



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: December 27, 2012
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Revise title of Section 324

Case 13-01 A

PURPOSE: Rigid pavement is commonly referred to as portland cement concrete pavement or PCCP. Although PCCP is a commonly used acronym, MAG specifications do not clearly identify a specification for PCCP. Revising the title of section 324 will clearly identify the specification as being for portland cement concrete pavement (PCCP).

REVISION:
Change section title from *PORTLAND CEMENT CONCRETE STREET PAVEMENT* to *PORTLAND CEMENT CONCRETE PAVEMENT (PCCP)*.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: December 27, 2012

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Miscellaneous Corrections

Case 13-01 B and C

PURPOSE: Correct minor errors.

REVISION:

B. Section 505.6.3.3 (4) Typing error correction

Change "Armor: All steel ~~for~~cast-in-place deck joint ..." to "Armor: All steel **for** cast-in-place deck joint ..."

C. Section 735.4 (D) Delete obsolete reference as noted:

(D) Rubber gaskets shall be in accordance with ASTM C443 ~~or~~ **AASHTO M 315**.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

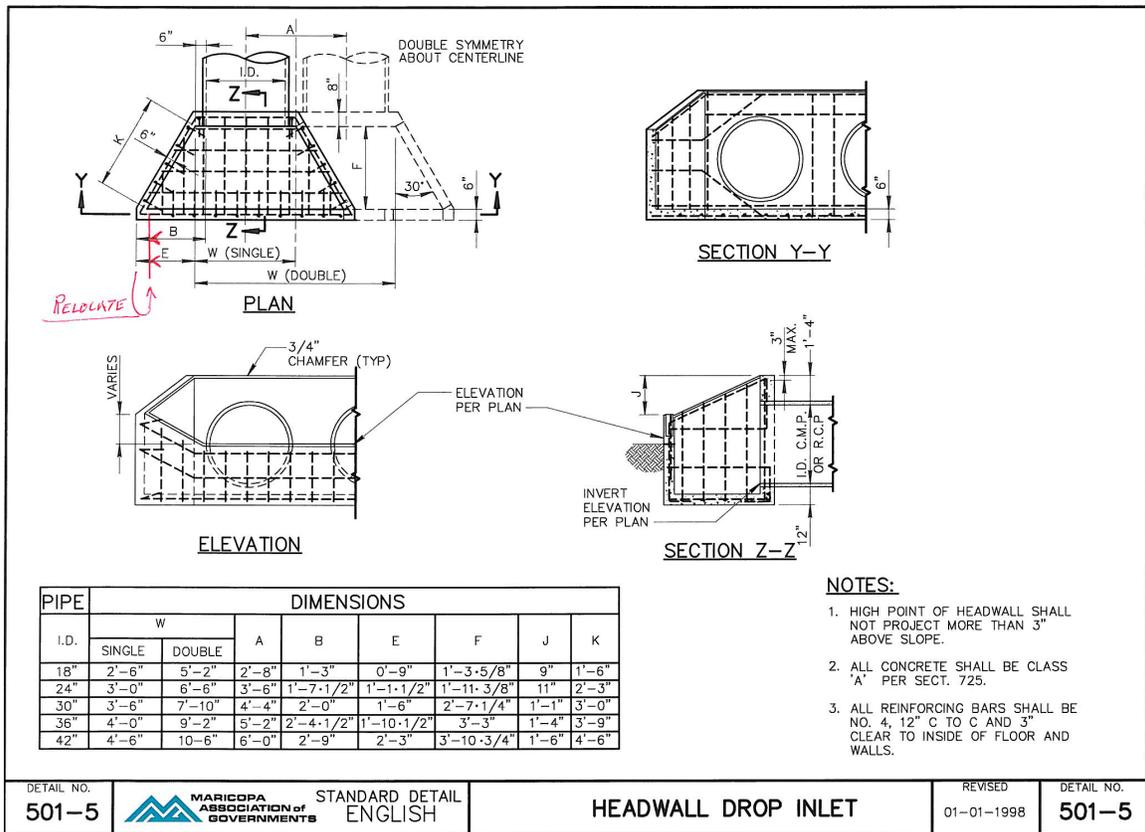
Date: January 15, 2013
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Correction to Detail 501-5

Case 13-01 D

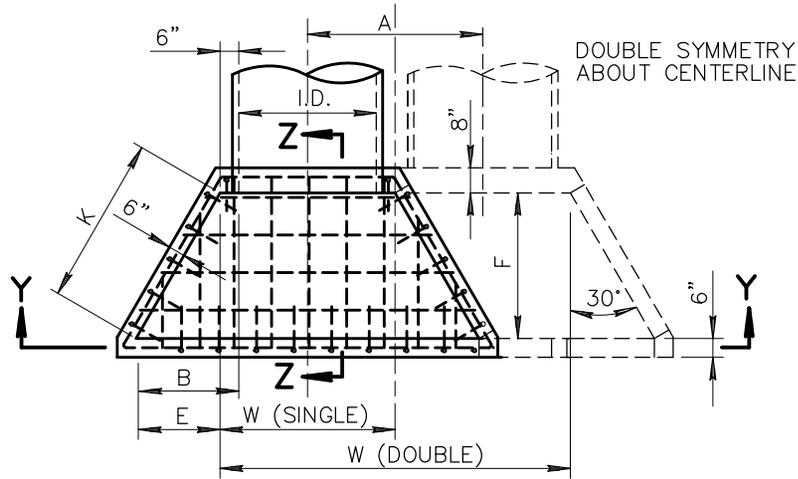
PURPOSE: Correct depicted distance B and E shown on PLAN view of Detail 501-5.

REVISION:

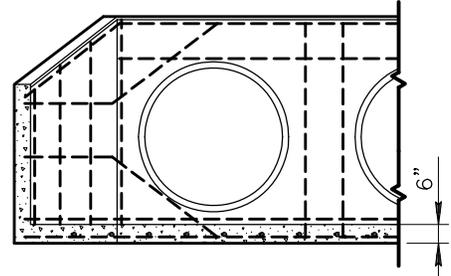
Variable distance B and E shown on the PLAN view are presently shown to the outside edge of the inlet basin wall, they should be shown to the inside edge of the inlet basin wall.
 (Distances E and F are the legs of a right triangle with hypotenuse K.)



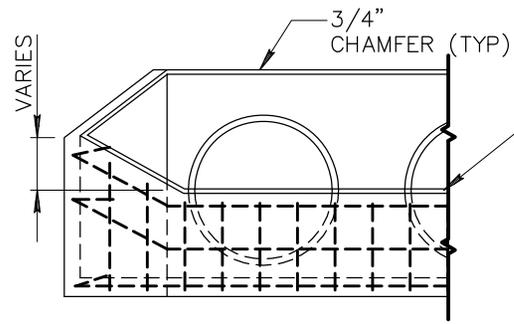
| | | | | |
|----------------------------|--------------------------------|----------------------------|-----------------------|----------------------------|
| DETAIL NO. 501-5 | STANDARD DETAIL ENGLISH | HEADWALL DROP INLET | REVISED 01-01-1998 | DETAIL NO. 501-5 |
|----------------------------|--------------------------------|----------------------------|-----------------------|----------------------------|



PLAN

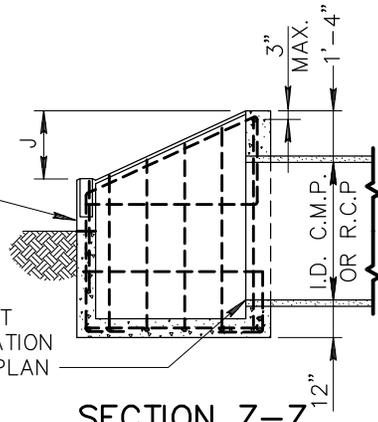


SECTION Y-Y



ELEVATION

ELEVATION PER PLAN



SECTION Z-Z

INVERT ELEVATION PER PLAN

| PIPE | DIMENSIONS | | | | | | | |
|------|------------|--------|-------|-----------|------------|------------|-------|-------|
| | W | | A | B | E | F | J | K |
| | SINGLE | DOUBLE | | | | | | |
| 18" | 2'-6" | 5'-2" | 2'-8" | 1'-3" | 0'-9" | 1'-3.5/8" | 9" | 1'-6" |
| 24" | 3'-0" | 6'-6" | 3'-6" | 1'-7.1/2" | 1'-1.1/2" | 1'-11.3/8" | 11" | 2'-3" |
| 30" | 3'-6" | 7'-10" | 4'-4" | 2'-0" | 1'-6" | 2'-7.1/4" | 1'-1" | 3'-0" |
| 36" | 4'-0" | 9'-2" | 5'-2" | 2'-4.1/2" | 1'-10.1/2" | 3'-3" | 1'-4" | 3'-9" |
| 42" | 4'-6" | 10'-6" | 6'-0" | 2'-9" | 2'-3" | 3'-10.3/4" | 1'-6" | 4'-6" |

NOTES:

1. HIGH POINT OF HEADWALL SHALL NOT PROJECT MORE THAN 3" ABOVE SLOPE.
2. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725.
3. ALL REINFORCING BARS SHALL BE NO. 4, 12" C TO C AND 3" CLEAR TO INSIDE OF FLOOR AND WALLS.

DETAIL NO.
501-5



STANDARD DETAIL
ENGLISH

HEADWALL DROP INLET

REVISED
01-01-2014

DETAIL NO.
501-5

SECTION 311

PLACEMENT AND CONSTRUCTION OF CEMENT TREATED SUBGRADE

311.1 DESCRIPTION:

This item shall consist of a cement treated subgrade composed of a mixture of local soil, Portland cement, and water compacted at optimum moisture content.

311.2 MATERIALS:

Portland cement and water shall comply with Sections 725. The soil for the mixture shall consist of the material in the area to be paved. The material shall not contain more than 5 percent gravel or stone retained on a 3 inches sieve. It shall be demonstrated by laboratory tests that the plasticity and strength characteristics as defined in Section 311.4.5 of the soil will be adequately modified by the specified cement content.

311.3 EQUIPMENT:

An ample number of machines, combination of machines and equipment shall be provided and used to produce the complete soil cement treated layer meeting the requirements for soil pulverization, cement distribution, water application, incorporation of materials, compaction, finishing, and for application of the curing material as provided in these specifications.

Mixing shall be accomplished by means of multiple-pass soil-cement mixer, single-pass soil-cement mixer or central plant mixer.

Water may be applied through the mixer or with the water trucks equipped with pressure sprays. Water trucks providing fine fog-type sprays shall be furnished for finishing and curing. Properly adjusted garden type nozzles on a pressure bar may be used to produce fog spray if approved by the Engineer.

Cement spreader shall be a specially constructed device to distribute bulk cement at the specified rate. The spreader shall have the ability to maintain a consistent spread rate over variable travel speeds.

311.4 CONSTRUCTION METHODS:

Prior to construction, the contractor shall remove all deleterious material, organic material, and particles retained on the 3 inch sieve from the area to be treated. The soil shall be brought to a compacted condition, true to line and grade as directed by the Engineer or as shown on the plans. The compacted soil and surface shall be approved by the Engineer prior to proceeding with mixing.

The material shall be scarified, pulverized, mixed with water and cement, compacted, finished and cured in lengths permitting the full roadway width to be complete in not more than 4 hours from the time that cement is exposed to water. Such lengths will generally be not less than 600 feet or the length of one City block and preferably more. Where a gutter section exists the material shall be pulled back from the gutter face for the full depth of the course before processing.

311.4.1 Pulverizing: Prior to application of cement, soil to be processed shall be scarified to depth of base. The material shall be damp at time of scarifying to reduce the dust generation and to aid in pulverization. Soil shall be pulverized until not less than 80 percent, exclusive of gravel or stone, will pass a No. 4 sieve.

311.4.2 Application of Cement: The quantity of cement shall be by weight as a percentage of the dry weight of the soil as determined by the laboratory and/or as directed by the Engineer and shall be applied uniformly on the soil in a manner satisfactory to the Engineer. The allowable deviation in uniformity shall not exceed 10 percent. The entire operation of spreading and mixing shall be conducted in such a manner as will result in a uniform soil cement and water mixture for the full design width and depth.

The percentage of moisture in the soil, at the time of cement application, shall not exceed the quantity that will permit a uniform and intimate mixture of the soil and cement during mixing operations, and it shall not exceed the specified optimum moisture content for the soil cement mixture.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: February 20, 2013

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Correction to Section 795.8.4

Case 13-01 F

PURPOSE: Delete non-existent reference located within Section 795 LANDSCAPE MATERIAL. The testing that was required in the 2012 specification section 702.4 is not needed when decomposed granite is used for general landscaping purposes.

REVISION:

795.8.4 Decomposed Granite: ~~Decomposed granite shall be as per Subsection 702.4 with the following exceptions.~~ All material used for a specific project or location shall be from a single source and shall present a uniform appearance. The gradation shall be as shown below. If a specific color or type is required, it will be so indicated in the Contracting Agency's specifications.

| Sieve Size | Percent Passing |
|-------------------|------------------------|
| 3/4 inch | 100% |
| 1/2 inch | 60-70 |
| No. 40 | 5-20 |



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: March 6, 2013

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Revision to Section 107.4

Case 13-01 G

PURPOSE: Change the Arizona Revised Statute reference 41-846 to 41-865.

REVISION:

107.4 ARCHAEOLOGICAL REPORTS:

Attention is directed to Sections 41-844 and 41-~~846-865~~ Arizona Revised Statutes. In view of the above, it shall be a provision of every contract that when archaeological features are encountered or unearthed in the excavation of material pits or of the roadway prism, or other excavation, the Contractor shall report promptly to the Director of the Arizona State Museum and the Contracting Agency. The Contractor will be allowed extra time as appropriate in accordance with the provisions of Section 108.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: March 18, 2013

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Section 108.8 Correction

Case 13-01 I

PURPOSE: Change “or” to “and”.

REVISION:

108.8 GUARANTEE AND WARRANTY PROVISIONS:

The Contractor shall guarantee the work against defective workmanship ~~or~~ and materials for a period of one year from the date of its final acceptance under the contract, ordinary wear and tear and unusual abuse or neglect excepted.

SECTION 301

SUBGRADE PREPARATION

301.1 DESCRIPTION:

This Section shall govern the preparation of natural or excavated areas prior to the placement of sub-base material, pavement, curbs and gutters, driveways, sidewalks or other structures. It shall include stripping and disposal of all unsuitable material including existing pavement and obstructions such as stumps, roots, rocks, etc., from the area to be paved.

301.2 PREPARATION OF SUBGRADE:

With the exception of areas where compacted fills have been constructed as specified in Section 211, in the areas where new construction is required, the moisture content shall be brought to that required for compaction by the addition of water, by the addition and blending of dry, suitable material or by the drying of existing material. The material shall then be compacted to the specified relative density. If pumping subgrade should become evident at any time prior to paving, the Engineer may require proof rolling with a pneumatic-tire roller or other approved equipment in order to identify the limits of the unacceptable area. The proof rolling will be performed at no additional cost to the Contracting Agency.

Subgrade preparation shall also include preparing the subgrade to the required line and grade for paved or unpaved shoulders, tapers, turnouts, and driveways, and at all other project locations where aggregate base and/or select material courses are used in accordance with the Project Plans.

301.2.1 The Contractor may use removed existing asphalt concrete and other existing bituminous roadway surfacing materials originating on the project site, as embankment fill. All materials used shall be thoroughly crushed to sizes not exceeding four inches, or as approved by the Engineer. These asphalt/bituminous materials shall be placed not less than two feet below finished subgrade elevation.

Project earthwork quantities when included as separate contract pay items will include removed asphalt/bituminous material volumes, unless otherwise specified in the Special Provisions.

All unsuitable material and all excess material shall be disposed of in accordance with the requirements of Sections 205.2 and 205.6, respectively. When additional material is required for fill, it shall conform to Section 210.

301.3 RELATIVE COMPACTION:

The subgrade shall be scarified and loosened to a depth of 6 inches. Rock 6-inches or greater in size that becomes exposed due to scarification shall be removed from the scarified subgrade. When fill material is required, a layer of approximately 3 inches may be spread and compacted with the subgrade material to provide a better bond. The subgrade cut and fill areas shall be constructed to achieve a uniform soil structure having the following minimum compaction, measured as a percentage of maximum dry density when tested in accordance with AASHTO T-99, Method A, and T191 or ASTM D6938 with the percent of density adjusted in accordance with the rock correction procedures for maximum density determination, ARIZ-227c to compensate for the rock content larger than that which will pass a No. 4 sieve. Unless otherwise noted in the project plans or project specifications, compaction shall be performed within 2 percentage points of the optimum moisture content.

- (A) Below pavement, curb & gutter, attached sidewalk, roadway shoulders, and other areas within right-of-way subject to vehicular traffic 95 percent
- (B) Below detached sidewalk not subject to vehicular traffic 85 percent

301.4 SUBGRADE TOLERANCES:

Subgrade upon which pavement, sidewalk, curb and gutter, driveways, or other structures are to be directly placed shall not vary more than 1/4 inch from the specified grade and cross-section. Subgrade upon which sub-base or base material is to be placed shall not vary more than 3/4 inch from the specified grade and cross-section. Variations within the above specified tolerances shall be compensating so that the average grade and cross-section specified are met.

ADD MISSING REFERENCE TO ARIZ-227c

(1) Arizona Department of Transportation test method.

SECTION 321

321.14.2 Core Drilling Device: The core drilling device will be powered by an electrical motor, or by an acceptable gasoline engine. Either device used shall be capable of applying enough effective rotational velocity to secure a drilled specimen. The specimen shall be cored perpendicularly to the surface of pavement, and that the sides of the core are cut in a manner to minimize sample distortion or damage. The machinery utilized for the procedure shall be on a mounted base, have a geared column and carriage that will permit the application of variable pressure to the core head and carriage throughout the entire drilling operation. The carriage and column apparatus shall be securely attached to the base of the apparatus; and the base will be secured with a mechanical fastener or held in place by the body weight of the operator. The core drilling apparatus shall be equipped with a water spindle to allow water to be introduced inside of the drill stem while operating. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with embedded diamond chips in the cutting surface. The core barrel shall be of sufficient diameter to secure a specimen that is a minimum of four or six inches or whichever is prescribed for necessary testing. The core barrel shall not be missing more than one of the teeth used for cutting; if so it shall be discarded and another barrel shall be used. The core barrel shall also be a minimum of two inches longer than the anticipated depth of pavement in accordance with project paving plans.

321.14.3 Accessory Equipment: A sufficient supply of ice and dry ice shall be provided to sufficiently cool the pavement prior to securing the samples from the designated areas in the pavement. The ice should also be used to adjust the temperature of the water used to cool the core bit. A water supply (usually a plastic 35 – 55 gal drum) with sufficient hose to introduce the water into and through the spindle of the coring device by gravity feed. The drum should be white or light in color to minimize excessive thermal heating of the water (*for coring of asphalt rubber cores see Note 1*). At no time shall the water utilized in the coring operation exceed 65° F during the coring operation. Ice shall be utilized to ensure the temperature control of the water being introduced during the cutting operation. An ice chest or other suitably insulated container that can maintain a temperature of less than 70° F shall be used to secure the specimens during transport. The container will be equipped with flat shelving that will support the drilled cores throughout the entire specimen dimension during transport back to the testing facility.

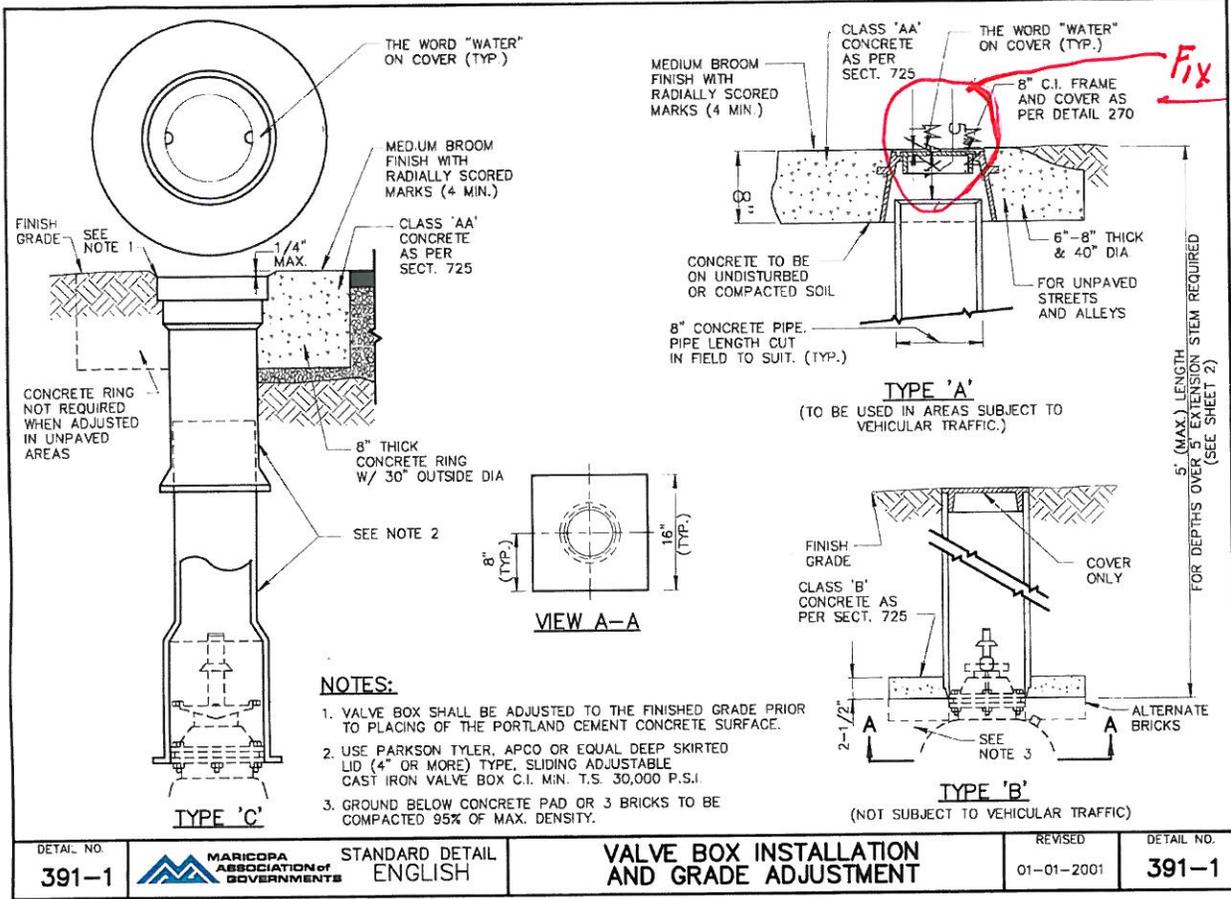
Miscellaneous hand tools to remove the drilled specimen from the drill hole or the core barrel taking great care in not disturbing the specimen more than necessary (refer to fig. 1 in ASTM D5361-05).

321.14.4 Process: The pavement surface at the time of coring shall not exceed a temperature of 90° F; the pavement shall be conditioned with ice or dry ice to ensure that this requirement is met. Immediately after it has been ensured that the pavement has dropped to the required temperature, core drilling shall begin. The operator will then apply an even and continuous pressure (Note 2) to penetrate through the full depth of the pavement. The operator will concurrently ensure that enough water is moving over the core surface as to adequately remove any and all cuttings that could damage the drilled core. After the pavement thickness has been penetrated the core shall be carefully removed from either the drill hole or the core barrel and be immediately transferred to an ice chest or other suitable container. Each individual core shall be placed on a shelf in the cooler with the exposed side of the specimen facing down, or the “top side” down. If the specimen is a two lift core, the only acceptable means of separating lifts is with a power or other acceptable wet saw type of equipment (conforming to ASTM D5361-05); however, at no time shall cores be split using a mallet and screwdriver or metal straight edge when being tested for bulk density. Perpendicularity of the specimen shall be checked in the field after the specimen has been extracted from the surface. The core operator shall hold the core up to eye level and place the core top side down in a “speed square” or small carpenters square. The specimen placed in the square shall not depart from perpendicular to the axis more than 0.5° (approximately equivalent to 1/16 of an inch in 6 inches). If the specimen is outside of this distance from square it shall be discarded in the field and another sample cored that falls within tolerance. The cores upon arriving at the laboratory for testing shall be carefully cleaned and measured for thickness in accordance with ASTM D3549. A speed square shall be utilized to measure perpendicularity as compared to a 90° degree angle and shall not depart from perpendicular to the axis more than 0.5° (approximately equivalent to 1/16 of an inch in 6 inches). All remaining testing shall be done within the parameters of the current project and / or agency required specification.

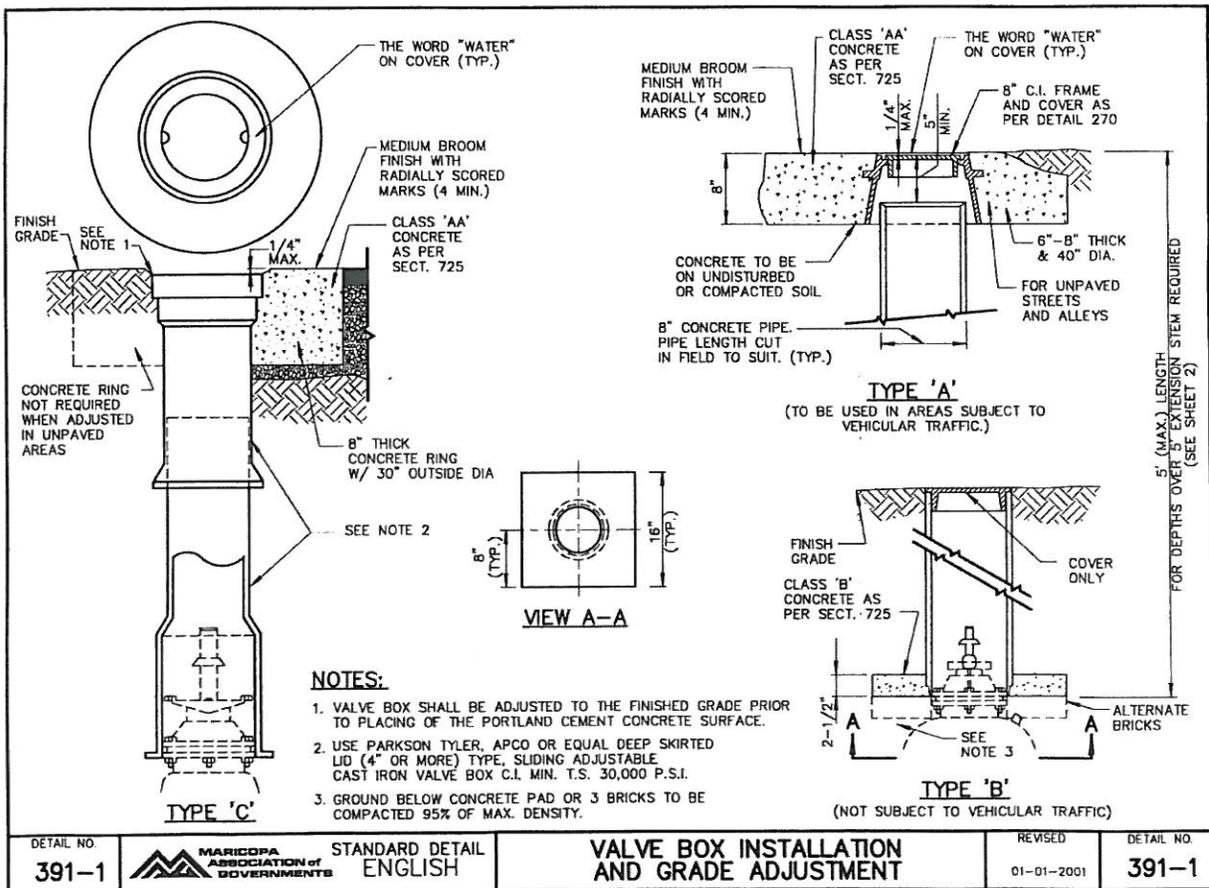
- End of Section -

*Note 1 – It should be noted that when the material to be cored is a rubberized asphalt mixture a wetting agent such as liquid dish soap shall be added to the water barrel to hinder the material from sticking or allowing the binder to spread during coring.

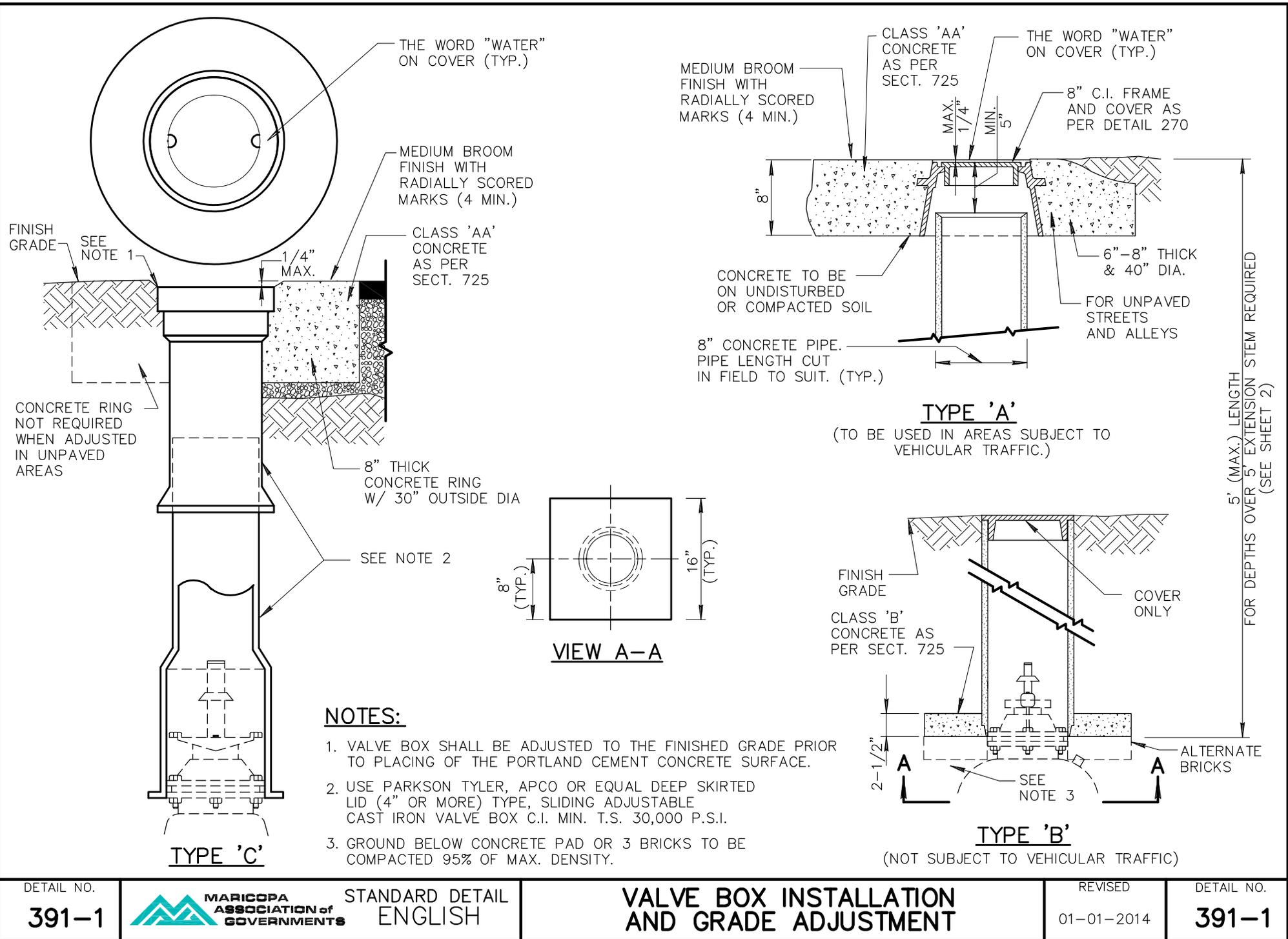
*Note 2 – This refers to pressure exerted on the core barrel and machine during the coring process. Too much pressure can cause damage to the core barrel and the motor; and too little pressure can cause a glazing of the diamonds, reducing cutting efficiency and premature wear of the barrel.



DETAIL IN 2013



DETAIL IN 2011



NOTES:

1. VALVE BOX SHALL BE ADJUSTED TO THE FINISHED GRADE PRIOR TO PLACING OF THE PORTLAND CEMENT CONCRETE SURFACE.
2. USE PARKSON TYLER, APCO OR EQUAL DEEP SKIRTED LID (4" OR MORE) TYPE, SLIDING ADJUSTABLE CAST IRON VALVE BOX C.I. MIN. T.S. 30,000 P.S.I.
3. GROUND BELOW CONCRETE PAD OR 3 BRICKS TO BE COMPACTED 95% OF MAX. DENSITY.

DETAIL NO.
391-1



STANDARD DETAIL
ENGLISH

VALVE BOX INSTALLATION AND GRADE ADJUSTMENT

REVISED
01-01-2014

DETAIL NO.
391-1

SECTION 735**REINFORCED CONCRETE PIPE****735.1 GENERAL:**

These specifications cover reinforced concrete pipe and related structures intended to be used for conveyance of sewage, industrial waste, and storm and irrigation water.

furnished

The size, type, and D-load of the concrete pipe to be ~~finished~~ shall be as shown on the plans, or as specified under the item of work for the project of which the pipe is a part and shall be for pipe installed by the open-cut method of construction.

When specified in the special provisions, four sets of pipe line layout drawings shall be furnished to the Engineer prior to the manufacture of the concrete pipe. Catch basin connector pipe need not be included in the pipe line layout; however, pipe stubs shall be included. In lieu of including catch basin connector pipe in the pipe layout, a list of catch basin connector pipes shall accompany the layout. The connector pipe list shall contain the following information.

- (A) Size and D-load of pipe.
- (B) Station at which pipe joins main line.
- (C) Number of section of pipe, length of section, type of sections (straight, horizontal bevel, vertical bevel, etc.).

The pipe layouts will be used by the Contracting Agency for reference only, but their use shall in no way relieve the Contractor of the responsibility for the correctness of the layout.

(D) All pipe installed in tunnels shall be ASTM C76, Class III. Pipe stronger than that specified may be furnished at the Contractor's option, and at no additional cost to the Contracting Agency, provided such pipe conforms in all other respects to the applicable provisions of these specifications.

Whatever struts or other protective methods proved necessary to furnish and install the pipe to meet the limitation of cracks as specified herein, shall be provided and maintained throughout pipe handling and transportation.

735.2 QUALITY:

Reinforced concrete pipe shall be manufactured and tested in conformance with the requirements of ASTM C76, except as modified herein.

All reinforced concrete pipes less than 36 inch inside diameter shall include an area of reinforcing steel in the bell not less than the area required for the circumferential reinforcement in the wall of the pipe.

735.3 CURVES, BENDS AND CLOSURES:

Horizontal and vertical long-radius curves shall be formed by bevel adapters or by beveling the straight pipe joint. The bevel of the pipe shall not exceed 5 degrees and the total angular deflection, for beveled pipe, shall not exceed 10 degrees. Small angular changes may be made with straight pipe provided that the joint opening does not exceed 3/4 inch. Short radius curves and closures shall be formed with fabricated specials; however, the angular deflection of any segment of the fabricated section shall not exceed 10 degrees.

735.4 MATERIALS:

Except when otherwise permitted by the Engineer, no materials other than water, Portland cement, Pozzolanic materials, mineral aggregates and steel shall be used in the manufacturing of the pipe, conforming to ASTM C76, with the following exceptions:

(A) Portland Cement: Portland cement shall comply with ASTM C150, Type II, and low alkali. The pipe manufacturer shall supply a cement mill certificate in triplicate for each load of cement delivered, showing the specification, type, chemical analysis, and quantity. In lieu of the above, on stockpiled pipe the manufacturer shall certify that the type of cement used meets