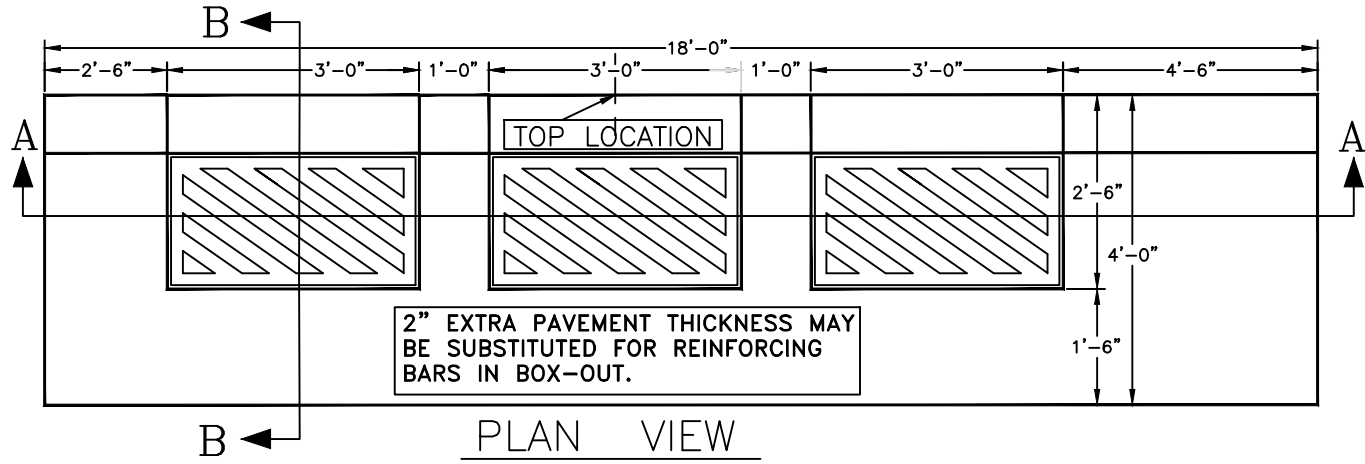
NOTE:

REINFORCING STEEL SHALL BE REQUIRED FOR PRECAST CONCRETE STRUCTURES SUFFICIENT TO INSURE THE ELIMINATION OF CRACKING PRIOR TO AND DURING PLACEMENT OF STRUCTURES AND TO MAINTAIN THE INTEGRITY OF THE STRUCTURE SHOULD CRACKING OCCUR AFTER CONSTRUCTION.

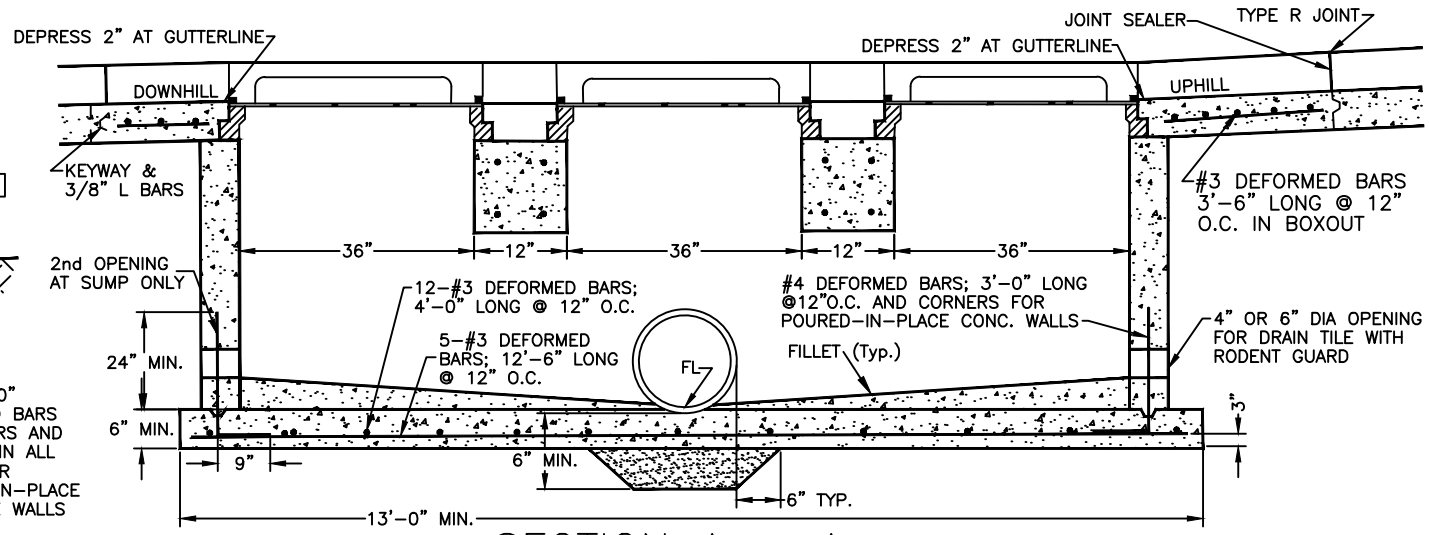
KEYWAYS SHALL HAVE NOMINAL DIMENSIONS OF 1 1/2" DEPTH AND 2 1/2" WIDTH.

LARGER DIAMETER BARS MAY BE SUBSTITUTED FOR #3 DEFORMED BARS.

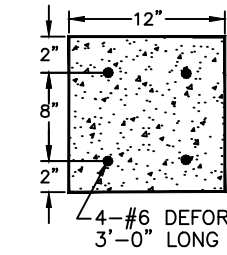
MINIMUM STRUCTURE WALL THICKNESSES ARE:
 5" FOR PRECAST CONCRETE
 6" FOR POURED CONCRETE



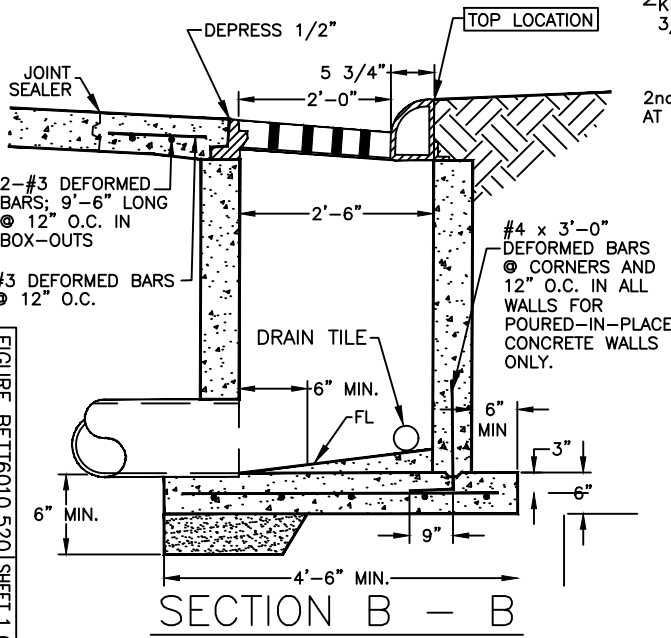
NEENAH R3246A FRAME WITH TYPE R GRATE OR TYPE L VANE GRATE, FLOW LEFT OR FLOW RIGHT OR EAST JORDAN IRON WORKS NO. 7510 WITH TYPE T4 BACK AND TYPE M5 (OR EQUAL) VANE STYLE GRATE OR EQUAL



SECTION A - A



CENTER BEAM DETAIL

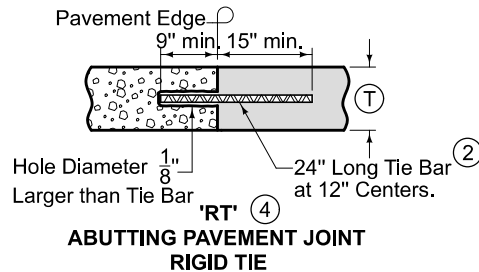
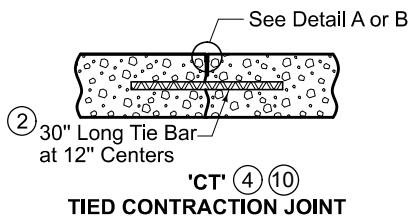
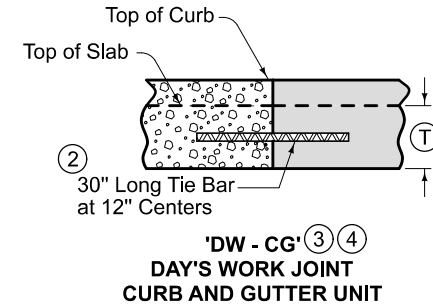
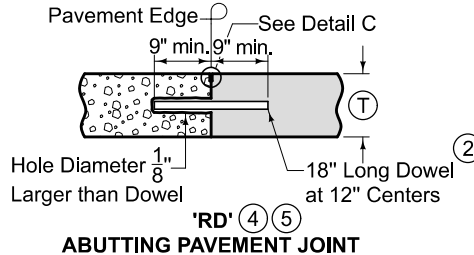
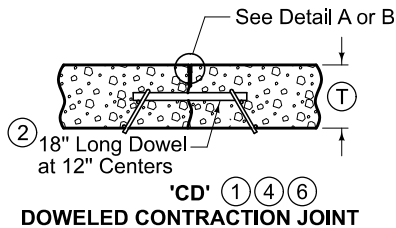
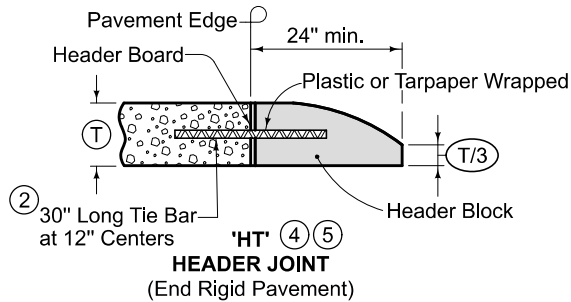
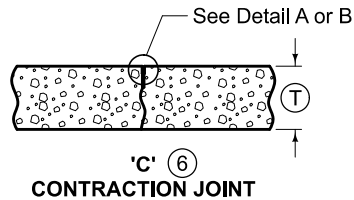
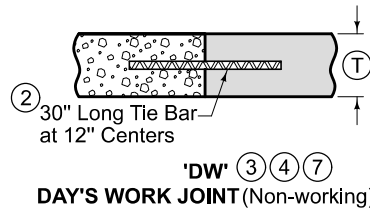
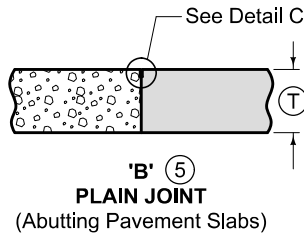


SECTION B - B

PRECAST BASES NOT ALLOWED

FIGURE BETT6010.520 SHEET 1 OF 1

	REVISION
	1 09-15-25
	BETT6010.520
STANDARD ROAD PLAN	SHEET 1 of 1
REVISIONS:	
SUDAS DIRECTOR	DESIGN METHODS ENGINEER
TRIPLE CATCH BASIN	



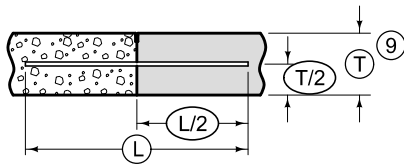
- ① See dowel assemblies for fabrication details.
- ② See Bar Size Table for Contraction Joints on Sheet 2.
- ③ Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.
- ④ Place bars within the limits shown under dowel assemblies.
- ⑤ Edge with 1/8 inch tool for length of joint. For HT joint, remove header block and board when second slab is placed.
- ⑥ Unless specified otherwise, use 'CD' transverse contraction joints in mainline pavement when (T) is greater or equal to 8 inches. Use 'C' joints when (T) is less than 8 inches.
- ⑦ 'RT' joint may be used in lieu of 'DW' joint at the end of the days work. Remove any pavement damaged due to the drilling at no additional cost to the Contracting Authority.

LEGEND	
	Existing Pavement
	Proposed Pavement

	REVISION
	12 09/10/25
	BETT7010.101
SHEET 1 of 8	

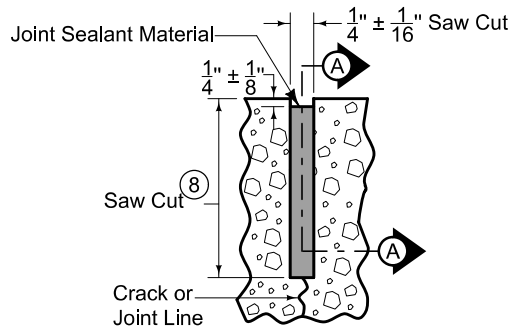
TRANSVERSE CONTRACTION

JOINTS



BAR PLACEMENT

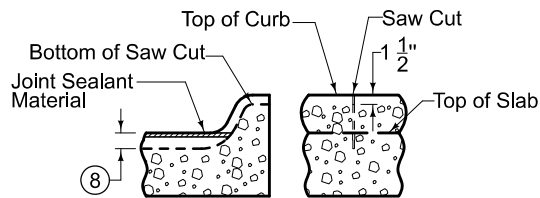
(Applies to all joints unless otherwise detailed.)



DETAIL A

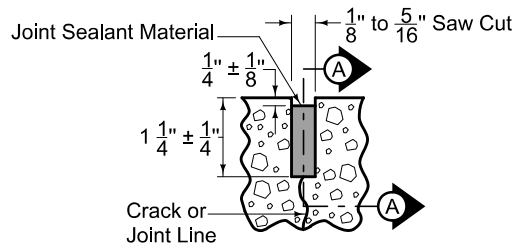
(Saw cut formed by conventional concrete sawing equipment.)

- ⑧ Saw 'CD' joint to a depth of $T/3 \pm 1/4"$; saw 'C' joint to a depth of $T/4 \pm 1/4"$.
- ⑨ When tying into old pavement, \textcircled{T} represents the depth of sound PCC.



'C' JOINT IN CURB

(Match 'CT', 'CD', or 'C' joint in pavement.)

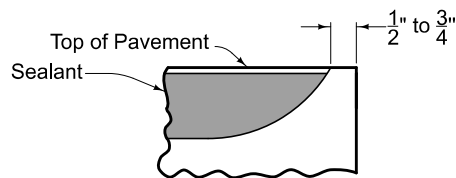


DETAIL B

(Saw cut formed by approved early concrete sawing equipment.)

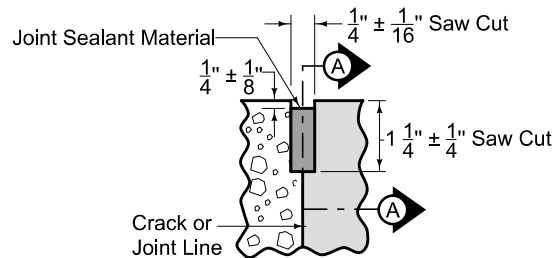
BAR SIZE TABLE FOR CONTRACTION JOINTS				
\textcircled{T}	Solid Dowel Diameter	Tubular Dowel Diameter	Elliptical	Tie Bar Size
< 8"	3/4"	7/8"	N/A	#6
$\geq 8"$ but < 10"	1 1/4"	1 3/8"	Small	#10
$\geq 10"$	1 1/2"	1 5/8"	Medium	#11

Tubular and Elliptical Dowel Bars will not be allowed for RD joints.



SECTION A-A

(Detail at Edge of Pavement)



DETAIL C

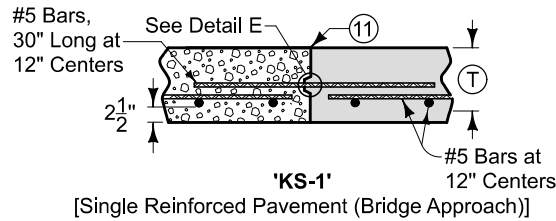
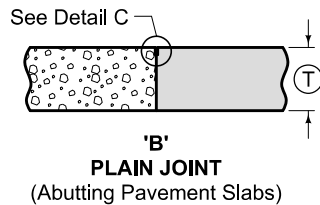
LEGEND	
	Existing Pavement
	Proposed Pavement



REVISION	
12	09/10/25
BETT7010.101	
SHEET 2 of 8	

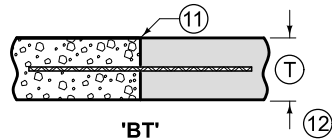
TRANSVERSE CONTRACTION

JOINTS



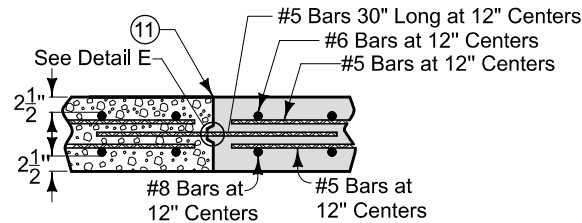
- ⑩ Bar supports shall be necessary for slip form paving to ensure the bar remains in a horizontal position in the plastic concrete.
- ⑪ Routing and sealing of joint is required.
- ⑫ The following joints are interchangeable, subject to the pouring sequence:
'L-1', 'BT-1', and 'KT-1'
'L-2', 'BT-2', and 'KT-2'
'L-3', 'BT-6', and 'KT-3'

KT joints should not be used when DOT is contracting authority.



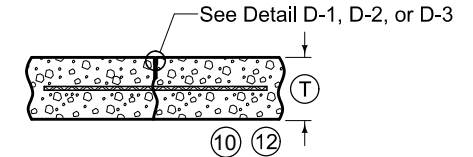
'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'BT-1'	#4	36" Long at 30" Centers
		#5	30" Long at 30" Centers
≥ 8"	'BT-2'	#5	36" Long at 30" Centers
	'BT-6'	#5	36" Long at 15" Centers



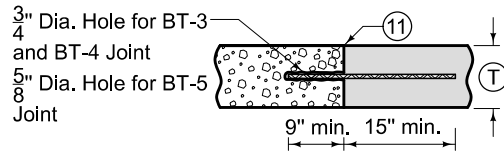
'KS-2'

[Double Reinforced Pavement (Bridge Approach)]



'L'
CONTRACTION JOINT

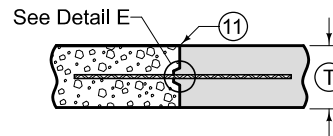
Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'L-1'	#4	36" Long at 30" Centers
≥ 8"	'L-2'	#5	36" Long at 30" Centers
	'L-3'		36" Long at 15" Centers



'BT'

ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'BT-5'	#4	24" Long at 30" Centers
≥ 8"	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'		24" Long at 15" Centers



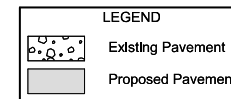
'K'

KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)

'KT'
ABUTTING PAVEMENT JOINT - KEYWAY TIE

Ⓣ	Joint	Bars	Bar Length and Spacing
< 8"	'KT-1'	#4	30" Long at 30" Centers
≥ 8"	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'		30" Long at 15" Centers

LONGITUDINAL CONTRACTION

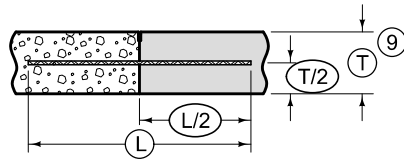


Bettendorf PUBLIC WORKS

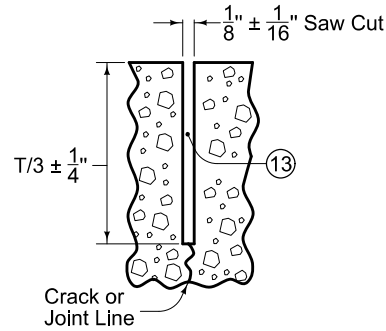
REVISION	
12	09/10/25

BETT7010.101
SHEET 3 of 8

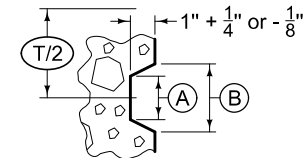
JOINTS



TIE BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)

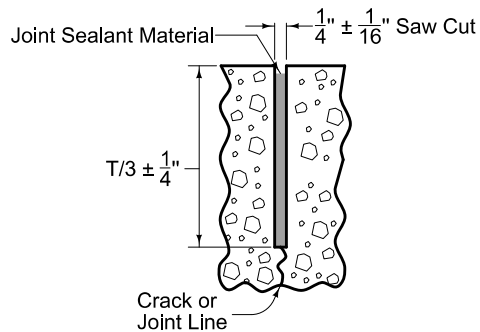


DETAIL D-1
(Required when specified in the contract documents.)

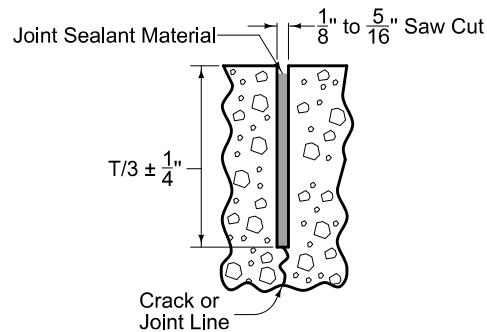


DETAIL E

- ⑨ When tying into old pavement, (T) represents the depth of sound PCC.
- ⑬ Sealant or cleaning not required.



DETAIL D-2
(Required when the Department of Transportation is not the Contracting Authority, or when specified in the contract documents)



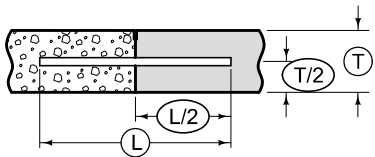
DETAIL D-3
(Required when the Department of Transportation is the Contracting Authority, or when specified in the contract documents)

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness (T)	(A)	(B)
Standard	8" or greater	1 3/4"	2 3/4"
Narrow	Less than 8"	1"	2"

LEGEND	
	Existing Pavement
	Proposed Pavement

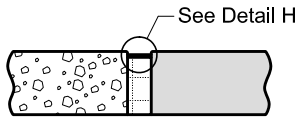


REVISION	
12	09/10/25
BETT7010.101	
SHEET 4 of 8	



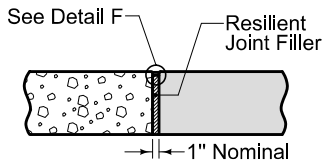
DOWEL PLACEMENT

(Applies to all joints unless otherwise detailed.)

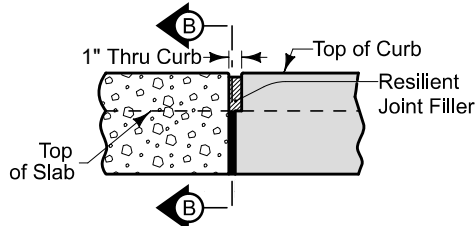


Width (See table below)
'CF' JOINT

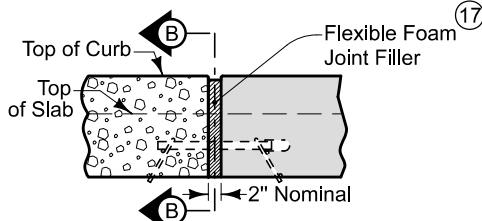
TYPE	WIDTH
CF-1	2"
CF-2	2 1/2"
CF-3	3"
CF-4	3 1/2"



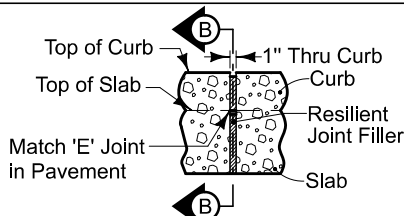
'E' JOINT
1" EXPANSION JOINT



'E' JOINT IN CURB
(View at Back of Curb)

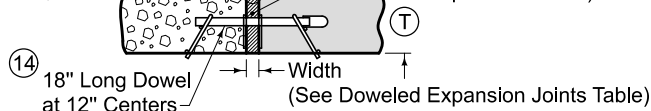


'EE' JOINT IN CURB
(View at Back of Curb)

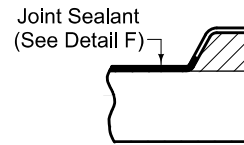


'ES' JOINT IN CURB
(View at Back of Curb)

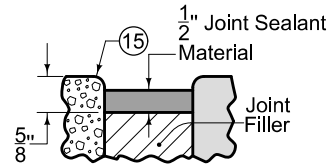
Detail F or Detail G (See Bar Size Table for Doweled Expansion Joints)
Joint Filler Material (17) (See Bar Size Table for Doweled Expansion Joints)



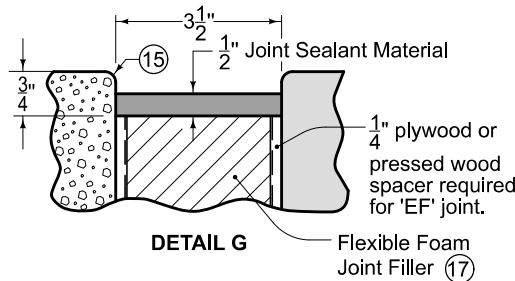
'ED', 'EE', 'EF' (16) DOWELED EXPANSION JOINT



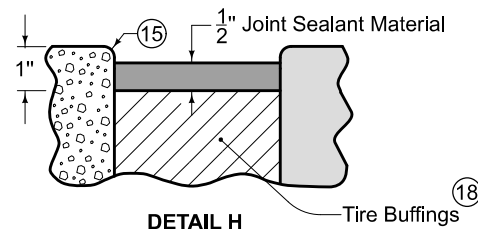
SECTION B-B



DETAIL F



DETAIL G



DETAIL H

EXPANSION

- (14) See Bar Size Table for Doweled Expansion Joints.
- (15) Edge with 1/4 inch tool for length of joint indicated if formed; edging not required when cut with diamond blade saw.
- (16) See Dowel Assemblies for fabrication details and placement limits. Coat the free end of dowel bar to prevent bond with pavement. At intake locations, dowel bars may be cast-in-place.
- (17) Predrill or preform holes in joint material for appropriate dowel size.
- (18) Compact tire buffings by spading with a square-nose shovel.

DOWELED EXPANSION JOINTS		
TYPE	WIDTH	FILLER MATERIAL (17)
ED	1"	Resilient (Detail F)
EE	2"	Flexible Foam (Detail F)
EF	3 1/2"	Flexible Foam (Detail G)

BAR SIZE TABLE FOR DOWELED EXPANSION JOINTS			
(T)	< 8"	≥ 8" but < 10"	≥ 10"
Dowel Diameter	3/4"	1 1/4"	1 1/2"

Tubular, GFRP, and Elliptical Dowel Bars will not be allowed for expansion joints.

LEGEND	
	Existing Pavement
	Proposed Pavement

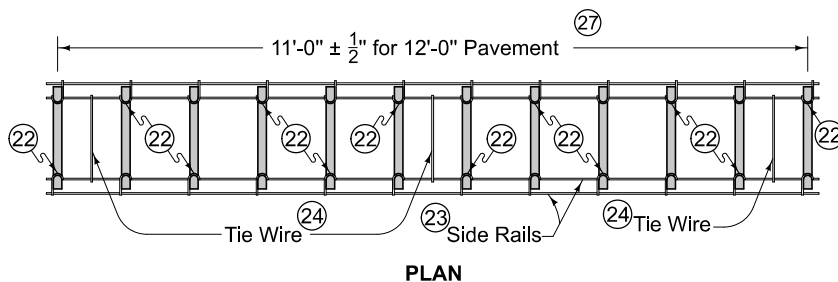
Bettendorf PUBLIC WORKS

REVISION	
12	09/10/25

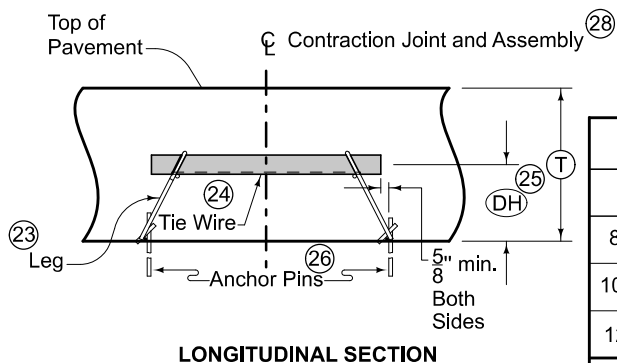
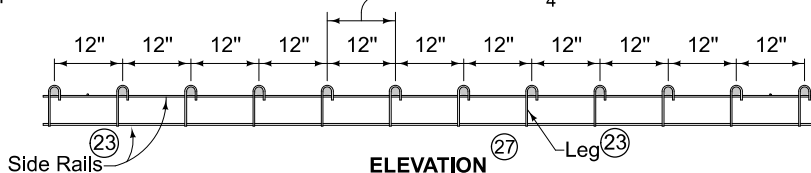
BETT7010.101
SHEET 5 of 8

JOINTS

CONTRACTION JOINTS



Spaces between dowel bars are nominal dimensions with a $\frac{1}{4}$ " allowable tolerance.



LONGITUDINAL SECTION

DOWEL ASSEMBLIES

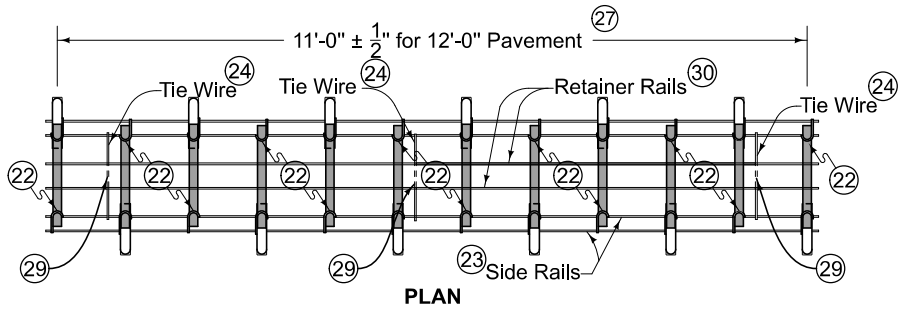
DOWEL HEIGHT AND DIAMETER FOR DOWELED CONTRACTION JOINTS				
(T)	(DH) (25)	Diameter (Solid)	Diameter (Tubular)	Elliptical
8" to 9 $\frac{1}{2}$ "	4 $\frac{1}{4}$ "	1 $\frac{1}{4}$ "	1 $\frac{3}{8}$ "	Small
10" to 11 $\frac{1}{2}$ "	5 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{5}{8}$ "	Medium
12" to 13"	6 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{5}{8}$ "	Medium

Tubular, Elliptical Dowel Bars will not be allowed for RD joints.

- (19) Use 18 inch long dowel bars with a tolerance of $\pm 1/8$ inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within $\pm 1/8$ inch.
- (20) Use wires with a minimum tensile strength of 50 ksi.
- (21) Details apply to both transverse contraction and expansion joints.
- (22) Weld alternately throughout.
- (23) 0.306 inch diameter wire. Wire sizes shown are the minimum required.
- (24) Maximum 0.177 inch diameter wire, welded or friction fit to upper side rail, both sides.
- (25) Measured from the centerline of dowel bar to bottom of lower side rail + 1/4 inch.
- (26) Per lane width, install a minimum of 8 anchor pins evenly spaced (4 per side), to prevent movement of assembly during construction. Anchor assemblies placed on pavement or PCC base with devices approved by the Engineer.
- (27) If dowel basket assemblies are required for curbed pavements, the assembly length is based on the jointing layout. See PV-101, sheet 8.
- (28) Ensure dowel basket assembly centerline is within 2 inches of the intended joint location longitudinally and has no more than 1/4 inch horizontal skew from end of basket to end of basket.

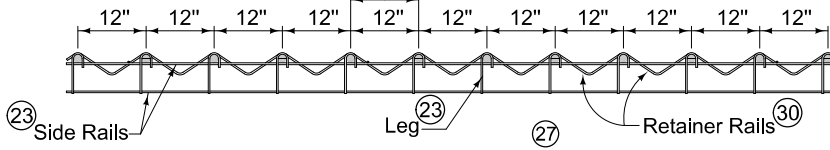
	REVISION
	12 09/10/25
	BETT7010.101
SHEET 6 of 8	
JOINTS	

EXPANSION JOINTS

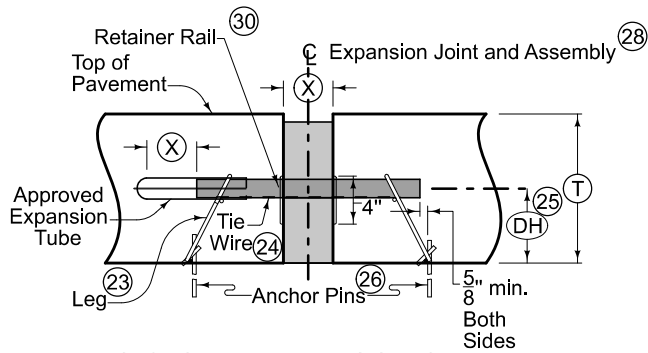


PLAN

Spaces between dowel bars are nominal dimensions with a 1/4" allowable tolerance.



ELEVATION



SECTION THRU EXPANSION JOINT

DOWEL HEIGHT AND DIAMETER FOR DOWELED EXPANSION JOINTS

T	DH (25)	Diameter
8" to 9 1/2"	4 1/4"	1 1/4"
10" to 11 1/2"	5 1/4"	1 1/2"
12" to 13"	6 1/4"	1 1/2"

Tubular, GFRP, and Elliptical Dowel Bars will not be allowed for expansion joints.

JOINT OPENING AND EXPANSION TUBE EXTENSION		
Joint Type	X	Minimum Tube Length
"ED"	1"	6"
"EE"	2"	7"
"EF"	3 1/2"	9"

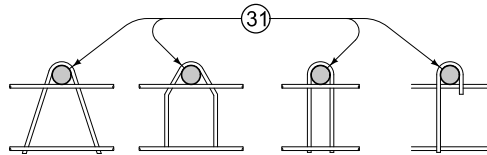
DOWEL ASSEMBLIES

(19) (20) (21)

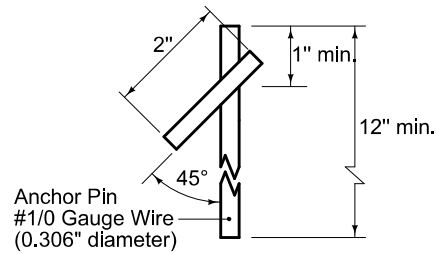
- (19) Use 18 inch long dowel bars with a tolerance of ± 1/8 inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within ± 1/8 inch.
- (20) Use wires with a minimum tensile strength of 50 ksi.
- (21) Details apply to both transverse contraction and expansion joints.
- (22) Weld alternately throughout.
- (23) 0.306 inch diameter wire. Wire sizes shown are the minimum required.
- (24) Maximum 0.177 inch diameter wire, welded or friction fit to upper side rail, both sides.
- (25) Measured from the centerline of dowel bar to bottom of lower side rail + 1/4 inch.
- (26) Per lane width, install a minimum of 8 anchor pins evenly spaced (4 per side), to prevent movement of assembly during construction. Anchor assemblies placed on pavement or PCC base with devices approved by the Engineer.
- (27) If dowel basket assemblies are required for curbed pavements, the assembly length is based on the jointing layout. See PV-101, sheet 8.
- (28) Ensure dowel basket assembly centerline is within 2 inches of the intended joint location longitudinally and has no more than 1/4 inch horizontal skew from end of basket to end of basket.
- (29) Clip and remove center portion of tie during field assembly.
- (30) 1/4 inch diameter wire.

FIGURE 7010.101 SHEET 7 OF 8

	REVISION	
	12	09/10/25
	BETT7010.101	
SHEET 7 of 8		
<p>JOINTS</p>		

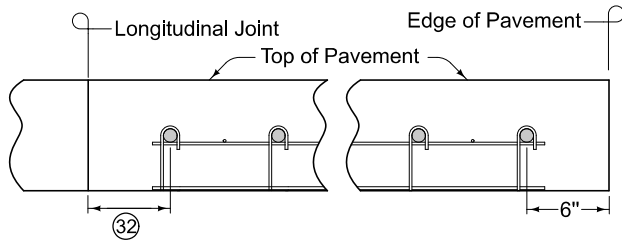


OPTIONAL LEG SHAPES

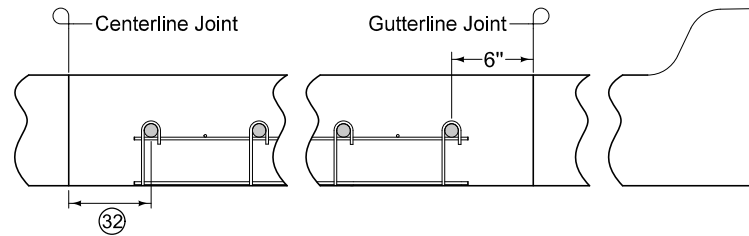


ANCHOR PIN

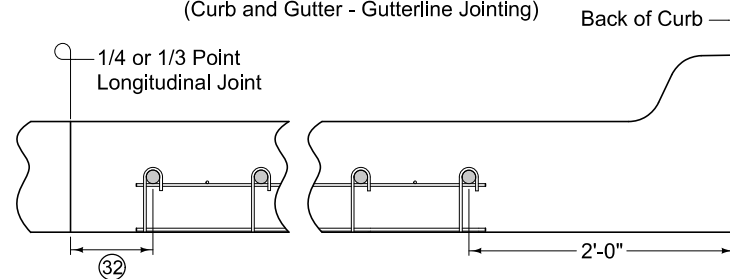
- ①9 Use 18 inch long dowel bars with a tolerance of $\pm 1/8$ inch. Ensure the centerlines of individual dowels are parallel to the other dowels in the assembly within $\pm 1/8$ inch.
- ②0 Use wires with a minimum tensile strength of 50 ksi.
- ②1 Details apply to both transverse contraction and expansion joints.
- ③1 Diameter of bend around dowel is dowel diameter + $1/8$ to $3/16$ inches.
- ③2 For uniform lane widths: 3 to 6 inches. For taper and variable width pavements: 3 to 12 inches.



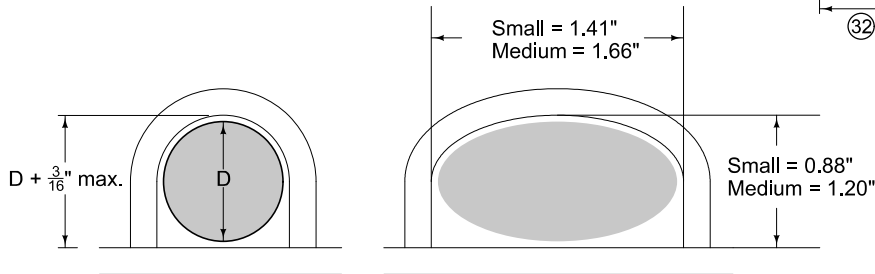
**PLACEMENT LIMITS
(Rural Section)**



**PLACEMENT LIMITS
(Curb and Gutter - Gutterline Jointing)**



**PLACEMENT LIMITS
(Curb and Gutter - 1/4 or 1/3 Point Jointing)**

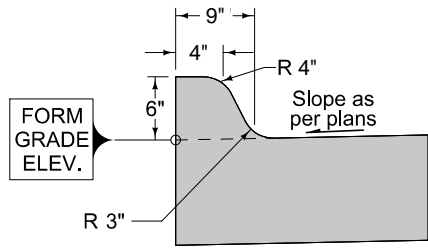


BEND AROUND DOWEL

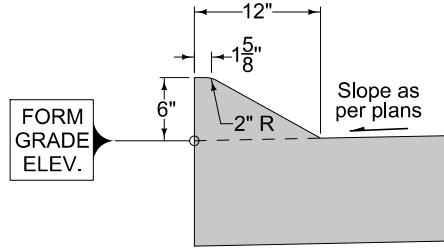
DOWEL ASSEMBLIES ①9 ②0 ②1

	REVISION	
	12	09/10/25
	BETT7010.101	
SHEET 8 of 8		

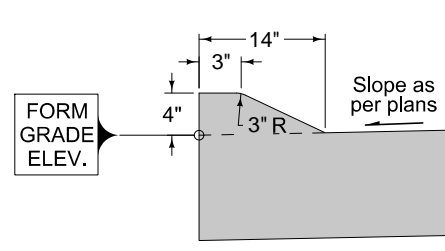
JOINTS



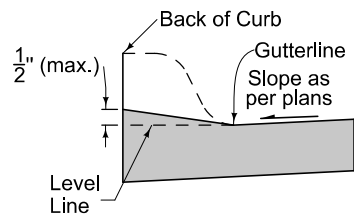
6" STANDARD CURB



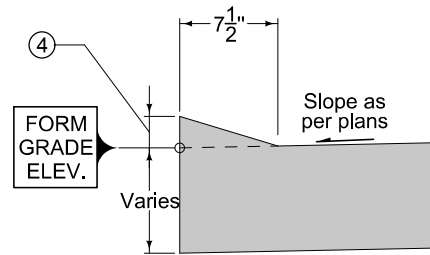
6" SLOPED CURB



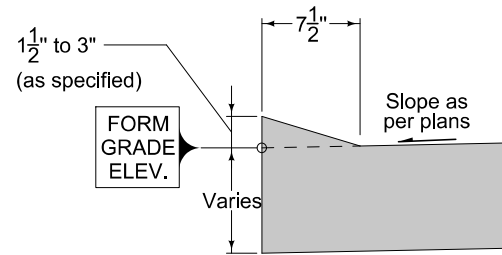
4" SLOPED CURB



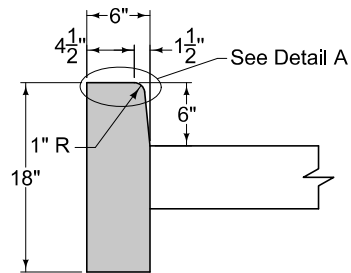
DROP CURB AT SIDEWALK



DRIVEWAY DROP CURB
(Iowa Department of Transportation is not the Contracting Authority)

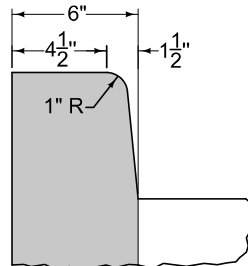


DRIVEWAY DROP CURB
(Iowa Department of Transportation is the Contracting Authority)

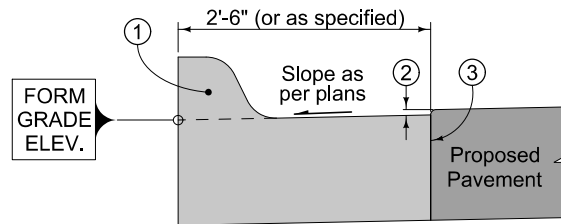


BEAM CURB*

*For short replacement sections, match existing curb profile



DETAIL A



CURB AND GUTTER UNIT

For joint details, see PV-101.

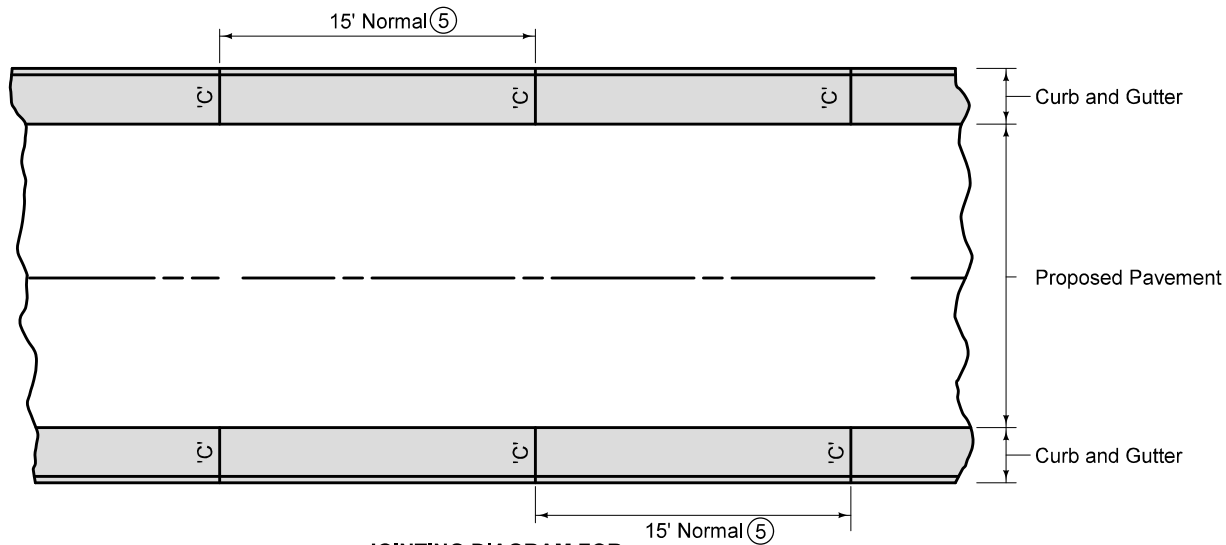
- ① 6 inch Standard Curb, 6 inch Sloped Curb, or 4 inch Sloped Curb as specified.
- ② 1/8 inch if Proposed Pavement is HMA. No elevation difference if Proposed Pavement is PCC.
- ③ 'BT', 'KT', or 'L' joint if Proposed Pavement is PCC. 'B' joint if Proposed Pavement is HMA.
- ④ 0 to 2 inches for residential entrances. 1 1/2 to 3 inches for industrial or commercial entrances.

FIGURE 7010.102 SHEET 1 OF 2

	REVISION
	1 05-23/25
STANDARD ROAD PLAN	BETT7010.102
	SHEET 1 of 2

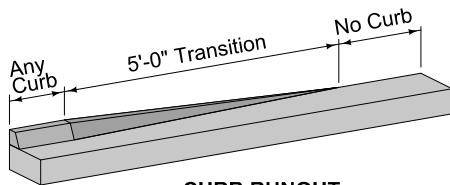
REVISIONS:	
SUDAS DIRECTOR	DESIGN METHODS ENGINEER

PCC CURB DETAILS

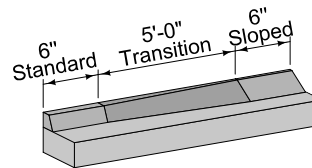


JOINTING DIAGRAM FOR CURB AND GUTTER UNIT

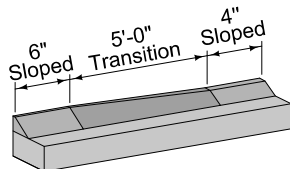
⑤ If proposed pavement is PCC, match joint spacing for proposed pavement. Place 'E' joints in curb and gutter section where expansion joints are to be placed in proposed pavement.



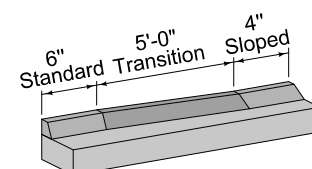
CURB RUNOUT FOR ALL CURBS



CURB TRANSITION FROM 6" STANDARD TO 6" SLOPED



CURB TRANSITION FROM 6" SLOPED TO 4" SLOPED



CURB TRANSITION FROM 6" STANDARD TO 4" SLOPED

FIGURE 7010.102

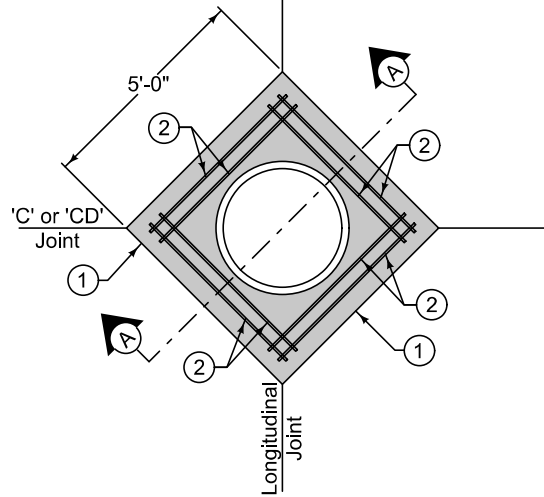
SHEET 2 OF 2

	REVISION	
	1	05-23/25
STANDARD ROAD PLAN		BETT7010.102
REVISIONS:		SHEET 2 of 2

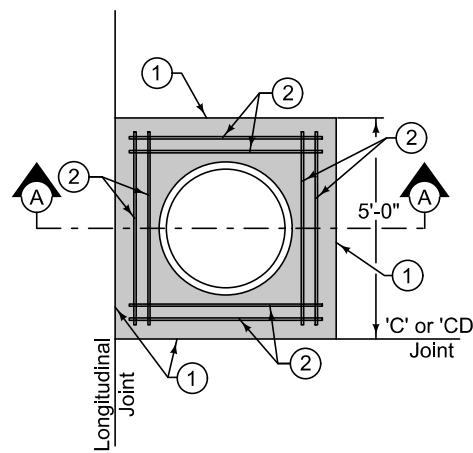
SUDAS DIRECTOR DESIGN METHODS ENGINEER

PCC CURB DETAILS

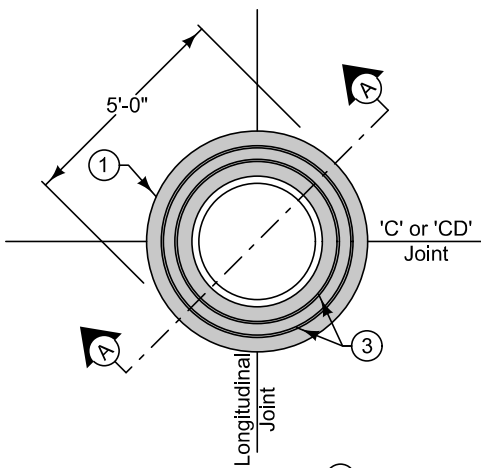
NOTE: CONTRACTOR MAY ADD 2" TO DEPTH OF PAVEMENT IN LIEU OF STEEL REINFORCEMENT.



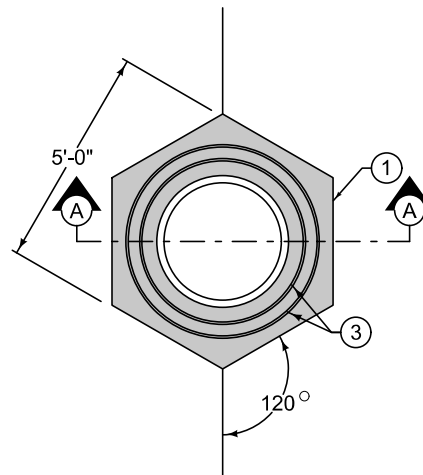
AT JOINT INTERSECTION



OFFSET AT JOINT INTERSECTION



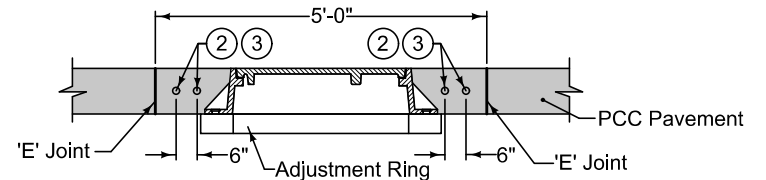
CIRCULAR



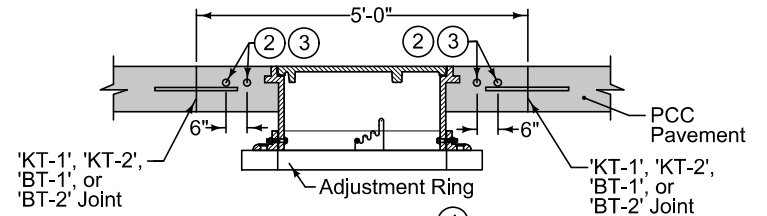
AT A SINGLE JOINT

Construct boxout with Class C concrete or match pavement class. Minimum 2 inches clear on reinforcement. Minimum 12 inches of concrete between outside of casting and nearest joint. Center casting within boxout area if possible.

- ① 'KT-1', 'KT-2', 'BT-1', or 'BT-2' joint if three-piece floating casting (SW 601 Type B and D or SW-602 Type F) is used. 'E' joint if two-piece fixed casting (SW 601 Type A and C or SW-602 Type E) is used.
- ② 4 foot 8 inch (typ.) #4 bar. Place at mid-slab.
- ③ #4 hoops (variable length). Place at mid-slab.
- ④ No boxout is required for three-piece floating castings (SW 601 Type B and D or SW-602 Type F). If a boxout is used with a three-piece casting, construct as detailed in Section A-A for three-piece floating casting.
- ⑤ If a circular boxout is cut and extracted after PCC construction, a 'B' joint may be substituted for the 'E' joint if approved by the Engineer.



SECTION A-A
(For two-piece fixed casting)

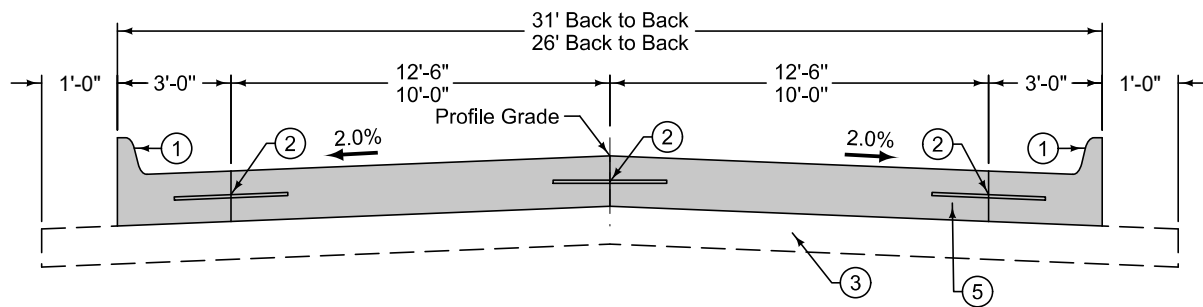
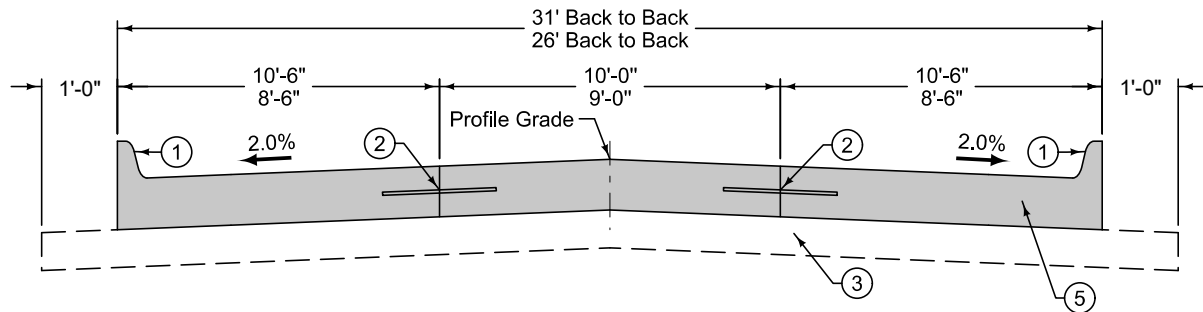
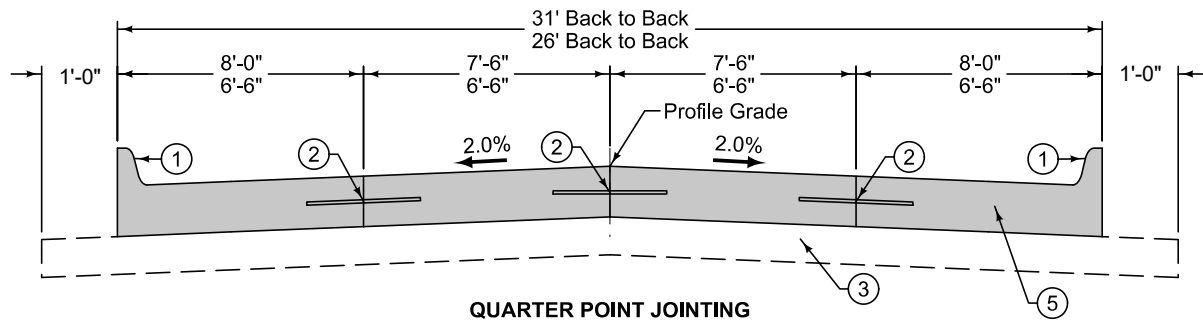


SECTION A-A ④
(For three-piece floating casting)

	REVISION	
	1	05-23/25
STANDARD ROAD PLAN		BETT7010.103
		SHEET 1 of 1

REVISIONS:	
SUDAS DIRECTOR	DESIGN METHODS ENGINEER

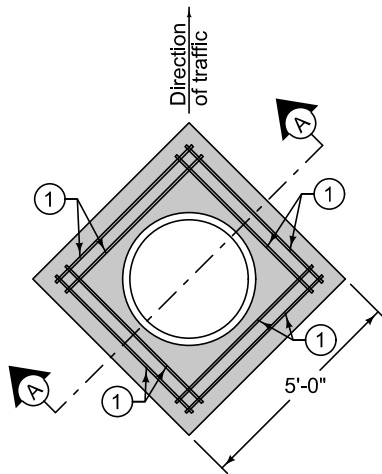
**MANHOLE BOXOUTS IN
PCC PAVEMENT**



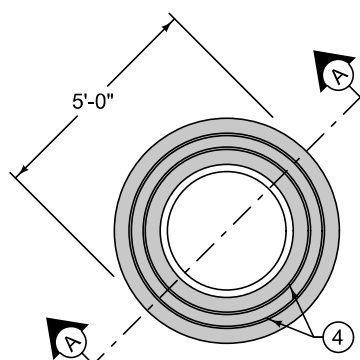
- ① 6 inch standard curb or 4 inch sloped curb.
- ② BT, KT, or L joint depending on pavement thickness and construction staging.
- ③ Subbase or subgrade as specified.
- ④ Unless otherwise specified in the contract documents.
- ⑤ No dowels within 24" of the back of curb. With gutterline joint, place first dowel 6 inches from the joint. See Figure 7010.101, Sheet 8.

TRANSVERSE JOINT REQUIREMENTS ④		
Pavement Thickness	Transverse Joint Type	Transverse Joint Spacing
6"	C	15'
7"	C	15'
8"	CD ⑤	15'
9"	CD ⑤	15'
≥10"	CD ⑤	17'

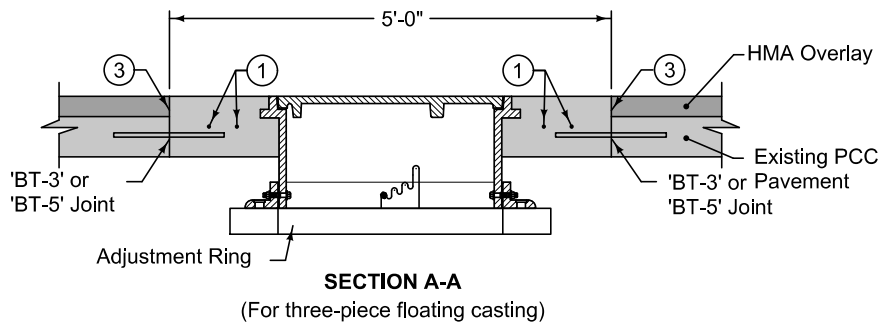
REVISION	
1	05-23/25
BETT7010.901	
SHEET 1 of 1	



RECTANGULAR

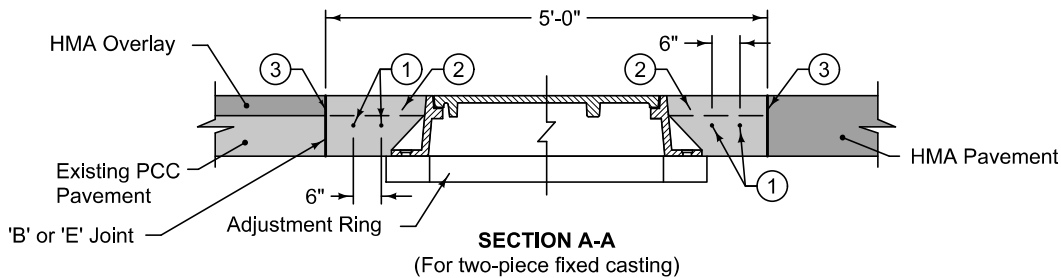


CIRCULAR



SECTION A-A

(For three-piece floating casting)



SECTION A-A

(For two-piece fixed casting)

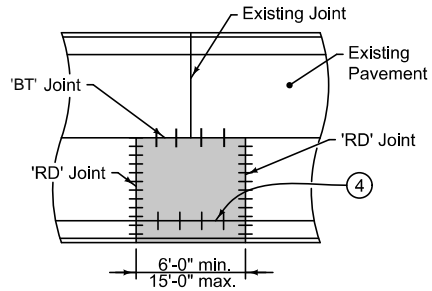
Construct boxout with Class C concrete or match pavement class. Minimum 2 inches of concrete between outside of casting and nearest joint. Center casting within boxout area if possible.

- ① 4 foot 8 inch (typ.) #4 bar. Place at mid-slab.
- ② If boxout is constructed prior to placement of HMA overlay or final lift of HMA pavement, boxout may be constructed low, with a 'B' joint in place of the 'E' joint, and then final lift or overlay placed.
- ③ Apply tack coat.
- ④ #4 hoops (variable length). Place at mid-slab.

NOTE: CONTRACTOR MAY ADD 2" TO DEPTH OF PAVEMENT IN LIEU OF STEEL REINFORCEMENT.

	REVISION
	1 05-23/25
STANDARD ROAD PLAN	BETT7020.201
SHEET 1 of 1	
REVISIONS:	
SUDAS DIRECTOR DESIGN METHODS ENGINEER	
MANHOLE BOXOUTS IN HMA PAVEMENT AND HMA OVERLAYS	

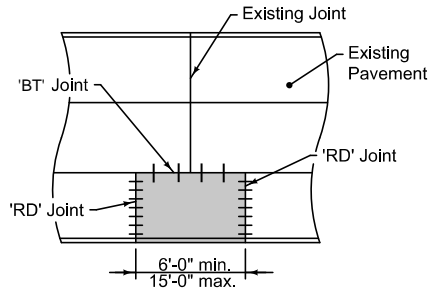
GUTTERLINE JOINTING



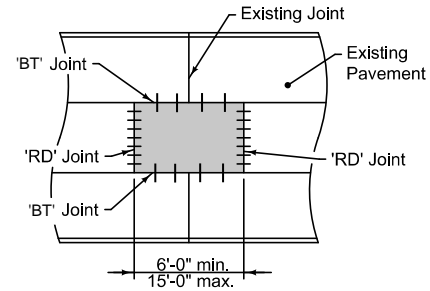
ONE PANEL WIDTH PATCH WITH OPPOSING JOINT

THIRD POINT JOINTING

①

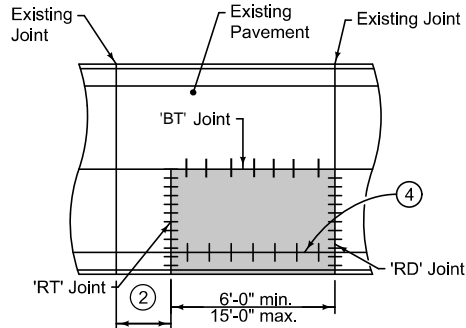


OUTSIDE PANEL PATCH WITH OPPOSING JOINT

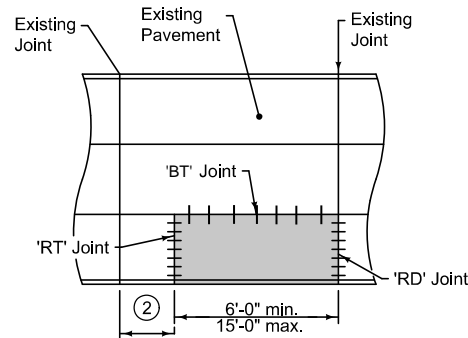


CENTER PANEL PATCH WITH OPPOSING JOINT

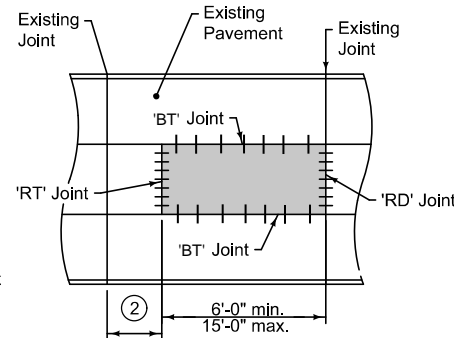
- ① Patches on roadways with quarter point jointing will be similar to third point jointing details.
- ② Minimum distance between existing joint and patch is 6 feet. If distance is less than 6 feet, extend patch to existing joint.
- ③ If subgrade or subbase material is required below patch, bring material to a level 2 inches below bottom of existing pavement.
- ④ BT, KT, or L joint depending on pavement thickness and pouring sequence.



ONE PANEL WIDTH PATCH NO OPPOSING JOINT

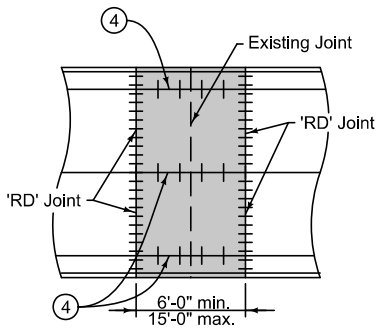
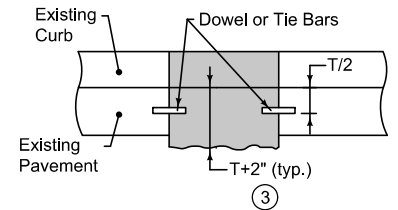


OUTSIDE PANEL PATCH NO OPPOSING JOINT

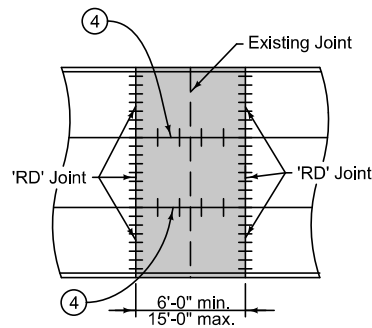


CENTER PANEL PATCH NO OPPOSING JOINT

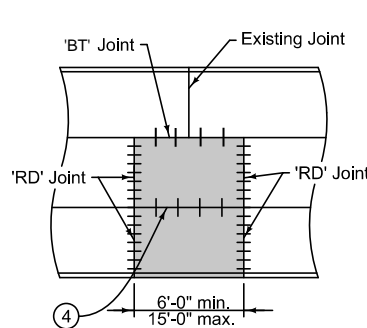
LONGITUDINAL SECTION THRU PCC PATCH



FULL ROADWAY WIDTH PATCH



FULL ROADWAY WIDTH PATCH



ADJACENT PANELS PATCH

	REVISION
	1 12-05-25
	BETT7040.101
SHEET 1 of 1	

FULL DEPTH PCC PATCHES LESS THAN OR EQUAL TO 15' LONG

Refer to the contract documents for dimensions, grades, and additional requirements for permeable interlocking pavers and associated improvements.

- ① Permeable interlocking pavers as specified in the contract documents.
- ② 2 inch minimum permeable pavement bedding aggregate to accommodate imperfections in the permeable pavement filter aggregate layer.
- ③ Permeable pavement storage aggregate thickness as specified in the contract documents.
- ④ When underdrain collectors and/or laterals are specified, install to the line and grade specified in the contract documents. Place permeable pavement filter aggregate to springline of pipe.
- ⑤ Place 4 inches of filter aggregate under curb and gutter section. Extend to 12 inches beyond the back of curb. Extend engineering fabric under aggregate.
- ⑥ Install paver edge restraint system along unrestrained edges.

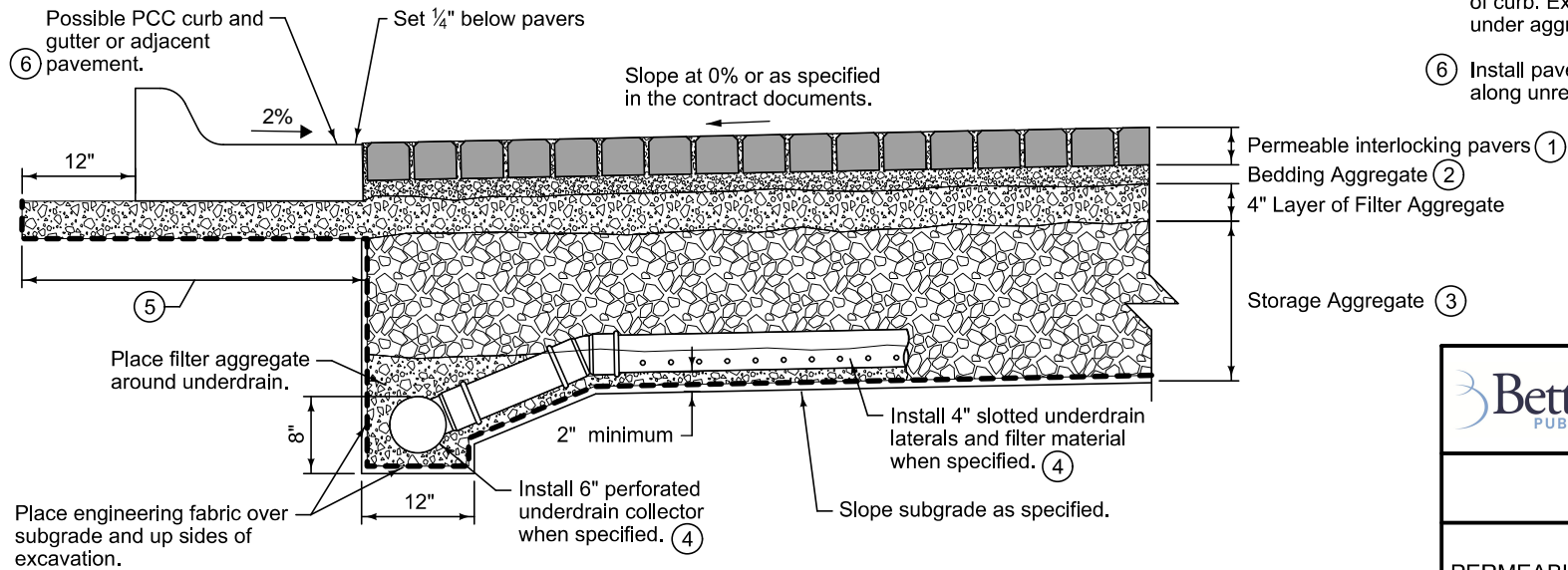


FIGURE 7080.101 SHEET 1 OF 1

	REVISION	
	1	05-23/25
BETT7080.101		
SHEET 1 of 1		
PERMEABLE INTERLOCKING PAVERS		