

# **SPOKANE COUNTY STANDARDS FOR ROAD AND SEWER CONSTRUCTION**

**January 2018**



**SPOKANE COUNTY**

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## **1.00 GENERAL CONSIDERATIONS**

### **1.01 APPLICABILITY**

These Standards shall apply to all new construction of public and private roads in Spokane County and as far as practicable and feasible to reconstruction, resurfacing, restoration, and rehabilitation of old roads comprising the Spokane County Road System. In case of any ambiguity or dispute over interpretation of the provisions of these Road Standards, the decision of the County Engineer shall be final but subject to the review process described in 1.08 "Deviations and Review of Decision". Prior to the issuance of a building permit, a lot, parcel, or tract of land shall have access by a driveway, private road, or public road.

### **1.02 DEFINITIONS**

1. "3-R" shall mean a construction activity that involves the resurfacing, restoration, or rehabilitation of an existing road.
2. "All-weather road" shall mean a gravel or paved road described under Section 1.07 "Non-Conforming Private Roads" of these Standards. The traveled way shall have a two-percent crown and, be surfaced with a minimum of seven inches of Crushed Surfacing Top or Base Course.
3. "Border" shall mean the portion of a street between the edge of pavement and the right-of-way line, or the area between the edge of shoulder and the right of way line. This area is used for curbing, planting areas, sidewalk, utilities, etc.
4. "Border easement" shall mean the areas on curbed roads, between the right of way line and the back of sidewalk dedicated as an easement.
5. "Change of Use" shall conform to the provisions of the International Building Code.
6. "Clear Zone" is used to designate the unobstructed area provided beyond the edge of the traveled way for the recovery of errant vehicles.
7. "County Engineer" is the Spokane County Engineer, having authorities specified in RCW 36.75.050 and 36.80, or an authorized representative.
8. "Cul-de-sac" is a short street having one end open to traffic and ending with a vehicle turnaround, either permanent or temporary.
9. "Curb Ramp" shall mean a short, depressed section of curb and sidewalk, normally placed at street intersections, designed to facilitate travel of physically disadvantaged persons.
10. "Design Deviation Review Panel" shall mean an advisory review panel selected by the County Engineer to review deviation request denials. The panel consists of

three professional engineers, two from public service and one from the private sector.

11. "Driveway" shall mean private driveways that provide primary vehicular access from a public or private road to up to three lots.
12. "Driveway Approach" shall mean any area, construction or facility between the roadway of a street and private property to provide access for vehicles from the roadway of a street to serve up to three lots, tracts or parcels, except as provided herein.
13. "Engineer" shall mean the Professional Engineer, licensed to practice in the State of Washington, responsible for development of the design, plans, specifications, engineering reports, and other technical documents.
14. "Established County Road" shall mean a road that has been accepted by Spokane County for maintenance with public funds.
15. "Established Grade" shall mean the profile and cross-sections approved by the County Engineer.
16. "Final Approval" shall mean the signature of the County Engineer on the final plat map, short plat, binding site plan, or commercial building permit release, or the County Engineer's concurrence for approval of a certificate of occupancy.
17. "Half-street" is an access street completely constructed on one side of the centerline plus the twelve-foot lane on the opposite side of the centerline.
18. "Hazard" shall mean a side slope steeper than 3:1 (horizontal/vertical), a fixed object, or water which, when struck, would apply unacceptable impact forces on the vehicle occupants or place the occupants in a hazardous position. It may be natural or manmade.
19. "Level of Service" (LOS) is a qualitative measure of traffic flow. Six levels are defined as "A" through "F" with "A" being the best operating conditions and "F" being the worst. (See Highway Capacity Manual)
20. "New Construction" shall mean the construction of a new roadway or structure on a new alignment. It also means the upgrading of an existing roadway or structure by the addition of one or more continuous traffic lanes.
21. "Planting Strip" shall mean the space between the edge of the pavement or the back of the curb and the sidewalk.
22. "Private Road" shall mean privately owned vehicular access route serving more than three residential lots; or any commercial parcels which do not have frontage on a public road right-of-way. Spokane County does not maintain private roads.

23. "Project" shall mean the design and construction of infrastructure associated with land development activities.
24. "Public Road" where used in these standards, shall mean a road is, or shall be, established by Spokane County.
25. "Reconstruction" shall mean major construction of an existing road greater than 3-R. Reconstruction includes significant changes in cross section and/or shifts in vertical or horizontal alignment. A project is considered reconstruction if 50% or more of the project length involves significant vertical or horizontal alignment change.
26. "Record Drawings" shall mean the plan set, which is certified to contain a true and accurate representation of the actual field conditions for the project during construction, or upon completion of construction.
27. "Resurfacing" shall mean the addition of a layer or layers of paving material to provide additional structural integrity or improved profile and serviceability. This includes paving existing gravel roads if the improvement is not reconstruction as defined above.
28. "Restoration" shall mean work done on pavement or bridge decks to prepare them for an additional stage of construction. This may include supplementing the existing roadway by increasing surfacing and paving courses to provide structural capability, widening up to a total of 10 feet, and installing localized safety improvements. Restoration will generally be done within the existing right of way.
29. "Rehabilitation" shall mean work similar to restoration except the work may include but is not limited to the following:

Reworking or strengthening the base or subbase

Recycling or reworking existing materials to improve their structural integrity

Adding underdrains

Replacing or restoring malfunctioning joints

Substantial pavement undersealing when essential for stabilization

Grinding of pavements to restore smoothness, providing adequate structural thickness remains

Removing and replacing deteriorated materials

Crack and joint sealing but only when required shape factor is established by routing or sawing

Improving or widening shoulders

30. "Road" and "Street" will be considered interchangeable terms in these Standards.

31. "Roadway" shall mean the portions of a street, including shoulders but excepting concrete gutters, designed or ordinarily used for vehicular travel.
32. "Rural" shall mean a location outside of the current Urban Growth Boundary as adopted by The Board of County Commissioners.
33. "Sponsor" shall mean the party identified as the proponent of a development action. The Sponsor is ultimately responsible for the provision of the required infrastructure and documentation for the project acceptable to Spokane County.
34. "Sponsor's Engineer" shall mean:

Design phase - the Design Engineer who directly prepared plans and calculations, or who directly supervises the preparation of project plans and calculations. The Design Engineer seals, signs and dates the plans and calculations, certifies that they meet the required standards, and approves the plans for construction. Also known as the "Engineer of Record", the Design Engineer may also act in capacity of the Construction Engineer.

Construction phase - the Construction Engineer who directly inspects, or who directly supervises the inspection of the construction of a project to ensure compliance to the plans and standard specifications. The Construction Engineer maintains and certifies the Record Drawings. The Construction Engineer may have also acted in the capacity of the Design Engineer.

35. "Standards" shall mean the requirements contained in the "Spokane County Standards for Road and Sewer Construction"
36. "Street" is intended to include any avenue, boulevard, circle, drive, street, court, alley, or other public passageway within the Spokane County.
37. "Substantial Completion" shall mean that (1) Spokane County and/or any applicable homeowner association must have full and unrestricted use and benefit of the facilities, both from an operational and a safety standpoint; (2) The facilities must conform to the Conditions of Approval and the Standards; (3) and only minor, incidental repair work, replacement of temporary substitute facilities remains to reach physical completion of the work.
38. "Surety" shall mean a financial guarantee by the Sponsor, naming Spokane County as beneficiary, that infrastructure required for a project will be constructed and certified according to the plans and specifications and all applicable Standards. The financial guarantee may be in the form of a cash savings assignment or a letter of credit. The language of the surety document must be acceptable to the Spokane County Prosecuting Attorney's Office.
39. "Surveyor" shall mean a Professional Land Surveyor licensed by the State of Washington.



40. "Traffic Barrier" shall mean a barrier oriented parallel or nearly parallel to the roadway. The purpose of these devices is to contain or redirect errant vehicles from hazards within the clear zone.
41. "Traffic Impact Study" shall mean a report that documents a study of traffic conditions before and after construction of a proposed development. It addresses any deficiencies in the transportation system, either current or after development, and proposes recommended mitigation to correct those deficiencies. (See Technical Reference A)
42. "Traveled way" is comprised of the through traffic lanes. It is the portion of a street designed or ordinarily used for vehicular travel excluding shoulders, medians, bicycle lanes, or exclusive turn lanes.
43. "Urban" shall mean a location within the current Urban Growth Boundary as adopted by the Board of County Commissioners.

### **1.03 RESPONSIBILITY TO PROVIDE**

All development shall include provision for construction or improvement of the road according to these Standards. The Sponsor's Engineer shall consider the following guidelines in planning transportation systems.

1. Adequate vehicular and pedestrian access should be provided to all parcels of land.
2. Local access streets should be designed to minimize through traffic movements and excessive speeds.
3. Street patterns and names should be logical, consistent and understandable to satisfy the needs of emergency and delivery vehicles.
4. Vehicular and pedestrian-vehicular conflict points should be minimized. The Sponsor's Engineer should use Tee intersections on local access systems. Four-way intersections should be minimized on local access roads.
5. Traffic generators within the project should be considered and the street system designed appropriately.
6. The Sponsor's Engineer should consider bordering arterial routes and should provide design continuity.
7. No direct residential lot access should be allowed to urban principal and minor arterials or urban collectors. Access management should be considered on major rural arterials.
8. When a project has the cumulative effect of creating a total number of living units served by an access road equal to or greater than 30 residential units or 100 apartments/attached housing, the Sponsor shall provide an additional access road into the development. The second access shall be a full and open roadway, meaning that it shall be built to the same standards as the first access whether it is

public, private, or commercial. If the location and layout of a development, in the opinion of the fire district authorities, causes a concern for safety, an additional access road may be required. Gates will only be allowed with prior approval of the County Engineer and the fire district.

9. The Sponsor's Engineer shall consider ease of maintenance when designing public roads.

#### **1.04 REFERENCES**

These Standards are intended to be consistent with the following references, as amended:

1. City and County Design Standards for the Construction of Urban and Rural Arterial and Collectors adopted February 10, 1994 per RCW 35.78.030 and RCW 43.32.020.
2. Spokane County Subdivision Ordinance.
3. Washington State Local Agency Guidelines.
4. "A Policy on Geometric Design of Highways and Streets" published by the American Association of Highway and Transportation Officials (AASHTO).
5. "Highway Capacity Manual" (Special Report 209) published by the Transportation Research Board, National Research Council.
6. "Roadside Design Guide" published by the American Association of Highway and Transportation Officials (AASHTO).
7. Spokane County Comprehensive Plan including the Arterial Road Plan.
8. Spokane County Zoning Code.

#### **1.05 NOT USED**

#### **1.06 STATE SPECIFICATIONS AND PLANS**

Except where stated in these Standards, design and construction shall conform to the current editions of the following Washington State Department of Transportation publications, as adopted by Spokane County:

1. Standard Specifications for Road and Bridge Construction. It will be referred to as the "Standard Specifications."
2. Standard Plans for Road and Bridge Construction.

#### **1.07 NON-CONFORMING PRIVATE ROAD**

A non-conforming private road is an access easement (1) recorded with the Spokane County Auditor (Record-of-Survey, easement document, other) and (2) approved by Spokane County (Certificate-of-Exemption issued prior to May 15, 1995, building permit, other) as a private road.

Private roads will not be required to comply with the provisions of these standards if all of the following conditions exist:

1. The roads are located within easements recorded prior to May 15, 1995.
2. The roads have all-weather surfaces and comply with this manual.

Private roads constructed according to Spokane County Standards on or before May 15, 1995 shall be deemed as non-conforming and shall not be required to comply with the provisions of these Standards.

### **1.08 DEVIATIONS AND REVIEW OF DECISION**

1. Deviations from these Standards may be granted by the County Engineer in writing upon written evidence from the Project Sponsor that the proposed deviation does not conflict with or modify a condition of approval, and
2. Deviations are based upon sound engineering principles, and
3. Deviations meet requirements for safety, function, appearance, and maintainability. Public road safety outweighs economic feasibility and physical constraints.

Desired deviations must be approved before road plans are accepted for residential development. Deviations must be approved before commercial building permits are issued. The County Engineer may apply conditions to the approval of design deviations. The conditions may not have been required in the preliminary plat approval. In case of a denial of a deviation request, the Developer may request a review and reconsideration of the denial. The Design Deviation Review Panel will review the deviation request and make a recommendation to the County Engineer. The County Engineer will then consider the recommendation of the Design Deviation Review Panel and render a final decision on the deviation request.

### **1.09 NOT USED**

### **1.10 NOT USED**

### **1.11 ROADWAY TYPES**

The types and widths of County streets are shown in Tables 3.08, 3.08A, and 3.08B. Standard Plan sheets entitled "Roadway Section-Curbed" and "Roadway Section-Shouldered" show typical roadway cross-sections. Curbed streets shall be constructed on roads within an urban land use classification. The County Engineer may also require curbs in other land use classifications near schools or commercial establishments.

## 1.12 ROADWAY CLASSIFICATIONS

### 1. RURAL ARTERIAL SYSTEM

- A. Major Collector Arterial - These routes (1) serve County seats on arterial routes, larger towns not directly served by the higher systems, and other important traffic generators, such as consolidated schools, shipping points, County parks, and important mining and agricultural areas; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intra-county travel corridors.
- B. Minor Collector Arterial - These routes should (1) be spaced at intervals consistent with population density to accumulate traffic from local routes and bring all developed areas within reasonable distance of collector roads, (2) provide service to remaining smaller communities, and (3) link the locally important traffic generators with their rural surrounding areas.

### 2. URBAN ARTERIAL SYSTEM

- A. Principal Arterial Street - The urban principal arterial system serves the major centers of activity of urbanized areas. They are the highest traffic volume corridors and have the longest trip desires. Principal arterials carry a high proportion of the total urban area travel on a minimum of mileage. Access to principal arterials may be controlled or uncontrolled. The system should be integrated internally and between major rural connections. The principal arterial system carries most of the trips entering and leaving the urban area, and most of the through movements bypassing the central city. This class of facility serves significant intra-area travel. This includes travel between central business districts and outlying residential areas, between major inner-city communities, and between major suburban centers.

Frequently, the principal arterial system carries important intra-urban and inter-city bus routes. Finally, in urbanized areas, this system provides continuity for all rural arterials that intercept the urban boundary. (AASHTO)

- B. Minor Arterial Street - The minor arterial street system interconnects with and augments the principal arterial system. It provides trips of moderate length at a lower level of travel mobility than principal arterials do. This system distributes travel to geographic areas smaller than those identified with the higher system. The minor arterial street system includes all arterials not

classified as principal. Minor arterials system place more emphasis on land access than the higher system does and offers lower traffic mobility. Such a facility may carry local bus routes and provide intra community continuity but ideally does not penetrate identifiable neighborhoods. Minor arterials include urban connections to rural collector roads where such connections have not been classified as principal arterials for internal reasons. (AASHTO)

### 3. COLLECTOR SYSTEM

The collector street system provides both land access service and traffic circulation within residential neighborhoods and commercial and industrial areas. It differs from the principal and minor arterial systems in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the area to their ultimate destinations. Conversely, the collector street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system. The collector street system may also carry local bus routes. (AASHTO)

### 4. LOCAL ACCESS ROADS

Local access roads allow direct access to abutting lands and connections to the higher order systems. They offer the lowest level of mobility. Local access roads should be designed to discourage service to through traffic movement.

1. Industrial/Commercial - Industrial local access streets abut manufacturing facilities, processing plants or warehousing facilities, stores, dense multiple family dwellings, commercial sources, office and professional buildings. These roads support access to industrial/commercial uses and promote connectivity to compatible trip destinations. Transit routes may be designated on these local access roads if appropriate for supporting land use and transit system needs.
2. Residential Access - Through streets, loop streets and cul-de-sac streets that provide access to homes connecting to a collector arterial or other residential access streets. These roads do not support through traffic and usually do not contain transit routes.

#### 1.13 HALF-STREET

A half-street is permitted as an interim facility. Half-streets may be used pending construction of the entire street by the owner on the opposite side of the road. When a project has frontage on an undeveloped or gravel roadway, a half street improvement will be required. This will require the full improvement of the side adjacent to the project and the addition of 12 feet of asphalt and gravel shoulder on the side away from the development.

#### 1.14 SUMMER ROADS

Summer roads are existing, rural, low-volume, unpaved, access roads and are designated as such by a sign at all places where the summer road portion begins or connects with a highway or road other than a summer road. These roads are not fully maintained roads. Maintenance occurs as needed, on an irregular basis within system-wide priorities, only during the summer months. Snow removal is not performed on these roads. Summer roads are usually not constructed to proper design standards and do not have warning nor regulatory traffic signs. The creation of new lots whose only access is by summer roads shall not be allowed.

### **1.15 NOT USED**

### **1.16 ROAD NAMES**

The Sponsor may suggest road names within a development. Road Names will be reviewed by the County Engineer and modified as necessary to conform to regulations. Road name designations shall be as follows:

1. All streets located outside the Urban Growth Area shall be called Roads.
2. All North-South streets shall be called Streets.
3. All East-West streets shall be called Avenues.
4. Streets in large subdivisions that do not have a definite directional course shall be called Drives.
5. A dead-end street or cul-de-sac when not an extension of an existing street or a continuation of any future street shall be called a Court.
6. A street that lies diagonally to the east-west, north-south grid system and is an arterial or collector street shall be called a Boulevard.
7. A street that has its ingress and egress on the same street shall be called a Circle.
8. A private road shall be called a Lane.

### **1.17 – 1.19 NOT USED**

### **1.20 LEVELS OF SERVICE**

The County Engineer has established acceptable Levels of Service (LOS) for traffic at Spokane County intersections. Levels of Service are used in determining the impacts on the road system by land development proposals. The minimum acceptable LOS are:

1. signalized-"D"
2. unsignalized-"E"

### **1.21 - 1.29 NOT USED**

### **1.30 TRAFFIC IMPACT STUDY**

Prior to a land use action, the Sponsor shall perform a traffic impact study when the project meets the criteria of one or more of the items listed below:

1. The County Engineer determines that the proposed development will generate enough peak hour trips to lower or aggravate the minimum acceptable LOS.
2. The County Engineer determines that driveways from the land development proposal have the potential to generate traffic safety problems on the adjacent public roadway or when driveways have the potential to create queue issues on public roads.
3. The County Engineer determines that an existing route with a history of traffic accidents will be further impacted by an increase in traffic from the proposal.
4. When project action would impact public roadway traffic circulation or access.

A specific scoping by the County Engineer may range from an in-depth analysis of site generated levels-of-service to a cursory review of safety issues. The County Engineer shall determine the specific project scope. The Sponsor shall submit a traffic report signed by a Professional Engineer, licensed in the State of Washington. The traffic impact study shall be performed in accordance with Technical Reference A of these Standards.

### **1.31 FRONTAGE IMPROVEMENT OBLIGATION**

All commercial, industrial, institutional, and multi-family residential property development together with all plats, short plats, and binding site plans shall have the general obligation to bring any substandard and abutting County right(s)-of-way and County road(s) up to the current requirements of the arterial road plan and functioning classification of the road, respectively. Required roadway improvements must be completed prior to finalization of any non-residential binding site plan, short plat, or plat unless otherwise allowed by the County Engineer or their authorized agent. Additional road improvements or mitigation measures may also be required pursuant to the findings of the accepted traffic study or analysis required for that proposal.

These obligations may be applied at the time of any land-actions involving subdivisions of land in conjunction with plats and short plats of residential properties and binding site plans of commercial/industrial properties, and to zone changes granting more traffic intensive uses. In the cases where land-actions are not involved or when involved where deferment is deemed by the County Engineer, or their agent, in the public best interest, these obligations will be applied at the time of the "commercial" building permits. This refers to new property development, redevelopment, major expansion & modernization projects, building changes of use, and to any building permit where legal, non-conforming conditions are already present.

General right-of-way/easement obligations will be met in the following way, unless an alternative that best provides for the long-term public benefit has been accepted by the County Engineer or their authorized agent:

Dedication of additional County right(s)-of-way/public easements along the entire property frontage to the standard half-width including corner radii and end transitions for the road classification and type, together with the necessary abutting Border Easement for any accessory uses such as grading, drainage, sidewalks, and other accessory road needs.

General half-road improvement obligations will be met in the following way, unless an alternative that best provides for the long-term public benefit has been allowed and accepted by the County Engineer or their authorized agent:

Construction of standard or special section half-road improvements along the property frontage shall be required. The extent of the frontage improvements may be reduced at the discretion of the County Engineer or their agent should a certain or reasonable opportunity exist for the remainder of the improvements to be required at a later time. Half road improvements may not be limited to simple widening, but may include providing two valid travel lanes with any attenuate reconstruction and adequate construction materials.

### **1.32 CONNECTIVITY**

The intent of urban connectivity design standards is to provide for a system of streets that offer multiple routes and connections allowing ease of movement for cars, bikes and pedestrians including frequent intersections and few closed end streets (cul-de-sacs). The design of projects within Spokane County's Urban Growth Areas shall adhere to the following urban connectivity design standards, unless otherwise approved by the Director of Planning and the Spokane County Engineer pursuant to 12.300.123(2) below:

1. Block length for local streets shall not exceed 660 feet, unless an exception is granted based on one or more of the following:
  - a. Physical Conditions preclude a block length 660 feet or less. Such conditions may include, but are not limited to, topography, natural resource areas, critical areas or shorelines.
  - b. Buildings, train tracks or other existing development on adjacent lands physically preclude a block length 660 feet or less.
  - c. An existing street or streets terminating at the boundary of the development site have a block length exceeding 660 feet, or are situated such that the extension of the street(s) into the development site would create a block length exceeding 660 feet.
2. The proposed development shall include street connections to any streets that abut, are adjacent, or terminate at the development site.
3. The proposed development shall include streets that extend to undeveloped or partially developed land that is adjacent to the development site. The streets will be in locations that will enable adjoining properties to connect to the proposed development's street system.
4. Permanent dead end streets or cul-de-sacs shall only be allowed when street connectivity can not be achieved due to barriers such as topography, natural



features or existing development, e.g. train tracks. Cul-de-sacs that are allowed based on the above, shall be limited to 300 feet as measured from the centerline of the intersecting street to the radius point of the cul-de-sac.

5. Streets should be public if they are designed to connect to an adjacent site, or will serve lots on an adjacent site.
6. The Sponsor's Design Engineer shall consult with Spokane County to determine if the new roads created by a project will be public or private. The decision to make roads public or private will be solely that of the County Engineer.

Exceptions to 12.300.123(1) above may be granted with the approval of the Director of Planning and the Spokane County Engineer based on the unique attributes of the site or surrounding properties. Exceptions shall not be based on economic considerations related to the costs associated with infrastructure improvements.

In rural areas private roads may still be allowed at the sole discretion of the County Engineer. Even where private roads are allowed the dedication of right-of-way and border easements may be required to facilitate future connectivity to adjacent properties.

The applicant is strongly encouraged to meet with Spokane County Public Works staff prior to laying out the project to determine what connectivity requirements will apply and whether roads will be public or private.

### **1.33 - 1.39 NOT USED**

### **1.40 SEVERABILITY**

If any part of the Spokane County Guidelines for Road and Sewer Construction as established by ordinance shall be found invalid, all other parts shall remain in effect.

## 2.00 ROAD TYPES & GEOMETRIC FEATURES

1. County roads are classified functionally as shown in subsection 1.12 and as shown on the arterial road plan. Based on these classifications the criteria for right of way, road width, and other geometric features shall be as stated. Function is the controlling element for classification. Access, spacing, average daily traffic (ADT) and design hourly volume (DHV) are merely typical.
2. Terrain is a basis for further classification of geometric requirements.
  - A. Flat terrain is that condition where roadway sight distances, as governed by both horizontal and vertical restrictions, are generally long or could be made to be so without construction difficulty or major expense. The slope of the existing terrain is from 0% to and including 5%.
  - B. Rolling terrain is that condition where the natural slopes rise above and fall below the roadway grade line consistently. Normal roadway alignment is restricted some by occasional steep slopes. The slope of the existing terrain is from 5% to and including 15%.
  - C. Mountainous terrain is that condition where longitudinal and transverse changes in the elevation of the ground with respect to a roadway are abrupt and where the roadbed is obtained by frequent benching or side hill excavation. The slope of the existing terrain exceeds 15%.

Terrain classification pertains to the general character of the specific route corridor. Roads in valleys or passes of mountainous areas that have all the characteristics of roads traversing flat or rolling terrain should be classified as flat or rolling. In rolling terrain, trucks reduce their speeds below those of passenger cars on some sections of roadway. Mountainous terrain is responsible for some truck operation at crawl speeds. In cases where the terrain classification is in question, the County Engineer shall make the final decision.

### **3.00 NEW CONSTRUCTION DESIGN STANDARDS**

#### **3.01 COUNTY ARTERIAL AND COLLECTOR STREETS**

Standards for construction of new arterial roads and reconstruction of existing arterial roads within Spokane County shall follow these standards and criteria shown below. "A Policy on Geometric Design of Highways and Streets" (AASHTO) shall govern all design elements not shown in these standards.

#### **3.02 COUNTY LOCAL ACCESS STREETS**

Standards for construction of new local access roads and reconstruction of existing local access roads within Spokane County shall follow the criteria shown on Table 3.08B Local Access Street Design Elements. "A Policy on Geometric Design of Highways and Streets" (AASHTO) shall govern all design elements not shown in these standards.

#### **3.03 TYPICAL ROADWAY SECTION**

The County Engineer shall for each application designate typical roadway sections using the widths shown in Tables 3.08, 3.08A, and 3.08B of these Standards. In selecting the roadway section to be applied, the County Engineer will review and give consideration to certain factors in connection with the proposal, including but not necessarily limited to the functional classification of the roadway, traffic volume, the terrain, density of the proposed or existing development, the proposed or existing zoning, the existing roads in the immediate area, the cost relationship of the proposed improvements, the surrounding developments, transit, pedestrians/bicycles, on-street parking needs, and other such factors as are deemed significant of the proposal being reviewed in light of public health, safety and welfare.

The County Engineer may allow special sections incorporating certain design elements (planting strips, median treatments, etc.) that enhance the roadway's geographic location, scenic vistas, recreational opportunities, and/or enhance stormwater management. The design should not degrade the functionality or safety of the roadway. Where a special section is desired and includes landscaping, a care and maintenance plan will also be required.

#### **3.04 INTERSECTIONS**

The minimum curb-return radius at intersections on an arterial road shall be thirty feet. Roads 24 feet or narrower shall have return radii of 30 feet. The minimum curb return radius at all other intersections shall be twenty feet. Larger radii may be required where truck traffic is a significant factor.

The right of way at curb returns on arterial streets shall allow space for future signal foundations.

All intersections shall be designed at right angles to the intersecting road, where possible. If a right angle is not possible, the skew angle shall not vary more than 15 degrees from a right angle. At four legged intersections, opposite legs shall lie on a straight alignment where possible. The minimum distance between intersections on a County road shall be:

- 300 feet for any road intersecting with a principal or minor arterial.
- 150 feet for any road intersecting with a local access or collector arterial.

Distances are measured from the centerline of the intersecting road to the centerline of the next intersecting road.

The cross slope of the higher priority roadway shall be extended through the intersections. The grade of the crossroad shall be adjusted to meet the cross slope of the higher priority roadway.

The road approach area is where vehicles store while waiting to enter an intersection, and shall be designed with a nearly flat grade. The road approach at a traffic controlled intersection, or potential future traffic controlled intersection, shall have a downgrade approaching the intersection of no greater than 2%. An upgrade approaching the intersection shall be no steeper than 4%. The minimum length of the road approach area, measured from the edge of curb face, or traveled way where curbs are not present, is to be in accordance with Table 3.04. For any road classification not listed in Table 3.04, the County Engineer may require a traffic analysis to determine the road approach length.

Average Daily Traffic (ADT) of Higher Priority Road	Minimum Road Approach Length (2% Maximum Downgrade and 4% maximum upgrade)	
	Local Access Streets & Private Roads <sup>(1)</sup>	Collector Arterials <sup>(2)</sup>
ADT < 1000	25 ft.	50 ft.
1000 < ADT < 5,000	50 ft.	75 ft.
5,000 < ADT < 7,000	75 ft.	100 ft.
7,000 < ADT < 9,000	75 ft.	analysis required

Notes:

- (1) Using a threshold of 70 peak hour left turns
- (2) Using a threshold of 110 peak hour left turns

**Table 3.04 MINIMUM LANDING LENGTH**

### 3.05 BORDER EASEMENTS

On curbed roads with separated sidewalks or pathways border easements shall be granted to Spokane County and shall be described in the plat dedication. Border easements shall include the area from the right-of-way line to the back of sidewalk or

pathway and shall run the total length of the road on both sides. The abutting property owner shall maintain sidewalks, driveways, and landscaping within the border easements. Spokane County will maintain drainage inlets, grates, pipes, and drywells used for disposal of public road drainage.

Fences shall not be constructed inside the easement. The border easement area shall be kept clear of other objects that would obstruct a driver's view. The sidewalk or pathway shall be open for use of pedestrian and bicycle traffic at all times. The easement shall be available for use by utility companies as long as those uses do not impair road uses.

### **3.06 NOT USED**

### **3.07 SLOPES**

The steepest slope for embankment or excavation shall normally be 2:1 (horizontal/vertical). Approval of steeper slopes will require a report signed by a licensed engineer qualified in soils testing and analysis. Please note that slopes exceeding 4:1 may require a roadside safety evaluation.

The Sponsor's Engineer shall provide a space between the catch point of the slope and the right of way line on shouldered roads side slope of 3:1 or steeper. This space provides for utility poles, fences, sloped rounding, etc. The minimum distance of this space shall be five feet.

Embankment slopes constructed with native soil or imported soil shall not be steeper than an inclination of 2:1 provided proper fill placement and compaction criteria, and erosion control are called for in the contract documents. Steeper embankment slopes for any embankment height, including mechanically stabilized earth slopes, may be permitted by the County provided the Sponsor's Engineer can demonstrate that the factor of safety against slope instability (global and internal) is not less than 1.3, and that erosion potential of the slopes will be properly mitigated during construction.

Cut slopes in competent native soils shall not be steeper than an inclination of 2:1 unless a qualified geotechnical engineer provides approval for slopes of steeper inclination. Erosion mitigation shall be included in the contract documents. Cut or fill slopes taller than 20 feet should be approved by a licensed geotechnical engineer. The terrain or design features of a road may require slope, wall or drainage easements beyond the right of way line and involve structural design for retaining walls greater than four feet in height or surcharged on the high side. The County Engineer shall require easements or acquisition of right of way.

### **3.08 RIGHT-OF-WAY**

The road ROW width shall be determined by summing the total of widths of all required roadway elements from Tables 3.08A and 3.08B and applying sums to the Standard Plans entitled "Roadway Sections-Curbed" or "Roadway Sections-Shouldered", as applicable.

Minimum Design Elements <sup>1</sup>	Type	Urban Arterial System				Urban Collector System	Rural Arterial System		
		Classification	Principal (Controlled Access)	Principal (Uncontrolled)	Minor	Collector	Minor or Major Collector		
	Construction	Curb	Shoulder	All	All	All	Shoulder <sup>5</sup>		
	ADT	All	All	All	All	All	Below 400	400-2000	Over 2000
Design Speed (mph)	Flat Rolling Mountainous	55 50 40	55 50 40	40 40 35	40 35 30	30 30 30	50 40 30	50 40 30	55 50 40
Horizontal Curve Radius <sup>2</sup> (ft)	Flat Rolling Mountainous	1190 955 500	1190 955 500	575 500 350	500 350 230	275 275 230	765 470 255	765 470 255	960 765 470
Superelevation (%)	Maximum	4	4	4	4		8	8	8
Grade (%) <sup>3</sup>	Maximum Minimum	6 0.5	6 0.5	6 0.5	8 0.5	8 0.5	8 0.5	6 0.5	6 0.5
Stopping Sight Distance (ft)	Flat Rolling Mountainous	450 400 275	450 400 275	275 275 225	275 225 200	200 200 200	400 275 200	400 275 200	450 400 275
Intersection Sight Distance(ft)	AASHTO (latest edition)								
Crest Vertical Curves <sup>4,6,7</sup> (K)	Flat Rolling Mountainous	150 110 60	150 110 60	60 60 40	60 40 30	60 40 30	110 60 30	110 60 30	150 110 60
Sag Vertical Curves <sup>4,6,7</sup> (K)	Flat Rolling Mountainous	100 90 60	100 90 60	60 60 50	60 50 40	60 50 40	90 60 40	100 60 40	100 90 60

See next page for footnotes.

**TABLE 3.08  
ARTERIAL AND COLLECTOR STREET DESIGN ELEMENTS<sup>1</sup>**

1. In addition, geometric design shall be consistent with "A Policy on Geometric Design of Highways and Streets, AASHTO".
2. Minimum horizontal curves reflect maximum superelevation rates. Flatter rates require larger radius curves.
3. Maximum grades may be exceeded for short distances subject to approval by the County Engineer "(+ 2%)".
4. Length in feet per percent of algebraic grade difference. (K value).  $L = K \times \text{Algebraic difference in grade}$ . Sponsor's Engineer may use method shown in AASHTO
5. Curbed Rural Collectors shall be designed using Urban Minor standards.
6. Grade differences less than 1% do not require a vertical curve.
7. Minimum length vertical curve shall be 100 feet.
8. Superelevation requires the approval of the County Engineer.

**TABLE 3.08**  
**ARTERIAL AND COLLECTOR STREET DESIGN ELEMENTS**

Type	Urban Arterial System			Urban Collector System	Rural Arterial System			
Classification	Principal		Minor	Collector	Major and Minor Collector			
Construction	Curb	Shoulder	Curb	Curb				
ADT	All	All	All	All	Below 400	400-2000	Over 2000	
Painted Center/Left-turn Lanes <sup>4</sup>	12'	12'	12'	12'	-	-	-	
Inside lanes	12'	12'	12'	12'				
Intermediate lanes	12'	12'	12'	12'				
Outside lanes <sup>1</sup>	16'	12'	16'	16'	12'	12'	12'	
Shoulder		8'			3'	6'	8'	
Border w/ Swale	18'	15'	18'	18'	10'	10'	15'	
Border w/o Swale	15'	8'	15'	15'	6'	8'	8'	
Roadway Width (W) <sup>2</sup>	2 lanes	--	--	44' <sup>3</sup>	37' <sup>3</sup>	32'	36'	40'
	3 lanes	46'	--	46'	--	--	--	--
	4 lanes	56'	64'	56'	--	--	--	64'
	5 lanes	70'	78'	70'	--	--	--	--
	6 lanes	80'	102'	--	--	--	--	--
	7 lanes	94'	--	--	--	--	--	--
Right of Way width	See Section 3.08							

See next page for footnotes.

**TABLE 3.08A  
ARTERIAL AND COLLECTOR STREET DESIGN ELEMENTS  
MINIMUM WIDTHS**



1. Traveled lanes of a two-lane road are shown as outside lanes.
2. Distance W is shown on Standard Plan sheet A-1
3. Parking lanes included.
4. Where raised median islands are required, the center lane or left-turn lane shall be fourteen feet in width.

Category <sup>6</sup>	1						2					
FFC	08 & 09						8					
FGTS	5 & N/A						4 & 5					
ADT	400						400 to 1500					
Design speed <sup>5</sup>	Traveled way <sup>1</sup>	paved shld <sup>2</sup>	gravel shld <sup>2</sup>	paved width	road width	Bridge Width <sup>3</sup>	Traveled way <sup>1</sup>	paved shld <sup>2</sup>	gravel shld <sup>2</sup>	Paved Width	road width	Bridge Width <sup>3</sup>
25	20	1	1	22	24	28	20	1	4	22	30	30
30	20	1	1	22	24	28	20	1	4	22	30	30
35	20	2	0	24	24	28	22	2	3	26	32	32
40	20	2	0	24	24	28	22	2	3	26	32	32
45	20	2	0	24	24	28	22	4	1	30	32	34
50	20	N/A	N/A	N/A	24	N/A	22	N/A	N/A	N/A	32	N/A
55	22	N/A	N/A	N/A	26	N/A	22	N/A	N/A	N/A	32	N/A
shld width <sup>2, 4</sup>	2						5					

Category <sup>6</sup>	3			4		
FFC	7			06 & 07		

FGTS	3						1 & 2					
ADT	1500 to 2000						over 2000					
Design speed <sup>5</sup>	Traveled way <sup>1</sup>	paved shld <sup>2</sup>	gravel shld <sup>2</sup>	Paved Width	road width	Bridge Width <sup>3</sup>	Traveled way <sup>1</sup>	paved shld <sup>2</sup>	gravel shld <sup>2</sup>	Paved Width	road width	Bridge Width <sup>3</sup>
25	22	2	4	26	34	34	24	N/A	N/A	N/A	40	N/A
30	22	2	4	26	34	34	24	N/A	N/A	N/A	40	N/A
35	22	4	2	30	34	34	24	5	3	34	40	40
40	22	4	2	30	34	34	24	5	3	34	40	40
45	22	5	1	32	34	36	24	6	2	36	40	40
50	22	5	1	32	34	36	24	6	2	36	40	40
55	24	5	1	34	36	38	24	6	2	36	40	40
shld width <sup>2, 4</sup>	6						8					

Notes:

1. AASHTO minimum width of traveled way - Table 6-5
2. AASHTO shoulder width each side
3. Bridge width (28' min.) is paved width +2' each side or road width, whichever is greater, 12' lanes except category 1
4. Minimum 4' paved shoulder on designated bike routes on arterials, gravel shoulder may be reduced.
5. Posted speed = design speed
6. ADT controls category, add/subtract 500 ADT for each FFC & FGTS in higher or lower categories

**TABLE 3.08A1  
RURAL ARTERIAL ROAD WIDTHS**

Minimum Design Elements <sup>1</sup>	Classification	Industrial/Commercial		Residential				Private Roads <sup>11</sup>
	ADT	All		200 and Above		Below 200		All
	Construction	Curbed	Shoulder	Curbed	Shoulder <sup>5</sup>	Curbed	Shoulder	All
Design Speed (mph)	Flat	35	35	30	30	25	30	25
	Rolling	30	30	30	30	25	30	25
	Mountainous	25	25	25	25	20	20	20
Minimum Horizontal Curve Radius <sup>2, 6</sup> (ft)	Flat	510	410	335	275	200	275	200
	Rolling	335	275	335	275	200	275	200
	Mountainous	200	165	200	165	110	90	110
Superelevation Rate (%)	Maximum	--	2	--	2	--	2	--
Grade (%) <sup>3</sup>	Maximum	8	8	8	8	8	8	8
	Minimum	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Stopping Sight Distance (ft)	Flat	225	225	200	200	150	150	150
	Rolling	200	200	200	200	150	150	150
	Mountainous	150	150	150	150	125	125	125
Intersection Sight Distance (ft)	AASHTO (latest edition)							
Crest Vertical Curves <sup>4</sup> (K)	Flat	40	40	30	30	20	30	20
	Rolling	30	30	30	30	20	30	20
	Mountainous	20	20	20	20	10	10	10
Sag Vertical Curves <sup>4</sup> (K)	Flat	50	50	40	40	30	40	30
	Rolling	40	40	40	40	30	40	30
	Mountainous	30	30	30	30	20	20	20
Roadway Width (ft) <sup>7,8</sup>	Minimum	40	40	29	29	29	24	29/24/20 <sup>12</sup>
Intersection return radii (ft)	Minimum	30	30	20	20	20	20	20
Right of Way Width (ft)	See Section 3.08							

See next page for footnotes.

**TABLE 3.08B  
LOCAL ACCESS STREET DESIGN ELEMENTS**

1. In addition, geometric design shall be consistent with "A Policy on Geometric Design of Highways and Streets, AASHTO".
2. Where superelevation rate is shown, minimum horizontal curves reflect maximum superelevation rates. Curves with lower rates require longer radius curves.
3. Maximum grades may be exceeded for short distances subject to approval by the County Engineer.
4. Length in feet per percent of algebraic grade difference (K value).  $L = K \times \text{Algebraic difference in grade}$ . Sponsor's Engineer may use method shown in AASHTO pg. 281 through 295. Grade differences less than 1% do not require a vertical curve. The minimum length vertical curve shall be 50 feet.
5. Rural access roads with higher speed limits shall be designed for no less than the speed limit.
6. Minimum radius curves for curbed roads shall be consistent with AASHTO, low speed urban streets standards.
7. Paved roadway width does not include curb and/or gutter section.
8. Includes shared access.
9. Superelevation requires the approval of the County Engineer.
10. Median islands noses shall be no closer than 20 feet to the public road curb line.
11. The Sponsor's Design Engineer shall consult with Spokane County to determine if the new roads created by a project will be public or private. The decision to make roads public or private will be solely that of the County Engineer. All rural roads with a design and future projected ADT below 200 shall be 24 feet wide plus shoulders. Vested urban density plats outside the UGA shall be 29 feet wide. For private roads on urban, infill projects with no more than 9 lots total for the project and no longer than 300 feet, a 20 foot wide shouldered roadway with no sidewalks may be allowed at the discretion of the County Engineer. This will only be allowed in locations where the County Engineer determines that no potential for future connectivity exists. "No parking" signs shall be installed on both sides of the roadway.

**TABLE 3.08B**  
**LOCAL ACCESS STREET DESIGN**

### **3.09 CONNECTIONS OF STATE HIGHWAYS AND NEW COUNTY ROADS**

The Sponsor shall prepare and submit to the County Engineer a design proposal, acceptable to the Washington State Department of Transportation (W.S.D.O.T.), of the proposed state highway - county road intersection. W.S.D.O.T. approval of the proposed design must be received before the filing of the final plat. Improvements to the state highway are the responsibility of the Sponsor. The Sponsor may either construct the improvements or furnish to the County Engineer a bond to cover the cost of such improvements. The County Engineer and W.S.D.O.T. will decide the amount of the bond.

### **3.10 NOT USED**

### **3.11 RAILROAD GRADE CROSSING**

UTC and railroad approval is required before crossing plans will be approved by the County Engineer. Standard signs and markings shall be installed at all railroad-road grade crossings. All railroad grade crossing signs and markings shall comply with the Manual of Uniform Traffic Control Devices and all other applicable State and Federal regulations.

The Sponsor shall install flashing light signals and gates, showing the approach or presence of trains, at those railroad-road crossings where studies by the County Engineer show the need of warning beyond that provided by standard signs and markings.

### **3.12 STANDARD ROAD AND TRAFFIC CONTROL SIGNING**

The sponsor shall be responsible for installation of all permanent traffic control devices. They shall submit a traffic control devices, signing and pavement markings plan for approval. The plan shall show the types and locations of all traffic control devices such as; signs, pavement markings and delineators to be installed by the project. The submitted plan shall also show existing and proposed traffic control devices and features when connecting to or widening an existing county road, including all relocations and/or alterations of traffic control devices and pavement markings.

All traffic control devices, including type and materials used shall be as required by the County Engineer and required materials shall meet the material requirements in WSDOT standard specifications. Certain devices may be required to be a specific brand or type to conform to existing county facilities.

Traffic control devices shall conform to the MUTCD for their type and intended use. If the permanent traffic control devices are not installed in a timely manner, or not properly installed, the Sponsor shall be given a 30 day notice after which time the County will furnish and install all traffic control devices on the projects. The County will bill the Sponsor for the work based on the actual cost for labor, equipment rental, and materials. If the absence of critical safety devices such as stop signs is causing a present endangerment to the traveling public, the County will immediately furnish and install the devices and bill the Sponsor for the work. All signs shall be installed per the applicable Spokane County standard plans.

### **3.13 NOT USED**

### **3.14 ROADSIDE SAFETY**

#### **The Clear Roadside Concept**

It is desirable to keep the roadside traversable and clear of hazards that can increase the consequences of a vehicle leaving the road. Using mitigating measures such as Clear Zone, breakaway devices and shielding by traffic barriers are all examples of roadside safety improvements. The project engineer is responsible for roadside safety measures on private roads.

#### **Collision History**

Any location that has a history of road departure collisions will need an analysis of the collisions and will need to be mitigated. The analysis and mitigation measures shall be approved by the County Engineer.

#### **Clear Zone**

For Clear Zone definition and information, see AASHTO Roadside Design Guide.

##### **Rural Arterials and Collectors**

Criteria set forth in the latest edition of the AASHTO Roadside Design Guide shall be used.

##### **Rural Local Access**

Criteria set forth in the latest edition of the AASHTO Roadside Design Guide shall be used. All cases clear zone shall be a minimum of 10 feet measured from traveled way.

##### **Urban Arterials and Collectors**

Criteria set forth in the latest edition of the AASHTO Roadside Design Guide shall be used. Design Speed of less than 40 MPH clear zone is a minimum of 10 feet, measured from the traveled way.

##### **Urban Local Access**

Criteria set forth in the latest edition of the AASHTO Roadside Design Guide shall be used. Design ADT less than 400 clear zone is 6 feet measured from the face of curb. Design ADT of more than 400 clear zone is 10 feet measured from the face of curb.

#### **Horizontal clearance to obstructions**

A minimum operation offset of 2 feet measured from the face of curb or edge of pavement shall be provided. No features (including clear zone compatible features) shall be placed, or remain, within this offset.

## Traffic Barrier

Traffic barrier should only be installed when warranted and shall be approved by the County Engineer. Other mitigating measures should be used prior to proposing to install traffic barriers including but not limited to; project design, clear zone, using crashworthy or traversable design.

Traffic barrier shall be designed and constructed as specified in the Washington State Department of Transportation Design Manual, Standard Plans and Standard Specifications for Road, Bridge, and Municipal Construction. Plans shall be submitted to the County Engineer for review for all barrier installations, the plan shall also show a roadway/barrier cross section. All plans shall be sealed by an engineer licensed in the State of Washington.

### 3.15 NOT USED

### 3.16 ROAD SURFACING REQUIREMENTS

All public roads and urban private roads in Spokane County shall be paved. A pavement surfacing design procedure must be performed for all public and private roads. Table 3.16 may be used in place of performing a pavement design for some local access and private roads depending on subgrade classification and drainage characteristics. Rural private roads may be allowed to be gravel at the discretion of the County Engineer. For new gravel roads Table 3.16A may be used depending on subgrade classification and drainage characteristics. The design life for all roads shall be 20 years. The design procedure used must be approved by the County Engineer and must consider the following:

1. Traffic Loading - an estimate of the number and types of loadings the roadway will carry for the design life. This estimate of loading must be established by a procedure accepted by the County Engineer and be expressed in 18-Kip Equivalent Single Axle Loads (ESALs).
2. Subgrade Support - a representative value for the stiffness of the native material on which the road will be built. This value will be established by a procedure accepted by the County Engineer and be expressed as resilient modulus ( $M_R$ ). When determining  $M_R$ , soil sampling shall be done in accordance with Technical Reference B.
3. Analysis - a procedure for establishing the surfacing depth requirements for a given traffic loading and subgrade resilient modulus. This procedure must be approved by the County Engineer. The following procedure is pre-approved: *Guide for Design of Pavement Structures*, by the American Association of State Highway and Transportation Officials (AASHTO).

Structural pavement design and reporting is to be done in accordance with Technical Reference B. As an alternative, cement modified soil (CMS) design can be used with the approval of the County Engineer.

Minimum Thickness: Regardless of the thickness computed by the design procedure, the minimum thickness of road structural section shall be as follows:

- Local Access:                    2" Asphalt Concrete Pavement HMA 1/2  
   6" Crushed Surfacing Base Course
  
- Arterial and Collector:        4" Asphalt Concrete Pavement HMA 1/2  
   6" Crushed Surfacing Base Course



<b>Paved Residential Streets</b>	
<b>Soil Type</b> Per Unified Soil Classification System (USC)	<b>Local Access &amp; Private Streets</b>
GW	2 inches/6 inches
GP	2 inches/7 inches
GM	2 inches/8 inches
GC	3 inches/6 inches
SW	2 inches/7 inches
SP	2 inches/8 inches
SM	<sup>1</sup> Pavement Design Needed
SC	<sup>1</sup> Pavement Design Needed
ML	<sup>1</sup> Pavement Design Needed
CL	<sup>1</sup> Pavement Design Needed
OL	<sup>1</sup> Pavement Design Needed
MH, OH, Pt	<sup>1</sup> Pavement Design Needed

<sup>1</sup>See Technical Reference B for Pavement Design Criteria

Notes:

- a) Values listed denote asphalt over crushed surfacing top coarse (minimum compacted thickness)  
{e.g. "2 inches/6 inches" denotes 2 inches of asphalt pavement over 6 inches of crushed surfacing top coarse}
- b) Values were calculated using the flexible pavement design method by AASHTO, and assuming traffic loads for residential-type neighborhoods. A 20-yr-design life was used.
- c) A minimum of 2 inches/6 inches structural pavement section was used in the table.
- d) The upper two feet of roadway subgrade shall be compacted to 95 percent of the maximum dry density, based on the AASHTO T-180 test procedure (Modified Proctor)
- e) To use this table the Engineer shall acquire soil samples at the project site and classify the soils encountered, in accordance with sampling requirements listed in Technical Reference B.
- f) Regardless of soil type the subgrade drainage characteristics must be taken into account during the design.

**STRUCTURAL ROAD SECTIONS  
FOR LOCAL ACCESS AND PRIVATE  
ROADS  
PAVEMENT DESIGN ALTERNATE**

**TABLE 3.16**

<b>Low Volume Gravel Roads</b>	
<b>Soil Type</b> Per Unified Soil Classification System (USC)	<b>Minimum Thickness of Crushed Surfacing Top Coarse</b>
GW	7 inches
GP	7 inches
GM	7 inches
GC	8 inches
SW	7 inches
SP	7 inches
SM	11 inches
SC	18 inches
ML	12 inches
CL	18 inches
OL	12 inches
MH, OH, Pt	18 inches

Notes:

- a) Values listed denote minimum compacted thickness
- b) Values were calculated using the low volume road design method by AASHTO, and assuming traffic loads for residential-type neighborhoods. A 10-yr-design life was used.
- c) A minimum of 7 inches of crushed surfacing top coarse was used in the table for maintenance consideration.
- d) For soil types GW through SP, the upper two feet of roadway subgrade shall be compacted to 95 percent of the maximum dry density, based on the AASHTO T-180 test procedure (Modified Proctor).
- e) To use this table the Engineer shall acquire soil samples at the project site and classify the soils encountered, in accordance with sampling requirements listed in Technical Reference B.
- f) Regardless of soil type the subgrade drainage characteristics must be taken into account during the design.
- g) When multiple soil classifications are encountered below the planned road subgrade, if the higher strength soil is at least 2 feet in depth and is above the lower strength soil, then the section applicable to the higher strength soil can be used only for soil types GW through SP.
- h) To utilize a smaller section of crushed aggregate, for soil types SM through MH, OH, and Pt it may be possible to substitute a soil type GW through SP or provide a geo-grid product, upon approval of the Spokane County Engineer.

**LOW VOLUME GRAVEL ROADS  
DESIGN ALTERNATE  
TABLE 3.16A**

### 3.17 CUL-DE-SACS

The use of dead end urban streets is discouraged. (see Section 1.32 Connectivity) Where allowed any dead-end or stub road more than one lot deep shall have a cul-de-sac constructed at the end. Cul-de-sacs shall have a minimum length of 150 feet (so the cul-de-sac can be fully formed including curb returns) and a maximum length of 300 feet in an urban project. Cul-de-sacs are shown on the Standard Plan sheet entitled "Cul-de-Sac Roads". In areas not served by fire hydrants, cul-de-sacs shall have a radius of 50 feet. On paved rural roads, a paved cul-de-sac with a 45-foot radius and a 5-foot gravel shoulder may be used.

At the end of private roads, the developer shall construct an area for vehicles to turn around. This turn-around area shall be constructed as shown on the Standard Plan sheet entitled "Cul-de-Sac Private Roads ". Unless terrain constraints exist the preferred turn around for a private road will be a cul-de-sac.

### 3.18 CURBS, SIDEWALKS, AND PATHWAYS

1. As part of any project all new and existing facilities shall be made to comply with current ADA Guidelines. This is a requirement for all public and private roads within urban, commercial, and industrial land use zones, except special arterial section as approved per Section 3.03:

A. Concrete curb and gutter shall be constructed on both sides of the road and sidewalk shall be constructed on one or both sides of the road as directed by the County Engineer.

This requirement applies to all new roads, roads to be reconstructed, or where there is a change in use of a commercial property.

The County Engineer may require sidewalk and /or curb and gutter on one or both sides of the road in rural areas where pedestrian traffic can be expected to occur, including but not limited to arterial roads, commercial uses, industrial uses, schools, parks, churches, or shopping areas.

B. If roads abutting commercial property have concrete curb and gutter and/or sidewalks for which the following actions are requested:

1. A building permit for a new building, or
2. Change in use of an existing building.

The owner shall replace broken or off-grade curb and gutter and/or sidewalks. The project Sponsor shall remove or replace all driveways not conforming to this chapter as directed by the County Engineer.

C. Where new concrete curb is to be placed to form a wider road than the existing paved road, the area between the existing edge of the pavement and the new curb shall be paved as directed by the County Engineer. Where

the existing curb is removed and replaced at a new grade, the Sponsor shall pave the road next to the gutter to match the new grade of the gutter. D. Standard: See Standard Plans entitled “Curbs and Gutters” and “Urban Driveways - Separated Sidewalks”.

2. On shouldered, rural public roads, pedestrian walkways may be incorporated into the shoulder of the road. This is done by constructing shoulders wider than those shown on Tables 3.08, 3.08A, and 3.08B. The Sponsor’s Engineer shall use the structural section of the shoulder for the walkway area.

### **3.19 NOT USED**

### **3.20 CURB RAMPS**

As part of any project all new and existing curb ramps shall be made to comply with current ADA Guidelines. The Sponsor shall construct ramps to provide passage of disabled persons. The ramp shall be constructed in curb and sidewalk at all corners of intersections. Ramps shall be constructed at other crosswalk locations. Ramps shall be constructed as shown on the Standard Plan entitled “Curb Ramp”. At “T” intersections a ramp shall be constructed on the through street opposite one of the two corners. At intersections that may be signalized two curb ramps shall be installed at each corner.

### **3.21 NOT USED**

### **3.22 PRIVATE ROADS**

A private road is a privately owned vehicular access route serving more than three residential lots; or any commercial parcels which do not have frontage on a public road right of way. The Sponsor’s Design Engineer shall consult with Spokane County to determine if new roads created by a project will be public or private. The decision to make roads public or private will be solely that of the County Engineer. Refer to Section 1.32 Connectivity for additional information.

Commercial/industrial, institutional, and multi-family residential developments shall be subject to the private road standards if the access routes are linear features that exceed 300 feet in length and have traffic volumes greater than 40 ADT. This requirement does not apply to travel passages in parking areas, fire access, loading dock drives, and other situations where the general public does not regularly travel. Commercial/industrial, institutional, and multi-family residential developments with multiple properties shall not be subject to the private road standards where the above access route conditions are not present.

In urban areas private roads shall be paved. Rural private roads within mandated non-attainment areas for suspended particulate shall also be paved. Rural, private roads in all other areas may be allowed to provide only an all-weather driving surface. The traveled way of a private road shall be designated as a fire apparatus access road under the International Fire Code, as amended. Spokane County will not maintain private roads.

In cases where private roads are permitted the following conditions must be met:

1. A title notice has been approved and recorded with the County that provides for maintenance of the private roads and associated parking areas by owners in the development. The title notice shall include language indicating that the county is not responsible for maintenance of the private road, and
2. A ten (10) foot easement shall be provided for on each side of the roadway for roadway maintenance and utilities, and
3. Provision is made for the roads to be open for emergency and public service vehicle use, and
4. The private roads will not obstruct public road circulation.

Private road design plans, drainage studies, drainage plans and appropriate calculations shall be submitted by the Sponsor to the County Engineer prior to construction of the road. All submittals shall bear a certification by the Sponsor's Design Engineer that they were prepared in conformance with and meet the requirements of these Design Standards and all other applicable laws and regulations. Prior to private road construction, the Sponsor must acquire acceptance of a private development drainage plan. Submittal requirements and procedures shall be according to Section 5.01.

The Sponsor shall submit record drawings of private road and drainage improvement construction to the County Engineer. All record drawing submittals shall bear certification by the Sponsor's Construction Engineer that construction was performed in conformance with these standards, the provisions for Section 9.10 and the Spokane Regional Stormwater Manual.

Spokane County does not furnish, install, or maintain signs for private roads including stop signs or street name signs for private roadways intersecting public roads. The owner may install their own signs in accordance with the MUTCD, but must have approval from the County Engineer when installing signs at intersections with public roads. Prior to installing signs at the private road intersecting with a public road, an approach permit shall be obtained. Private roads intersecting arterials or collectors shall have a stop sign. Private roads intersection local access public roads shall have a yield sign unless sight distance analysis (per AASHTO) requires a stop sign.

### **3.23 PRIVATE ALLEYS**

Privately owned alleys may be constructed to provide secondary access to urban, residential lots. An alley must be sixteen feet wide, paved, and must be located within a minimum twenty-six foot wide easement or private right-of-way. The alley shall connect to a public or private road at each end. The intersection of an alley with a public road shall conform to the Standard Drawing entitled "Cement Concrete Approaches". Prior to final plat approval, the developer must provide an agreement for the maintenance of private alleys.

3.03. Private alleys are designated fire apparatus access roads as described in the current edition of the International Fire Code.

### **3.24 DRIVEWAY APPROACHES**

Approaches shall be constructed to define the access openings in accordance with the Spokane County Standards for Road and Sewer Construction and Standard Plan sheets entitled "Cement Concrete Approaches" or "Rural Road Approaches", as appropriate. Driveway approaches must provide access to an off road parking area located on private property. The driveway shall be of sufficient length so a vehicle in the driveway does not project into the road right-of-way, sidewalk, or pathway. Driveway approaches shall be constructed to avoid interference with existing drainage inlets, culverts, road lighting standards, utility poles, traffic regulating devices, fire hydrants or other public facilities. The applicant shall bear the cost of relocating any such public facility. The agency holding authority for the particular structure shall decide how the facility will be relocated. Where the County Engineer deems that these standards will not provide the proper control of access or safety for the traffic using the street additional requirements may apply to insure public safety. All driveways must demonstrate adequate sight distance.

#### **Urban Residential Approaches**

Private driveways may serve a maximum of three residential lots. The total width of all driveway approaches on a road for any ownership shall not exceed 50% of the frontage of that ownership along the road and shall not be more than two in number. Refer to the Standard Plan entitled "Cement Concrete Approaches" for approach dimensions. Any project or alteration of the existing approaches will require conformance with these standards along with replacement of any unused approaches with standard curb, gutter, and sidewalk. Driveways shall not be constructed, reconstructed, or altered to be within 20 feet of the end of a curb return for an intersection. Driveway approach grades within right of way shall not exceed 8% (a rise or descent of 8 feet in 100 feet) in the urban area.

#### **Urban Commercial Approaches**

These approach standards are general in nature and pertain mainly to local access road situations. Arterials, railroad crossings, signalized intersections, channelization, and findings from a specific traffic analysis may result in superseding requirements. Refer to the Standard Plan entitled "Cement Concrete Approaches" for approach dimensions.

Where the existing curb, gutter, or sidewalk is not continuous along the road frontage, the Project Sponsor shall construct the missing improvements. Driveways and site development shall be arranged to allow vehicles to exit without backing out into the roadway. Driveways shall not be constructed, reconstructed, or altered to be within 30 feet of the end of a curb return for an intersection or within 30 feet of a theoretical curb return end in standard location, if not present. Driveway approach grades within right of way shall not exceed 8% (a rise or descent of 8 feet in 100 feet) in the urban area. Drainage from private driveways that connect to public roads shall be controlled to prevent stormwater runoff from entering the public right-of-way. The spacing between driveway approaches in the curb line of ownerships or leaseholds shall not be less than

ten feet for commercial uses nor less than fifteen feet for industrial uses measured parallel with the frontage. Shared approaches will be encouraged to access commercial local access roads and limit number of approaches on arterials.

### **Rural Approaches**

Refer to the Standard Plan entitled "Rural Road Approaches" for approach dimensions. Driveway approach grades within right of way shall not exceed 2% (a rate of rise or descent of 2 feet in 100 feet) in rural areas. For shouldered roads with ditches, storm drainage shall be passed under a driveway by a culvert pipe. A suitable warning marker shall be placed at each end of the culvert. The culvert shall be corrugated metal pipe and a minimum of 12 inches in diameter (or larger as determined by the County Engineer to accommodate the anticipated flow of water). Culvert ends must be beveled to the slope (4:1) that are within the clear zone for culvert sizes 12" – 24". Culverts over 24" within clear zone require roadside safety design. Driveways shall not be constructed, reconstructed, or altered to be within 80 feet of any road intersection.

## 4.00 3-R DESIGN STANDARDS

### 1. GENERAL

A publicly-funded road project becomes 3-R when the proposed improvement consists of resurfacing, restoration, and rehabilitation of the existing pavement. The purpose of these projects is to preserve and extend the service life of the roadway. They also result in enhancing the safety of the traveling public.

Projects, classified as 3-R, involve work on an existing roadway surface and/or subsurface. Their purposes include extending the service life, providing additional pavement strength, paving existing gravel roads, increasing skid resistance, improving the ride of the roadway, and enhancing safety. A project may be considered 3-R if no more than 50 percent of the project length involves vertical or horizontal alignment changes. To be considered 3-R, the road cannot be widened more than one traffic lane. All projects that are not qualified as a 3-R project must meet design standards for new construction.

Normally, project sponsors make 3-R improvements within the existing right of way. The Sponsor should consider acquiring right of way and/or easements, if practical.

Survey monuments shall be perpetuated in accordance with the "Land Survey Standards" sections of the manual.

### 2. DESIGN STANDARDS:

It is desirable that 3-R projects be designed to meet the standards for new construction. However, if for reasons such as environmental concerns, social impact, or cost, it is impractical or impossible to meet new construction standards, the Project Sponsor should make a careful analysis of the alternatives. The analysis should consider adjacent roadway sections, future improvements, and existing conditions. If meeting the new construction standards is unreasonable, improvements in roadway widths should still be considered.

- A. Design Speed - The County Engineer will set the design speed for 3-R projects.
- B. Super elevation - To provide for the same degree of safety and comfort on 3-R projects as on any other, super elevation, including transitions, should be provided on projects with a design speed greater than 35 mph.
- C. Roadway Width - The minimum roadway surfaced width (W) for 3-R projects is 32 feet for rural arterial, 28 feet for rural local access, 32 feet on a curbed road.
- D. Ditches - Fill slopes and slope ditches shall not be steeper than 3:1. Flatter slopes are desirable.



- E. Alignment - Alignment improvements should be undertaken where the number of accidents is high, and where previously installed warning signs, markings, or other devices have not proven effective. If existing horizontal and vertical alignments are to be retained, a careful analysis should be undertaken to provide adequate signing and marking.
- F. Clear Zone - For safety, it is desirable to provide a roadside recovery area that is as wide as practical. The designer must give particular attention to the clear zone at identified high roadside accident locations. An adequate clear zone at horizontal curves at the end of a downgrade, should be provided if practicable. The clear zone is discussed in Section 3.14. The Sponsor should relocate utility poles, luminaries, and sign supports or make to break away, if necessary, to provide for safety.
- G. Bridge - A bridge to be replaced on a 3-R project shall be designed to new construction standards.
- H. Curb ramps - Curb ramps shall be provided on 3-R projects where curbs and sidewalks are provided.

## **5.00 PROJECT APPLICATION AND CERTIFICATIONS**

### **5.01 APPLICATION PROCEDURE**

Submittal requirements and procedures shall be as prescribed by the County Engineer. The application and certification procedure for public and private road construction shall be as prescribed by the County Engineer and shall generally include, in sequence, the following items:

1. Conduct a Pre-Design Meeting with the County Engineer to reach concurrence on the design parameters (including connectivity and road type) and drainage concept,
2. If needed, conduct a joint site visit by the Sponsor's Design Engineer and the County Engineer,
3. Submit and receive approval of any design deviations,
4. Submittal of the plans and calculations by the Sponsor's Design Engineer,
5. Review of the submittal and acceptance of the plans and calculations by the County Engineer,
6. Construction and inspection by the Sponsor's Construction Engineer,
7. Final inspection by the Sponsor's Construction Engineer and the County Engineer,
8. Submittal of certification and record drawings by the Sponsor's Construction Engineer.

The Sponsor's Engineer shall schedule a pre-design meeting with the County Engineer. The purpose of the Pre-Design meeting is to identify the major design parameters prior to design, review the general design concepts proposed by the Sponsor's Engineer, and reach concurrence on design concepts and design parameters.

It is strongly recommended that any proposed design deviations be applied for and approved prior to submittal of final road and drainage plans. The design deviation application shall be submitted in a format prescribed by the County Engineer.

The Sponsor shall obtain acceptance of the plans and calculations from the County Engineer before the start of construction and before recording the plat. The County Engineer will require that a Temporary Erosion/Sedimentation Control Plan be approved prior to starting construction. Construction within public ROW and connection to public roads require permits per section 9.00.

The Sponsor's Surveyor shall comply with procedures for perpetuation of survey monuments in accordance with the "Land Survey Standards" section of this manual.

The County Engineer relies upon the certification and approval of the road and drainage plans and calculations by the Sponsor's Engineer for approval of the plat. The County Engineer's acceptance of the plans shall not relieve the Sponsor or the Sponsor's Design Engineer from any liability related to portions of the design which are not in conformance with these Standards or do not follow good engineering practice.

The plans, basin maps and calculations shall be signed, sealed, and dated by the Sponsor's Design Engineer. The cover sheet of the plan set and the cover sheet of all the calculations shall bear the certification, which reads:

"The design improvements shown in this set of plans and calculations conform to the applicable editions of the Spokane County Standards for Road and Sewer Construction and the Spokane Regional Stormwater Manual. The Spokane County Engineer has approved all design deviations. I approve these plans for construction."

The Sponsor shall reimburse the County for all costs incurred for pre-submittal meetings, submittal reviews, site-visits, and any other work associated with a developer's project. Costs shall be assessed as outlined on the latest fee schedule adopted by the Board of County Commissioners, and in accordance with the Fee Agreement signed by the Sponsor.

For each construction phase, the Sponsor's Construction Engineer shall provide construction inspection, which complies with the requirements of Section 9.04, and upon completing the construction inspection shall provide "Record Drawings" which comply with the requirements of Section 9.10 of these Standards.

## **5.02 GENERAL FORMATTING**

The general format, number of copies, and application processes shall be as follows:

### **1. PRIVATE DESIGN:**

Original sheets shall be good quality reproducible, ink on mylar.

- A. All plan sheets shall be in size 24 inches x 36 inches.
- B. First and subsequent applications shall contain one set of prints of road plans, typical cross sections, profiles, and detail sheets. Drainage plans, a drainage report and calculations shall also be submitted as required in the Spokane Regional Stormwater Manual. The drainage report shall be based upon a geotechnical report and recommendations.
- C. The first application shall contain a letter signed and sealed by the Sponsor's Surveyor that a thorough search has been made for survey monuments. He/she shall indicate that all found monuments are properly referenced in accordance with current applicable state laws. A copy of references shall be filed in the County Engineer's Office.

- D. The final application shall contain a mylar set of corrected road plans, profiles, typical cross sections, detail sheets, and drainage plans and calculations. If the Sponsor or the Sponsor's Design Engineer desires the County to return an accepted set of reproducible plans, the Sponsor should also submit an extra set of mylar plans. Upon the County Engineer's acceptance of the final application, the County Engineer will retain the original, using it to make copies for public inspection and distribution as required. The acceptance of construction plans shall expire two years from the acceptance date shown on the plans, or coordinate with the expiration of the preliminary plat, whichever occurs sooner. It may be extended at the option of the County Engineer. Before the extension of acceptance, the Sponsor's Engineer shall revise the plans to reflect current standards unless an allowance is made by the County Engineer.

## **2. COUNTY DESIGN:**

Procedures for county design shall be as required for coordination and for approval by funding authorities. Survey monuments shall be perpetuated in accordance with the "Land Survey Standards" sections of this manual.

### **5.03 DRAFTING STANDARDS**

1. Fonts- Lettering shall be legible to be easily read and understood by the reviewer. The lettering shall be of sufficient size and scale to produce clear, readable images when scanned digitally by an optical scanner. Submitted plans not meeting these criteria will be returned to the Sponsor for correction.
2. Lines and Symbols - Standard drafting lines and symbols are shown on the Standard Plans entitled Spokane City/County Drafting Standards. Both the City of Spokane and Spokane County have adopted these conventions. All drawings submitted for review shall use these Standards. Symbols and line types for plan features not available in the Standards shall be described in a legend on each plan sheet.

### **5.04 PLAN**

Plans may be comprised of more than one set of project drawings each depicting separate items of work. Plans shall include the following:

1. The first sheet of the plans shall include a project title, vicinity map, an index of plan sheets, the engineer's certification statement, and signature block containing approval signatures of both the Project Sponsor and the Sponsor's Design Engineer.
2. Road alignments with 100' stationing, reading from left to right, and stationing at points of curve, tangent, and intersections, with appropriate ties to existing road surveys and stationing, section corners, quarter corners, and the horizontal

control net established by the County Engineer. Stations shall increase from west to east and from south to north.

3. Section, township, and range.
4. Bearings on the road centerline, keyed to an associated plat map.
5. Curve data including radius, delta, arc length, and semi-tangent length, on all road centerlines and curb returns.
6. Right of way lines, width for proposed road, intersecting roads, and existing road improvements with dimensions.
7. All topographic features within right of way limits or future right of way limits and sufficient area beyond to resolve questions of setback, slope, drainage, access onto abutting property, and road continuations.
8. All existing utilities.
9. All proposed water and sewer utilities that will be designed and constructed.
10. Identification of all roads and adjoining subdivisions.
11. A Traffic Control Devices, Signing & Pavement Marking Plan. (See Sec. 3.12)
12. Existing and proposed drainage features, showing direction of flow, size, and kind of each drainage channel, pipe, and structure and other requirements as specified in the Spokane Regional Stormwater Manual.
13. Minimum Scale: 1" = 50'. However, 1" = 100' shall be optional for development of lots one acre or larger. Details for clarification may be shown on a convenient scale. A scale of 1" = 20' may be required for urban arterial streets where detail is sufficiently dense to cause a "cluttered" drawing at a smaller scale.
14. A north arrow.
15. As a minimum, one new control monument shall be set at each end of a new road and intermediate monuments as required under 6.02.
16. Project beginning and ending designation with stations.
17. A title block to include:
  - A. The project name
  - B. County Project Number
  - C. Sheet number
  - D. Road names

E. Road limits

18. All found and referenced survey monuments.
19. Section and lot lines
20. Standard symbols as shown on Standard Plan entitled Symbols.
21. Beginning, middle, and ending elevations of curb returns.
22. Other data necessary for the specific project.

**5.05 NOT USED**

**5.06 PROFILE ELEMENTS**

Profile elements shall include the following:

1. Original ground line at 100' stations and at significant ground breaks and topographic features based on field measurement accurate within 0.1' on unpaved surface and 0.01' on paved surface.
2. A final road and storm drain profile. The stationing shall be the same as the horizontal plan, reading from left to right. It shall include stationing of points of curve, tangent, length, and point of intersection of vertical curves, with elevations to 0.01'.
3. Profiles for curbed roads shall show the tops of both curbs and the centerline clearly labeled. Profiles for shouldered roads shall show the centerline only.
4. On a grid of numbered lines, a continuous profile shall be shown for both existing and proposed improvements.
5. Grade and vertical curve data, all profiles.
6. The datum used and all benchmarks, which must refer to established control when available. (See Section 6.02)

**5.07 NOT USED**

**5.08 TYPICAL CROSS SECTION**

Typical cross sections shall include the following:

1. The dimensions of traffic lanes, shoulders, gutters, sidewalks, swales, depths, planting strips, easements, and right of way, etc.

2. The cross slope of all elements, such as, the pavement, ditches, swales, gutters, sidewalks, planting strips, etc.
3. Type of curb.
4. Dimensions of structural section material layers.
5. Retaining walls where required.
6. A separate full width roadway typical section for each street or portion of the street that differs significantly. Station limits shall be shown.
7. Show the location of the clear zone requirements and any roadside safety features relative to the edge of the traveled way.
8. All other data necessary for a specific project.

#### **5.09 NOT USED**

#### **5.10 DRAINAGE PLAN**

A drainage plan is required by the Spokane Regional Stormwater Manual. The drainage plan shall be based upon a geotechnical report and recommendations. The Sponsor's Design Engineer may submit the drainage plan integrally with the road plan and profile, if space permits. Otherwise, he/she shall submit it on separate plan and data sheets.

## **6.00 LAND SURVEY STANDARDS**

### **6.01 REGULATIONS**

1. Surveys shall conform to all applicable state and local regulations.
2. Prior to any construction within County right-of-way, a surveyor shall conduct a thorough search for all survey monuments. Any found monuments shall be referenced in accordance with current applicable state laws. A copy of the references shall be filed in the office of the County Engineer.

### **6.02 MONUMENTATION**

1. The responsible surveyor shall set permanent monuments with his/her registration number as follows:
  - A. For placing new or replacement of section corners, quarter corners, closing corners, witness corners, and meander points that have been disturbed or destroyed, the minimum acceptable monument is a 3/4 inch inside diameter iron pipe or a #4 steel reinforcing rod, 24 inches in length. The monument shall be marked in conformance with state laws and regulations. Any of these corners in paved roads shall be covered by a Spokane County standard cast iron monument case. Monument cases are shown on the Spokane County Standard Plan sheet entitled "Monument Case and Cover".
  - B. For placing of new or replacement of disturbed road centerline angle points, curve points, and road intersection points, the minimum acceptable monument is a 1/2 inch inside diameter iron pipe or a #4 steel reinforcing rod, 18 inches in length. On principal arterials, monument cases and covers shall be set to protect the monuments. All monuments in other paved roads shall be set flush with the road surface.
  - C. For placing of new or replacement of all permanent monuments not covered above, the minimum acceptable monument is a 1/2 inch inside diameter iron pipe or a #4 steel reinforcing rod, 18 inches in length.
  - D. If it is impossible to set the above monuments, the County Engineer may approve an alternative monument.
2. Each monument set according to 6.02 1A through 6.02 1D shall have at least three reference points. The reference points may consist of, in order of preference, cross on curbs, bearing trees, property corners or an alternative approved by the County Engineer.



### **6.03 HORIZONTAL CONTROL NET**

A horizontal control net established by the County Engineer shall be the mapping base for all surveys lying within its boundaries. All surveys done within this net shall conform to the degree of accuracy required under applicable state laws with adequate supplemental information as required by the County Engineer to ensure accuracy.

### **6.04 TEMPORARY BENCH MARK**

The surveyor shall provide a temporary benchmark along the roadway every one thousand feet. These temporary bench marks shall be based on a datum plane approved by the County Engineer. The surveyor shall submit field notes or sealed statement insuring work according to third order accuracy. Please refer to Washington State Department of Transportation Standards.

## **7.00 BRIDGES AND OTHER STRUCTURES**

### **7.01 PRINCIPAL REFERENCE FOR BRIDGES**

Except as specified below, Spokane County bridges on public roads shall be designed and constructed according to the latest edition of "LRFD Bridge Design Specifications", adopted by American Association of State Highway and Transportation Officials (AASHTO) including all interim addenda. Plans and structural computations shall be submitted for approval of the County Engineer before construction begins. All new bridges shall be designed to carry an AASHTO HL 93 live load or greater.

1. The bridge roadway shall comprise the full width of the road being served. This includes the traveled way, curb, sidewalk, walkway, bike lanes, equestrian lanes, and/or shoulders. Requirements of utilities shall be duly considered.
2. Where typical speed is 35 MPH or higher and significant pedestrian, bike and/or horseback traffic can be expected, the Engineer may require that the lane for the secondary modes be separated from motor vehicle traffic by use of a bridge traffic barrier and further protected by a pedestrian rail at the outer edge.
3. The width of a bridge shall be the greater of the design roadway width or the existing roadway width but not narrower than 28 feet.
4. Traffic and pedestrian railings or combination traffic-pedestrian railings shall meet AASHTO specifications.
5. Vertical Clearances;
  - a) The minimum vertical clearance for a bridge over a roadway shall be 16.5 feet.
  - b) The minimum vertical clearance for a pedestrian bridge over a roadway shall be 17.5 feet.
6. For bridges constructed over water the bottom of the superstructure shall be 3 feet above the 100 year design flood.

### **7.02 OTHER BRIDGE DESIGN CRITERIA**

Criteria under other recognized road and bridge classifications, such as those of the Federal-Aid Rural Area Design Standards, may be applied under conditions deemed appropriate by the County Engineer.

### **7.03 RETAINING WALLS AND OTHER STRUCTURES**

A preliminary design meeting will be held by Spokane County with the proponent to discuss applicable design standards for retaining walls and other structures. In the absence of other agreed upon standards, analysis and design of retaining walls and

other structures constructed within Spokane County right-of-way and/or maintained by Spokane County shall conform to the requirements of the "LRFD Bridge Design Specifications", adopted by American Association of State Highway and Transportation Officials (AASHTO) including all interim addenda. Plans and structural computations shall be submitted for approval of the County Engineer before construction begins.

## **8.00 UTILITIES**

### **8.01 FRANCHISING POLICY**

Utilities to be located within the Spokane County road right-of-way shall be constructed according to current franchise and permit procedure and according to these standards. In their use of the right of way, utilities shall be given consideration only after the requirements of the road are met. These requirements are to provide safe, efficient and convenient passage for motor vehicles, pedestrians, and other traffic. Aesthetics shall be a consideration. As a matter of policy, Spokane County strongly encourages utility companies to place electric lines underground, particularly in urban development.

### **8.02 STANDARD UTILITIES LOCATIONS**

Utilities within the right-of-way on new roads shall be located as shown on Standard Plan entitled Utility Locations. The locations shown on the standard plan shall be used on existing roadways where topography, utilities, or storm drains do not conflict. Where existing utilities or storm drains are in place, new utilities shall conform to these Standards as nearly as practical and yet be compatible with the existing installations.

Exceptions may be approved when necessary to meet the special requirement of overhead utilities when right of way space is limited in planned unit developments, manufactured home parks, multifamily developments and commercial developments.

1. Notwithstanding other provisions, underground systems shall be placed at least five feet away from road centerline and where they will not otherwise disturb existing survey monuments.
2. Underground utilities that can use a joint trench shall have the option of occupying any other utility company's standard location if that company is a participant in the joint trench installation.
3. Any utility company may use another utility company's standard location provided they obtain approval from that company. A copy of the approval shall be furnished to the County Engineer.

### **8.03 SCHEDULING OF UTILITIES INSTALLATION, RELOCATION AND INSPECTION**

When possible, utilities, including service crossings, shall be installed or relocated before the start of road construction. If planned road cuts and fills are large or if the location of road elements cannot be clearly shown in advance, the utility company will coordinate the relocation of utilities with the contractor before construction. Otherwise, such utilities and connections shall be installed or relocated after the subgrade has been completed but before surfacing has been placed.

As a matter of policy, Spokane County discourages utility trenching or transverse cuts in County roads. Cutting or trenching roads that have been reconstructed within the previous five years will not be permitted unless it can be shown that alternatives are not feasible. Possible alternatives are boring, jacking, relocating outside the paved area, or installing the utility just before reconstruction or overlay of the road. For more information on utility cut requirements please refer to Technical Reference D – Utility Cut Policy.

In instances where trenching or cutting is permitted, pavement patching shall include:

1. Cutting the existing pavement
2. Removal of existing pavement
3. Preparation and compaction of subgrade
4. Placement and compaction of aggregate base material
5. Application of tack coat and construction of the asphaltic concrete pavement "patch"

This work shall conform to the applicable sections of the Washington State Department of Transportation Standard Specifications. On arterial roads, the utility company may be required to backfill the trench in paved roads with controlled density fill to the top of the adjacent crushed surfacing. This requirement may be applied on all paved roads during cool or inclement weather.

Monumentation: The contractor, according to the "Land Survey Standards" section of these standards, shall protect existing survey monumentation.

## **9.00 PERMITS AND INSPECTION**

### **9.01 APPLICATION**

Any party that intends to work within or impact a County right-of-way, including connecting a road or driveway to a county road, shall first obtain a permit by filing a written application with the County Engineer. Such application shall be made on a Spokane County form provided for that purpose, and shall include:

1. The name and address of the applicant.
2. The name and address of the owner of the property abutting the road and where the work is proposed.
3. The exact location of the proposed work, giving the road address or legal description of the property involved.
4. A detailed plan accurately showing:
  - A. The dimensions of the abutting property.
  - B. The dimensions and locations of existing or proposed driveways.
  - C. Utility poles.
  - D. Hydrants.
  - E. Road light standards.
  - F. Trees within the limits of the frontage of said property.
  - G. Other pertinent features.
5. The plan shall also show the location of buildings, loading platforms and off-road parking facilities being served or to be served by such driveways.
6. The County Engineer may require, at his discretion, the filing of any other information when he feels such information is necessary to properly enforce the provisions of this section.
7. The County Engineer will not approve a plan nor issue a permit where it appears that the proposed work conflicts with the provision of this standard or any other ordinance or resolution of Spokane County; nor shall issuance of a permit be construed as a waiver of the Zoning Ordinance or other ordinance requirements concerning the plan.

## 9.02 BASIS FOR CONTROL OF THE WORK

Work shall be done to the satisfaction of the County Engineer and according to approved plans (Section 5.00). This includes work done in the existing, proposed, or future public right of way. It applies to work by a private project sponsor, by county forces, or by a county contractor. It is emphasized that no work may be started until such plans are approved. The County Engineer shall approve any revision to the plans before the proposed revision is constructed.

The County Engineer shall have authority to enforce the Standards just as other referenced or pertinent specifications. He/she will appoint engineers, assistants, and inspectors as necessary to control and inspect the work and they will exercise such authority as the County Engineer may delegate.

### 1. PERMIT REQUIRED

No person, firm or corporation shall commence work or permit any other person, firm, or corporation to commence work on the construction, alteration, repair, removal, cutting and/or paving of any road, alley or other public place in Spokane County without first obtaining a written permit and approved plans from the County Engineer.

The Sponsor shall be responsible for the County costs incurred for inspection. The costs shall be assessed as outlined on the latest fee schedule adopted pursuant to Board of County Commissioner's Resolution or as the same may be amended.

### 2. TEMPORARY TRAFFIC CONTROL

#### Traffic Control Plans (TCP)

Before commencing work, the project sponsor shall prepare and submit a TCP for each major phase of the work to the County Engineer for review and approval. As work progresses, the Sponsor shall revise the work zone to changing conditions. Changes that revise the intent of the previously approved TCP shall be submitted for approval. Note; a TCP may be required even if the work does not impact traffic. It is encouraged that the Sponsor set up proper work zones for projects not on county right of way but open to public travel.

#### Standards

All TCP's and work zones shall conform to Spokane County's Guidelines for Temporary Traffic Control, this can be found at:

[www.spokanecounty.org/engineer/](http://www.spokanecounty.org/engineer/)

Select "TRAFFIC" link

Then select "TRAFFIC CONTROL PLAN SUBMITTAL"

Or contact the Spokane County Engineers office.

### **9.03 NOT USED**

### **9.04 ROAD CONSTRUCTION INSPECTIONS**

The Sponsor's Construction Engineer or a designated representative shall perform inspections on all road construction generated by a land use action.

The County Engineer may elect to perform the construction inspection on public road improvements generated by a building permit or project.

### **9.05 NOT USED**

### **9.06 CONSTRUCTION INSPECTION NOTIFICATIONS AND RECORDS**

The Sponsor's Engineer shall be responsible to ensure that construction of roads and appurtenances is according to county accepted project plans, County General Provisions, the Standard Specifications, and applicable portions of the WSDOT Construction Manual. County forces may make random visits to project construction sites, as deemed necessary. Random visits are to ensure a quality construction inspection process and do not express or imply approval or disapproval of the contractor's work. The County Engineer shall have access to all construction inspection records and reports.

The Sponsor's Engineer shall submit all construction change orders that propose changes to the accepted plans or specifications to the County Engineer for his review and approval. The County Engineer will use a fast-track system for change order approvals when the progress of construction makes it infeasible to wait for formal approval.

If, in the opinion of the County Engineer, the Sponsor's Engineer fails to satisfactorily perform the proper inspection, testing, and record-keeping duties, the County may take action as provided for in Section 1.10 "Compliance Review".

Prior to scheduling a final inspection with Spokane County, the Sponsor's Engineer shall:

1. Submit all construction records to the County Engineer. This shall include but not be limited to, Daily Inspector's Reports, correspondence, manufacturer's certifications, material test reports, and Record Drawings as required in Section 9.10.
2. Ensure that all previously identified project deficiencies have been corrected.

The Sponsor's Engineer shall schedule a final inspection meeting between the Sponsor's Engineer and the County Engineer prior to acceptance of the roads by Spokane County. Deficiencies found shall be corrected by the Sponsor prior to road



acceptance. At the time of establishment of the public roads by the Board of County Commissioners, the County will assume responsibility for road maintenance and operation. The County will then release the Sponsor's Engineer from responsibility with regard to construction inspection.

### **9.07- 9.08 NOT USED**

### **9.09 COUNTY FORCES AND COUNTY CONTRACT ROAD INSPECTION**

Representatives of the County Engineer will inspect road construction done by county forces or by county contract.

### **9.10 RECORD DRAWINGS**

During construction, the Sponsor's Surveyor and/or Construction Engineer shall record any changes to the plans.

All substantive differences shall be noted on the approved final road and drainage plans and shall be labeled Record Drawings. The following statement shall be lettered on the Record Drawings and stamped and signed by the Sponsor's Surveyor and/or Construction Engineer certifying the Record Drawings: "I have reviewed the construction and to my knowledge find it to be in substantial conformance with the approved certified plans and Standard Specifications except as noted."

When changes to the design are necessary, the Sponsor shall be responsible for obtaining approval of plan changes from the Sponsor's Design Engineer. The Sponsor shall forward a copy of the approved plan changes, and any related calculations, to the County Engineer.

## **10.00 SURETY**

### **10.01 PERFORMANCE SURETY**

#### **1. Road and Drainage Improvements**

The Surety will generally address the construction and installation of all public road, private alley, and private road improvements, including but not limited to the roadway, drainage improvements, utility work within County right-of-way, monumentation, construction inspection, and other costs. For commercial building permits, the guarantee shall apply to improvements in the public right-of-way, and drainage improvements, located in tracts or easements on the project site, which serve the public right-of-way. In any case, the Surety shall be in an amount equal to at least 110% of the County Engineer's estimate. The Sponsor's Engineer shall provide Spokane County with quantities on the provided spreadsheet. Then Spokane County will apply unit pricing to arrive at the bond amount

In order to obtain Final Approval of a Project (either a Land Use Action such as a Plat, Short Plat, or Binding Site Plan, or a Certificate of Occupancy for a Commercial Project), a private Sponsor must select one of these options: (1) Post a Surety prior to construction; or (2) Partially construct the Project and provide a Surety; or (3) Complete construction of the Project, certify the construction, obtain the County Engineer's acceptance of the Project Certification Package, and post a warranty Surety for public road portions prior to final approval of the Project.

The Sponsor is not required to post a Surety prior to Final Approval. However, the County Engineer will only recommend Final Approval if either the required improvements have been constructed and certified by the Sponsor, and accepted by the County Engineer, or a Surety acceptable to the County Engineer has been posted.

The Surety that is posted with the County Engineer for compliance with this section shall conform to the following conditions:

- a. The surety shall be of a form approved by the Prosecuting Attorney's Office and acceptable to the County Engineer. The surety amount shall be in United States currency.
- b. Acceptable surety instruments are:
  - Cash Savings Assignment, held by a duly chartered Financial Institution;
  - Letter of Credit issued by a duly chartered Financial Institution; or
  - Surety Instrument ("Bond") issued by a duly chartered Bonding Company.
- c. The term of the surety shall be for two years from the date of the County Engineer's Plan acceptance. The surety must automatically renew until all improvements are constructed and certified, as required herein. Also the

warranty cannot be released until the roads have been established for County maintenance.

- d. At the discretion of the County Engineer, a surety may be reduced with satisfactory progress on the project. The surety shall not be reduced below \$10,000, or 20% of the original surety amount, whichever is greater.
- e. A performance surety will not be required if the improvements are constructed and certified according to these standards prior to final development approval.

#### **A. Performance Surety Prior to Construction**

The Sponsor may choose to post a surety for the entire estimated construction and inspection cost in order to obtain Final Approval. The County Engineer shall estimate the amount of the surety.

Under this option, Final Approval will not occur until the Design Documents have been accepted by Spokane County Public Works, and an acceptable surety has been posted.

#### **B. Partial Construction Before Final Approval**

The Sponsor may choose to construct a portion of the required road and drainage improvements in order to obtain Final Approval. The amount will be calculated from the original surety estimate, to account for such elements as changed quantities, revised unit prices, construction of the remaining work through Public Works contracting procedures, project inspection and certification, etc.

Under this option, Final Approval will not occur until:

1. The Sponsor's Engineer has submitted Inspection Reports for the Project (the "Surety Reduction Certification Package") to the Spokane County Engineer for the constructed improvements constructed to date;
2. The Spokane County Engineer has provisionally accepted the Surety Reduction Certification Package; and

The Sponsor has posted a surety for any remaining road and drainage improvements (public or private), in accordance with the edition of the Spokane County Standards for Road and Sewer Construction (the "Standards") applicable to the Project, and the accepted plans on file at Spokane County Public Works.

#### **C. Complete and certify construction before Final Approval**

The Sponsor may choose to construct all of the required road and drainage improvements prior to obtaining Final Approval. Under this option, Final Approval will not occur until such time as:

1. All required improvements for the Project are constructed in accordance with the accepted plans on file at Spokane County Public Works; and
2. The Sponsor's Engineer has submitted complete Certified Record Drawings and associated Inspection Reports for the Project (the "Certification Package") to the Spokane County Engineer; and
3. The Spokane County Engineer has accepted the Certification Package; and
4. The Sponsor has posted a Cash Savings Assignment, Letter of Credit, or Surety Instrument to warranty the construction and materials for any required public road and drainage improvements, in accordance with the current edition of the Spokane County Standards for Road and Sewer Construction (the "Standards"). The term of the warranty surety shall be as described in Section 10.02.

#### **D. Reductions in Surety; Surety Release**

##### **1. General**

Reductions in the surety will only be made if:

- a. The Sponsor's Engineer has submitted inspection reports for the project (the "Surety Reduction Certification Package") to the Spokane County Engineer for the improvements constructed to date; and
- b. The Spokane County Engineer has provisionally accepted said Certification Package; and
- c. The reductions do not exceed 80 percent of the full surety amount.

##### **2. Substantial Completion**

Once the Substantial Completion Surety has been posted, the County Engineer may, at his sole discretion, recommend Final Approval to the Board of County Commissioners. The County Engineer's recommendation is not to be construed as a guarantee or warranty of any sort that the Board of County Commissioners will, in fact, grant Final Plat Approval.

##### **3. Surety Release**

The County Engineer will release the performance surety in full only when all of the following conditions have been met:

- a. The Sponsor's Construction Engineer submits the required certification that the project has been constructed in substantial conformance with the certified construction plans and specifications.
- b. The Sponsor submits certified "Record Drawings" and project records of all road and drainage improvements constructed for the project.
- c. The Sponsor has paid all costs incurred by the County in full.
- d. All monuments have been reset and referenced by a surveyor.
- e. (Public Roads only) The County has received a warranty surety as specified in Section 10.02 of these standards.
- f. (Public roads only) The roads have been established by resolution of the Board of County Commissioners.

## **2. Sureties for Sanitary Sewer Improvements**

### **A. Plats**

For Plats, Short Plats, or other land use actions requiring a Spokane County Environmental Services sewer collection system final approval will only be recommended if either the required improvements have been constructed by the Developer, accepted by Environmental Services (to include Record Drawings), and secured at the warranty amount, or if a surety acceptable to the Environmental Services Director has been posted.

If Public off-site Sewer Extension is not required:

The Sponsor shall post a surety equal to the amount estimated by the Environmental Services Department for the on-site sewer improvements, prior to Final Approval.

If Public off-site Sewer Extension is required:

The Sponsor shall post separate sureties equal to the amount estimated by Environmental Services for the on-site sewer improvements and for the off-site extension, prior to Final Approval.

When the construction has passed the air test and mandrel test, the guarantee may be reduced to 50% of the initial amount.

When Environmental Services has accepted the sewer construction for operation and maintenance, and Record Drawings have been approved, the guarantee may be reduced to 25% of the initial amount. This 25% will be held as security for the duration of a warranty period. If either of the initial guarantee

amounts exceed \$100,000, then the security will be 20% of the respective initial amount.

**B. For Commercial Projects:**

Private Sewer System:

No surety is required for private sewer systems. Plans must be submitted to Environmental Services and accepted for construction prior to issuance of a Sewer Connection Permit. Inspection of sewer construction must also be scheduled through Environmental Services.

Public Sewer Extension required:

A surety, acceptable to the Environmental Services Director, must be posted prior to sewer construction plans being accepted by Environmental Services. Sewer connection permits will be issued only when Environmental Services has accepted the sewer extension construction for operation and maintenance (subject to a one year warranty period) and record drawings have been approved.

**10.02 WARRANTY SURETY**

The sponsor of a private development shall post a warranty surety for improvements within or serving County rights-of-way with the County Engineer before:

1. The acceptance of construction by the County Engineer; and
2. The establishment of any public road(s) by the Board of County Commissioners;  
and
3. The release of the performance surety.

The Warranty Surety shall conform to the following:

- A. The surety for improvements within public rights-of-way shall remain in effect for two years from the date of certification of the roads.
- B. The warranty surety shall be for an amount equal to 20% of the County Engineer's estimate of the construction costs or \$10,000; whichever amount is greater. If a savings assignment is used for the warranty the surety may be reduced to 10% of the County Engineer's estimate of the construction costs or \$10,000; whichever is greater. The County Engineer, at his/her discretion, may reduce the warranty surety amount for projects valued at less than \$20,000.
- C. The Warranty Surety shall guarantee against defects in road construction, utility work performed within the County right-of-way, and/or drainage facilities as determined by the County Engineer.
- D. The release of the Warranty Surety for improvements within public rights-of-way shall take place two years from the date of certification of the roads. Thirty days prior to expiration of the warranty surety, the Sponsor shall retain a professional

engineer to inspect the improvements. Any deficiencies noted must be repaired prior to the surety release. If the inspection is not conducted and the deficiencies are not repaired, the warranty surety shall be renewed by the Project Sponsor until the inspection is conducted and needed repair work is completed.

### **10.03 PERMIT SURETIES**

A surety, commensurate with the extent of work to be done, shall be posted with the County Engineer before the issuance of a permit to work within public roads.



# Sanitary Sewer Standards Manual



**Spokane County**  
ENVIRONMENTAL SERVICES

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## 11.00 SANITARY SEWERS

The Sanitary Sewer Standards Manual, hereinafter referred to as the “Manual”, provides minimum standards, consistency in design and baseline construction specifications applicable to the design and construction of public and private sewers within Spokane County’s sewer service area. All sanitary sewer designs and construction projects shall focus on providing infrastructure that is efficient and reliable to operate with the ultimate goal of protecting the Spokane Valley – Rathdrum Prairie Aquifer, the Spokane River, the local environment, and public health.

This Manual cannot address all situations. It is intended to help but not substitute for competent work by design professionals. It is not intended to limit innovative or creative effort that could result in higher quality, cost savings or both. The Environmental Services Director will make the final determination to allow designs and techniques that depart from the Standards in this Manual. The following documents are incorporated by reference as part of the Sanitary Sewer Standards:

1. Specifications from other jurisdictions having authority
2. Construction Specifications Institute (CSI; for design of buildings only)
3. Spokane County 2014 Comprehensive Wastewater Management Plan (CWMP)
4. Dept. of Ecology “Criteria for Sewage Works Design” (aka the “Orange Book”)

Technical Reference E of the Road and Sewer Standards contains the “Side Sewer Installation Handbook”. The Handbook provides the specifications for private sewer lines constructed with pipe six inches (6”) in diameter or smaller.

In cases of conflict, the Environmental Services Director will determine the appropriate specification or standard to be used based on state and local laws and the requirements of the jurisdictions having authority.

### 11.01 DEFINITIONS

The following definitions are supplemental to definitions provided elsewhere in this document.

**“Acceptance”** – Pertains to construction plans, calculations, engineering reports and details. For documents that have not been prepared by the Environmental Services Department, the Department relies upon the responsible Professional Engineer’s seal as the indicator of the adequacy, thoroughness, and suitability of the document for its intended purpose. The Department’s acceptance of a document does not transfer any responsibility from the sealing Professional Engineer to the Department.

**“Approval”** – Related to design and/or construction deviation from the County Standards.

**“Comprehensive Wastewater Management Plan” “(CWMP)”** - The Comprehensive Wastewater Management Plan (CWMP) is intended to satisfy the regulations established by the Washington State Department of Ecology (Ecology) regarding preparation of a General Sewer Plan (GSP) per Washington Administrative Code (WAC) 173-240-050. The CWMP

outlines sewer program implementation steps necessary to fulfill the County's requirements per the Growth Management Act (GMA).

**“Department”** means the Spokane County Environmental Services Department (formerly Division of Utilities).

**“Director”** means the Director of the Spokane County Environmental Services Department, or his or her designee.

**“Developer”** generally refers to an individual, company, or corporation undertaking the conversion of a property to a new use or the expansion of an existing use on a property.

**“Engineer”** means the Professional Engineer, licensed to practice in the State of Washington, responsible for development of the design, plans, specifications, engineering reports, and other technical documents.

**“Sponsor”** is the party identified as the proponent of a development action. The Sponsor is ultimately responsible for the provision of the required infrastructure and documentation for the project acceptable to Spokane County.

## **11.02 INDUSTRIAL PRETREATMENT PROGRAM**

Spokane County as the owner and operator of a wastewater collection system has the responsibility to protect its infrastructure by implementing the Industrial Pretreatment Program requirements codified in Spokane County Code (SCC) Chapter 8.03A, and related guidance. The Pretreatment program controls pollutants in wastewater from industrial facilities before they reach the water reclamation facility (wastewater treatment plant). Without proper pretreatment, these pollutants have the potential to interfere with the operation of the water reclamation facility and/or pass through untreated into the Spokane River and the local environment.

Industrial users are responsible for all cost and liability to provide wastewater pretreatment to comply with the County’s Industrial Pretreatment Program and SCC 8.03A, and shall achieve compliance with all applicable pretreatment standards and requirements. Any facilities required to pretreat wastewater to acceptable levels must comply with the regulations for submission of plans and reports for construction of wastewater facilities, Chapter 173-240 WAC. Engineering reports, detailed plans and specifications, and an operations and maintenance manual acceptable to the Director showing pretreatment facilities and operating procedures, together with any other information required by the Director shall be submitted to the Director for review and approval before construction.

## **11.03 PLANNING PROCESS**

### **1. AVAILABILITY OF SEWER**

Included in this section are excerpts of Spokane County Code Chapter 13.650, "CONCURRENCY", pertinent to sanitary sewers. The entire code chapter should be referred to for a complete discussion of the concurrency requirements.

a. Definitions

- a. Adequate Public Facilities - Facilities which have the capacity to serve development without decreasing levels of service below locally established minimums.
- b. Available Public Facilities - Those facilities or services that are either in place or have a financial commitment in place to provide the facilities or services within a specified time. In the case of transportation, the specified time is six years from the time of development.
- c. Concurrency - Means that adequate public facilities are available when the service demands of development occur: This definition includes the two concepts of "adequate public facilities" and of "available public facilities" as defined above.
- d. Dry Side Sewer - (also referred to as "double plumbing") is a sewer service line installed on properties with on-site sewage disposal systems, which will allow for future connection to a public sewer, when the public sewer becomes available. Unless otherwise indicated or approved by the Director, all side sewer requirements shall apply to dry side sewers.
- e. Dryline Sewer - A public or private sewer that is not put into service until it is connected to the operational public sewer system.
- f. Project Permit/Project Permit Application - Any land use or environmental permit or license required from a review authority for a project action, including but not limited to building permits, short plats, subdivisions, binding site plans, planned unit developments, conditional uses, variances, shoreline permits, site plan review, permits or approvals required by the Critical Area Ordinance, site-specific zone reclassifications, manufactured home parks, and change of condition request.

b. Applicability

The following facilities and services must be evaluated for Concurrency:

- a. Transportation
- b. Public Water
- c. Public Sewer
- d. Fire Protection
- e. Police Protection
- f. Parks and Recreation
- g. Libraries
- h. Solid Waste Disposal
- i. Schools

c. Direct Concurrency

Transportation, Public Water and Public Sewer shall be considered Direct Concurrency Services.

d. Water and Sewer Concurrency Inside Urban Growth Areas

New development shall not be approved within the Urban Growth Area boundary unless the proposal can demonstrate the availability of public water and sewer services consistent with adopted Levels of Service, and consistent with the definition for Concurrency in the Spokane County Comprehensive Plan Update. New development must: 1) be connected to a live (fully operational) public sewer

at the time of occupancy, or 2) be located within the Spokane County 6-year Sewer Capital Improvement Program, as adopted.

New development located within a 6-year Sewer Capital Improvement Program area may install septic systems on an interim basis until such time as sewer service is available. All new development shall install dry line sewers and double plumbing if the new development will rely on an interim septic tank/drainfield system rather than being connected to a live sewer. Once sewer service is available, the development shall be required to immediately connect to the County's sewer system.

New development shall be deemed to have met the "availability" threshold for sewer concurrency if the Developer has sewer plans approved by the Department and provides adequate financial security to cover the full cost of constructing the sewerage facilities required for the development. Acceptable plans and security shall be provided before final approval of the proposed development.

Developer-financed extensions of public sewer may be allowed within any area of the Urban Growth Area provided capacity and infrastructure needs are adequately addressed.

For purposes of this section, new development shall include subdivisions, short plats, binding site plans, manufactured home park site development plans, planned unit developments, and zoning reclassifications. Conditional use permits shall also be considered new development if the proposed use would result in an increased amount of wastewater generated on the site.

New developments not requiring sewer and/or water service (e.g. cellular towers) are exempt from this section.

e. Limitation of Services Outside Urban Growth Areas

Public Sewer Service shall not be provided outside the Urban Growth Area except as follows:

- In response to an immediate threat to public health or safety.
- When necessary for the protection of aquifers designated in accordance with RCW 6.70A.170.
- To a vested development that is required to be served with sanitary sewer as a condition of development approval.
- As may otherwise be allowed by state law.

The extension of sewer service according to the exceptions permitted in this section shall not be considered an inducement to types or levels of growth that are not appropriate in the rural area.

f. Applicability:

These regulations shall not apply to land use applications vested in accordance with state and local law.

g. Conflicts between Provisions

This ordinance shall apply as an overlay and in addition to other adopted plans, ordinances and regulations affecting lands in Spokane County. In the event of any conflict between this ordinance and other plans, ordinances and regulations, the provisions of this ordinance shall prevail.

In the event of any conflict between this ordinance and any development agreement which has been executed under RCW 36.708.170, prior to the effective date of this ordinance, the development agreement or provisions therein shall govern and prevail during the term of the agreement.

h. Effective Date:

These procedures came into full force and effect on September 1, 2001. (Res. 01-0700 Attachment A (part), 2001).

## 2. SCOPING MEETING

A scoping meeting shall be scheduled with the Department prior to any substantive planning of sewers for a development project. It is the responsibility of the Developer to initiate and coordinate the scoping meeting. It may be beneficial to have a joint scoping meeting to include all agencies which are affected by or can affect the project. Some of the major topics to address at the scoping meeting are:

- The purpose of the project.
- Requirements of the project to comply with the County's general sewer plan.
- Project timeline and planned phasing.
- Background projects.
- Input needed from governmental agencies.
- Planned projects by the agencies which will impact the project.
- Is a Latecomer Agreement requested.
- Connection fees.

## 3. ENGINEERING REPORTS

Prior to commencing the design of the project, the Engineer shall contact the Department for a determination regarding the requirement for an engineering report. **AN ENGINEERING REPORT IS REQUIRED PRIOR TO THE DESIGN OF ALL SEWAGE PUMP STATIONS.** The engineering report, when required, must be accepted by the Department prior to the Department's acceptance of construction plans for the project. The engineering report shall be submitted in both paper and electronic format and shall include the following:

- The name of the project.
- Name and contact information of the project sponsor.
- Name and contact information of the responsible Engineer.
- Professional Engineer's stamp, signature and date.
- Table of contents, including, tables and maps.
- Aspects of the design (see below).
- Design alternatives considered and the recommended alternative.

The engineering report shall, at a minimum, address the following aspects of the sewer design:

- Compatibility with the expansion and upgrades of the regional sewer system as described and/or identified in the County's (CWMP).
- The total service area, projected population and land use forecasts that will contribute wastewater flows to the proposed project and be used to determine the ultimate size of the proposed sewer infrastructure.
- The projected wastewater flows and loads from the project area and contributing drainage areas to the project. The flows and loads shall be calculated for both current and ultimate development.
- Pipe routing that will best meet the service needs of the proposed project and the ultimate contributing drainage area. The Engineer shall confer with the Department to verify the proposed routings align with the County's regional plans for sewer system expansion.
- Conditions and environmental constraints that would impact the overall project and alternatives to avoid or mitigate the impact.
- Special design features planned to address difficult or unusual challenges to the project.
- Additional concerns related to the project expressed by the Environmental Services Department.
- Other concerns expressed by the Department.

The planning criteria to be used is included in Table 11.04A.

Additionally, the Director may require calculation of the projected wastewater loads for BOD, TSS, TP and TKN as defined in SCC 8.03.1970 – Standard Strength Sewage, or SCC 8.03.1450 – Non-standard Strength Sewage, whichever is applicable.

## **11.04 DESIGN OF SANITARY SEWERS**

### **1. GENERAL DESIGN APPROACH**

This section serves as a guide for the design of sewage collection systems within Spokane County's sewer service area. The goals are:

- To ensure that the design of the sewage collection infrastructure is consistent with public health and water quality objectives of Spokane County and the State of Washington.
- To establish a basis for the design and review of plans and specifications for public and private sewer systems.
- To provide guidelines to engineers for the preparation of plans, specifications, reports and other data.

All designs for public sewer systems and pump stations shall be stamped and signed by a Professional Engineer licensed to practice in the State of Washington. Designs shall meet or



exceed the minimum requirements and criteria set forth in Table 11.04A and conform to design parameters specified by the Criteria for Sewage Works Design issued by the Washington State Department of Ecology, a.k.a. the "Orange Book". These design criteria are minimum standards and are intended to assist, but not substitute for competent work by design professionals.

Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow. Storm water discharges into the County's sanitary sewers are not allowed. Computations and data used for the design of the sewer system shall be provided to the Director upon request.

Collection systems shall be designed to serve the ultimate development of the tributary areas within the sewer service area defined by the County's CWMP. In selecting the size of the sewer system components, the Engineer shall take into account:

- Population and economic growth projections, feasibility, benefit, and comparative cost of staged construction alternatives.
- Growth Management Area boundaries.
- Possibility of solids deposition, odor and corrosion that might occur at initial low flows.

## 2. SERVICE TO EXISTING AND FUTURE PROPERTIES REQUIRED

Extensions of the public sewer system must be designed to comply with the County's CWMP and to facilitate future expansion of the system. To meet this goal, the design must support the County's general sewer plan in the following ways:

- The final pipe size, slope, depth and alignment must be acceptable to the Environmental Services Department.
- To facilitate service to future areas and to protect newly paved roadways, sewers shall be constructed beneath all new roadways and beneath existing paved surfaces that are required to be improved in conjunction with the development.
- When sewer is being installed adjacent to properties outside of the project necessitating the extension of sewer, side sewer stubs must be provided to each of those properties. The side sewer stubs shall be installed deep enough to permit a gravity connection of all sewage facilities on the property, if practicable. The property owners shall be contacted for their input regarding preferred side sewer stub locations and needs for future development. Documentation confirming this effort shall be provided to the Department. The final location, size, and number of side sewer stubs are subject to approval by the Department.

## 3. GENERAL SEWER DESIGN CRITERIA

In addition to the design criteria specified in Table 11.04A, the Standard Plans, and other technical manuals included by reference, design and construction specifications shall adhere to the following requirements:

- The specified pipe material shall be manufactured and adapted for local conditions such as soil characteristics, characteristics of wastewater, external loads,

susceptibility to corrosive environments and other installation and operating conditions anticipated by the Engineer or the Department.

- Material and installation specifications shall adhere to appropriate requirements as established by the industry in technical publications such as ASTM, AWWA and APWA standards.
- The method of joining pipe and the material used shall be included in the specifications. Joints specifications shall meet the requirements established by the ASTM.
- Pipe slope shall be designed to achieve a minimum flow velocity of 2.0 feet per second when flowing full. Refer to the “Orange Book” for minimum pipe slopes by pipe size. When practicable, pipe slopes should be 1.25 times the minimum slope, particularly at the upstream end of the system or in low flow areas.
- Gravity sewers shall be straight line and uniform grade between manholes.
- Distance between manholes shall not exceed 400 feet unless approved by the Director.
- Pipe systems and manholes should be designed to maintain a uniform energy grade line throughout the manhole to minimize turbulence.
- Flow channels in manholes shall be of such shape and slope to provide a smooth transition from inlet to outlet pipes.
- Manholes must be installed at the upstream end of each sewer line of 8-inch diameter or greater unless the line is expected to be extended in the near future, in which case, a cleanout may be installed, but no further than 100 feet from the downstream manhole. No more than one live sewer connection will be allowed between the cleanout and the next downstream manhole.
- Ductile iron pipe must be used:
  - a. When wastewater velocities are anticipated to exceed 15 fps.
  - b. When the pipe will have less than three feet of cover.
  - c. For all above-ground installations such as bridge crossings.
- 4” diameter side sewers shall be limited to serving a maximum of two equivalent residential units on a single property.
- Commercial properties shall be served by 6” minimum diameter side sewer stubs.
- Side sewers are not allowed to connect directly into a manhole unless the manhole is, and will remain, the upstream terminal manhole in that branch of the system. A maximum of three side sewers, 6” diameter or smaller may be allowed in a single terminal manhole.

#### 4. EASEMENTS

Easement for public sanitary sewers shall be a minimum of 20 feet wide or 1.8 times the depth of the sewer, whichever is greater. Easements must be recorded with Spokane County prior to acceptance of the sewer system by the Department for ownership and maintenance.

Maintenance access roads shall be 14 feet wide, and shall be constructed with 8-inch thick crushed surfacing base course at a maximum longitudinal grade of 12% and with maximum cross slopes of 2%. The crushed surfacing shall be compacted to 92% of maximum density.

### 11.05 DESIGN OF PUBLIC SEWAGE PUMP STATIONS

In the interest of cost savings and efficiency for construction and operation, the Department has established a generalized standard design for the construction of public sewage pump stations. All sewage pump stations which are to be owned and operated by the County shall be based upon this design unless site conditions or operational requirements present the need for an alternate design. Any alternative designs shall be subject to approval by the Department. Pump station designers shall contact the Department to acquire a template of the pump station plans and additional design criteria. Following are some of the design features to be incorporated into the pump station design:

- The pump station must fit in aesthetically with the surrounding neighborhood including an acceptable color scheme.
- The structure shall be constructed of split-face CMUs and have a 40-year rated asphalt shingle roof to provide Class A fire rating.
- The site must be able to accommodate the County's large service trucks and equipment as well as parking for three pickup trucks.
- Facility power shall be 3-phase where available.
- Electrical and HVAC controls shall be located in a room separate from the room housing the pumps, piping and back-up power equipment.
- HVAC equipment shall be designed to maintain the inside space at temperatures between 45 and 90 F.
- The station shall be a submersible pump style. There shall be a minimum of two pumps, each capable of pumping the design flow.
- The station shall be designed to accommodate the ultimate wastewater flow. Some equipment may be permitted to be downsized for the initial flow.
- The wet well shall be located outside of the building and accessible to the County equipment for cleaning.
- The pump suction and discharge openings shall be at least 4 inches in diameter.
- All piping in the wet well, station and within the boundary of the pump station site shall be ductile iron.
- Back-up power supply shall be required in one of two methods, as determined by the Department:
  - a. Provision of power receptacle of type and size to mate to the County's mobile generator, or
  - b. Provision of an on-site generator, either natural gas or diesel, to be determined by the Department. Diesel fuel storage shall be above ground with appropriate spill prevention and containment provisions.
- The station shall include space and electrical connections for the SCADA equipment. When required, the SCADA equipment shall be designed and provided by the Department's contractor. The Sponsor is responsible for SCADA-related costs.
- In most cases, equipment for odor mitigation will be required, typically using activated carbon.
- Depending on the wet well and force main detention time, equipment to mitigate H<sub>2</sub>S generation may be required.
- Arc flash hazard analysis must be performed in accordance with NFPA 70E. Resultant stickers shall be placed as required.
- Two hard copies and one electronic copy of Operation and Maintenance (O&M) manuals shall be provided to the Department. Electronic O&M manuals shall be compatible with the Department's electronic O&M database.

The Engineer shall contact the Department for specific design requirements.

It is the Department's preference that the ownership of the land upon which the pump station is constructed be transferred to Spokane County prior to the Department's acceptance of the pump station. Under certain circumstances, an easement granting the Department the right to access, operate, construct and maintain the sewage facilities on site may be acceptable, subject to the approval of the Director. The easement must be in the form of a sewer easement document or noted on the final plat. A sewer easement document must be recorded with the County Auditor's Office.

## **11.06 SEWER FORCE MAINS**

- All force main piping shall generally be ductile iron. Subject to the Department's consideration, smaller diameter force mains (generally less than eight (8) inches in diameter may be AWWA C900 PVC. When the force main has less than 3 feet of cover or is installed above ground such as for a bridge crossing, ductile iron pipe material is required.
- Force mains shall typically have at least 5 feet of cover.
- Force mains should be sized to operate at velocities between 2.5 and 6.0 feet per second. In no case should force main velocities exceed 8 feet per second.
- Force mains shall be designed and tested to withstand twice the operating pressure expected for a minimum of 40 minutes. The minimum test pressure is 100 psi.
- Force mains shall be designed without intermediate high points if possible. Force main designs shall include a surge analysis as appropriate. When necessary, air release valves and vacuum valves shall be of the make and model acceptable to the Department.
- Force mains shall also be designed to adequately manage grease and other potentially clogging materials. Appurtenant piping such as for air release and/or vacuum valves must be designed to manage such impacts.

## **11.07 PLAN SUBMITTAL PROCESS**

### **1. PLAN SUBMITTALS**

For public and private sanitary sewer infrastructure proposed to be constructed within Spokane County's sewer service area, plans must be submitted and accepted by the Department prior to construction. Two (2) sets of plans are required for initial submittal. Plans accepted by the Department are valid for one year from the date of acceptance. If construction of the sewer improvements has not commenced within the one-year period following acceptance, resubmittal of the plans is required.

The plans shall include the items listed below. Additional items may be required depending on the project.

- Project name and site address.
- Tax parcel number of all parcels within or adjacent to the project.

- Section, Township, Range and Qtr. Section of the Project Site.
- Engineering firm's name, address and phone number.
- Name and address of the owner(s) of the subject property.
- Vicinity Map showing the project location.
- State of Washington Professional Engineer's seal with signature and date on each sheet.
- Plan sheets are to be 24" x 36".
- Plan Scale; Plan & Profile sheets, Horz. 1"=50', Vert. 1"=10'.
- Design must be based on NAVD 88 and so noted on plan sheets.
- North arrow (located at the top or right side of page).
- Depiction of all existing sanitary sewer lines, manholes and side sewer stubs, within the drawing extent, with a dashed line.
- Sewer easements noting the County Auditor's recording number.
- Location of all water well sites within proposed development with a 100-foot buffer also depicted.
- The following language placed inside or directly beneath the Developer approval / signature block - "This construction plan expires one (1) year from date of approval".
- Adjacent roads identified. Include road names, existing and proposed edge of pavement, road centerline, shoulders, and curbs. Curbs are to be shown with two (2) lines.
- Number of units, buildings, lots, and blocks identified on plans.
- Standard Spokane County Environmental Services Department construction notes and details shall be included on the plans.
- Cover sheet showing the proposed project referenced to section lines or corners (*Suggested scale: 1"=200'*).
- Cover sheet showing the proposed project tied to section lines or corners (*Suggested scale: 1"=200'*).
- Provide an overall schematic of the pipe system showing existing adjacent sewers with dashed lines and proposed sewer lines with solid lines with flow direction indicated.
- Invert and rim elevations and stationing shall be provided for all manholes in both plan and profile views.
- Show all existing and proposed manholes (*with County manhole numbers*) and sewer lines located on or adjacent to project. Depending on the size of the project, the pipe schematic with County manhole numbers may be on the cover sheet or may require a separate sheet.

## 2. FEES AND OTHER COSTS

The Project Sponsor should anticipate payment of various fees, charges and security costs in connection with the project. The required fees may include, but not limited to:

- Connection fees including General Facility Charges and Special Connection Charges as calculated by the Department.
- Sewer Connection Permit Fees.
- Sewer Tap Permit Fees.
- Video Inspection Fees.
- Construction and/or Warranty Security.

- Concurrency Review Fee.
- Plan Review Fees.
- Recording Fees.

## 11.08 CONSTRUCTION - GENERAL REQUIREMENTS

Refer also to the General Provisions of this Manual

### 1. PERMITS

It is the Sponsor's responsibility to make sure that all required permits have been obtained and complied with during the course of the project. Examples permits that may be required by other agencies are:

- Right-of-Way Permits (for work within the public right-of-way).
- Plumbing, Mechanical and Electrical Permits.
- Utility Crossing Permits.
- Shoreline Permits.

Some agencies, such as the Washington State Department of Transportation, require a public agency to be the applicant and ultimate owner of any resulting franchises. In those cases, the Sponsor is responsible for paying all costs associated with the application of, and compliance with, the permit. When the application is acceptable to the Environmental Services Department, the Director may execute the associated permit documents as the future facility owner.

### 2. INSPECTIONS

Refer also to Technical Reference C

<u>Inspection of ....</u>	<u>...Shall be performed by...</u>
Public and private gravity sewer installation, 8" dia. and larger.	...the Sponsor's independent inspection firm.
4" & 6" side sewer stub installation from the main to the property line.	...the Sponsor's independent inspection firm.
4" & 6" side sewer from the property line to the building drain connection.	Spokane County Environmental Services Dept. A Sewer Connection Permit is required.
All taps of existing sewer mains and manholes.	Spokane County Environmental Services Dept. A Main Line / Manhole Tap Permit is required.
Pressure sewers within the right-of-way.	...the Sponsor's independent inspection firm.

Pressure side sewer from the property line to the sewage pump.	Spokane County Environmental Services Dept. A Sewer Connection Permit is required.
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**VIDEO INSPECTION**

Sanitary sewer lines 8-inch diameter and larger must be video inspected by the Department before final acceptance by the Department. Refer to Technical Reference C, Attachment 5 for the protocol for the video inspection of sewers.

It is recommended that the sewer lines be video inspected prior to paving over the pipe. The Department may be contacted to provide this additional inspection and all costs to perform this pre-pavement inspection shall be borne by the Developer or Contractor. The Contractor must provide safe, unobstructed access to the manholes for the Department’s video inspection vehicle and personnel.

**3. LAWS TO BE OBSERVED**

The Sponsor shall ensure that the project and associated work complies with all applicable federal, state, tribal, or local laws, ordinances, and regulations. Spokane County shall be indemnified and held harmless by the Sponsor against any and all claims that may arise as a result of the negligence of the Sponsor or his/her representatives and agents in the prosecution of the project.

The Contractor and the Engineer are responsible to immediately report to the Department violations pertaining to environmental compliance, including but not limited to spills, unauthorized fill in waters of the state or in wetlands, water quality standards, noise, and/or air quality.

The Contractor shall be responsible for the safety of all workers and shall comply with all appropriate state safety and health standards, codes, rules, and regulations, including, but not limited to those promulgated under the Washington Industry Safety and Health Act RCW 49.17 (WISHA), and as set forth in Title 296 WAC (Department of Labor and Industries). In particular the Contractor’s attention is drawn to the requirements of WAC 296.800 which requires employers to provide a safe workplace.

**4. PRIVATE / PUBLIC PROPERTY**

Property shall not be utilized or entered upon without written approval from the property owner or the jurisdiction having authority. The Sponsor shall bear all costs associated with providing protection measures and repair, replacement or compensation for any damage to property and improvements resulting from the Sponsor’s project.

The Developer, Engineer and/or Contractor shall be responsible for the preconstruction documentation and replacement of all property corners and survey monuments disturbed or removed due to construction operations. Replacement of property corners shall be performed only by a Washington State licensed Land Surveyor and shall be in accordance with all applicable regulations, including those of the Washington State Department of Natural Resources.

## 5. PRECONSTRUCTION MEETING REQUIRED

Prior to the Contractor beginning the work, a preconstruction conference may be required by the Department, including representatives from the Department, the Contractor, the Sponsor's Engineer and other interested parties. The purpose of the preconstruction conference is to discuss the prosecution of the work, inspection requirements, requirements for providing record information and other documentation to the Department, and to clarify requirements of installation and material specifications.

## 11.09 ACCEPTANCE OF NEW INFRASTRUCTURE

### WARRANTY SECURITY

The Sponsor shall post security to warrant the sanitary sewer infrastructure and related work as follows:

- Warranty for two years all work and materials of all pump station components constructed or installed within the pump station site.
- Warranty for two years all pressure pipe installations including all appurtenances to the pipe system.
- Warranty for one year all gravity pipe installations including all appurtenances to the pipe system.
- Warranty for one year for any other sanitary sewer items not covered above.

The warranty period shall commence when:

1. All project elements have passed the required testing.
2. Record drawings have been submitted and accepted by the Department.
3. Recorded easement documentation and titles have been received (if applicable).
4. Operation & Maintenance manuals have been submitted and accepted (if applicable).
5. The Warranty Security has been provided in an acceptable form.



TABLE 11.04A

SPOKANE COUNTY  
SEWER DESIGN CRITERIA

Capita per Equivalent Residential Unit (ERU)	
Single Family	2.5
Multi-Family	2.0
Wastewater Flow Per Capita	80 GPD
Depth of Flow; 15" Dia. Pipe and Larger	70%
Depth of Flow; 8" to 12" Dia. Pipe	100%
Peaking Factor Curve (See Table 11.04B)	Ten States Standards
Infiltration/Inflow (I/I) Allocation	Residential – 125 GPAD Commercial/Industrial – 200 GPAD
Manning's "n" factor	0.013
Commercial/Industrial Flow	2,000 GPAD Unless Reliable Data is Available

Minimum Slope	Sewer Size (Inches)	Minimum Slope* (Feet Per 100 Feet)
	8"	0.40
	10"	0.28
	12"	0.22
	15"	0.15
	18"	0.12
	21"	0.10
	24"	0.08

\* When grade is available, the preferred pipe slope is 25% steeper than the minimum slopes stated above, especially for the upper reaches of the system.

Table 11.04B  
PEAK FACTORS based on TEN STATES STANDARDS

ERUs	Population (rounded up)	Average Flows*		Peak Factor**
		MGD	CFS	
1	3	0.000	0.000	<b>4.5</b>
2	5	0.000	0.001	<b>4.4</b>
5	13	0.001	0.002	<b>4.4</b>
9	23	0.002	0.003	<b>4.4</b>
13	33	0.003	0.004	<b>4.3</b>
38	95	0.008	0.012	<b>4.2</b>
80	200	0.016	0.025	<b>4.1</b>
140	350	0.028	0.043	<b>4.0</b>
223	558	0.045	0.069	<b>3.9</b>
336	840	0.067	0.104	<b>3.8</b>
477	1,193	0.095	0.148	<b>3.7</b>
660	1,650	0.132	0.204	<b>3.6</b>
890	2,225	0.178	0.275	<b>3.5</b>
1,180	2,950	0.236	0.365	<b>3.4</b>
1,540	3,850	0.308	0.477	<b>3.3</b>
1,980	4,950	0.396	0.613	<b>3.2</b>
2,530	6,325	0.506	0.783	<b>3.1</b>
3,210	8,025	0.642	0.993	<b>3.0</b>
4,050	10,125	0.810	1.253	<b>2.9</b>
5,100	12,750	1.020	1.578	<b>2.8</b>
6,410	16,025	1.282	1.984	<b>2.7</b>
8,050	20,125	1.610	2.491	<b>2.6</b>
10,130	25,325	2.026	3.135	<b>2.5</b>
12,800	32,000	2.560	3.961	<b>2.4</b>
16,240	40,600	3.248	5.025	<b>2.3</b>
20,740	51,850	4.148	6.418	<b>2.2</b>
26,730	66,825	5.346	8.271	<b>2.1</b>
34,850	87,125	6.970	10.784	<b>2.0</b>

\*Average flow based on 200 gpd per ERU  
 \*\*Determined by formula  $\frac{(18 + \text{sq. root of 'P'})}{(4 + \text{sq. root of 'P'})}$   
 'P' = population in thousands

## DIVISION 7

### 7-05 MANHOLES, INLETS, AND CATCH BASINS

Refer also to Standard Plans U-1 through U-14

#### 7-05.2 MATERIALS

Precast concrete manholes for sanitary sewers shall meet the requirements of AASHTO M199. The joints may be the tongue and groove type or the shiplap type, sufficiently deep to prevent lateral displacement.

As an alternative to steel reinforcing, 48-inch diameter precast manhole barrel sections with no knock-outs using synthetic structural fibers may be used. These components shall meet the following requirements:

1. Synthetic fibers shall be monofilament or monofilament/fibrillated blend made of polyolefin, polypropylene, or polypropylene/polyethylene blend, meeting the requirements of ASTM C1116, Section 4.1.3, and ICC ES Acceptance Criteria 32, Sections 4.1.3 and 4.1.2. The fibers shall have a minimum tensile strength of 50 ksi and a minimum modulus of elasticity of 600, when tested in accordance with ASTM D3822. Additionally, the vendor or manufacturer must furnish an Engineering Report that provides test data in accordance with ASTM C1018 and/or ASTM C1399 from an ICC-qualified commercial laboratory relating to the specification requirements. The fibers shall be a minimum of 2 inches in length and have an aspect ratio (length divided by the equivalent diameter of the fiber) between 70 and 100 when the fibers are in their final phase.
2. When secondary synthetic fiber reinforcement is used in the cone section, a minimum of two hoops of W2 wire shall be placed in the 48-inch end of each cone. No steel is required in the remainder of the cone. The fiber shall meet the requirements of ASTM C1116, Section 4.1.3 3 and ICC ES AC 32, Sections 4.1.1 and 4.1.2. Synthetic fibers shall be added at a minimum dosage rate of 1.0 pound of nylon multifilament fibers per cubic yard of concrete or 1.5 pounds of polypropylene fibrillated fibers per cubic yard of concrete and shall be thoroughly mixed with the concrete before placement in the forms. The synthetic fibers shall be a minimum of 0.75 inches and a maximum length of 2 inches.

Manhole steps are required for all manholes except Type III manholes, which shall have no steps. Steps shall be reinforced copolymer polypropylene plastic as manufactured by Lane International Corporation or an alternate acceptable to the Department. Manhole steps shall have integral restraints to prevent side slippage of feet.

Manhole bases shall be monolithically cast with a wall which shall extend a minimum of twelve inches (12") above the top of the highest inflowing pipe. The channels shall conform accurately to the sewer grade. Entry couplings shall be "Kor-N-Seal" or a PVC manhole adapter as manufactured by GPK Products, Inc. or a Dura-Seal III gasket as manufactured by Dura-Tech, Inc., or acceptable alternate. Gasket material shall comply with the provision of ASTM D-2000 3 BA715. Kor-N-Seal shall be installed at the manhole manufacturer's plant. Field installation will not be permitted.

All manholes shall be constructed with gasketed eccentric cone sections, unless otherwise allowed by the Department.

Frames shall be cast iron conforming to the provisions of ASTM A48, Class 35B or ductile iron conforming to the provisions of ASTM A-536, Grade 80-55-06. Covers shall be ductile iron conforming to the provisions of ASTM A-536, Grade 80-55-06. Frames and covers shall provide a minimum 24-inch diameter opening. Castings shall be free of porosity, shrink cavities, cold shots or cracks, and all surface defects that impair serviceability. Frames and covers shall be machine ground on seating surfaces so as to insure non-rocking fit in any position and interchangeability.

### 7-05.3 CONSTRUCTION REQUIREMENTS

- The subgrade for the manhole shall be compacted with a rammer-type compactor to a level and uniform foundation before setting the manhole base.
- Covers shall be seated properly to prevent rocking.
- Leveling and adjustment devices that do not modify the structural integrity of the metal frame, grate or cover, and do not void the originating foundry's compliance to these specifications and warranty are allowed.
- Leveling and adjusting devices that interfere with the backfilling, backfill density, grouting and asphalt density will not be allowed. The hardware for leveling and adjusting devices shall be completely removed.
- The entry opening and manhole steps shall be vertically aligned and centered over the largest-diameter incoming pipe. Steps shall be cast in manhole sections or installed by being driven into a drilled or formed hole per manufacturer's recommendations. Chipping out or drilling an oversized hole and grouting in the steps shall not be acceptable.
- In the event any pipe enters the manhole through the precast concrete units, the Contractor shall make the necessary cut through the manhole wall and steel mesh. The steel shall be cut flush with the face of the concrete and shall be cut in such a manner that it will not loosen the reinforcement in the manhole wall. The cut shall be made by drilling or sawing but not by a sledgehammer.
- The ends of all pipes shall be trimmed flush with the inside walls.
- Joints between precast manhole units used for sanitary sewers shall be made watertight with a rubber gasket. All other joints and all openings cut through the walls shall be grouted and watertight. If gaskets are used, handling of the precast units after the gasket has been affixed shall be done carefully to avoid disturbing or damaging the gasket or contaminating it with foreign material. Care shall be exercised to attain proper alignment before the joints are entirely forced home. During insertion of the tongue or spigot, the units shall be partially supported to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned.
- Rigid pipes connecting to sanitary sewer manholes shall be provided with a flexible joint at a distance from the face of the manhole of not more than 1½ times the nominal pipe diameter or 18 inches, whichever is greater.
- Flexible pipes connecting to sanitary sewer manholes shall be provided with an entry coupling or gasket acceptable to the Department. No pipe joint in flexible pipe shall be placed within 10 feet of the manhole. Entry couplings shall be installed per manufacturer's recommendations. The opening shall be pre-formed or cored. Breaking an opening with a sledgehammer is not acceptable.

### 7-05.3(1) ADJUSTING MANHOLES TO GRADE

The adjustment section of the manhole shall be constructed using precast concrete adjustment rings, concrete brick or metal shims. Polyethylene adjustment rings may also be used, subject to the acceptance of the Department. "Infra-Riser", manufactured by East Jordan Iron Works, may be used. Each component of the adjustment section must be mortared in place with waterproof non-shrink mortar grout. The casting shall also be set in mortar. The adjustment section shall then receive coating of waterproof non-shrink mortar grout on the outside and inside and the joints on the inside shall be struck off and pointed.

The final rim elevation shall be set at 1/8- to 3/8-inches below the surrounding final pavement elevation or ground.

### 7-05.3(3) CONNECTION TO EXISTING MANHOLES

Connections to existing manholes shall be coordinated through Spokane County Environmental Services Department at least 24 hours in advance of the work. The County's representative shall be on-site prior to manhole core drilling and during connection. In addition, the Contractor shall notify Spokane County Wastewater Operations at (509) 477-1984 at least 24 hours prior to performing the work.

In making connection to existing manholes, core the manhole to the diameter sufficient for installation of the adapter diameter required for the pipe diameter shown on the Plans. Coring shall extend through the manhole shelf to the existing channel. Install the adapter and connect the new pipe to the manhole. Adapters shall be "Inserta-Tee" by Fowler Industries, and no substitutes will be accepted. Shape the new manhole channel to provide a smooth and uniform transition to the existing channel. The new channel shall slope at a minimum of 0.5% slope.

The crown elevation of laterals shall be the same as the crown elevation of the incoming pipe unless the Department authorizes a deviation. The existing base shall be reshaped to provide a channel equivalent to that specified for a new manhole.

Water used for flushing and testing shall not be allowed to enter sewer lines owned and operated by the County.

### 7-05.3(4) TESTING OF MANHOLES

The Department requires testing of all or some of the manholes constructed as part of the project. The number and location of the manholes to be tested will be determined by the Department. For each selected manhole that fails the test, the Department may require testing of an additional manhole in addition to re-testing the failed manhole.

Either the water exfiltration method or vacuum method described below shall be used for the manhole test.

1. Water Exfiltration Test: Prior to testing, the manhole shall be completely constructed, and all inlet and outlet pipes shall be plugged. The Contractor shall fill the manhole to a depth of 6-feet above the highest pipe crown with water. Four hours after the manhole has been filled, the Contractor shall refill the manhole to original water level and commence the test. The Contractor shall keep the water surface to the six-foot level for a 6-hour period. The leakage rate shall not exceed 0.2 gallons per hour per foot at test head above the pipe crown elevation.

2. Vacuum Testing: Each manhole shall not be tested until after final assembly and backfilling is completed. Plug all openings in the sides of the manhole and all pipes entering the manhole, taking care to securely brace the plugs from being drawn into the manhole. Openings shall be plugged with a non-shrink grout acceptable to the Sponsor's Engineer. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. The manhole shall pass if the test time is in accordance with the following table:

<u>Depth (ft.) of Manhole</u>	<u>Diameter (inches) / Time (seconds)</u>		
	<u>48"</u>	<u>60"</u>	<u>72"</u>
8	14	18	23
10	17	23	28
12	21	28	34
14	25	32	40
16	28	37	45
18	32	41	51
20	35	46	57
22	39	51	62
24	42	55	68
26	46	60	74
28	49	64	80
30	53	69	85

## 7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

### 7-08.3 CONSTRUCTION REQUIREMENTS

Pipe installed within public right-of-way shall be constructed in accordance with the rules and specifications of the jurisdiction having authority. The contractor shall take measures to protect the public from property damage and personal injury that could be incurred by the contractor's work. The Contractor shall provide a Trench Excavation Safety System, per Chapter 39.04 RCW, meeting the provisions of the Washington Industrial Safety and Health Act, Chapter 296-155-655 WAC. The trench shall be of such width to provide safe working conditions in accordance with federal, state and local requirements.

For common excavation, the depth to be excavated below the pipe invert elevation shall be 4 inches where native material does not meet pipe zone bedding specifications, in the written opinion of the Engineer, and 6 inches for rock excavation. Pipe bell holes shall be provided at each piping joint to permit the joint to be made properly and to ensure that the pipe is supported along the full length of the pipe barrel and not at the joint. All ledge rock, boulders, and stones shall be removed to provide a minimum of 6 inches clearance under all portions of the pipe. All material excavated from trenches and piled adjacent to the trench shall be maintained so that the toe of the slope is at least 2 feet from the edge of the trench. It shall be piled to cause a minimum of inconvenience to public travel, and provision shall be made for merging traffic where necessary. Free access shall be provided to all fire hydrants, water valves, and meters; and clearance shall be provided to enable free flow of storm water in gutters, conduits, or natural watercourses.

Tracer wire shall be installed over all non-metallic pressure sewer pipe, including side services. The wire shall be placed approximately one foot above the top of the sewer pipe and shall be continuous its entire length. The tracing wire shall be directed vertically inside the mainline flushing connection points and service line curb stops and terminate approximately six inches below valve box or manhole cover. For the main line, the tracer wire shall be secured to the flushing connection assembly in a manner acceptable to the Department.

The Sponsor's Engineer is responsible for confirming during construction that the trench bottom material is adequate to support pipe and manholes. If the trench material is not adequate, the unsuitable material shall be over-excavated as needed and replaced with crushed surfacing top course.

### 7-08.3(1)C BEDDING THE PIPE

Placement of bedding material shall precede the installation of all pipe. This shall include necessary leveling of the native trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to a uniform grade so that the entire length of pipe will be supported on a uniformly dense unyielding foundation. Pipe zone bedding shall provide uniform support along the entire pipe barrel, without load concentration at joint collars or bells. All adjustment to line and grade shall be made by scraping away or filling in with bedding material under the body of the pipe and not by blocking or wedging.

Pipe zone bedding shall be compacted to 92 percent maximum density. Bedding shall be placed, spread, and compacted before the pipe is installed so that the pipe is uniformly supported along the barrel. The Contractor shall compact the bedding beneath the spring line of the pipe with a "J" bar or similar device acceptable to the Engineer. A maximum of 6 inches of bedding material shall be placed before use of the "J" bar. Bedding material shall be placed a minimum of 12 inches horizontally to each side of the pipe to facilitate compaction of the bedding material. Bedding material shall be placed to a minimum depth of 12 inches above the pipe prior to backfilling.

Native material meeting the gradation limits provided below may be used for bedding the pipe unless the Engineer requires the use of imported bedding. Imported bedding shall be Crushed Surfacing Top Course or a clean sand/gravel mixture. All pipe zone bedding shall be free from organic matter and conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
¾" square	100
U.S. No. 4	50-100
U.S. No. 200	0-15

### 7-08.3(2)B PIPE LAYING – GENERAL

#### SEPARATION BETWEEN WATER AND SANITARY SEWER LINES

Sanitary sewers shall be installed in compliance with Section C1-9.1 of the Criteria for

Sewage Works Design regarding the required separation from potable and reclaimed water lines. When a sewer line is sleeved, the ends of the pipe sleeve shall be plugged with grout to prevent soil and groundwater migration into the casing.

### 7-08.3(3) BACKFILLING

Pipe zone backfill material shall be clean earth or sand, free from clay, frozen lumps, roots, or moisture in excess of that permitting required compaction. Rocks or lumps larger than 3 inches maximum shall not be used for pipe zone backfill.

Pipe zone backfill shall be placed and compacted in accordance with the jurisdiction having authority over the roads and rights-of-way in which the work takes place. Backfill shall be brought up simultaneously on each side of the pipe to the top of the pipe zone. The pipe shall then be covered to the top of the pipe zone and the materials compacted in a manner to avoid damaging or disturbing the completed pipe.

### 7-08.3(4) PLUGGING EXISTING PIPE

Existing pipes and conduits greater than nominal 4" diameter and not being utilized shall be plugged on the exposed open end for a distance of two pipe diameters with commercial concrete or mortar. Care shall be used in placing the concrete in the pipe to see that the opening of the pipe is completely filled and thoroughly plugged.

## 7-17 SANITARY SEWERS

### 7-17.2 MATERIALS

Acceptable pipe for Gravity Sewers:

- Solid Wall PVC pipe conforming to ASTM D3034, SDR 35 or ASTM F-789. Joints shall meet ASTM D 3212 with integral elastomeric gaskets conforming to ASTM 477. Profile wall PVC pipe shall not be used, unless allowed by the Director for a specific situation. PVC Pipe fittings conforming to ASTM 3034, SDR 35 except that all main line tees and wyes shall be SDR 26.
- Ductile Iron pipe conforming to ASTM A746. Cement-mortar lined. Bell and spigot type with push on joints conforming to ANSI A21.11. Exterior coating meeting ANSI A21.51
- Vitrified Clay sewer pipe conforming to ASTM C700. Joints shall be compression joints in accordance with ASTM C425.
- Reinforced Concrete Pipe, RCP, conforming to ASTM C76 or ASTM C655. The appropriate ASTM specification and pipe class shall be determined by the installation and operating conditions.

Acceptable pipe for Pressure Sewers:

- Ductile Iron pipe for pressure sewers shall conform to ANSI/AWWA C150/A21.51 and ASTM A746-03. The pipe shall be lined with ceramic epoxy ("Protecto 401<sup>®</sup>"), or an alternate lining system acceptable to the Department, to effectively resist corrosion. Installation shall be consistent with AWWA C-600. In corrosive soils, the piping may be required to be protected with polyethylene encasement in accordance with AWWA C105. Joints and method of joint restraint shall be determined by anticipated pressure



conditions as approved by the Department. When thrust blocking is permitted, it shall be achieved with pour-in-place concrete. Using pre-cast blocks is not permitted.

- The Department shall make case-by-case determinations regarding the use of PVC pipe for specific sewer force mains. When allowed, PVC pipe (4-inch diameter and greater) shall be AWWA Class C-900 or C-905 conforming to ASTM D 1785 with fittings per ASTM D 2466 and D 2467. Pipe must be solid-wall. Cellular core pipe is not acceptable.
- PVC pipe (3-inch diameter and smaller); Schedule 80 per ASTM D 1784 and D 1785.
- High Density Polyethylene (HDPE) (1-1/4" – 3" dia.) shall be manufactured in accordance with ANSI/AWWA C901 and shall meet ASTM D3035, ASTM F714 SDR 11. Joints shall be Standard Mechanical HDPE couplings or fusion welding conforming to ASTM D3261. Joining of plain-end pipes shall be by butt fusion per PPI TR-33. Inserted Stiffeners are required when using mechanical couplings.

It is not intended that materials listed are to be considered equal or generally interchangeable for all applications. The Sponsor's Engineer shall specify the pipe material on the plans and the use of the selected material shall be subject to review and acceptance by the Department.

All pipe shall be clearly marked with type, class, and thickness designation as appropriate. Lettering shall be legible and permanent under normal conditions of handling and storage.

Couplings are subject to the acceptance of the Department. Only rigid couplings will be allowed.

Ball valves for flushing connections and mainline shutoff valves on 3-inch diameter and smaller pressure lines shall be 2-way, full port, stainless steel ball valves, sized to match force main diameter. Provide operating nut in place of shutoff handle. Provide valve key.

Valve box covers for mainline shutoff valves shall have the word "Sewer" cast in the lids.

Tracing wire for force main and pressure side sewers shall be 10 gauge galvanized aluminum.

Detectable marking tape for force main and pressure side sewers shall be 2-inch wide with encased aluminum wire, minimum 10 gauge and identified for buried sewer.

### 7-17.3 CONSTRUCTION REQUIREMENTS

#### TRENCHLESS UNDERCROSSINGS

Reference Standard Plans U-24 & U-25

In addition to the typical warranty required by the Spokane County Environmental Services Department for sanitary sewer projects, the Environmental Services Department requires a five year warranty for the Contractor to repair any ground settlement within twenty five feet (25') of either side of the centerline of trenchless undercrossings. The five (5) year warranty shall commence on the date of acceptance of the system by the Environmental Services Department.

A permit to work within the public right-of-way must be obtained from the jurisdiction having authority prior to performing any trenchless undercrossing work. The Developer and his Contractor are fully responsible to meet the requirements of all municipal agency, railroad and

WSDOT Franchise / Utility permit(s) associated with the specific undercrossing even though the WSDOT Franchise / Utility permit may list Spokane County as the utility owner.

Unless otherwise approved by the Director, only the Auger Boring or the Pipe Ramming methods are allowed for trenchless undercrossing installations.

**AUGER BORING METHOD:** Auger Boring is a trenchless construction method that involves simultaneously jacking a casing pipe through the earth while removing the soil using a flight of augers within the jacking pipe. The auger flights are rotated to transport the spoils to the jacking pit. Hydraulic jacks located in the jacking pit are used to propel the boring head, auger flights and jacked pipe sections forward. Casing Pipe for Auger Boring shall be steel casing pipe conforming to ASTM 139, Grade B, and shall have minimum yield strength of 36,000 psi or as specified by the requirements of the permitting agencies. Ends of the steel casing pipe shall be beveled or field butt-welded joints in accordance with the requirements of AWWA C 206 or a press-fit connection manufactured by Perma-Lok or an approved equal. All Casing Pipe shall be joined by a full penetration butt weld around the entire Casing Pipe.

Casing grout ports shall be installed on both sides of the spring line and at the crown of the casing pipe. Sets of three casing grout ports shall be installed on maximum ten (10) foot spacing. Immediately upon completion of the Auger Boring operation the Contractor shall grout the exterior of the casing pipe to fill any voids caused by the Auger Boring and to prevent any ground settlement of the surrounding material. Grout shall conform to ASTM C 476, Fine Grout standard and shall have a 28-day compressive strength of 300 psi Minimum.

**PIPE RAMMING METHOD:** Pipe Ramming is a trenchless installation of an open-ended steel casing by repeated, percussive forces that impart energy to the end of the casing. During the pipe ramming process, soil enters into the open ended casing. Upon completion of the pipe ramming process, soil is removed from within the pipe.

The Casing Pipe for the Pipe Ramming method shall be steel pipe conforming to ASTM 139, Grade B, and shall have a minimum yield strength of 50,000 psi and meet the requirements of the permitting agency(s). No hydrostatic testing is required for the casing pipe; however, all other requirements for of ASTM 139, Grade B will apply. Ends of the steel casing pipe shall be beveled or field butt-welded joints in accordance with the requirements of AWWA C 206. All Casing Pipe shall be joined by a full penetration butt weld around the entire Casing Pipe.

## Formation Grouting

The Department may require formation grouting to take place prior to installation of the casing to provide soil stabilization along the alignment and shaft base stability. Typical methods include jet grouting, permeation grouting and compaction grouting. The Sponsor's Engineer is responsible for determining the proper method and material for this process.

## Casing Spacers

Pre-Fabricated casing spacers shall be a minimum width of eight inches (8") and have a minimum of four runners. Spacers shall be T-304 stainless steel or coated steel structures with dielectric insulators when ductile iron carrier pipes are specified. For PVC carrier pipe up to 48" O.D., spacers are required within one foot of each end of the pipe and intermediate spacers

installed at a maximum spacing of six feet. For ductile iron carrier pipe, the maximum intermediate spacing is ten feet. Spacing shall be reduced if recommended by the casing spacer manufacturer. The spacing and the weight-bearing structure of steel casing pipe and the pre-fabricated spacers shall be designed for a full pipe condition. The design shall be stamped and signed by a Professional Engineer licensed in the State of Washington. The design shall verify that the carrier pipe will not be damaged during installation of the carrier pipe and spacers into the casing pipe.

### End Seals

End Seals shall be installed at both ends of the casing pipe. End seals shall be pre-manufactured, designed for the specific purpose of preventing the migration of soil or liquid into the annular space of the casing pipe.

The annular space between the carrier pipe and the casing pipe shall not be filled except as necessary to seal the ends of the casing.

## 7-17.3(2) CLEANING AND TESTING

All sewers and appurtenances shall be reasonably clean prior to acceptance by the Department. All sewer mains and sewer service stubs shall be tested by the low pressure air method. Tested portions of gravity pipe shall include main line and all side sewers between manholes. Tested portions of force mains shall include flushing connections. All mandrel and pressure testing shall be witnessed and recorded by the Sponsor's Engineer.

All wyes, tees, and stubs shall be plugged or capped to withstand the internal test pressure. The ends of the stubs shall be beveled carefully prior to installing the plugs or caps to facilitate future connection to the stub. Plugs and caps shall be readily removable.

- Low Pressure Air Test Method for Gravity Sewers of Non Air Permeable Material

Non air permeable materials include ductile iron, ABS composite, polyvinyl chloride (PVC), and polyethylene (PE). When non air permeable pipe is subjected to a low-pressure air test, all of the provisions of Section 7-17.3(2)E shall apply, except that the time in seconds for the pressure drop shall be equal to or greater than four times the required time calculated in Section 7-17.3(2)E.

Pipe over 30 inches in diameter shall be tested one joint at a time in accordance with ASTM C 1103.

Reaches of thermoplastic pipe containing no joints are exempt from testing requirements.

- Testing Force Main

Force mains shall be hydrostatically tested with a minimum pressure 50 percent greater than the design working pressure for 15 minutes. No loss in pressure is permitted. The force main shall be tested with shut off valves at the main open and the outermost stub valves closed. A test plug shall be used only at the manhole connection point.

## 7-18 SIDE SEWERS

Reference Standard Plans U-16 through U-19

### 7-18.3 CONSTRUCTION REQUIREMENTS

Side sewer stubs shall meet the same material and installation requirements as the sewer mains. All PVC tees and wyes must be SDR 26. Compaction of the pipe zone material immediately below side sewer adjacent to the main line tees is critical to reducing stress on the tees and pipe.

For gravity service, Side Sewers Stubs shall be Type "A" whenever possible. Refer to Standard Plan U-17. Type "B" stubs are permitted when the Sponsor's Engineer feels the additional depth is beneficial to obtaining gravity service. Type "C" stubs are only allowed between the last and the next to last manholes on a branch of the pipe system. Type "C" stubs are not allowed if an upstream extension of the pipe system is anticipated in the future.

All side sewers shall be installed by open trenching.

Testing of the stubs must be incorporated with the main line testing.

### CONNECTION OF EXISTING DRY LINES

Where directed by the Department, existing dry lines shall be connected to the new sewer main. The Contractor shall field verify the location and elevation of the existing dry line prior to installing the side sewer tee. The connection shall not be made until after the new mainline sewer and side sewer stubs have been successfully tested. A cleanout shall be installed at the point of connection to the dry line.

### SIDE SEWER RECORD DRAWINGS REQUIRED

The Sponsor's Engineer will prepare and provide to the Department a record drawing for each side sewer stub. The required record information shall be provided on Spokane County Standard Plan U-16 or a similar form acceptable to the Department.

### INSTALLING NEW SERVICES TO EXISTING PUBLIC SEWER

Connection to existing public sewer mains shall be coordinated through the Department a minimum of 24 hours in advance of the work. The existing mainline pipe shall not be cored or cut until a representative of the Department is on-site. In addition, the Contractor shall notify Wastewater Operations (477-1984) 24 hours prior to performing the work.

When adding service connections to existing PVC sewer line, the Contractor shall use a hole saw to cut the PVC sewer line at 10 o'clock or 2 o'clock positions. Other locations must be authorized by the Department. Saddle taps shall utilize the "GPK Saddle with Centering Ring", Series 136 CR. or approved equal.

When installing a new 6-inch service to existing 8-inch PVC sewer lines, saddle taps are not permitted. The connection must be made by installing an 8-inch x 8-inch x 6-inch PVC Tee, using two 8-inch PVC rigid, slip repair couplings with rubber gaskets.

When adding service connections to existing RCP sewer line, the Contractor shall core drill RCP sewer line at 10 o'clock or 2 o'clock positions and install "Inserta Tee" by Fowler Industries.

### SLEEVING SIDE SEWER PIPE

All side sewer pipe installed above a water pipe shall be sleeved. All side sewer pipe installed with less than 18-inches of clearance between the outside wall of the sewer pipe and the

outside wall of the water pipe shall be sleeved. The sleeve shall be one continuous segment of pipe 20-feet in length, and shall be centered over the waterline crossing. Waterproof grout shall be placed in the annular space at the ends of the sleeve to prevent soil migration into the sleeve.

When a side sewer is required to be sleeved, the sleeve shall be material meeting AWWA C900 minimum requirements. In cases where the top of the side sewer pipe is less than 4-feet below grade at the edge of traveled way, steel casing material shall be used.

### END PIPE MARKER

The Contractor shall mark the location of the side sewers at the property line with a 2-inch by 4-inch board that extends from the top of the side sewer riser to within 6-inches below the top of the ground. An 18-inch length of ½-inch rebar shall be secured to the top portion of the board and set at 6-inches below grade.

## 7-19 SEWER CLEANOUTS

Reference Standard Plan U-15

### 7-19.3 CONSTRUCTION REQUIREMENTS

Sewer Cleanouts for sanitary sewer main lines may be allowed in lieu of manholes when approved by the Director *and* only as a temporary installation. The maximum distance from a main line clean-out to the downstream manhole shall not exceed one hundred feet.

All cleanouts located in public rights of way shall be extended to grade and accessible through a traffic-rated valve box.

## Introduction

Traffic studies or site impact studies are required by the Spokane County Engineer to examine the demands that development may or may not have on the surrounding transportation system. The need for a traffic study shall be determined on a case by case basis. A list of general guidelines and decision criteria are available in §1.30, Traffic Impact Study, of the *Spokane County Standards for Road and Sewer Construction*.

This Technical Reference has been prepared to provide engineers, planners, and developers with information regarding traffic impact study requirements within Spokane County. It is not intended to be a textbook or all inclusive of the possible scenarios or requirements that may be encountered during a study. It is believed that by following the guidelines and recommendations made within this handout, the time spent during the application and review process may be reduced. Internal site circulation plans may be required if concerns arise that circulation may impact public road traffic flow or safety.

## Scoping

A scoping meeting should be scheduled with Spokane County prior to starting the field work for the study. A minimum of three working days before scheduling the scoping meeting, the proponent's traffic engineer shall send Spokane County a traffic distribution letter, for information on the traffic distribution letter contact Spokane County's Transportation Engineering section. During the scoping meeting, the general requirements of the study will be discussed. It shall be the responsibility of the developer/consultant to initiate and coordinate the scoping meeting. Although not required, Spokane County recommends that a joint scoping meeting with all reviewing agencies be coordinated through the project's traffic consultant. The following is a list of items that shall be discussed during the scoping meeting and recorded on the Traffic Study Scope Worksheet found at the end of this appendix.

1. Project description
  - A. proposed land uses (if known)
  - B. trip generation
  - C. pass-by & diverted trips
2. Project phasing and horizon year
3. Anticipated directional distribution of project traffic.
4. Background projects
5. Background growth rate (non site specific)
6. Affected intersections for study

## Public Participation

Two public meetings shall be held within the project study area. A public scoping meeting shall be conducted by the developer/consultant to allow public input to the

scope of the project and following study. It is anticipated that with the public scoping meetings, additional neighborhood issues will be brought forward and addressed and/or resolved prior to the public hearing.

The second public meeting shall be after the traffic study work is complete and is intended to brief the surrounding neighborhood on the traffic study results. Projects proposed mitigation shall be agreed upon by proponent and all affected agencies before scheduling second public meeting. All costs associated with the public meetings (signs, room rental, notification mailing, etc.) shall be the responsibility of the developer/consultant.

### **Public Notification**

Notice of date, time, place and purpose of the public meetings shall be provided by the following means.

1. One publication in Spokane County's official newspaper at least fifteen (15) days prior to the meeting.
2. Adjacent residents, property owners, neighborhood groups and/or organizations within a four hundred (400) foot radius of the project boundaries shall be notified by a mailing not less than fifteen (15) days prior to the public meeting.
3. Additionally, a sign with dimensions no less than four (4) feet in width and four (4) feet in height and lettering three (3) inches in size shall be erected on the subject property fronting and adjacent to the most heavily traveled public street. The sign must be easily read by the traveling public from the right of way at least fifteen (15) days prior to the meetings. This sign shall announce the date, time and place of the traffic meetings and brief description of the project.

Proper notification and all associated costs shall be the responsibility of the developer/consultant. Notification shall be considered satisfied upon receipt of an affidavit provided by the developer/consultant to Spokane County stating the above requirements have been completed.

### **Traffic Study Report**

The means by which the work of the traffic study is conveyed to others is through the traffic study report. The traffic study report should stand on its own merits. There should be sufficient information and detail to allow the reader to follow the study step by step and draw the same conclusions as the author. The report should be factually based, written from an impartial viewpoint and report all aspects of the traffic study work that was undertaken. In addition, the report should be written such that the lay person, someone not familiar with traffic studies (e.g., political decision-makers and citizens), will be able to understand and follow the process, findings and recommendations.

## TECHNICAL REFERENCE A

### Traffic Studies and Review Procedures

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As a general rule, the traffic study report shall include, but not be limited to, the following.

- I. Title Page
  - A. Name of Project
  - B. Project Sponsor's Name and Address
  - C. Study Preparer's Name, Address and Phone Number
  - D. Date of Study Preparation
  - E. Responsible Engineer's Seal, Signature and Date
  
- II. Table of Contents
  - A. Major Sections
  - B. List of Figures
  - C. List of Tables
  
- III. Executive Summary
  - A. Site Location and Study Area
  - B. Development Description
  - C. Principal Findings
  - D. Conclusions
  - E. Recommendations
  
- IV. Introduction
  - A. Purpose of Report and Study Objectives
  - B. Project Description
  - C. Scope of the Report
  - D. Assumptions
  - E. Methodology
  - F. Description of other known projects (public or private) in the study area.
  
- V. Existing Conditions
  - A. Transportation Network Description
  - B. Existing Zoning
  - C. Existing Traffic Volumes
  - D. Accident History
  
- VI. Proposed Other Development (Background Projects)
  - A. Background Project Description
    1. Vicinity Map
    2. Trip Generation
    3. Trip Distribution
    4. Trip Assignment
  - B. Planned Roadway Improvements
    1. Project Name
    2. Description of Improvements



VII. Proposed Project

- A. Project Description
  - 1. Site Plan
  - 2. Trip Generation
  - 3. Trip Distribution
  - 4. Trip Assignment
- B. Project Phasing and Timing

VIII. Traffic Analysis

- A. Existing Volumes and LOS
- B. Future Volumes and LOS without Project at Each Phase
- C. Future Volumes and LOS with Project at Each Phase
- D. Future LOS with Proposed Improvements at Each Phase
- E. Future Volumes and LOS without Project at Complete Build-out
- F. Future Volumes and LOS with Project at Complete Build-out

IX. Other Analysis

- A. Sight Distance
- B. Queuing
- C. Safety
  - 1. Vehicle
  - 2. Non-motorized (Pedestrian/Bicycle)
- D. Noise
- E. Transit
- F. Non-motorized (Pedestrian/Bicycle)
- G. Analysis of Improvement Alternatives

X. Conclusions

- A. Transportation Impacts
- B. Needed Improvements

XI. Recommendations

- A. Proposed Mitigation (provide conceptual sketch and detailed description of all proposed mitigation)
- B. Proportionate Share Recommendations
- C. Other Recommendations

XII. Appendix

- A. Raw Turn Movement Counts
- B. LOS Calculation Sheets
- C. Other Information Provided

The above outline provides the minimum criteria for a detailed traffic study report. Where the size/scope of the project or work to be performed would not warrant inclusion of all of the topics above, a shorter report format may be used. In this case, the topics to be included in the report would be discussed during the scoping process.

### **Additional Information**

**Background Growth Rate (non-site specific)** - The annual percentage rate of traffic growth that cannot be assigned to a specific project. This rate is to be applied to the existing turn movement volumes prior to the addition of the background project traffic or site generated traffic volumes.

**Background Project Traffic** - The total site generated traffic volumes for approved background projects shall be used in the build-out analyses of the proposed project irrespective of each projects anticipated completion date. This is required to ensure that capacity that was available when the background project was approved is still available at the completion of the proposed project. Quicker developed projects will not be allowed to deplete the capacity needs of longer-term development.

**Level of Service (LOS)** - Levels of Service shall be determined in accordance with the methods reported in the latest edition/update of the *Highway Capacity Manual*, Special Report 209.

**Pass-by Trips** - Pass-by trip reductions, if used, shall be shown and calculated on separate figures. The pass-by rates must be established during the scoping process. Rates and procedures shown in the latest edition of the ITE *Trip Generation* manual may be used. For those land uses without pass-by trip rates, sufficient documentation supporting the proposed rates shall be provided to and accepted by Spokane County.

**Peak Hour Factors (PHF)** - Peak hour factors shall be determined from the recorded turn movement volumes and used throughout the study. For cases where a peak hour factor was not calculated or was unable to be calculated, the default values contained in the latest edition/update of the Highway Capacity Manual shall be used.

**Responsible Engineer** - The engineer that is responsible for the work of the study and report shall affix his/her seal on the cover page of the report. The responsible engineer shall be licensed in the State of Washington and have experience in traffic/transportation engineering.

**Right Turns on Red (RTOR)** - RTOR movements, if they are to be used as reductions in the study, shall be recorded in the field and submitted with the turn movement counts. The number of vehicles that can take advantage of this maneuver greatly varies by intersection and area.

As v/c ratios increase, fewer gaps will be available to allow RTOR movements and a methodology for use in future year scenarios shall be provided and accepted by Spokane County prior to submission of the traffic study report.

**Trip Generation** - Trip generation shall be based on local trip generation rates for similar facilities provided there has been sufficient study to provide good statistical significance.

## TECHNICAL REFERENCE A

### Traffic Studies and Review Procedures

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Where local rates are not available, the rates contained in the latest edition of the ITE *Trip Generation* manual shall be used.

Turn Movement Counts - As a general rule, traffic counts should be recorded less than one year prior to submitting a traffic study. Older counts may be used provided they are adequately factored to represent current volumes and the methods used in determining and applying the factors are discussed in the report. Counts older than two years shall not be used.

Mitigation – All proposed mitigation shall be described in detail and conceptual sketch included as part of the study. The description should be in enough detail to explain how the land use action transportation impacts will be mitigated by the proposed mitigation. The conceptual sketch shall be in enough detail to determine if the proposed mitigation can be reasonably implemented and acceptable to the County Engineer.

Internal site circulation – circulation plans and discussion may be required if concerns arise that site access and circulation may impact public road traffic.

Transit access – access to transit may need to be addressed in the traffic impact study.

Updated Studies - Occasionally traffic impact studies will need to be updated and/or revised. Should this be necessary, all information and procedures shall be brought into conformance with these standards. For example, new turn movement counts may need to be gathered depending on the age of counts or change in traffic patterns, phasing and/or build-out year may need adjusted, etc. Where the revisions to a study are minor and would not warrant the submission of a new report, errata sheets shall be provided along with a notice to affected parties to make the necessary additions, deletions and/or changes.

**References**– the following references may be cited during the review of the traffic study report. Editions of references are the latest at the date of the writing of this technical reference, current edition if available shall be used in developing the traffic study report.

*Guidelines for Traffic Impact Reports/Studies*, State Highway Administration, Maryland Department of Transportation.

*Highway Capacity Manual*, HCM2000. Washington D. C.: TRBoard, 2000.

*Site Impact Traffic Evaluation (SITE) Handbook*. Washington D. C.: FHWA, 1985.

*Transportation Impact Analysis for Site Development*. Washington D. C.: Institute of Transportation Engineers, 2005.

*Trip Generation*, Eighth Edition. Washington D. C.: Institute of Transportation Engineers, 2008.

**Traffic Study Scope Worksheet**

Transportation Engineering

Name of Project _____
Planning File Number _____ S-T-R _____ Lead Planner _____
Date of Scoping Meeting _____
Attended By _____
_____
Description of Project _____
Land Uses (if known) _____
Project Phasing _____ Build Out Year _____
Public Scoping Meeting: Date _____ Time _____ Place _____

**Scope of Study**

- Threshold     Full Traffic Study     Other Study/Review  
For Threshold and Other Study/Review, describe below

Intersections to Study \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Background Development Projects \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Background Growth Rate \_\_\_\_\_ Pass-by Traffic Rate \_\_\_\_\_  
Site Distance Analysis \_\_\_\_\_  
\_\_\_\_\_

Area Transportation Improvement Projects (Planned/Scheduled) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Anticipated Directional Distribution of Project Traffic \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Other Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\* Final scope will be established after the first public meeting and upon receipt of a distribution letter and map from the project's traffic engineer.  
\* This scoping document fulfills the requirements set forth by Spokane County Engineering. Additional analysis may be required by other reviewing agencies.

### Pavement Design Criteria

The pavement design criteria is summarized in Sec. 3.16 of the Spokane County Standards for Road & Sewer Construction, which references the AASHTO *Guide for Design of Pavement Structures*, 1993.

The structural pavement calculations, soil sample locations, lab results, design criteria and recommendations are to be included in a report prepared by the Sponsor's Engineer. All design factors used are to be listed in the report, including traffic loads projected to occur over the life of the pavement. The report is to be stamped by an engineer, licensed in the State of Washington. Spokane County shall review all pavement designs prior to approval.

The following parameters are to be used in the design of flexible pavements, unless technical justification can be provided which demonstrates that certain other parameters and constants are applicable.

1. The County standard pavement design life is 20 years for new construction, 15 years for pavement overlays.
2. Truck Factors will be determined for each vehicle type or the following factors may be used in the absence of other information available:

Vehicle Type	Factor (ESAL/Vehicle)
School Bus	2.87
STA Bus	2.57
Refuse Truck	1.03
Urban	0.44
Rural	0.77

3. The Level of Reliability, R is to be as follows:  
Local Access, R = 75%                      All other Public Road Classifications, R = 90%
4. The overall Standard of Deviation (S) is to be as follows:  
New Construction, S = 0.45                      Overlay, S = 0.49

TECHNICAL REFERENCE B  
Structural Pavement Design of Flexible Pavements

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5. The Initial and Terminal Serviceability Indexes (PSI) are to be as follows:

Road Class.	PSI (initial)	PSI (terminal)
Local Access	4.2	2.00
Minor Arterials & Collectors	4.2	2.25
Principal Arterials	4.2	2.50

6. The Structural Layer Coefficients (aj) and Drainage Coefficients (mj) for new material is to be in accordance with Table 2.4 and Appendix DD of the AASHTO *Guide for Design of Pavement Structures*, 1993. In the absence of following the more rigorous design approach outlined in these two references, the following factors can be used:

Material	Structural Coeff.	Drainage Coeff.
<b>ACP Class A</b>	0.42	1.00
<b>ACP Class E</b>	0.42	1.00
<b>Bituminous Surface Treatment</b>	0.20	0.95
<b>Crushed Surfacing Top Course</b>	0.14	0.95
<b>Crushed Surfacing Base Course</b>	0.14	0.95
<b>Cement Modified Soil</b>	0.25	0.95

### **Soil Sampling Procedure**

The Engineer shall obtain soil samples which sufficiently represents the subgrade, and identifies where significant changes in subgrade strength occurs. Normally, the following procedure needs to be followed:

1. Obtain a minimum of 3 samples per job per SCS soil type. Larger projects will require more frequent sampling;
2. Conduct soil borings/test pits to a minimum of 5 ft. depth below proposed subgrade, classify the soil per the USC method;
3. Provide written soil logs; and
4. Record the station, offset and elevation of the samples, stationing is to correspond with the road plans.

### **Subgrade Modulus**

For structural pavement design of roadways that are not within residential neighborhoods, or not subject to residential type traffic loading, an analysis of the resilient modulus and traffic loading is necessary. Selecting the appropriate subgrade modulus requires experience and judgement. A licensed engineer with experience in pavement design should be consulted to help evaluate the subgrade modulus in addition to the prescribed tests. The resilient modulus can be acquired using the following methods:

1. Contract with a private firm/laboratory to perform the  $M_R$  testing. Soil samples need to be obtained, and sent to the private lab for testing.
2. Obtain soil samples and have a WSDOT lab perform the test work. WSDOT will not perform the work directly for private developers or consulting engineers; however, they will perform the work for Spokane County. This work can be requested through Spokane County if the work will be for public road construction. Once Spokane County receives the soil samples, the County will deliver them to a WSDOT lab.
3. Conduct in-situ testing of the subgrade using a non-destructive deflection test method. The results are to be reported by road stationing. The Sponsor shall acquire concurrence with the County Engineer on the type of non-destructive deflection test method proposed, prior to conducting the tests.
4. Index testing of soils. For certain USC soil classifications, Indexed values can be used to estimate the resilient modulus ( $M_R$ ), in lieu of conducting resilient modulus testing. The Index values are listed in the table below. Soil sampling to classify the soil and record its location, shall be done in accordance with the Soil Sampling Procedure listed in this Technical Reference.

<b>Soil Type per Unified Soil Classification System (USC)</b>	<b>Resilient Modulus Values (<math>M_R</math>) psi low-high range<sup>(1)</sup></b>
GW	15,000
	18,000
GP or GM	10,000
	12,000
SW	8,000
	10,000
SP	5,000
	10,000

Note (1) The gradation and fines content needs to be considered when selecting an appropriate  $M_R$  value. An  $M_R$  value near the low end of the specified range for SP or SM is appropriate for predominately fine sands or silty sand with a fines content exceeding approximately 25%. An  $M_R$  value near the high end of the specified range for SP or SM soils is appropriate for predominately medium to course sands or silty sands with less than 25% fines. Fines content is the soil which passes a #200 sieve.

## TECHNICAL REFERENCE B

### Structural Pavement Design of Flexible Pavements

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For the non-destructive deflection test method a statistical analysis is needed, and is to include a graph of the tested resilient modulus values -vs- road stationing (i.e. location). The graph shall be included in the design report prepared and submitted by the Sponsor's Engineer.

In certain limited cases, the of non-destructive deflection test equipment which is owned and operated by Spokane County is available for privately sponsored road construction projects. The equipment needs a driveable surface over the proposed subgrade. County road projects always take priority. But, if there is an interest in paying for the use of the equipment, please call the Spokane County Engineer's Office to check on availability and make the necessary arrangements.



# PROJECT CONSTRUCTION CERTIFICATION PROCEDURES

for

## SPOKANE COUNTY ROAD, DRAINAGE AND SEWER PROJECTS

APRIL, 2002  
Updated December 2017


PREPARED BY

SPOKANE COUNTY  
PUBLIC WORKS DEPARTMENT  
AND  
ENVIRONMENTAL SERVICES DEPARTMENT

In association with

AMERICAN COUNCIL OF ENGINEERING COMPANIES OF  
WASHINGTON  
SPOKANE COUNTY CONSTRUCTION CERTIFICATION COMMITTEE

County Engineer



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Chad Coles, P.E.

12/28/17  
Date

Environmental Services Director



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Kevin Cooke, P.E.

12/28/17  
Date

## INTRODUCTION

The original of this Technical Reference was developed by the Construction Certification Committee in April 2002. The document was later incorporated into the Spokane County Standards in January 2010. This 2018 update focuses on departmental naming convention due to a recent restructuring of the Public Works Department. The Division of Engineering and Roads is now the Public Works Department and the Division of Utilities is now the Environmental Services Department. Additionally, Attachment 5 is modified to show a change in the process and payment responsibility for video inspection of sewer mains.

The Construction Certification Committee was comprised of representatives of the Spokane County Public Works Department and the local chapter of the American Council of Engineering Companies of Washington (ACEC). The Committee worked over a three year period to address issues of concern regarding the construction certification procedures for projects within Spokane County. The major focus by this Committee was to develop guidelines for a consistent approach to the technical and administrative procedures during the construction phases of projects.

The initial meeting of the Committee was held on February 12, 1999. Meetings were initially held twice a month and then changed to once monthly. Meeting minutes were kept and distributed to Committee members and to the ACEC membership as a whole as the work progressed.

The committee's first interim report was completed and made available to interested parties (local developers, contractors, and engineers) in June of 2000. Workshops were scheduled and held with the development/contracting community on June 15, 2000, and subsequently on March 21, 2001 to present the interim work products of the Committee and to receive comments on the committee's findings and recommendations.

The procedures developed by the Committee and presented herein are intended to foster consistent high quality products for the developer, and to facilitate the subsequent transfer of ownership of the finished products to Spokane County. The procedures have been derived from the committee's interim report documents, with consideration of comments received and concerns expressed by the development/contracting community, and were adopted by the Division of Engineering and Roads, and by the Division of Utilities.

These procedures provide the needed framework for effective interaction between the sponsor, the Sponsor's Engineer, and the County. Additionally, the procedures promote adherence to the County's adopted Standards for Road and Sewer Construction. Note that these procedures apply to public and private road and sewer projects. It is anticipated that specific separate procedures will be developed for and adopted by the County for commercial and industrial development projects.

## **GUIDELINES and PROCEDURES**

- Authority of County** Prior to the start of construction, the County will determine the specific reporting needs for a project, and the sponsor will identify the Sponsor's Engineer and the Project Coordinator. The County will identify areas of particular technical concern and historical problem areas to the Sponsor's Engineer. The County has defined the general structure for objective measurements and/or determination methods for construction acceptability (See Attachment 3). The Sponsor's Engineer is responsible for the reasonable application of those methods to the specific project. County inspectors may make site visits intermittently during the construction of the project to verify progress and will periodically discuss inspection activities with the Project Coordinator.
- Sponsor's Engineer** The Sponsor's Engineer shall be a licensed Professional Engineer in the State of Washington. Inspections are to be performed by that engineer, or by his/her representative. An outline of Construction Phase Services is presented in Attachment 1 to this document.
- Project Coordinator** The project sponsor shall designate a Project Coordinator for each project. The Project Coordinator shall be responsible for managing the day-to-day operations of the project including traffic control, citizen concerns, and overall coordination. The Project Coordinator shall be the contact for the County personnel. The Project Coordinator's responsibilities are separate from construction inspection and certification duties of the Sponsor's Engineer. The Sponsor's Engineer need not be the Project Coordinator, although he/she can be if the developer so designates.
- Inspection Bonding** The inspection and construction bonds/securities will not be released until the project is certified and the project is accepted by the County and written authorization for release is received from the Sponsor's Engineer. In some cases, partial releases of certain types of construction securities may be allowed by the County Engineer or the Environmental Services Director.
- Pay Requests** The sponsor should include review of the construction pay requests for percent complete and/or items complete as a part of the engineering services contract. This is related to the County's requirements for security reductions. The percent complete or items completed will need to be signed off by the Sponsor's Engineer and certified before a financial security reduction is allowed.

<b>Record Keeping</b>	At a minimum, there will be weekly project summary reports submitted to the County by the Sponsor's Engineer, even if no work was performed. Specific reporting requirements will be discussed at the pre-design meeting and established prior to construction. For some projects, the County will require daily reports to be submitted.
<b>Reporting Forms</b>	All lab and field-testing reports need to be included in the final certification package. Test reports that show failing tests need to have follow-up test reports that show passing tests for the area of failure. On-site samples need to be used for testing. The use of test reports from other projects to certify work on the project being certified is not allowed. Any nonconforming issues shall be fully documented with subsequent documents on how the issue was corrected.
<b>Traffic Control</b>	The Project Coordinator needs to make sure that the requirements for traffic control on a project are being properly handled.
<b>Construction Complaints</b>	Complaints from citizens regarding the project need to be documented by the Project Coordinator and resolved. Spokane County personnel should be involved in the process when the County's authority needs to be used to resolve an issue.
<b>Drainage Swale Inspections</b>	The Sponsor's Engineer will verify that the volume of each finished drainage swale equals or exceeds the design volume of the swale at a six-inch depth. Additionally, the Sponsor's Engineer will verify that there is adequate and continuous grade from the road to the swale for the effective conveyance of runoff. The Sponsor's Engineer and the County will monitor the performance of swales during the construction and warranty period for proper percolation. Swales that do not percolate properly will require corrective work or measures.
<b>Utility Inspections</b>	<p>A sewer inspection policy was developed and has since been updated by the Environmental Services Department. It was originally adopted by the Board of County Commissioners (See Attachment 4, Resolution No. 98-0771).</p> <p>In addition, the Environmental Services Department has updated the protocol for the scheduling and review of television inspections, which is Attachment 5 to this document.</p> <p>Whenever pipe installation or pipe zone material placement and compaction is underway, the Sponsor's construction engineer, or his/her representative, shall observe the work on a continual basis.</p>

TECHNICAL REFERENCE C  
Construction Certification

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**Changes During Construction** Changes during construction that affect the scope of the project and/or the accepted individual lot plans must be submitted for review by the County. Minor changes do not need to be reviewed by the County, but must be documented in the daily and weekly inspection reports.

**Acceptance vs. Approval** The County uses these terms in the following ways:  
  
Acceptance: Pertains to construction plans, calculations, and details. Spokane County has not prepared them, and relies upon the responsible engineer's stamp.

Approval: Related to design and/or construction deviation from the County Standard. County approval is required for all deviations from Standards.

**Project Acceptance After Construction Completion** 1) The Sponsor's Engineer performs an inspection with the contractor and as necessary issues a punch list to be completed.  
2) The "walk through" with the County is scheduled as soon as possible after the Sponsor's Engineer is satisfied that all punch list items are completed.

3) The "walk through" with Spokane County is performed and any remaining deficiency items are noted to a punch list. If no deficiency items are noted, this is considered the "final walk through". The Sponsor's Engineer may then submit certified Record Drawings and Project Certification documents to the County requesting acceptance of the project.

4) The sponsor should consider taking verification photographs immediately following the "final walk through". The sponsor continues to be responsible for correction of all deficiencies until the Board of County Commissioners (the Board) accepts of the project. Verification photographs can be helpful in resolving cases of damage by third parties (e.g. utility companies, builders, landscapers, etc.)

5) The Sponsor's Engineer shall compile and submit a certification package to the County. The package shall include all related construction documents, one set of mylar record drawings, and a stamped and signed certification statement from the Sponsor's Engineer. See Attachment 3 for an example checklist presenting the minimum certification requirements.

6) If the engineer's submittal is not received within two weeks of the walk through, or if deficiencies are noted during the walk through, another walk through inspection with the County inspector may be

required. NO NEW ITEMS WILL BE ADDED TO THE LIST AT THIS TIME, UNLESS NEW DAMAGE HAS OCCURRED SINCE THE PREVIOUS "WALK THROUGH".

7) If the certification package is incomplete, or otherwise unacceptable, the Sponsor's Engineer shall be required to provide the missing documents before the County will issue the Notice of Substantial Completion.

8) The County will review the certification documents within a two-week period and issue a Notice of Substantial Completion if appropriate. This Notice of Substantial Completion is conditioned upon no further deficiencies becoming evident before the Board has accepted the project.

9) If no acceptance by the Board is required (i.e. sewers, private roads etc,) the Notice of Substantial Completion shall be considered the point of acceptance by Spokane County for the project, and the start of the warranty period.

10) For projects requiring the Board's acceptance, the County staff will make reasonable efforts to bring the project before the Board for acceptance within a six-week period following the Notice of Substantial Completion. The sponsor will remain responsible for the condition of the project as documented during the final walk through until formal acceptance by the Board.

11) A flow chart of this procedure is included as Attachment 2.

**Conflict  
Resolution**

During the construction process, occasional differences may arise between the Sponsor's Engineer and County staff regarding the interpretation of policies, standards or guidance documents. When the Sponsor's Engineer does not agree with an interpretation made by County staff, the Sponsor's Engineer may appeal to the County Engineer or Environmental Services Director, as appropriate. The County Engineer or Environmental Services Director will review the circumstances and make a determination in support of the position of the Sponsor's Engineer or County staff. If the Sponsor's Engineer disputes the outcome of this review process, he/she may request that the issue be referred to an Engineering Review Panel with a structure similar to that of the panel identified in the County's Standards for Road and Sewer Construction for the resolution of design deviation issues.

**Record  
Drawings**

Changes from the originally accepted documents shall be clearly noted with "clouds." Revised notes, elevations, grades or other text

should be lined through. “Clean new sheets” are not desired. Any changes to easements need to be clearly shown on the Record Drawings. The Record Drawings should be marked “Record Drawings.”

General Guidance: If a change represents a change from the design intent or system performance in the judgment of the engineer, then it should be clearly shown. Record Drawings are to reflect the correct location of that which is in the field. Spot elevations (on swales, curb, gutter, etc.) to depict the final grades should be taken and compared with the final design, and differences noted on the Record Drawings. Elements of the plans that were not built need to have a design change acceptance from Spokane County prior to final inspection and submittal of Record Drawings.

The County will provide examples of acceptable Record Drawings at the request of the Sponsor’s Engineer.

**Warranty  
Period and  
Damage by  
Third Parties**

The start date and the extent of the warranty period shall be as stipulated in the County Standards for Road and Sewer Construction. The County will hold the sponsor responsible for any damage until final acceptance by the Board has occurred. Once the project has been accepted by the Board, the County will hold the property owner, utility company, builder, etc., responsible for damages that may occur that are not warranty items.

**ATTACHMENTS**

- Attachment 1 – Construction Phase Services Outline
- Attachment 2 – Flow Chart – Project Acceptance
- Attachment 3 – Final Certification Checklist - Sample
- Attachment 4 – Interim Policy Regarding Sewer Construction Inspections
- Attachment 5 – Spokane County TV Inspection Protocol
- Attachment 6 – Minimum Testing Frequencies

**ATTACHMENT 1 – CONSTRUCTION PHASE SERVICES**

**AMERICAN COUNCIL OF ENGINEERING COMPANIES OF WASHINGTON  
SPOKANE COUNTY  
CONSTRUCTION CERTIFICATION SUBCOMMITTEE**

Required Items to be completed by the Sponsor's Engineer:

- I. Specific Certification Inspections
  - A. Roads
    - Erosion Control.
    - Drainage Improvements/Testing.
    - Embankment Placement/Density Control.
    - Trenching Backfill/Density Control.
    - Subgrade Line and Grade/Density Control.
    - Surfacing Line and Grade/Density Control.
    - Curbs and Sidewalks/Material Quality.
  - B. Sewer
    - Full time inspection and testing during pipe installation and pipe zone material placement.
- II. Review and approval of changes to approved plans including approval through the County if necessary.
- III. Record keeping and weekly reporting to the County.
- IV. Contractor pay requests/bond reduction assistance.
- V. Project acceptance of construction (See interim report flow chart).
- VI. As built survey/record drawings and side sewer (stub) reports.
- VII. Certification report.

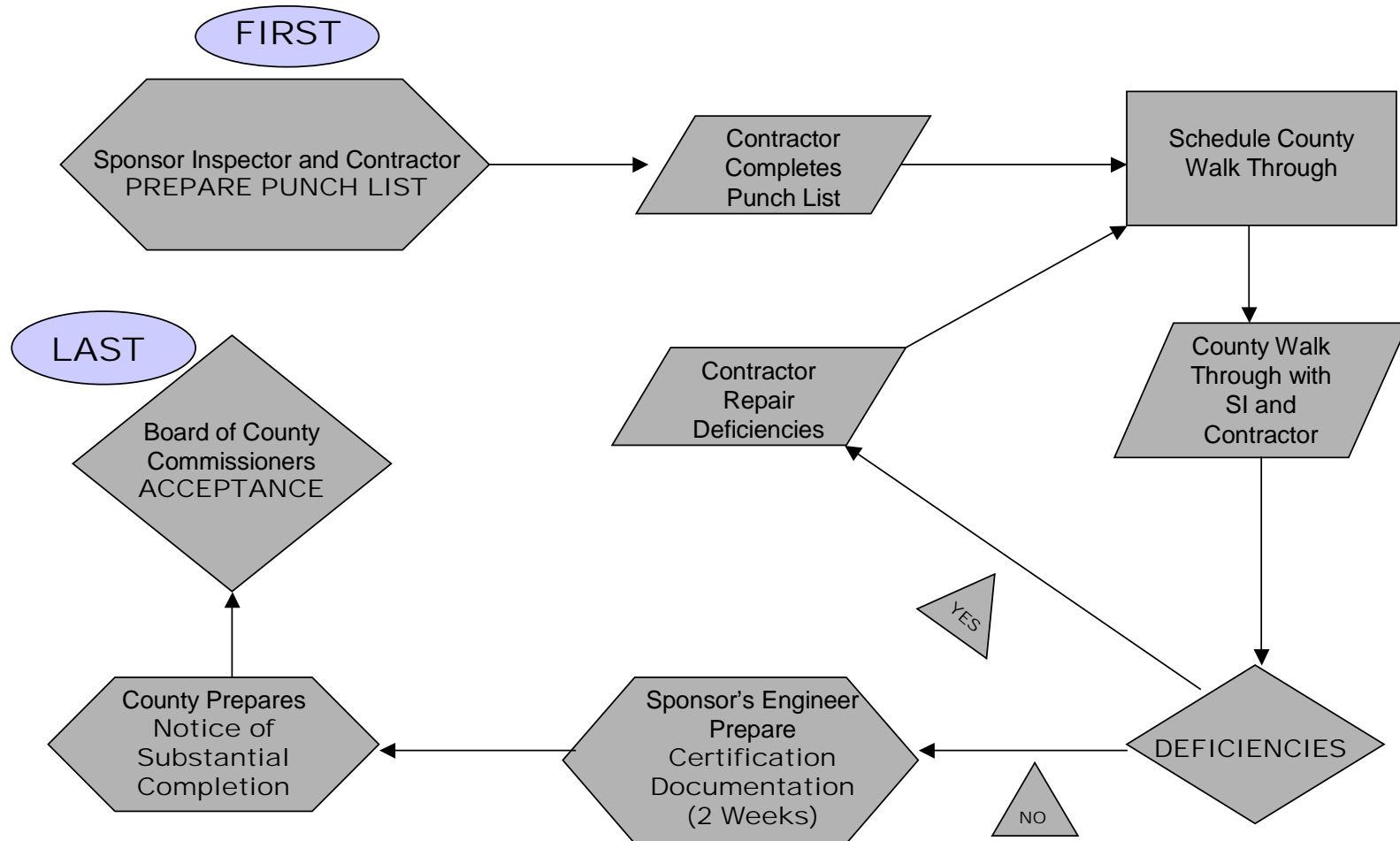
Required Items that may be completed by designated Project Coordinator or Sponsor's Engineer:

- I. Pre-Construction meeting.
- II. Construction staking.
- III. General project administration, coordination, and schedule monitoring.
- IV. Traffic and dust control.
- V. Response to construction complaints and resolution of complaints.
- VI. Monumentation



ATTACHMENT 2 FLOW CHART

PROJECT ACCEPTANCE AFTER CONSTRUCTION COMPLETION



TECHNICAL REFERENCE C  
Construction Certification

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**ATTACHMENT 3 – FINAL CERTIFICATION CHECKLIST (SAMPLE)**

**Project:** \_\_\_\_\_

**Certificate Head Letter:** \_\_\_\_\_

Statement of intent to certify the project.  
PE Stamp and Signature.

**Record Drawings / Mylar Drawings:** \_\_\_\_\_

PE Stamp and Signature, Signed Certification  
Lettered certification statement (9.10 Spokane County Standards)

**Project Documents:** \_\_\_\_\_

**Daily Inspection Reports:** \_\_\_\_\_

**Field Reports:** \_\_\_\_\_

Inspection of Asphalt Paving: \_\_\_\_\_

100% On site inspection during paving. \_\_\_\_\_

Compaction Reports: \_\_\_\_\_

Sewer trench lifts. \_\_\_\_\_

Water trench lifts. \_\_\_\_\_

Utility trench lifts. \_\_\_\_\_

Crushed Rock Lifts. \_\_\_\_\_

**Material Documents: Field and Laboratory Tests:** \_\_\_\_\_

	Field Test	Lab Test
Concrete:	(Slump, Air Content, Temp.)	(Break Test)
Sub-Grade:	(Compaction)	(Gradation, Proctor)
Crushed Rock:	(Compaction, Depth)	(Gradation, Proctor)
Asphalt:	(Compaction, Thickness)	(Rice, Gradation, Oil Content)

**On Site Inspections Of Drainage Items:** \_\_\_\_\_

Drywells: \_\_\_\_\_

Gutter Inlets: \_\_\_\_\_

Culverts: \_\_\_\_\_

Sidewalk Vaults: \_\_\_\_\_

Drainage Ditches: \_\_\_\_\_

Other: \_\_\_\_\_

**Incoming / Outgoing Correspondence:** \_\_\_\_\_

(This is a guide line of required documents, but not limited to, for final certification.)

**ATTACHMENT 4**

**INTERIM POLICY REGARDING SEWER CONSTRUCTION INSPECTIONS,  
RECORD DRAWINGS & ENGINEER'S STATEMENT**

**Inspection Requirements**

The following requirements apply to all public and private sewer lines eight inches and larger in diameter, and to side sewer stubs extended from those lines to the property lines of individual parcels. These requirements also apply to pressure mains, valves, pressure service stubs and related pressure sewer appurtenances. Note that all sewer service lines six inches and smaller in diameter, other than those side sewer stubs noted above, will be inspected by Spokane County Environmental Services Department.

On all sewer construction for development, inspections will be performed by the Sponsor's Engineer or his/her designated representative. At the request of the sponsor, the County may provide the sewer inspection services, provided that the sponsor agrees to pay all costs associated with the County inspections and provided that the County determines that staff is available to perform the inspections.

The inspection of sewers shall include the items listed below. However, the listing provided below is not intended to be all inclusive. It will be the responsibility of the Sponsor's Engineer to determine additional inspection activities that may be needed for a specific project in order to report substantial conformance of the project with the County's standards.

1. Conformance of all construction materials with County standards shall be verified prior to installation.
2. The sewer trench shall be inspected for proper dimensions and pipe zone clearances prior to placement of pipe.
3. The placement and compaction of the pipe zone material and bedding shall be inspected.
4. The pipe joints shall be inspected visually for proper insertion.
5. Horizontal alignment and grade of the pipe shall be checked for conformance to the standards prior to backfilling of the trench.
6. Side sewer tees and stubs shall be inspected for correct installation prior to backfilling of the trench.
7. Accurate measurements shall be made and recorded to facilitate the reestablishment of side sewer tee locations and stub end locations. The placement of the required stub markers shall be verified.
8. Manholes shall be inspected for proper materials, location, assembly, and installation.
9. Trench backfilling operations shall be observed and compaction tests shall be performed. Minimum requirements for backfilling shall be as set forth in the accepted plans and/or specifications for the project.
10. Mandrel testing, hydrostatic and/or air pressure testing, and manhole testing shall be performed following completion of trench backfilling operations. The testing shall be observed until passing results are obtained. Manhole testing shall be performed on ten percent of the manholes in the project, in accordance with Department of Ecology's "Criteria for Sewage Works Design".

## TECHNICAL REFERENCE C

### Construction Certification

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11. The Sponsor's Engineer shall schedule television inspection of the sewer lines through the Environmental Services Department once the other testing has been satisfactorily completed. The Environmental Services Department will then perform the television inspection and review the video recordings for deficiencies requiring correction or repair.

Adopted Via Resolution 98-0771

9/22/98

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12. Daily inspection reports shall be prepared, summarizing construction activities, contractor work force and work period, testing results, problems encountered, and other pertinent information.

The project sponsor or the sponsor's Construction Engineer shall notify the Environmental Services Department 48 hours in advance of the start of construction of the sewer system, and shall provide a generalized schedule for the progress of the work. County inspection personnel may make occasional site visits to inspect the work and do materials testing as deemed necessary. County inspection personnel will address concerns and questions to the Engineer of Record. The cost of these occasional site visits may be charged to the Construction Permit for the work.

The sponsor will bear the cost of all inspections and materials testing. The Environmental Services Department shall have access to all construction inspection records and reports. Before the County accepts the sewer system, the Sponsor's Engineer shall submit all construction records to the Environmental Services Department. This shall include but not be limited to Daily Inspection Reports, correspondence, manufacturers' certifications, and material test reports.

When changes to the design are necessary, the sponsor shall be responsible for coordinating the proposed design changes with the sponsor's Design Engineer. The sponsor's Design Engineer shall forward two copies of the proposed plan changes, together with related calculations, to the Environmental Services Department for review and acceptance prior to construction.

The Sponsor's Engineer shall schedule a final inspection meeting between the Sponsor's Engineer, the sponsor, and the Environmental Services Department at the completion of construction and testing of the sewer system. Deficiencies found shall be corrected by the sponsor prior to the County's acceptance of the sewer.

#### **Record Drawings & Engineer's Statement**

During construction the sponsor's Surveyor and/or Construction Engineer shall record any changes to the accepted plans. All substantive changes shall be indicated and noted on the accepted final sewer plans and the plans shall be annotated as "Record Drawings". In those cases where the County provides the inspection services, the County will produce the Record Drawings.

Side sewer stub sketches shall also be prepared on the County's standard form. Final ("As-built") elevations, locations, pipe lengths, and pipe slopes must be verified on the Record Drawings. The following statement shall be lettered on the Record Drawings and stamped and signed by the sponsor's Construction Engineer on the Record Drawings: "I have reviewed the construction of this sewer system and to my knowledge find it to be in substantial conformance with the accepted plans and Spokane County Standards except as noted."

**ATTACHMENT 5**

**SPOKANE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT  
PROTOCOL FOR TELEVISION (TV) INSPECTION OF SEWERS**

In the interest of developing a consistent methodology for the coordination and review of TV inspections, the following steps have been established:

**PRE-PAVE TV INSPECTION**

The Environmental Services Department requires a pre-pave TV inspection be performed on all sanitary sewer installations. The inspection may be performed by the Department or by a private firm.

- 1) At least two weeks prior to the desired pre-pave TV inspection, the Contractor requests the television inspection through the Sponsor's Engineer. If the Environmental Services Department is selected to perform the TV Inspection, the Engineer shall submit the request (on standard form) to the Environmental Services Department, Sewer Planning and Design Section.
- 2) The Sewer Planning and Design Section schedules the TV inspection with the Wastewater Operations Section.
- 3) Prior to the inspection, the sewer mains will need to be high-pressure cleaned, mandrel tested, and pressure tested. In addition, manholes will need to be accessible by the TV van. Backfill must be in place around the cone sections of the manholes. If the contractor has placed temporary steel plates on top of the manholes, then the contractor will need to provide manpower and equipment to remove and replace the plates to facilitate the television inspection.
- 4) The Environmental Services Department will not charge the Contractor or Developer for the initial TV Inspection. The Contractor or Developer is responsible for the cost of all subsequent pre-pave television inspections.

**REVIEW OF PRE-PAVE TV INSPECTION**

- 1) When the Department has completed the TV inspection, the Wastewater Operations Section compiles the video files, an observation log and still photographs of any observations that were noted by the inspection crew. This information is placed on an ftp site and the Sewer Planning and Design Section representative is notified. The Sewer Planning and Design representative may review the inspection materials at that time, after which, the Engineer is notified that the inspection has been completed.
- 2) The Engineer shall review the inspection information and make a determination of any repairs that need to be undertaken.
- 3) The Engineer coordinates with the Sewer Planning and Design Section representative for concurrence on repairs, if any, that are needed. In some cases, this may necessitate joint review of the inspection materials.
- 4) After concurrence between the Engineer and the Sewer Planning and Design Section representative, the Engineer will stipulate any required repairs to the contractor.

**ACCEPTANCE STANDARDS FOR GRADE DEVIATIONS**

The Standard Specifications stipulate that reverse grades are not acceptable. In the review of television inspection materials, the Engineer and the Sewer Planning and Design Section representative will consider the combined effects of pipe joints, allowed variations in pipe diameter, and grade on any entrapped water appearing on the video or noted in the observation log.

### **POST-PAVE TV INSPECTION**

- 1) After the roadway is substantially complete above the sewer, a post-pave TV inspection must be scheduled. The post-pave inspection shall be performed by the Environmental Service Department.
- 2) The post-pave TV inspection will note tee locations / stations, check for pipe cleanliness and identify any structural defects that may have occurred or presented since the initial television inspection.
- 3) The review of the inspection materials and concurrence on needed repairs will proceed in the same fashion as identified for the pre-paving TV inspection
- 4) The Contractor or Developer shall pay the cost of all post-pave TV inspections.

### **REMEDY PROVISIONS**

In the case of a pipeline swale, or other defect, that is identified during the post-pave TV inspection, the Engineer and the Sewer Planning and Design Section representative shall determine the need for repair work to correct the defect.

In certain cases, in lieu of undertaking the repair, the Contractor may be required to pay the estimated cost of making the repair to the County. Such payment will then be deposited in the County's sewer repair and replacement fund.

### **MANHOLE INSPECTIONS**

The Engineer shall inspect the sewer manholes for conformance with Spokane County Standards. Observations regarding the condition of manholes made by the TV inspection crew are to be considered as supplementary information, and are not intended to replace the Engineer's complete inspection of the manholes.

### **MAKING CONNECTIONS TO NEW SEWER LINES**

No connections to the new sewer lines will be allowed until the County has accepted the sewer lines for operation and maintenance. Before acceptance can occur, the Engineer must provide acceptable record drawings for the project to the Environmental Services Department, together with the required Engineer's Statement. Additionally, the warranty period security must be provided by the developer as stipulated in the County's Standards for Road and Sewer Construction.

**ATTACHMENT 6 – MINIMUM TESTING FREQUENCIES**

<b>Earth Embankment</b>	- 1 test / 500 CY placed
<b>Road Subgrade</b>	- 1 test per 100 l.f. of lane or equivalent
<b>Base Course</b>	- 1 test per 100 l.f. of lane or equivalent
<b>Trenches</b>	- 1 test per 150 CY with varying test depths
<b>Curb Grade</b>	- 1 test per 100 l.f.
<b>Concrete</b>	- 1 set (4 cylinders) / day or / 100 CY - 1 set of air, slump, temperature, etc. / day or /100 CY
<b>Aggregate</b>	- 1 test to verify that gradation meets specifications
<b>Asphalt Pavement</b>	Lot = 400 tons 5 Compaction tests per lot, Minimum 5 Compaction tests per day - 1 test to verify gradation / 1,000 tons - 1 test to verify maximum density / 1,000 tons - 1 test to verify asphalt content / 1,000 tons

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## INLAND NORTHWEST REGIONAL PAVEMENT CUT POLICY

**Effective January 1, 2017**

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**PURPOSE:**

The purpose of this policy is to establish a uniform approach to pavement cuts and repair applicable to utilities and other contractors working in the public rights-of-way.

**POLICIES:**

The local agency shall establish a tiered system based on the date of construction or reconstruction of pavement and may also apply additional criteria for roadway condition. The policies applicable are as follows:

1. A pavement cut moratorium will be in effect for a period of three years for all new and reconstructed Tier 1 roadways.
2. The policies for Tiers 2-4 roadways is as follows:
  - a. Full Policy: Patches/paving shall extend the full width of an established travel lane. Pavement cuts shall be full depth and extend 2 feet (2'-0") beyond the nominal trench edge longitudinally and transversely. There shall be no gaps  $\leq$  four feet (4'-0") from curb or gutter.
  - b. Modified Policy: Patches paving shall extend beyond the wheel path to the middle of the travel lane. Pavement cuts shall be full depth and extend one foot (1'-0") beyond the nominal trench edge longitudinally and transversely.. There shall be no gaps  $\leq$  four feet (4'-0") from curb or gutter.



3. Tiers Based on Age of Pavement

	Tier 1	Tier 2	Tier 3	Tier 4
<b>Arterial Streets:</b>	<u>0 – 36 Months (3 years from date of substantial completion)</u>	3 – 5 Years	5-12 Years	> 12 years
Principal	Moratorium Policy	Full Policy	Full Policy	Modified Policy
Minor	Moratorium Policy	Full Policy	Modified Policy	Modified Policy
Neighborhood Collector	Moratorium Policy	Full Policy	Modified Policy	Modified Policy
<b>Local Access Streets:</b>				
Industrial/Commercial	Moratorium Policy	Modified Policy	Modified Policy	Modified Policy
Residential	Moratorium Policy	Modified policy	Modified Policy	Modified Policy

**Note:** It is the discretion of each jurisdiction to review the individual road segment ages to determine patch requirements on longitudinal installation over multiple roadway segments with variable ratings. In principle, each road section will be patched according to the tier in which it is ranked.

**Note:** Any deviation from the Tier Policy will require approval in advance by the local agency.

**Note:** Each agency will provide date of last major reconstruct either electronically, on issued permits, or on the respective agency website.

**DEFINITIONS**

**Agency Engineer:** City or County Engineer, his/her designee (Engineers, Inspectors, Project Managers, Field Personnel) representing a Local Agency.

**Assignee:** The contractor who is taking out the permit.

**Bell Hole:** A hole dug to allow room for workmen to make a repair or connection in buried pipe, such as caulking bell-and-spigot pipe or welding steel pipe. A bell hole can also be used for the starting location of an underground bore, when using the directional boring equipment. In the broad sense, any hole other than a continuous trench opened for working on a buried facility

**Compaction:** Restoration and backfill of the Trench, Pothole, and Bell hole. Each shall be compacted in lifts using the industry standard equipment to tamp the backfill material to 95% density.

**Full depth:** Asphalt depth top to base of asphalt or thickness of asphalt

**Gap:** Distance between two asphalt patches

**Keyhole:** Core drilling in asphalt or concrete used when performing installation, maintenance, or repair work.

**Length of Patch:** For this document the length of all patches is the patch dimension parallel to the roadway.

**Local Agency:** The governing entity having jurisdiction of the area that the permittee has submitted an application to obstruct or conduct construction operations.

**MUTCD: Manual on Uniform Traffic Control Devices:** Traffic Control should be set up to warn and protect the workers and general public by avoiding the working area during construction. Traffic Control must meet or exceed the Washington State modifications to the MUTCD (see <http://mutcd.fhwa.dot.gov> section, Chapter 6G and 6H).

**New Roadway:** Any roadway that has had a designed rehabilitation in the permitted excavation location that is less than or equal to three years.

**Patch:** Cut in the pavement as part of the current permitted job.

**Permittees:** The utility company or contractor who submits an application for a permit to obstruct and/or conduct construction operations in the public right-of-way. Local agencies and their contractors shall be considered permittees for application of this policy even though the respective agencies and/or their contractors may not take out permits.

**Potholing:** Potholing is the practice of digging a test hole to expose underground utilities to ascertain the horizontal and vertical location of the facility. The horizontal and vertical position of the exposed facility must be tied to a survey benchmark or permanent above grade feature. The position may be identified by GPS or traditional survey coordinates or by measuring the distance, with a tape measure, to permanent features in three horizontal directions. In addition, the vertical distance below grade should be obtained.

**Project Completion:** Date when the following has occurred: final permanent restoration of roadway is complete and approved by the inspector, and all as-built documentation has been submitted to the local agency. A fax transmittal confirmation ticket of 'as built' shall be considered confirmation.

**Standard Specifications:** Current version of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, Supplemental Specifications and/or Drawings as attached by local agencies.

**Travel Lane:** travel lanes shall be established based on striping, or where there is no striping, shall be twelve feet (12'-0") in width.

**Width of Patch:** For this document the width of all patches is the patch dimension perpendicular to the roadway.

## GENERAL REQUIREMENTS

### 1. Patching:

- a. No patching material will be allowed within an existing patch if the new patch exceeds seventy percent or more (70%+) of the existing patch. The entire existing patch shall be replaced.
- b. The minimum length of the patch parallel to the road shall be six feet (6'-0"). If any part of the excavation, patch or damaged area intrudes into an adjacent lane, that lane shall also be replaced in accordance with the tiered chart.
- c. New patches adjacent to any existing patch shall be installed at the existing patch line. When this is not feasible, no gap of 4 feet or less shall exist.
- d. When 2 or more patches are created within a given job that measure 15 feet or less longitudinally or transversely they will be incorporated into a single patch. Anytime five or more patches are required within a 350-foot longitudinal area, the utility will notify the agency to determine if cost sharing is an option to expand the pavement repair/replacement area.
- e. Only saw cutting or approved grinding device will be allowed. Only parallel and perpendicular pavement cuts will be allowed. No jagged, broken or rolled undermined edges.
  - i. Per agency approval, grind and overlay outside of the full depth asphalt removal limits may be allowed to achieve full patch limits.
  - ii. There may be times when a diamond shaped patch is the preferred method for the repair (i.e. man holes and valve boxes), since it will provide a smoother ride instead of a square patch.
- f. All pavement **overcuts** shall be sealed full depth, flush with the pavement surface. The contractor is required to use an approved sealing material. The area to be sealed must be clean and dry, and the material heated to melt into and fill the overcut (maximum length of cut is equal to depth of asphalt). If any holes remain after application, contractor is to repeat procedure.

- Contractor will clean the overcut to remove any debris which may obstruct the sealing process.
- g. The completed surface of all courses shall be of uniform texture; smooth, uniform as to crown and grade and free from defects. The completed surface of the wearing course shall not vary more than 1/4 inch from the lower edge of a ten foot straightedge placed parallel to the centerline. Recognition and consideration will be made for existing roadway conditions. The Agency Engineer must approve corrective measures.
  2. Keyholes. Can be used on moratorium streets, subject to agency approval.
    - a. Keyholes should be kept to vertical as close as possible.
    - b. Backfilling the keyhole should follow same method as open trenching, using crushed aggregate.
    - c. Core reinstatement shall be per manufacture specifications.
  3. Materials. All patching materials and construction requirements not addressed in this document shall conform to each Local Agency's Standards. Longitudinal cuts that extend through multiple tier classifications will require discussion with the local agency to determine appropriate patching approach. In principle, each road section will be patched according to the tier in which it is ranked.
  4. Traffic Control:
    - a. All existing traffic control markings will be replaced as soon as possible after permanent paving is completed.
    - b. Temporary markings for lane lines and stop lines shall be in place prior to the roadway opening for traffic.
    - c. All remaining temporary striping will be completed within seven days of new pavement completion and shall be maintained by permittee until permanently restored.
    - d. All traffic markings will be replaced per normal work practices. All temporary traffic control for the work zone shall conform to the MUTCD and Washington State modifications to the MUTCD. All traffic control is subject to the approval of the Agency Engineer or his/her designee
  5. Emergency Repairs. The permittee shall be allowed to make emergency repairs provided a more reasonable alternative does not exist. Every reasonable effort will be made to restore the roadway quickly. Local agency will be notified of emergency repairs not later than the next business day.

**SPECIFIC REQUIREMENTS**

1. Chip sealed roads shall be rehabilitated according to construction requirements for asphalt roads per agency and tier level.
2. All existing pavement types shall be constructed at the existing depth of asphalt and crushed surfacing, in accordance with applicable Local Agency Standards (including any fabric or membranes); Replacement section of asphalt and crushed rock shall not be less than the minimum section specified in Local Agency's Design Standards.
3. All concrete road cuts shall be pre-approved before beginning work (except in the case of an emergency situation). Concrete roads shall require full panel replacement unless approved otherwise by local agency. All concrete joints shall require an approved tie bar and dowel retrofit. Depth of concrete replacement shall match the existing thickness, or shall be in accordance with Local Agency's Standards. Care shall be made not to undermine the existing panels. If the adjacent panels are disturbed or damaged, they also shall be replaced at the discretion of the Local Agency. All joints shall be sealed with an approved material.
4. Asphalt over concrete road cuts – if known - shall be pre-approved before beginning work (except in the case of an emergency situation). Saw cutting or other approved practice for removal of the concrete shall be allowed at the discretion of Local Agency. The asphalt portion of the cut shall be constructed according to the pavement cut policy.
5. All areas outside of the travel lanes that are affected by the work shall be restored to their original condition. All shoulders shall be restored to their original condition.

**EXCEPTIONS:**

1. Valve and manhole repairs shall be exempt from the patching requirements of this policy. Valve and manhole patching requirements shall be per each Local Agency's Standards. All warranty and construction requirements shall be met. No longitudinal construction joints shall be allowed in the wheel path.
2. Potholing to find utilities shall be allowed. To be exempt from the gap and patching policy, cuts shall be a maximum of two-feet square (2'-0") with no longitudinal joints in the wheel path and shall be backfilled with controlled density or other approved fill from six inches above the utility to six inches below bottom of asphalt. Round vs. square cuts are preferred.

**NEW DEVELOPMENT**

The moratorium policy will be explained both as to costs and to construction practices by the Local Agencies as part of the permitting/zoning process for new construction or major remodeling projects. Individual permittees/utilities will not be responsible for this function. Individual permittees/utilities will be responsible for doing the work and the costs associated with

the moratorium policy as they open roadways for work. Cost recovery from developers will be calculated and coordinated by permittee/utility.

### WARRANTY REQUIREMENTS

1. Pavement cuts on roadways ten years old or less will have a warranty period of five years. The patch in the roadway shall be repaired as necessary until the warranty has passed.
2. All other roadways shall require a minimum three-year warranty period. All warranties shall become void if rehabilitation work is performed to the road within the patching limits.
3. For road cuts performed by a Utility using its internal capability, that Utility or assignee will be responsible for repairs required during the warranty period.
4. All curb, sidewalks and structures that are affected by the excavation shall be included in this policy and have a warranty for five years.
5. All warranty work requires that an agency inspector be on site. The permittee shall be required to coordinate inspection with the appropriate department within the Agency.
6. The following defects identified by the local agency engineer shall be covered by warranty:
  - a. Sunken pavement patches greater than or equal to one-quarter inch (Measured by a ten-foot straight edge).
  - b. Failure to meet agency visual rating standard for patching and joints to medium or high).
  - c. Poor workmanship.
  - d. Inadequate compaction per Agency standard.
  - e. Sunken or damaged curb and sidewalks in excavation work area.
  - f. Sunken or damaged drywells and catch basins in excavation work area.
7. Notice of Repairs.
  - a. If emergency repairs are needed due to safety concerns, the permittee shall have twenty-four hours in which to make such repairs from time of verbal notice by the Local Agency.
  - b. For non-emergency repairs on arterial roads the permittee shall have forty-eight hours to make such temporary repairs.
  - c. Residential streets, the permittee shall have up to seven days to make such temporary repairs.

The local agency may provide for repairs not completed within the specified timeframe and permittee will be assessed all costs associated with the repairs. The costs shall be based on actual costs or the average bid items for comparable projects for the year preceding, plus ten

percent overhead fees. If repairs are made other than seam sealing to the warranted patch, a new warranty will be implemented for the new patch.

The permittee shall have two days to notify their asphalt company of the needed permanent repairs. If the work is not done in a timely manner and following notification the work shall be privately contracted or Local Agency maintenance crews will perform the needed repairs. The permittee shall be assessed the associated fees for the repairs. All utility cut construction shall follow the construction and warranty requirements per local agencies standards.

### TEMPORARY PATCHING

1. During winter asphalt concrete paving plant closures or outside of temperature specifications (see section 5-04 of the WSDOT/APWA Standard specification). The permittee shall install and maintain a temporary patch until it can construct a permanent patch. A temporary patch will be required if the road must be opened to traffic before a permanent patch can be made.
2. The temporary patch shall consist of four inches of crushed surfacing or current local agency standards, and two inches of cold-mix asphalt pavement, or upon approval of the Agency Engineer, crushed surfacing top coarse and/or steel plates may be used. On arterials, when a temporary patch is required for more than two months, Portland Cement Concrete shall be used to construct the temporary patch if weather permits (Contact Local Agency for mix design requirements). The permittee shall maintain the temporary patch until the patch has been permanently restored.

### PERMITS

1. All work in the 'Public Right-of Way' requires a permit issued by the local agency. Permittee shall take out all permits and perform all work.
2. The permittee shall fax or send a letter to the appropriate Local Agency permit center designating their assignees. The permittee will be required to submit a construction and traffic control plans required by local agencies when applying for a permit. If the Agency Engineer determines that abuse of obligations are prevalent, future construction permits shall not be issued until the permittee has fulfilled all obligations to existing permits. Written notification by Local Agency will be sent prior to this action.
3. The permittee shall provide a detailed "As-built" record of the pavement cut after construction is completed. The permittee shall provide details indicating existing pavement section, new pavement section and any unusual conditions at the location of the constructed utility. The location shall include the name of the road the work is being performed on and the name of the closest intersections in each direction. Distance measurements shall be from intersecting streets. This information will be provided to the Local Agency's Permit department for a permanent record. This information shall be returned no later than seven days after the completion of the permitted project by mail, fax, or other electronic means by either permittee or patching contractor. The intent of this process is to record small patching details. Larger projects shall be reviewed and approved prior to construction.

4. Each Local Agency may provide permittee to contribute normal patching costs to local agencies to accomplish paving or full depth replacement of the roadway. (This does not apply to work done within sewer projects).
5. The Local Agency should be notified of existing problems with the adjacent roadway to a proposed patch. Every effort will be made to leverage both utility and agency dollars for street improvements.

### **RESPONSIBLE PARTY**

The permittee shall be responsible for all construction and warranty requirements of this policy. Utilities will provide identity of excavator/permittee as known to local agencies. Local agencies will attempt to get permittee to correct warranty defects. If permittee is a subcontractor for utilities, the utilities will assume responsibility if permittee can not/will not make repairs.

### **COMPLIANCE**

Failure to comply with any part of this policy may result in denial of future permits.

After 3 notices of noncompliance, the Agency shall send a notice to comply within 10 working days or all future permits may be denied until the problems have been corrected.

A meeting shall be arranged with the appropriate Agency and a plan of action to prevent future noncompliance shall be presented before issuance of any new permits.

An appeal can be applied for in writing to the appropriate Agency.

Noncompliance Activities include:

1. Failure to take out a permit.
2. Failure to maintain temporary patches.
3. Failure to make permanent repairs.
4. Failure to make emergency repairs.
5. Failure to make warranty repairs.
6. Failure to send back As-Built information.
7. Failure to inform agency of asphalt completion date.
8. Failure to follow traffic control measures, as required.

### **EXEMPTIONS FOR MORATORIUM ROADWAYS**

It is understood that field conditions may warrant a waiver or an exemption from these regulations. Developers, Contractors or Owners may appeal for a waiver of the moratorium to allow for excavation into a street that meets the criteria for the moratorium tier.

The appeal process completion in NO WAY obligates the affected Agency Engineer to allow such an excavation, and any such decisions are at the Agency Engineer's discretion.



- Submit a letter of intent to the affected Agency Engineer outlining their proposed project and the impact of the project.
- Establish that all alternative avenues have been investigated and fail to meet the needs of the project.
- Acknowledge the requirements of restoration of the area affected, and that there will be required special inspection, the cost of which shall be borne by the applicant of the waiver.
- Propose a meeting with the Agency Engineer to discuss the project.
- Establish a timeline of the project through completion.

### **POLICY REVIEW**

The local agencies will host a meeting with each other and other interested stakeholders at the end of each construction season for the purpose of reviewing the effectiveness of the policy for the completed construction season and suggested improvements for future construction seasons.

---

**REFERENCES**

- “Trench Restoration Requirements”. City of Bellevue  
“Utility Trench Cut Restoration Specifications”. Metropolitan Transportation Commission (January 1997)  
“Asphalted Pavement Warranties”. Wisconsin Department of Transportation (June 2001)  
“Impact of Utility Cuts on Pavement Performance”. City of Seattle  
“Managing Utility Cuts” APWA (August 1997)  
“Gas Industry’s Use of Public Right-of-Way” A.G.A. White Paper (September 1998)  
“Pavement Cut and Repair Standards Manual” DPW&T City of Dallas (October 2003)

**PARTICIPATING JURISDICTIONS**

Spokane County  
City of Spokane  
City of Spokane Valley  
City of Airway Heights  
City of Cheney  
City of Medical Lake  
City of Deer Park  
City of Millwood  
City of Liberty Lake

**City of Spokane Resources**

Side sewer card info link can be reached at: [www.spokanewastewater.org](http://www.spokanewastewater.org)  
City of Spokane Engineering web site: [www.spokanecity.org](http://www.spokanecity.org)  
City of Spokane GIS maps: <http://www.spokanegis.org/citymap2/default.htm>

**SUGGESTED SPECIFICATIONS FOR JOINT SEALING****Option 1 - Joint Adhesive**

Joint adhesive material shall conform to the following requirements:

**Test Specification**

Cone Penetration, 77°F (25°C) (ASTM D 5329) 60 - 100  
Flow, 140°F (60°C) (ASTM D 5329) 5 mm maximum  
Resilience, 77°F (25°C) (ASTM D 5329) 30% minimum  
Ductility, 77°F (25°C) (ASTM D 113) 30 cm minimum  
Ductility, 39.2°F (2°C) (ASTM D 113) 30 cm minimum  
Adhesion, 77°F (25°C) (ASTM D 5329) 500% minimum  
Softening Point (ASTM D 36) 170°F (77°C) minimum  
Asphalt Compatibility (ASTM D 5329) Pass  
Installation: Install according to manufacturer specifications.

**Option 2 – Adhesive Joint Tape**

Joint adhesive joint tape shall conform to the following requirements:

Test Specification

Softening Point, 225° F (107) min.

Flexibility 90 degree Bend, 1" (25mm) mandrel (ASTM D311), Pass at 30° F (-34° C)

Cone Penetration 77° F (25° C) (ASTM 5329), 50 max

Elongation 77° F (25° C), 1,000% min

Opening to traffic time, immediate

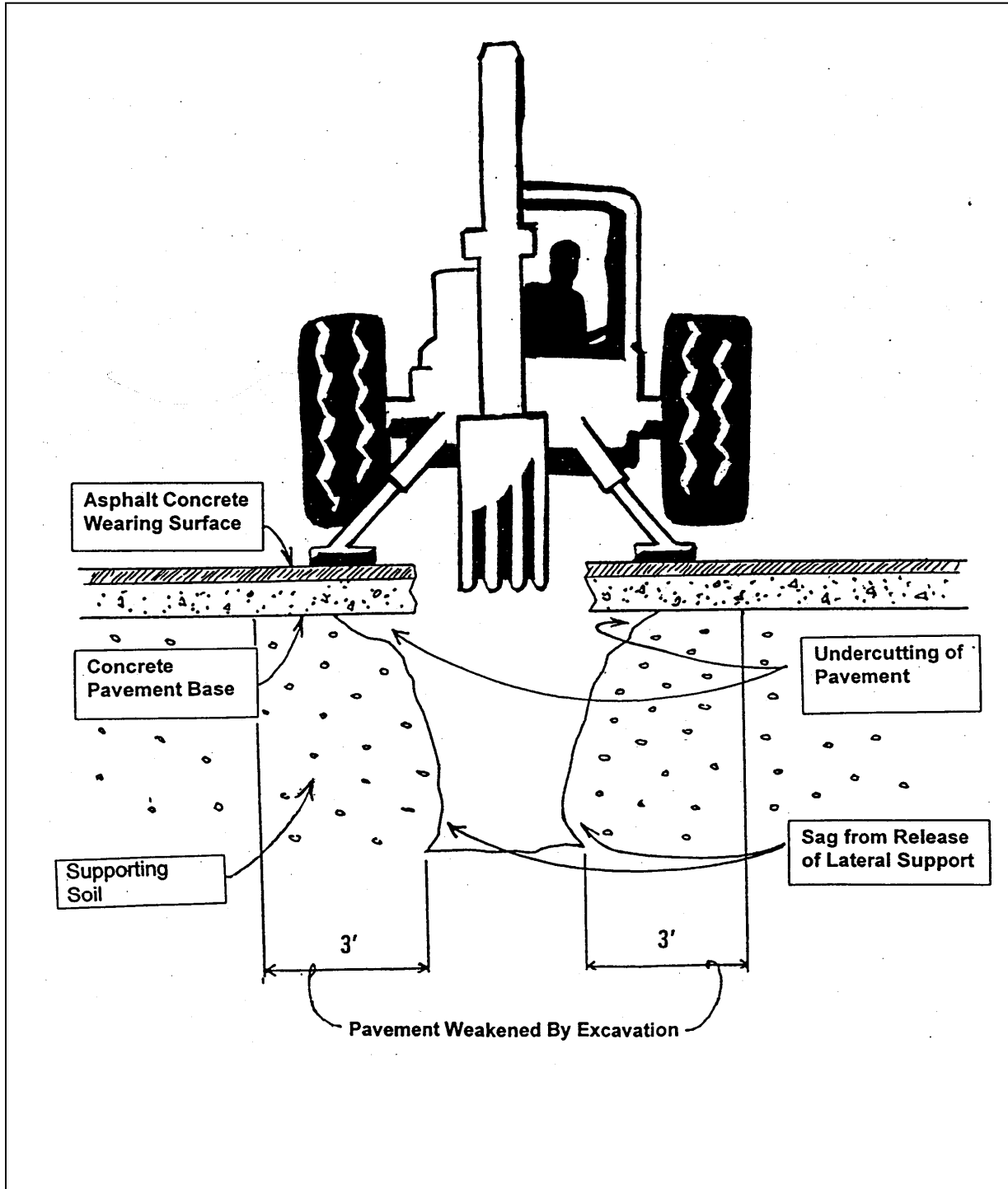
Installation: Install according to manufacturer specifications.

**Construction Requirements**

Section 5-04.3 is supplemented with the following:

The Contractor shall install Joint Adhesive to all joints of wearing course lifts that are not hot lapped or as designated by the Engineer. Equipment used for performing the joint adhesive application shall be maintained in satisfactory working condition at all times. Prior to the application of the joint adhesive the face of the joint shall be thoroughly dry and free from any loose material, dust, or other debris that would inhibit adhesion. Heating and pumping of joint adhesive shall be in accordance with manufacture recommendations. Application of the joint adhesive shall be in a continuous, 1/8 inch thick band over the entire vertical face of the joint. Joint adhesive shall be applied concurrent with HMA placement and application shall be limited to the surfaces that will be paved during the same working shift.

TYPICAL TRENCH EXCAVATION  
EXHIBIT A



PATCH TO BE COMPLETED AFTER JOINT USE TRANSFER & POLE REMOVED

**ASPHALT AND CONCRETE PAVEMENT REPAIR**

Permittee Name: \_\_\_\_\_

Job Address: \_\_\_\_\_  
(if no house number, please list hundred-block)

Coordinates: \_\_\_\_\_  
(Example: 15N 24W)

Street  
 Alley

Project/Task #: \_\_\_\_\_

RC / Area: \_\_\_\_\_

Date Cut: \_\_\_\_\_ Crew: \_\_\_\_\_

PO/Job #: \_\_\_\_\_ City/County Permit #: \_\_\_\_\_

Unusual Conditions/Special Instructions: \_\_\_\_\_

<b>Tier#:</b> <small>(Please circle)</small>	1	2	3	4
<b>Policy:</b> <small>(Please circle)</small>	Moritorium	Full	Modified	Trench

<u>Condition of Cut</u> <small>(Circle any that apply)</small>	<u>Type of Work</u>	<u>Type of Repair</u>	<u>Existing Road Condition</u>	<u>Overcut Sealant</u> <small>(Approved List)</small>
6" Gravel (required)	Gas	Asphalt	Depth of Asphalt _____	Dow Corning - 890-SL Self Leveling Silicone Joint Sealant Sonneborn - Sonolastic SL1 One-Compound Elastomeric, Self Leveling Polyurethane Sealant
Cold Mix	Electric	Concrete	Depth of Gravel _____	
Winter Mix	Water	Sub Base Type	_____	
Sawcut	CATV			
Grind	Communications Sewer Other _____			

**Asphalt**

Width	x	Length
_____	x	_____
_____	x	_____
_____	x	_____
_____	x	_____

**Concrete**

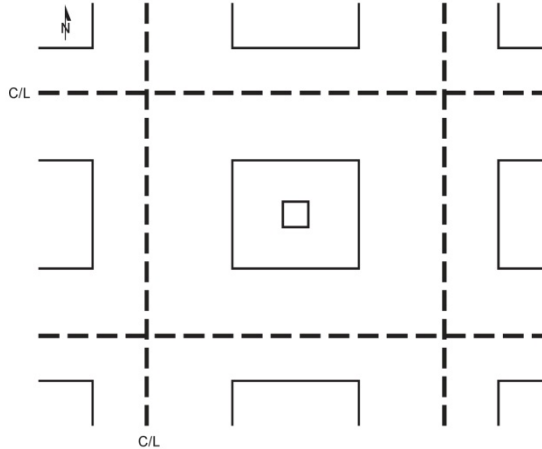
Width	x	Length
_____	x	_____
_____	x	_____

striping (linear foot) \_\_\_\_\_

Date Sent for Repair: \_\_\_\_\_

Date Completed: \_\_\_\_\_

Patching Co. Signoff: \_\_\_\_\_  
(patching company to fax to local agency at completion)



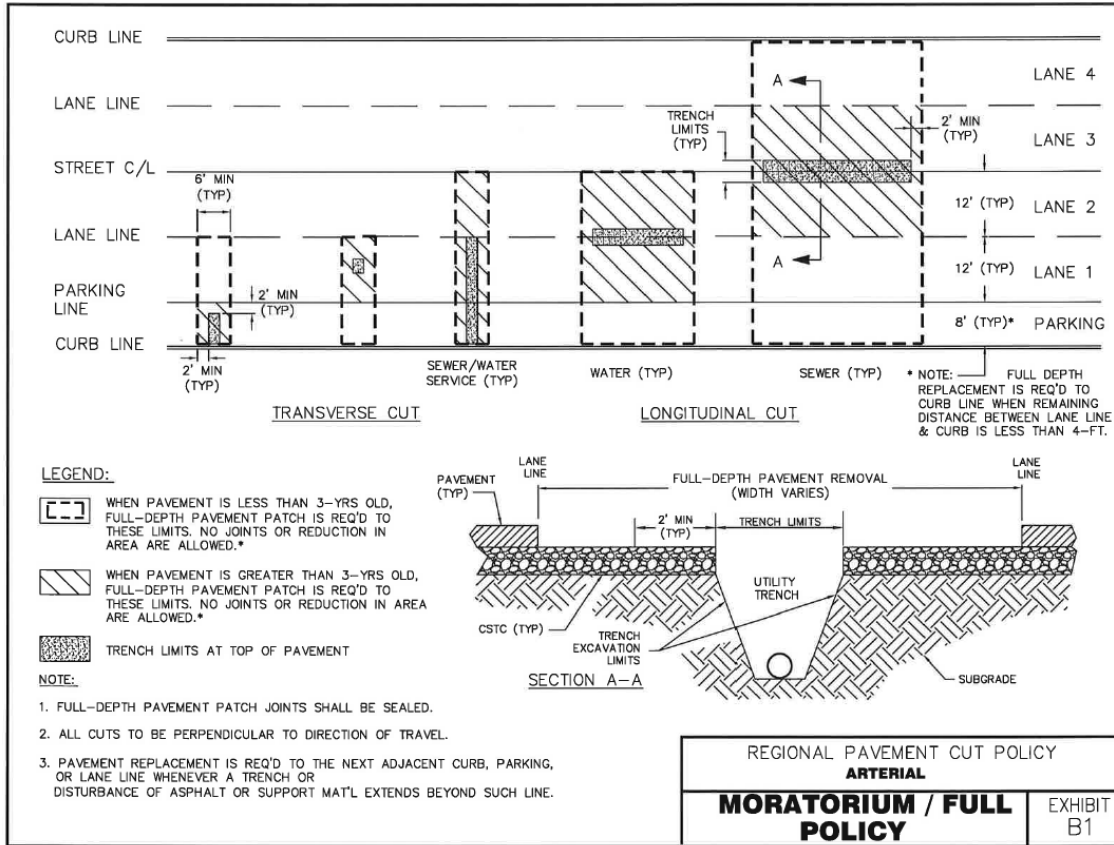
**DISCLAIMER**

This product is for informational purposes and as a general planning and Management tool. Care was used during compilation of this data and final product to insure accuracy, but it may be based in whole or in part on the quality of the source data and outside sources of information. This product may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Participating Parties do not accept responsibility for errors and omissions, and therefore, there are no warranties that accompany this material. Users of this information should consult the primary data and information sources to ascertain any usability of this information. This information may be periodically updated. Users of this information should check with the appropriate data sources to ensure the integrity of the information provided.

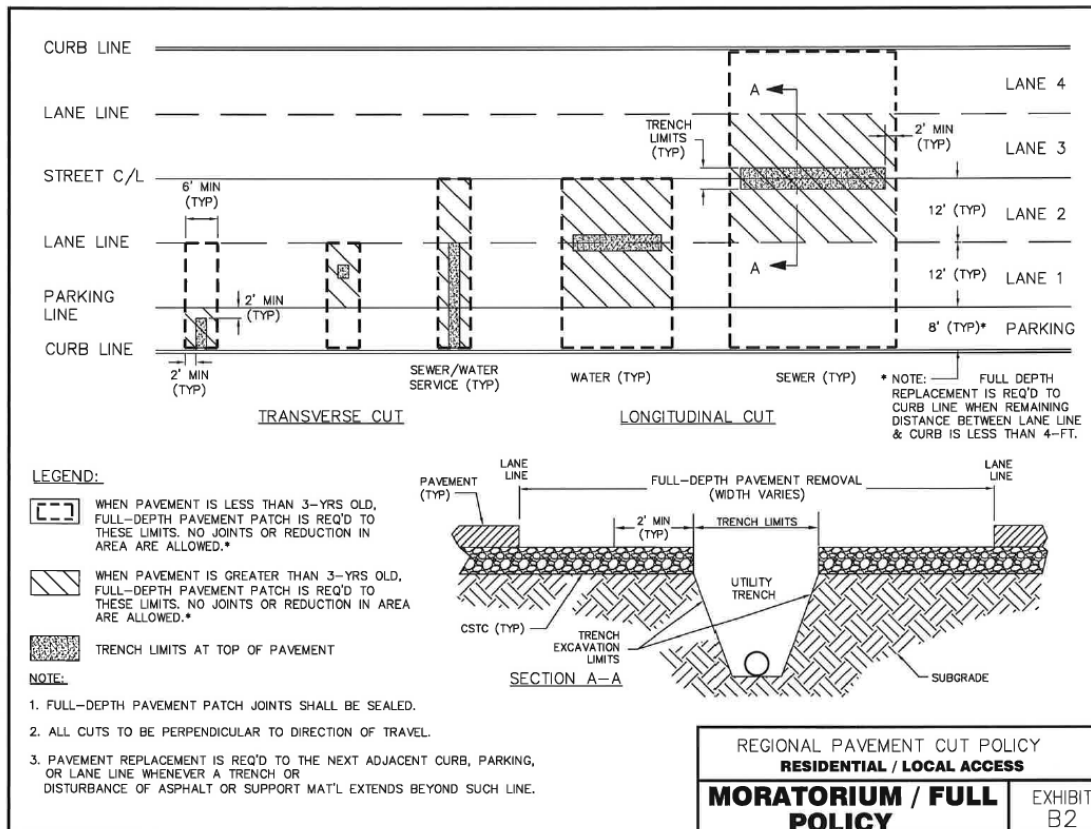
**Fax Completed Form to the Appropriate Jurisdiction**

N-2600 (01-12)

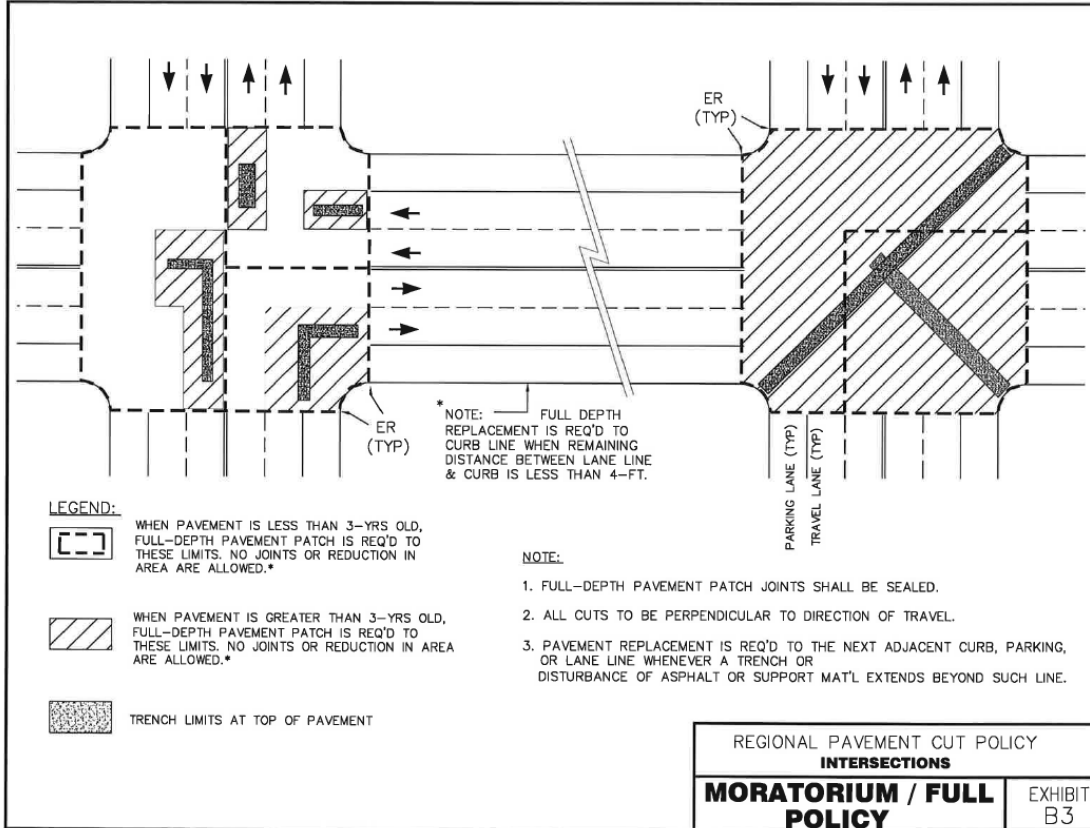
**EXHIBIT B1 - MORATORIUM/FULL POLICY - ARTERIAL**  
**“EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



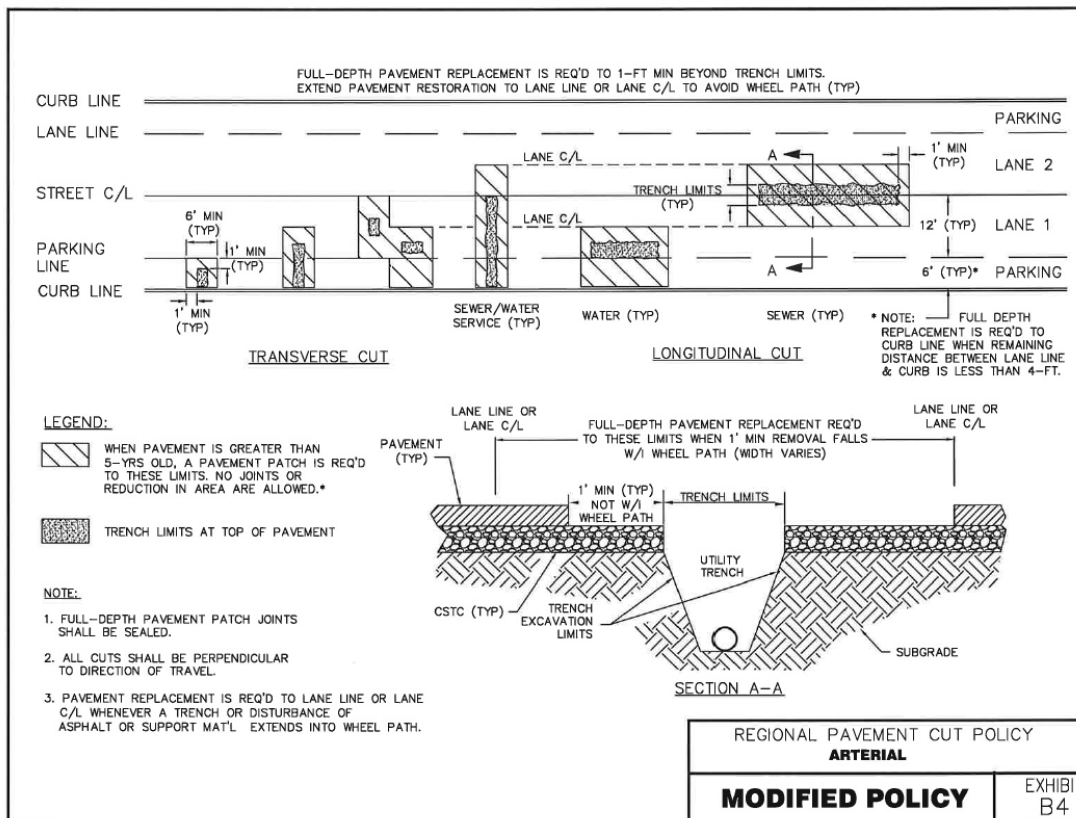
**EXHIBIT B2 - MORATORIUM/FULL POLICY – RESIDENTIAL /LOCAL ACCESS**  
**“EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



**EXHIBIT B3 - MORATORIUM/FULL POLICY – INTERSECTIONS**  
**“EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



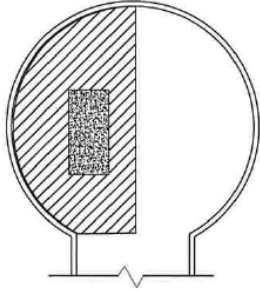
**EXHIBIT B4 - MODIFIED POLICY - ARTERIAL**  
**“EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



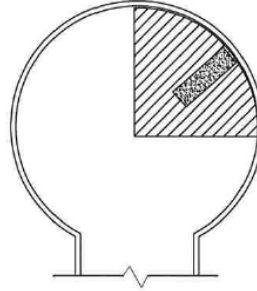




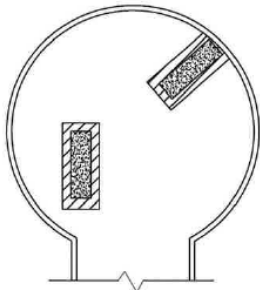
**EXHIBIT B6 - MODIFIED POLICY – CUL-DE-SAC  
 “EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



WHEN PAVEMENT IS 3 YEARS OLD OR LESS, A MORATORIUM PAVEMENT PATCH IS REQ'D TO THESE LIMITS. IF ANY PART OF THE PATCH EXTRUDES INTO ANOTHER HALF OF THE CUL-DE-SAC, THAT ADDITIONAL HALF SHALL BE REPLACED.



WHEN PAVEMENT IS GREATER THAN 3 YEARS TO 12 YEARS OLD, A MODIFIED PAVEMENT PATCH IS REQ'D TO THESE LIMITS. IF ANY PART OF THE PATCH EXTRUDES INTO ANOTHER ONE QUARTER OF THE CUL-DE-SAC, THAT ADDITIONAL ONE QUARTER SHALL BE REPLACED.



WHEN PAVEMENT IS GREATER THAN 12 YEARS OLD, A MODIFIED PAVEMENT PATCH IS REQ'D TO THESE LIMITS. PATCH MAY BE LOCATED ANYWHERE IN THE CUL-DE-SAC.



**NOTE:**

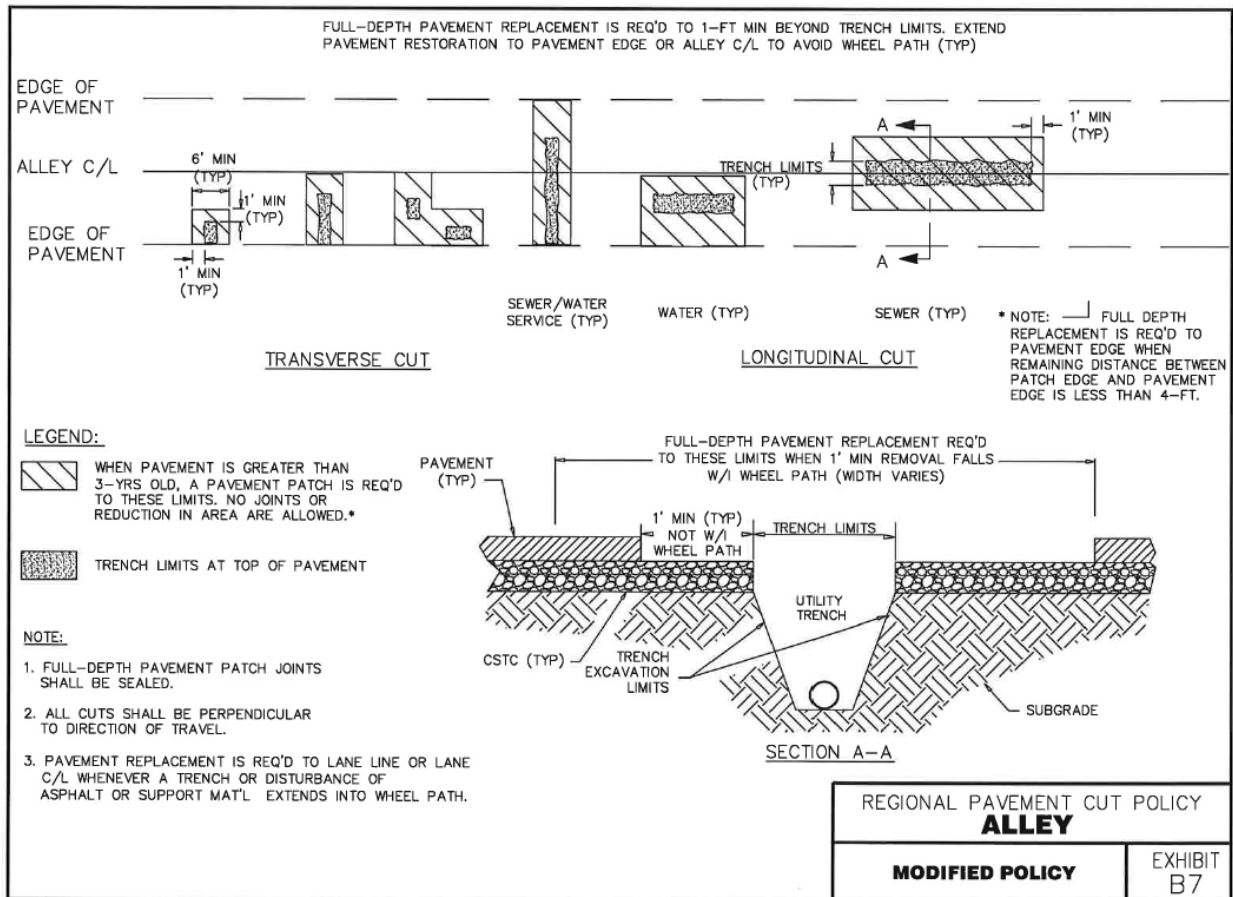
1. ALL OVER CUTS AND FULL-DEPTH PAVEMENT PATCH JOINTS SHALL BE SEALED.
2. ALL CUTS SHALL BE PERPENDICULAR TO DIRECTION OF TRAVEL.
3. FULL DEPTH PAVEMENT REMOVAL SHALL BE 1' BEYOND TRENCH LIMITS, 2' IN MORATORIUM SITUATION.

REGIONAL PAVEMENT CUT POLICY  
**RESIDENTIAL / CUL-DE-SAC**

**MODIFIED POLICY**

EXHIBIT  
 B6

**EXHIBIT B7 – MODIFIED POLICY – ALLEY**  
**“EMERGENCY ONLY FOR MORATORIUM OR PRIOR APPROVAL”**



# Side Sewer Installation Handbook



**Spokane County**  
ENVIRONMENTAL SERVICES

# SPOKANE COUNTY

## SIDE SEWER INSTALLATION HANDBOOK

**This Handbook replaces the Brochure BP-07, published by the Department of Building & Planning.**

The Side Sewer Installation Handbook (“Handbook”) is Technical Reference E of the Spokane County Standards Manual for Road and Sewer Construction (the “Manual”). The purpose of the Handbook is to provide regulations and specifications relative to materials, design, construction, and inspection policies for private side sewers constructed of pipe six inches (6”) diameter or less within Spokane County’s “Sewer Service Boundary”. The Handbook applies to new installations as well as repairs, extensions, replacement and abandonment of existing sewers.

The specifications and regulations provided herein are not all-inclusive and additional requirements may be imposed by the Director of the Environmental Services Department if deemed necessary. In the event these regulations do not specifically or completely cover any given situation, the Director shall have the final decision making authority.

The specifications contained within shall not be construed as imposing upon Spokane County Environmental Services Department any liability or responsibility for the design, construction, operation or maintenance of any portion of the private sewer system. It is expected that all installers in Spokane County will exercise good judgment and workmanship. [Cross Reference: SSO 8.03.6220].

### **PLEASE NOTE:**

- **Working in a trench is inherently dangerous and trenches for sewer lines are usually deeper than other utilities. In addition, electrical and natural gas service lines may be in close proximity to the work area. Homeowners performing the work themselves are advised to consider the risk and the cost to provide a safe work environment when evaluating their ability to install their own private sewer line.**

### **REQUIREMENT TO HAVE UNDERGROUND UTILITIES LOCATED PRIOR TO DIGGING**

- At least 3 days before any excavation, the installer is required to call for utility locate marks through any of the following methods:
  - Call 811
  - Call 1-800-424-5555
  - Go to [www.callbeforeyoudig.org](http://www.callbeforeyoudig.org)

More information about this service can be found at the website listed above. This service is free to homeowners.

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## PERMIT REQUIREMENTS

A Sewer Connection Permit is required to connect, construct, repair, alter, extend or abandon any sewer, dry side sewer, manhole tap, mainline tap and connection of inside and outside dry side sewer connections. A Sewer Connection Permit is required whenever wastewater is directed or redirected into the regional sewer system even if no construction is performed to accomplish this action. [ SCC 8.03.6040]

- **The permit application may be downloaded from the County's website at [www.spokanecounty.org](http://www.spokanecounty.org) or acquired at the Spokane County Public Works Building.**

The sewer connection permit may be issued to either the property owner or a contractor licensed to install building sewers by the State of Washington. The property owner may contact L&I at 1-800-647-0982 or visit their website at [www.LNI.wa.gov/tradelicensing](http://www.LNI.wa.gov/tradelicensing) for license information about a contractor or general information about hiring a contractor. If the property owner is going to do the work themselves, they must agree to have an on-site consultation with one of our inspectors prior to doing the work. A property owner is not permitted to do work within the public right-of-way.

Each tax parcel of land upon which work is being performed must have its own permit. A permit may include connection of multiple buildings or multiple permit categories occurring on a single tax parcel of land. Additional fees for the additional building connections or items of work will apply to the cost of the permit. Situations not specifically covered above shall be determined by the Director. [Cross Reference: SCC 8.03.6040]

- **A Sewer Connection Permit is valid for 12 months from the date of issuance.**
- **An administrative fee may be assessed for working without a valid permit. [Cross Reference: SCC 8.03.8500]**

In addition to the County's sewer connection permit, the following permits issued by other departments or agencies may be required:

- **STREET OBSTRUCTION PERMIT** issued by the jurisdiction having authority over the public right-of-way. Required when the trench, materials, spoil pile or equipment is located in the public right-of-way.
- **PLUMBING PERMIT.** Changes to existing plumbing within the structure or the addition of new fixtures requires a Plumbing Permit issued by the appropriate department of the jurisdiction having authority.
- **ELECTRICAL PERMITS FOR PUMPING SYSTEMS:** Sewer installation work involving electric sewer pumps will require an Electrical Permit and inspection by the State of Washington Department of Labor and Industries.

A copy of these permits, if required, shall be on site at the time of the sewer connection inspection.

## SCHEDULING AN INSPECTION

All side sewer construction, including new sewers, dry side sewers, repairs, replacements, alterations, extensions or abandonment of existing sewers **MUST BE INSPECTED**. The sewer connection permit allows for one (1) inspection not to exceed thirty minutes. Additional inspection time or additional inspection visits may result in the billing of additional fees. The Director reserves the right to set and/or change inspection times.

TO SCHEDULE A SEWER INSPECTION: Call the Environmental Services Department at **(509) 477-3604** during normal business hours. Please be prepared to provide the jobsite address, the name of the installer and the permit number. **Requests which are left on the phone mailbox outside of normal business hours will not be honored.**

- **One working days' notice is required when scheduling inspections performed by the Division of Utilities.**

CANCELLING OR POSTPONING A SCHEDULED INSPECTION. The installer **MUST** call the Environmental Services Department at (509) 477-3604 **a minimum of one-half hour prior to the scheduled inspection time.** Failure to provided adequate notice may result in assessment of a call back inspection fee.

SAME DAY INSPECTIONS shall only be permitted in situations where a safety hazard or a public health issue exists. Inspection time is dependent upon inspector availability.

REQUESTS TO HAVE INSPECTIONS OCCUR BEFORE OR AFTER NORMAL BUSINESS HOURS are subject to the approval of the Director and inspector availability. An overtime-hourly rate will be assessed to the installer. There shall be a one (1) hour minimum charge, with additional one-half (1/2) hour increments assessed as appropriate. The time assessed shall include travel time to or from the Public Works Building. The Director shall inform the installer if the sewer inspection is subject to overtime fees. [Cross Reference: SCC 8.03.8500]

WEEKEND OR HOLIDAY INSPECTIONS. Requests for weekend or holiday inspections are subject to the approval of the Director and inspector availability. To schedule a weekend or holiday inspection, the installer must contact the Environmental Services Department at **(509) 477-3604** at least 24 hours in advance. WEEKEND OR HOLIDAY INSPECTIONS **MAY NOT BE SCHEDULED DIRECTLY WITH THE INSPECTOR.** Additional fees for weekend or holiday inspections shall be paid at the time of permit issuance prior to the inspection date. The inspection will not be scheduled until the fee is paid. The installer may cancel the inspection before 5:00 p.m. of the preceding workday. The extra inspection fee is non-refundable if inspection is not canceled within this time frame. Any weekend or holiday inspections requiring multiple visits to the job site or exceeding the two (2) hour time limit shall be billed additional fees. Weekend or holiday inspection requests that cannot be made in advance are subject to the Director's approval and inspector availability.

EMERGENCY REPAIRS: In emergency situations where it is not feasible for an installer to obtain a permit in advance of the work, the installer shall obtain a permit for the work the next business day. If the work is being done during normal business hours, the installer must immediately contact the Environmental Services Department and request an inspection. If the work is being performed outside of normal business hours, the installer must leave the work exposed, providing necessary safety precautions in accordance with Labor and Industries guidelines, and schedule for inspection the next business day.

## **INSPECTION REQUIREMENTS**

- **All trenches must be shored, sloped or shielded as per Washington State Department of Labor and Industries ("L & I") standards before the sewer inspector may enter the trench. The inspector may refuse to complete an inspection of work within an unsafe trench until a representative from "L & I" determines the trench meets their safety regulations.**

The sewer connection permit shall be available at the job site and readily accessible. The installer shall be present at the job site during the inspection. The inspector may refuse to perform the inspection if the permit and/or installer are not at the job site.

All costs incurred to remedy non-compliance of these regulations shall be borne entirely by the installer. Follow-up inspections shall be subject to call back inspection charges.

BEFORE THE TRENCH MAY BE BACKFILLED, the sewers must be inspected and accepted as non-deficient unless specifically authorized by the Director. The sewer line must be inspected from the point of connection to the building drain(s) to the connection point to the public sewer. Work performed at the connection points shall also be inspected. Sewers installed and covered without authorization may be subject to the following:

- Exposure and inspection of the sewer or portion thereof.
- Video inspection at the installer's expense.
- Pipe testing for grade, leakage and contamination at the installer's expense. The installer shall be responsible for payment of additional inspection time.

ADDITIONAL INSPECTION FEES MAY BE ASSESSED TO THE INSTALLER FOR:

- Re-inspection due to violations of the Sanitary Sewer Ordinance and/or these regulations.
- Multiple inspections.
- Follow-up inspections.
- Inspections exceeding the thirty-minute time allotment.
- Failure to notify the inspector at least one half (1/2) hour in advance of the scheduled inspection time that you won't be ready for the inspection.
- Failure to cancel or reschedule the inspection at least one half (1/2) hour in advance of scheduled time.
- Not having the approved plans on site and readily available to the inspector.
- The sewer connection permit and/or installer not present at the worksite during the inspection.
- Re-testing of work that has failed initial tests.

### ACCEPTABLE MATERIALS FOR SIDE SEWERS

<b>Gravity Sewers installed by excavation method.</b>	PVC Pipe & Fittings	ASTM D 3034. Either SDR-26 or SDR 35, but fittings installed within the public right-of-way must be SDR-26. Integral-bell gasketed joints. Rubber gaskets shall be factory installed conforming to ASTM F 477. Pipe joints shall conform to ASTM D 3212.
<b>Gravity Sewers installed by excavation method.</b>	Ductile iron	Pipe conforming to ASTM A746. Cement-mortar lined. Bell and spigot type with push on joints conforming to ANSI A21.11. Exterior coating meeting ANSI A21.51
<b>Gravity Sewers installed by excavation method.</b>	High Density Polyethylene (HDPE)	Min. wall thickness DR11. Manuf. In accordance with ANSI/AWWA C901, ASTM D3035. Joints shall be Standard Mechanical HDPE couplings or fusion welded conforming to ASTM D3261
<b>Gravity Sewers installed by excavation method.</b>	Vitrified Clay Sewer Pipe	Pipe conforming to ASTM C700. Joints shall be compression joints in accordance with ASTM C425.



<b>Gravity sewers installed by boring method</b>	PVC Pipe & Fittings	ASTM D 3034. Either SDR-26 or SDR 35. Solvent-weld Joints conforming to ASTM D-2855. Pipe solvent cement shall conform to ASTM D-2564. Solvent weld primer meeting ASTM F-656 is required when solvent weld PVC is used.
<b>Pressurized Sewers</b>	<p>Ductile Iron</p> <p>PVC Pipe / Schedule 80</p> <p>High Density Polyethylene (HDPE) 1-1/4" – 3" dia.</p>	<p>D.I. Pipe for pressure sewers shall conform to ANSI/AWWA C150/A21.51. Joints and method of joint restraint shall be determined by anticipated pressure conditions as approved by the Director.</p> <p>ASTM D 1785 meeting Class 200 with fittings per ASTM D 2466 and D 2467 is acceptable. Pipe must be solid-wall. Cellular core pipe is not acceptable.</p> <p>Must be manufactured in accordance with ANSI/AWWA C901 and meet ASTM D3035, ASTM F714 SDR 11. Joints shall be Standard Mechanical HDPE couplings or fusion welding conforming to ASTM D3261. Joining of plain-end pipes shall be by butt fusion per PPI TR-33. Inserted Stiffeners are required when using mechanical couplings.</p>

## **SOLVENT CEMENT (GLUE) POLICY & SPECIFICATIONS**

Solvent welded pipe & Fittings are allowed only in the following circumstances:

- For cleanout risers.
- When connecting ABS pipe to PVC pipe with a solvent weld transition coupling.
- When connecting PVC pipe to ABS-type backwater valve.
- On straight-run bored sections of pipe.
- On pressure sewer lines.

Approved cements for specific material connections:

- PVC to PVC; Glue meeting ASTM D-2564, NSF and UPC approved. Must be applied with purple PVC Solvent Weld Primer meeting ASTM F-656. Must be installed in conformance with ASTM D-2855.
- ABS to ABS; Glue meeting ASTM D-2235, NSF and UPC approved. Must be installed in conformance with ASTM D-2661.
- ABS to PVC with glue transition coupler (for use with ABS to PVC glue-type transition couplers); Glue meeting ASTM D-3138 (green in color), NSF and UPC approved. Viscosity minimum 700 CPS., Must be installed in conformance with ASTM D-2661.

## **SIDE SEWER INSTALLATION SPECIFICATIONS**

Installation of all acceptable pipe, whether gasket or solvent weld, shall be in strict accordance with manufacturer's specifications and recommendations as specified by the following ASTM numbers:

- D2321 Procedure for installation of PVC plastic pipe.
- D2855 Procedure for making solvent cement joints.
- D2235 ABS solvent cement specifications.
- D2321 Underground Installation for Sewers

The installer shall field locate the point of connection (sewer stub or dry side sewer) and confirm the elevation prior to any other excavation. The installer shall make a reasonable attempt to confirm that the sewer stub and/or dry side sewer is unobstructed and has appropriate grade.

The installer is responsible for connecting ALL wastewater drains to the sewer. Floor drains are not required to be connected to the public sewer if their sole purpose is to receive potable water which emanates from the buildings plumbing system. It is a violation of County Code to discharge or cause to be discharged any storm sewage or storm water into a sanitary sewer [Cross Reference SCC 8.03.3200].

BEDDING THE PIPE: (Ref. Drawing 7) Private sewers shall be laid on a firm bedding throughout the length of the pipe on material acceptable to the Director. Approved bedding material shall be a compacted layer two to six inches thick beneath the pipe, six inches each side of the pipe and six inches over the top of the pipe. Bedding material shall not be clay or silty soil or contain organic material such as sod or wood and shall not contain stone larger than 3/4". Because Pea Gravel does not provide stable support, it shall not be used for bedding material.

PIPE GRADE (SLOPE) AND ALIGNMENT: Side sewer pipe shall be installed in practical alignment and with uniform slope between approved fittings. The minimum slope for 4" & 6" diameter pipe is 1/4 inch/foot (2% grade). With the approval of the Director, gravity sewer pipe may be installed with a minimum slope of 1/8 inch/foot (1% grade) provided the pipe grade is set by utilizing a surveyor's level.

MINIMUM PIPE SIZE: Gravity side sewers serving single family or duplex structures shall be minimum four-inch (4") inside diameter. Side sewers serving more than two (2) single family residential units and ALL commercial structures shall be minimum six-inch (6") inside diameter. Pressure side sewers shall be 1.25" inch minimum diameter. Specific pipe diameter should be determined in conjunction with estimated flows and if applicable, the design of the pumping system.

THE TRENCH shall comply with Labor and Industries safety standards. Groundwater must be removed from the trench during the pipe laying process. Trench width shall be wide enough to insure proper bedding.

METHOD: Sewers may be installed by either open trench installation or by utilizing boring methods. The installer is required to have all appropriate tools and a grade-checking instrument on the job site.

Where practical, sewer pipe shall be installed in a manner that provides gravity drainage from the building to the public sewer. Gravity flow sewers shall have a minimum of two feet of cover over the top of pipe to surface level. The pipe shall be installed with the bell end upstream (toward the structure). Pipe shall be installed with markings or letterings readily visible to the inspector.

Pressure side sewers shall have a minimum four feet (4') of cover over top of pipe. When laying pressure pipe, pipe deflection shall be accomplished in the pipe length, not at the joint. Maximum deflection shall be in accordance with the pipe manufactures recommendations.

Foreign material shall be kept out of pipe and joining surfaces. The installer is responsible for sewer line cleaning which includes cleaning the public sewer main if debris enters the pipe as a result of his work.

Pipe may be installed through the existing openings of a septic tank in the following manner:

- The septic tank shall be completely pumped and filled and compacted as per sewage container abandonment standards.
- The pipe must be a straight, continuous piece. No joints are permitted within the tank.

## **PIPE FITTINGS & CONNECTIONS**

**Refer to drawings 1, 2, 3, 4 and 6**

For gravity side sewers:

- Vertical drops and Angle-downs shall be accomplished using approved fittings and regulation standards.
- All changes of direction shall be made with twenty-two and one-half degree (22-1/2°), eleven and a quarter degree (11-1/4°) or forty-five-degree (45°) bends, wye branch or a combination of wye branch and bends. Ninety-degree (90°) bends are NOT ALLOWED in the flow line.
- Straight and sanitary tees are NOT ALLOWED.
- Stacking fittings in opposing directions (swinging joints) in the flow line are NOT ALLOWED.
- Stacking fittings on a horizontal plane in the flow line is NOT ALLOWED unless a twelve -inch (12") in length minimum spacer pipe is inserted between the fittings (note: a spacer pipe is not required for wye combination connections or for cleanout riser pipe assemblies).
- Stacking fittings on a vertical step not exceeding sixty-eight degrees (68°) utilizing a twenty-two and one half degree (22-1/2°) fitting and a forty-five-degree (45°) fitting is ALLOWED (note: See Cleanouts).
- The manufacturer's installation specifications and recommendations shall be followed.

For pressure side sewers (outside the pump chamber):

- Solvent Weld Pipe: Ninety degree (90°) fittings are not allowed.
- All fittings shall be of the same specifications as the pipe to which they are being connected. The manufacturer's installation specifications and recommendations shall be followed.

## **CONNECTING TO THE SIDE SEWER STUB**

**Refer to Drawings 2, 3 and 4**

Prior to making connection to the side sewer stub, the installer shall:

- Confirm that connection will be made to the side sewer stub designated for the property. When multiple stubs are located in close proximity; the Installer shall coordinate with the Environmental Services Department to insure that the appropriate stub is used in the connection.
- Verify that the elevation of the stub is appropriate to provide gravity drainage from the building drain.
- Check that the stub has proper grade and that the piping is unobstructed.

Pressure side sewer connections to a gravity or pressure sewer stub shall be made by a solvent weld adaptor. A clean-out of the same size as the downstream piping shall be installed at this junction.

## **CONNECTING TO THE BUILDING DRAIN**

**Refer to Drawing No. 1**

The gravity side sewer shall only connect to Cast Iron, ABS or D3034 SDR 35 PVC building drains.  
CONNECTION TO ANY OTHER PIPE TYPE MATERIAL REQUIRES PRIOR APPROVAL FROM

THE ENVIRONMENTAL SERVICES DEPARTMENT. It is the installer's responsibility to check that the building drain(s) piping is in good condition, has sufficient grade and that the piping is unobstructed. If the building drain(s) piping is defective and cannot be repaired or is made of unapproved pipe material, replacement with an approved pipe material is required prior to connecting to the side sewer.

Connection to existing gravity building drain(s) piping shall be made with a flexible clamp type coupling meeting ASTM C1173 and C564. Solvent weld adaptors for ABS to PVC pipe connections are acceptable, provided that the manufacturer's solvent cement and joint preparation specifications are followed. Adaptors which have gaskets designed for ABS to PVC pipe connections are acceptable. **PVC-to- PVC pipe connections must be made with PVC couplers or fittings with acceptable gaskets.**

If connecting to a dry side sewer, the installer shall check for allowable pipe material type, proper grade and that the dry side sewer is unobstructed prior to making the building drain or sewer stub connection.

### **TRANSITION COUPLINGS & FITTINGS**

All transition fittings, couplings and donuts must be factory manufactured and specifically designed for the specific situation.

- Rubber fittings and donuts shall be Elastomeric Plastic with series 300 stainless steel clamps install per the manufacturer's specifications.
- For PVC to PVC connections, only PVC fittings and couplings are permitted. **No Fernco couplers are allowed.**
- For PVC to ABS connections, use PVC to ABS transition coupler with approved transition glue or a Fernco rubber coupler. **Fernco rubber couplers are allowed ONLY at the building drain connection.**

### **BACKFILLING THE TRENCH**

The trench shall not be backfilled until the pipe installation has passed inspection by the Spokane County Environmental Services Department. The installer shall take adequate precautions to protect the pipe from breakage or crushing from large rocks. If concrete or asphalt surfacing will be installed over the trench area, the backfill material must be placed in 6" thick layers and each layer compacted with appropriate compacting equipment. The soil should be moist, not wet, to facilitate compaction.

### **DRY SIDE SEWERS**

Dry side sewers shall be installed under the same requirements as live gravity or pressure sewers.

The dry side sewer shall be installed to allow the future removal of existing wastewater pump(s) where possible. Dry side sewers terminating inside the structure may be installed into a pump chamber (basin).

When a dry side sewer is required by the Environmental Services Department, it shall extend to the right-of-way. It may be necessary to install the sewer pipe beneath other utilities to meet this requirement. It is the responsibility of the installer to have the property line clearly identified. Dry side sewers with less than **six feet (6')** of cover installed in a utility easement shall include warning tape indicating buried sewer. The warning tape shall be placed **18" to 30"** above the dry side sewer pipe and extend from the end of the pipe to a point past the easement boundary.

Both ends of the dry side sewer shall have approved removable caps or plugs installed. The downstream end of the dry side sewer shall be marked with a length of a treated two by four wood with galvanized wire or rebar attached. The two by four shall be set vertical at the end of the dry sewer with the top end terminating within **6” inches** of finished grade.

There shall be a minimum of three feet (3') horizontal separation between parallel building drain piping and the dry side sewer to allow for an approved future reversal type of connection. The dry side sewer must be installed at a depth that permits a minimum two percent (2%) slope from the building drain to the dry side sewer.

## CLEANOUTS

### **Refer to Drawing No. 5**

#### REQUIRED LOCATIONS:

Cleanouts are required at the following locations along the pipeline:

- When there is a change in direction of ninety degrees (90°) or greater.
- When the cumulative change in direction exceeding one hundred thirty-five degrees (135°). This includes vertical step downs and horizontal piping to the entry point of the side sewer stub into the sewer main.
- At the building connection within three feet of the exterior face of the building foundation unless the required location would place the cleanout beneath a deck or patio, in which case the cleanout shall be installed within three (3') feet of the edge of the deck or patio.
- The distance between cleanouts in a straight run of pipe shall not exceed one hundred feet (100') including the height of the upstream cleanout riser.
- At the connection point of dissimilar pipe sizes and shall be of the larger pipe size.
- At the connection point of a pressure sewer into a gravity sewer. The cleanout access shall be the same size as the gravity sewer.
- Immediately downstream of an external backwater valve. An external backwater valve without the riser extension is acceptable as a limited range cleanout.
- At vertical drop type pipe connections

#### INSTALLATION REQUIREMENTS

- The connection of the cleanout riser to the building sewer shall be made with only wye or forty five degree (45°) fittings. Straight or sanitary tees are not allowed. Ninety degree (90°) elbows are not allowed.
- Reverse or Two-Way cleanouts may be required due to site constraints that prohibit standard cleanout placement.
- The top of the cleanout riser shall be within six inches (6”) of the casting cover or ground surface.
- All cleanouts shall have approved removable caps or plugs manufactured specifically for connection to the approved pipe. Approved caps or plugs shall be easily removed and replaced inside the casting or cover.
- All cleanouts on commercial property are required to be surface accessible with approved castings or covers.
- All cleanouts located in driveways or other traveled areas (including but not limited to bare earth, gravel or paved) are required to be surface accessible within a traffic rated casting.

## **BACKWATER VALVES (BWV)**

When the flood-level rim of a fixture (see definitions) is below the rim elevation of the next upstream sewer manhole, the drainage pipe serving that fixture shall be protected from sewage backflow with an approved type backwater valve (BWV). Fixtures with rim elevations above this elevation shall not discharge through *this* backwater valve. If installation of the required BWV in such a manner is not practical, the backwater valve may be installed downstream of the confluence of the upper and lower level drainage piping *with the approval* of the Director. For duplexes and Multi-family buildings, separate BWVs must be installed as described above for each dwelling unit connected to a jointly-used building drain to prevent sewage from one dwelling unit from backing up into a separate dwelling unit.

The BWV must be readily surface accessible for inspection, maintenance and repair. A watertight housing shall surround the BWV and have an adequately sized lid to provide access. The housing shall be supported by a concrete pad or blocks and installed in such a manner that it will not rest or settle on the sewer pipe. Installing the housing to one side of the backwater valve (offset) will facilitate better access. A traffic rated housing is required for installations in traveled areas.

A concrete block of adequate size shall be positioned under the BWV for support. BWVs shall have cast iron, plastic, or brass bodies, non-corrosive bearings, seats and self-aligning discs, and constructed to insure a positive mechanical seal which remains closed except when discharging wastewater.

## **INSTALLING SIDE SEWERS USING THE BORING METHOD**

- Solvent weld pipe joints are allowed in the straight pipe run sections of the bored pipe.
- Bored pipe may be sleeved within Schedule 40 PVC casing pipe to reduce friction drag.
- Three feet (3') horizontal separation is required between the building drain and the bored portion of piping to allow for an acceptable smooth sweep connection.
- It is the responsibility of the installer to aim the boring tool at the sewer stub in such a fashion to allow connections as per these regulations to be made.
- The minimum grade allowed for bored side sewers is ¼" inch per foot or 2% grade. The installer will be required to excavate and relay to an acceptable slope any portion of bored sewer with insufficient grade. The relayed and connection points to buried sewer shall be left uncovered for inspection. If the connection point is within five-feet (5') of the structure the installer may be required to install an outside cleanout at this point.
- All bored side sewers shall be tested for acceptance. (See Testing Requirements and Procedure).

## **TESTING REQUIREMENTS AND PROCEDURE**

Any segment of a side sewer installed by the boring method which has pipe joints within the bored portion is required to be tested. Multiple bored sections shall be tested independently.

Pressure sewer lines constructed with PVC pipe is required to be tested. Pressure sewer lines constructed with HDPE and have no pipe joints between the connection at the pump and the point of connection to the curb stop or gravity sewer stub are not required to be tested.

The County reserves the right to require sewer pipe testing for non-typical installations.

The Installer shall furnish all labor, materials, tools and equipment necessary to conduct the required test, clean the sewer lines and perform all incidental work. The installer is responsible for the repair of any damage which

may be incurred from the testing process. All tests shall be made in the presence of the Spokane County inspector. The inspector may require the sewer to be tested after backfill.

#### EXFILTRATION METHOD FOR TESTING GRAVITY FLOW PIPE:

1. Sewers shall be cleaned prior to testing.
2. A riser pipe shall be installed six feet (6') above the crown at the upper end of the test section.
3. The length of sewer being tested shall be limited so that the pressure at the lower end of the test section does not exceed sixteen feet (16') of head above the invert at the lower end.
4. The lower end of the test section shall be plugged to withstand the test pressure and shall have a readily removable plug.
5. All wyes, tees, stubs and risers shall be plugged to withstand test pressure and shall have readily removable caps or plugs.
6. The test section shall be filled with clear water from the upper end only.
7. Test time is five (5) to fifteen (15) minutes. NO LEAKAGE IS ALLOWED.

#### TESTING SEWERS INSTALLED BY THE BORING METHOD

1. Bored sections of the sewer shall be tested using the exfiltration method described above.
2. The inspector shall observe the release of the test water.
3. Test water shall drain quickly, completely and be free of any dirt or debris.
4. The bored sewer line may be required to be visually inspected to verify accuracy of alignment, standing water/grade problem, debris or obstructions. The full diameter of the bored section shall be visible when viewed from the upper or lower ends using lights and mirrors (lamping). A video inspection at the expense of the installer may be required in cases where lamping cannot provide an acceptable visual inspection.

#### LOW PRESSURE AIR TEST METHOD

The Director may approve a low-pressure air test in lieu of the exfiltration method for gravity and pressure pipe. The tested section shall hold 3.5 psig pressure for two (2) minutes minimum with NO leakage loss. The inspector shall witness the filling and discharge of air into the pipe. In addition, an empty container with a minimum volume of one gallon shall be placed at the lower end of the bored section. One (1) gallon of water shall be poured into the upper end of the test section. The full amount of water poured in must discharge into the container. The inspector shall observe the release of the test water. The test water shall drain quickly, completely and be free of any dirt or debris.

### **SEPTIC TANK/WASTE WATER RECEPTACLE ABANDONMENT**

Septic tanks and other on-site wastewater receptacles removed from service as part of a connection to the Spokane County sewer system are required to be abandoned in accordance with the regulations set by the Spokane Regional Health District per the following standards:

1. When the connection to public sewer is accomplished with only work inside the structure (interior dry sewer connection), septic tank abandonment shall be inspected by Spokane County Environmental Services Department.

Spokane County Environmental Services Department will perform septic tank/receptacle abandonment inspections if they are done at the same time as the sewer connection inspection. All other tank abandonment inspections shall be performed by the Spokane Regional Health District (SRHD). The Health District's phone number is (509) 324-1560. The SRHD's permit and fees for septic tank / receptacle

abandonment are in addition to the sewer connection permit fees charged by the Environmental Services Department.

The contents of the tank/receptacle (wastewater and solids) shall be completely removed and hauled offsite by a commercial pumper licensed by SRHD.

**➤ IN NO CASE SHALL THE CONTENTS OF THE SEPTIC TANK BE DISCHARGED INTO THE REGIONAL SEWER SYSTEM.**

2. The septic tank(s)/receptacle(s) shall be abandoned under one (1) of the three (3) options below:
  - 1) Remove the tank(s)/receptacle(s) and transport it to an approved disposal site; or
  - 2) Thoroughly collapse/crush the tank(s)/receptacle(s) in place. The top and sides must be broken up into pieces, and the area shall be filled with compacted native soil or fill material; or
  - 3) Fill the chamber(s)/compartment(s) with pea gravel or coarse sand. Native inorganic soil or clean fill material may be accepted, providing these materials are carefully placed and hand tamped to ensure all voids are reached. All fill materials must be reasonably dry. Frozen material is not acceptable. Risers are to be removed prior to filling the tank(s)/receptacle(s).
3. The time limit to complete abandonment is seven (7) days after final connection to sewer.
4. Improperly abandoned septic tank(s)/receptacle(s) are subject to a re-inspection fee. Spokane County Environmental Services Department has the right to defer the re-inspection to the SRHD, upon which applicable fees and permits required by the SRHD for re-inspection shall be due to the SRHD. If site conditions prevent proper septic tank/receptacle abandonment, the property owner may apply for a waiver from SRHD.

## **PRIVATE LOW PRESSURE PUMP SYSTEMS**

### **Refer to Drawing No. 8**

THE FOLLOWING SPECIFICATIONS APPLY TO PRIVATELY-OWNED PUMP SYSTEMS INSTALLED OUTSIDE OF THE BUILDING(S) BEING SERVED. PUMP SYSTEMS INSTALLED WITHIN THE BUILDING(S) SHALL MEET THE REQUIREMENTS OF THE BUILDING DEPARTMENT OF THE JURISDICTION HAVING AUTHORITY

Wherever practicable, plumbing fixtures shall be drained to the public sewer by gravity. If a building's upper level floors can connect by gravity to the public sewer but lower levels cannot, wastewater from lower level fixtures shall be pumped and discharged into the upper level plumbing.

The Director shall make the final determination to allow the pump system. The installer and/or the pump supplier shall be responsible for the design and construction of the pump system. Requirements for various components of the pump system shall include the following:

#### **1. SIZE AND TYPE OF PUMPS**

For systems where sewage is being pumped from the building into a gravity sewer main, a sewage (ejector) pump may be used. The pump shall be capable of passing a one and one-half inch (1-1/2") diameter solid ball and the discharge piping of each pump shall have a backwater valve and gate valve, and be not less than two inches (2") in diameter.



For systems where sewage is being pumped into a pressurized sewer main, a grinder pump shall be used. The discharge piping shall be sized in accordance with the manufacturer's instructions and shall not be less than one and one-fourth inches (1-1/4") in diameter. A check valve and full way-type shutoff valve shall be located within the discharge line.

All mechanical components of the pump(s) shall be rated for use with sewage. The inlet port of the pump(s) shall be at least two inches (2") above the bottom of the pump chamber (basin).

## 2. DUPLEX PUMP SYSTEMS – WHEN RECOMMENDED OR REQUIRED

For properties that will be pumping five hundred (500) gallons or more per day, the property owner should consider installing a duplex pump system for added reliability and protection. The pumps shall alternate with each pump cycle and in cases of high flow, both pumps can operate simultaneously. All duplex pump systems require an engineered design. In some cases, the Director can require that the pump system installed shall be a duplex system.

## 3. PUMP CONTROLS and ALARMS

The automatic switching mechanisms shall be adjustable mercury-float type, mechanical type or ultrasonic-type. Control mechanisms and corresponding alarms shall include the following set points:

- "High Level" indicating a high liquid level in the pump chamber (basin). The high-level float switch shall be adjusted in the pump chamber (basin) such that it activates the alarm when the liquid level in the pump chamber (basin) is no less than one inch below the invert elevation of the inlet pipe.
- "Pump on" float switch shall be adjusted to activate the pump at a predetermined liquid level.
- "Pump Off" low-level float switch shall be adjusted to deactivate the pump at a predetermined liquid draw down level.
- "Redundant Pump Off" switch is a secondary pump off switch that should guarantee the pump is always submerged.
- Alarms must be on an electrical circuit separate from the pump power circuit.

## 4. PUMP CHAMBER (a.k.a BASIN)

The pump chamber, or basin, is the vessel into which the sewage or ejector pump and various pipe and components are installed. Sewage from the buildings plumbing system is discharged into the pump chamber.

Pump chambers may be installed either inside or outside the building. Inside installations shall meet the requirements of the Building Department of the jurisdiction having authority. The Environmental Services Department shall inspect pump chambers and assemblies installed outside the structure. Pump assemblies and installations shall meet or exceed the requirements listed in this handbook.

The pump chamber, including its access cover or lid, shall be watertight construction of fiberglass, noncorrosive metals, reinforced concrete or other approved material. The access cover or lid shall be at least three inches (3") above the surrounding ground surface and secured in a manner to prevent unauthorized access. The cover or lid shall have a neoprene type seal or other approved material to prevent the infiltration of water into the chamber.

The pump chamber must be properly sized to ensure the pump does not short cycle and cause premature pump failure. The chamber must be vented to atmosphere with a minimum two-inch (2") diameter vent.

## 5. UTILIZING THE EXISTING SEPTIC TANK TO HOUSE THE PUMP

Under special circumstances *and with approval of the Director*, one chamber of the emptied and cleaned septic tank MAY be utilized to house the sewage pump assembly. However, in addition to other requirements of this section, the following modifications must be done to the septic tank:

- The pump must be installed within a watertight sump separate from the septic tank. The septic tank chamber shall not be used as the pump basin unless the Director determines that the anticipated sewage flow is large enough to require the larger volume of the septic tank chamber.
- The annular space around the pump chamber to the septic tank walls must be filled with concrete at least 10" deep to prevent movement of the pump.
- The septic tank chamber containing the pump must be sealed off from the other chambers of the septic tank with concrete or non-shrink grout.
- The tank must be accessible from the ground surface without digging.

Consideration should be given to the cost of modifying the existing tank versus installation of a new pump structure.

## 6. PIPING and CONNECTIONS INSIDE THE PUMP CHAMBER

The pump shall be installed to allow for easy removal for repairs. An accessible gate valve or ball valve and quick disconnects for both electrical and discharge piping shall be provided to facilitate removal of the pump from the pump chamber. The valve or its control, shall be located above the high liquid level depth, or located outside the chamber in a secured valve box with above ground accessibility. The pump(s) may be tethered using a minimum quarter-inch (1/4") poly type rope (or an equivalent as approved by the Director) doubled and secured to the pump(s) and to a point above the high liquid level in the pump chamber (basin). The pump(s) shall be provided with an accessible check valve located above the "pump on" liquid level and shall be the type approved for the application and rated to withstand expected backpressure. All exposed fasteners shall be Series 300 stainless steel. Pump chamber piping shall be minimum schedule 40 PVC with a minimum pressure rating of one hundred fifty pounds per square inch (150 psi). All fittings shall be minimum schedule 40 PVC with the exception of the quick disconnect coupler (union) which shall be schedule 80. All pipe and fitting joining shall be in strict accordance with the manufacturer's specifications and recommendations.

The pipe from the building drain to the pump chamber shall be gasketed PVC meeting ASTM 3034 SDR 35 and a minimum diameter of four inch (4"). The pump chamber (basin) inlet pipe opening shall be sealed or gasketed. Mortar or concrete seals applied to PVC pipe to bond the inlet pipe to concrete pump chambers are **NOT** allowed; concrete pump chambers shall have cast in place gaskets or seals. All cleanout specifications shall apply.

Check valves shall be cast iron or brass body type. PVC ball check valves **NOT** allowed.

## 7. PRESSURE PIPE

This is the pipe operating under pressure extending from the pump to the sewer stub. The pipe shall be sized to pump between two feet per second (2 fps) and five feet per second (5 fps), but in no case be less than 1 ¼ inch inside diameter. A minimum of three feet (3') of cover is required over the top of force mains.

Force mains exceeding two hundred (200') feet in length shall require a flushing connection every one hundred (100') feet (See Flushing Connection Specifications). The Director may require an engineered design be submitted.

## 8. ELECTRICAL CONNECTIONS

The Washington State Department of Labor and Industries Electrical Division shall inspect all electrical components and wiring. Proof of the electrical installation approval must be submitted to the Director.

## 9. PUMP TESTS

A pump cycle test is required for commercial and residential installations. The following operational aspects of the pump shall be tested:

- The pump turns on when liquid meets the high set point.
- The pump turns off when liquid meets the low set point.
- The alarm is activated when the liquid exceeds the high set point and the pump does not turn on. The pump test shall be performed with clean water, not sewage.

## GREASE INTERCEPTORS

THE FOLLOWING REGULATIONS PERTAIN TO THE INSTALLATION REQUIREMENTS OF GREASE INTERCEPTORS INSTALLED ON THE EXTERIOR OF THE BUILDING FOR COMMERCIAL APPLICATIONS. GREASE TRAPS INSTALLED WITHIN THE BUILDING(S) SHALL MEET THE REQUIREMENTS OF THE BUILDING DEPARTMENT OF THE JURISDICTION HAVING AUTHORITY.

GREASE INTERCEPTORS SHALL BE INSTALLED AND OPERATED AS REQUIRED BY ARTICLE 5000 OF CHAPTER 8.03 OF THE SPOKANE COUNTY SANITARY SEWER CODE. GREASE INTERCEPTORS SHALL COMPLY WITH THE FOLLOWING DESIGN AND CONSTRUCTION SPECIFICATIONS.

**GRAVITY GREASE INTERCEPTORS:** Any commercial food facility which generates grease waste shall include a grease interceptor as part of their sewer. An approved type grease interceptor complying with the provisions of these regulations shall be installed in the waste line leading from sinks, drains, and other fixtures or equipment in any business or where grease is introduced into the drainage or sewer pipes in quantities sufficient to create blockage in said pipes. A grease interceptor is not required for individual dwelling units or private living quarters.

In addition to other design requirements, grease interceptors shall comply with the following:

- a. Shall be installed outside the structure, easily accessible for inspection, cleaning, maintenance and repair of the interceptor.
- b. Only waste discharge from the kitchen and cleanup area shall drain into the grease trap. Toilets, urinals, and other similar fixtures shall not drain through the grease trap.
- c. Waste shall enter the interceptor only through the inlet pipe.
- d. The grease interceptor shall be designed, constructed, and sized in accordance with the current edition of the Uniform Plumbing Code.
- e. Grease interceptor shall be maintained in operating condition by periodic removal of the accumulated grease and latent materials. Should Spokane County determine that a grease interceptor is not being properly maintained, a maintenance program shall be initiated.

**EXISTING GREASE INTERCEPTORS:** Existing grease interceptors shall be thoroughly pumped out and cleaned by a licensed septic tank pumper and inspected by County staff prior to the building's connection to the public sewer. The grease trap may have to be pumped out to allow for a proper inspection. A grease interceptor which does not meet County standards must be repaired or replaced prior to the building's connection to the public sewer.

**INDUSTRIAL INTERCEPTORS (CLARIFIERS) AND SEPARATORS:** Interceptors (clarifiers) (including grease, oil, and sand interceptors (clarifiers), etc.) shall be provided when, in the judgment of the Director or as required by the "SSO", they are necessary for the proper handling of liquid wastes containing grease, flammable wastes, sand, solids, acid or alkaline substances, or other ingredients harmful to the building drainage system or the public or private sewer system. In addition to other requirements, industrial interceptors and clarifiers shall meet the following standards:

- a. The size, type, and location of each interceptor (clarifier) or separator shall be approved by the Director in accordance with Spokane County Sanitary Sewer Ordinance. Except where otherwise specifically permitted, no wastes other than those requiring treatment or separation shall be discharged into any interceptor (clarifier).
- b. Interceptors (clarifiers) for sand and similar heavy solids shall be so designed and located as to be readily accessible for cleaning and shall have a water seal of not less than six-inches (6").
- c. Interceptors (clarifiers) shall be so designed that they will not become air bound if closed covers are used. Each interceptor (clarifier) shall be properly vented.
- d. Each interceptor (clarifier) cover shall be readily accessible for servicing and maintaining the interceptor (clarifier) in working and operating condition. The use of ladders or the removal of bulky equipment in order to service interceptors (clarifiers) shall constitute a violation of accessibility. Location of all interceptors (clarifiers) shall be shown on the approved building and sewer plans and the record drawings.
- e. Every private or public wash rack and/or floor or slab used for cleaning machinery, vehicles or machine parts shall be adequately protected against storm or surface water and shall drain or discharge into an interceptor (clarifier) of an approved design for this use.
- f. Access covers, lids and traffic rated interceptors (clarifiers) and separators shall conform to the grease trap requirements contained in these regulations.

### **ABANDONMENT OF SEWER SERVICE**

Abandonment of the sewer service requires a permit and inspection by the Environmental Services Department. The Department will not discontinue billing of the monthly sewer service fee until the abandonment has been accomplished to the satisfaction of this Department as follows:

1. When a mobile or manufactured home is removed from the site for the purpose of replacement of a newer mobile or manufactured home, the sewer drain pipe within the footprint of the home shall be capped with a glue-on cap manufactured for this specific use.
2. For all other situations, the building sewer shall be cut at a point no more than fifteen feet from the property line where the sewer service line enters the property. The open end of the sewer pipe leading the public sewer must be plugged or capped with fittings manufactured for this specific purpose.

## **SECTION II - ADMINISTRATIVE**

**AUTHORITY:** Pursuant to the authority of Spokane County Sanitary Sewer Ordinance No. 96-0752 adopted October 1, 1996, the Director of the Spokane County Environmental Services Department is authorized to prepare, revise and administer standards, as established by resolution by the Board of County Commissioners. The standards shall be printed in manual form as a "separate" section (or Appendix) of the "Spokane County Standards for Road and Sewer Construction" and shall be referred to as the "Sewer Standards Handbook". This handbook contains excerpts from the Sanitary Sewer Ordinance (referred to as "SSO" in these regulations) and these excerpts may be enhanced to provide comprehensive standards. [Cross References: SSO 8.03.1835, 8.03.6220]

**ENFORCEMENT:** Spokane County Environmental Services Director shall enforce these regulations and may refer violation cases to Spokane County Prosecuting Attorney Office, as appropriate. In the event of a violation, the Director and/or Spokane County Prosecutor's Office may initiate enforcement or disciplinary actions or any other legal proceeding authorized by law, including but not limited to any one or a combination of the following:

- Informal administrative conferences, convened at the request of the Director, installer or property owner, to explore facts and resolve problems.
- Formal Administration Hearings, convened at the request of the Director to determine the facts for possible issuance of a Conditional Probationary Order and/or a Cease and Desist Order and its duration. [Cross Reference: SSO 8.03.6220 D].
- Denial, suspension, modification or revocation of permits, approvals or acceptance.
- Civil or criminal action.

Orders authorized under this section include the following:

- Orders requiring corrective measures necessary to effect compliance with these regulations which may include a compliance schedule.
- Orders to stop work and/or refrain from using any sewer or portion of the sewer or improvements to the sewer.

Enforcement orders issued under this section shall be in writing and shall specify:

- The name of the person(s) to whom the order is directed;
- A description of each action or inaction constituting the violation;
- The required corrective action, if applicable;
- The effective date of the order, with time(s) of compliance;
- The consequences of failure to comply with said corrective action or repeated violations.
  - Such notices may include a statement that continued or repeated violation may result in:
    - Denial, suspension, or revocation of sewer connection permits.
    - Referral to the office of the County Prosecutor or Attorney General.
    - Other appropriate remedies.

Enforcement orders shall be personally served in the manner of service of a summons in a civil action or in a manner showing proof of receipt.

**APPEAL PROCEDURE:** The Director shall make available an administrative appeals process to consider procedural and technical conflicts arising from the administration of the regulations and establish rules for conducting hearings requested to contest the Director's actions. The Director shall provide notice of a denial, suspension, modification or revocation of a sewer connection permit. A person contesting the Director's decision regarding a sewer permit, approval, acceptance or applied penalties may file a written request for an adjudicative proceeding consistent with the regulations and the ordinance.

**DEVIATION OF REGULATIONS WAIVER:** Whenever a strict interpretation of these regulations would result in extreme hardship or there are other unusual factors to be considered; as determined by the Director, the Director may waive such regulation or portion thereof, provided that the waiver is consistent with the intent of these regulations and that no public health hazard will result. The Director may require a written waiver request be submitted with all the reasons for granting the waiver stated. Any waiver requests granted must be in writing with all the reasons for granting the waiver stated and shall be attached to the sewer connection report or the appropriate file.

**LIABILITY OF SPOKANE COUNTY OR ITS EMPLOYEES:** This regulation shall not be construed as imposing upon Spokane County any liability or responsibility resulting from any defective portion of the side

sewer or the installation thereof; nor shall Spokane County or its employees be held as assuming any liability or responsibility by reason of the authorized inspection(s).

**CONFLICTS:** In any case where a provision of these regulations is in conflict with the provisions of any zoning, building, fire, safety, shoreline management or health regulations, law, or ordinance effective within Spokane County, the provision which established a higher standard or specification or which is more stringent in its requirements shall control.

**SEVERABILITY:** If any section, subsection, subdivision, sentence, clause or phrase of these regulations is determined by a court of competent jurisdiction to be invalid, unenforceable or unconstitutional, such determination shall not affect the validity of the remaining portions hereof. Further, if it is determined that some or all of these regulations cannot be enforced as to a particular set of circumstances or as to a particular person, the application of the provision to other persons or circumstances shall not be affected.

**PUBLIC EMPLOYEES:** Obstructing a public servant is a misdemeanor Title 9a.76.180 RCW: Washington Criminal Code. Intimidating a public servant is a Class B felony, Title 9a.76.180 RCW: Washington Criminal Code.

**AUTHORIZED INSTALLERS:** Construction of sewers shall only be performed by State of Washington licensed and bonded contractors. In the case of private sewers, sewers may also be constructed by the owner of the property to be served by the sewer. Owner installations are subject to the Director's approval. The installer shall be responsible for compliance with the Spokane County Sanitary Sewer Ordinance and Spokane County Standards for Road and Sewer Construction. [Cross Reference: SCC 8.03.6005]

## DEFINITIONS

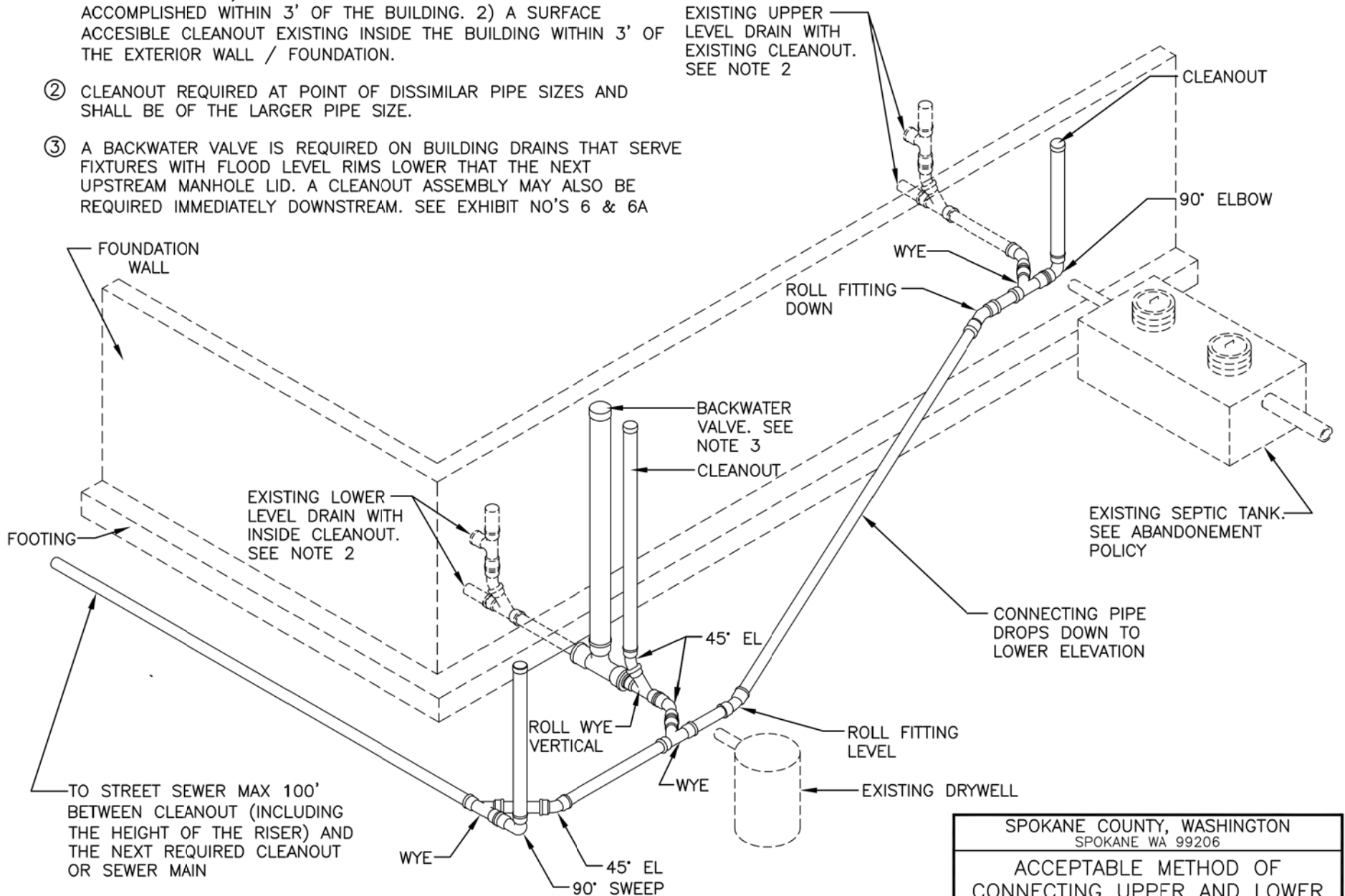
The definitions provided below are an excerpt from Article 1000 of the SSO to provide clarification of terms relative to the design and construction of private side sewers and is not an all-inclusive list. Also, included in this section are definitions which are not from the SSO but are deemed applicable to the design and construction of side sewers.

- a. "ABS" refers to Acrylonitrile-Butadiene pipe.
- b. "BUILDING DRAIN" is that part of the lowest piping of a drainage system which receives the wastewater discharge from a structure or building to a point two feet outside the outer face of a structure, wall or foundation and conveys it to the sewer or an on-site sewage disposal system.
- c. "BUILDING SEWER" is that part of drainage piping from the building drain to a sewage container or public sewer.
- d. "DIRECTOR" means the Director of the Spokane County Environmental Services Department, or his/her designee. [Cross Reference: SSO 8.03.4800}
- e. "DRY SIDE SEWER" (also referred to as "double plumbing") is a sewer service line installed on properties with on-site sewage disposal systems, not connected to the building drain, to facilitate future connection to a public sewer once the public sewer becomes available.
- f. "FLOOD-LEVEL RIM" is the top surface of a fixture over which excess liquid would spill.

- g. "L & I". Washington State Department of Labor & Industries.
- h. "ON-SITE SEWAGE DISPOSAL SYSTEM" is any system or combination of piping, treatment, or other facilities that stores, treats and/or disposes of sewage and effluent on the property where it originates, or on adjacent or nearby property under the ownership of the user of the system or in which the user has a recorded interest for the purpose of maintaining the system on such other property. These systems include, but are not limited to, septic tank disposal systems and cesspools.
- i. "PRIVATE SEWER" is a sewer not owned or maintained by a public authority.
- j. "PVC" refers to Polyvinyl Chloride plastic pipe.
- k. "SIDE SEWER" is a sewer, not directly controlled or maintained by a public authority, which begins approximately two feet outside the outer face of a structure wall or foundation, conveying wastewater from the building(s) drain(s) to a public sewer or private sewer. The term side sewer also includes any double plumbing dry side sewer and temporary sewer connections. The property owner is responsible for the maintenance and repair of the entire side sewer, including the portions located within the public right-of-way.
- l. "SIDE SEWER STUB" is that portion of a side sewer, located between the public sewer line and a point near the property line of the premises to be served. After connection has been made to the premises, the side sewer stub shall become part of a side sewer and shall be maintained by the property owner to the point of entry into the public sewer.
- m. "SRHD" The Spokane Regional Health District.
- n. "SSO" The Sanitary Sewer Ordinance

# NOTES

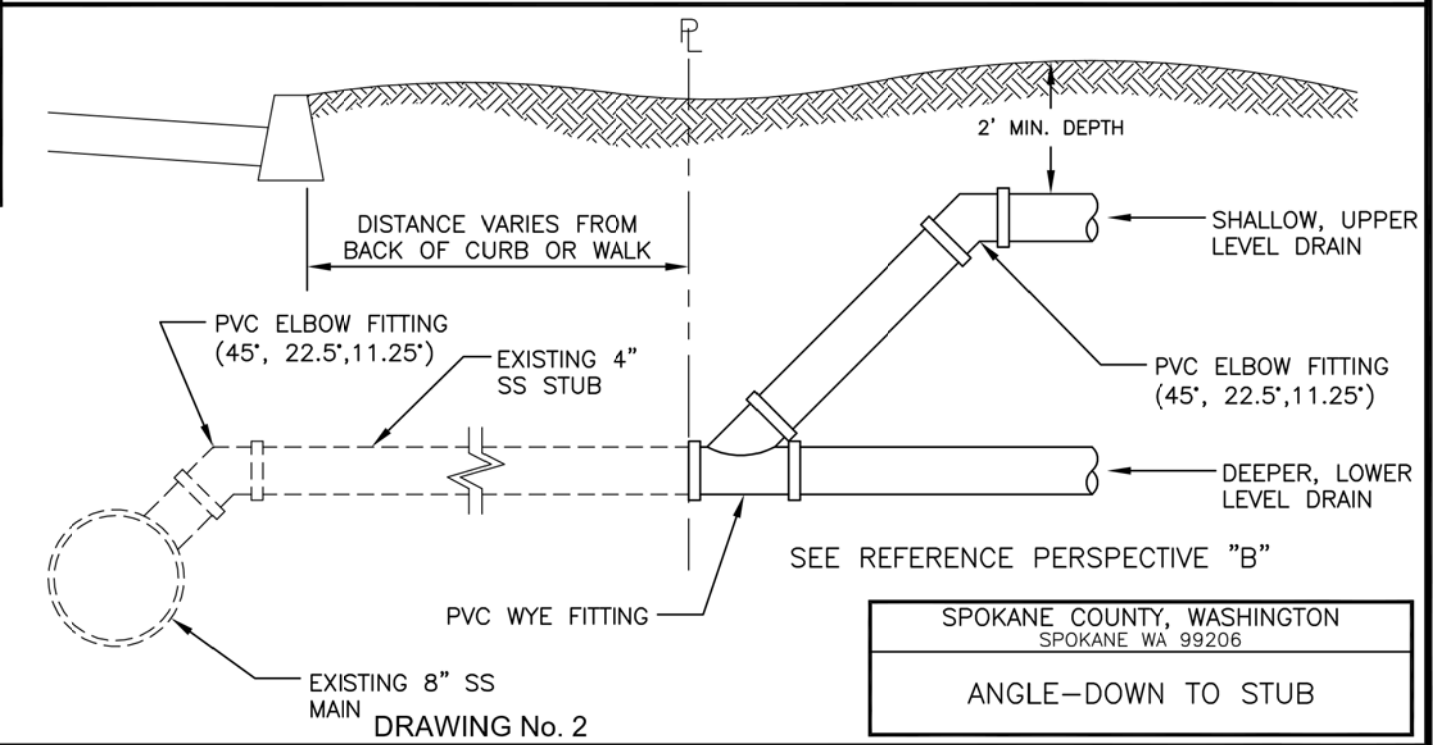
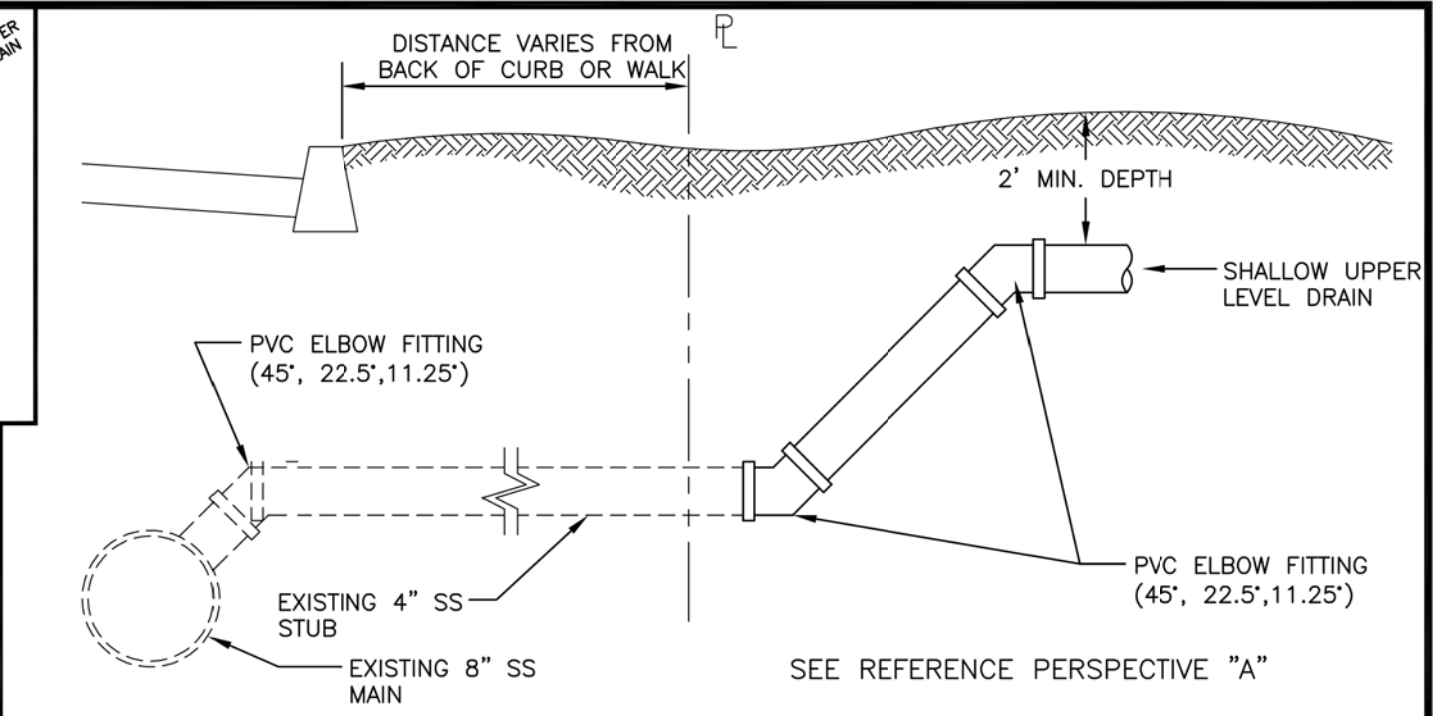
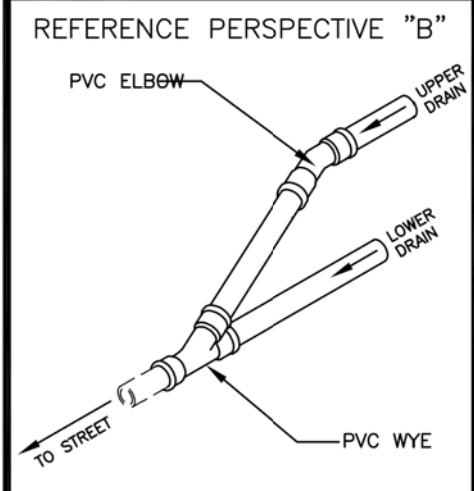
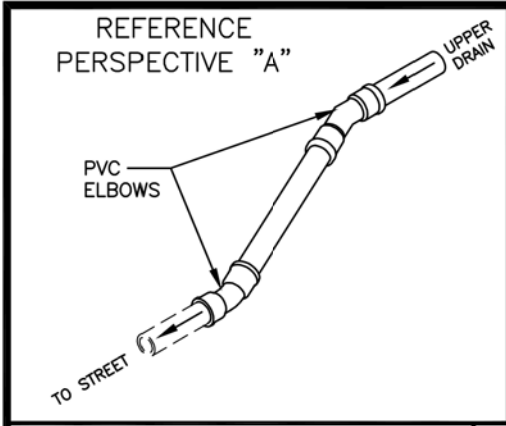
- ① CLEANOUT IS REQUIRED AT POINT OF CONNECTION TO THE BUILDING DRAIN UNLESS: 1) A 90° CHANGE OF DIRECTION CAN BE ACCOMPLISHED WITHIN 3' OF THE BUILDING. 2) A SURFACE ACCESSIBLE CLEANOUT EXISTING INSIDE THE BUILDING WITHIN 3' OF THE EXTERIOR WALL / FOUNDATION.
- ② CLEANOUT REQUIRED AT POINT OF DISSIMILAR PIPE SIZES AND SHALL BE OF THE LARGER PIPE SIZE.
- ③ A BACKWATER VALVE IS REQUIRED ON BUILDING DRAINS THAT SERVE FIXTURES WITH FLOOD LEVEL RIMS LOWER THAT THE NEXT UPSTREAM MANHOLE LID. A CLEANOUT ASSEMBLY MAY ALSO BE REQUIRED IMMEDIATELY DOWNSTREAM. SEE EXHIBIT NO'S 6 & 6A



DRAWING No. 1

SPOKANE COUNTY, WASHINGTON SPOKANE WA 99206
ACCEPTABLE METHOD OF CONNECTING UPPER AND LOWER DRAIN FACILITIES OF A HOUSE

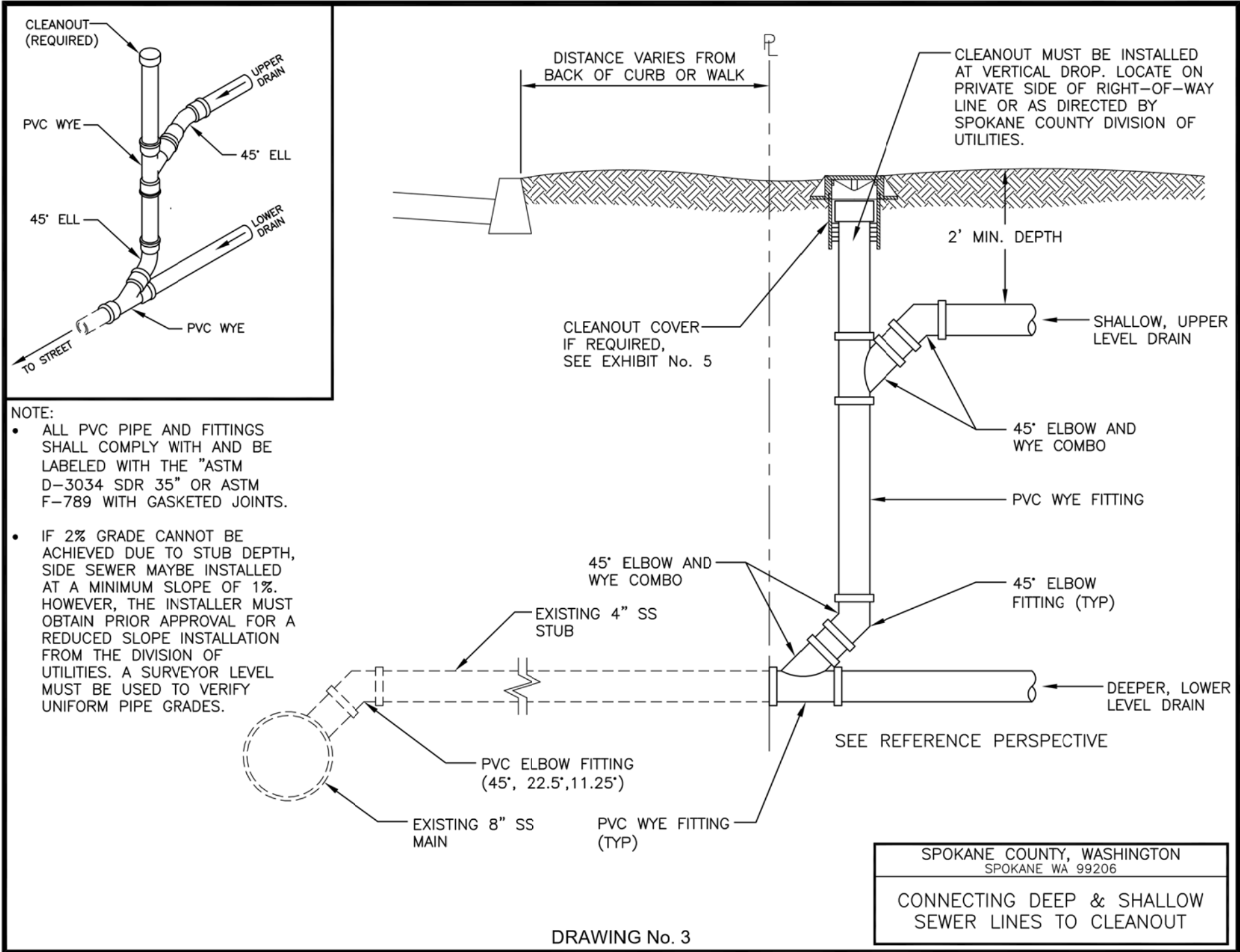




- NOTE:
- ALL PVC PIPE AND FITTINGS SHALL COMPLY WITH AND BE LABELED WITH THE "ASTM D-3034 SDR 35" OR ASTM F-789 WITH GASKETED JOINTS.
  - IF 2% GRADE CANNOT BE ACHIEVED DUE TO STUB DEPTH, SIDE SEWER MAYBE INSTALLED AT A MINIMUM SLOPE OF 1%. HOWEVER, THE INSTALLER MUST OBTAIN PRIOR APPROVAL FOR A REDUCED SLOPE INSTALLATION FROM THE DIVISION OF UTILITIES. A SURVEYOR LEVEL MUST BE USED TO VERIFY UNIFORM PIPE GRADES.
  - FOR ANGLE DOWN EXCEEDING 1:1 SLOPE, THE INSTALLER SHALL OBTAIN PRIOR TO APPROVAL FROM THE DIVISION OF UTILITIES. A CLEANOUT MAY BE REQUIRED AT A LOCATION DESIGNATED BY THE DIVISION OF UTILITIES.

SPOKANE COUNTY, WASHINGTON  
 SPOKANE WA 99206  
 ANGLE-DOWN TO STUB

DRAWING No. 2

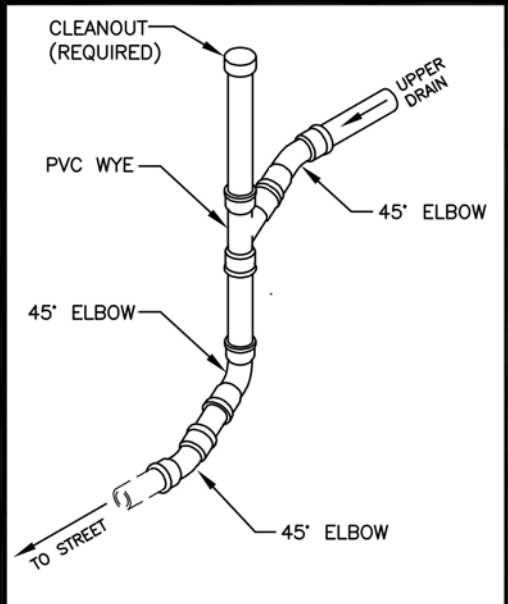


- NOTE:
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SPOKANE COUNTY, WASHINGTON  
 SPOKANE WA 99206

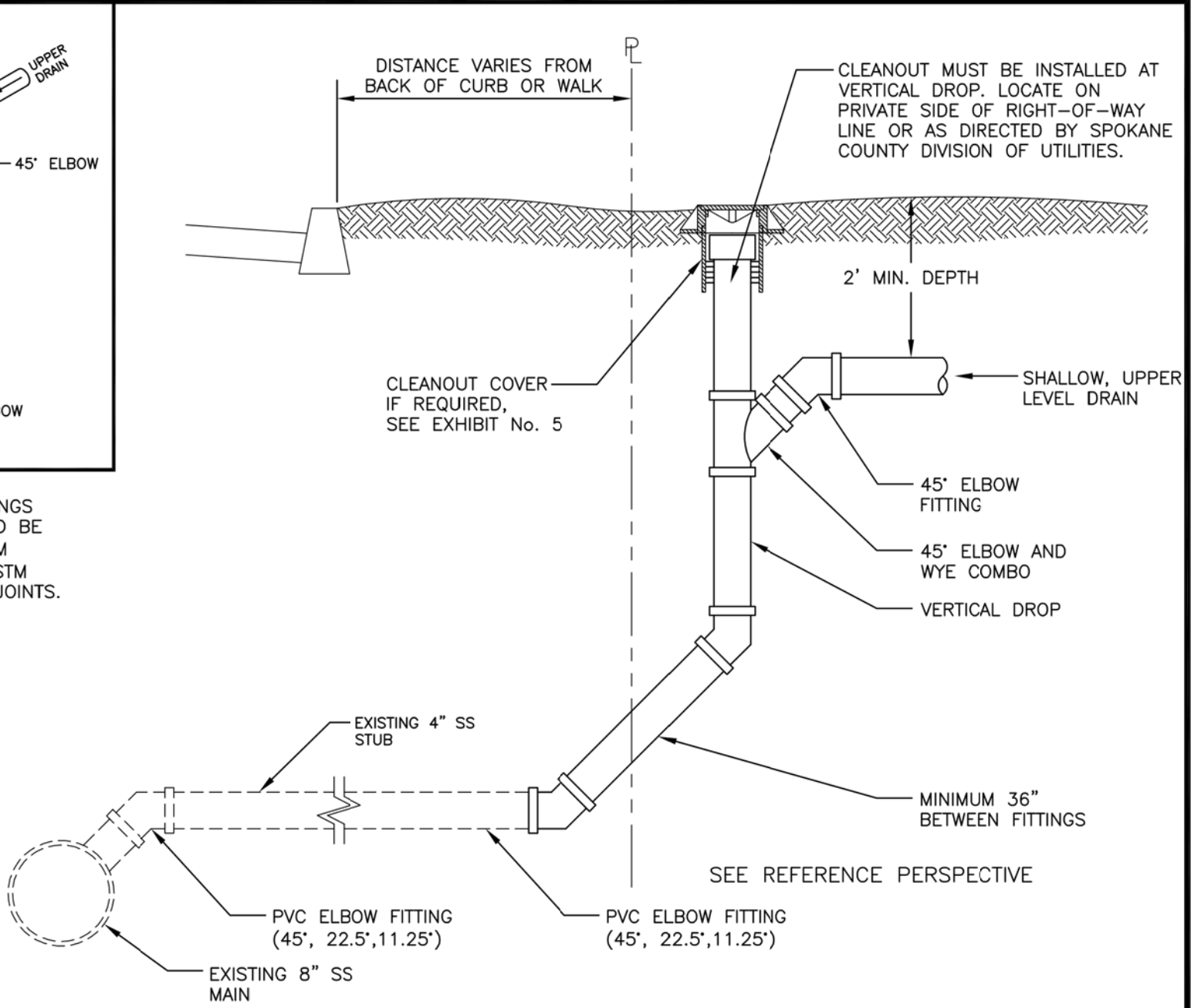
CONNECTING DEEP & SHALLOW  
 SEWER LINES TO CLEANOUT

DRAWING No. 3



NOTE:

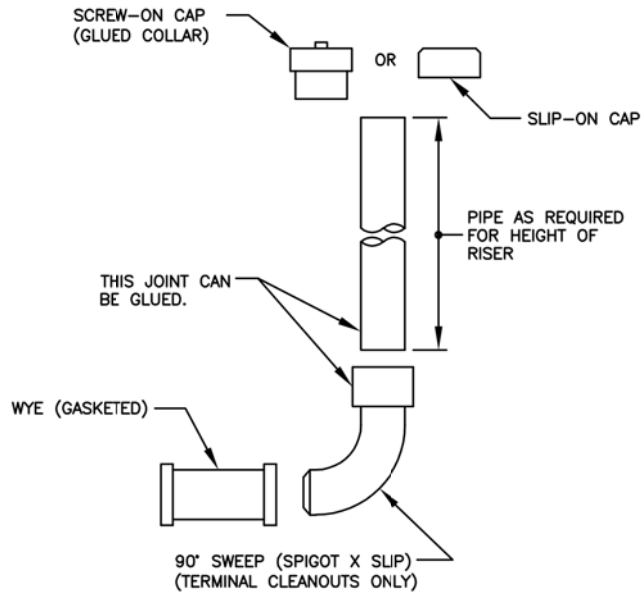
- ALL PVC PIPE AND FITTINGS SHALL COMPLY WITH AND BE LABELED WITH THE "ASTM D-3034 SDR 35" OR ASTM F-789 WITH GASKETED JOINTS.



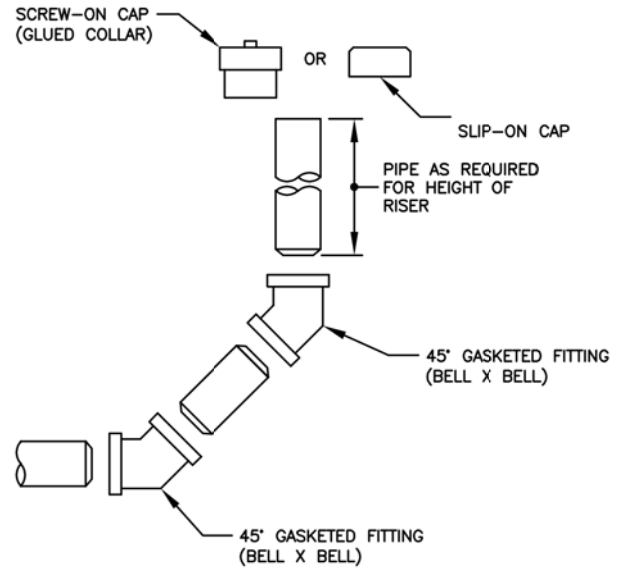
SPOKANE COUNTY, WASHINGTON  
 SPOKANE WA 99206

VERTICAL DROP TO STUB

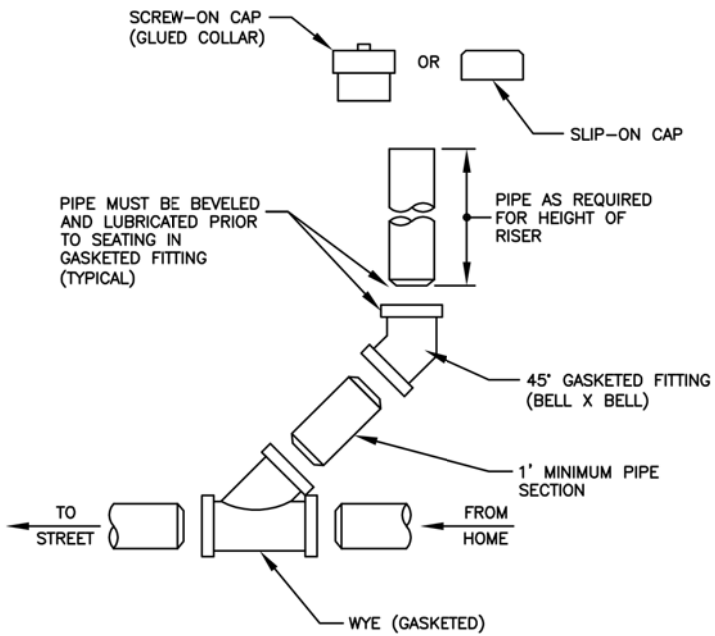
DRAWING No. 4



TERMINAL CLEANOUT - OPTION 1

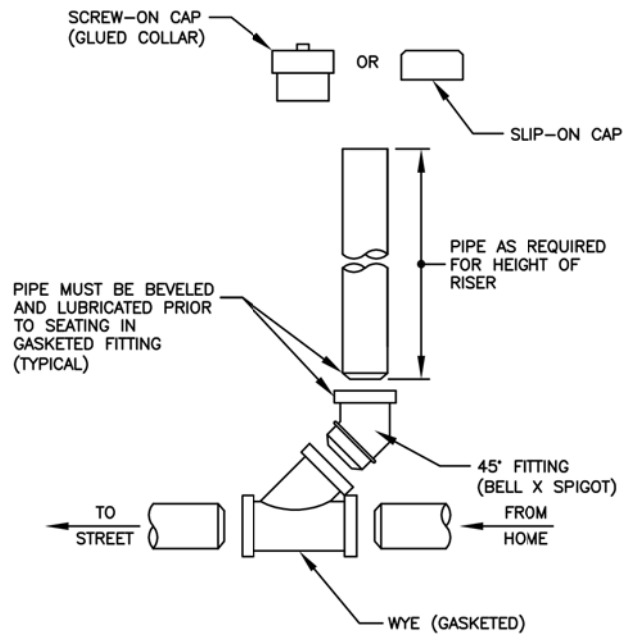


TERMINAL CLEANOUT - OPTION 2

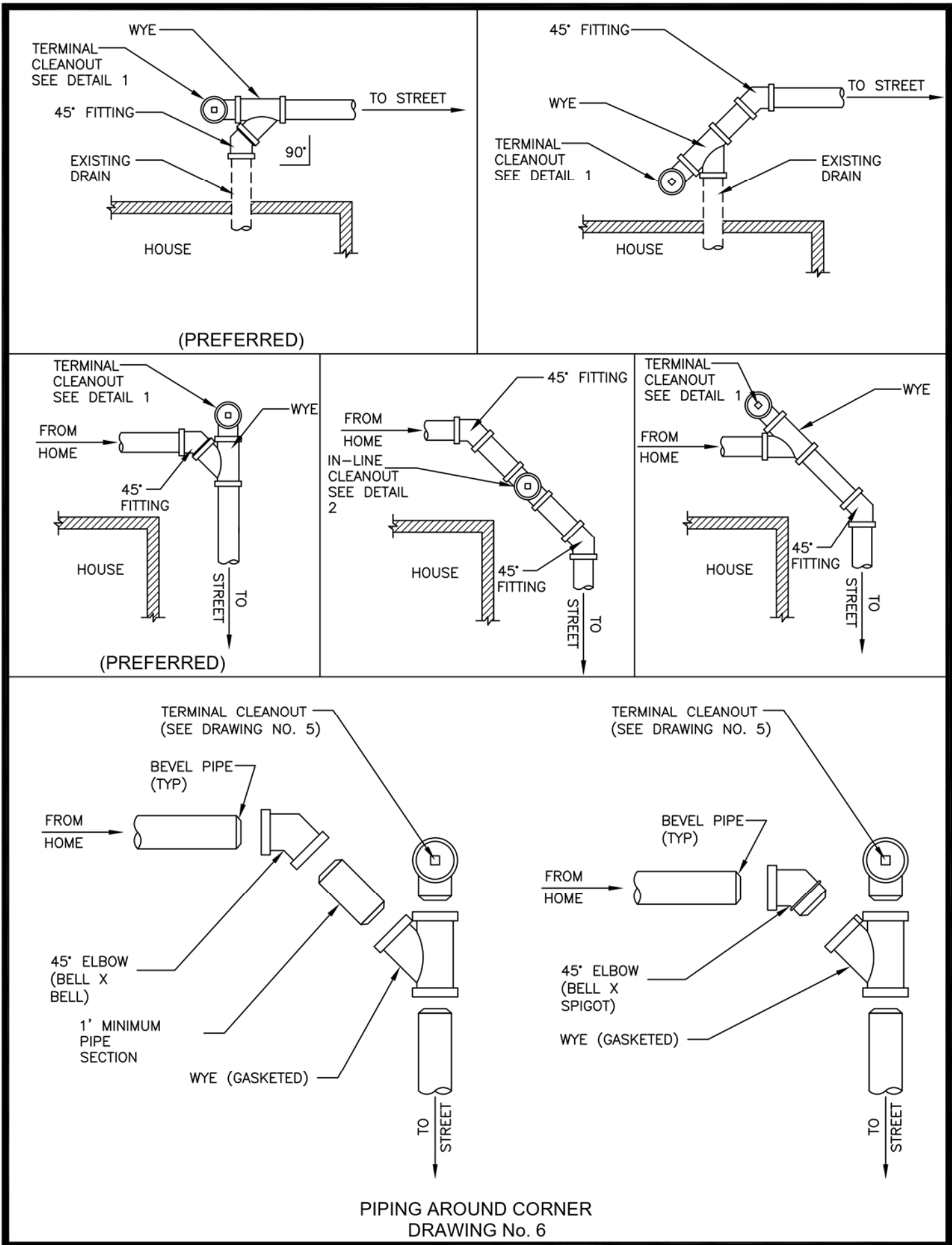


IN-LINE CLEANOUT - OPTION 1

CLEANOUT ASSEMBLY  
DRAWING No. 5

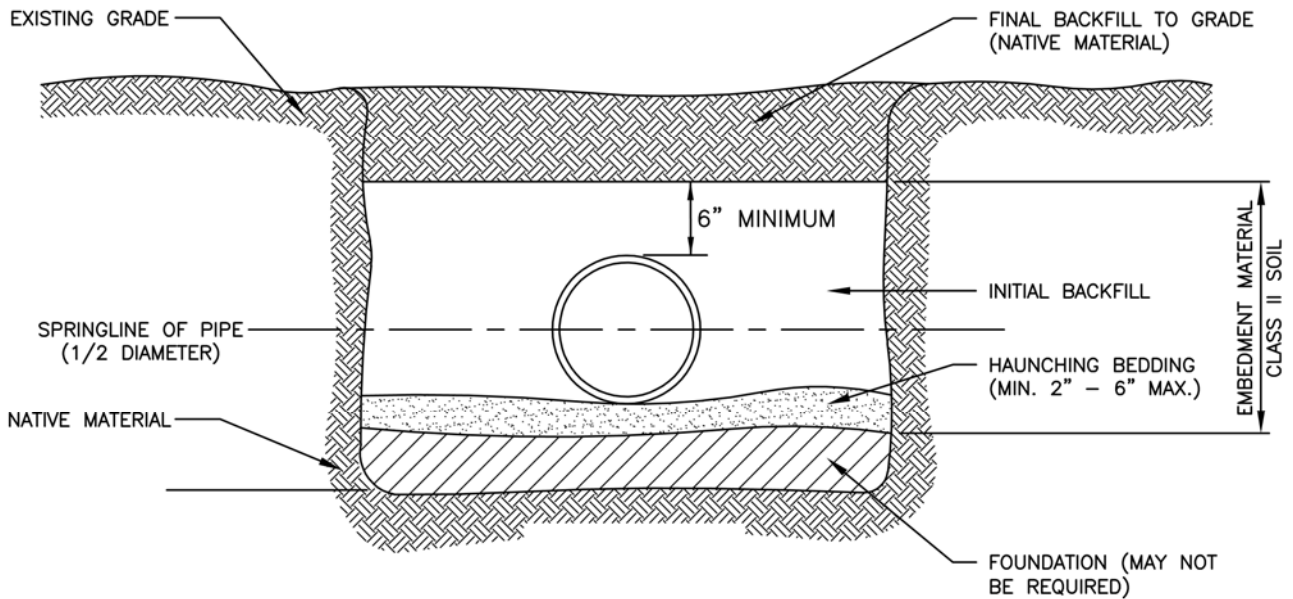


IN-LINE CLEANOUT - OPTION 2



PIPING AROUND CORNER  
DRAWING No. 6

## SIDE SEWER INSTALLATION & BEDDING DETAIL



SPOKANE COUNTY UTILITIES DIVISION REQUIRES ASTM D-2321 BE FOLLOWED FOR INSTALLATION OF SIDE SEWERS. THE CONTRACTOR/INSTALLER AND/OR ENGINEER SHOULD BE FAMILIAR WITH SOIL CLASSES AND THE STEPS REQUIRED IN HANDLING THE DIFFERENT TYPES. ASTM D-2321 LISTS FIVE BASIC CLASSES DIVIDED AS FOLLOWS:

### SOILS RECOMMENDED FOR BACKFILL

- CLASS I ANGULAR (1/4" TO 3/4" PARTICLE SIZE) GRADED STONE AND CRUSHED STONE.
- CLASS II COARSE SANDS AND GRAVELS WITH A MAXIMUM PARTICLE SIZE OF 3/4".
- CLASS III FINE SANDS AND CLAY GRAVELS.

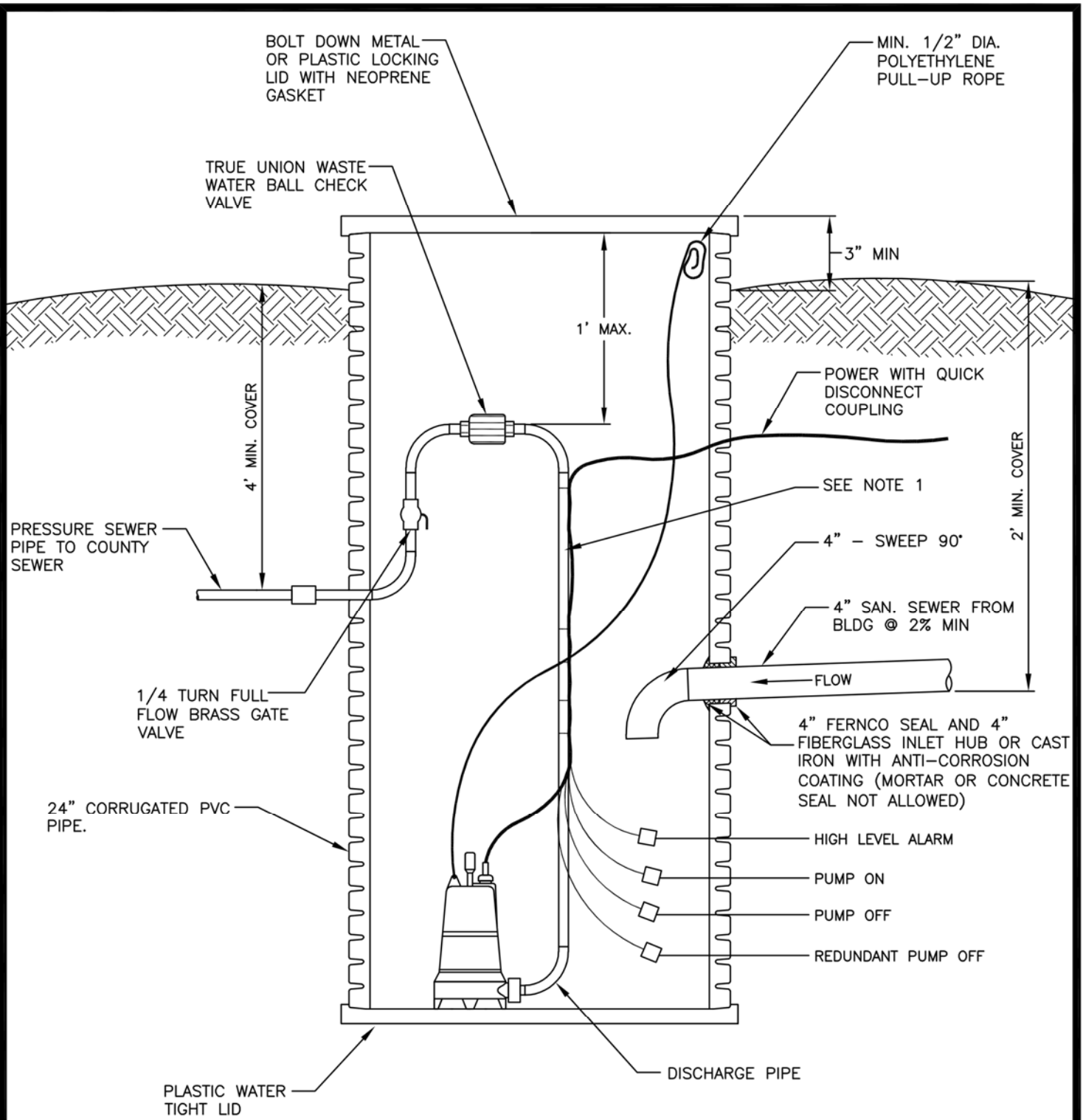
### SOILS NOT RECOMMENDED FOR BACKFILL NEAR THE PIPE

- CLASS IV SILT, SILTY CLAYS AND CLAYS.
- CLASS V ORGANIC SOILS CONTAINING FROZEN EARTH DEBRIS, ROCKS LARGER THAN 3/4" AND OTHER FOREIGN MATERIALS.

### TRENCHING AND BACKFILLING

- KEEP THE TRENCHING WIDTH AS NARROW AS IS PRACTICAL. THE TRENCH IS MODERATELY OVER-EXCAVATED AND BACKFILL MATERIAL IS PLACED TO GRADE (APPROXIMATELY 6" DEEP).
- CLASS I MATERIAL REQUIRES NO COMPACTION. CLASSES II AND III MATERIALS SHOULD BE COMPACTED TO 85 AND 90 PERCENT STANDARD PROCTOR DENSITY.
- WITH BEDDING LAYER TO GRADE AND COMPACTED, THE PIPE IS PLACED AND JOINED. BLOCKING SHALL NOT BE USED TO OBTAIN SLOPE. THE BEDDING LAYER MAY BE EXCAVATED IN THE VICINITY OF THE JOINT. THE PIPE IS THEN PLACED AND THE MATERIAL REPLACED AND RE-COMPACTED TO SUPPORT THE JOINT. THE HAUNCHING LAYERS ARE ADDED CAREFULLY TO THE SPRING-LINE OF THE PIPE AND COMPACTED IN LAYERS, IF NECESSARY.
- PERFORM INITIAL BACKFILLING IN TWO STAGES; THE FIRST LIFT TO THE TOP OF THE PIPE AND THE NEXT LIFT TO ABOUT 6" OVER THE TOP OF THE PIPE. THE DITCH MAY THEN BE FILLED WITH ANY AVAILABLE BACKFILL PROVIDED THAT LARGE PARTICLES ARE NOT IN DIRECT CONTACT WITH THE PIPE.
- SHOULD THE TRENCH-CUT GO THROUGH ROCK, THE DEPTH OF THE CUT SHOULD BE 4" TO 6" BELOW THE GRADE OF THE PIPE AND FOUNDATION MATERIAL PLACED TO SUPPORT THE BEDDING MATERIAL.
- SPECIAL STEPS MAY BE NECESSARY TO CONTROL GROUND WATER IN HIGH WATER TABLE AREAS OR TO COMBAT UNSTABLE SOIL CONDITIONS. THIS IS USUALLY ACCOMPLISHED BY LOWERING THE WATER TABLE ABOUT 12" BELOW THE TRENCH BOTTOM AND/OR OVER-EXCAVATING THE TRENCH BOTTOM AND BRING IT TO GRADE WITH A STABLE MATERIAL BEFORE LAYING THE PIPE.

DRAWING No. 7



NOTE:

- 1) DRILL A 3/16" HOLE IN THE DISCHARGE PIPE BETWEEN THE PUMP AND THE CHECK VALVE FOR VACUUM RELEASE. THIS HOLE NEEDS DRILLED ABOVE THE SEWAGE HIGH LEVEL ALARM DEPTH.
- 2) IN PLACE OF USING A COMBINED UNION/CHECK VALVE ASSEMBLY, SEPARATE UNION AND CHECK VALVE FITTINGS MAY BE USED. PLACE THE CHECK VALVE BETWEEN THE UNION AND THE PUMP. SEE NOTE 1

SPOKANE COUNTY, WASHINGTON SPOKANE WA 99206
<b>TYPICAL PUMP CHAMBER          INSTALLATION</b>

DRAWING No. 8

# GENERAL PROVISIONS

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## **GENERAL PROVISIONS**

Besides the requirements contained in the Washington State Department of Transportation Standard Specifications, the following General Provisions will be used on all projects, private or public, constructed within Spokane County. These provisions represent additions and/or changes to the Standard Specifications and govern over the Standard Specifications.

### **DIVISION 1**

#### 1-01.3 DEFINITIONS

Section 1-01.3 shall be revised as follows:

State shall mean the County of Spokane, Washington a political subdivision, acting through its authorized representatives.

Commission or Washington State Transportation Commission shall mean the Board of County Commissioners of Spokane County, an elected body having authority over County matters as provided by law. All references to Commission in the Standard Specifications shall conform to this definition.

Department, or Department of Transportation shall mean the Spokane County Engineer or his authorized representative.

Secretary or Secretary of Transportation shall mean the Spokane County Engineer or his authorized representatives.

Engineer or Project Engineer shall mean the Spokane County Engineer or his/her authorized representative.

### **DIVISION 2**

#### 2-03.3(14)C COMPACTING EARTH EMBANKMENTS

Method B. Change 90 percent maximum density to 92 percent.

## 2-03.3(14)D COMPACTION AND MOISTURE CONTROL TESTS

Delete these provisions and substitute the following provision:

Maximum density and optimum moisture will be determined using the AASHTO T180-90, with Method A or D as appropriate; and AASHTO T-224-90, with the following modifications:

1. AASHTO T-180-90
  - a. Notice 8 (Method D). Rock will not be replaced with soil as part of the laboratory determination for maximum dry density and optimum moisture content.
  - b. Oven drying or direct heating will be the only acceptable methods of moisture content determination.
  - c. Oven drying to dry back saturated or very wet soils, at temperature above 140 degrees F. will be permitted only with frequent mixing.
  
2. AASHTO T-224-90
  - a. Specific gravity for rock will be determined in the laboratory. The fraction of 3/4 inch material in the backfill may be determined in the field by sieving the sample in a wet or moist condition.

In-place density will be determined utilizing AASHTO T-238-86.

In-place moisture content will be determined utilizing AASHTO T-239-90.

The Contractor shall provide a safe environment for the compaction control test to be performed. This may include temporarily stopping the backfill operation such as the conveyor belt, backhoe, roller, etc. long enough for the safe completion of the test.

## **DIVISION 3**

NOT USED

## **DIVISION 4**

### **4-04.3(5) SHAPING AND COMPACTION**

The first sentence of the first paragraph in Section 4-04.3(5) is replaced by the following:

Immediately following spreading and final shaping, each layer of surfacing shall be compacted to at least 95 percent of the density determined using the AASHTO T180-90, with Method A or D as appropriate; and ASSHTO T-224-90 with the following modifications:

1. AASHTO T-180-90
  - a. Notice 8 (Method D). Rock will not be replaced with soil as part of the laboratory determination for maximum dry density and optimum moisture content.
  - b. Oven drying or direct heating will be the only acceptable methods of moisture content determination.
  - c. Oven drying to dry back saturated or very wet soils, at temperatures above 140 degrees F. will be permitted only with frequent mixing.
2. AASHTO T-224-90
  - a. Specific gravity for rock will be determined in laboratory. The fraction of  $\frac{3}{4}$  inch material in the backfill may be determined in the field by sieving the sample in a wet or moist condition.

In-place density will be determined utilizing AASHTO T-238-86.

In-place moisture content will be determined utilizing AASHTO T-239-90.

The Contractor shall provide a safe environment for the compaction control test to be performed. This may include temporarily stopping the backfill operation such as the conveyor belt, backhoe, roller, etc. long enough for the safe completion of the test.

## **DIVISION 5**

### **5-04.3(12)) JOINTS**

Section 5-04.3(11) shall be supplemented as follows:

#### **JOINING EXISTING PAVEMENT**

Where new pavement joins existing pavement, this joint shall be trimmed to a vertical face and to a neat line. New pavement shall be feathered at transverse joints as required to conform to the requirements of Section 5-04.3(13) for surface smoothness.

#### **FEATHERING ASPHALT CONCRETE PAVEMENT**

Where designated by the Engineer, the Contractor shall feather the asphalt concrete pavement overlay in a manner to produce a smooth riding connection to the existing pavement.

Hot Mix Asphalt (HMA) utilized in the construction of the feathered connections to existing pavement, shall be modified by eliminating the coarse aggregate from the mix at the Contractor's plant or the commercial source from which the Contractor obtains the mix or by raking the joint on the roadway, to the satisfaction of the Engineer.

### **SC5-04a ASPHALT CONCRETE PAVEMENT**

January 1, 1994

#### **TRENCH REPAIR**

Disturbance of an existing asphalt concrete pavement due to trench excavation of less than six feet in width shall be repaired by the Contractor as follows:

1. **Pavement Cutting:** The contractor shall cut the existing pavement along the trench edges with equipment approved by the Engineer. Immediately before placement of a patch, the existing pavement shall be cut with a saw along rectangular lines as shown on the plans or as directed by the Engineer. The pavement shall be removed to provide a firm, neat, straight, vertical edge. The Contractor shall be responsible for maintaining the edge.

Additional cuts with a saw will be required to correct broken or damaged edges.

2. Pavement shall be removed in an approved manner.
3. Trench depth shall provide 24 inches minimum cover over facility to be placed in the trench.
3. A tack coat of Grade CSS-1 or RC250 Asphalt shall be uniformly applied to all edges to be joined and lapping 6 inches over the existing pavement. The lines from the new asphalt pavement shall be raked over the tack coat, feathered and rolled or tamped to seal the joint. The structural section of the patch shall be equal to the section of the existing pavement. The thickness of Hot Mix Asphalt (HMA) shall not be less than 2 inches. HMA may be substituted for aggregate base if compacted layers do not exceed .25 feet with adequate compaction. HMA used for patching shall be HMA 64-28 Class ½". It shall be furnished, placed and compacted in conformance with the standard specifications.

In inclement weather or as determined by the Engineer, trenches located within the traveled way shall be backfilled with 0.10 feet of HMA over 0.5 feet of cement concrete, over an approved backfill material. Cement concrete shall contain 7.5 sacks per cubic yard of Type III cement. Additives may be added as approved by the Engineer to ensure opening of the road to traffic within 2 hours.

Repair of a trench over ten feet in width shall be made according to the standard specifications applying to new road construction. Road structural section materials and dimensions shall be determined by the County Engineer.

## **DIVISION 6**

Intentionally left blank.

## **DIVISION 7**

### SC7-04 STORM SEWERS

JANUARY 1, 1994

#### 7-04.2 MATERIALS

Section 7-05.2 shall be supplemented as follows:

Polyvinyl Chloride Pipe conforming to the minimum requirements for ASTM 3033 or ASTM 3034 may be used as an alternate for concrete or metal pipe when used as

connector pipes between drywells and catch basins or inlets where the maximum diameter is 15" and cover is 3 feet measured to the finished grade or as directed by the Engineer.

## SC7-05 MANHOLES, INLETS, AND CATCH BASINS

JANUARY 1, 1994

### 7-05.1 DESCRIPTION

Section 7-05.1 shall be supplemented by the following:

All specifications in this section applying to precast concrete manholes shall also apply to precast concrete drywells.

### 7-05.2 MATERIALS

Section 7-05.2 shall be supplemented as follows:

"Special Backfill for Drywells" shall meet the requirements of section SC9-03.12(4)A

### 7-05.3 CONSTRUCTION REQUIREMENTS

Section 7-05.3 shall be supplemented as follows:

#### METAL FRAMES AND GRATES

Cement concrete or clay brick adjustment blocks shall be placed on grouted to provide the proper alignment and grade for the frame and grate. Any existing frame and grate that is removed and not reused shall be placed within the right-of-way where directed by the Engineer and shall remain the property of the County.

Where "Metal Frame Type 2" are to be constructed in existing curbs, the existing curb shall be sawcut and removed. The curb shall then be repoured around the cast iron hood.

### 7-08.3 CONSTRUCTION REQUIREMENTS

Section 7-08.3(1)C and Section 7-08.3(3) shall be amended as follows:

Change all references to 90-percent maximum density to 92-percent maximum density.

## **DIVISION 8**

## SCB-04 CURBS, UTTER, AND SPILLWAYS

JANUARY 1, 1994

### 8-04.3 CONSTRUCTION REQUIREMENTS

Section 8-04.3 shall be

Cement Concrete Cross Gutters shall be constructed at locations shown on the plans in accordance with the standard specifications, these special provisions, and the standard plans.

#### 8-04.3(1) CEMENT CONCRETE CURBS, GUTTERS, AND SPILLWAYS

Section 8-04.3(1) shall be supplemented as follows:

The curb and gutter shall be water tested by the Contractor in the presence of the Engineer and any irregularities causing water to stand shall be corrected by the Contractor at his expense. All costs incurred for the gutter water test shall be incidental to and included in the unit contract price for "Cement Concrete Curb, Type B"

#### 8-04.3 ,2) EXTRUDED ASPHALT CONCRETE CURBS. AND GUTTERS

Section 8-04.3(2) shall be supplemented as follows:

Asphalt Concrete Curb, Type C shall be monolithically placed with the HMA wearing surface.

## **DIVISION 9**

### 9-03.12(4)A SPECIAL BACKFILL FOR DRYWELLS

Section 9-03.12(4) shall be supplemented as follows:

Special backfill for drywells shall consist of washed gravel conforming to the following gradation:

<u>Sieve</u>	<u>% Passing</u>
3"	100
1"	20
U.S. #200	2 max.

All percentages are by weight. A minimum of 90% of the aggregate, by weight, shall be unfractured, naturally occurring material.



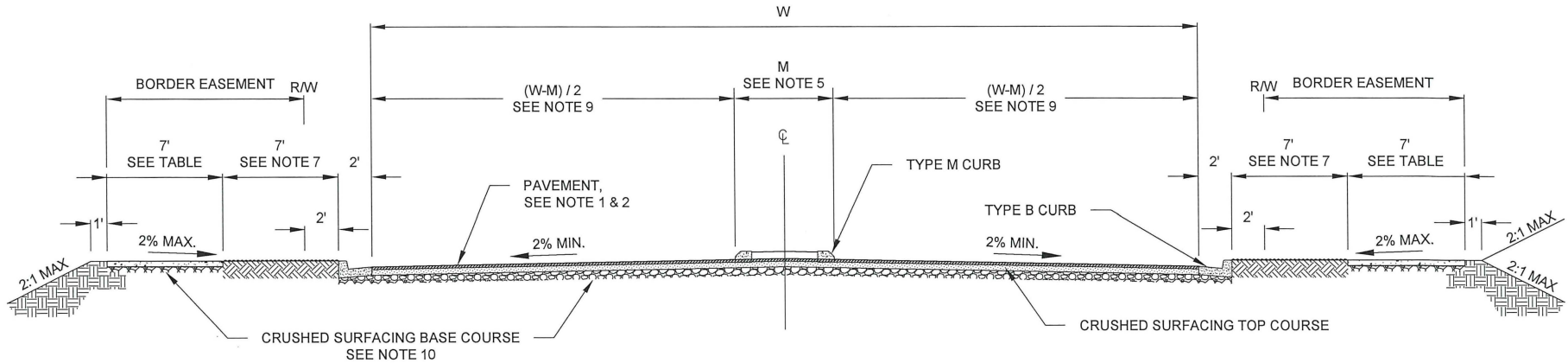
## STANDARD PLANS TABLE OF CONTENTS

PLAN	TITLE	LAST DATE
A-1	ROADWAY SECTION - CURBED	01/2018
A-2	ROADWAY SECTION – SHOULDERS	01/2018
A-3	CURBS & GUTTERS	01/2018
A-4	URBAN DRIVEWAYS – SEPARATED SIDEWALKS	01/2018
A-5A	CURB RAMP – PARALLEL	01/2018
A-5B	CURB RAMP – PERPENDICULAR	01/2018
A-5C	CURB RAMP – COMBINATION	01/2018
A-5D1	CURB RAMP – SINGLE DIRECTION	01/2018
A-5D2	CURB RAMP – SINGLE DIRECTION	01/2018
A-6	TRAFFIC ISLAND	01/2018
A-7	CEMENT CONCRETE APPROACHES	01/2018
A-8	RURAL ROAD APPROACHES	01/2018
A-8A	RURAL DRIVEWAY APPROACHES	01/2018
A-9	BIKE WAYS & PEDESTRIAN PATHS	01/2018
A-10	CUL-DE-SACS-PUBLIC ROADS	01/2018
A-10A	PRIVATE ROAD ALTERNATE TURN-AROUND	01/2018
A-11	SIDEWALK RETAINING WALL	01/2018
A-12	RETAINING WALL	01/2018
A-13	ENTRANCE STEPS TO ABUTTING PROPERTIES	01/2018
A-14	MONUMENT CASE & COVER	03/1998
A-15	UTILITY LOCATIONS – CURBED ROAD	11/2009
A-15A	UTILITY LOCATIONS – SHOULDERED ROAD	11/2009
A-16	STREET NAME SIGNS	01/2018
A-16B	SIGN AND POST INSTALLATION	01/2018
A-18	ROADWAY CONSTRUCTION PAYMENT LIMITS	03/2003
B-1	PRECAST DRYWELLS	01/2018
B-2	PRECAST DRYWELL DETAILS	08/1993
B-3	PRECAST DRYWELL & INLET DETAILS	04/1998
B-4	CATCH BASIN - TYPE 1	01/2018
B-5	CONCRETE INLET - TYPE 1	01/2018
B-6	CONCRETE INLET - TYPE 2	01/2018
B-7	CATCH BASIN & INLET INSTALLATION	03/2003
B-8	CURB INLET - TYPE 1 & TYPE 1-MODIFIED	01/2018
B-9	CURB INLET - TYPE 2	08/2007
B-10	METAL FRAME - TYPE 1	01/2018
B-11	METAL FRAME - TYPE 2	01/2018
B-12	METAL GRATE - TYPE 1	01/2018
B-14	METAL GRATE - TYPE 3	01/2018
B-15	METAL FRAME, GRATE & SOLID COVER – TYPE 4	01/2018
B-17	GRATE GUARD	05/1995
B-18	CONCRETE GUTTERS	01/2018
B-18A	HIGH VOLUME DRIVEWAY APPROACH	01/2018
B-19	INLET INSTALLATIONS	01/2018
B-20	SWALE WITH MODULE BLOCK WALL	04/1998

## STANDARD PLANS TABLE OF CONTENTS

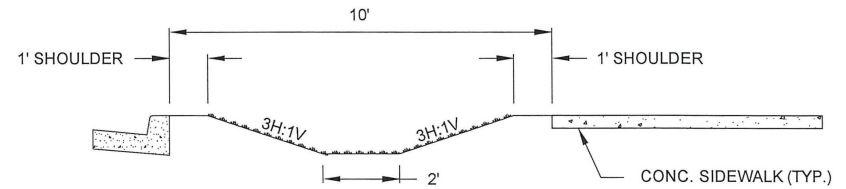
PLAN	TITLE
U-1	Manhole Types & Depths
U-2	Manhole Type I-48
U-3	Manhole Type I-60
U-4	Manhole Types II-72, II-96
U-5	Manhole Type III-48
U-6	Manhole Types III-60, 72 & 96
U-7	Manhole Type IV
U-8A	Doghouse Manhole Installation
U-8B	Doghouse Manhole Channeling & Barrel Configuration
U-9	Reducing Slabs and Manhole Steps
U-10	Manhole Ring & Cover
U-11	Manhole Invert Elevation Detail
U-12	Typical Channel Detail
U-13	Typical Manhole Placement in Signalized Intersection
U-14A	Exterior Drop Manhole Connection
U-14B	Interior Drop Manhole Connection
U-15	Main Line Sewer Clean-out
U-16	Side Sewer Stub Record Drawing
U-17	Side Sewer Stub Installation
U-18	Pressure Side Sewer Stub Connection to Gravity Sewer
U-19	Pressure Side Sewer Stub Connection to Force Main
U-20	Filter Fabric Wrap for Pressure Valve Assemblies & Ext.
U-21	Pressure Side Sewer Stub Detail for Water Main Crossing
U-22	HDPE Pressure Sewer Fittings
U-23	Terminal Flushing Connection for Low Pressure Sewer Sys.
U-24	Typical Pipe Casing Detail (PVC or DI Carrier Pipe)
U-25	Typical Casing Detail (Concrete Carrier Pipe)
U-26	Typical Pump Chamber Assembly

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### GENERAL NOTES

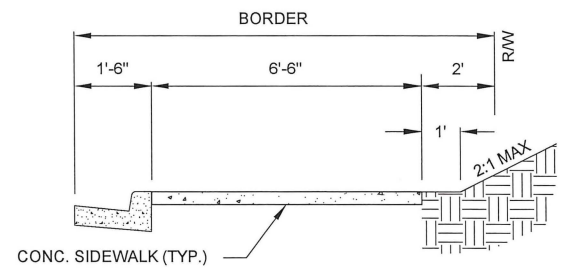
- PAVEMENT MAY BE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE AS DETERMINED BY THE COUNTY ENGINEER.
- PAVEMENT, CRUSHED SURFACING TOP COURSE AND CRUSHED SURFACING BASE COURSE THICKNESS SHALL BE DETERMINED BY A PAVEMENT DESIGN.
- DITCH SLOPES AND SIDE SLOPES SHALL BE NO STEEPER THAN RATIOS SHOWN UNLESS RECOMMENDED BY A SOILS REPORT AND APPROVED BY THE COUNTY ENGINEER. EXCAVATION SLOPES HIGHER THAN 8' SHALL BE DETERMINED BY SOILS TESTING.
- "W" SHALL BE SHOWN ON CONSTRUCTION PLANS.
- WHERE LEFT-TURN LANES ARE REQUIRED, M=12' WHEN MEDIAN IS PAINTED. WHEN RAISED MEDIAN WITH TYPE M CURB USED M=14' OTHERWISE M=0
- TYPE R CURB SHALL BE USED ONLY WHERE APPROVED BY THE COUNTY ENGINEER ON LOCAL ACCESS ROADS ONLY.
- IF PLANTING STRIPS ARE USED AS A BIOFILTRATION SWALE, THE WIDTH SHALL BE 10' MIN. 4' SEPARATION ALLOWED ON LOCAL ACCESS.
- REFER TO ROADSIDE SAFETY SECTION FOR LOCATION OF RIGID OBJECTS.
- WHEN RAISED MEDIANS ARE CONTINUOUS BETWEEN INTERSECTIONS, (W-M)/2 SHALL NOT BE LESS THAN 18 1/2 FEET.
- CRUSHED SURFACING SECTION SHALL BE EXTENDED UNDER CURB. 4" MIN. CRUSHED SURFACING IS REQUIRED UNDER SIDEWALKS.



SEPARATED SIDEWALK  
(SEE NOTE 7)

#### SEPARATED SIDEWALK

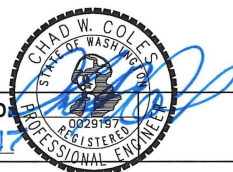
WIDTHS	
ROAD TYPE	"SW"
RESIDENTIAL ACCESS	5' MIN.
OTHER	6' MIN.



CONTIGUOUS SIDEWALK  
(PRIVATE ROAD)

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3800

APPROVED  
COUNTY ENGINEER  
DATE: 9/1/17

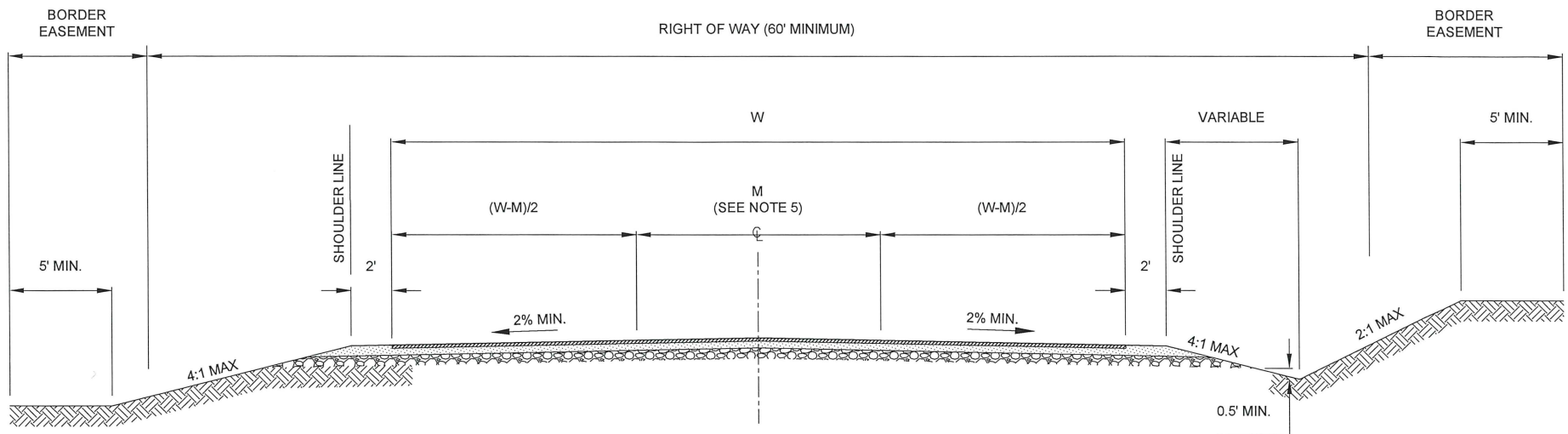


STANDARD  
ROADWAY SECTION - CURBED

NO.	DATE	BY	CKD.	APPR.	REVISION

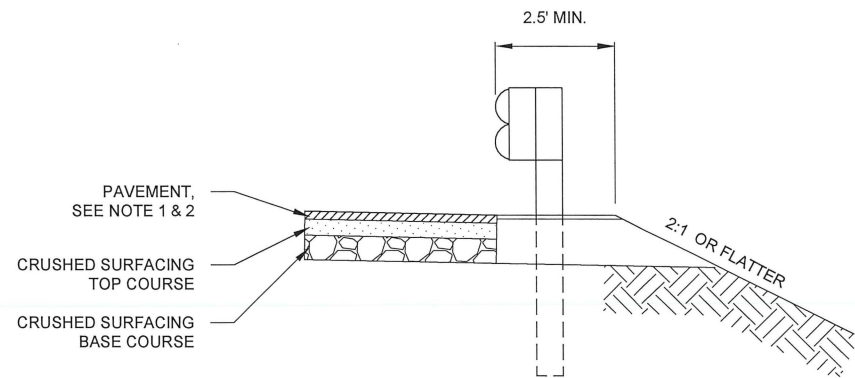
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A - 1

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### GENERAL NOTES

1. PAVEMENT MAY BE ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE AS DETERMINED BY THE COUNTY ENGINEER.
2. PAVEMENT, CRUSHED SURFACING TOP COURSE AND CRUSHED SURFACING BASE COURSE THICKNESS SHALL BE DETERMINED BY A PAVEMENT DESIGN.
3. DITCH SLOPES AND SIDE SLOPES SHALL BE NO STEEPER THAN RATIOS SHOWN UNLESS RECOMMENDED BY A SOILS REPORT AND APPROVED BY THE COUNTY ENGINEER. EXCAVATION SLOPES HIGHER THAN 8' SHALL BE DETERMINED BY SOILS TESTING.
4. "W" SHALL BE SHOWN ON CONSTRUCTION PLANS.
5. WHERE LEFT TURN LANES ARE REQUIRED M=12', OTHERWISE M=0.
6. MEDIAN ISLANDS ON SHOULDERED ROADS REQUIRE "SPECIAL SECTION" APPROVED BY COUNTY ENGINEER.



**WIDENING FOR BARRIER**  
REFER TO SECTION 3.14  
FOR BARRIER INSTALLATION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

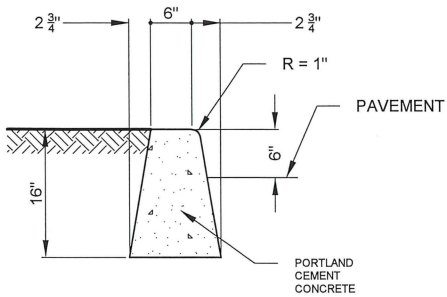
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COUNTY ENGINEER  
DATE: 7/11/17



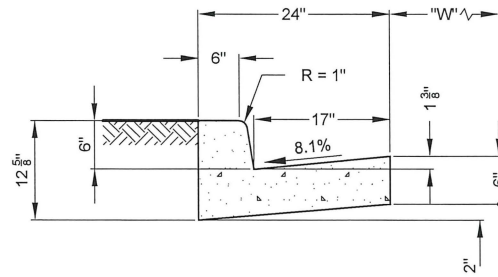
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ROADWAY SECTION - SHOULDERS

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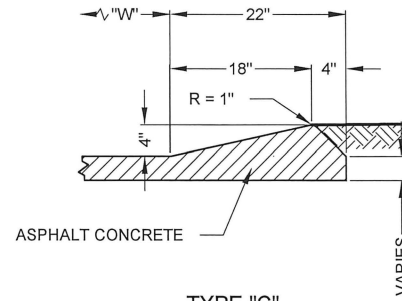
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A - 2



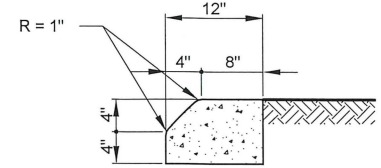
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 SEE NOTE 5



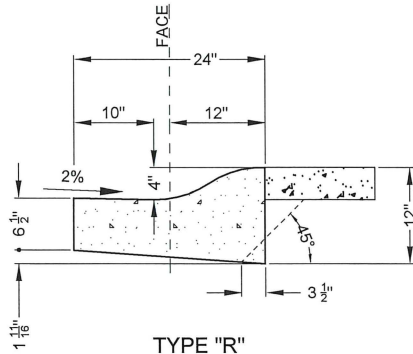
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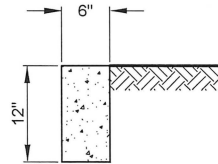
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 SEE NOTE 5



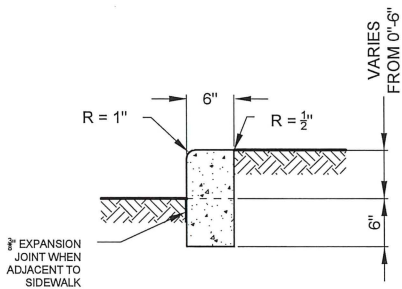
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 SEE NOTE 5



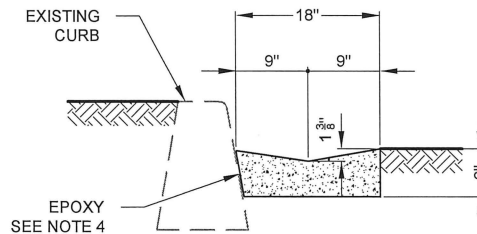
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**TYPE "S"**  
 QUANTITY = 0.018519 C.Y. / L.F.



**TYPE "PED"**  
 QUANTITY = VARIES



**CONCRETE GUTTER**  
 QUANTITY = 0.024419 C.Y. / L.F.

## GENERAL NOTES

1. PORTLAND CEMENT CONCRETE SHALL BE 6-SACK COMMERCIAL CONFORMING TO THE STANDARD SPECIFICATIONS.
2. WEAKENED PLANE JOINTS FOR PORTLAND CEMENT CONCRETE SHALL BE PLACED AT 2 TIMES SIDEWALK WIDTH OR 12' MAX. & SHALL MATCH SCORES IN SIDEWALK WHERE APPLICABLE. 4" WIDE BY 3/8" EXPANSION JOINTS IN PORTLAND
3. CEMENT CONCRETE SHALL BE PLACED AT CURB RETURNS.
4. EPOXY CEMENT SHALL BE APPLIED AT A 10-15 MIL THICKNESS AND SHALL CONFORM TO THE REQUIREMENTS OF SECTION 9-26 OF THE STANDARD SPECIFICATIONS.
5. TO BE USED ONLY IN SPECIAL CASES WITH APPROVAL OF THE COUNTY ENGINEER.
6. 92% COMPACTION UNDER SIDEWALK AND 95% UNDER CURB. (MODIFIED PROCTOR)
7. EXPANSION JOINT SHALL BE PLACED TO ENSURE COMPLETE SEPARATION OF CONCRETE.
8. 4" MIN. CSTC UNDER ALL CURBS. (INCIDENTAL) TYP.

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99280 477-3600

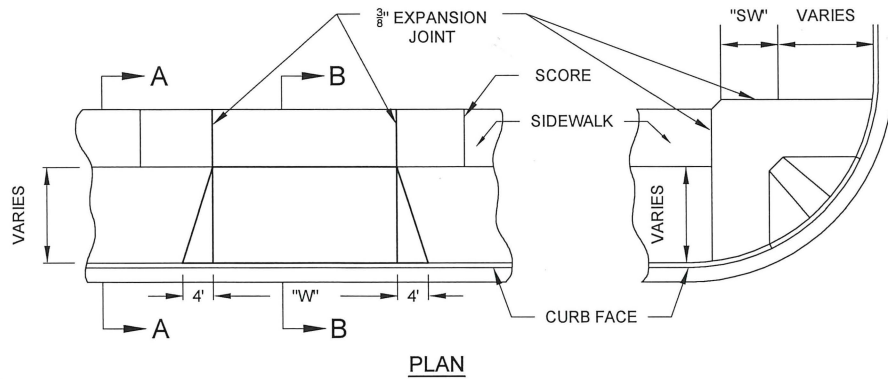
APPROVED  
 COUNTY ENGINEER  
 DATE: 9/17/17



STANDARD  
 CURBS & GUTTERS

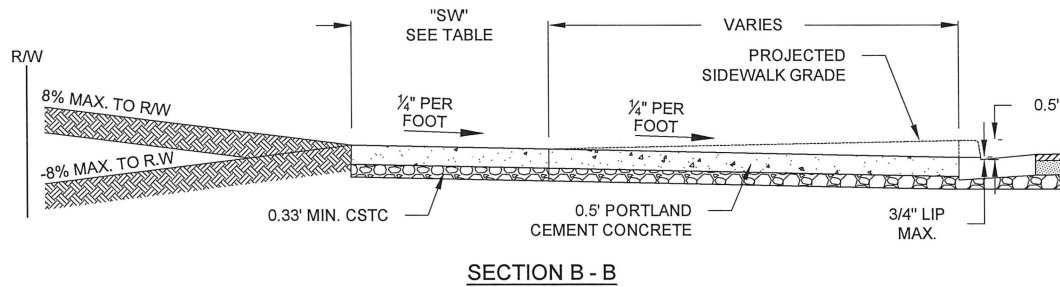
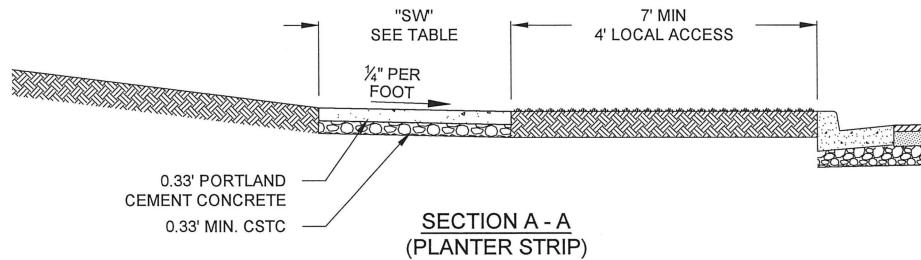
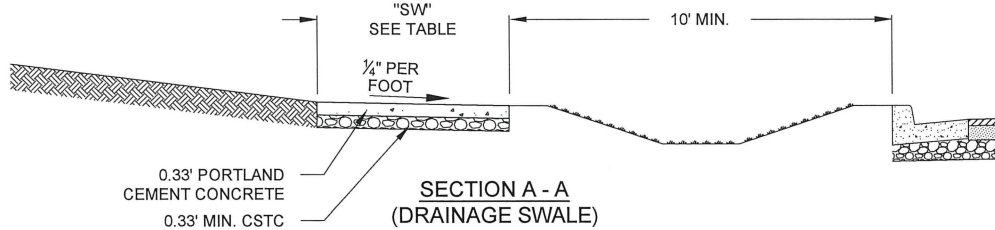
SHEET  
 A - 3

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### GENERAL NOTES

1. FULL DEPTH 4" WIDE BY 3/8" EXPANSION JOINT MATERIAL SHALL BE PLACED IN THE CENTER OF ALL DRIVEWAYS OVER 20' IN WIDTH.
2. 4" WIDE BY 3/8" EXPANSION JOINT REQUIRED IF POUR INCLUDES ADDITIONAL DRIVEWAY AREA.
3. CONCRETE FOR DRIVEWAYS SHALL BE 6-SACK COMMERCIAL AIR ENTRAINED.
4. ALL EXTERNAL EDGES TO BE TOWELED WITH 1/4" RADIUS EDGER.
5. SIDEWALK TO BE SCORED EVERY 5'. 4" WIDE BY 3/8" EXPANSION JOINT TO BE INSTALLED EACH SIDE OF A CURB RETURN AND AT LOCATIONS WHERE SIDEWALK INTERSECTS OTHER SIDEWALKS, DRIVEWAYS AND CURBS, EVERY 50' MAXIMUM.
6. THE WIDTH OF COMMERCIAL DRIVEWAYS MAY BE WIDER THAN SHOWN, IF APPROVED BY THE COUNTY ENGINEER.
7. SEE SHEET A-5 (WHEEL CHAIR RAMPS)
8. SEE SHEET A-7 (CEMENT CONCRETE APPROACHES)



### DIMENSION TABLE

TYPE	DISTANCES	
	"W"	
	MIN.	MAX.
COMM.	16'	40'
RES.	16'	30'

### SEPARATED SIDEWALK

WIDTHS	
ROAD TYPE	"SW"
RESIDENTIAL ACCESS	5' MIN.
OTHER	6' MIN.

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

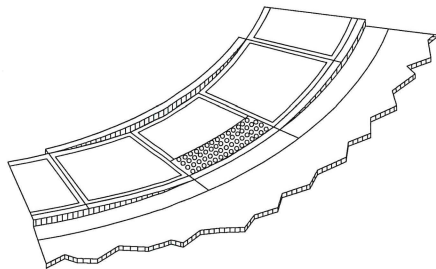
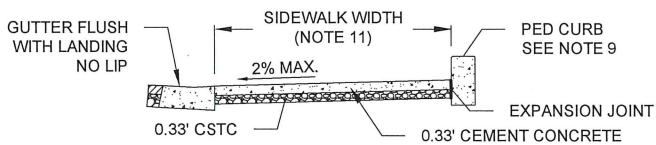
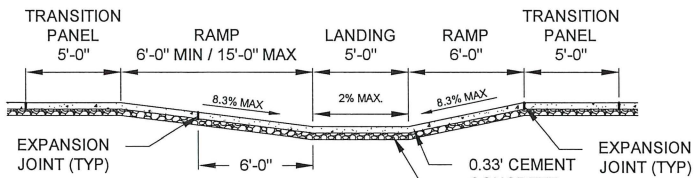
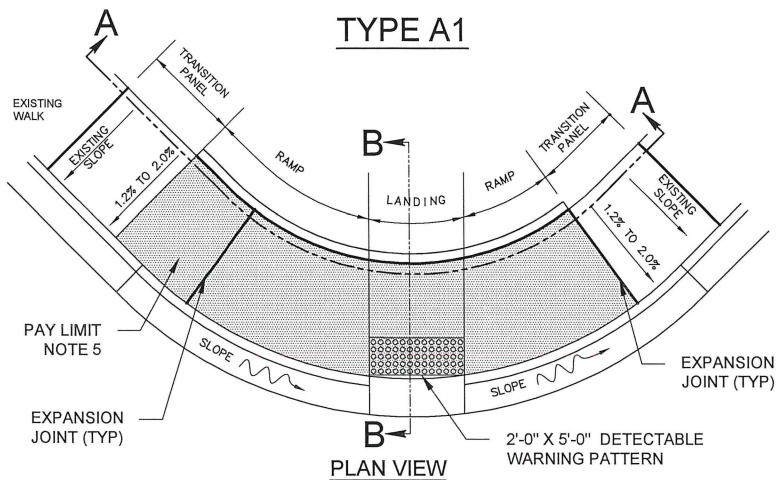
APPROVED  
 COUNTY ENGINEER  
 DATE: 8/1/17



STANDARD  
 URBAN DRIVEWAYS - SEPARATED SIDEWALKS

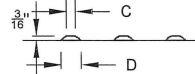
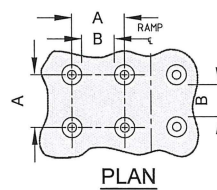
NO.	DATE	BY	CKD.	APPR.	REVISION

I:\Standards\Standard Plans (County)\2017 Revisions\A - SHEETS\STD-A05a.dwg Aug 29, 2017 2:47pm



ISOMETRIC VIEW  
(TYPE A1)

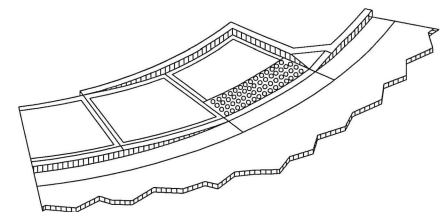
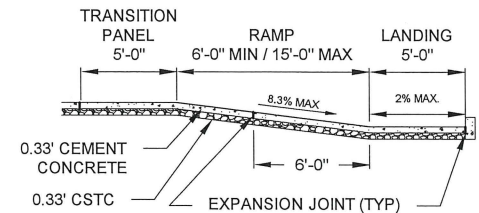
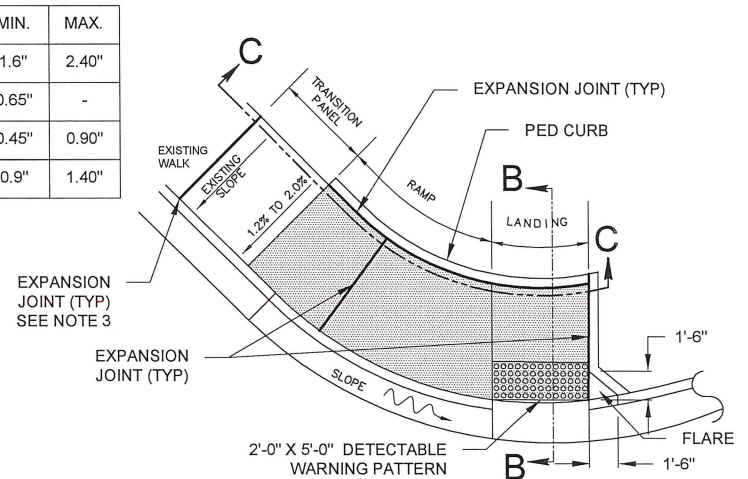
**TRUNCATED DOMES**  
DETECTABLE WARNING PATTERN DETAIL



**PROFILE**

	MIN.	MAX.
A	1.6"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.9"	1.40"

**TYPE A2**



ISOMETRIC VIEW  
(TYPE A2)

**GENERAL NOTES**

1. CONCRETE FOR CURB RAMPS SHALL BE AIR-ENTRAINED 6-SACK COMMERCIAL CONCRETE.
2. FULL DEPTH EXPANSION JOINT MATERIAL SHALL BE 3/8-INCH PRE-MOLDED JOINT FILLER. EXPANSION JOINTS SHALL EXTEND THROUGH THE FULL CROSS-SECTION OF THE SIDEWALK.
3. FULL EXPANSION JOINTS ARE REQUIRED BETWEEN EXISTING SIDEWALKS AND CURB/GUTTER AND NEW SIDEWALKS AND CURB/GUTTER.
4. DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER SIMILAR OBSTRUCTIONS SHALL NOT BE PLACED IN FRONT OF THE RAMP ACCESS, ON THE RAMP OR ON THE LANDING.
5. PAY LIMITS FOR CURB RAMPS INCLUDE SHADED AREAS ONLY. ALL CURB AND ALL OTHER SIDEWALK WILL BE PAID SEPARATELY.
6. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN CROSS SLOPE OF EXISTING SIDEWALK EXCEEDS 2%.
7. IF THE ADJACENT ROADWAY GRADE IS SUCH THAT AN 8.3% RAMP SLOPE CANNOT BE ACHIEVED IN 15 FEET, THE RAMP LENGTH MAY BE LIMITED TO 15 FEET WITH NO MAXIMUM SLOPE REQUIREMENT.
8. NO ADDITIONAL CONSTRUCTION TOLERANCE IS ALLOWED ON MAXIMUM SLOPES (8.3% , 2.0%) WITHOUT A DESIGN DEVIATION APPROVAL FROM THE COUNTY ENGINEER.
9. SEE STANDARD PLAN A-3 FOR PED CURB DETAIL, PED CURB MAY BE OMITTED IF THERE WILL NOT BE MATERIAL TO RETAIN BEHIND LANDING.
10. DETECTABLE WARNING PATTERNS SHALL BE YELLOW. IN COMPLIANCE WITH STANDARD SPECIFICATION 8-14.3(3).
11. AN UNOBSTRUCTED 4 FOOT MINIMUM WIDTH IS REQUIRED FOR ACCESSIBILITY STANDARDS. SEE STANDARD PLAN A-4 FOR ADDITIONAL SIDEWALK WIDTH REQUIREMENTS.

**SPOKANE COUNTY**  
DEPARTMENT OF PUBLIC WORKS  
SPOKANE, WA. 99260 477-3600

APPROVED  
COUNTY ENGINEER  
DATE: 8/21/17

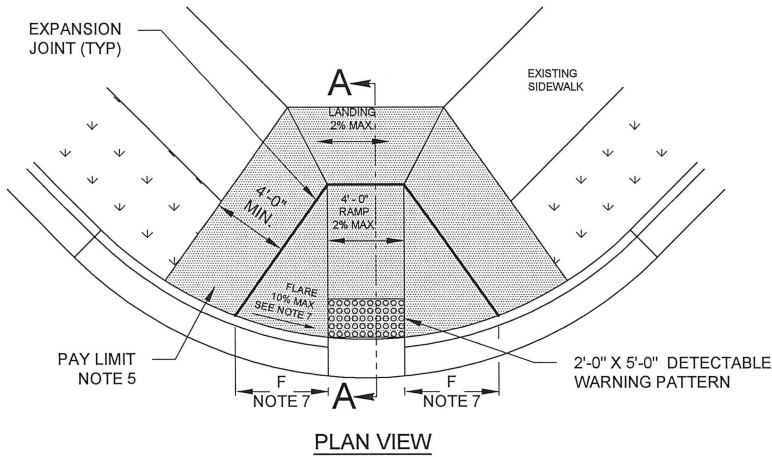


STANDARD  
CURB RAMP - PARALLEL

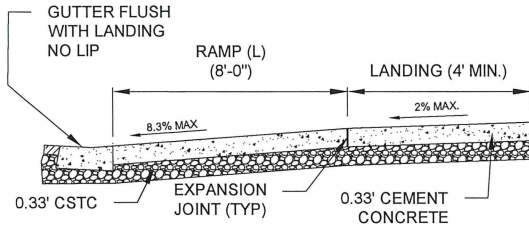
SHEET  
A - 5A

NO.	DATE	BY	CKD.	APPR.	REVISION

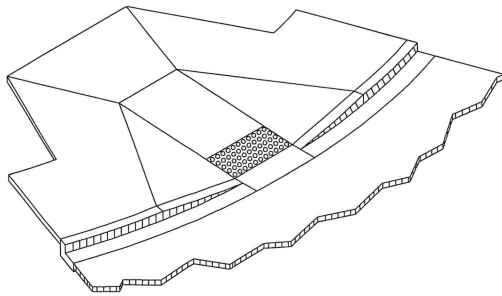
### TYPE B1



PLAN VIEW

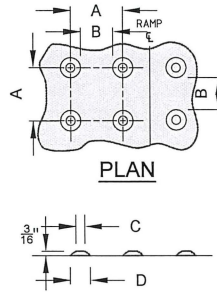


SECTION A - A



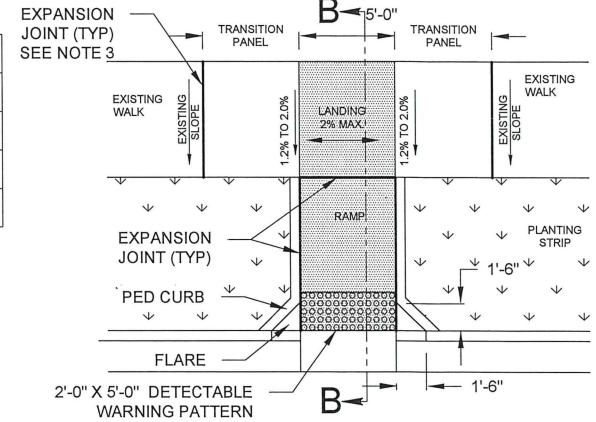
ISOMETRIC VIEW  
(TYPE B1)

### TRUNCATED DOMES DETECTABLE WARNING PATTERN DETAIL

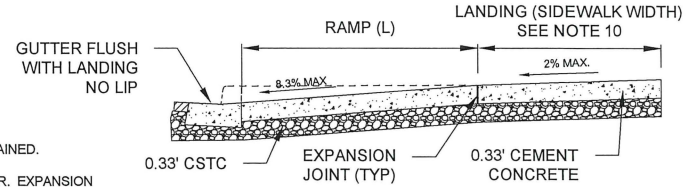


	MIN.	MAX.
A	1.6"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.9"	1.40"

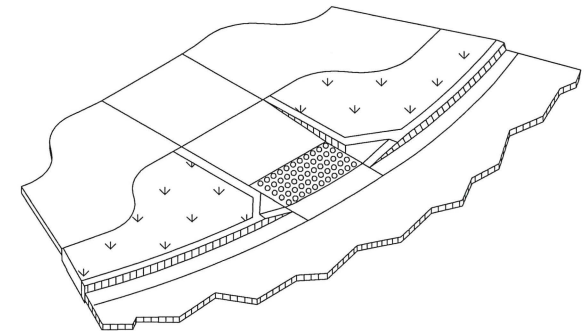
### TYPE B2



PLAN VIEW



SECTION B - B



ISOMETRIC VIEW  
(TYPE B2)

### GENERAL NOTES

1. CONCRETE FOR CURB RAMPS SHALL BE COMMERCIAL (6 SACK) AIR ENTRAINED.
2. EXPANSION JOINT MATERIAL SHALL BE 3/8-INCH PREMOLDED JOINT FILLER. EXPANSION JOINTS SHALL EXTEND THROUGH THE FULL CROSS-SECTION OF THE SIDEWALK.
3. EXPANSION JOINTS ARE REQUIRED BETWEEN EXISTING SIDEWALKS AND CURB/GUTTER AND NEW SIDEWALKS AND CURB/GUTTER.
4. DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER SIMILAR OBSTRUCTIONS SHALL NOT BE PLACED IN FRONT OF THE RAMP ACCESS, ON THE RAMP OR ON THE LANDING.
5. PAY LIMITS FOR CURB RAMPS INCLUDE SHADED AREAS ONLY. ALL CURB AND ALL OTHER SIDEWALK WILL BE PAID SEPARATELY.
6. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN CROSS SLOPE OF EXISTING SIDEWALK EXCEEDS 2%.
7. MAXIMUM FLARE SLOPE SHALL BE 10% MEASURED PARALLEL TO THE CURB, HOWEVER FLARE LENGTH (F) IS NOT REQUIRED TO EXCEED RAMP LENGTH (L). BOTH FLARES SHALL BE THE SAME LENGTH FOR RAMP SYMMETRY.
8. NO ADDITIONAL CONSTRUCTION TOLERANCE IS ALLOWED ON MAXIMUM SLOPES (8.3% , 2.0%) WITHOUT A DESIGN DEVIATION APPROVAL FROM THE COUNTY ENGINEER.
9. DETECTABLE WARNING PATTERNS SHALL BE YELLOW. IN COMPLIANCE WITH STANDARD SPECIFICATION 8-14.3 (3)
10. AN UNOBSTRUCTED 4-FOOT MINIMUM WIDTH IS REQUIRED FOR ACCESSIBILITY STANDARDS. SEE STANDARD PLAN A-4 FOR ADDITIONAL SIDEWALK WIDTH REQUIREMENTS.

**SPOKANE COUNTY**  
DEPARTMENT OF PUBLIC WORKS  
SPOKANE, WA. 99260 477-3600

APPROVED: [Signature]  
COUNTY ENGINEER  
DATE: [Signature]  
REGISTERED PROFESSIONAL ENGINEER

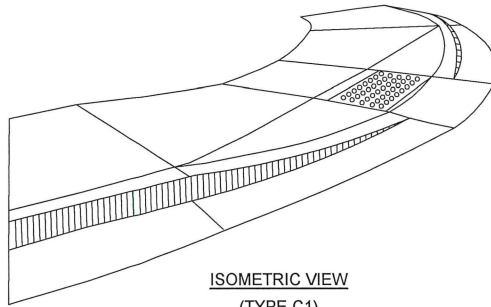
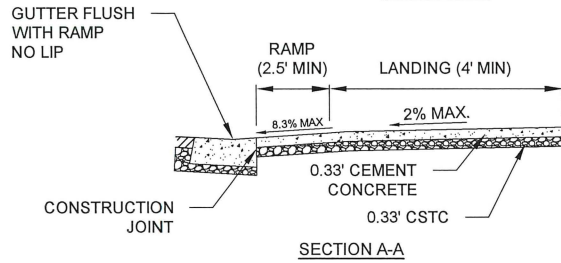
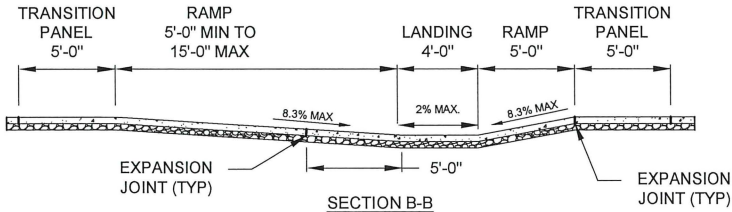
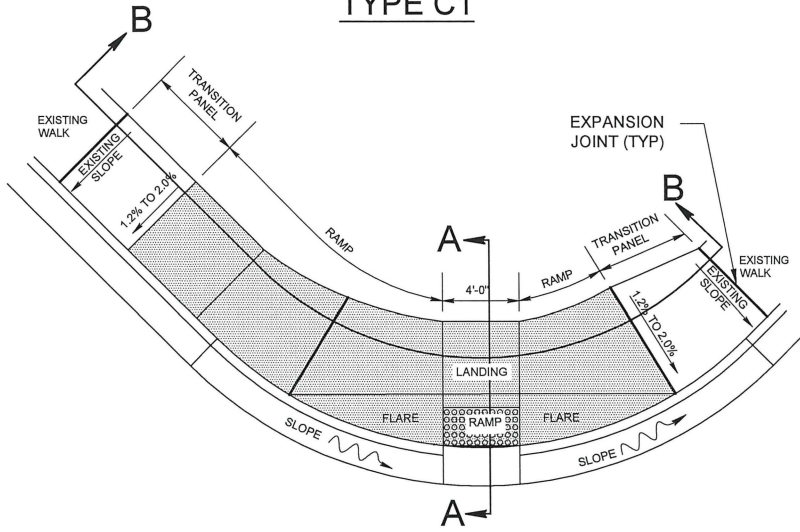
STANDARD  
CURB RAMP - PERPENDICULAR

SHEET  
A - 5B

NO.	DATE	BY	CKD.	APPR.	REVISION

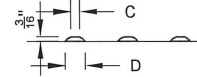
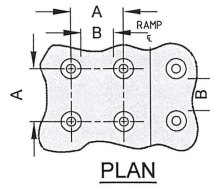


### TYPE C1



ISOMETRIC VIEW  
(TYPE C1)

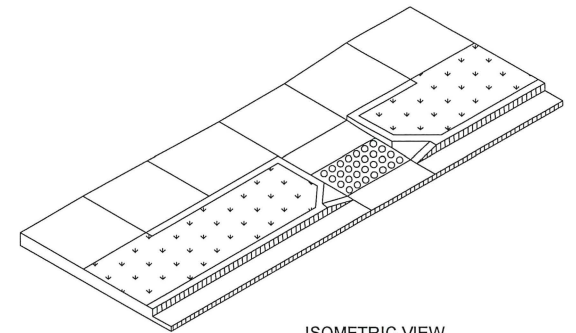
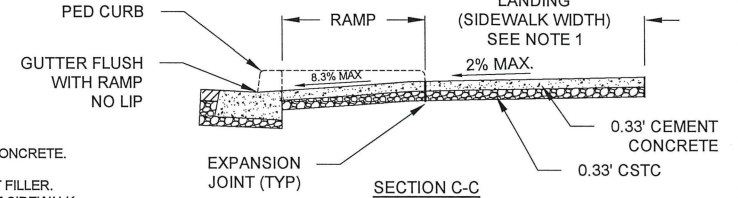
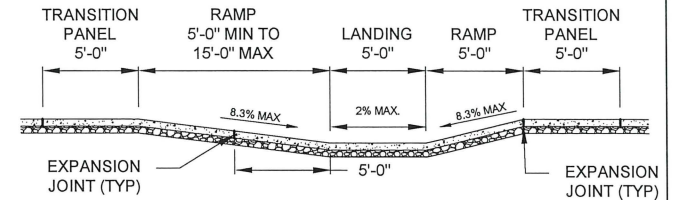
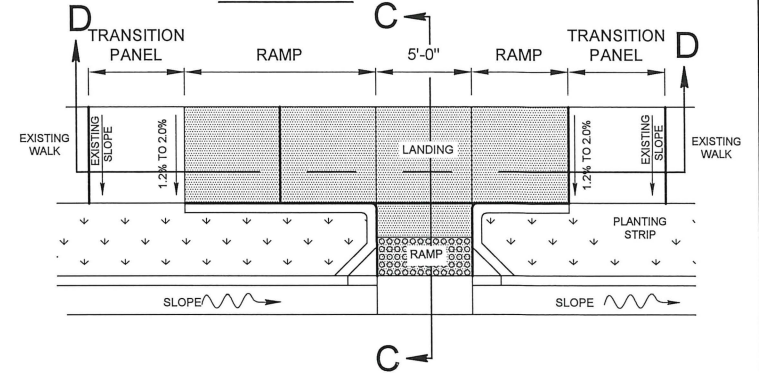
### TRUNCATED DOMES DETECTABLE WARNING PATTERN DETAIL



### PROFILE

	MIN.	MAX.
A	1.6"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.9"	1.40"

### TYPE C2



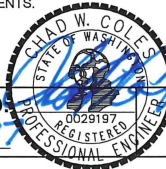
ISOMETRIC VIEW  
(TYPE C2)

### GENERAL NOTES

1. CONCRETE FOR CURB RAMPS SHALL BE AIR-ENTRAINED 6-SACK COMMERCIAL CONCRETE.
2. FULL DEPTH EXPANSION JOINT MATERIAL SHALL BE 3/8-INCH PRE-MOLDED JOINT FILLER. EXPANSION JOINTS SHALL EXTEND THROUGH THE FULL CROSS-SECTION OF THE SIDEWALK.
3. EXPANSION JOINTS ARE REQUIRED BETWEEN EXISTING SIDEWALKS AND CURB/GUTTER AND NEW SIDEWALKS AND CURB/GUTTER.
4. DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER SIMILAR OBSTRUCTIONS SHALL NOT BE PLACED IN FRONT OF THE RAMP ACCESS, ON THE RAMP OR ON THE LANDING.
5. PAY LIMITS FOR CURB RAMPS INCLUDE SHADED AREAS ONLY. ALL CURB AND ALL OTHER SIDEWALK WILL BE PAID SEPARATELY.
6. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN CROSS SLOPE OF EXISTING SIDEWALK EXCEEDS 2%.
7. IF THE ADJACENT ROADWAY GRADE IS SUCH THAT AN 8.3% RAMP SLOPE CANNOT BE ACHIEVED IN 15 FEET, THE RAMP LENGTH MAY BE LIMITED TO 15 FEET WITH NO MAXIMUM SLOPE REQUIREMENT.
8. NO ADDITIONAL CONSTRUCTION TOLERANCE IS ALLOWED ON MAXIMUM SLOPES (8.3%, 2.0%) WITHOUT A DESIGN DEVIATION APPROVAL FROM THE COUNTY ENGINEER.
9. SEE STANDARD PLAN A-3 FOR PED CURB DETAIL.
10. DETECTABLE WARNING PATTERNS SHALL BE YELLOW. IN COMPLIANCE WITH STANDARD SPECIFICATION 8-14.3(3).
11. AN UNOBSTRUCTED 4-FOOT MINIMUM WIDTH IS REQUIRED FOR ACCESSIBILITY STANDARDS. SEE STANDARD PLAN A-4 FOR ADDITIONAL SIDEWALK WIDTH REQUIREMENTS.

**SPOKANE COUNTY**  
DEPARTMENT OF PUBLIC WORKS  
SPOKANE, WA. 99260 477-3600

APPROVED  
COUNTY ENGINEER  
DATE: 7/17/17

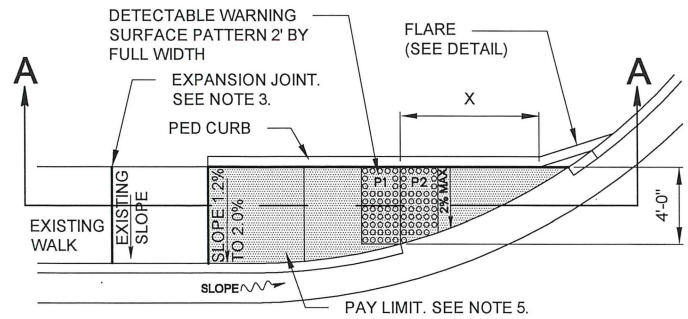


STANDARD  
CURB RAMP - COMBINATION

SHEET  
A - 5C

NO.	DATE	BY	CKD.	APPR.	REVISION

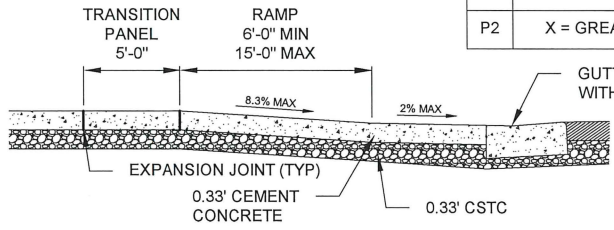
### TYPE D1



PLAN VIEW

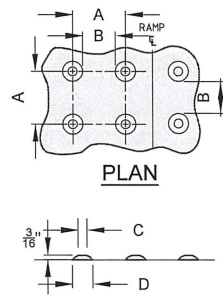
### DETECTABLE WARNING PATTERN POSITION

P1	X = LESS THAN 5'
P2	X = GREATER THAN 5'



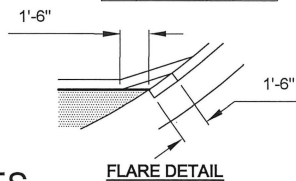
SECTION A-A

### TRUNCATED DOMES DETECTABLE WARNING PATTERN DETAIL



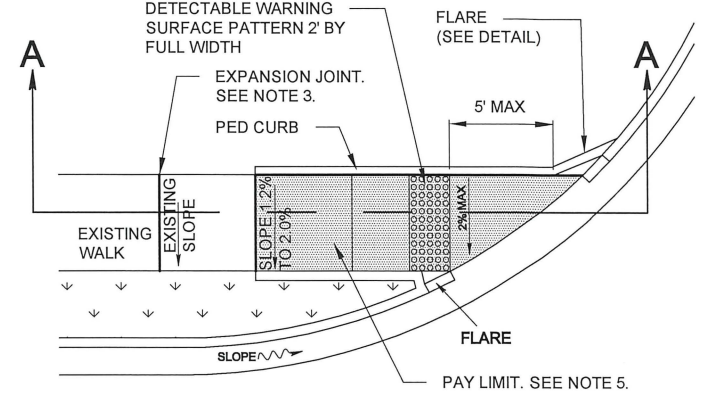
PROFILE

	MIN.	MAX.
A	1.6"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.9"	1.40"

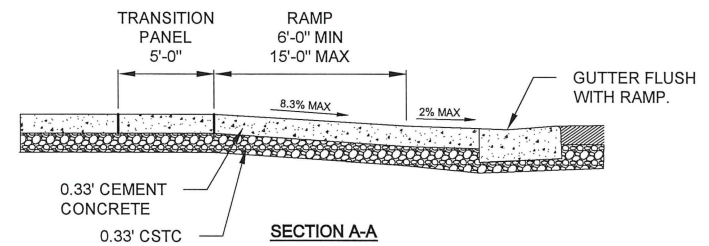


FLARE DETAIL

### TYPE D2



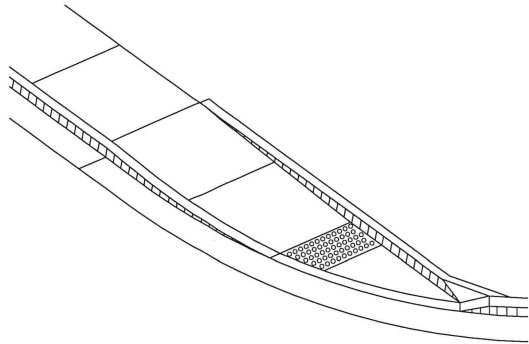
PLAN VIEW



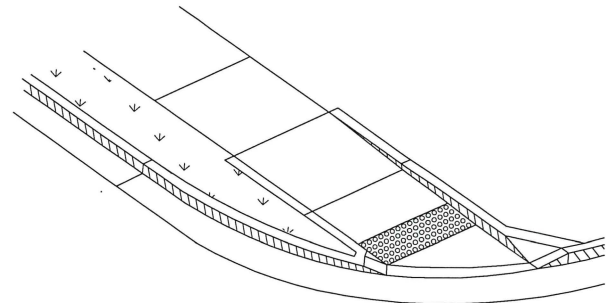
SECTION A-A

### GENERAL NOTES

1. CONCRETE FOR CURB RAMPS SHALL BE COMMERCIAL (6 SACK) AIR-ENTRAINED.
2. EXPANSION JOINT MATERIAL SHALL BE 3/8-INCH PREMOLDED JOINT FILLER. EXPANSION JOINTS SHALL EXTEND THROUGH THE FULL CROSS-SECTION OF THE SIDEWALK.
3. EXPANSION JOINTS ARE REQUIRED BETWEEN EXISTING SIDEWALKS AND CURB/GUTTER AND NEW SIDEWALKS AND CURB/GUTTER.
4. DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER SIMILAR OBSTRUCTIONS SHALL NOT BE PLACED IN FRONT OF THE RAMP ACCESS, ON THE RAMP OR ON THE LANDING.
5. PAY LIMITS FOR CURB RAMPS INCLUDE SHADED AREAS ONLY. ALL CURB AND ALL OTHER SIDEWALK WILL BE PAID SEPARATELY.
6. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN CROSS SLOPE OF EXISTING SIDEWALK EXCEEDS 2%.
7. IF THE ADJACENT ROADWAY GRADE IS SUCH THAT THE RAMP SLOPE CANNOT BE ACHIEVED IN 15 FEET, THE RAMP LENGTH MAY BE LIMITED TO 15 FEET WITH NO MAXIMUM SLOPE REQUIREMENT.
8. NO ADDITIONAL CONSTRUCTION TOLERANCE IS ALLOWED ON MAXIMUM SLOPES (8.3% , 2.0%) WITHOUT A DESIGN DEVIATION APPROVAL FROM THE COUNTY ENGINEER.
9. SEE STANDARD PLAN A-3 FOR PED CURB DETAIL, PED CURB MAY BE OMITTED IF THERE WILL NOT BE MATERIAL TO RETAIN BEHIND LANDING.
10. DETECTABLE WARNING PATTERNS SHALL BE YELLOW. IN COMPLIANCE WITH STANDARD SPECIFICATION 8-14.3(3).



ISOMETRIC VIEW  
(TYPE D1)



ISOMETRIC VIEW  
(TYPE D2)

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
DEPARTMENT OF PUBLIC WORKS  
SPOKANE, WA. 99260 477-3600

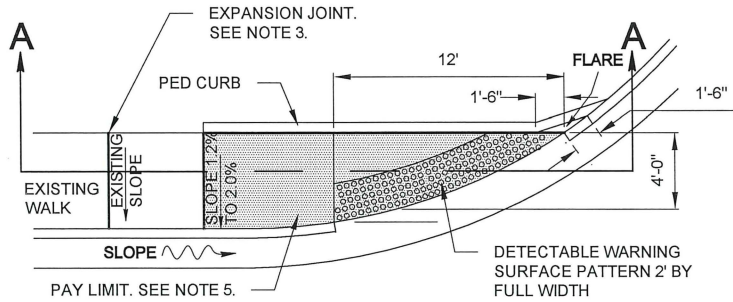
APPROVED  
COUNTY ENGINEER  
DATE: 10/11/17



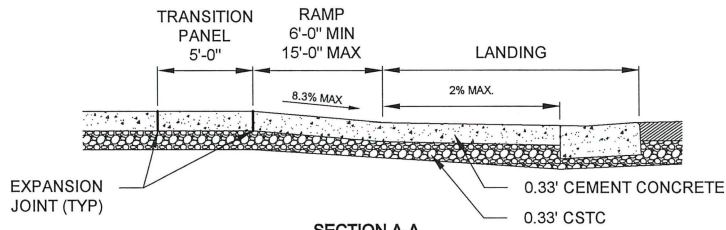
STANDARD  
CURB RAMP - SINGLE DIRECTION

SHEET  
A - 5D1

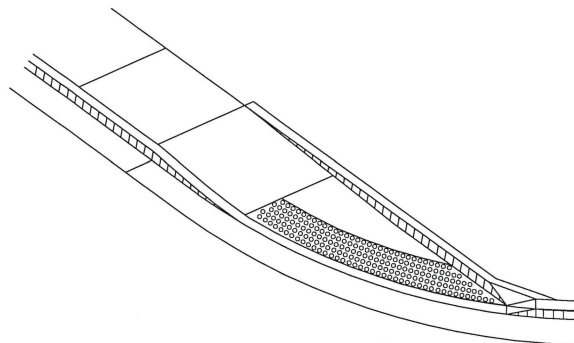
**TYPE D3**



**PLAN VIEW**

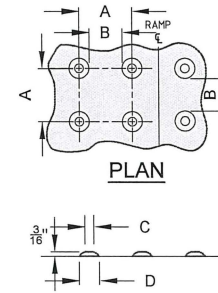


**SECTION A-A**



**ISOMETRIC VIEW (TYPE D3)**

**TRUNCATED DOMES  
 DETECTABLE WARNING PATTERN DETAIL**



**PROFILE**

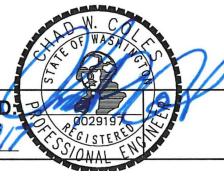
	MIN.	MAX.
A	1.6"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.9"	1.40"

**GENERAL NOTES**

1. CONCRETE FOR CURB RAMPS SHALL BE COMMERCIAL (6 SACK) AIR-ENTRAINED.
2. EXPANSION JOINT MATERIAL SHALL BE 3/8-INCH PREMOLDED JOINT FILLER. EXPANSION JOINTS SHALL EXTEND THROUGH THE FULL CROSS-SECTION OF THE SIDEWALK.
3. EXPANSION JOINTS ARE REQUIRED BETWEEN EXISTING SIDEWALKS AND CURB/GUTTER AND NEW SIDEWALKS AND CURB/GUTTER.
4. DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER SIMILAR OBSTRUCTIONS SHALL NOT BE PLACED IN FRONT OF THE RAMP ACCESS, ON THE RAMP OR ON THE LANDING.
5. PAY LIMITS FOR CURB RAMPS INCLUDE SHADED AREAS ONLY. ALL CURB AND ALL OTHER SIDEWALK WILL BE PAID SEPARATELY.
6. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN CROSS SLOPE OF EXISTING SIDEWALK EXCEEDS 2%.
7. IF THE ADJACENT ROADWAY GRADE IS SUCH THAT THE RAMP SLOPE CANNOT BE ACHIEVED IN 15 FEET, THE RAMP LENGTH MAY BE LIMITED TO 15 FEET WITH NO MAXIMUM SLOPE REQUIREMENT.
8. NO ADDITIONAL CONSTRUCTION TOLERANCE IS ALLOWED ON MAXIMUM SLOPES (8.3% , 2.0%) WITHOUT A DESIGN DEVIATION APPROVAL FROM THE COUNTY ENGINEER.
9. SEE STANDARD PLAN A-3 FOR PED CURB DETAIL, PED CURB MAY BE OMITTED IF THERE WILL NOT BE MATERIAL TO RETAIN BEHIND LANDING.
10. DETECTABLE WARNING PATTERNS SHALL BE YELLOW. IN COMPLIANCE WITH STANDARD SPECIFICATION 8-14.3(3).

**SPOKANE COUNTY  
 DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

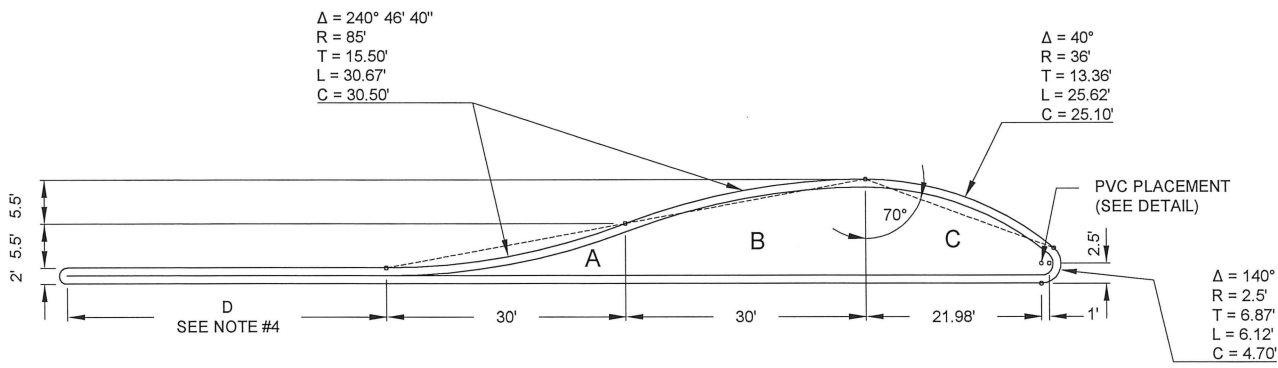
**APPROVED**  
 COUNTY ENGINEER  
 DATE: 8/29/17



STANDARD  
 CURB RAMP - SINGLE DIRECTION

NO.	DATE	BY	CKD.	APPR.	REVISION

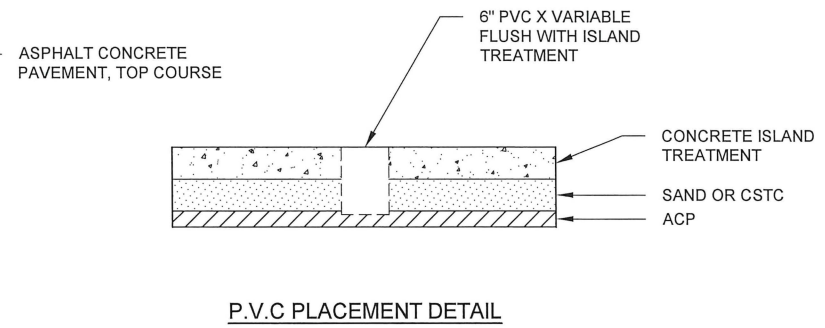
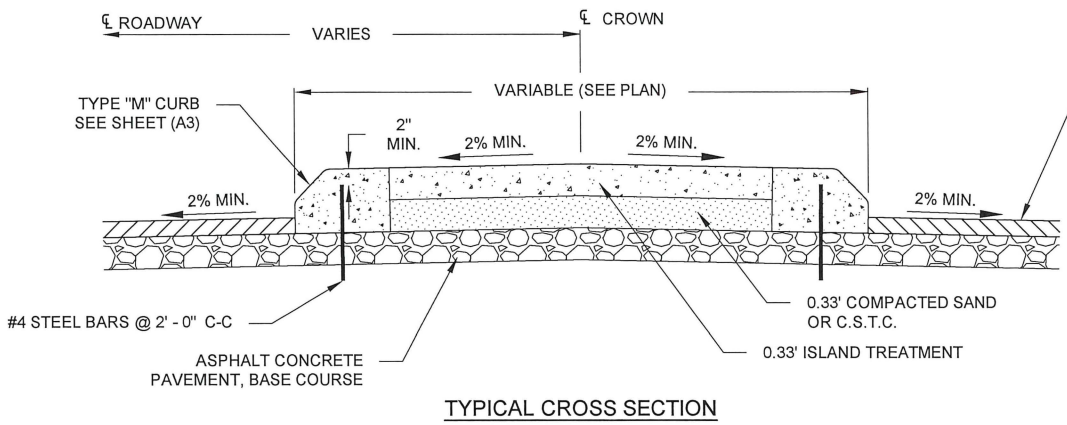
**SHEET**  
 A - 5D2



**GENERAL NOTES**

1. CONSTRUCTION OF ISLAND TREATMENT SHALL CONFORM TO SECTION 8-04 & 8-14 OF THE STANDARD SPECIFICATIONS.
2. EXPOSED CURB SURFACES SHALL BE STEEL TROWELLED TO PROVIDE A DENSE, SMOOTH, REFLECTIVE FINISH. THE CONCRETE SLAB SHALL HAVE A BROOMED FINISH.
3. ISLAND NOSES SHALL BE DOWELED TO THE PAVEMENT IN AT LEAST TWO PLACES.
4. "D" SHALL BE SHOWN ON CONST. PLANS.
5. DEVIATION FROM THE STANDARD ISLAND DIMENSIONS MUST BE APPROVED BY THE TRAFFIC ENGINEER.

AREA TABLE	A	B	C	TOTAL
TOTAL AREA (FT <sup>2</sup> )	114.27	335.74	244.73	694.74
CURB AREA (FT <sup>2</sup> )	58.71	62.63	52.14	173.48
TREATMENT AREA (FT <sup>2</sup> )	55.56	273.11	192.59	521.26
CURB (OUTER EDGE) (L.F.)	60.87	60.67	53.27	175.06



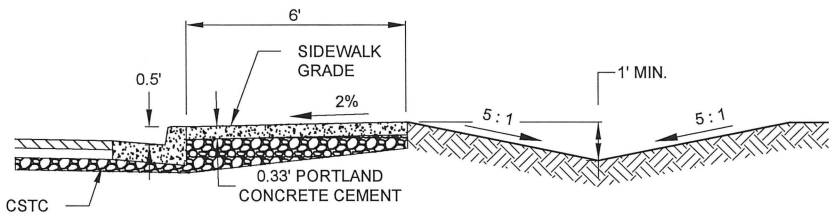
NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600



STANDARD  
 TRAFFIC ISLAND

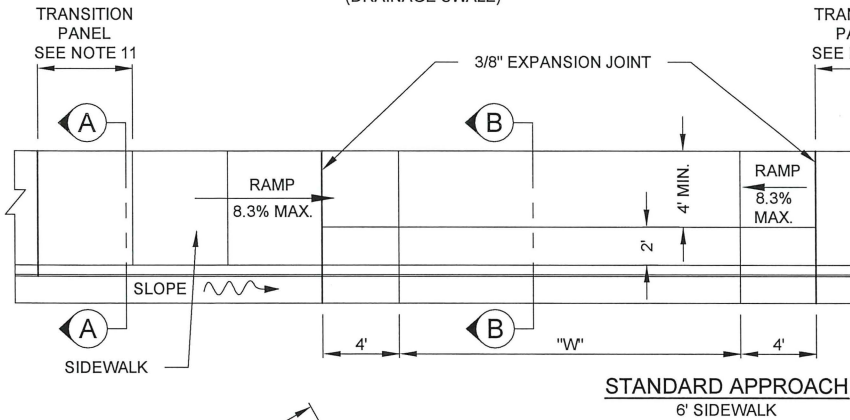
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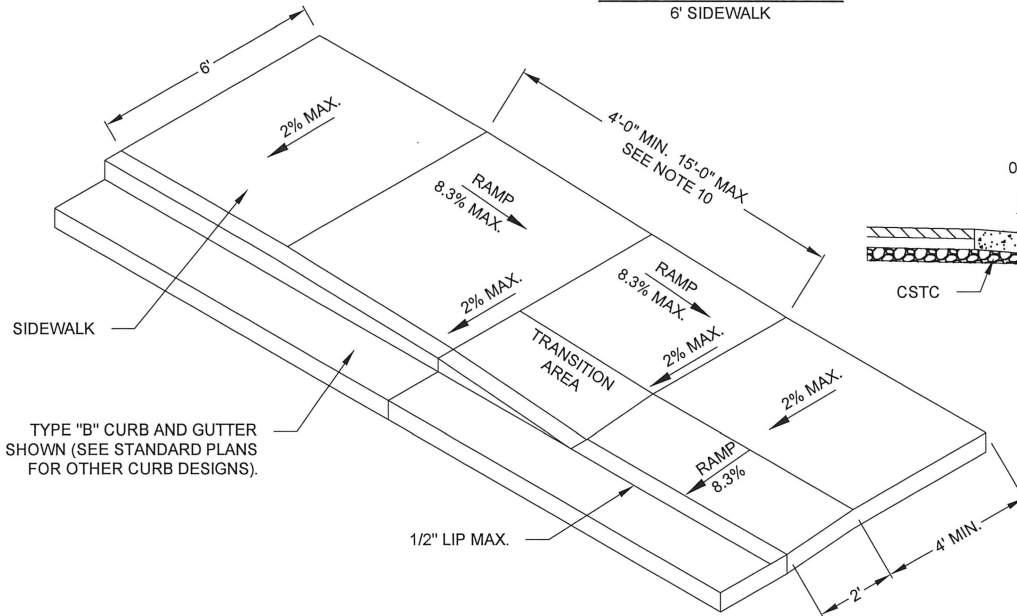
**SECTION A - A**  
(DRAINAGE SWALE)

**DIMENSION TABLE**

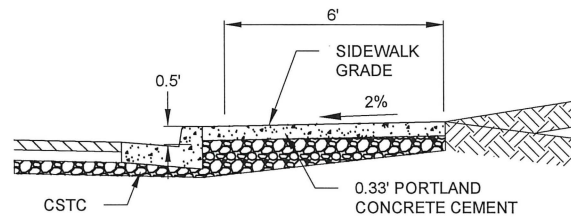
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	MIN.	MAX.
COMM.	16'	40'
RES.	16'	30'



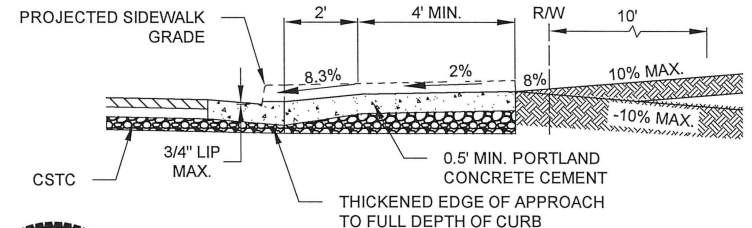
**STANDARD APPROACH**  
6' SIDEWALK



**STANDARD APPROACH**  
(ISOMETRIC VIEW)



**SECTION A - A**



**SECTION B - B**

**GENERAL NOTES**

1. EXPANSION JOINT MATERIAL SHALL BE PLACED IN THE CENTER OF ALL DRIVEWAY APPROACHES OVER 20' IN WIDTH.
2. EXPANSION JOINT REQUIRED IF POUR INCLUDES ADDITIONAL DRIVEWAY AREA.
3. CONCRETE FOR DRIVEWAYS SHALL BE 6-SACK COMMERCIAL AIR ENTRAINED.
4. ALL EXTERNAL EDGES TO BE TROWELLED WITH 1/4" RADIUS EDGER.
5. SIDEWALK TO BE SCORED EVERY 5'. 4" WIDE BY 3/8" EXPANSION JOINT TO BE INSTALLED EACH SIDE OF A CURB RETURN AND AT LOCATIONS WHERE SIDEWALK INTERSECTS OTHER SIDEWALKS, DRIVEWAYS AND CURBS, EVERY 15' MAXIMUM.
6. EXPANSION JOINT SHALL BE PLACED TO ENSURE COMPLETE SEPARATION OF CONCRETE.
7. THE COUNTY ENGINEER MAY REQUIRE A WIDER SIDEWALK THAN MINIMUM, WHERE PEDESTRIAN TRAFFIC VOLUMES INDICATE IT IS WARRANTED.
8. CEMENT CONCRETE APPROACHES SHALL BE CONSTRUCTED AT ALL CURB DROP LOCATIONS TO INSURE STORMWATER FLOW ALONG GUTTER LINE REGARDLESS OF SIDEWALK CONSTRUCTION.
9. 95% COMPACTION UNDER APPROACHES. 92% COMPACTION UNDER SIDEWALKS. (MODIFIED PROCTOR)
10. IF THE ADJACENT ROADWAY GRADE IS SUCH THAT AN 8.3% RAMP SLOPE CANNOT BE ACHIEVED IN 15', THE RAMP LENGTH MAY BE LIMITED TO 15' WITH NO MAXIMUM SLOPE REQUIREMENT.
11. TRANSITION PANELS ARE REQUIRED ON RETROFITS WHEN THE CROSS SLOPE OF THE EXISTING SIDEWALK EXCEEDS 2%.

**SPOKANE COUNTY**  
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SPOKANE, WA. 99260 477-3600

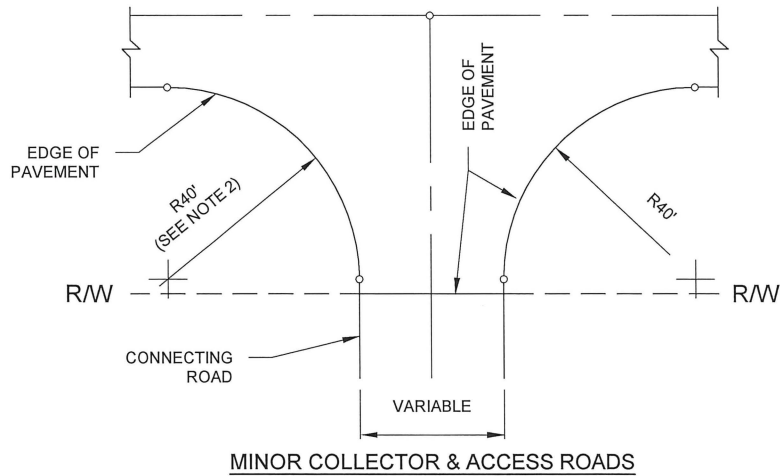
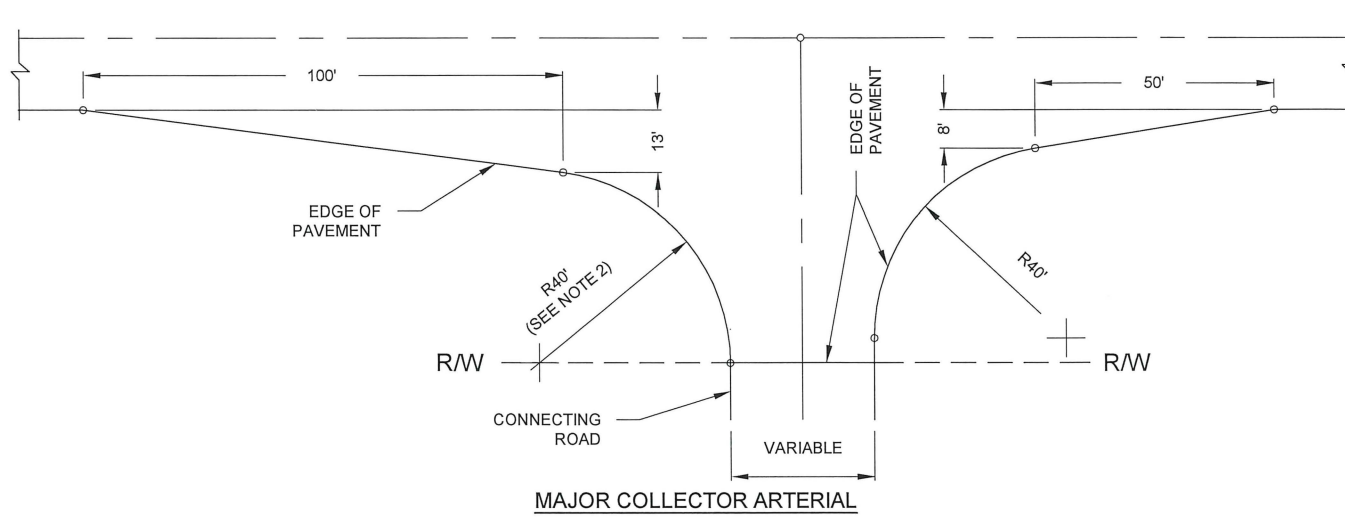
APPROVED  
COUNTY ENGINEER  
DATE: 8/1/17



STANDARD  
CEMENT CONCRETE APPROACHES

SHEET  
A - 7

NO.	DATE	BY	CKD.	APPR.	REVISION

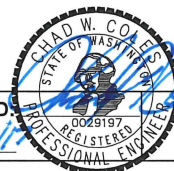


### GENERAL NOTES

1. ALL APPROACHES ARE SYMMETRICAL ABOUT CENTERLINE UNLESS OTHERWISE NOTED.
2. WHERE LARGER TRUCK TURNING MOVEMENTS ARE ENCOUNTERED LARGER RETURN RADII AND RIGHT TURN TAPERS MAY BE REQUIRED. RADIUS AND TAPERS SHALL BE DETERMINED BY THE COUNTY ENGINEER.
3. DECELERATION/ACCELERATION LANES MAY BE REQUIRED IF DETERMINED BY ENGINEERING ANALYSIS OR REQUIRED BY THE SPOKANE COUNTY ENGINEER.

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED  
 COUNTY ENGINEER  
 DATE: 7/11/17

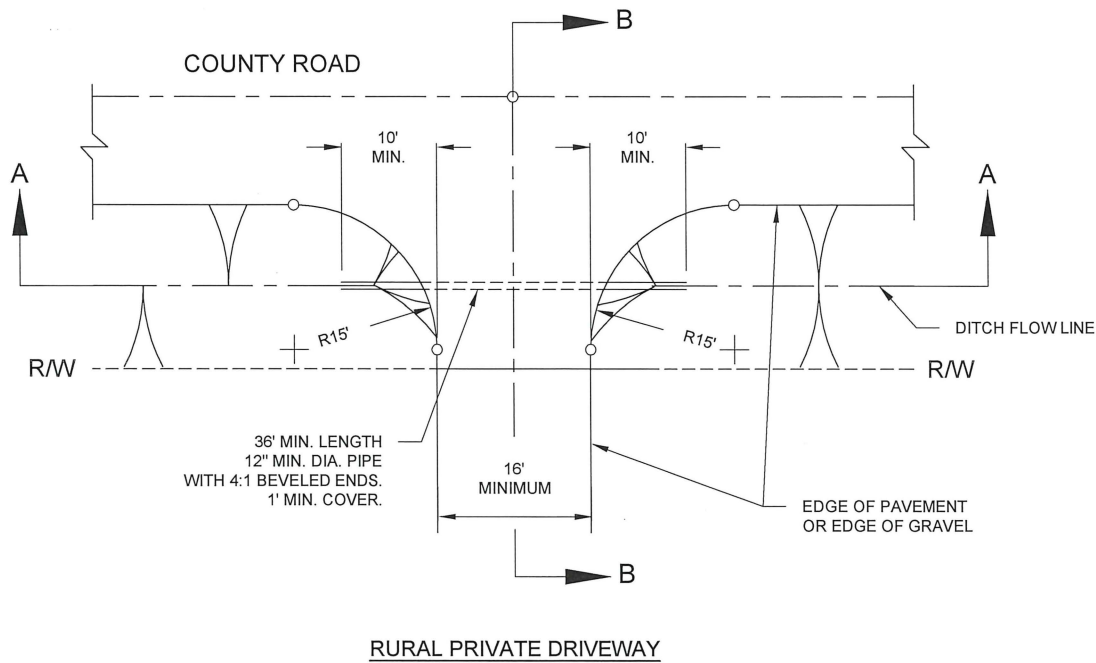


STANDARD  
 RURAL ROAD APPROACHES

NO.	DATE	BY	CHKD.	APPR.

REVISION

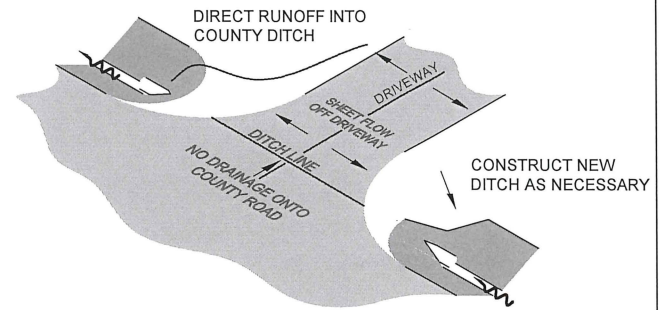
SHEET  
 A - 8



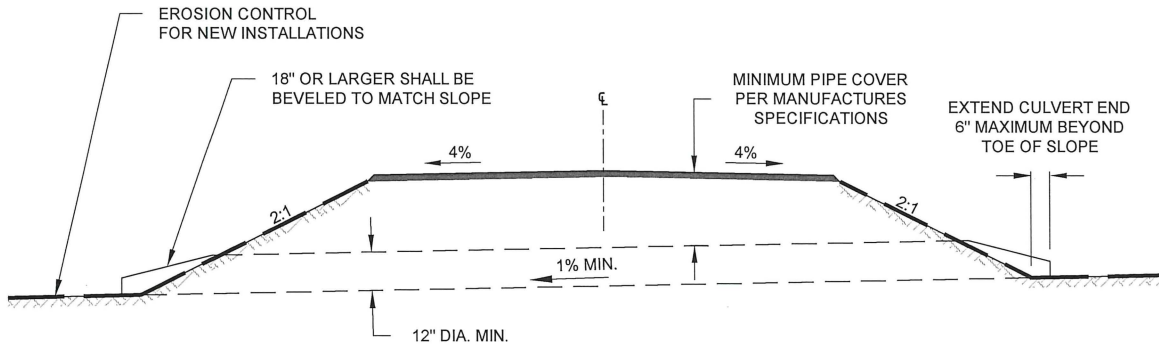
RURAL PRIVATE DRIVEWAY

**GENERAL NOTES**

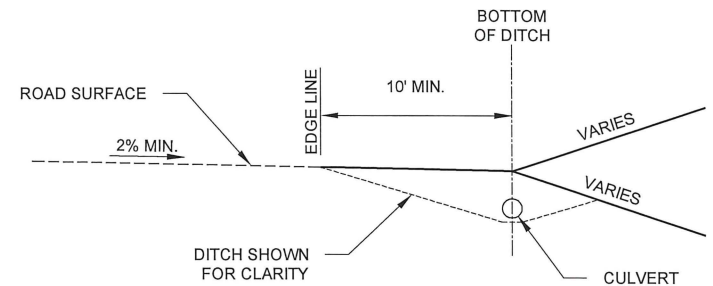
1. THE DRAINAGE PIPE SHALL HAVE A MINIMUM DIAMETER OF 12". LARGER PIPES MAY BE REQUIRED BY THE COUNTY ENGINEER WHERE LARGER FLOWS OCCUR.
2. REFER TO APPROACH SECTION REGARDING LARGER CULVERTS.



**DRAINAGE PLAN**



SECTION A - A  
(CULVERT SECTION)

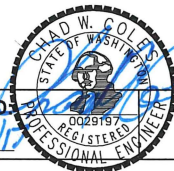


SECTION B - B  
(APPROACH SECTION)

NO.	DATE	BY	CKD.	APPR.	REVISION

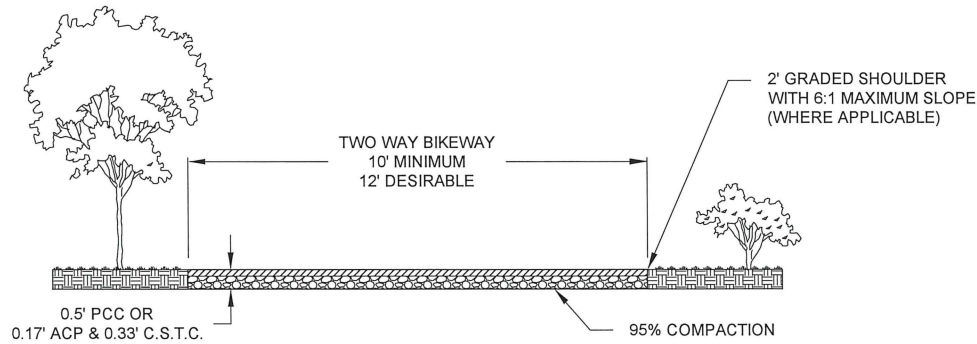
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED: \_\_\_\_\_  
 COUNTY ENGINEER  
 DATE: 12/11/17

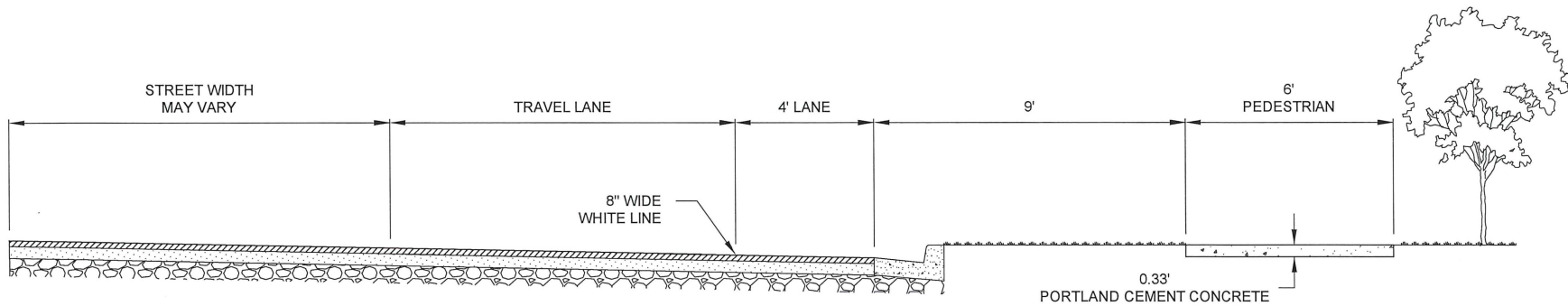


STANDARD  
 RURAL DRIVEWAY APPROACHES

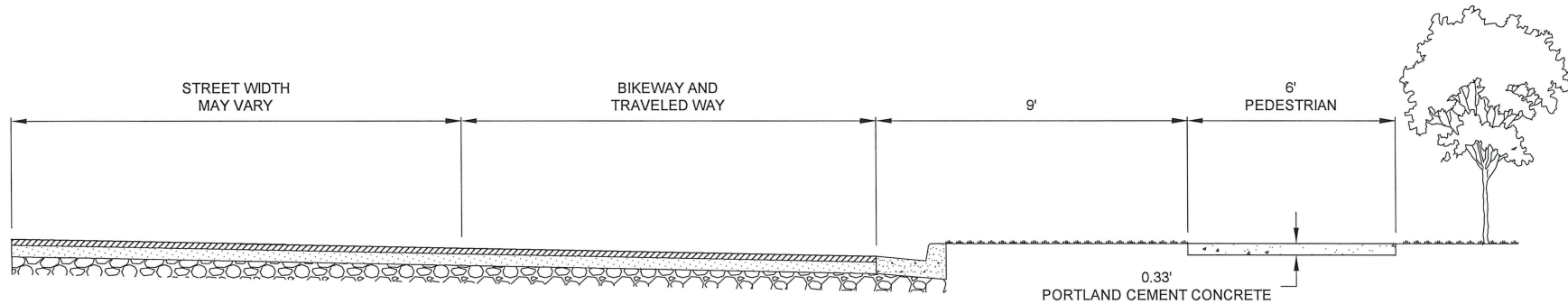
SHEET  
 A - 8A



SHARED USE PATHWAY



BIKE LANE

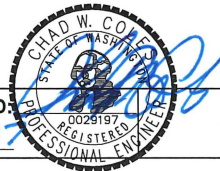


BIKE ROUTE

NOTE: SIGNING FOR BIKEWAYS BE CONSISTENT WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

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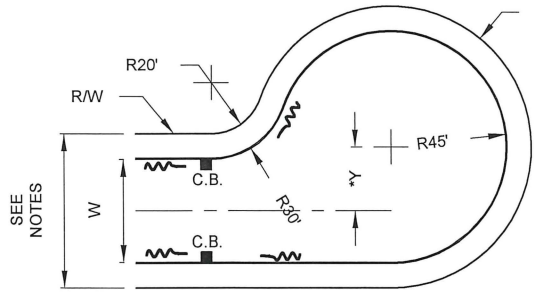
APPROVED:  
COUNTY ENGINEER  
DATE: 7/11/17



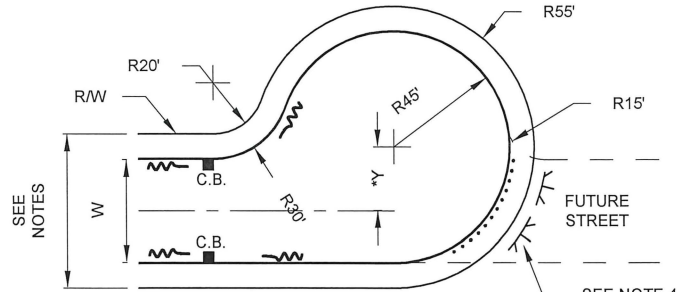
STANDARD  
BIKE WAYS & PEDESTRIAN PATHS

NO.	DATE	BY	CKD.	APPR.	REVISION

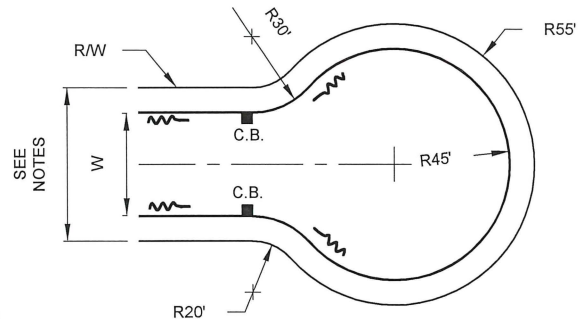




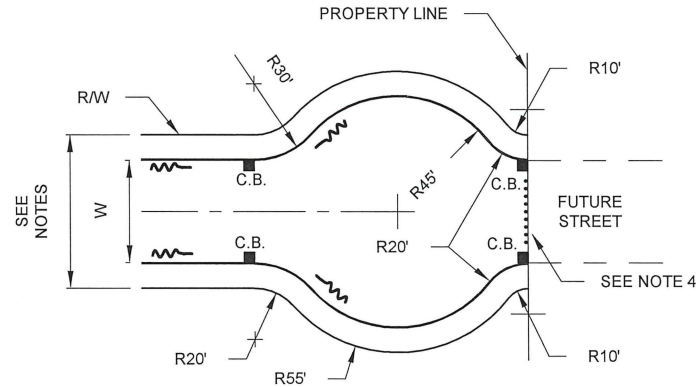
**OFFSET CUL-DE-SAC**  
\*Y = 45' - W/2



**TEMPORARY OFFSET CUL-DE-SAC**  
\*Y = 45' - W/2



**FULL CUL-DE-SAC**



**TEMPORARY FULL CUL-DE-SAC**

**GENERAL NOTES**

1. THE CATCH BASINS (C.B.) SHOWN ON THIS SHEET ARE REQUIRED ONLY WHEN THE STREET SLOPES TOWARD THE CUL-DE-SAC.
2. THE WIDTH OF RIGHT-OF-WAY AND THE CURB TO CURB STREET DIMENSIONS SHALL BE SPECIFIED BY THE COUNTY ENGINEERS OFFICE.
3. MINIMUM CURB GRADES ON CUL-DE-SACS SHALL BE 1%.
4. TEMPORARY CUL-DE-SAC WILL BE MARKED BY INSTALLATION OF PERMANENTLY INSTALLED TYPE 3 BARRICADES AND TWO "END OF ROADWAY MARKERS". SIGNS OM4-1 IN THE PATH OF THE APPROACHING TRAFFIC LANE TO THE END OF THE CUL-DE-SAC.

NO.	DATE	BY	CHKD.	APPR.	REVISION

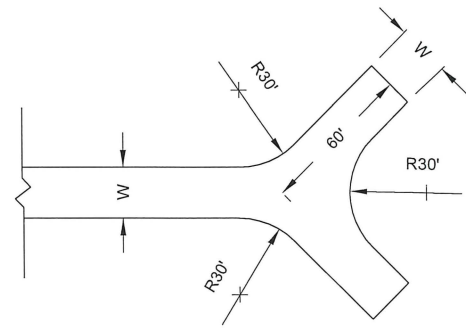
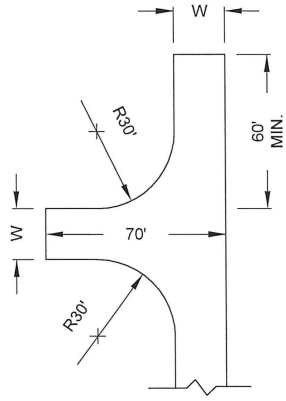
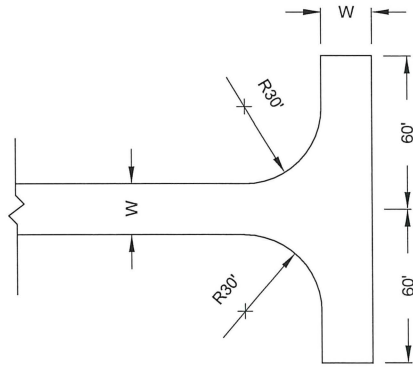
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

APPROVED  
COUNTY ENGINEER  
DATE: 7/11

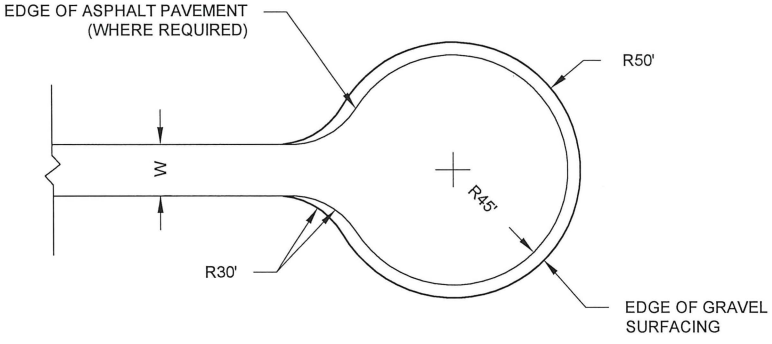


STANDARD  
CUL-DE-SAC-ROADS

SHEET  
A - 10



**ALTERNATE TURN-AROUNDS**  
 W = WIDTH OF ROADWAY BEING TERMINATED



**STANDARD CUL-DE-SAC**

**NOTE**

ALTERNATE TURN-AROUNDS MAY BE USED WHEN THE TERRAIN PRECLUDES THE USE OF STANDARD CUL-DE-SAC.

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 COUNTY ENGINEER  
 DATE:



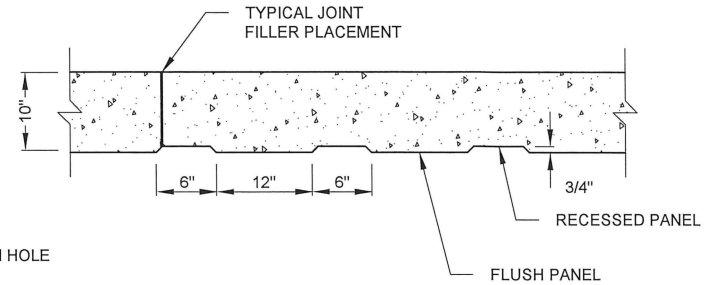
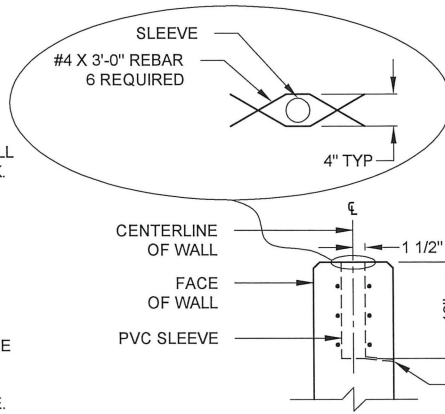
STANDARD  
 PRIVATE ROAD ALTERNATE TURN-AROUND

SHEET  
 A - 10A

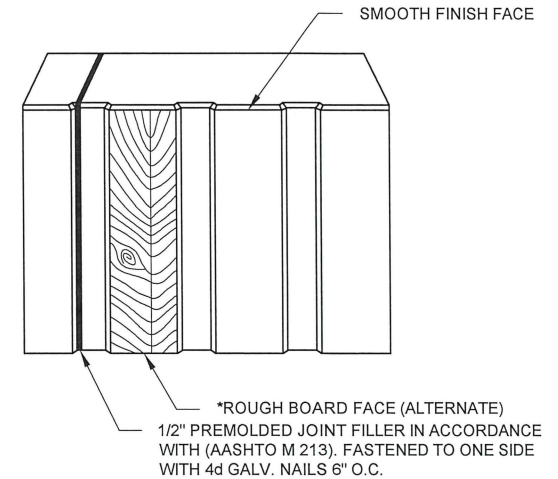
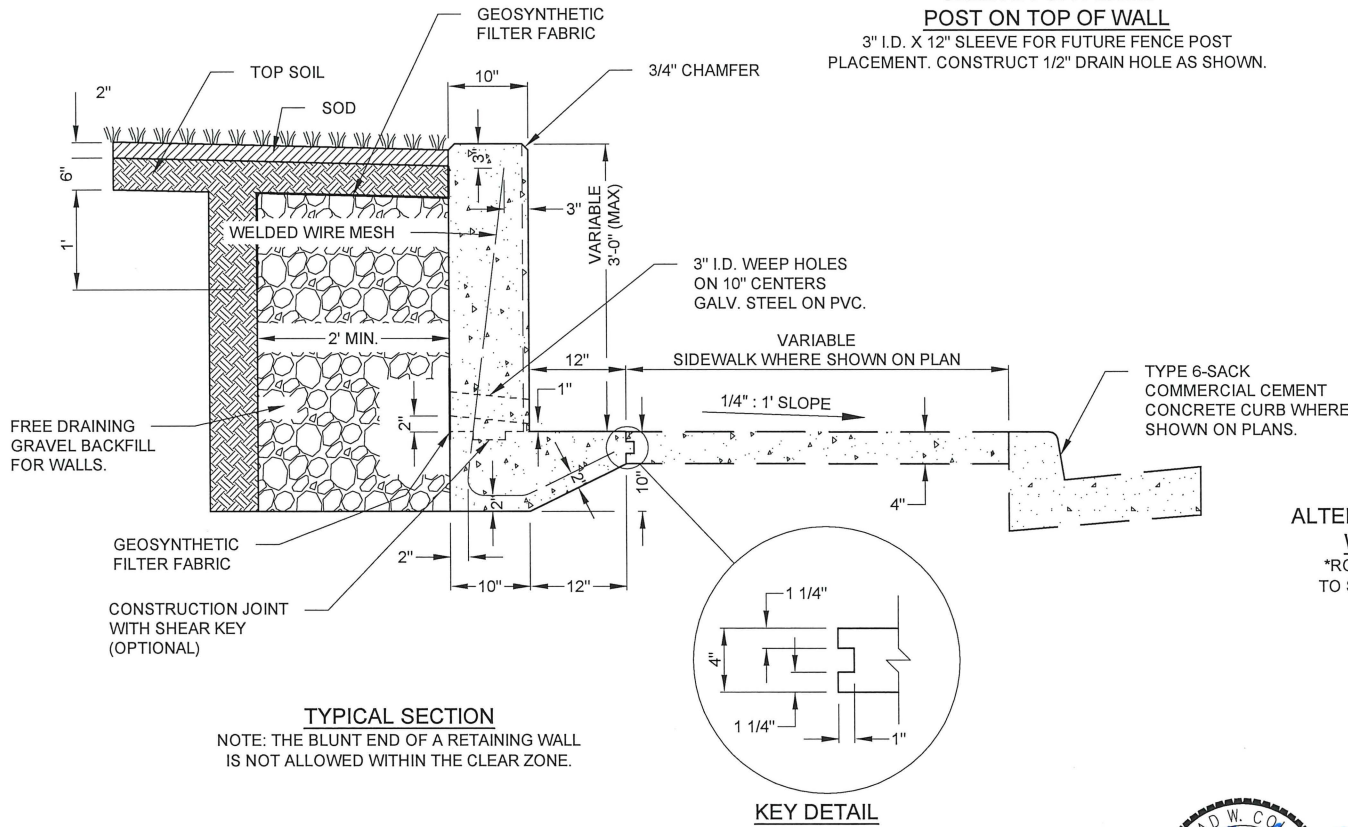
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# GENERAL NOTES

1. ALL CONCRETE SHALL BE 6-SACK COMMERCIAL.
2. 1/2" PREMOLDED JOINT FILLER IN WALL AT MAXIMUM 25' CENTERS. JOINT SHALL OCCUR AT PANEL EDGE AND CONTINUE TRANSVERSELY THROUGH SIDEWALK.
3. REINFORCING SHALL BE A CURTAIN OF 4"X4" - W4/W4 WELDED SIRE MESH.
4. CLASS 1 SURFACE TREATMENT ON ALL EXPOSED WALL SURFACES.
5. ALL BACKFILL BEHIND WALL SHALL BE FREE DRAINING GRANULAR MATERIAL.
6. SLEEVES FOR FENCE POSTS SHALL BE CENTERED AS DIRECTED BY THE ENGINEER. WALLS 2'-6" OR TALLER REQUIRE A FENCE OR AS DIRECTED BY THE ENGINEER.
7. THIS WALL DESIGN TO BE USED WITH A LEVEL BACKFILL AND NO SURCHARGE.



**SLEEVE FOR FENCE POST ON TOP OF WALL**  
 3" I.D. X 12" SLEEVE FOR FUTURE FENCE POST PLACEMENT. CONSTRUCT 1/2" DRAIN HOLE AS SHOWN.



**ALTERNATE FACE TREATMENT TO BE CONSTRUCTED WHERE DESIGNED IN SPECIAL PROVISIONS**  
 \*ROUGH BOARD FORM-FINISHED SURFACE OF FLUSH PANEL IS TO SIMULATE THE GRAIN OF ROUGH BOARDS. USE FORM LINER.

**SPOKANE COUNTY**  
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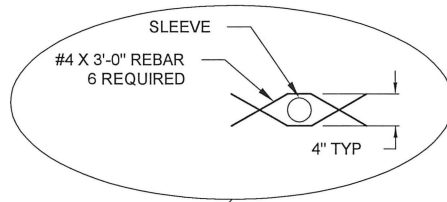
APPROVED  
 COUNTY ENGINEER  
 DATE: 8/11/17



STANDARD  
 SIDEWALK RETAINING WALL

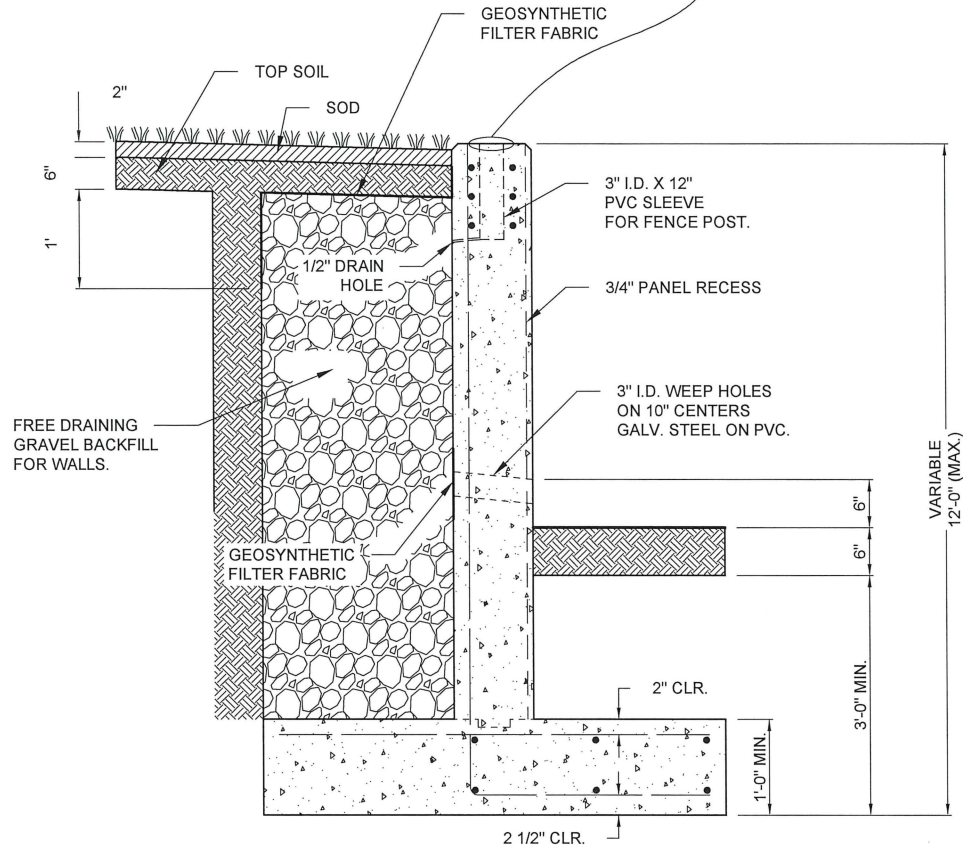
SHEET  
 A - 11

NO.	DATE	BY	CHKD.	APPR.	REVISION



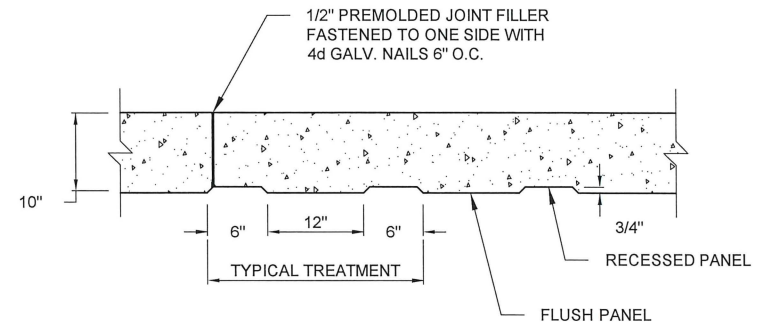
### GENERAL NOTES

1. ALL CONCRETE 6 SACK, COMMERCIAL.
2. ALL EDGES TO BE 3/4" CHAMFER.
3. CONCRETE THICKNESS, STRUCTURAL DETAILS, SIZE AND NUMBER OF REINFORCEMENT SHALL BE DETERMINED BY ENGINEER.
4. 1/2" PREMOLDED JOINT FILLER IN WALL AT MAXIMUM 25' CENTERS. JOINT SHALL OCCUR AT PANEL EDGE AND CONTINUE TRANSVERSELY THROUGH SIDEWALK.
5. SLEEVES FOR FENCE POSTS SHALL BE CENTERED AS DIRECTED BY ENGINEER. WALLS 2'-6" OR TALLER REQUIRE A FENCE OR AS DIRECTED BY ENGINEER.



### TYPICAL SECTION

NOTE: THE BLUNT END OF A RETAINING WALL IS NOT ALLOWED WITHIN THE CLEAR ZONE.

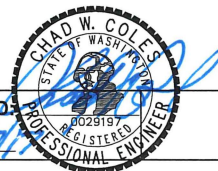


### FACE TREATMENT ON WALL

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

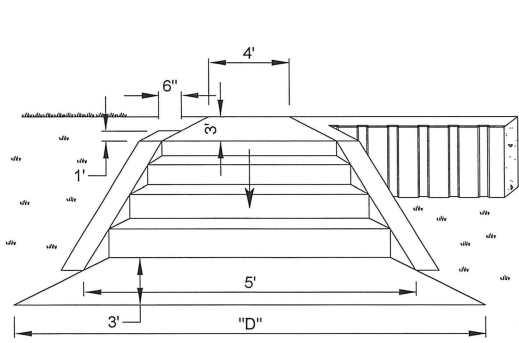
APPROVED  
 COUNTY ENGINEER  
 DATE: 11/14/17



STANDARD  
 RETAINING WALL

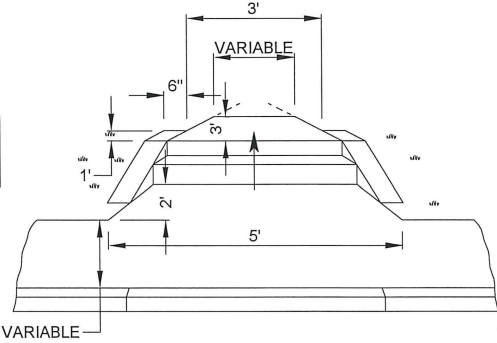
SHEET  
 A - 12

**TYPE 1**



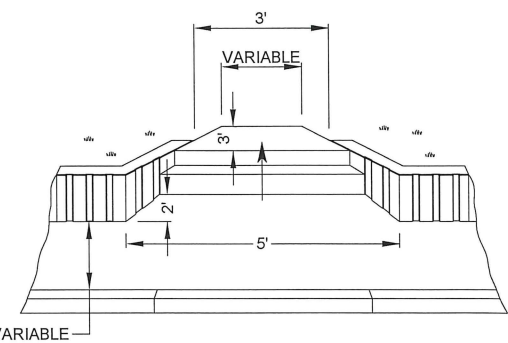
**ENTRANCE STEPS DOWN**  
WITH OR WITHOUT RETAINING WALL

**TYPE 2**



**ENTRANCE STEPS UP**

**TYPE 3**

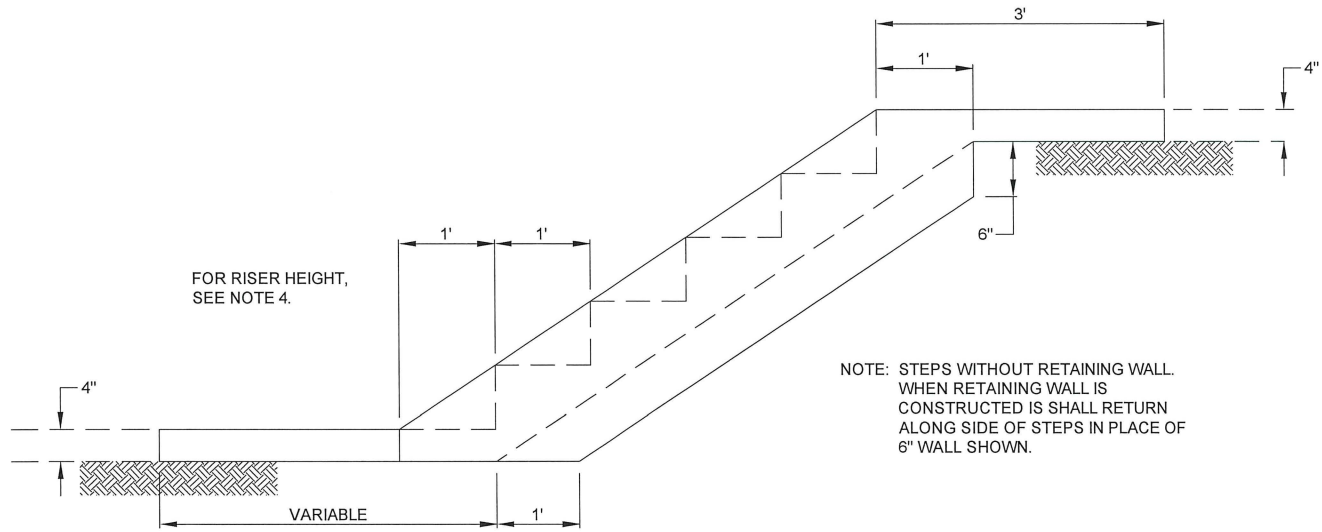


**ENTRANCE STEPS UP**  
WITH RETAINING WALL

NOTE: WIDTH "D" THIS IS VARIABLE TO MEET THE WIDTH OF THE ENTRANCE WALK TO BE JOINED. IF NO WALK EXISTS THIS WIDTH IS TO BE 5 FEET.

**GENERAL NOTES**

1. PORTLAND CEMENT CONCRETE SHALL BE COMMERCIAL 6-SACK CONFORMING TO THE STANDARD SPECIFICATIONS.
2. ALL EXPOSED EDGES TO BE FINISHED WITH 3/4" RADIUS.
3. TREADS SHALL PITCH DOWN AND OUT 1/4" AND SHALL NOT TRAP WATER.
4. RISERS SHALL HAVE A MINIMUM 5" AND MAXIMUM 8" HEIGHT AND ALL SHALL BE EQUAL AT ANY ONE LOCATION.
5. NUMBER OF STEPS WILL VARY TO MEET THE GRADE OF PROPERTY BEING SERVED.
6. VARIATIONS IN DIMENSIONS MAY BE MADE ON SITE BY THE ENGINEER TO SATISFY PARTICULAR CONDITIONS.



FOR RISER HEIGHT, SEE NOTE 4.

NOTE: STEPS WITHOUT RETAINING WALL. WHEN RETAINING WALL IS CONSTRUCTED IS SHALL RETURN ALONG SIDE OF STEPS IN PLACE OF 6" WALL SHOWN.

**TYPICAL SECTION**



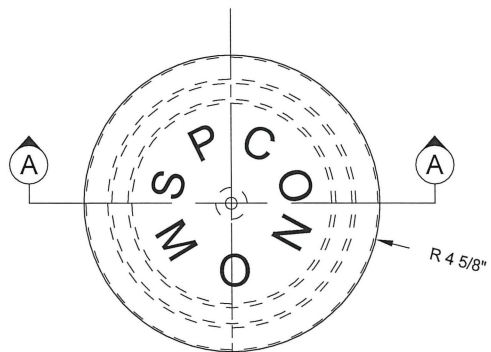
NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

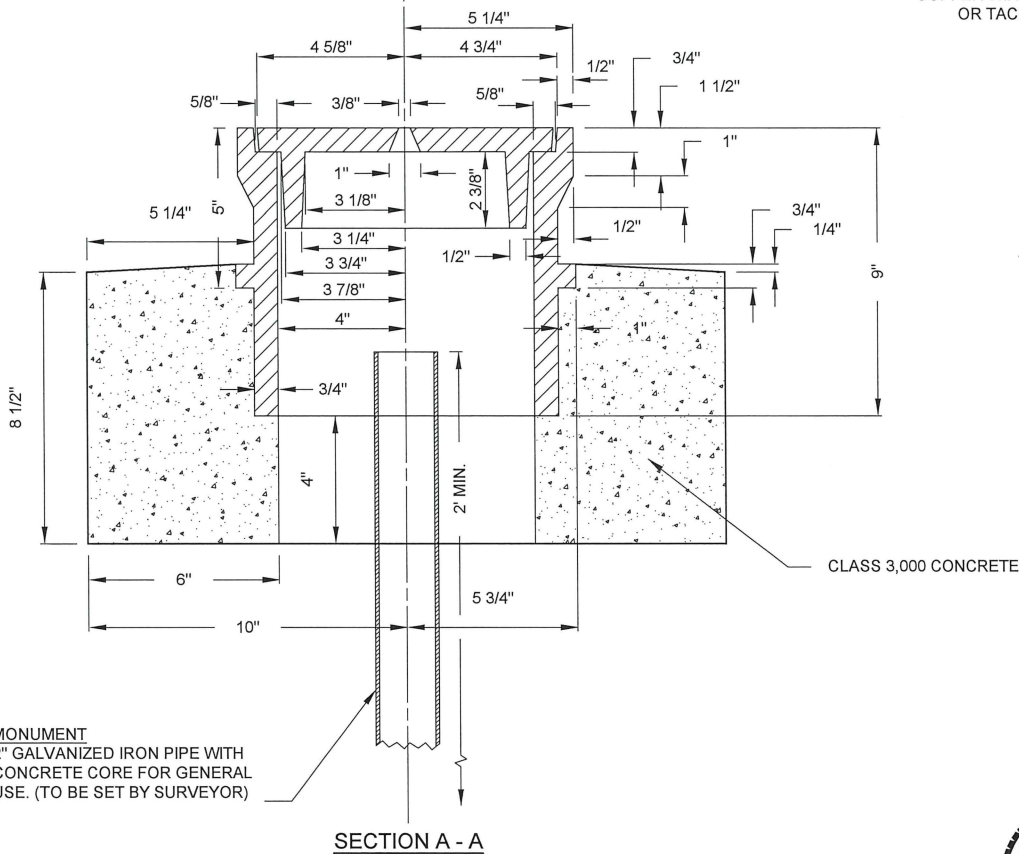
APPROVED  
COUNTY ENGINEER  
DATE: \_\_\_\_\_

STANDARD  
ENTRANCE STEPS TO ABUTTING PROPERTIES

SHEET  
A - 13



**PLAN VIEW**  
1" LETTERS

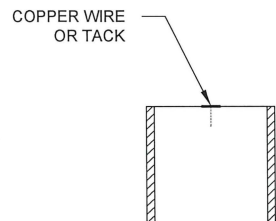


**MONUMENT**  
2" GALVANIZED IRON PIPE WITH  
CONCRETE CORE FOR GENERAL  
USE. (TO BE SET BY SURVEYOR)

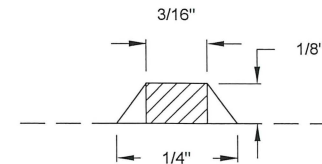
**SECTION A - A**

**GENERAL NOTES**

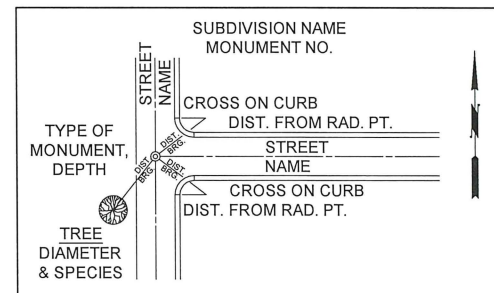
1. THE CASTINGS SHALL BE GRAY IRON CASTINGS, AASHTO DESIGNATION M-105, CLASS 30B. THE COVER AND SEAT SHALL BE MACHINED SO AS TO HAVE CONTACT AROUND THE ENTIRE CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.
2. WHEN THE MONUMENT CASE AND COVER ARE PLACED IN CEMENT CONCRETE PAVEMENT THE CONCRETE BASE IS NOT NEEDED.
3. A RECORD OF REFERENCES TO SURVEY POINTS SHALL BE SUBMITTED TO THE COUNTY ENGINEERS OFFICE AS SHOWN ON AMPLE.



**IRON PIPE DETAIL**



**SECTION OF LETTER**



**SAMPLE REFERENCE CARD**

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

**APPROVED:**  
COUNTY ENGINEER  
DATE: 5/19/17



STANDARD  
**MONUMENT CASE & COVER**

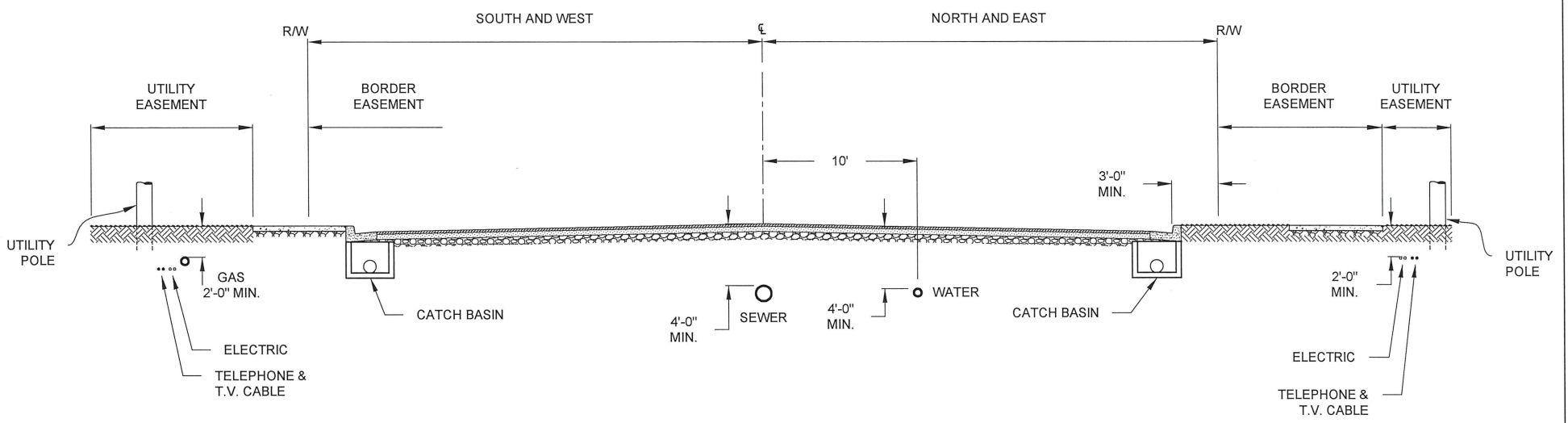
**SHEET**  
A - 14

NO.	DATE	BY	CHKD.	APPR.	REVISION

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### GENERAL NOTES

1. THIS PLAN SHOWS NORMAL LOCATIONS FOR ALL UTILITY INSTALLATIONS.
2. LOCATIONS OF EXISTING UTILITIES MUST BE FIELD LOCATED WITH THEIR RESPECTIVE OWNERS BEFORE MAKING NEW CONNECTIONS.
3. TELEPHONE PEDESTAL SHALL BE LOCATED JUST INSIDE R/W LINE.
4. REFER TO ROADSIDE SAFETY SECTION FOR ADDITIONAL INFORMATION.



NO.	DATE	BY	CHKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED  
 COUNTY ENGINEER  
 DATE: 5/11/17



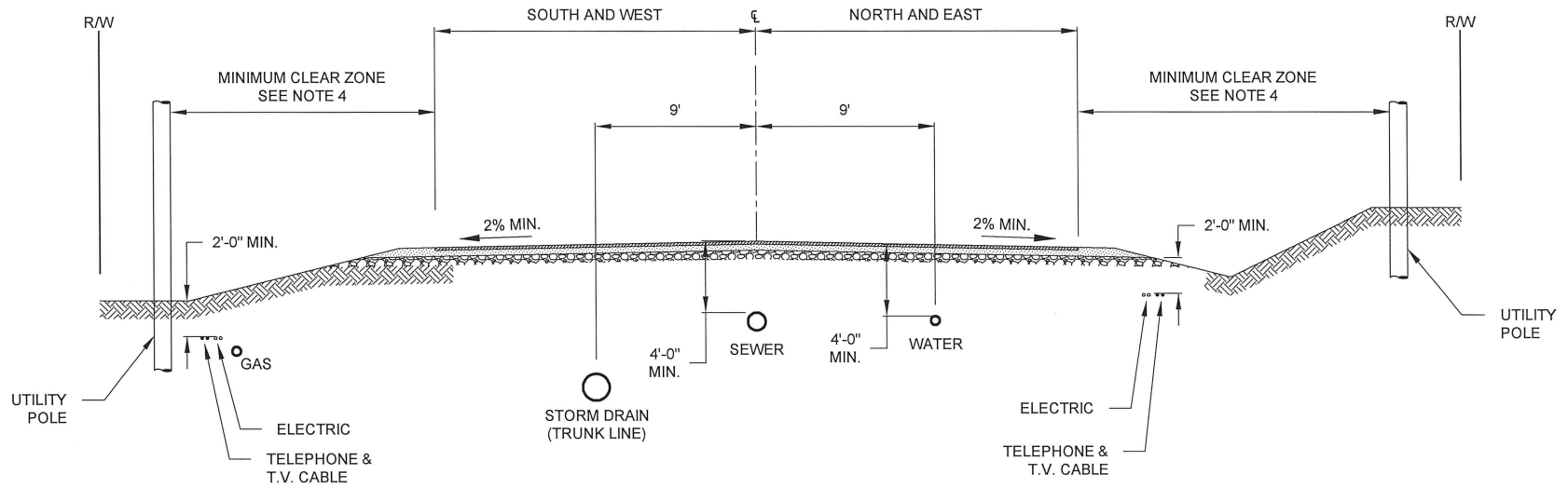
STANDARD  
 UTILITY LOCATIONS - CURBED ROAD

SHEET  
 A-15

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### GENERAL NOTES

1. THIS PLAN SHOWS NORMAL LOCATIONS FOR ALL UTILITY INSTALLATIONS.
2. LOCATIONS OF EXISTING UTILITIES MUST BE FIELD LOCATED WITH THEIR RESPECTIVE OWNERS BEFORE MAKING NEW CONNECTIONS.
3. TELEPHONE PEDESTAL SHALL BE LOCATED JUST INSIDE RW LINE.
4. REFER TO ROADSIDE SAFETY SECTION FOR ADDITIONAL INFORMATION.



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APPROVED  
 COUNTY ENGINEER  
 DATE: 7/17/17

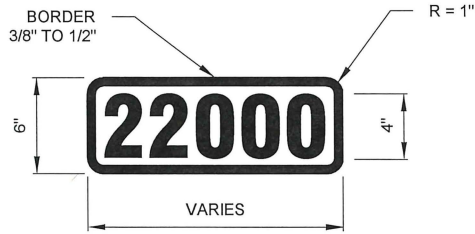


STANDARD  
 UTILITY LOCATIONS - SHOULDERED ROAD

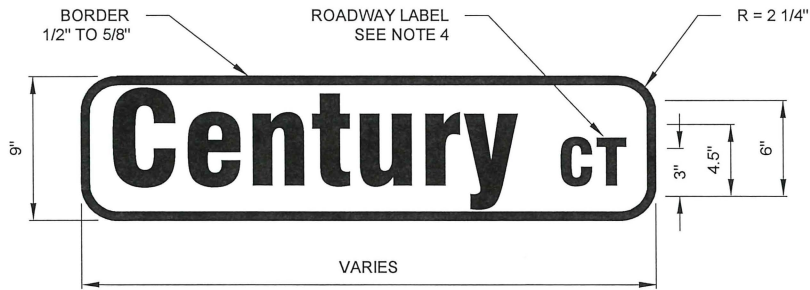
NO.	DATE	BY	CKD.	APPR.	REVISION

SHEET  
 A - 15A

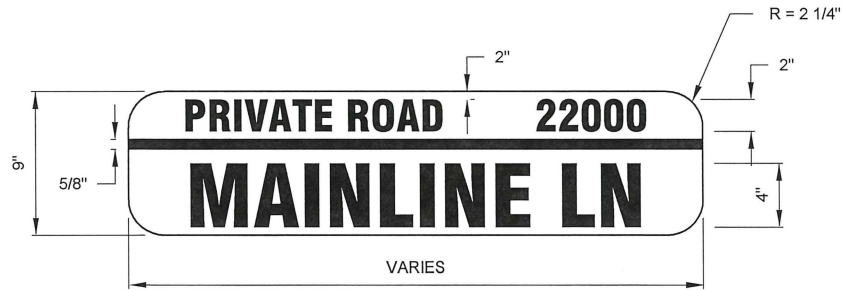




PUBLIC ROADS



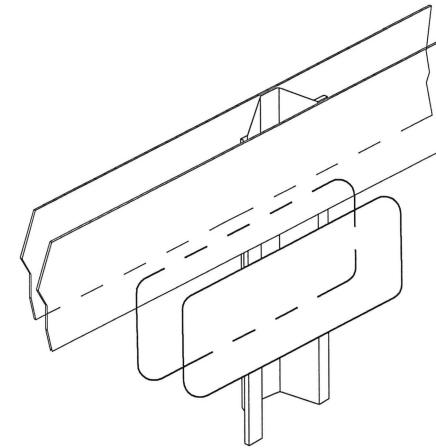
PUBLIC ROADS



PRIVATE ROADS

## GENERAL NOTES

1. SIGNS SHALL MEET SPECIFICATIONS FOR FLAT PLATE ALUMINUM, 0.08" THICK, ALODINE 1200 OR EQUAL.
2. THE SIGN SURFACE SHALL BE WHITE LETTERS/DIGITS AND WHITE BORDER (NON-PRIVATE ROADS) ON A GREEN BACKGROUND. WHITE LETTERS/DIGITS, BORDER AND GREEN BACKGROUND SHALL MEET OR EXCEED ASTM D4956 TYPE III (HIGH INTENSITY) RETROREFLECTIVE SHEETING OR GREEN TRANSPARENT ELECTRONIC CUTTABLE (EC) FILM REVERSE WEEDED ON WHITE TYPE III (HIGH INTENSITY) RETROREFLECTIVE SHEETING BACKGROUND.
3. LETTERS SHALL BE A BLOCK TYPE FONT.
4. THE ROADWAY LABEL MAY BE OMITTED FOR "STREET", "ROAD", AND "AVENUE". ALL OTHER ROADWAYS SHALL INCLUDE THE ABBREVIATED LABEL (I.E. - COURT - CT. DRIVE - DR. ETC.) ROADWAY LABEL SHALL BE UPPER CASE
5. SIGN INSTALLATION SHALL CONFORM TO THE CURRENT EDITION OF THE M.U.T.C.D.



TYPICAL SIGN INSTALLATION

**SPOKANE COUNTY  
DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

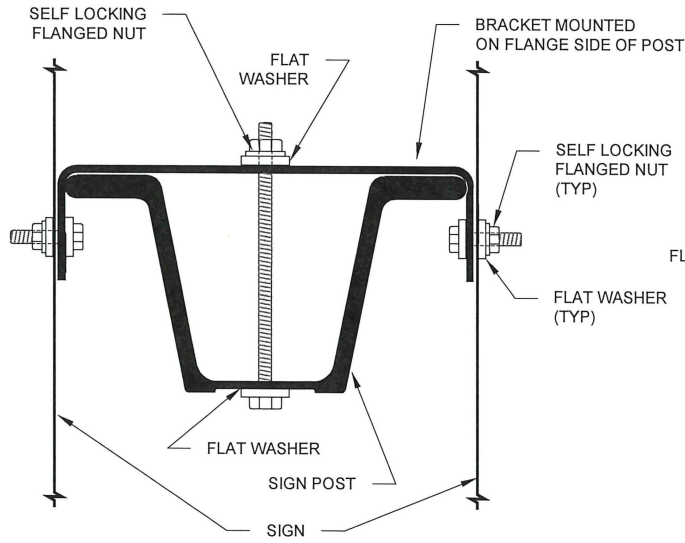
APPROVED  
COUNTY ENGINEER  
DATE: 7/11/17



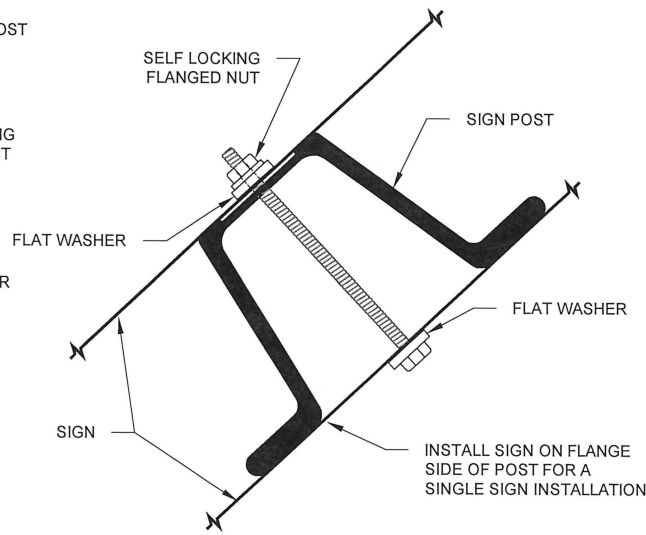
STANDARD  
STREET NAME SIGNS

NO.	DATE	BY	CKD.	APPR.	REVISION

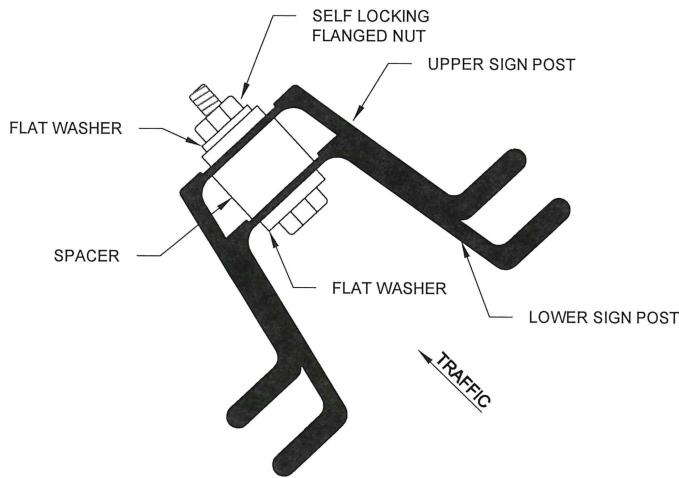
SHEET  
A - 16



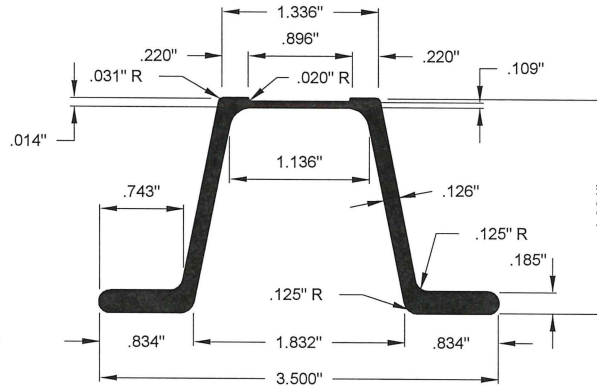
SIGN INSTALLATION WITH SIGN BRACKET



SIGN INSTALLATION ON POST



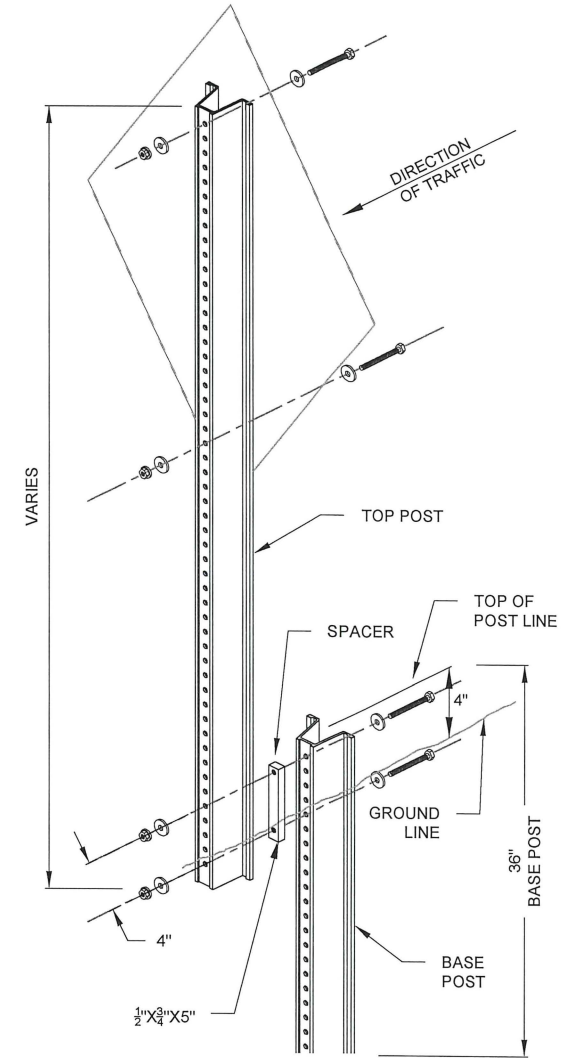
SIGN POST LAP SPLICE



WITH 3/8" Ø HOLE  
AREA = 0.840 SQ. IN.

X - X AXIS      X - X AXIS  
I<sub>xx</sub> = 0.376      I<sub>xx</sub> = 0.376  
S<sub>x</sub> = 0.340      S<sub>x</sub> = 0.340

POST CROSS SECTION



GENERAL NOTES

- SIGN TYPE, INSTALLATION AND APPLICATION SHALL CONFORM TO CURRENT EDITION OF M.U.T.C.D.
- POST WEIGHT SHALL BE 3 LBS. PER FT.

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**SPOKANE COUNTY**  
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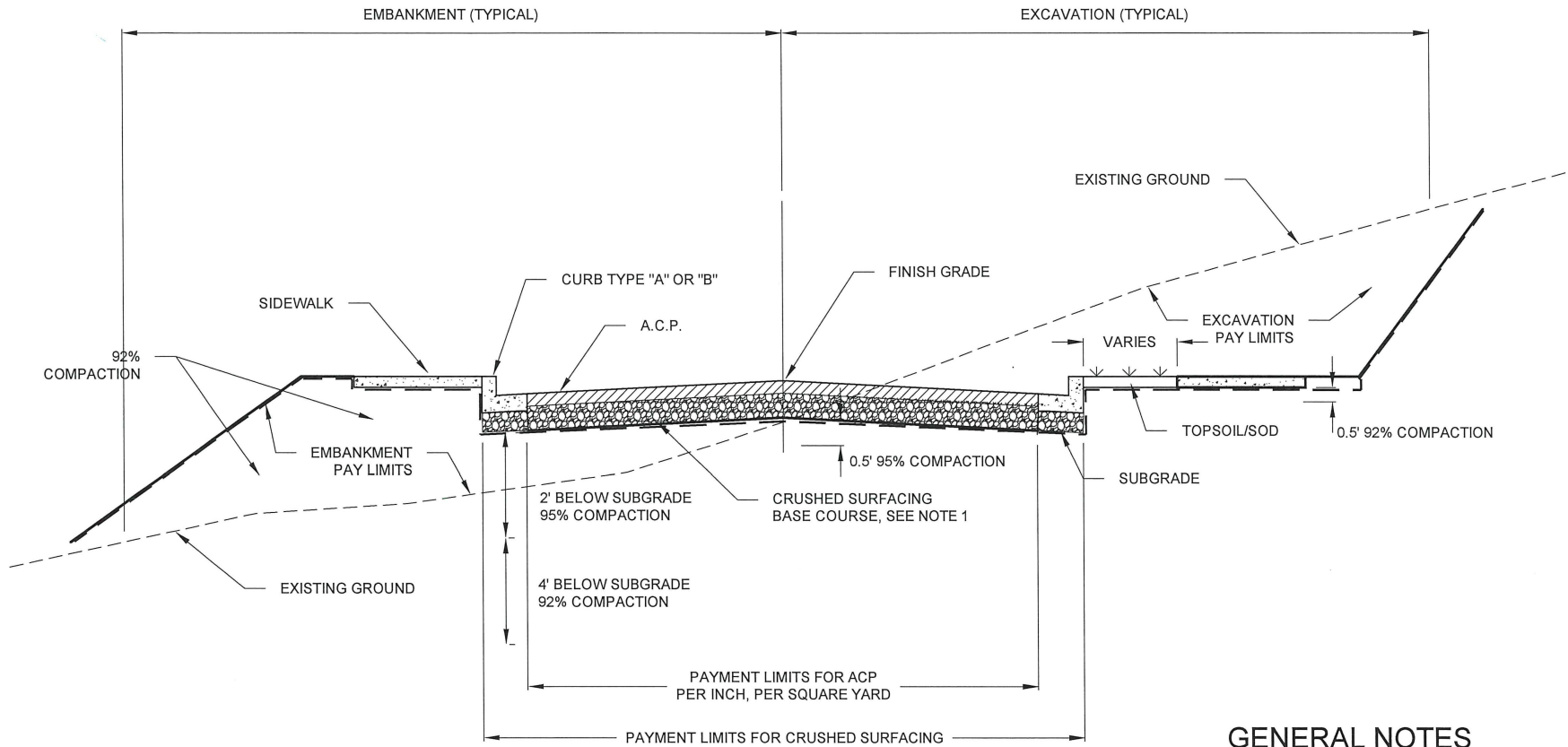
APPROVED  
COUNTY ENGINEER  
DATE: 7/11/17



— STANDARD —  
SIGN AND POST INSTALLATION

SHEET  
A - 16B

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STANDARD BID ITEMS:  
 HMA CL. 1/2 IN. PG \_\_\_-\_\_\_ FT. DEPTH, PER SQ.YD.  
 CRUSHED SURFACING BASE COURSE- PER CUBIC YD.  
 CRUSHED SURFACING TOP COURSE- PER CUBIC YD.  
 CEMENT CONCRETE SIDEWALK, PER SQ. YD.  
 CEMENT CONCRETE CURB TYPE \_\_, PER L.F.  
 ROADWAY EXCAVATION INCL. HAUL, PER C.Y.  
 EMBANKMENT COMPACTION, PER C.Y.  
 TOPSOIL TYPE A, PER C.Y.  
 SOD INSTALLATION, PER SQ.YD.

**GENERAL NOTES**

1. IF MEASURED BY C.Y.. MEASUREMENT WILL BE COMPACTED IN PLACE PER TYPICAL SECTION.
2. COMPACTION LEVELS REFER TO MODIFIED PROCTOR.

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 COUNTY ENGINEER  
 DATE: *7/11/17*



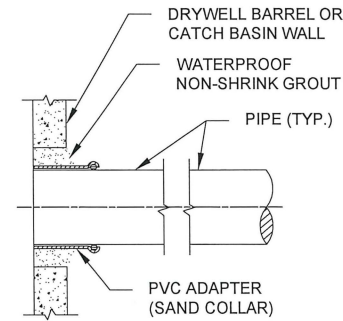
ROADWAY CONSTRUCTION PAYMENT LIMITS

SHEET  
 A - 18

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## GENERAL NOTES

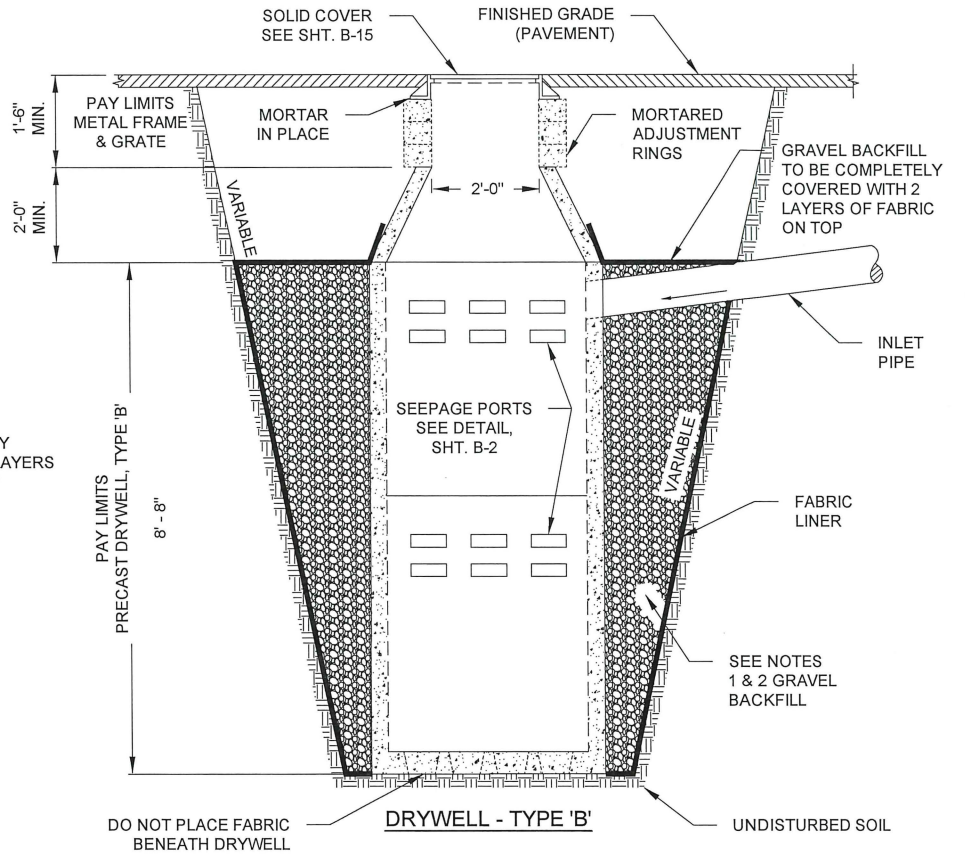
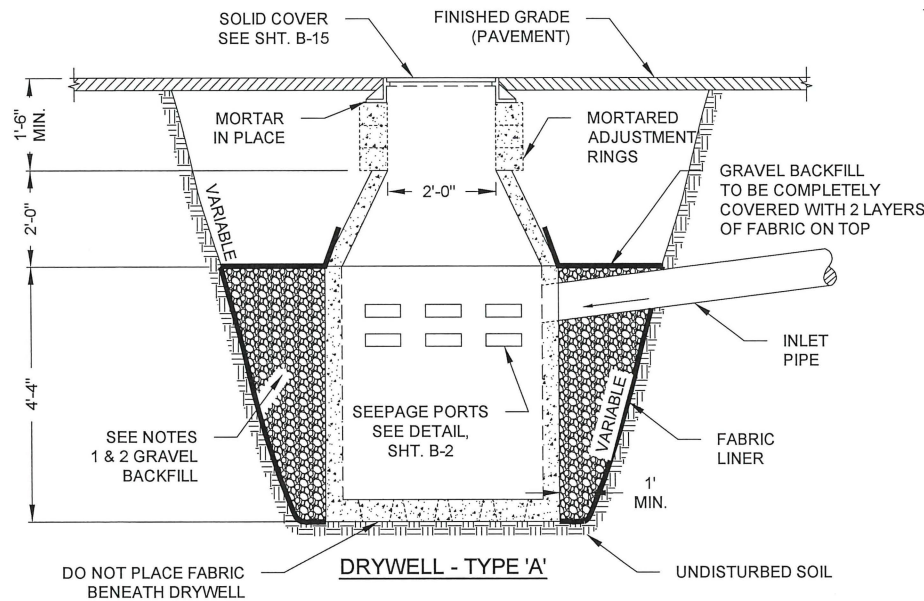
- GRAVEL BACKFILL QUANTITY FOR DRYWELLS :  
TYPE "A" - 30 CUBIC YARDS MINIMUM / 42 TONS.  
TYPE "B" - 40 CUBIC YARDS MINIMUM / 56 TONS.  
OR AS SPECIFIED ON ROAD PLANS.
- SPECIAL BACKFILL MATERIAL FOR DRYWELLS SHALL CONSIST OF WASHED GRAVEL GRADED FROM 1" TO 3" WITH A MAXIMUM OF 5% PASSING THE U.S. No. 200 SCREEN, AS MEASURED BY WEIGHT. A MAXIMUM OF 10% OF THE AGGREGATE, AS MEASURED BY WEIGHT, MAY BE CRUSHED OR FRACTURED ROCK. THE REMAINING 90% SHALL BE NATURALLY OCCURRING UN-FRACTURED MATERIAL.
- FABRIC SHALL BE MODERATE SURVIVABILITY NON WOVEN AS OUTLINED IN STANDARD SPECIFICATIONS 9-33.
- SEE STANDARD PLANS SHEETS B-2 AND B-3 FOR PRECAST CONCRETE DETAILS.
- ADJUSTMENT BLOCKS SHALL BE CEMENT CONCRETE.
- PRECAST RISER MAY BE USED IN COMBINATION WITH OR IN LIEU OF ADJUSTING BLOCKS.
- WHEN PVC PIPE IS USED A PVC ADAPTER SHALL BE INSTALLED.
- PIPES SHALL BE GROUTED INTO DRYWELLS WITH NON-SHRINK GROUT.
- DRYWELLS LOCATED IN SWALES SHALL HAVE A RIM ELEVATION 0.5' ABOVE SWALE FLOOR. USE METAL FRAME TYPE 4 AND GRATE TYPE 4 (SEE SHEET B-15).



### PVC ADAPTER (SAND COLLAR)

#### NOTE

PVC PIPE ADAPTERS AND GASKET MAY VARY IN SHAPE AND SIZE AS ILLUSTRATED IN DETAIL BY ACCEPTABLE ALTERNATE IN ACCORDANCE WITH A.S.T.M.-C-428.



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APPROVED:  
COUNTY ENGINEER  
DATE: *[Signature]*

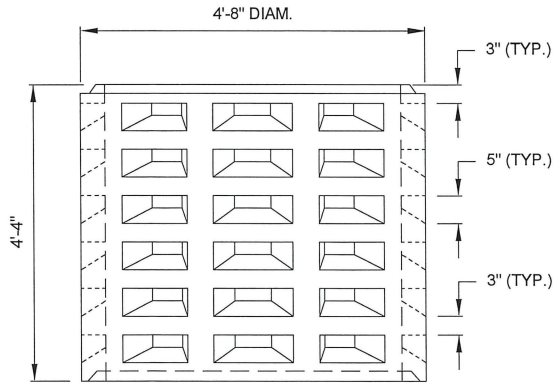


STANDARD  
PRECAST DRYWELLS

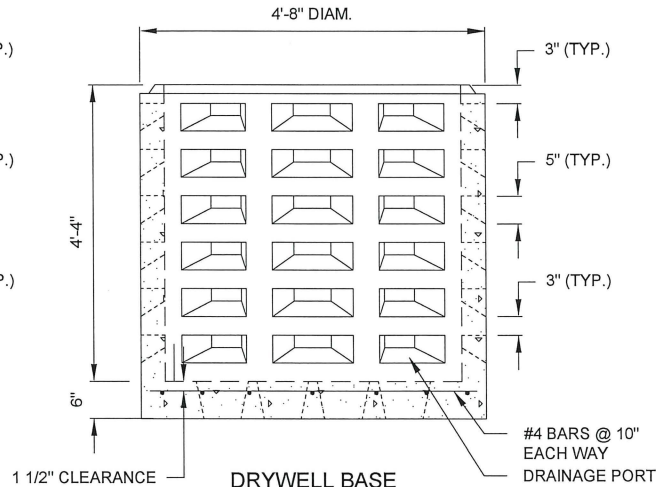
SHEET  
B - 1

### GENERAL NOTES

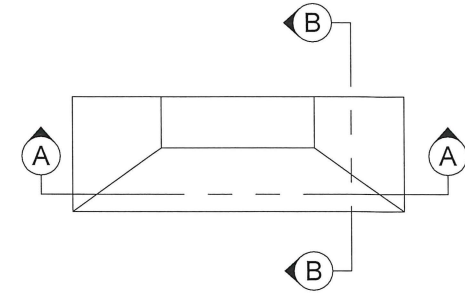
1. CONCRETE DRYWELL ITEMS SHALL BE CONSTRUCTED WITH THE BARRELS AND CONES REINFORCED WITH 0.12 SQ. IN. STEEL GRADE 40, PER LINEAL FOOT OF WALL.
2. TOLERANCE OF DIMENSIONS FOR DRAINAGE PORTS + SHALL BE 1/2".
3. EACH BARREL SECTION SHALL A MINIMUM OF 6 ROWS OF DRAINAGE PORTS VERTICALLY AND A MINIMUM OF 10 DRAINAGE PORTS AROUND THE CIRCUMFERENCE OF THE BARREL.



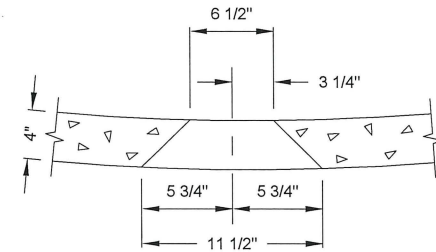
**DRYWELL BARREL**  
(ELEVATION)



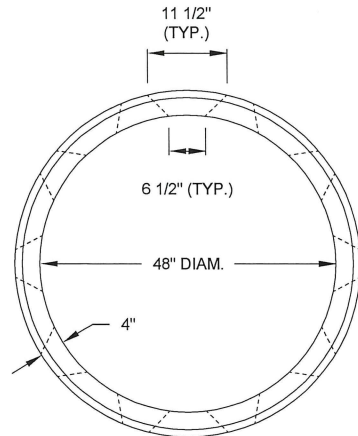
**DRYWELL BASE**  
(ELEVATION)



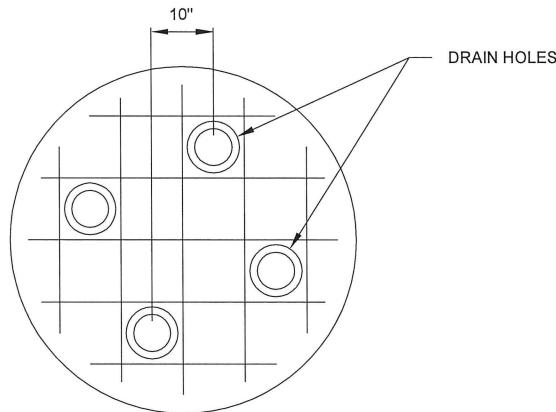
**DRAINAGE PORT**



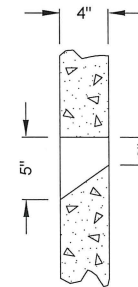
**SECTION A - A**  
NOT TO SCALE



**DRYWELL BARREL**  
(PLAN)



**BASE DRAIN HOLE DETAIL**  
(PLAN)



**SECTION B - B**  
NOT TO SCALE

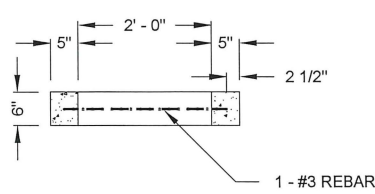
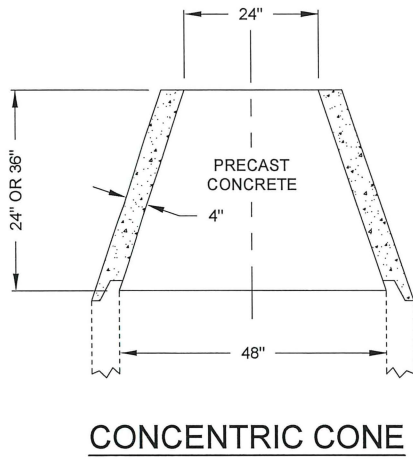
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APPROVED:  
COUNTY ENGINEER  
DATE:

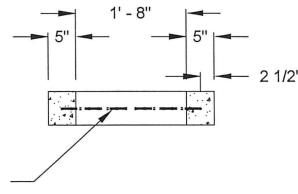


STANDARD  
PRECAST DRYWELLS DETAILS

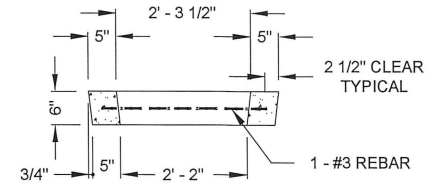
NO.	DATE	BY	CKD.	APPR.	REVISION



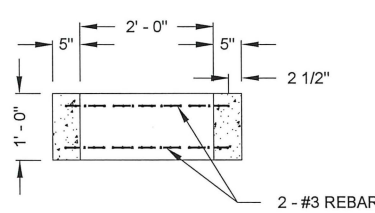
SECTION E - E



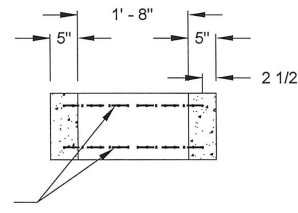
SECTION F - F



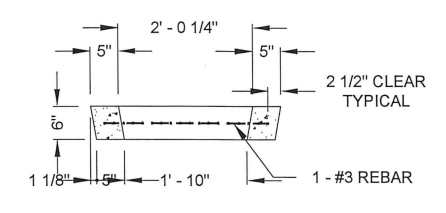
SECTION C - C



SECTION E - E



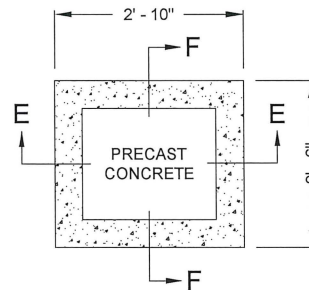
SECTION F - F



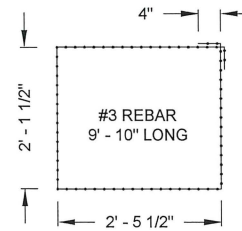
SECTION D - D

**GENERAL NOTES**

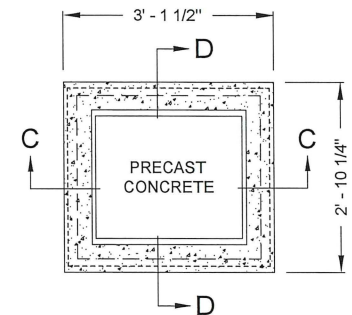
1. CONCRETE ITEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.



RISER, TYPE 1



BENDING



RISER, TYPE 2

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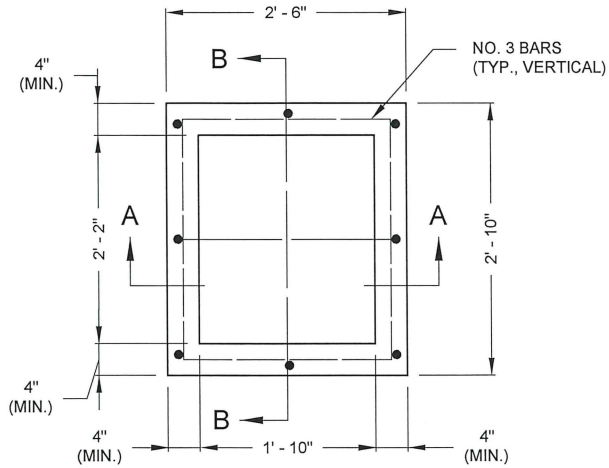
APPROVED  
 COUNTY ENGINEER  
 DATE: 7/17/17



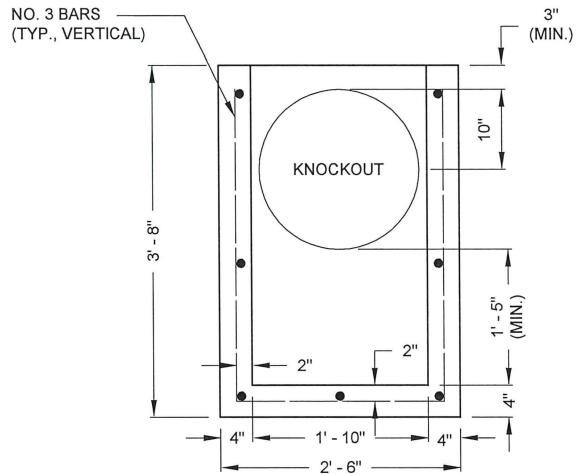
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STANDARD  
 PRECAST DRYWELL & INLET DETAILS

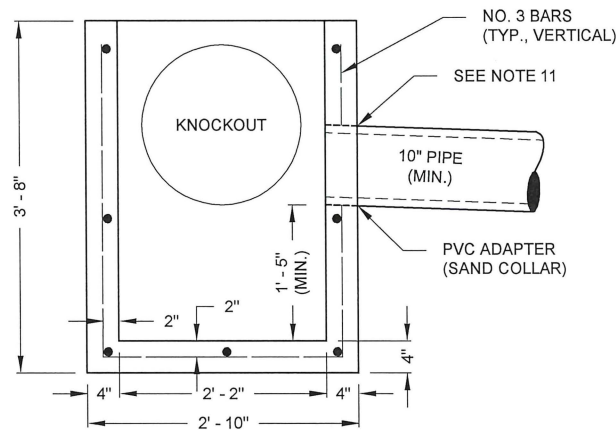
SHEET  
 B - 3



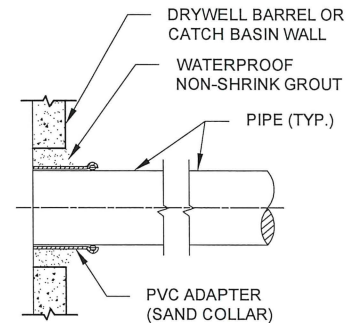
**PLAN**



**SECTION A - A**



**SECTION B - B**



**PVC ADAPTER (SAND COLLAR)**

**NOTE**

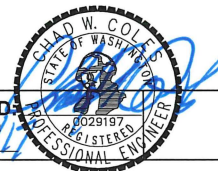
PVC PIPE ADAPTERS AND GASKET MAY VARY IN SHAPE AND SIZE AS ILLUSTRATED IN DETAIL BY ACCEPTABLE ALTERNATE IN ACCORDANCE WITH A.S.T.M.-C-428.

**GENERAL NOTES**

1. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. AS AN ACCEPTABLE ALTERNATE TO REBAR, WELDED WIRE FABRIC HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A 497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN THE KNOCKOUTS.
3. PRECAST BASINS SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUTS SHALL BE ON ALL 4 SIDES WITH MAXIMUM DIAMETER OF 20". KNOCKOUTS SHALL BE ROUND. PIPE SHALL BE INSTALLED IN FACTORY SUPPLIED KNOCKOUTS.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS CATCH BASIN WALL THICKNESS.
6. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
7. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
8. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATION. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT.
9. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
10. WHEN PVC PIPE IS USED, A PVC ADAPTER SHALL BE INSTALLED. SEE PVC ADAPTER DETAIL ON THIS SHEET.
11. PVC ADAPTER SHALL BE GROUTED INTO CATCH BASIN, WITH WATERPROOF NON-SHRINK GROUT.
12. SAWCUT HOLE FOR PIPE (NOT BROKEN).

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 COUNTY ENGINEER  
 DATE: \_\_\_\_\_



STANDARD  
 CATCH BASIN - TYPE 1

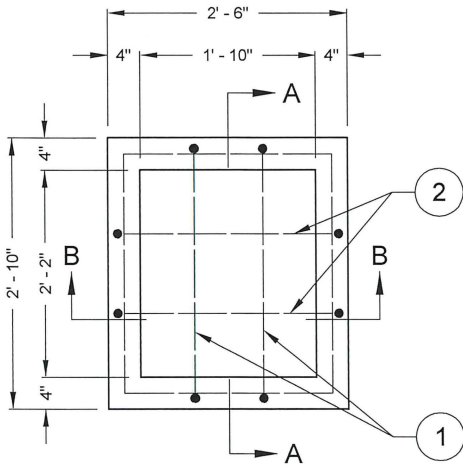
SHEET  
 B - 4

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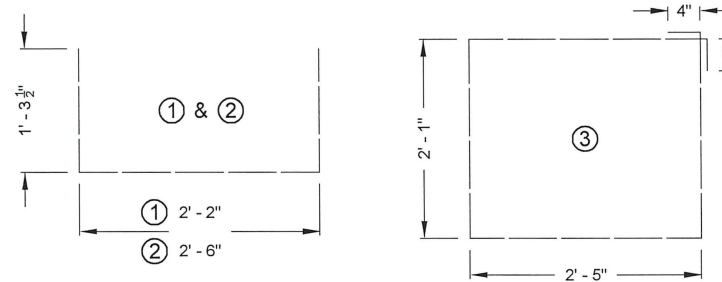
BAR LIST				
MARK	LOCATION	NO.	SIZE	LENGTH
①	BOTTOM SLAB & SIDEWALLS	2	3	4' - 9"
②	BOTTOM SLAB & SIDEWALLS	2	3	5' - 1"
③	SIDEWALLS	2	3	9' - 8"

### GENERAL NOTES

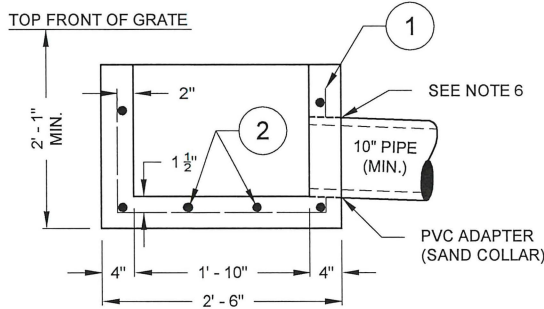
1. CONCRETE INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. REINFORCING STEEL SHALL BE GRADE 40 OR GRADE 60.
3. CONCRETE INLETS SHALL BE SET ON A COMPACTED OR UNDISTURBED LEVEL FOUNDATION.
4. AS AN ACCEPTABLE ALTERNATE TO REBAR, WELDED WIRE FABRIC HAVING A MINIMUM AREA OF .12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A 497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN THE KNOCKOUTS.
5. WHEN PVC PIPE IS USED, A SAND COLLAR SHALL BE INSTALLED. SEE PVC ADAPTER DETAIL ON THIS SHEET.
6. INLET PIPE SHALL BE GROUTED INTO CONCRETE INLET, WITH WATERPROOF NON-SHRINK GROUT.
7. KNOCKOUTS SHALL BE ON ALL 4 SIDES WITH MAXIMUM DIAMETER OF 17". KNOCKOUTS SHALL BE ROUND. PIPE SHALL BE INSTALLED IN FACTORY SUPPLIED KNOCKOUTS.



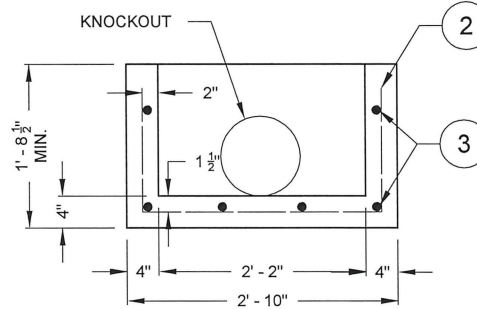
PLAN VIEW



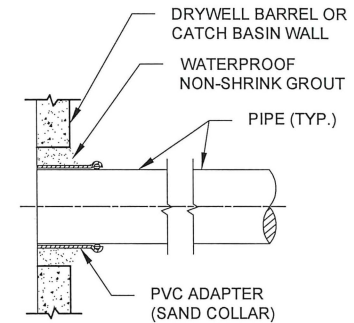
BENDING DIAGRAM



SECTION A - A



SECTION B - B



PVC ADAPTER (SAND COLLAR)

### NOTE

PVC PIPE ADAPTERS AND GASKET MAY VARY IN SHAPE AND SIZE AS ILLUSTRATED IN DETAIL BY ACCEPTABLE ALTERNATE IN ACCORDANCE WITH A.S.T.M.-C-428.

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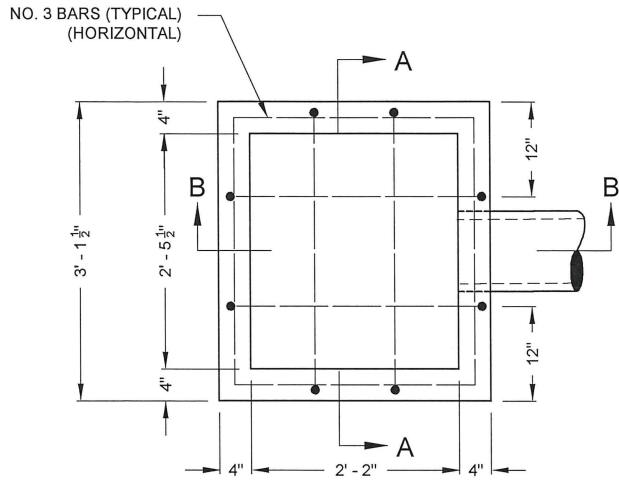
APPROVED  
 COUNTY ENGINEER  
 DATE: \_\_\_\_\_



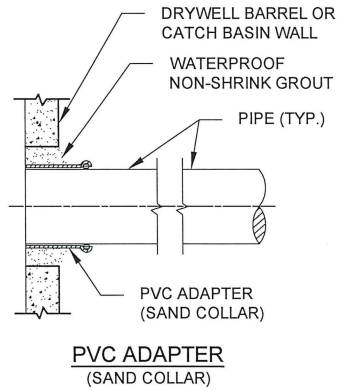
STANDARD  
 CONCRETE INLET - TYPE 1

SHEET  
 B - 5





PLAN VIEW



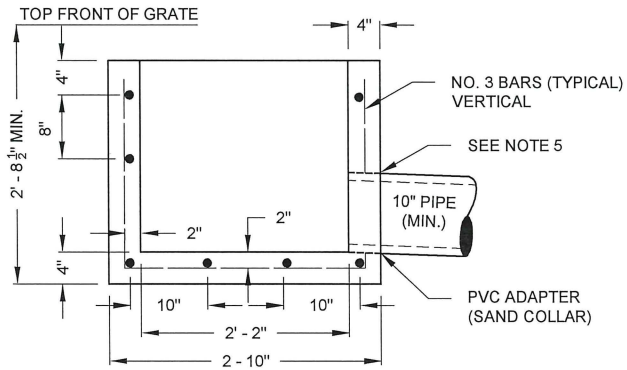
PVC ADAPTER  
(SAND COLLAR)

**NOTE**

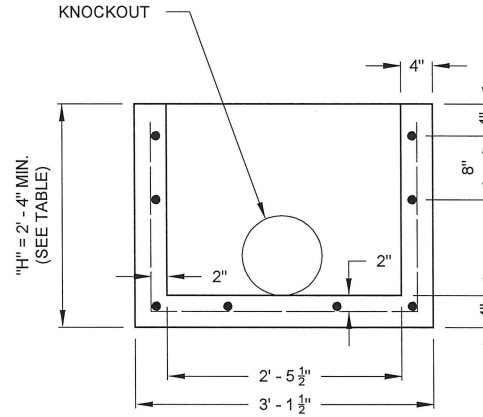
PVC PIPE ADAPTERS AND GASKET MAY VARY IN SHAPE AND SIZE AS ILLUSTRATED IN DETAIL BY ACCEPTABLE ALTERNATE IN ACCORDANCE WITH A.S.T.M.-C-428.

**GENERAL NOTES**

1. CONCRETE INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. CONCRETE INLETS SHALL BE SET ON A LEVEL, COMPACTED FOUNDATION.
3. AS AN ACCEPTABLE ALTERNATE TO REBAR, WELDED WIRE FABRIC HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A 497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN THE KNOCKOUTS.
4. WHEN PVC PIPE IS USED, A SAND COLLAR SHALL BE INSTALLED. SEE PVC ADAPTER DETAIL ON THIS SHEET.
5. INLET PIPE SHALL BE GROUTED INTO CONCRETE INLET, WITH WATERPROOF NON-SHRINK GROUT.



SECTION A - A



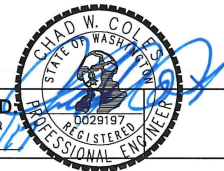
SECTION B - B

TABLE	
PIPE DIAMETER	"H"
10"	2' - 4"
12"	2' - 5 1/2"
15"	2' - 9"
18"	3' - 0"

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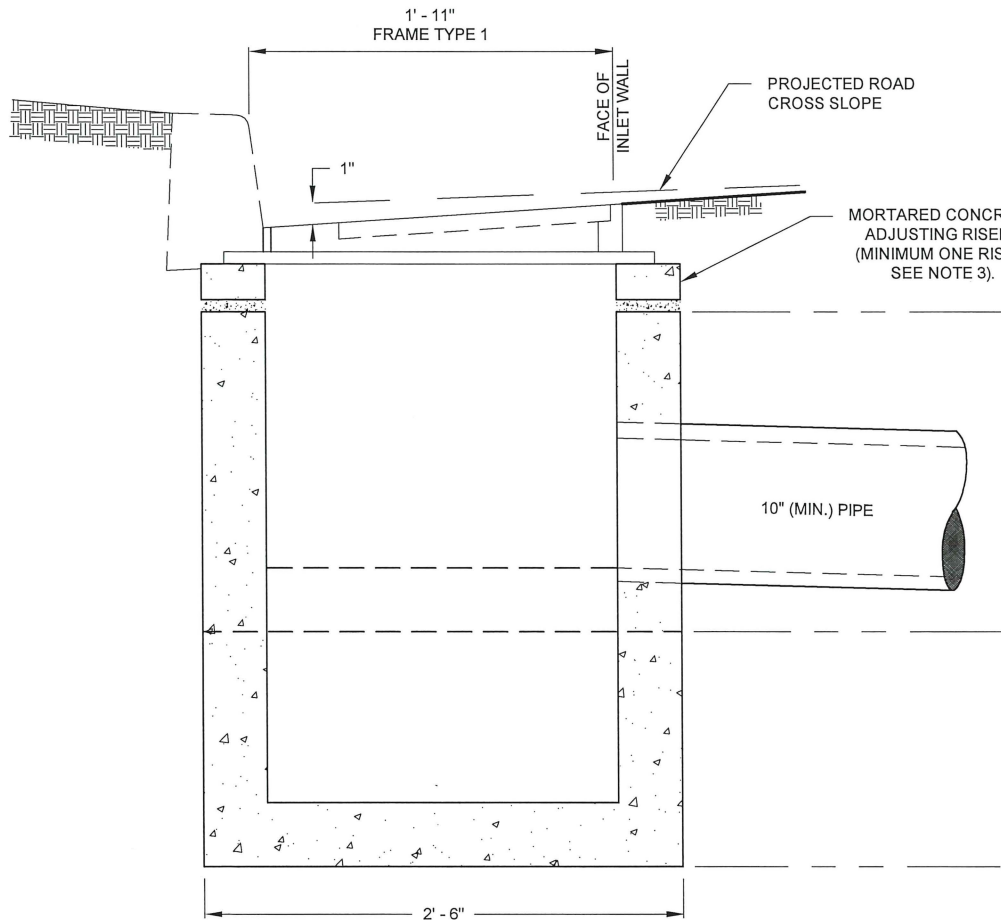
APPROVED: \_\_\_\_\_  
 COUNTY ENGINEER  
 DATE: \_\_\_\_\_



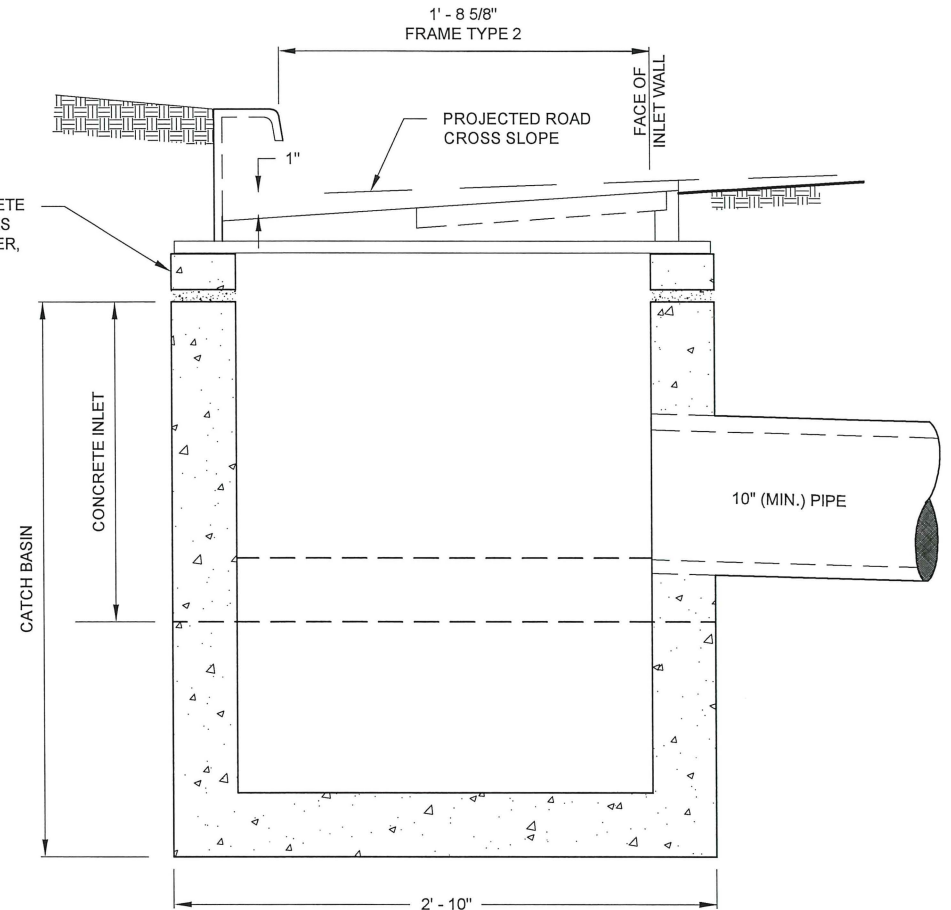
STANDARD  
 CONCRETE INLET - TYPE 2

### GENERAL NOTES

1. THE TOP OF GRATE SHALL BE INSTALLED 1" LOWER THAN THE PROJECTED GUTTER GRADE. (ALSO SEE STD. PLAN B-18 GUTTER DEPRESSION DETAIL)
2. THE PRECAST CONCRETE INLET SHALL BE PLACED ON THE SAME GRADE AS THE CURB.
3. RISER TYPE 2 TO BE USED WITH CATCH BASIN.



**CATCH BASIN & INLET TYPE 1**



**CATCH BASIN & INLET TYPE 2**

NO.	DATE	BY	CKD.	APPR.	REVISION

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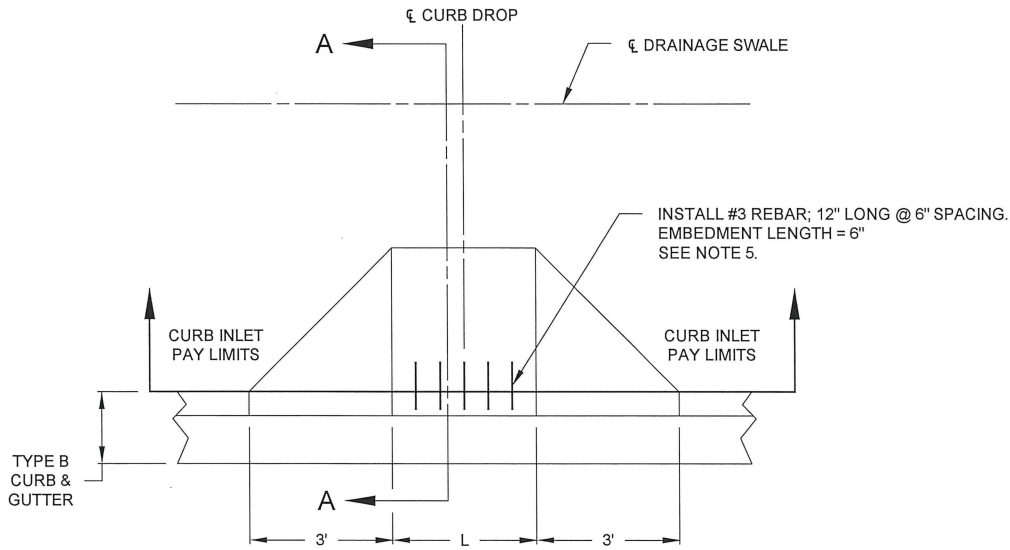
**APPROVED**  
 COUNTY ENGINEER  
 DATE: \_\_\_\_\_



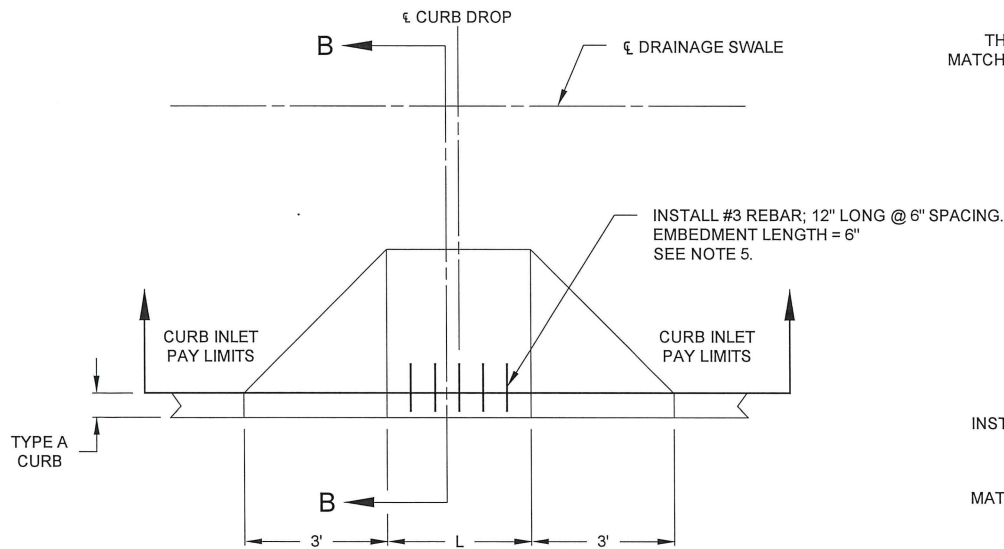
STANDARD  
**CATCH BASIN & INLET INSTALLATION**

SHEET  
**B - 7**

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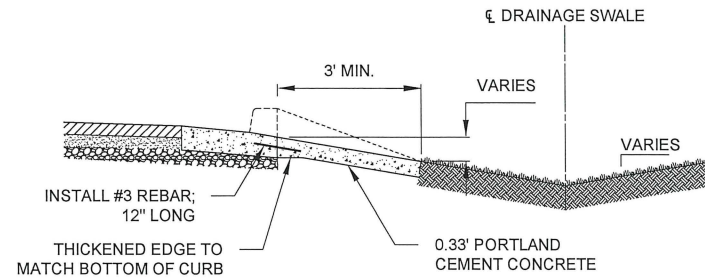
**CURB INLET - TYPE 1**



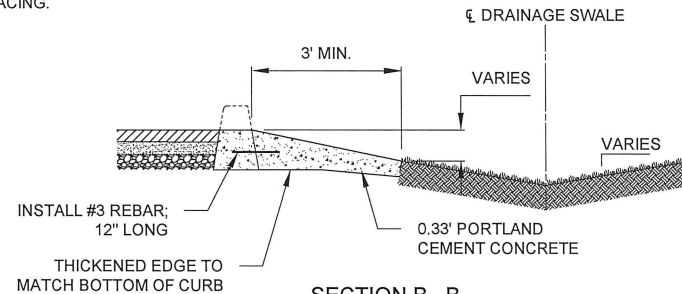
**CURB INLET - TYPE 1 (MODIFIED)**

**GENERAL NOTES**

1. CURB INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. TOP SURFACE TO BE BROOM FINISHED.
3. ALL EXTERNAL EDGES NOT LABELED SHALL BE TROWELLED WITH 1/4" RADIUS EDGER.
4. DIMENSION "L" SHALL BE SHOWN ON THE PLANS.
5. INLET PAD MAY BE POURED INTEGRAL TO CURB. REBAR IS NOT REQUIRED WITH INTEGRAL POURS.
6. SLOPE OF PAD SHALL MEET THE SLOPE OF THE DRAINAGE SWALE.



**SECTION A - A**



**SECTION B - B**

**SPOKANE COUNTY  
DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

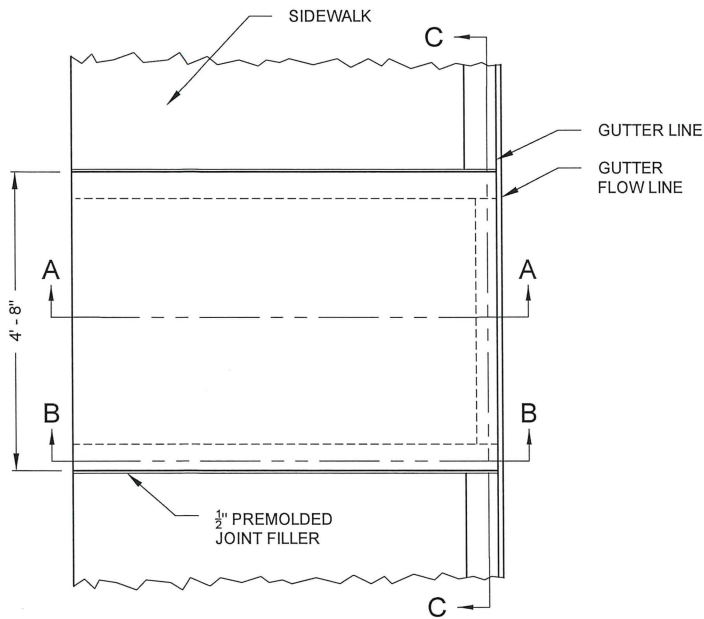
**APPROVED**  
COUNTY ENGINEER  
DATE: 7/17/17



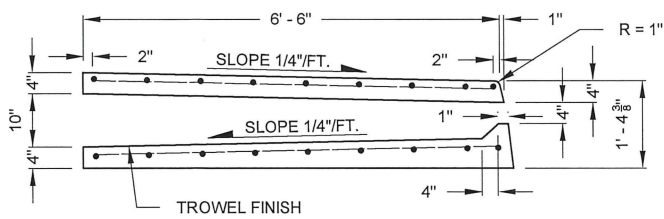
STANDARD  
**CURB INLET - TYPE 1 & TYPE 1-MODIFIED**

NO.	DATE	BY	CHKD.	APPR.	REVISION

SHEET  
**B - 8**



PLAN VIEW

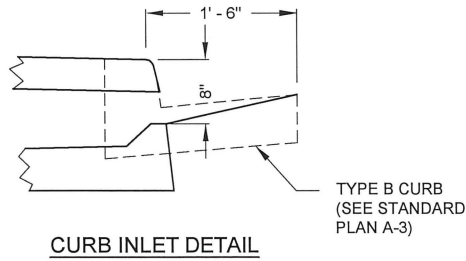


SECTION A - A



SECTION B - B  
REBAR PLACEMENT

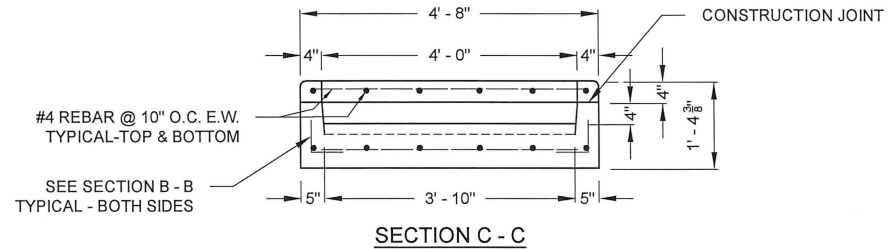
3/4" TAPER  
ALLOWED FOR  
FORM RELEASE



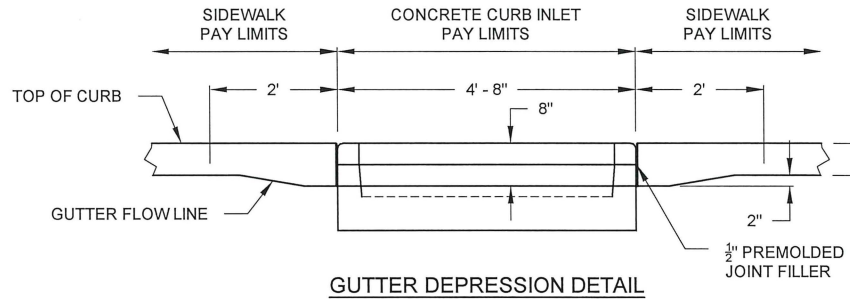
CURB INLET DETAIL

**GENERAL NOTES**

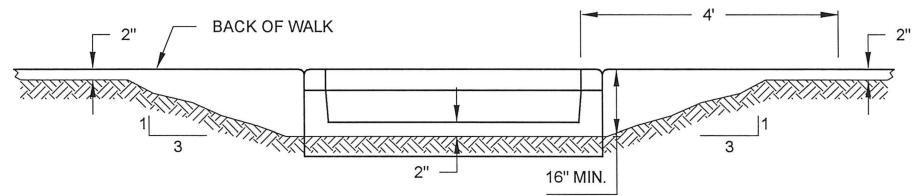
1. CURB INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) & ASTM C 890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.
2. TOP SURFACE TO BE BROOM FINISHED.
3. ALL EXTERNAL EDGES NOT LABELED SHALL BE TOWELED WITH 1/4" RADIUS EDGER.



SECTION C - C



GUTTER DEPRESSION DETAIL



OUTLET SWALE GRADING DETAIL

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SPOKANE, WA. 99260 477-3600

APPROVED  
COUNTY ENGINEER  
DATE:



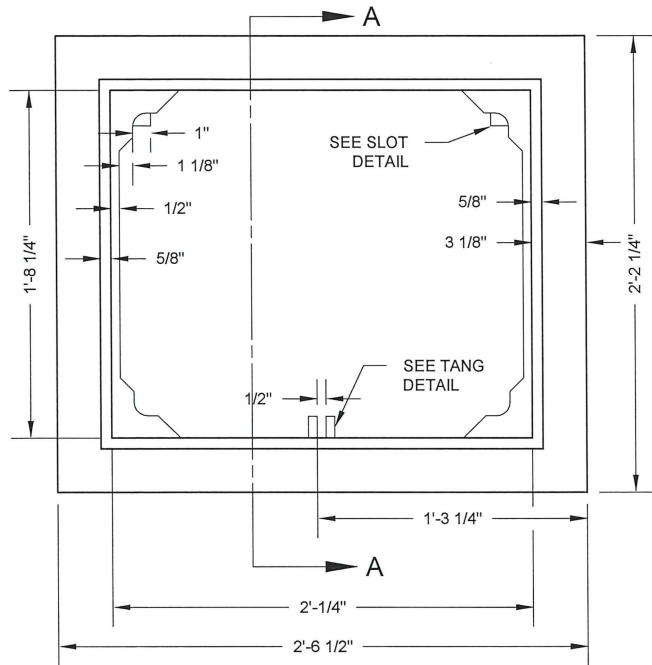
STANDARD  
CURB INLET - TYPE 2

NO.	DATE	BY	CKD.	APPR.

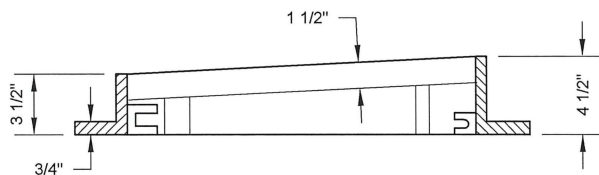
REVISION

SHEET

B - 9



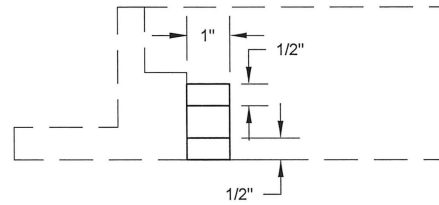
**FRAME - TYPE 1**



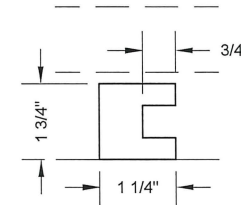
**SECTION A - A**

**GENERAL NOTES**

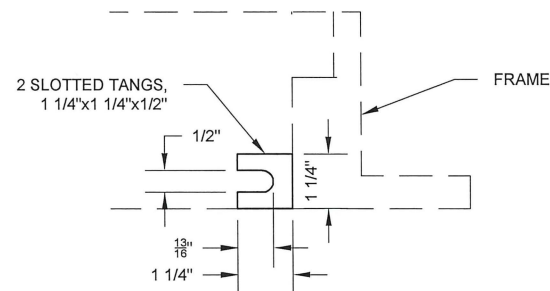
1. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48-03 CLASS 35 GRATE SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536-84, GRADE 80-55-06.
2. USE WITH CATCH BASIN AND CONCRETE INLET TYPE 1, SEE STD. PLAN SHEETS B-4,5 & 7.
3. FIT TOLERANCE SHALL BE 1/8" ±.
4. WELDING IS NOT PERMITTED.
5. GRATE GUARD REQUIRED. SEE SHEET B-17.
6. FOR GRATE DETAIL SEE STD. PLAN, SHEET B-12.
7. SPOKANE COUNTY GRATES MUST BE USED IN CONJUNCTION WITH W.S.D.O.T. CATCH BASIN TYPE 1 AND TYPE 2.



**SLOT DETAIL FRONT**



**SLOT DETAIL SIDE**



**TANG DETAIL**

NO.	DATE	BY	CKD.	APPR.	REVISION

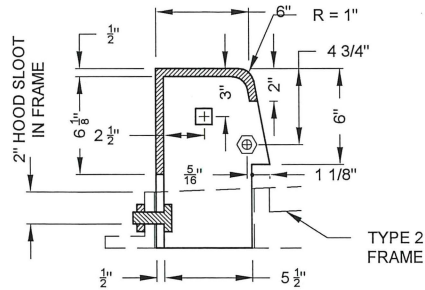
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

**APPROVED**  
 COUNTY ENGINEER  
 DATE: *[Signature]*

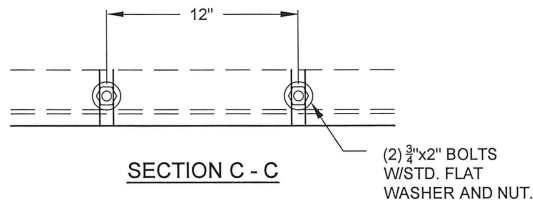


STANDARD  
**METAL FRAME - TYPE 1**

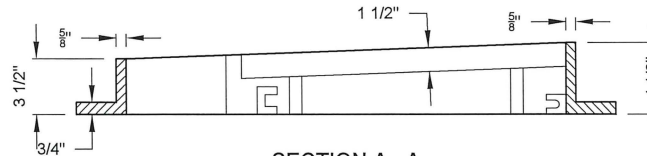
SHEET  
**B - 10**



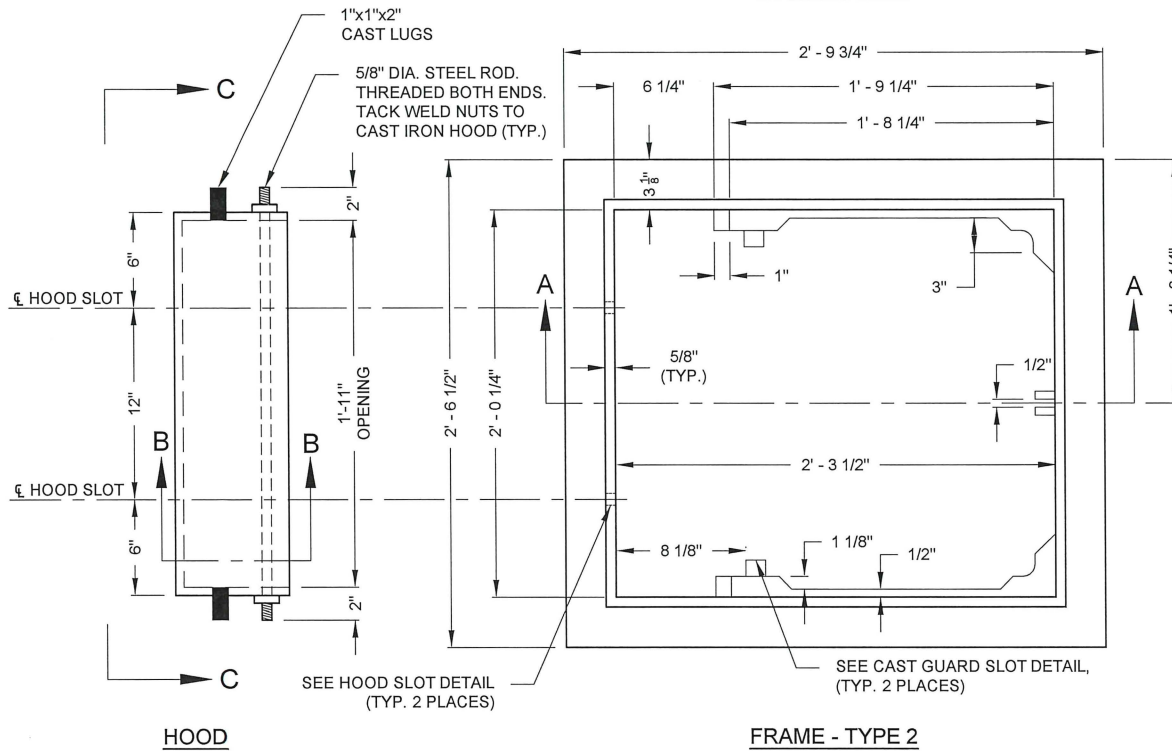
SECTION B - B



SECTION C - C



SECTION A - A

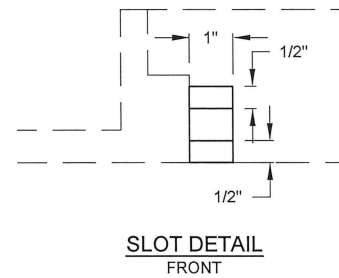


HOOD

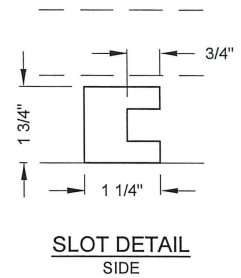
FRAME - TYPE 2

**GENERAL NOTES**

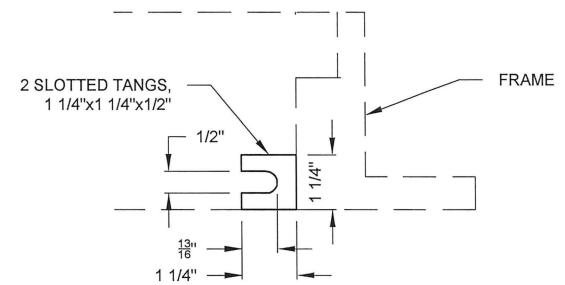
1. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48-03 CLASS 35. THE GRATE SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536-84, GRADE 80-55-06.
2. BOLTS AND ROD SHALL CONFORM TO A.S.T.M. DESIGNATION A307, GRADE A.
3. USE WITH CATCH BASIN AND CONCRETE INLET TYPE 2, SEE STD. PLAN SHEETS B-4,6 & 7.
4. FIT TOLERANCE SHALL BE 1/8" ±.
5. FOR GRATE DETAILS SEE STD. PLAN, SHEET B-13 OR B-14.
6. GRATE GUARD REQUIRED. SEE SHEET B-17.
7. SPOKANE COUNTY GRATES MUST BE USED IN CONJUNCTION WITH W.S.D.O.T. CATCH BASIN TYPE 1 AND TYPE 2.



SLOT DETAIL FRONT



SLOT DETAIL SIDE

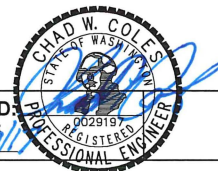


TANG DETAIL

NO.	DATE	BY	CKD.	APPR.	REVISION

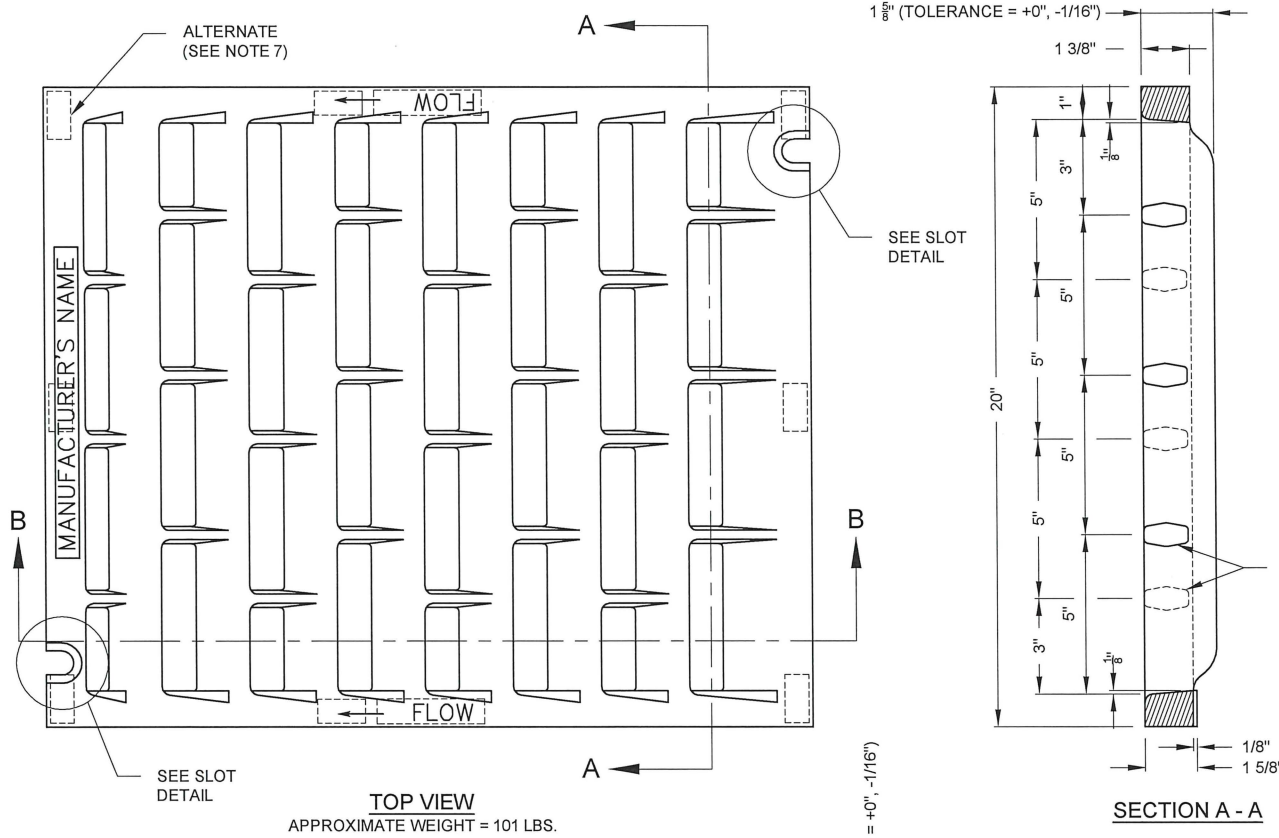
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED  
 COUNTY ENGINEER  
 DATE: \_\_\_\_\_



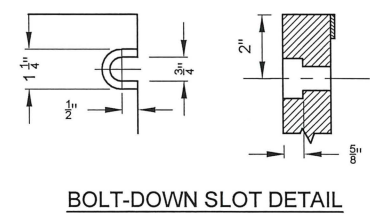
STANDARD  
 METAL FRAME - TYPE 2

SHEET  
 B - 11

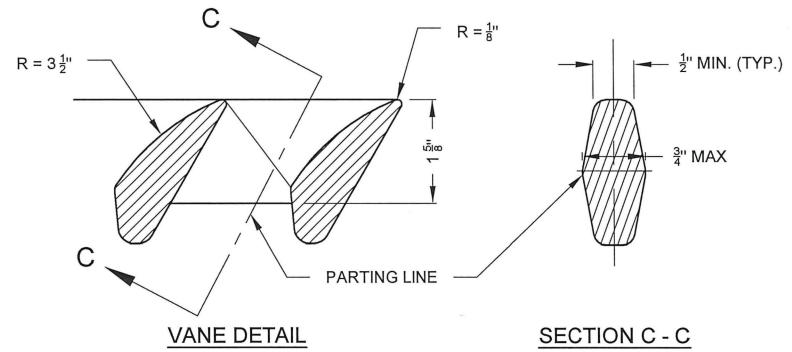


### GENERAL NOTES

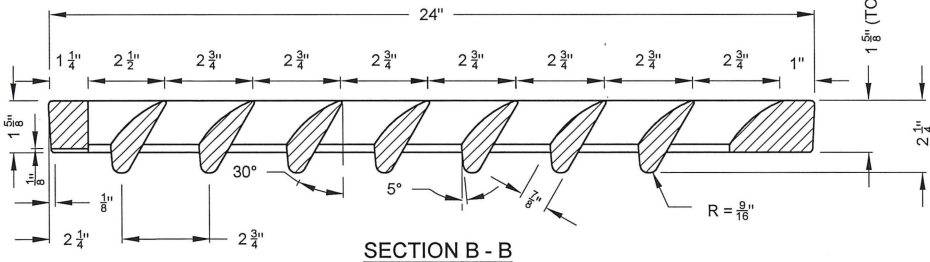
1. THE NAME OF THE MANUFACTURER AND DIRECTION OF FLOW SHALL BE EMBOSSED ON THE TOP SURFACE OF EACH GRATE. LETTERING TO BE RECESSED 1/16".
2. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48-03, CLASS 35. THE GRATE SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536-84 GRADE 80-55-06.
3. DIMENSIONS SHALL HAVE ±1/16" TOLERANCE, EXCEPT AS NOTED.
4. EDGES SHALL HAVE 1/8" RADIUS, 1/8" CHAMFER OR COMPLETE DEBURRING.
5. THE FRAME SHALL BE MANUFACTURED IN ACCORDANCE WITH STANDARD PLAN B-10.
6. WELDING IS NOT PERMITTED.
7. AS AN ALTERNATE, 8 PADS 1 1/2" X 3/4" X 1/8", INTEGRALLY CAST WITH THE GRATE, MAY BE USED.



### SECTION A - A



### SECTION B - B



NO.	DATE	BY	CKD.	APPR.	REVISION

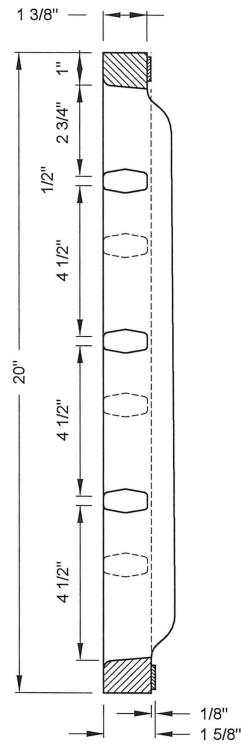
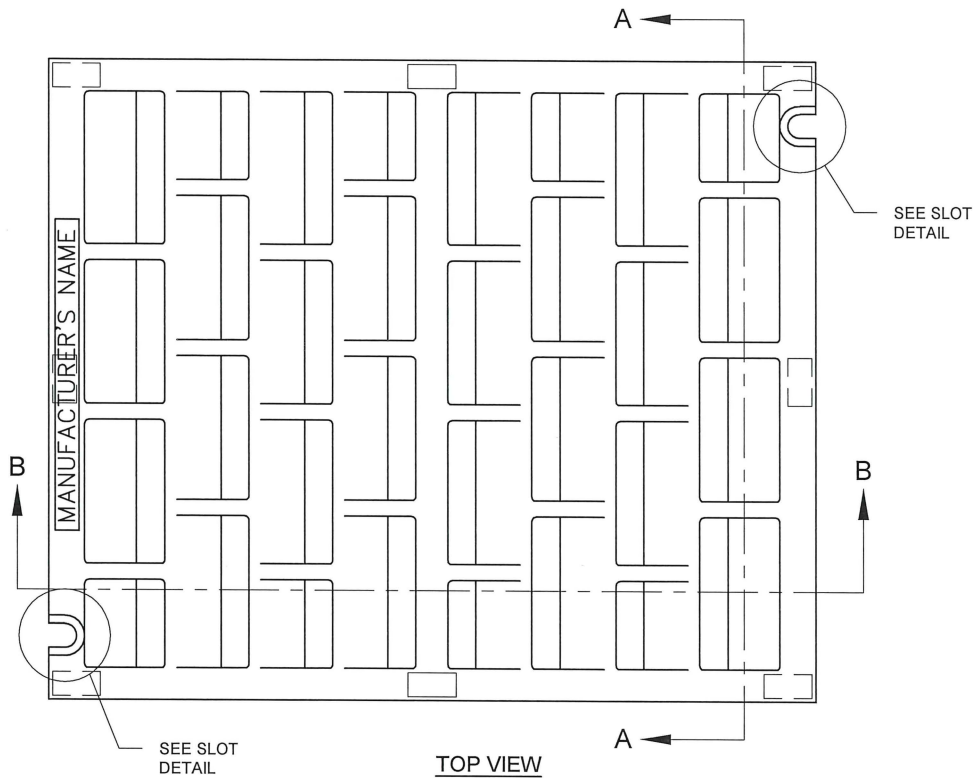
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED:  
 COUNTY ENGINEER  
 DATE: 11/20/17



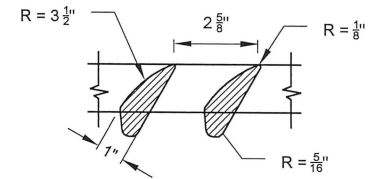
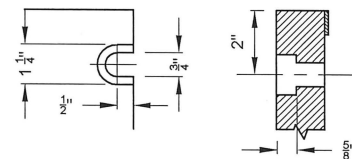
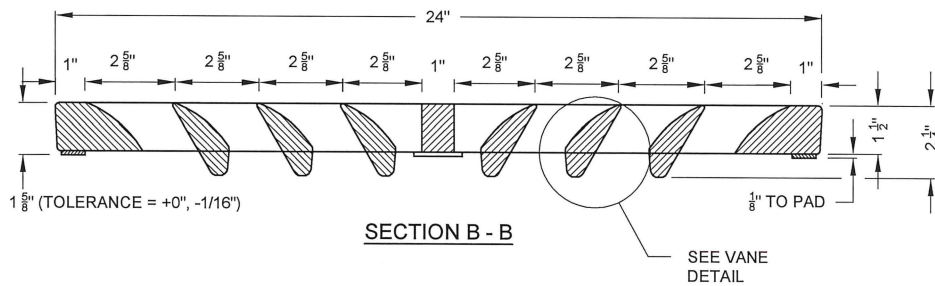
STANDARD  
**METAL GRATE - TYPE 1**

SHEET  
**B - 12**



### GENERAL NOTES

1. THE NAME OF THE MANUFACTURER AND THE DIRECTION OF FLOW SHALL BE EMBOSSED ON THE TOP SURFACE OF EACH GRATE. LETTERING TO BE RECESSED 1/16".
2. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48-03, GRADE 35. THE GRATE SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536-84 GRADE 80-55-06.
3. DIMENSIONS SHALL HAVE  $\pm 1/16"$  TOLERANCE, EXCEPT AS NOTED.
4. EDGES SHALL HAVE 1/8" RADIUS, 1/8" CHAMFER OR COMPLETE DEBURRING.
5. THE FRAME SHALL BE MANUFACTURED IN ACCORDANCE WITH STANDARD PLAN B-11.
6. WELDING IS NOT PERMITTED.



NO.	DATE	BY	CHKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

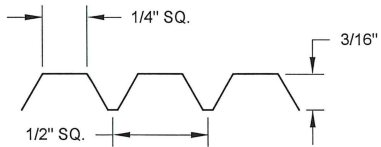
APPROVED:  
 COUNTY ENGINEER  
 DATE: 11/29/17



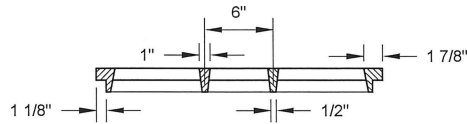
STANDARD  
**METAL GRATE - TYPE 3**

SHEET  
**B - 14**





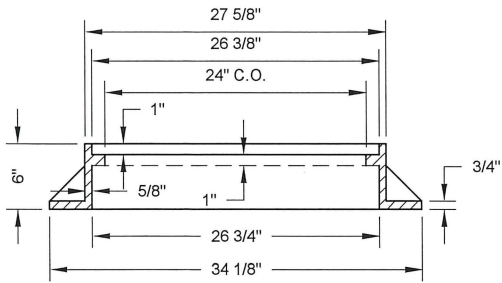
**COVER SKID DESIGN DETAIL**



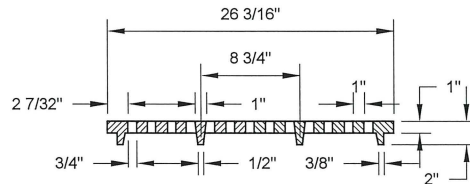
**SECTION J - J**

**GENERAL NOTES**

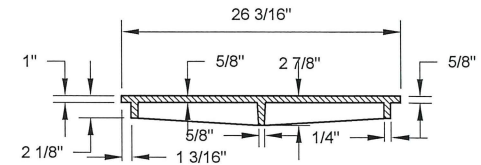
1. FRAME SHALL BE GRAY IRON CONFORMING TO A.S.T.M. A48-03, CLASS 35. THE GRATE SHALL BE DUCTILE IRON CONFORMING TO A.S.T.M. A536-84, CLASS 80-55-06.
2. METAL FRAME AND GRATE TYPE 4 SHALL ONLY BE USED WHERE SHOWN ON THE CONSTRUCTION PLANS. IT SHALL NOT BE USED AT A CURB LINE.
3. DRAINAGE SLOTS SHALL BE PLACED PARALLEL TO THE DIRECTION OF FLOW.
4. FIT TOLERANCE SHALL BE 1/8" ±.
5. WELDING IS NOT PERMITTED.



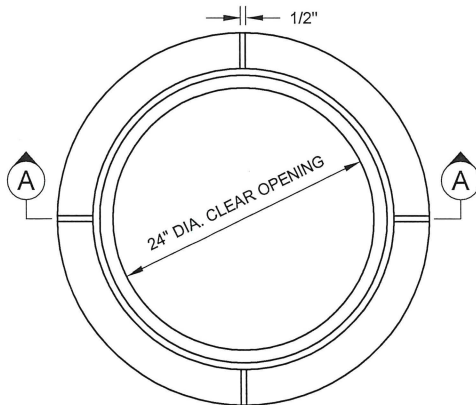
**SECTION A - A**



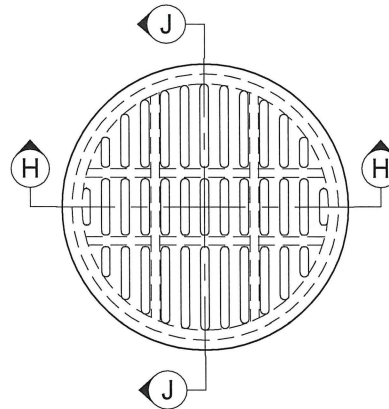
**SECTION H - H**



**SECTION B - B**

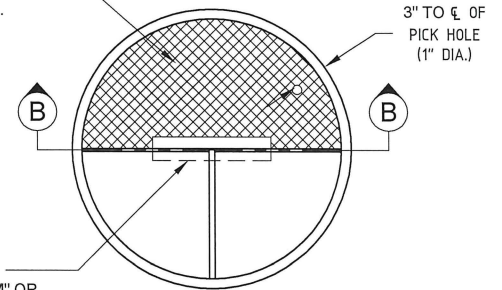


**FRAME - TYPE 4**  
MIN. WEIGHT 168 LBS.



**GRATE - TYPE 4**  
NOT TO BE INSTALLED ON TRAVELED WAY DUE TO DANGER TO BIKES.

NON-SKID PATTERN TO BE CAST INTERNAL ON TOP OF COVER.



**SOLID COVER**  
MIN. WEIGHT 118 LBS.

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

**APPROVED:**  
COUNTY ENGINEER  
DATE:

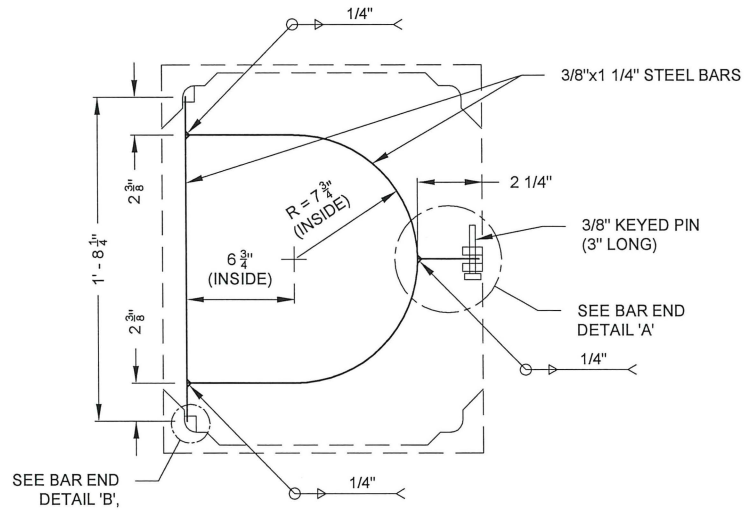


STANDARD  
METAL FRAME, GRATE & SOLID COVER - TYPE 4

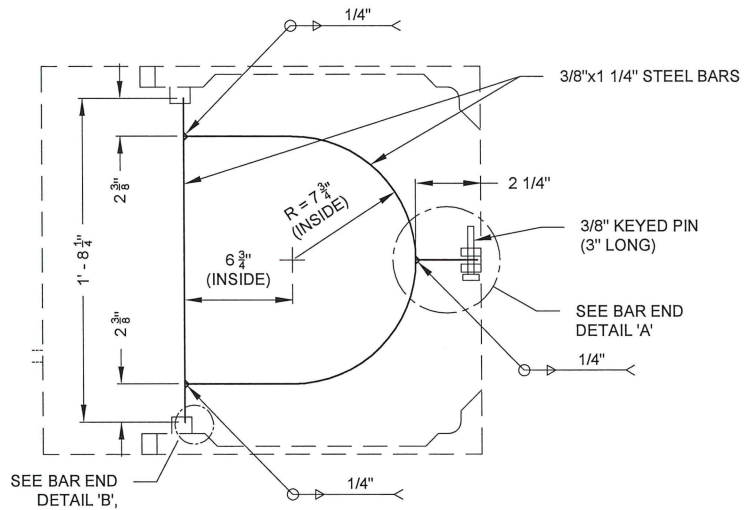
NO.	DATE	BY	CKD.	APPR.	REVISION

SHEET  
B - 15

i:\Standards\Standard Plans (County)\2017 Revisions\B - SHEETS\STD-B17.dwg Jul 14, 2017 8:14am



**TYPE 1 FRAME**

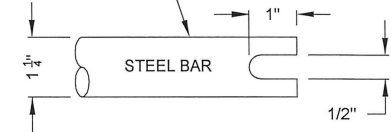


**TYPE 2 FRAME**

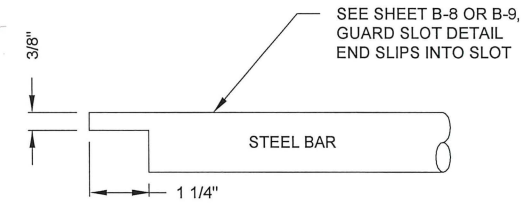
**GENERAL NOTES**

1. GRATE GUARD SHALL BE USED ON ALL TYPE 1 AND TYPE 2 FRAMES.
2. WELDS ON GRATE GUARD SHALL BE CONTINUOUS WELDS.
3. STEEL IN GRATE GUARD SHALL CONFORM WITH AASHTO M 183.
4. WELDS, WELDING PROCEDURES, AND WELDING MATERIALS SHALL CONFORM TO STANDARD SPECIFICATIONS FOR WELDING ISSUED BY THE AMERICAN WELDING SOCIETY.

SLIPS BETWEEN 2 SLOTTED TANGS, 3/8"x3" PIN HOLDS POSITION



**BAR END DETAIL 'A'**

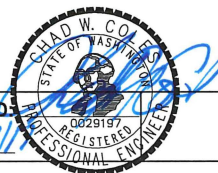


**BAR END DETAIL 'B'**  
FRONT

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

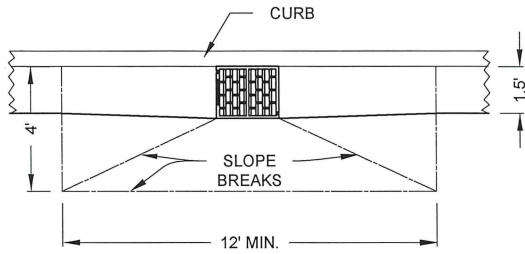
APPROVED  
COUNTY ENGINEER  
DATE:



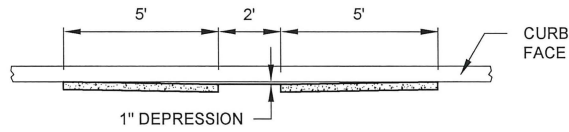
STANDARD  
GRATE GUARD

SHEET  
B - 17

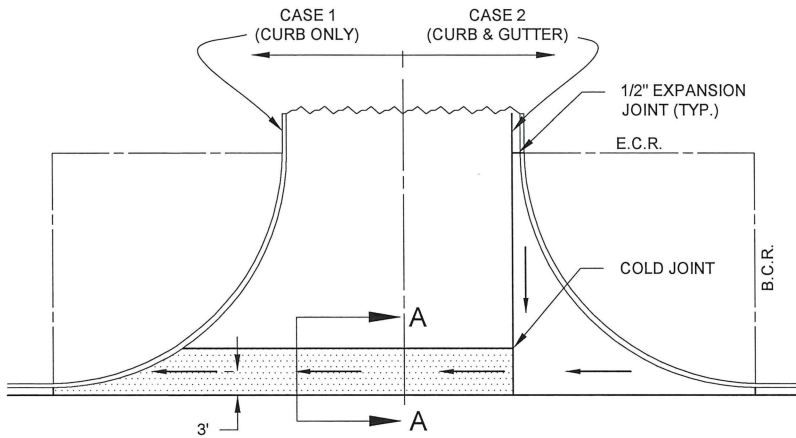
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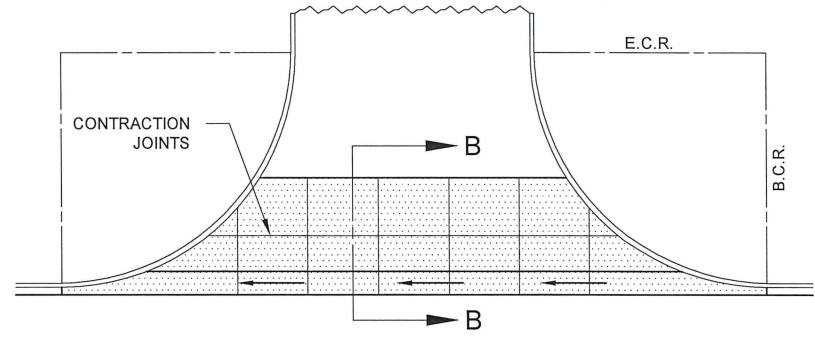
**GUTTER DEPRESSION**  
FRONT FACE



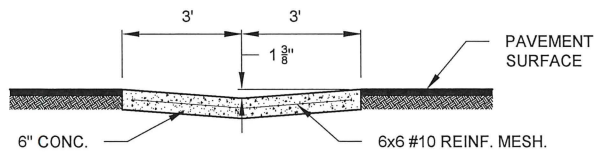
**GUTTER DEPRESSION**  
FRONT FACE



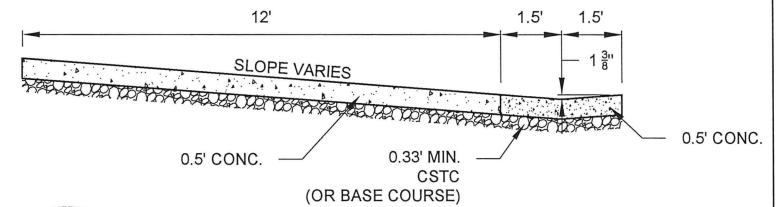
**CROSS GUTTER TYPE 1**



**CROSS GUTTER TYPE 2**



**SECTION A - A**



**SECTION B - B**

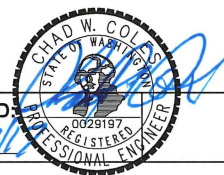
**GENERAL NOTES**

1. THE GUTTER DEPRESSION SHALL BE CONSTRUCTED OF ASPHALT CONCRETE WHERE NO CONCRETE GUTTER IS SPECIFIED. A.C. THICKNESS SHALL BE THE SAME AS SPECIFIED FOR THE ROAD.
2. PORTLAND CEMENT CONCRETE SHALL BE 6-SACK COMMERCIAL.

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
SPOKANE, WA. 99260 477-3600

APPROVED  
COUNTY ENGINEER  
DATE: *[Signature]*

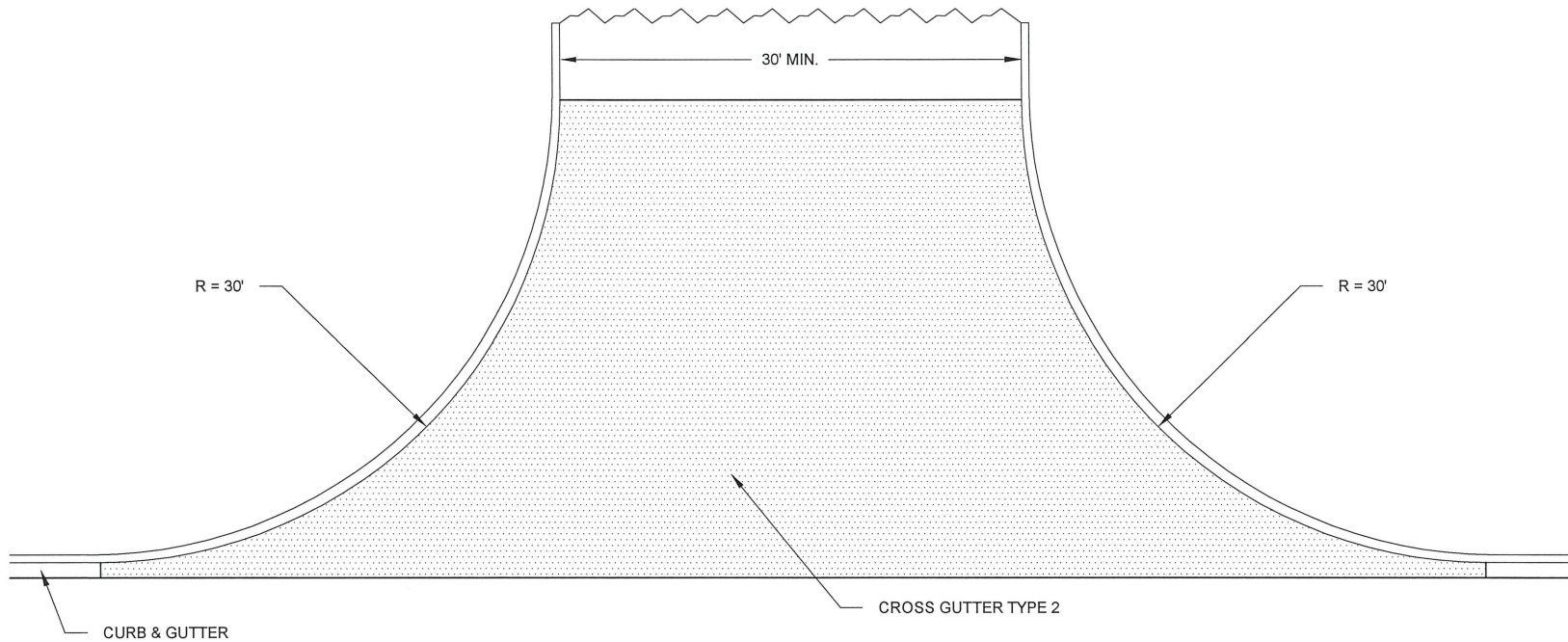


STANDARD  
CONCRETE GUTTERS

SHEET  
B - 18

### GENERAL NOTES

1. THE GUTTER DEPRESSION SHALL BE CONSTRUCTED OF ASPHALT CONCRETE WHERE NO CONCRETE GUTTER IS SPECIFIED. A.C. THICKNESS SHALL BE THE SAME AS SPECIFIED FOR THE ROAD.
2. PORTLAND CEMENT CONCRETE SHALL BE 6-SACK COMMERCIAL.



### HIGH VOLUME DRIVEWAY APPROACH

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

**APPROVED**  
 COUNTY ENGINEER  
 DATE: *7/14/17*

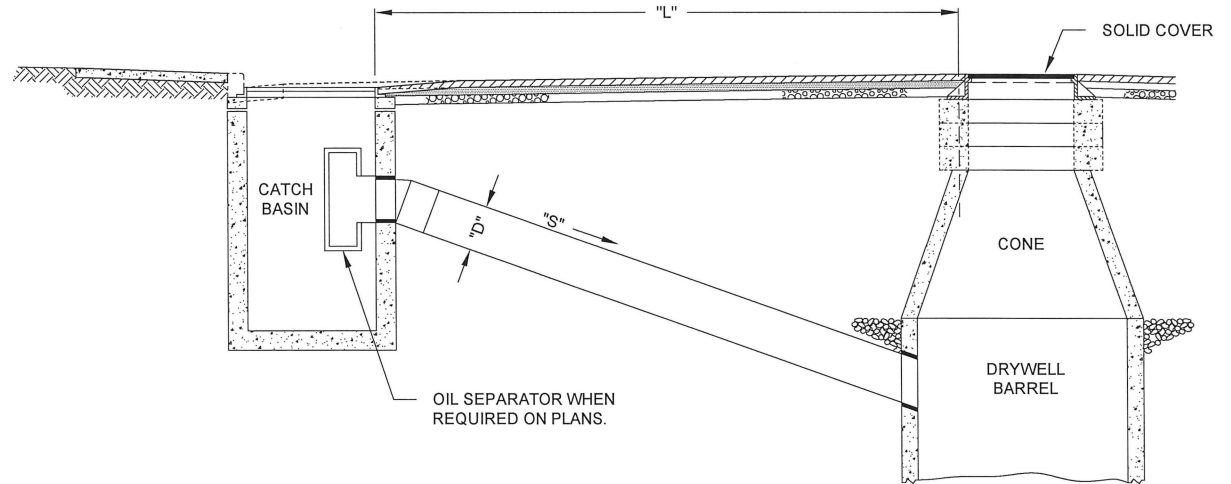
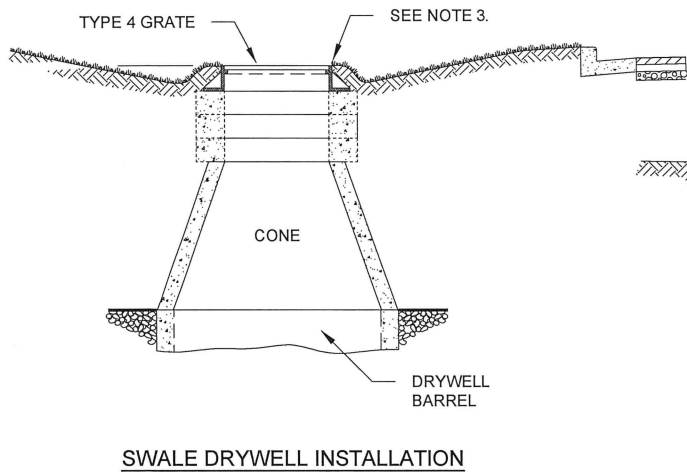
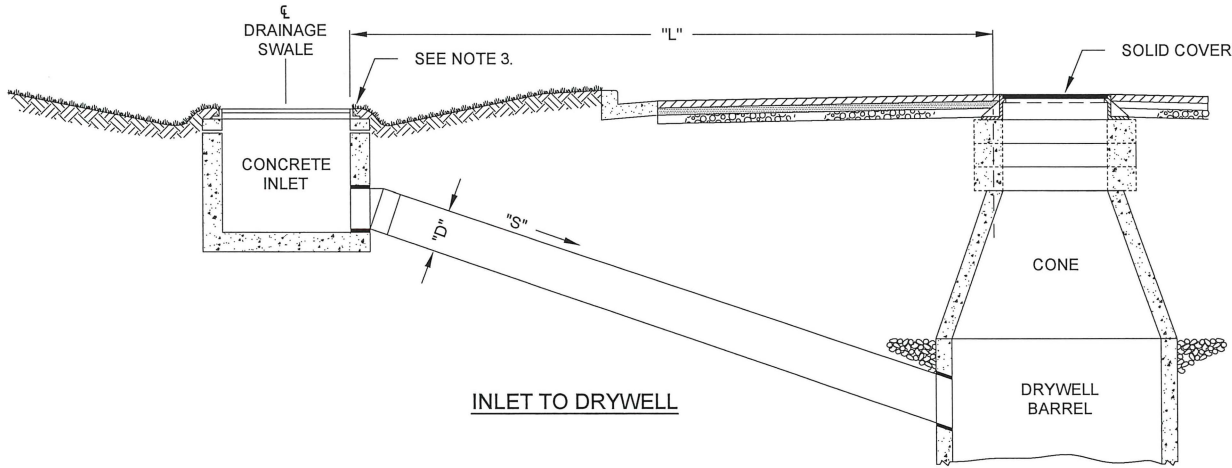


STANDARD  
 HIGH VOLUME DRIVEWAY APPROACH

SHEET  
 B - 18A

### GENERAL NOTES

1. WHERE SPECIFIED ON THE PLANS, A SOLID COVER SHALL BE USED IN LIEU OF A GRATE.
2. "D" SHALL BE A MINIMUM OF 10". "L", AND "D" SHALL BE SHOWN ON PLANS. "S" SHALL BE 2% MIN. UNLESS OTHERWISE SHOWN ON THE PLANS
3. INLET SHALL BE RAISED 6" ABOVE THE FLOWLINE OF THE DRAINAGE SWALE UNLESS OTHERWISE SHOWN ON THE PLANS.
4. DRYWELLS PLACED IN ROADWAY SHALL BE PLACED IN CENTER ON TRAFFIC LANE, A MINIMUM OF 15' FROM CATCH BASIN OR INLET.
5. WHEN PVC PIPE IS USED, A PVC ADAPTER SHALL BE INSTALLED.
6. PVC ADAPTERS SHALL BE GROUTED INTO INLETS, CATCH BASINS & DRYWELLS.
7. PVC PIPE INSTALLED UNDER ROADWAY SHALL HAVE 2' MINIMUM COVER.
8. ELBOWS UP TO 45° MAY BE USED FOR CONNECTION AT CATCH BASINS & INLETS.
9. SEE DWG. B-1 FOR DRYWELL STANDARDS.



CATCH BASIN TO DRYWELL

NO.	DATE	BY	CKD.	APPR.	REVISION

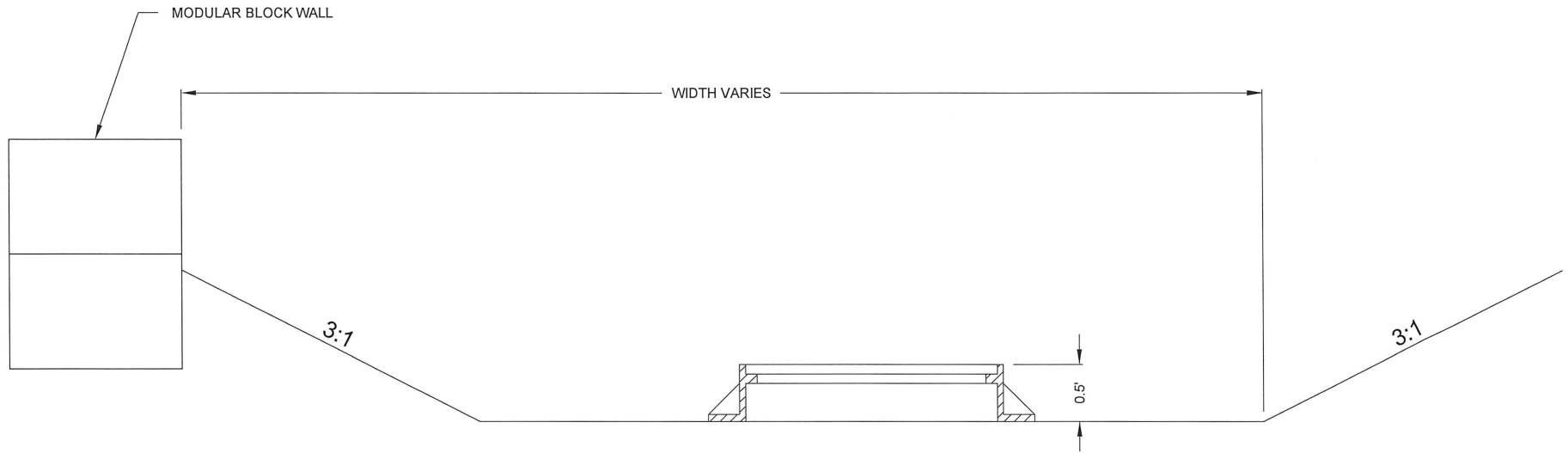
**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED  
 COUNTY ENGINEER  
 DATE: 7/14/17



STANDARD  
 INLET INSTALLATIONS

SHEET  
 B - 19



SWALE SECTION WITH MODULAR BLOCK WALL

NO.	DATE	BY	CKD.	APPR.	REVISION

**SPOKANE COUNTY**  
**DEPARTMENT OF PUBLIC WORKS**  
 SPOKANE, WA. 99260 477-3600

APPROVED  
 COUNTY ENGINEER  
 DATE: *7/14/17*



STANDARD  
 SWALE WITH MODULAR BLOCK WALL

SHEET  
 B - 20

MANHOLE TYPE	MIN. DEPTH TO I.E.	MAX. DEPTH	STEPS (SEE U-9)	MAX. PIPE SIZE (I.D.)*	SHEET NO.
I-48	6'	25'	YES	21"	U-2
I-60	9'	25'	YES	36"	U-3
II-72	9'	25'	YES	42"	U-4
II-96	12'	25'	YES	60"	U-4
III-48**	4'	6'	NO	21"	U-5
III-60	6'	9'	YES	36"	U-6
III-72	7'	9'	YES	42"	U-6
III-96	8'	12'	YES	60"	U-6
IV	8'	25'	YES	42" MIN. PIPE SIZE	U-7

\*MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.  
 \*\*MANHOLES LESS THAN 6' IN DEPTH MUST BE APPROVED BY SPOKANE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT

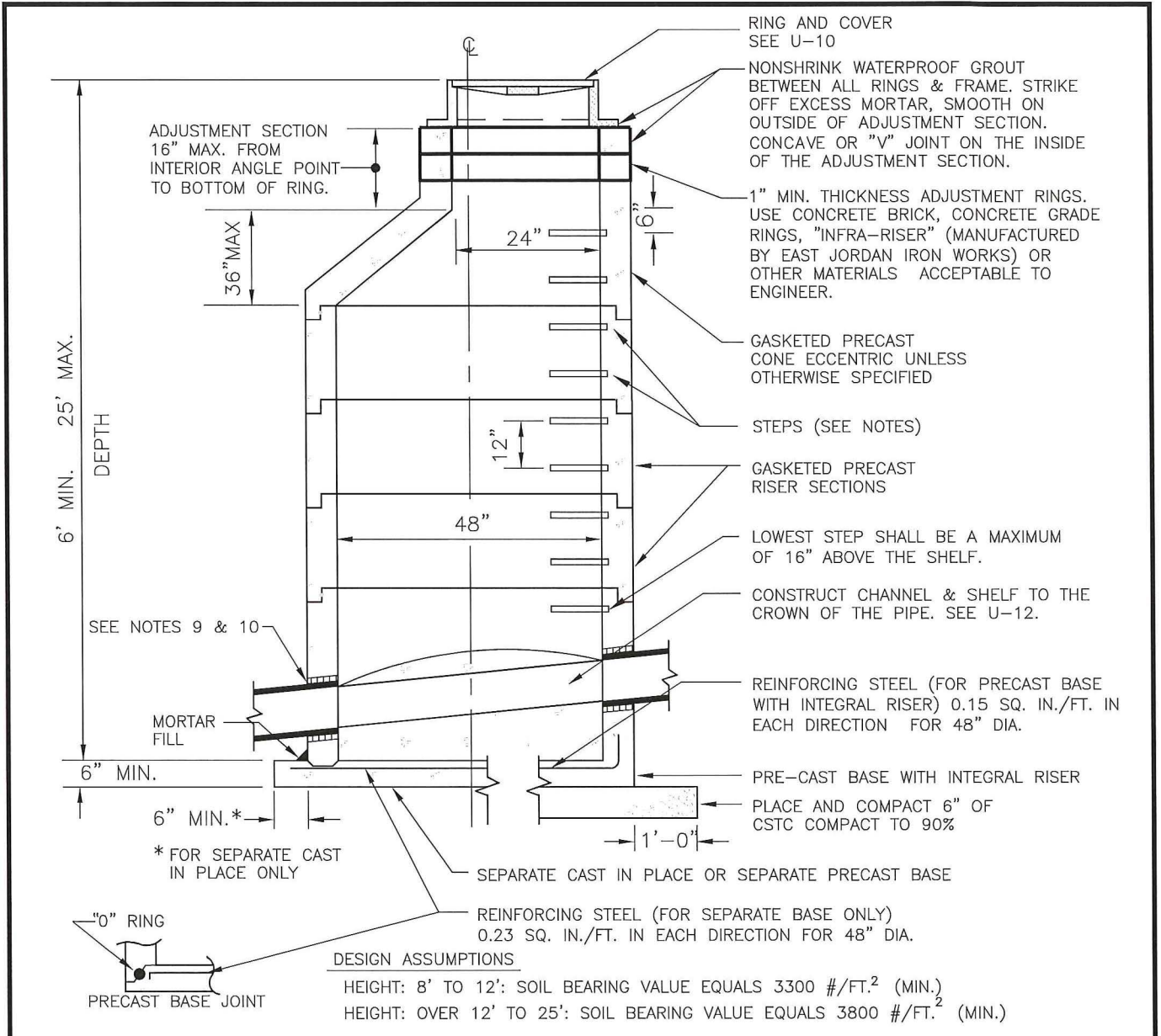


SHEET  
U-1

APPROVED: *[Signature]*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: 12/12/17

== STANDARD ==  
 MANHOLE TYPES & DEPTHS

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604



**NOTES**

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS
2. ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 21" FOR 48" MANHOLE. (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.) MINIMUM DISTANCE BETWEEN HOLES IS 8".
5. ALL BASE REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
6. NO STEPS SHALL BE PLACED IN THE ADJUSTMENT SECTION.
7. THE MANHOLE OPENING AND STEPS SHALL BE ORIENTED DIRECTLY OVER THE INVERT OF THE LARGEST INLET PIPE.
8. USE A-LOK, KOR-N-SEAL, INSERTA TEE, OR APPROVED EQUAL MANHOLE ADAPTORS.
9. TOP OF PIPE MUST BE FLUSH WITH INSIDE SURFACE OF MANHOLE WALL.



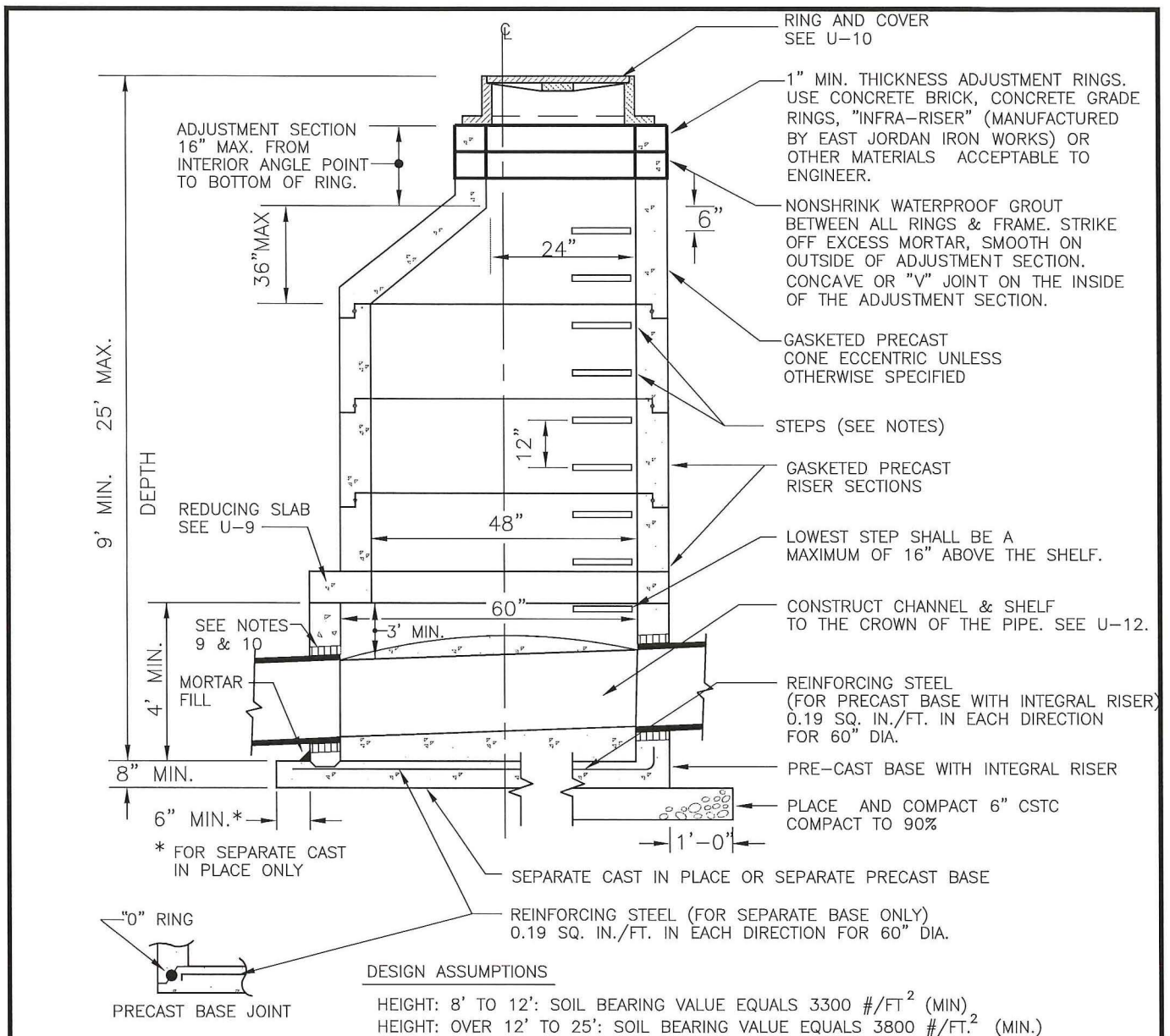
SHEET  
U-2

APPROVED: *HR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *12/12/17*

STANDARD  
 MANHOLE TYPE I-48

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604





**DESIGN ASSUMPTIONS**

HEIGHT: 8' TO 12': SOIL BEARING VALUE EQUALS 3300 #/FT.<sup>2</sup> (MIN)  
 HEIGHT: OVER 12' TO 25': SOIL BEARING VALUE EQUALS 3800 #/FT.<sup>2</sup> (MIN.)

**NOTES**

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS
2. ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 21" FOR 48" MANHOLE. (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.) MINIMUM DISTANCE BETWEEN HOLES IS 8".
5. ALL BASE REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
6. NO STEPS SHALL BE PLACED IN THE ADJUSTMENT SECTION.
7. THE MANHOLE OPENING AND STEPS SHALL BE ORIENTED DIRECTLY OVER THE INVERT OF THE LARGEST INLET PIPE.
8. USE A-LOK, KOR-N-SEAL, INSERTA TEE, OR APPROVED EQUAL MANHOLE ADAPTORS.
9. TOP OF PIPE MUST BE FLUSH WITH INSIDE SURFACE OF MANHOLE WALL.



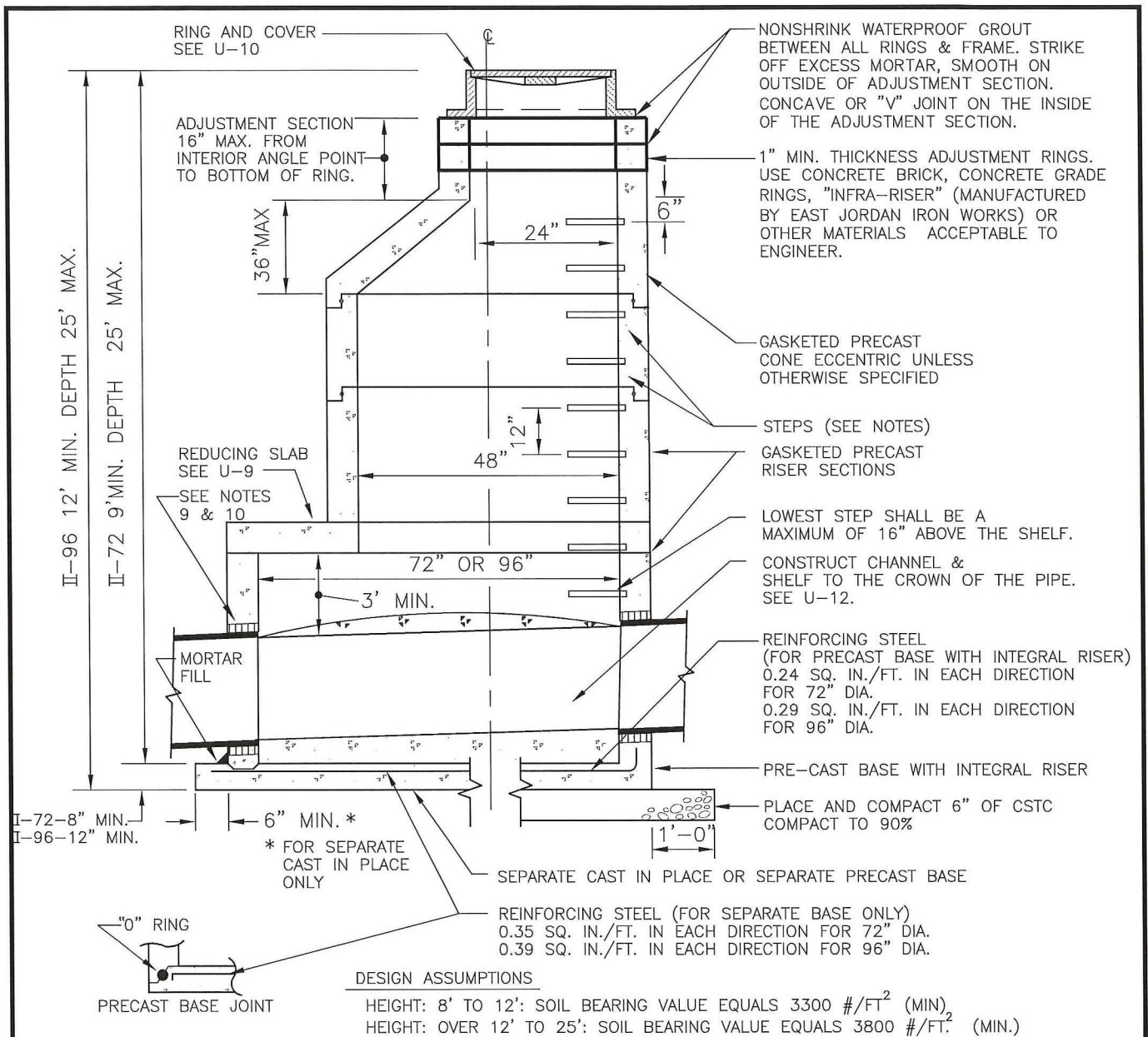
12/2/17

SHEET  
U-3

APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *2/12/17*

— STANDARD —  
 MANHOLE TYPE I-60

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604



**NOTES**

- MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS
- ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
- PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
- KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 42" FOR 72" MANHOLE, 60" FOR 96" MANHOLE (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.) MINIMUM DISTANCE BETWEEN HOLES IS 8".
- ALL BASE REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
- NO STEPS SHALL BE PLACED IN THE ADJUSTMENT SECTION.
- THE MANHOLE OPENING AND STEPS SHALL BE ORIENTED DIRECTLY OVER THE INVERT OF THE LARGEST INLET PIPE.
- USE A-LOK, KOR-N-SEAL, INSERTA TEE, OR APPROVED EQUAL MANHOLE ADAPTORS.
- TOP OF PIPE MUST BE FLUSH WITH INSIDE SURFACE OF MANHOLE WALL.

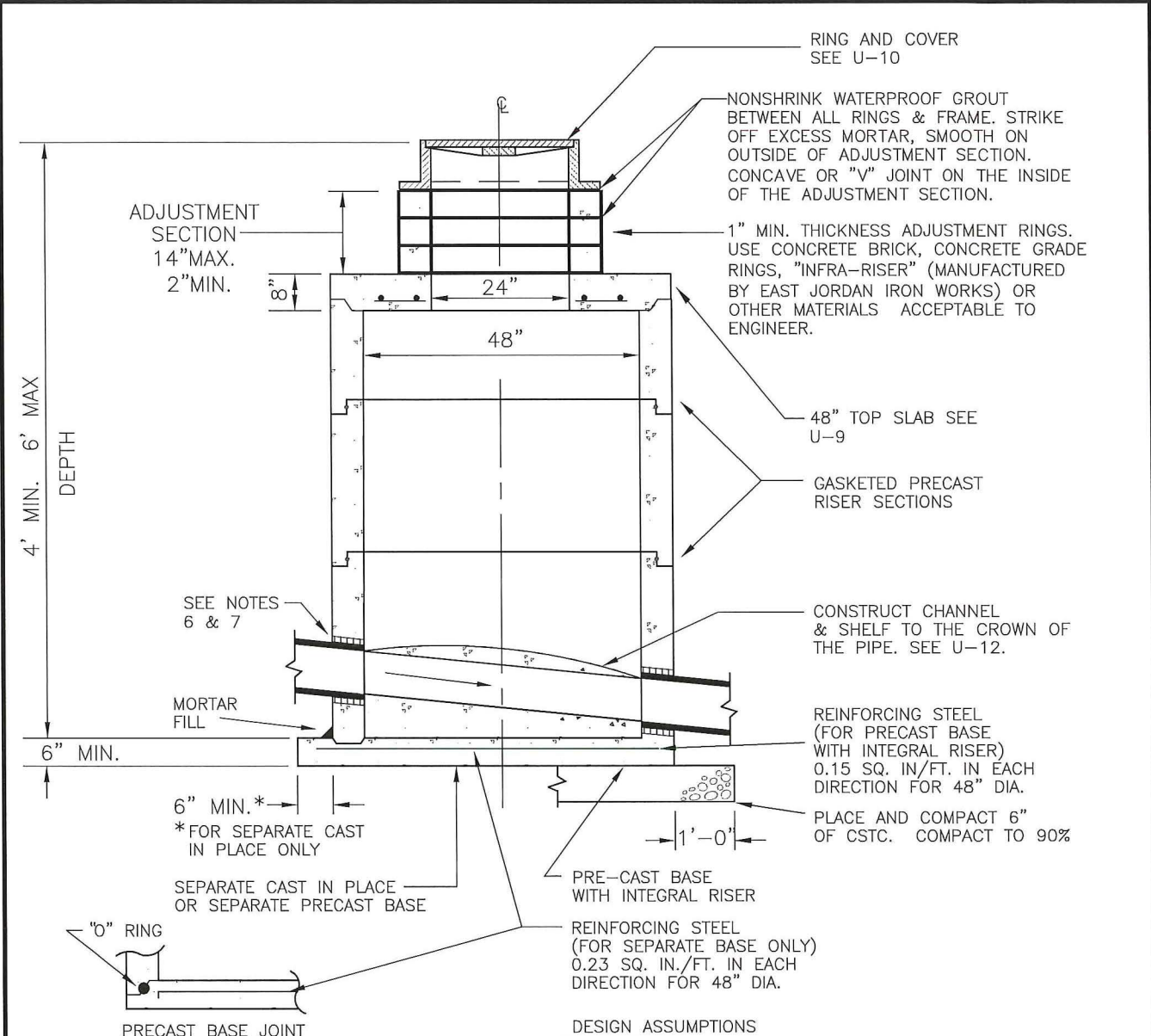


SHEET  
U-4

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
MANHOLE TYPES II-72, II-96

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



**NOTES**

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS.
2. ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 21" FOR 48" MANHOLE. (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.) MINIMUM DISTANCE BETWEEN HOLES IS 8".
5. ALL BASE REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
6. USE A-LOK, KOR-N-SEAL, INSERTA TEE, OR APPROVED EQUAL MANHOLE ADAPTOR.
7. TOP OF PIPE MUST BE FLUSH WITH INSIDE SURFACE OF MANHOLE WALL.

**DESIGN ASSUMPTIONS**

5'-4" TO 8': SOIL BEARING VALUE EQUALS 3300 #/FT (MIN)

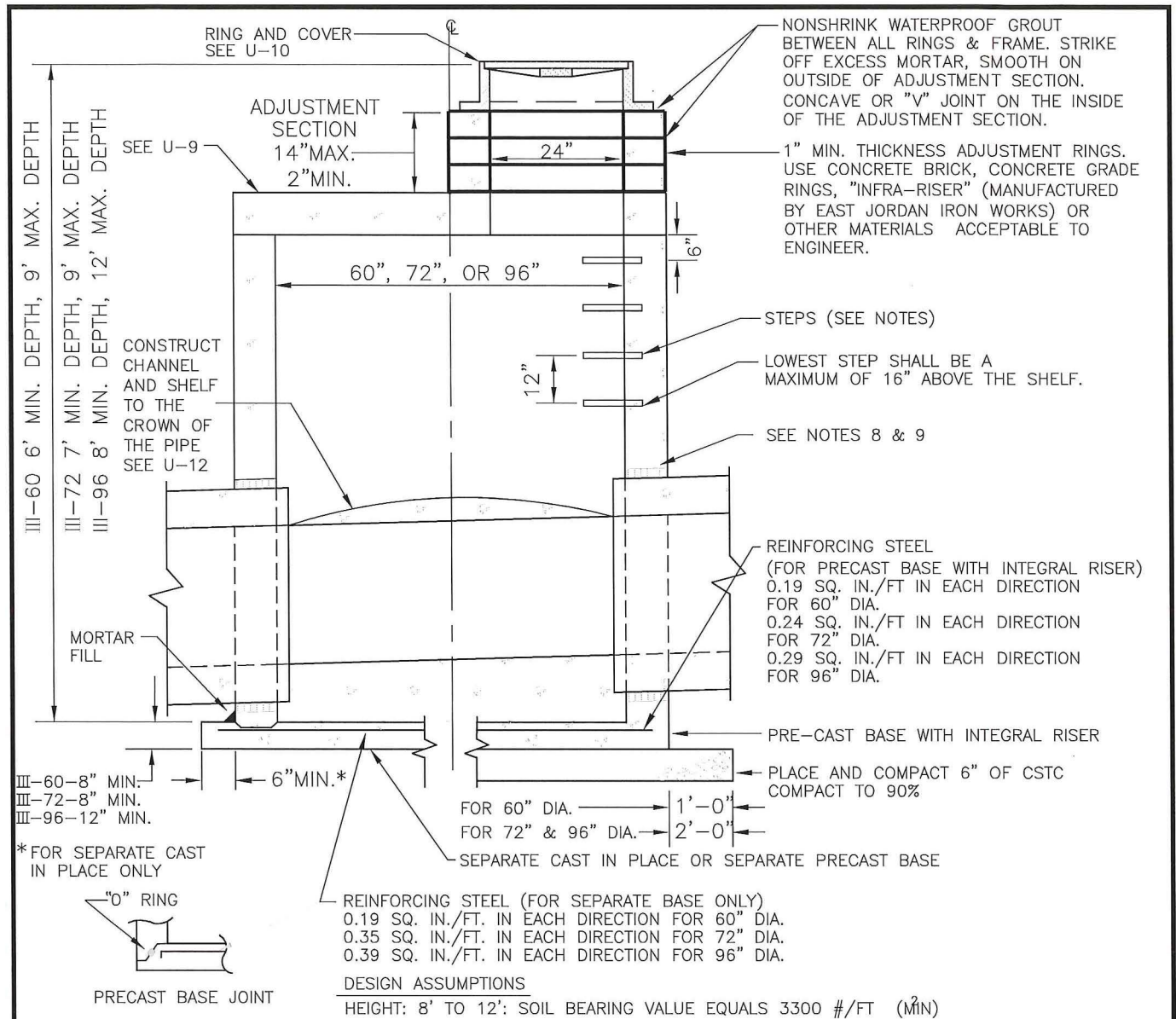


12/21/17  
SHEET  
U-5

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/21/17*

STANDARD  
MANHOLE TYPE III-48

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



NOTES

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS.
2. ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM.
4. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 36" FOR 60" MANHOLE, 42" FOR 72" MANHOLE, 60" FOR 96" MANHOLE. (MAX. PIPE SIZE MAY BE LIMITED BY PIPE CONFIGURATION.) MINIMUM DISTANCE BETWEEN HOLES IS 8".
5. ALL BASE REINFORCING SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
6. NO STEPS SHALL BE PLACED IN THE ADJUSTMENT RING
7. THE MANHOLE OPENING AND STEPS SHALL BE ORIENTED DIRECTLY OVER THE INVERT OF THE LARGEST INLET PIPE.
8. USE A-LOK, KOR-N-SEAL, INSERTA TEE, OR APPROVED EQUAL MANHOLE ADAPTOR.
9. TOP OF PIPE MUST BE FLUSH WITH INSIDE SURFACE OF MANHOLE WALL.



12/21/17  
SHEET  
U-6

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/21/17*

STANDARD  
MANHOLE TYPES  
III-60, III-72, III-96

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604

RING AND COVER  
SEE U-10

ADJUSTMENT SECTION  
16" MAX. FROM  
INTERIOR ANGLE POINT  
TO BOTTOM OF RING.

36" MAX

NONSHRINK WATERPROOF GROUT  
BETWEEN ALL RINGS & FRAME. STRIKE  
OFF EXCESS MORTAR, SMOOTH ON  
INSIDE AND OUTSIDE OF ADJUSTMENT  
SECTION.  
1" MIN. THICKNESS ADJUSTMENT SECTION.  
USE CONCRETE BRICK, CONCRETE GRADE  
RINGS, "INFRA-RISER" (MANUFACTURED  
BY EAST JORDAN IRON WORKS) OR  
OTHER MATERIALS ACCEPTABLE TO  
ENGINEER.

GASKETED ECCENTRIC  
CONCRETE PRECAST  
CONE

STEPS (SEE NOTES)

GASKETED PRECAST  
RISER SECTIONS

WELD REINFORCING STEEL AT JOINTS

12"

48"

VARIES  
(MIN. DIA 42")

MORTAR FILLET (TYP.)

SECTION A-A

48" DIA. RISER  
SECTION GRAFTED  
TO PIPE BY  
FABRICATOR.

MORTAR FILLET  
ALL AROUND

REINFORCED CONCRETE PIPE  
42" MIN. DIA.

NOTES

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS, AND IN ACCORDANCE WITH WSDOT SEC 6-02.3.
2. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. NO STEPS SHALL BE PLACED IN THE ADJUSTMENT RING
4. AN ECCENTRIC CONE SHALL BE REQUIRED.



12/12/17

SHEET  
U-7

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
MANHOLE TYPE IV

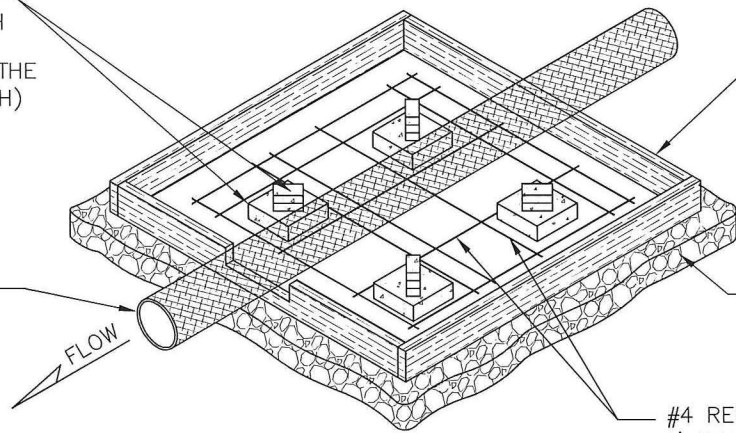
SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604

12"x12"x4" SOLID CONCRETE BLOCK WITH ADJUSTMENT BRICKS. CENTER BRICKS WITH THE BARREL WALL. (4 EACH)

2"x12" WOODEN FORM. NOTCH AS NEEDED TO FORM AROUND PIPE.

EXISTING SANITARY SEWER PIPE

12" THICK CRUSHED SURFACING BASE COURSE. (COMPACTED)

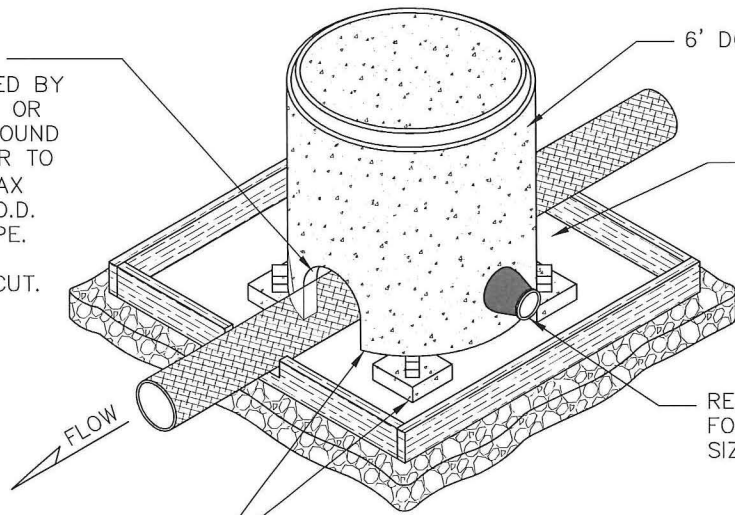


#4 REBAR GRID. TIE REBAR AT 1' SPACING AND AS NEEDED TO AVOID ADJUSTMENT BRICKS.

DOGHOUSE OPENING SHALL BE PREFORMED BY THE MANUFACTURER OR SAW CUT TO FIT AROUND PIPE. HOLE DIAMETER TO BE 4" MIN TO 8" MAX LARGER THAN THE O.D. OF THE EXISTING PIPE. HOLE SHALL BE A SMOOTH CIRCULAR CUT.

6' DOGHOUSE BASE

FORM SHALL ALLOW FOR NO LESS THAN 1' OF CONCRETE BETWEEN THE BARREL SECTION AND WOODEN FORM



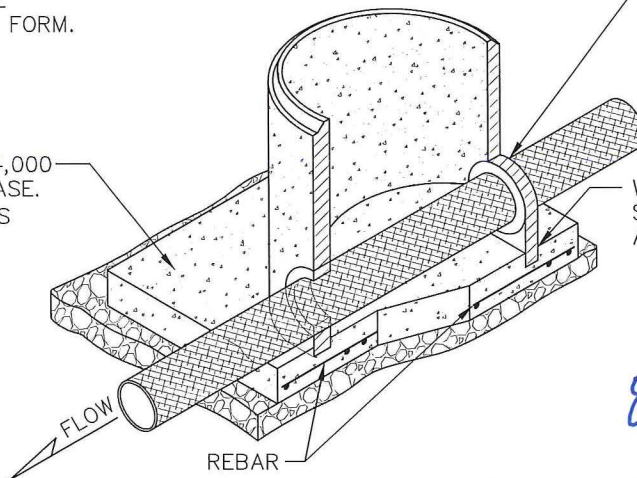
REFER TO APPROVED PLANS FOR INVERT ELEVATIONS, PIPE SIZES AND INLET LOCATIONS

SET DOGHOUSE BASE ON BRICKS. THE BOTTOM OF THE BASE SHALL BE BELOW THE TOP OF FORM.

FILL ANNULAR SPACE AROUND THE EXISTING PIPE WITH 3,000 PSI NON-SHRINK GROUT

CAST IN PLACE 4,000 PSI CONCRETE BASE. 8" MIN THICKNESS

WATER PROOFING SEALANT APPLIED AT ALL POURED JOINTS



12/12/17

SHEET U-8A

APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: 12/12/17

==== STANDARD ====  
 DOG HOUSE MANHOLE  
 INSTALLATION

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604

PRECAST CONCRETE MANHOLE BARREL SECTION. ALL JOINTS TO BE GASKETED.

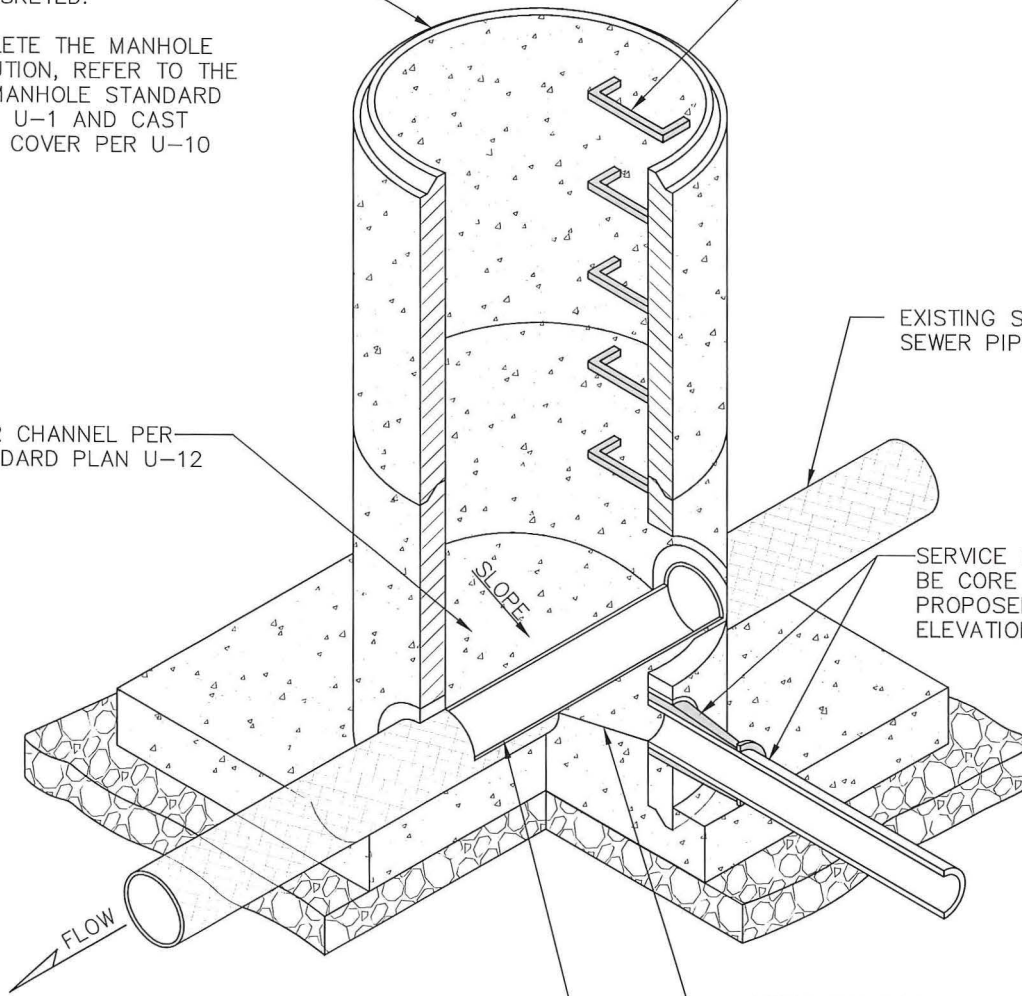
TO COMPLETE THE MANHOLE CONSTRUCTION, REFER TO THE PROPER MANHOLE STANDARD PLAN PER U-1 AND CAST RING AND COVER PER U-10

STEP PER PRECAST MANUFACTURER. SEE STANDARD PLAN U-3 FOR NOTES.

POUR CHANNEL PER STANDARD PLAN U-12

EXISTING SANITARY SEWER PIPE

SERVICE LATERALS TO BE CORE DRILLED TO PROPOSED INVERT ELEVATION AND BOOTED



CUT AND REMOVE TOP HALF OF PIPE AFTER INVERT AND SHELF HAVE BEEN FORMED

FORM CHANNEL FROM THE CORE DRILLED LATERAL TO THE EXISTING PIPE INVERT PER PLAN. BASE IS A CONTINUOUS POUR.



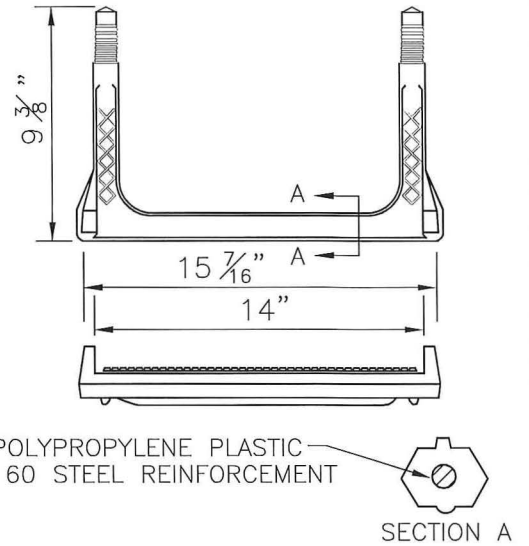
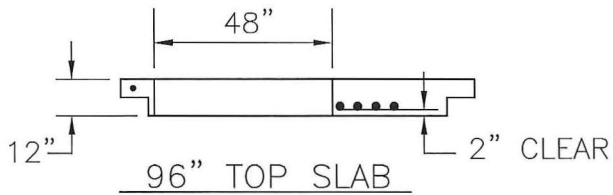
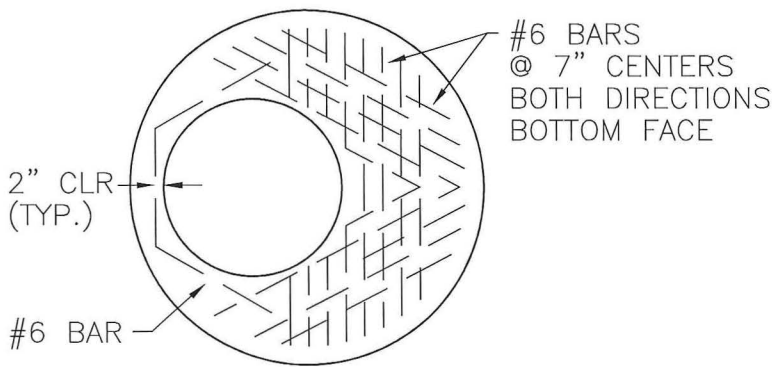
12/2/17

SHEET  
U-8B

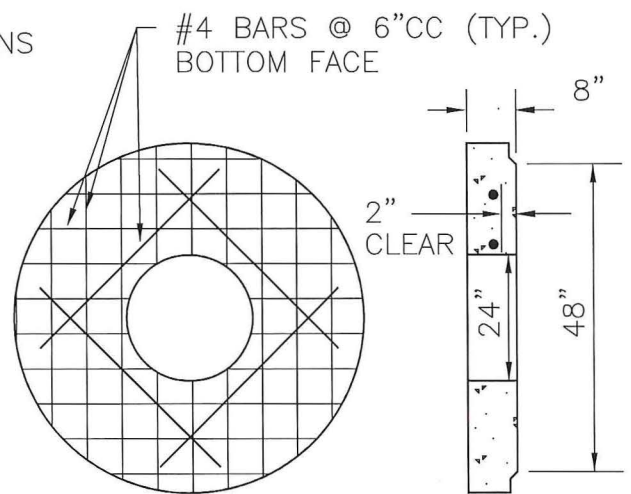
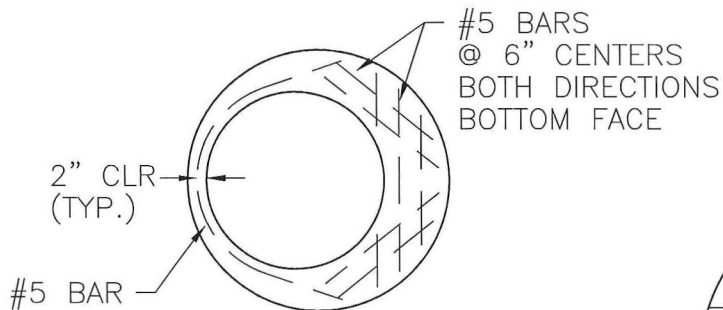
APPROVED: *K.R. Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: 12/2/17

STANDARD  
DOG HOUSE MANHOLE CHANNELING  
AND BARREL CONFIGURATION

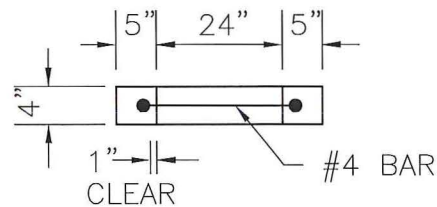
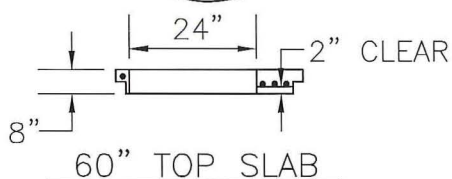
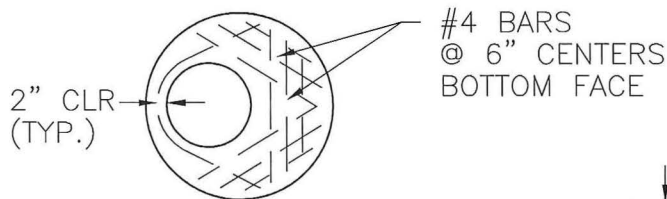
SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



MANHOLE STEP



48" TOP SLAB



GRADE RING



12/12/17  
SHEET  
U-9

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
REDUCING SLABS AND  
MANHOLE STEPS

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



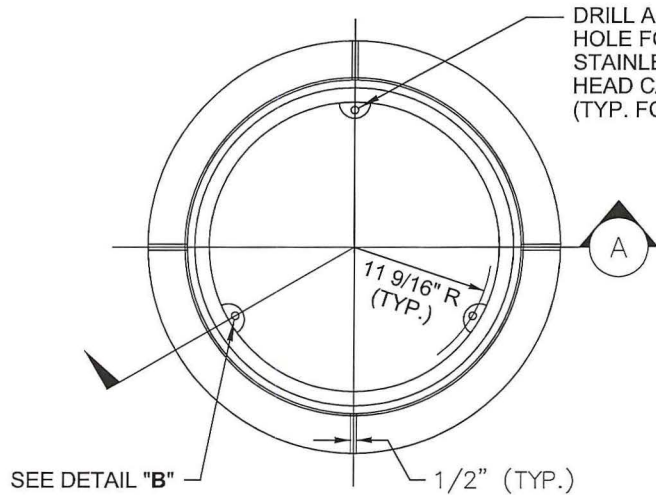
APPROVED: *KR Coates*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: 12/12/17

STANDARD  
 MANHOLE RING AND  
 COVER

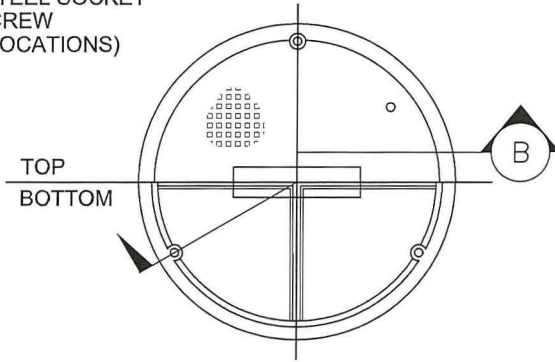
SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604



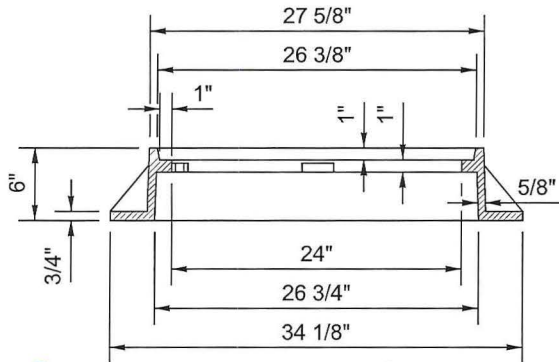
12/12/17  
 SHEET  
 U-10



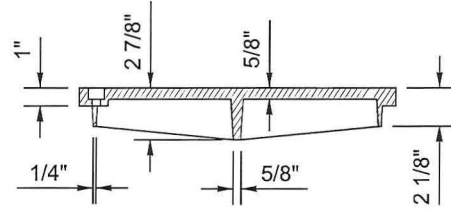
CAST IRON FRAME  
 MIN. WEIGHT 168 LBS.  
 MEETING ASTM A48 CL 30 GRAY IRON



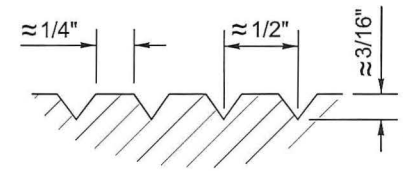
DUCTILE IRON COVER  
 MIN. WEIGHT 118 LBS.  
 MEETING ASTM A536 GR. 80-55-06



SECTION A



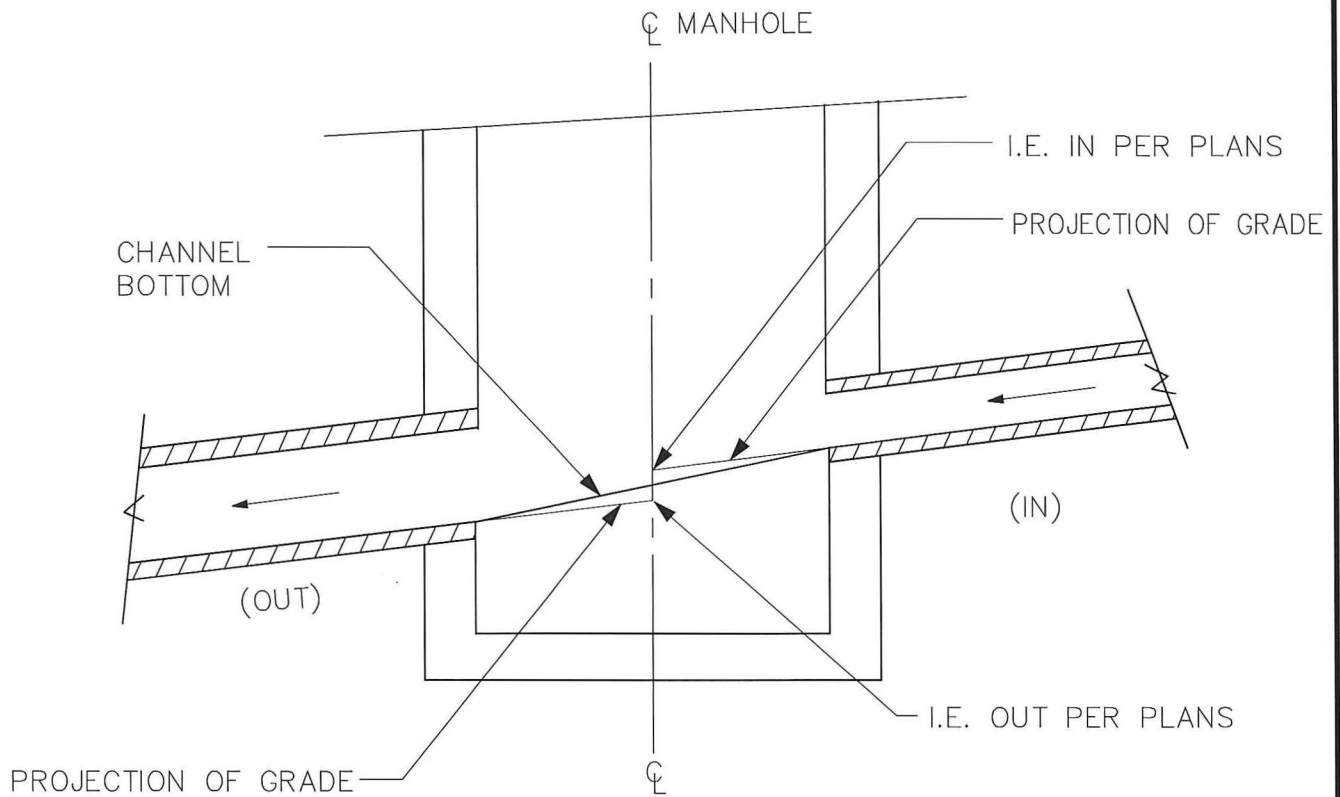
SECTION B



SKID GROOVE PATTERN  
 DETAIL

NOTES:

- 1) THE WORD SEWER SHALL BE EMBOSSED ON EACH SANITARY MANHOLE COVER WITH 3/16" RAISED LETTERS.
- 2) MANHOLE RINGS AND COVERS SHALL MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621E.
- 3) MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- 4) PROPRIETARY MANHOLE COVERS WITHOUT BOTTOM RIBS ARE ACCEPTABLE, PROVIDED THEY MEET THE STANDARD SPECIFICATIONS REQUIREMENTS FOR "METAL CASTINGS".
- 5) ALL MANHOLES SHALL HAVE BOLT DOWN LOCKING, MANHOLE RINGS, AND COVERS.



## MANHOLE I.E. DETAIL

NOT TO SCALE

**NOTES:**

INVERT ELEVATIONS SHOWN ON PLANS SHALL BE CALCULATED BY PROJECTING PIPE GRADES TO CENTER OF MANHOLE.

THE DIFFERENCE BETWEEN THE PLAN INVERT ELEVATION FOR THE INLET & THE DISCHARGE LINE SHALL BE AT LEAST 0.05FT REGARDLESS OF GRADE. DEVIATIONS MUST BE APPROVED BY SEWER DESIGN MANAGER



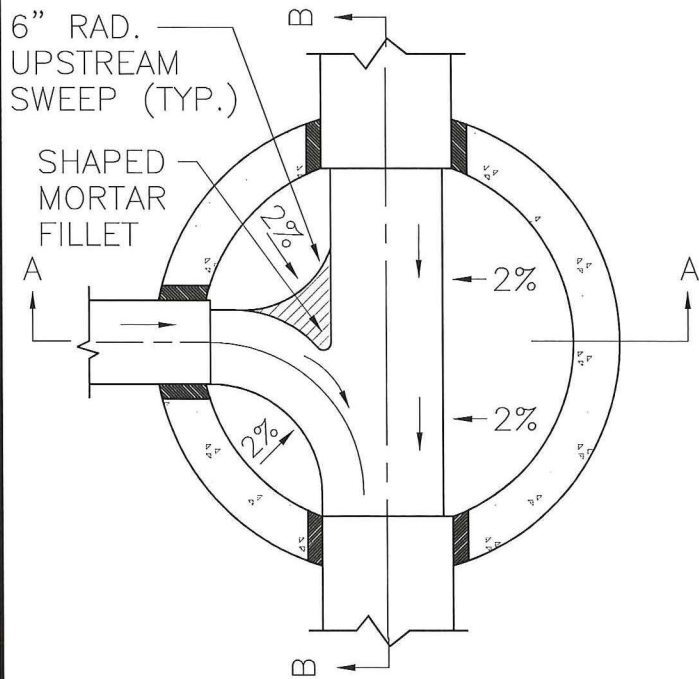
12/12/17

SHEET  
U-11

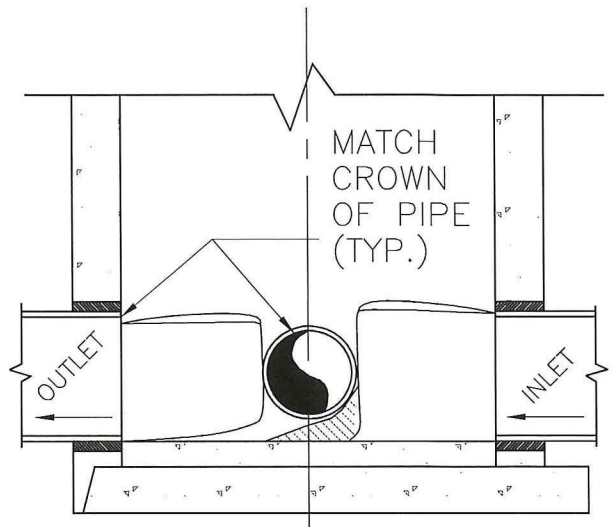
APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: 12/12/17

==== STANDARD ====  
MANHOLE INVERT ELEVATION  
DETAIL

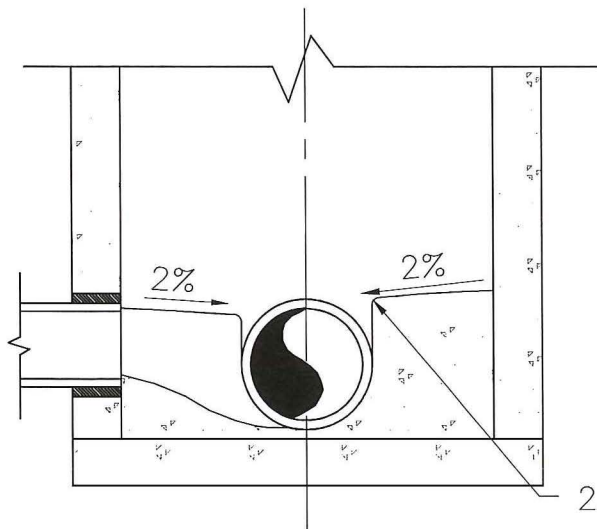
SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



PLAN



SECTION B-B



SECTION A-A

NOTES:

1. THE SHELF AND CHANNEL SHALL HAVE A SMOOTH FINISH.
2. CONSTRUCT SHELF TO THE CROWN LINE OF PIPE.



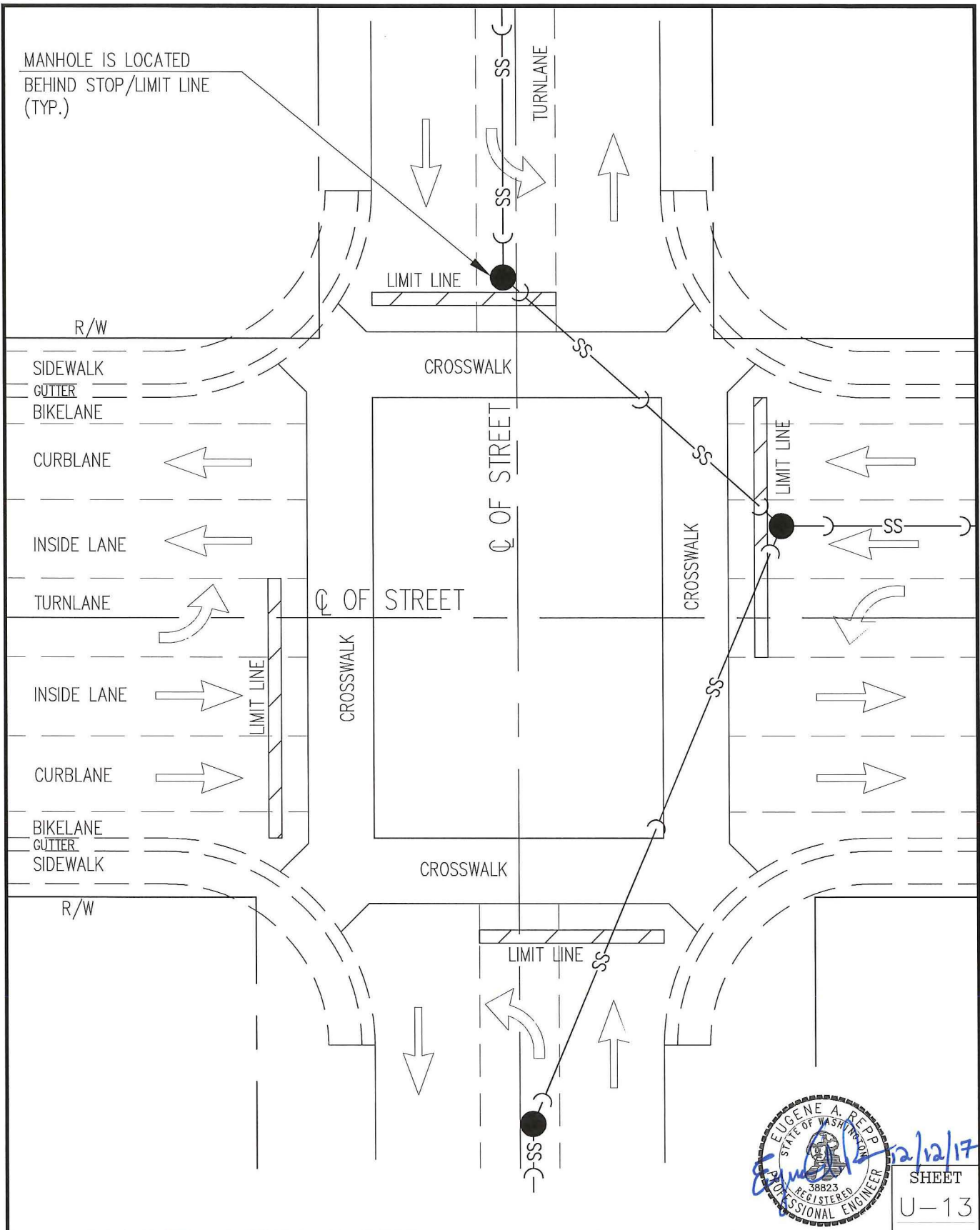
SHEET  
U-12

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
TYPICAL CHANNEL DETAIL

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604

MANHOLE IS LOCATED  
BEHIND STOP/LIMIT LINE  
(TYP.)



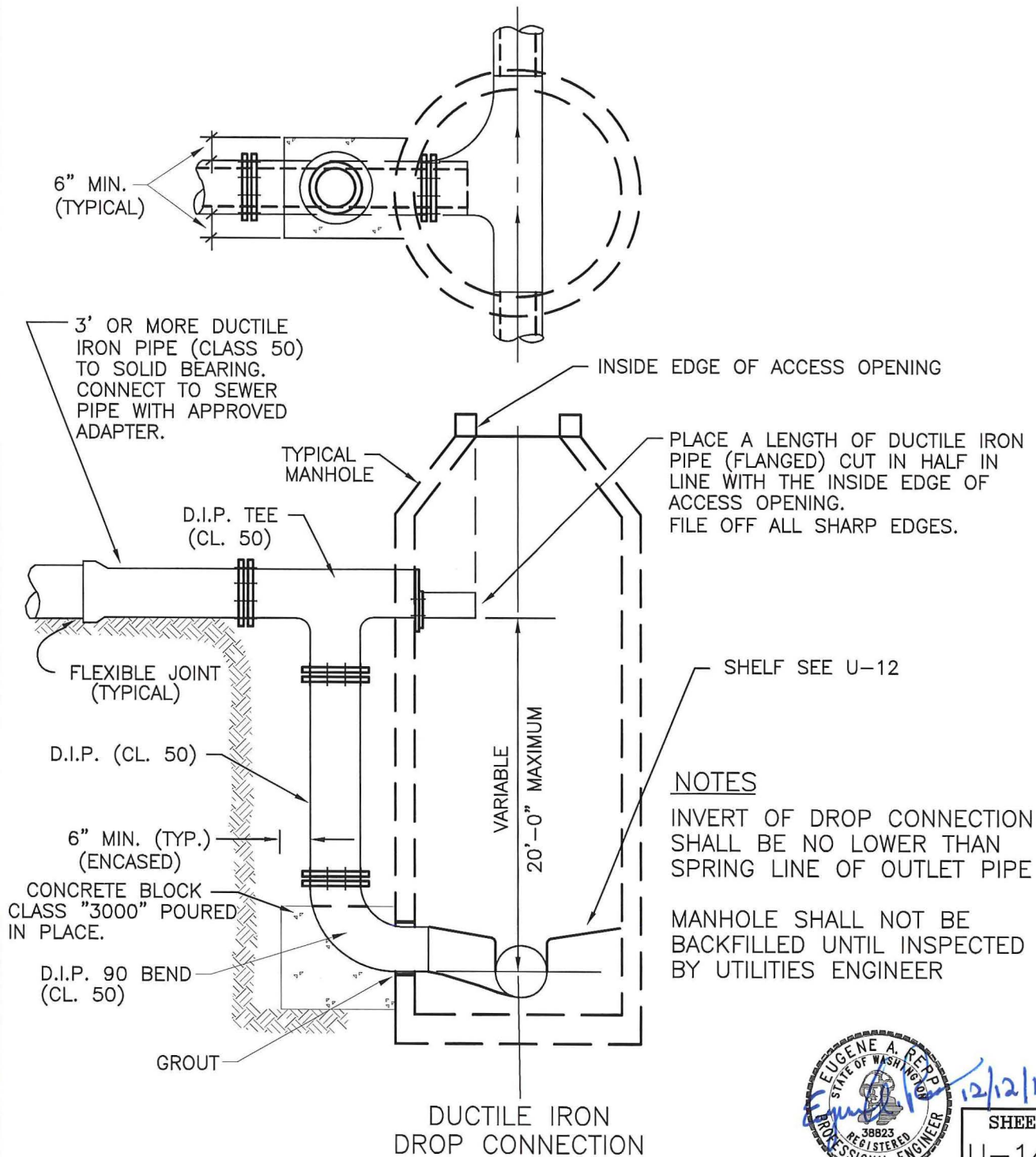

  
 12/12/17  
 SHEET  
 U-13

APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *12/12/17*

——— STANDARD ———  
 TYPICAL MANHOLE PLACEMENT  
 IN SIGNALIZED INTERSECTION

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604

NOTE: THIS MANHOLE MAY BE USED IN SPECIAL CIRCUMSTANCES UPON APPROVAL BY THE SPOKANE COUNTY ENVIRONMENTAL SERVICES DIRECTOR



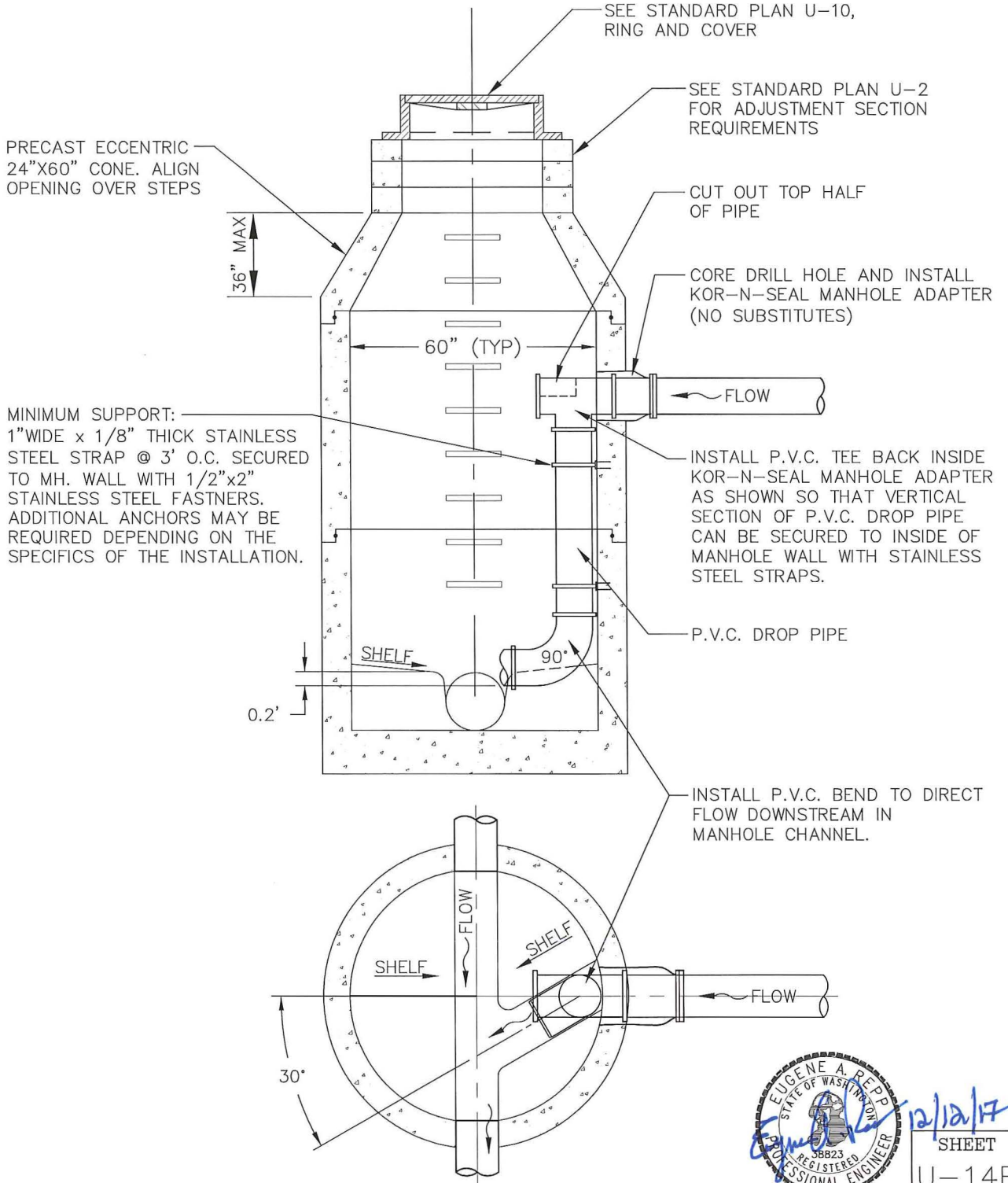
EUGENE A. REPP  
 STATE OF WASHINGTON  
 REGISTERED PROFESSIONAL ENGINEER  
 38823  
 12/12/17  
 SHEET  
 U-14A

APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *12/12/17*

STANDARD  
 EXTERIOR DROP MANHOLE  
 CONNECTION

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604

NOTE: THIS MANHOLE MAY BE USED IN SPECIAL CIRCUMSTANCES UPON APPROVAL BY THE SPOKANE COUNTY ENVIRONMENTAL SERVICES DIRECTOR

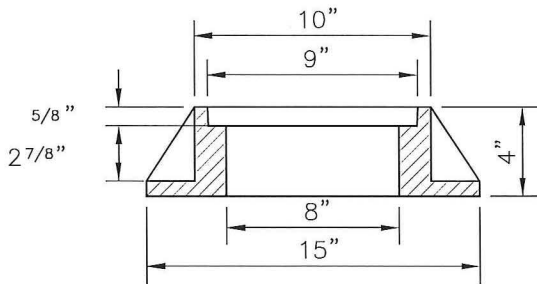
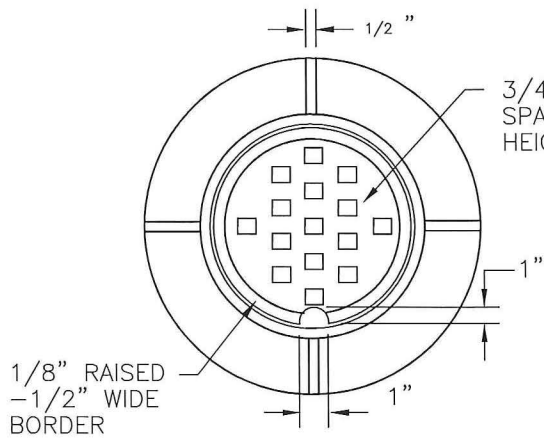


SHEET  
U-14B

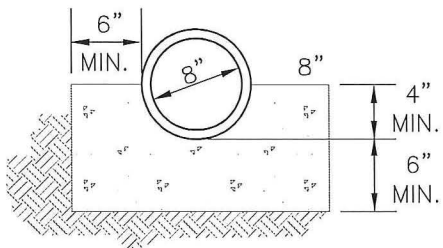
APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *12/12/17*

STANDARD  
 INTERIOR DROP MANHOLE  
 CONNECTION

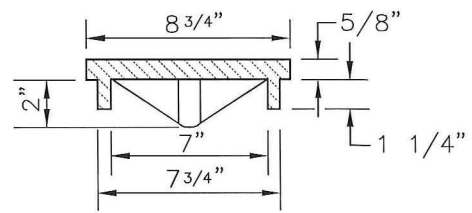
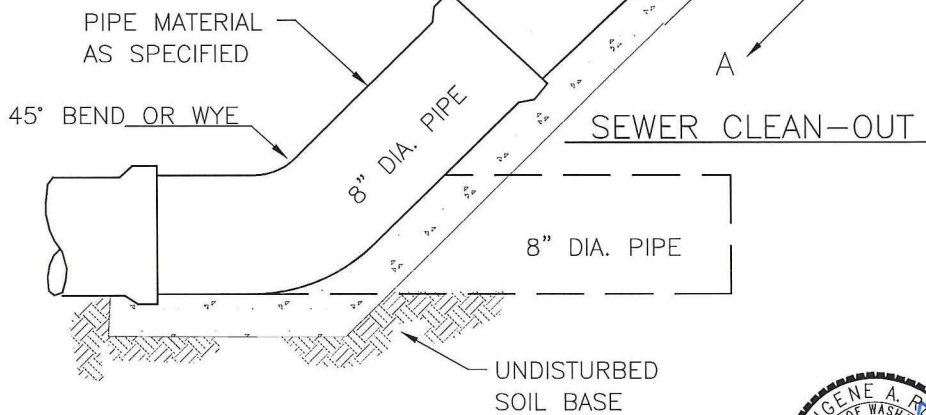
SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA. (509) 477-3604



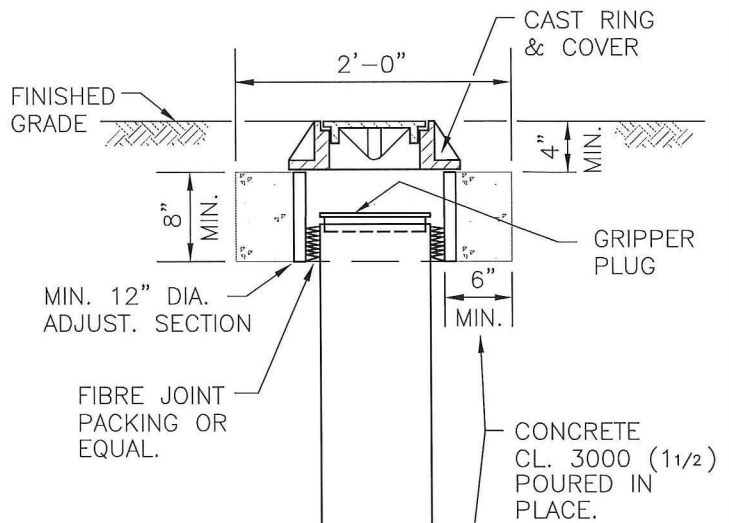
CAST IRON RING



SECTION A-A



CAST IRON COVER



12/12/17  
SHEET  
U-15

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

— STANDARD —  
MAIN LINE SEWER CLEAN-OUT  
WITH CAST IRON RING AND COVER

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604

CONTRACTOR \_\_\_\_\_

INSPECTOR \_\_\_\_\_

INSP. AGENCY \_\_\_\_\_

DATE INSTALLED \_\_\_\_\_

STUB: DIA. \_\_\_\_\_ TEE TYPE \_\_\_\_\_

LENGTH \_\_\_\_\_

CENTERLINE STATION \_\_\_\_\_

LINE NO. \_\_\_\_\_

STA. OF AND DIRECTION TO NEAREST MANHOLE \_\_\_\_\_

INVERT EL. \_\_\_\_\_

DEPTH FROM NATURAL GROUND TO STUB \_\_\_\_\_

LOCAL B.M. ELEV. \_\_\_\_\_

DESCRIPTION OF LOCAL B.M. \_\_\_\_\_

PIPE GRADE \_\_\_\_\_

\_\_\_\_\_ FT. BELOW THRESHOLD

HOUSE TYPE \_\_\_\_\_

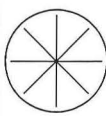
REMARKS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



NORTH  
ARROW

NOTE: MAKE TIES TO PERMANENT SURFACE FEATURES SHOWN ON PLANS

PROJECT NAME: \_\_\_\_\_

REF. DRAWING NO. \_\_\_\_\_

LOT \_\_\_\_\_ BLOCK \_\_\_\_\_

PARCEL: \_\_\_\_\_

STREET: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

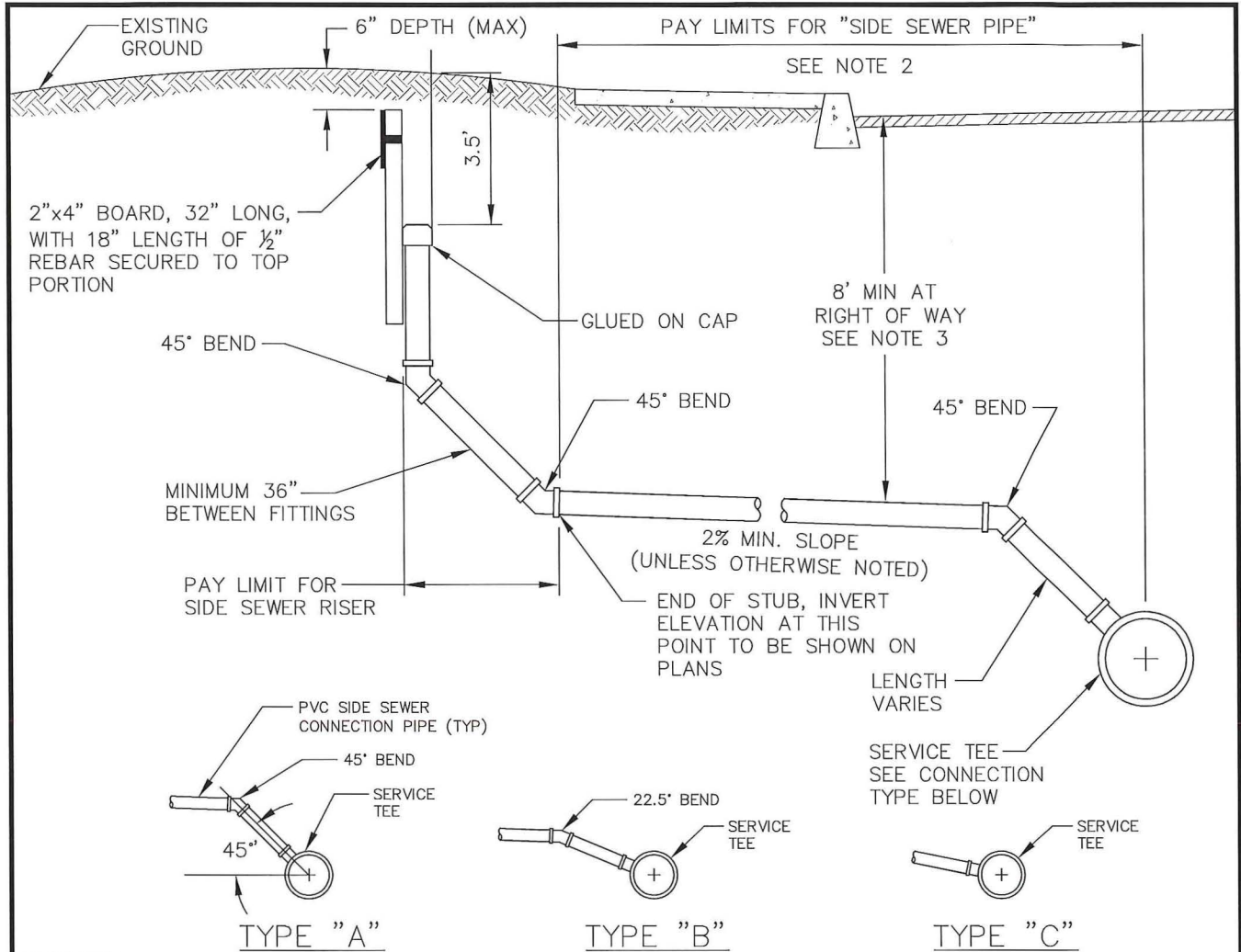
APPROVED: *[Signature]*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: 12/18/17

STANDARD  
SIDE SEWER STUB  
RECORD DRAWING

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA (509) 477-3604

SHEET  
U-16





**NOTES**

- 1) INSTALL PIPE ZONE MATERIAL (BEDDING) PER SPECIFICATIONS.
- 2) THE SIDE SEWER PIPE SHALL EXTEND TO THE POINT SHOWN ON THE PLANS. THE ENGINEER MAY FURTHER EXTEND THE SIDE SEWER PIPE TO MAINTAIN A 1:1 SLOPE FROM EXISTING OR PLANNED EDGE OF ASPHALT OR CONCRETE IMPROVEMENTS.
- 3) ALL SIDE SERVICES TO BE INSTALLED AT A MINIMUM DEPTH OF 8' WITHIN THE RIGHT OF WAY, UNLESS OTHERWISE APPROVED BY THE ENVIRONMENTAL SERVICES DEPARTMENT.
- 4) THE RECORD DRAWINGS FOR EACH INDIVIDUAL STUB SHALL INCLUDE TWO (2) HORIZONTAL TIES TO THE TOP OF THE RISER. IN ADDITION, THE SEWER MAINLINE STATION AND 90° OFFSET DISTANCE TO THE RISER PIPE SHALL BE PROVIDED. THE DEPTH AND INVERT ELEVATION REQUIRED ON THE RECORD DRAWING (SPOKANE COUNTY STD. SHEET U-16) SHALL REFER TO THE PIPE INVERT AT THE BOTTOM OF THE SIDE SEWER RISER.
- 6) SIDE SEWER RISER IS OPTIONAL INSIDE NEW DEVELOPMENTS. IF RISER IS NOT INSTALLED, EXTEND 2"x 4" MARKER TO STUB INVERT.
- 7) ALL CONNECTIONS SHALL BE TYPE "A" UNLESS OTHERWISE NOTED.
- 8) SERVICE TEE SHALL MEET ASTM D3034, SDR 26.



SHEET  
U-17

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
SIDE SEWER STUB  
INSTALLATION

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
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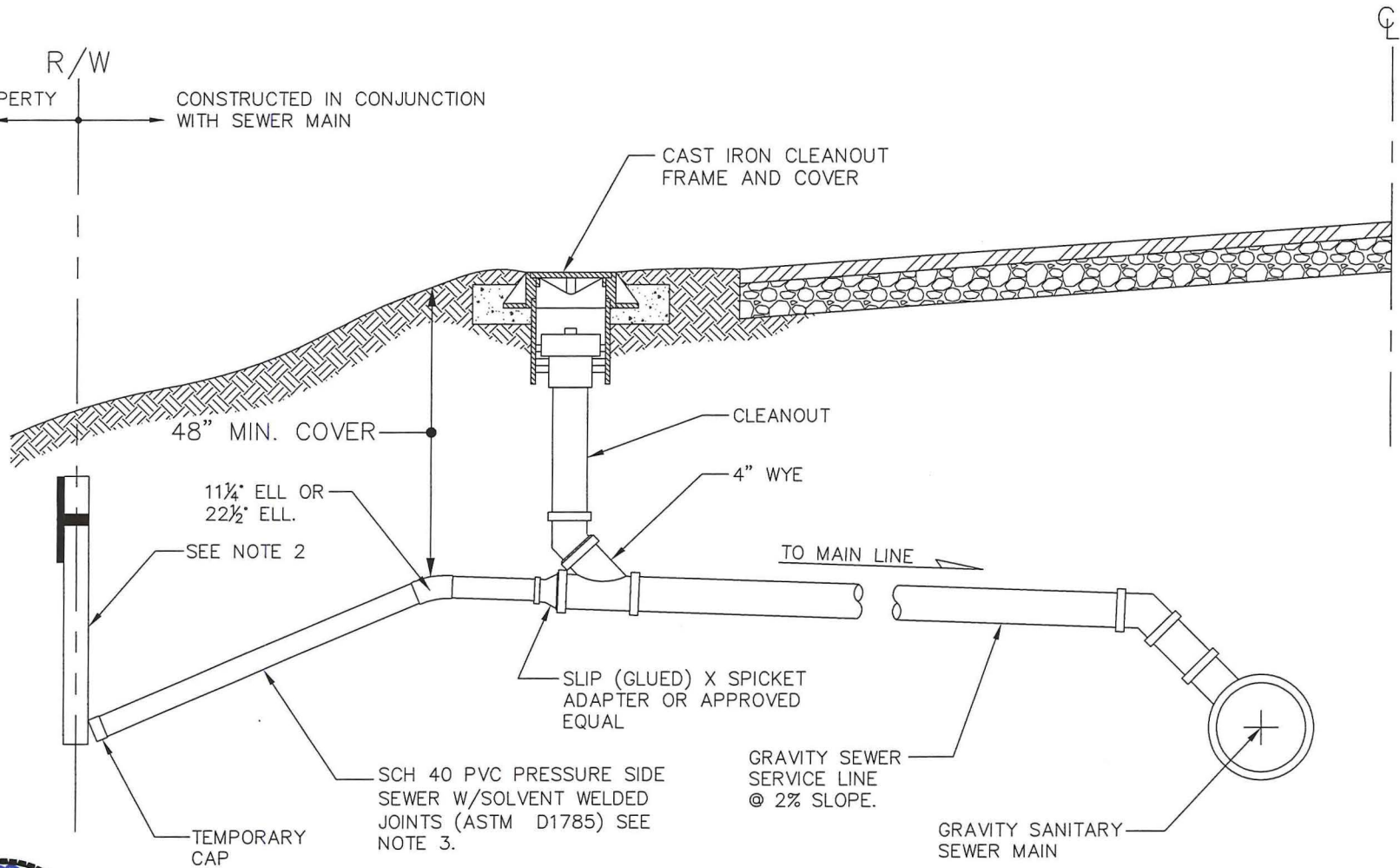
APPROVED: *[Signature]*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: 12/12/17

STANDARD  
 PRESSURE SIDE SEWER STUB  
 CONNECTION TO GRAVITY SEWER

SPOKANE COUNTY  
 ENVIRONMENTAL SERVICES DEPARTMENT  
 SPOKANE, WA (509) 477-3604

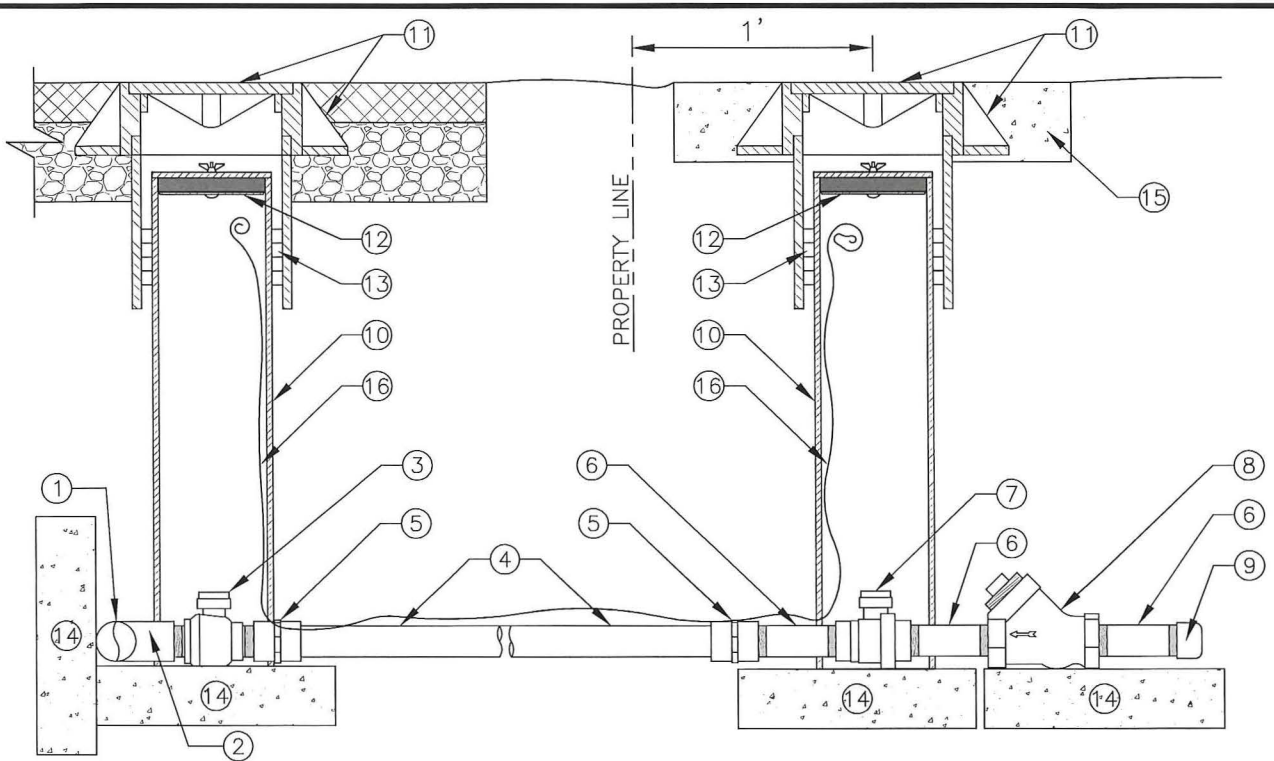


SHEET  
 U-18



NOTES:

1. SEWER PUMP ASSEMBLY CHECK VALVE AND PRESSURE SIDE SEWER INSTALLED BY PROPERTY OWNER.
2. THE END OF THE PIPE (TEMPORARY CAP) SHALL BE MARKED ACCORDING TO SPOKANE COUNTY STANDARD PLAN U-17.
3. PRESSURE SERVICE STUB TO BE CONSTRUCTED IN CONFORMANCE WITH SPOKANE COUNTY STANDARD PLAN U-21 IF WATER MAIN CROSSING IS ENCOUNTERED.



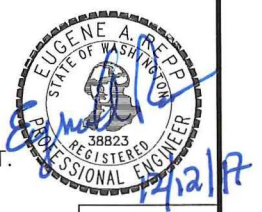
NO MALE THREADED PVC FITTINGS ARE ALLOWED WITHIN THE ASSEMBLY

KEYED NOTES

- |   |   |  |
|---|---|--|
| ① LOW PRESSURE MAIN                       | ⑦ BRASS CURB STOP   | ⑫ 6" GASKETED GRIPPER PLUG               |
| ② SERVICE CLAMP OR TEE                    | ⑧ BALL CHECK VALVE  | ⑬ FIBER JOINT PACKING OR EQUAL           |
| ③ BRASS CORPORATION STOP                  | ⑨ CAP (METAL OR PVC)  | ⑭ 12"x12"x4" SOLID CONCRETE THRUST BLOCK |
| ④ PVC PIPE SCHEDULE 40 PER ASTM 1785      | ⑩ 6"-C900 PVC PIPE  | ⑮ 12"x12"x6" THICK POURED CONCRETE PAD   |
| ⑤ SLIP x THREADED FEMALE COUPLER          | ⑪ TRAFFIC RATED CAST IRON RING AND COVER. ADJUST VALVE BOX TO MATCH FINAL GRADE. TOP OF COVER TO READ "SEWER" | ⑯ TRACING WIRE                           |
| ⑥ 6" PIPE STAINLESS STEEL OR BRASS NIPPLE |   |  |

NOTES / SPECIFICATIONS

- 1) SEE PLANS FOR PIPE AND FITTING DIAMETERS AND INSTALLATION LENGTHS
- 2) PIPE SHALL SCHEDULE 40 PER ASTM 1785.
- 3) FITTINGS SHALL BE PVC SCHEDULE 80 PER ASTM 2467 UNLESS OTHERWISE INDICATED
- 4) CORPORATION STOPS AND CURB STOPS SHALL BE BRASS AND CONFORM TO THE PROVISIONS OF AWWA 800
- 5) SERVICE CLAMP SHALL CONFORM TO THE PROVISIONS OF AWWA C800, BRONZE, SIZED TO FIT THE PRESSURE MAIN DIAMETER, WITH THREADS COMPATIBLE WITH THE CORPORATION STOP.
- 6) INSTALLATION SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THE SPOKANE COUNTY STANDARD SPECIFICATIONS FOR ROAD AND SEWER CONSTRUCTION, LATEST EDITION.
- 7) BALL CHECK VALVE SHALL BE FLOWMATIC MODEL 208, CAST IRON, WITH EPOXY COATED BODY
- 8) INSTALL VALVE BOX OPERATING NUT EXTENSION FOR SHUT OFF IF DEPTH EXCEEDS 4 FEET.

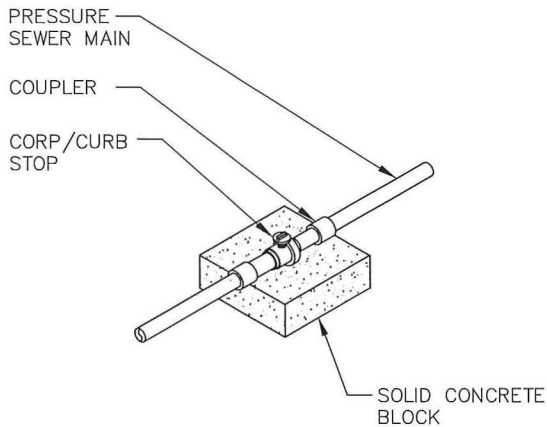


SHEET  
U-19

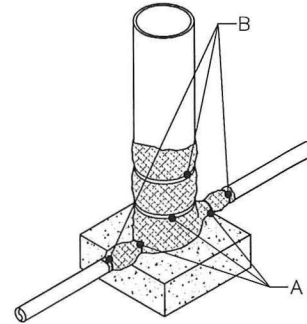
APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
PRESSURE SIDE SEWER STUB  
CONNECTION TO FORCE MAIN

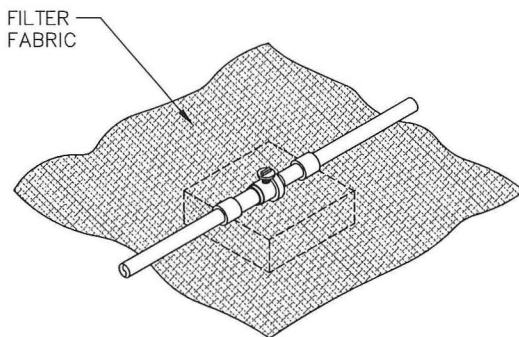
SPOKANE COUNTY  
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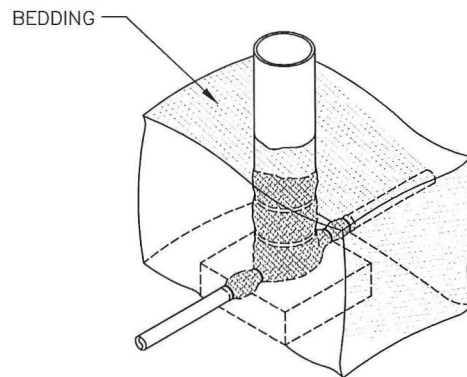
1) BEFORE STARTING, MAKE SURE THE SOLID CONCRETE BLOCK IS MADE LEVEL



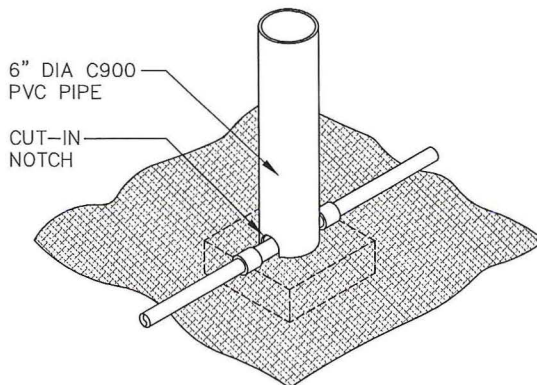
4) WRAP THE FILTER FABRIC UP AND AROUND THE PIPES. SECURE THE FABRIC IN PLACE BY USING ZIP TIES OR METAL BANDS. BEGIN BY SECURING THE "A" LOCATIONS THEN THE "B" LOCATIONS. COMPLETE THIS STEP BY PLACING A 6" GRIPPER PLUG INTO THE OPEN TOP.



2) TAKING A MIN. 3'x3' SHEET OF FILTER FABRIC, SLIDE IT BETWEEN THE BLOCK AND STOP ASSEMBLY



5) BACK FILL WITH THE PROPER MATERIAL AND WITH ENOUGH BEDDING SO THE PIPE WILL STAND. THEN USE A LEVEL TO PLUMB THE 6" PIPE VERTICAL. VERIFY THE PIPE HAS STAYED PLUMB AS BACKFILLING CONTINUES.



3) THE PVC PIPE IS USED AS A VALVE EXTENSION. AFTER NOTCHING THE PIPE, PLACE IT OVER THE ASSEMBLY AND REST IT ON THE LEVELED BLOCK

### NOTES

1) CURSORY INSPECTION WILL BE PROVIDED AT THE FOLLOWING TIMES:

A) WHEN ALL BLOCKING IS IN PLACE AND VALVE ASSEMBLIES HAVE BEEN COMPLETED.

B) WHEN C900 HAS BEEN PLACED OVER VALVES AND FILTER FABRIC HAS BEEN WRAPPED AND RESTRAINED.

C) A VISUAL PREPAVE INSPECTION WILL NEED PERFORMED TO MAKE SURE ALL VALVES ARE LOCATED CORRECTLY AND AT THE PROPER DEPTH. VERIFY THAT THE C900 VALVE EXTENSIONS HAVE NO DAMAGE, REMAINED PLUMB AND A VALVE KEY CAN BE SEATED ON TOP OF THE VALVE.



12/12/17

SHEET  
U-20

APPROVED: *KR Coode*  
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DATE: *12/12/17*

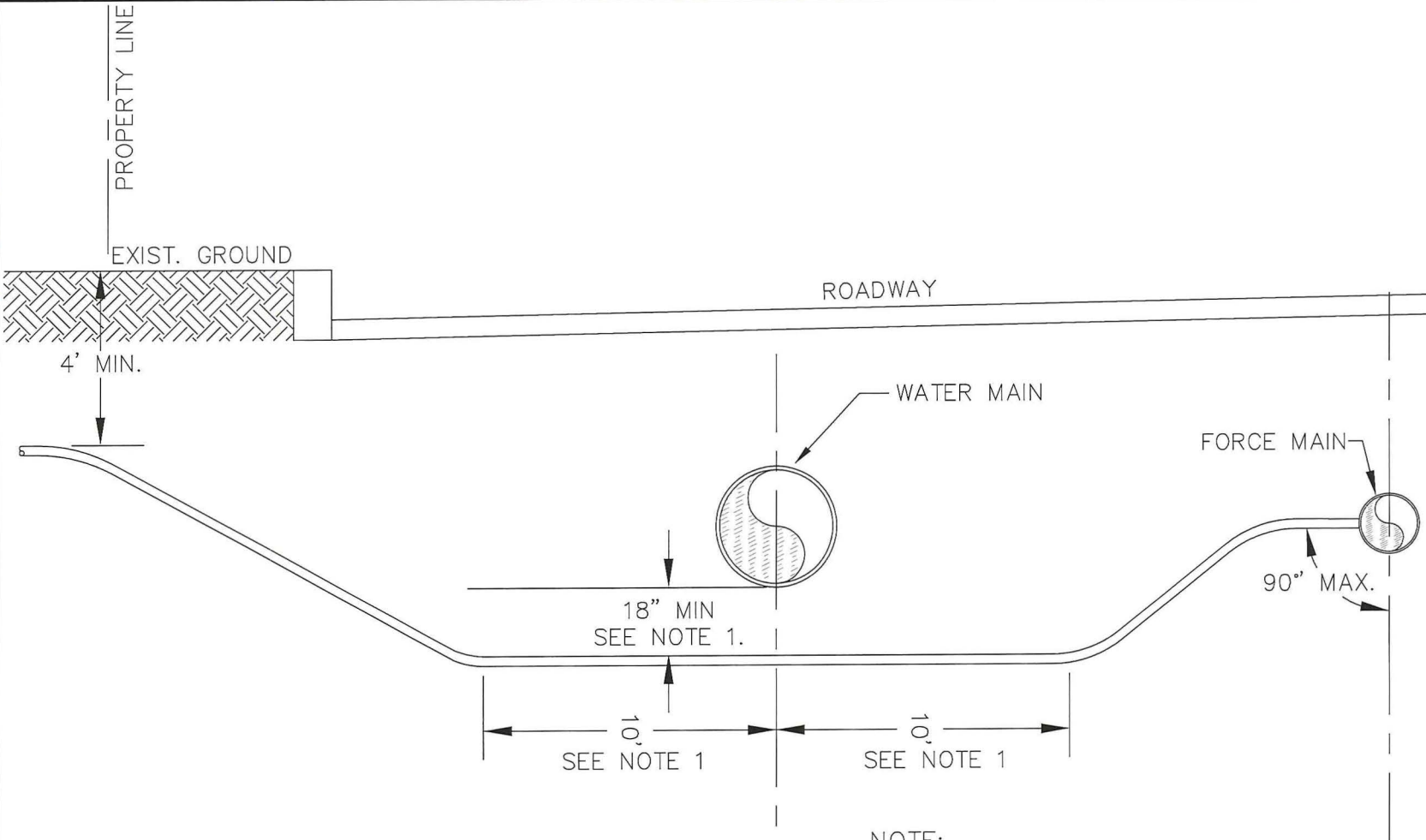
STANDARD  
FILTER FABRIC WRAP FOR  
PRESSURE VALVE ASSEMBLIES AND  
EXTENSIONS

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604

APPROVED: *KR Coode*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
PRESSURE SIDE SEWER STUB  
DETAIL FOR WATER MAIN  
CROSSING

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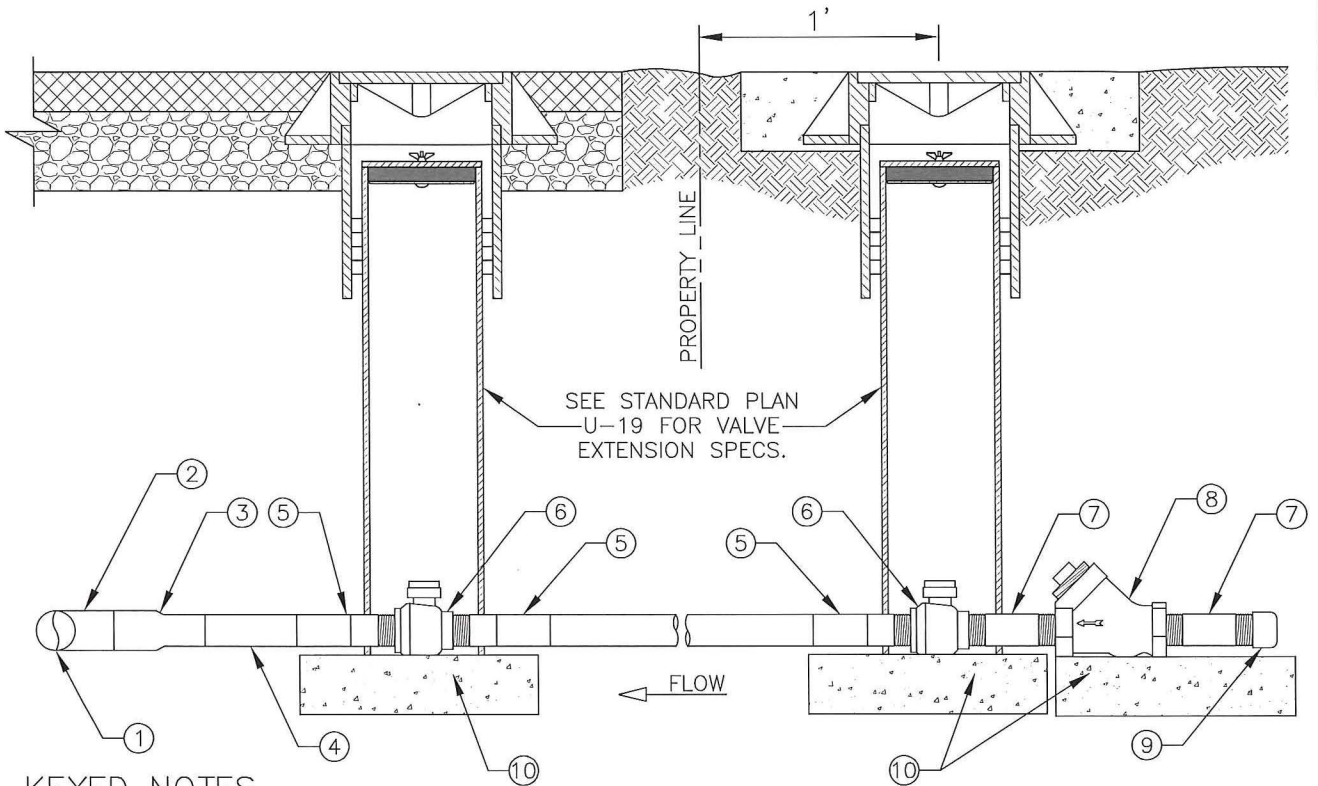
NOTE:

1. SLEEVE WITH C900 DR18 PIPE 10' EACH SIDE OF WATER MAIN CROSSING IF PIPE SEPARATION IS LESS THAN 18".
2. PRESSURE SERVICE CONNECTION SHALL BE INSTALLED IN CONFORMANCE WITH SPOKANE COUNTY STANDARD PLAN U-19.



*12/12/17*  
SHEET  
U-21

## HDPE CORP STOP ASSEMBLY

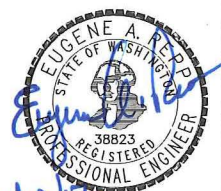
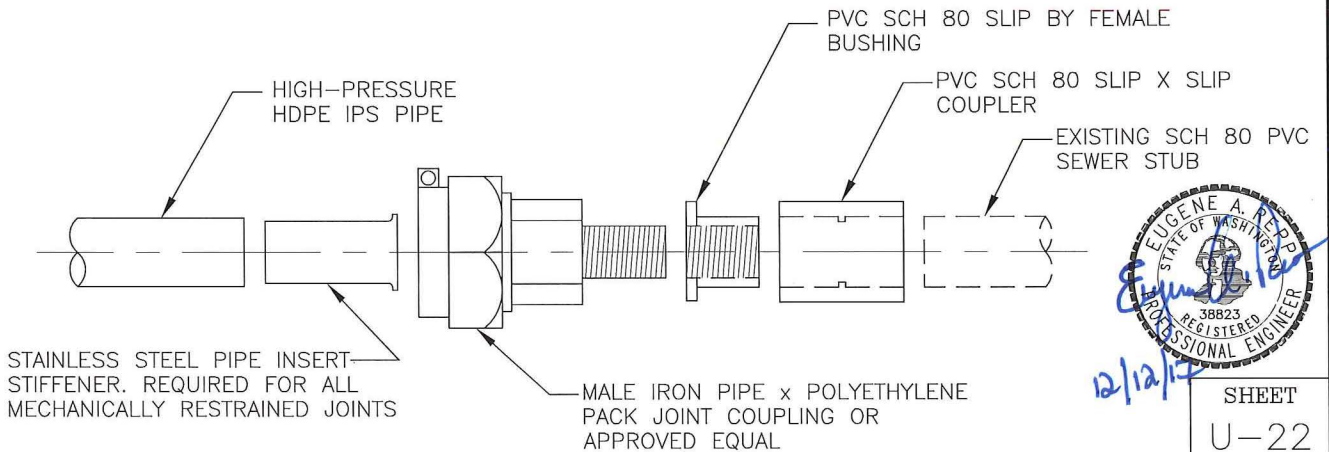


### KEYED NOTES

- |                          |                                      |  |
|--------------------------|--------------------------------------|--|
| ① HDPE LOW PRESSURE MAIN | ⑤ HDPE X STAINLESS STEEL NIPPLE      | ⑧ BALL CHECK VALVE                       |
| ② TEE                    | ⑥ BRASS CORPORATION STOP             | ⑨ CAP (METAL OR PVC)                     |
| ③ REDUCER                | ⑦ 6" STAINLESS STEEL OR BRASS NIPPLE | ⑩ 12"x12"x4" SOLID CONCRETE THRUST BLOCK |
| ④ HDPE SERVICE LINE      |                                      |  |

NOTE:  
 HDPE TO HDPE JOINTS SHALL BE EITHER BUTT-FUSION WELDED OR MECHANICALLY RESTRAINED JOINTS.  
 STAINLESS STEEL PIPE INSERT STIFFENERS REQUIRED AT ALL MECHANICALLY RESTRAINED HDPE JOINTS.

### HDPE TO PVC TRANSITION

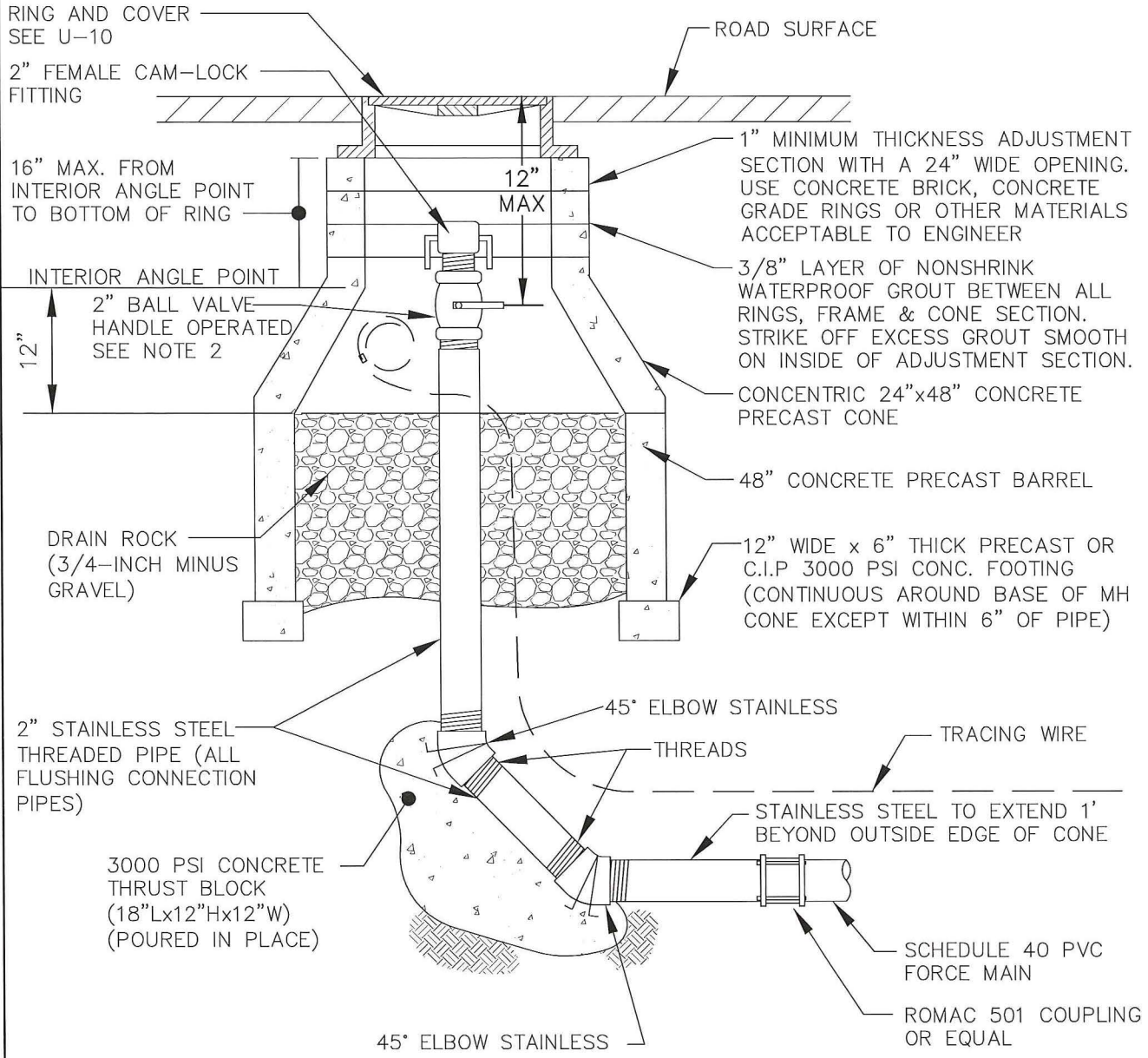


APPROVED: *KR Cooke*  
 ENVIRONMENTAL SERVICES DIRECTOR  
 DATE: *12/12/17*

STANDARD  
 HDPE PRESSURE SEWER PIPE

SPOKANE COUNTY  
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SHEET  
 U-22



NOTES:

1. TERMINAL FLUSHING CONNECTIONS SHALL BE INSTALLED AT TERMINAL END OF EACH MAIN.
2. BALL VALVE SHALL BE 2 PC. FULL PORT 2000 WOG WITH OPERATING HANDLE BY FNW OR APPROVED EQUAL
3. TRACING WIRE (10GA. GALV.) TO BE INSTALLED MAX 2' ABOVE FORCE MAIN LINE FOR THE ENTIRE LENGTH, WITH CONTACT POINTS AT MAIN LINE GATE VALVES AND FLUSHING CONNECTIONS. COIL 36-INCH LENGTH AT RISER PIPE.

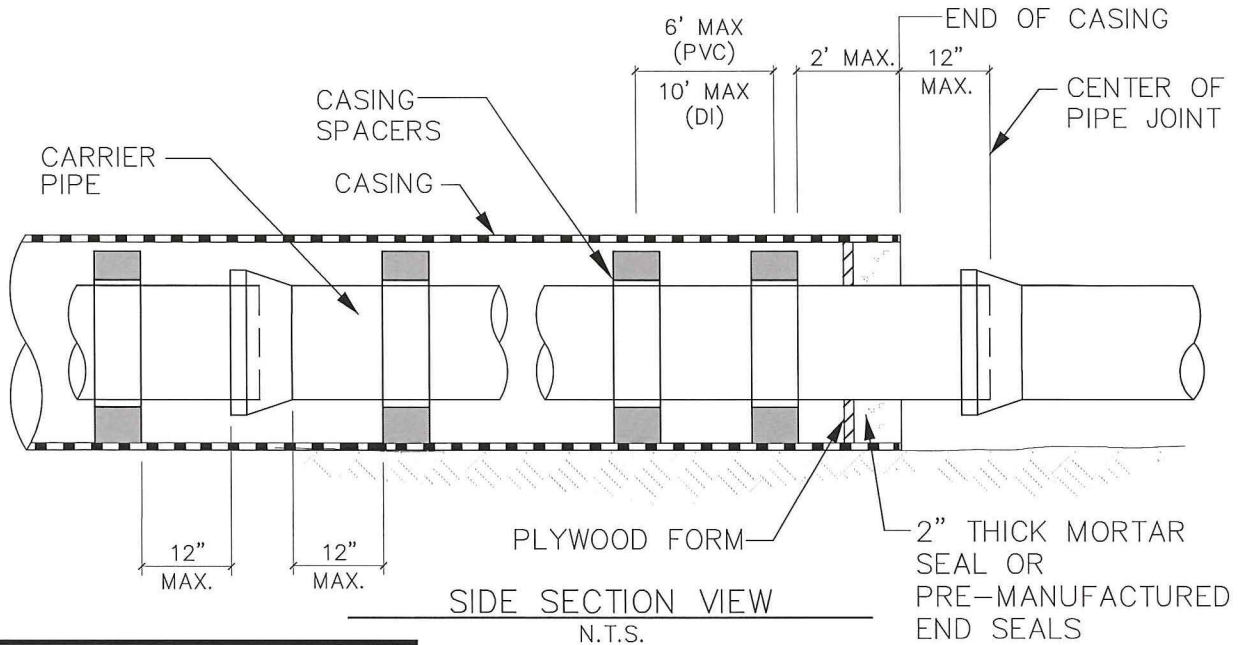


12/12/17  
SHEET  
U-23

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
TERMINAL FLUSHING  
CONNECTION FOR LOW  
PRESSURE SEWER SYSTEM

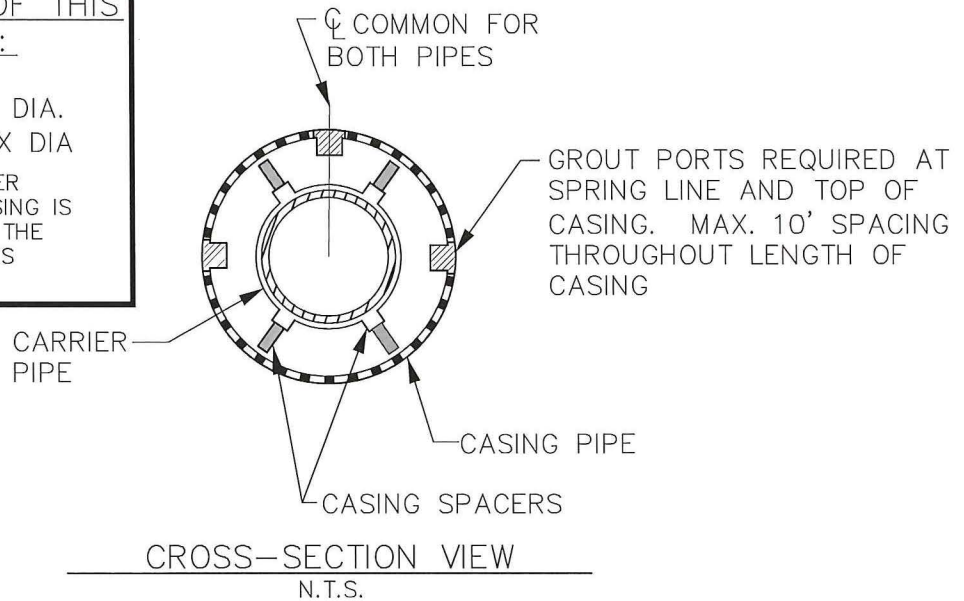
SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



LIMITS ON USE OF THIS STANDARD PLAN:

CASING - 36" MAX DIA.  
 CARRIER - 24" MAX DIA

USE OF LARGER DIAMETER CARRIER PIPES AND CASING IS SUBJECT TO REVIEW BY THE ENVIRONMENTAL SERVICES DEPARTMENT



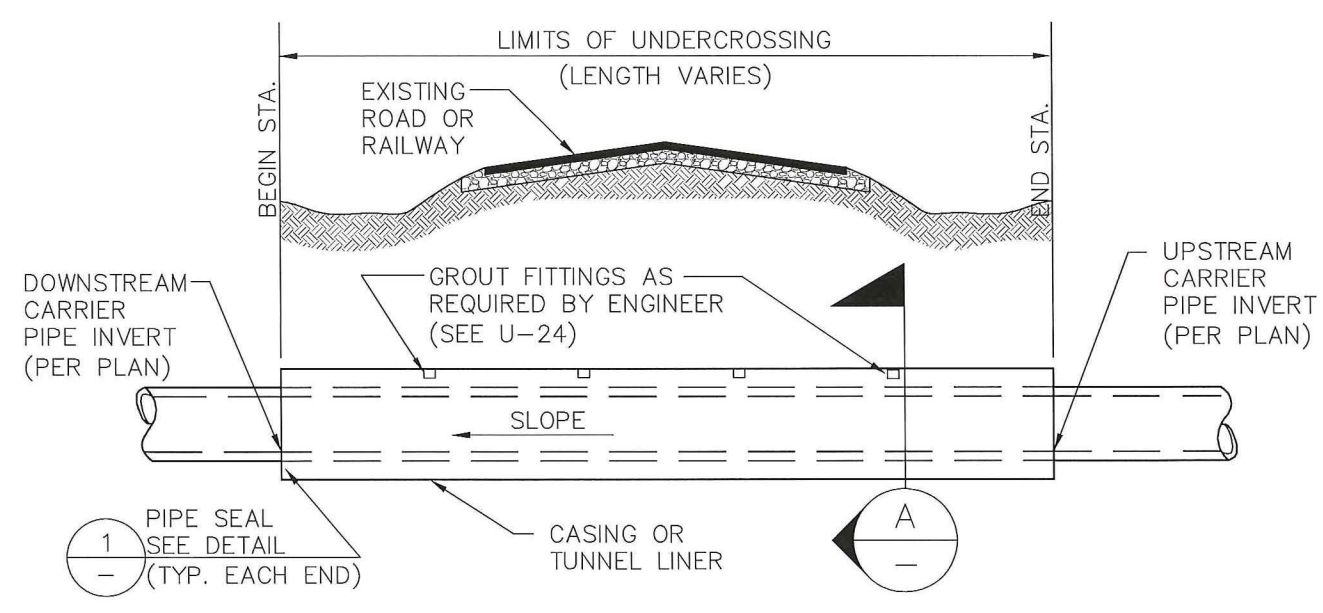
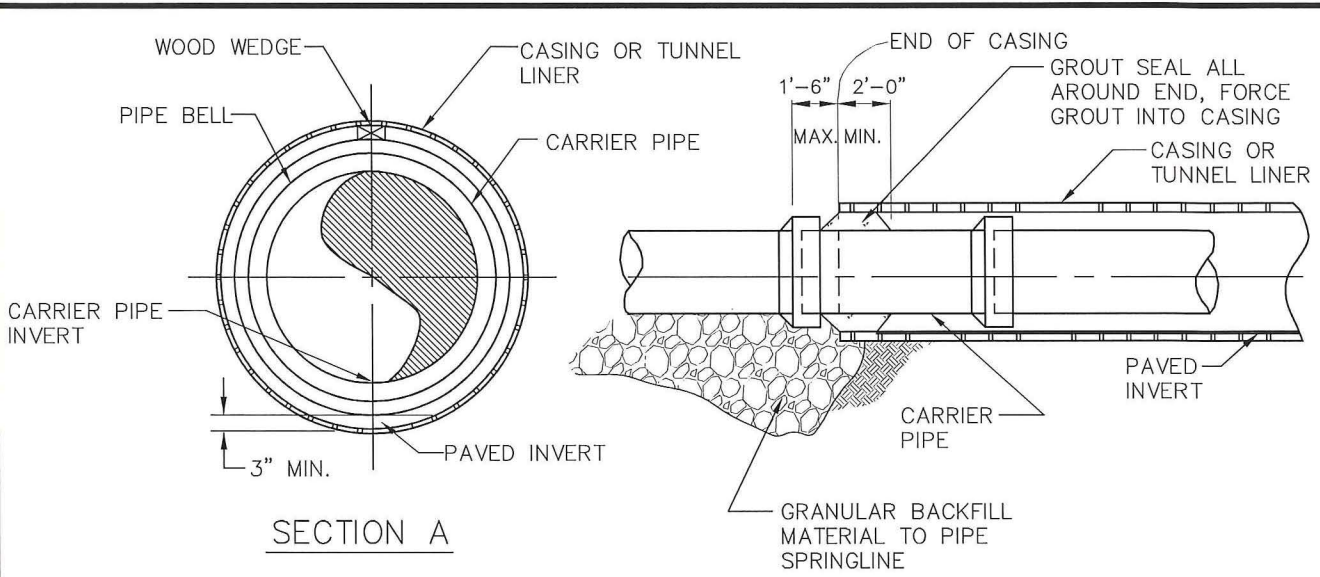
NOTES:

- 1) CASING SPACERS SHALL BE A MINIMUM WIDTH OF EIGHT-INCHES (8") CONSTRUCTED OF T-304 SS FOR PVC CARRIER PIPE OR BE COATED STEEL STRUCTURES WITH DIELECTRIC INSULATORS FOR DI CARRIER PIPE AND SHALL BE AS MANUFACTURED BY CASCADE WATERWORKS MFG, OR APPROVED EQUAL.
- 2) CASING SPACERS SHALL HAVE FOUR (4) RUNNERS. UPPER RUNNERS SHALL EXTEND TO TOP OF CASING ("RESTRAINED" CONFIGURATION).
- 3) A CASING SPACER SHALL BE INSTALLED ON EACH SIDE OF EACH PIPE JOINT WITHIN THE CASING. DISTANCE FROM THE CENTER OF THE PIPE JOINTS TO THE CENTERS OF THESE CASING SPACERS SHALL BE 1 FT.
- 4) CENTER-TO-CENTER DISTANCE FOR CASING SPACERS ALONG PIPE SHALL NOT EXCEED SIX (6) FEET FOR PVC AND TEN (10) FEET FOR D.I.
- 5) IN ADDITION, COMPLY WITH ALL RECOMMENDATIONS OF THE CASING SPACER MANUFACTURER.



12/12/17  
 SHEET  
 U-24





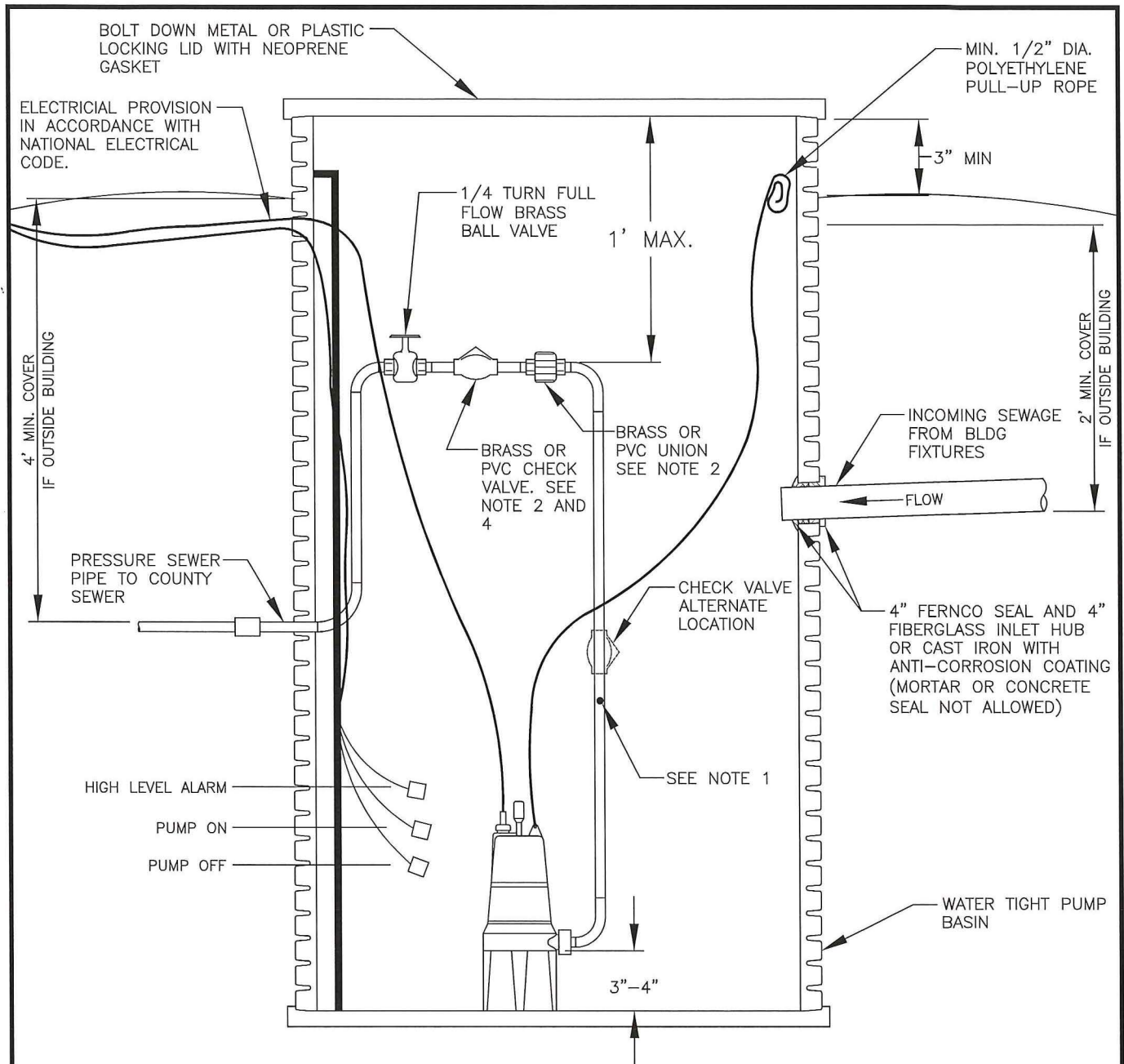
12/2/17

SHEET  
U-25

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/12/17*

STANDARD  
PIPE CASING DETAIL  
(CONCRETE CARRIER PIPE)

SPOKANE COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT  
SPOKANE, WA. (509) 477-3604



THIS STANDARD ILLUSTRATES THE MINIMUM COMPONENTS FOR A SEWAGE PUMP BASIN AND THEIR RELATIVE PLACEMENT. THE REQUIRED SIZE OF ALL NECESSARY COMPONENTS, INCLUDING THOSE NOT SHOWN, SHALL BE PROVIDED BY THE PUMP SUPPLIER OR ENGINEER BASED ON THE NEEDS OF THE STRUCTURE.

NOTES:

- 1) DRILL A 3/16" HOLE IN THE DISCHARGE PIPE, BETWEEN THE PUMP AND THE CHECK VALVE FOR VACUUM RELEASE. THIS HOLE NEEDS TO BE DRILLED ABOVE THE SEWAGE HIGH LEVEL ALARM DEPTH.
- 2) EITHER A COMBINED UNION/CHECK VALVE ASSEMBLY OR SEPARATE UNION AND CHECK VALVE FITTINGS MAY BE USED.
- 3) PUMPS DISCHARGING TO A PRESSURE FORCE MAIN SHALL BE A GRINDER-TYPE PUMP.
- 4) CHECK VALVES SHALL BE GRAVITY OPERATED FLAPPER TYPE. BALL TYPE CHECK VALVES ARE NOT ALLOWED. INSTALL CHECK VALVES ABOVE ELEVATION OF HIGH LEVEL ALARM.
- 5) IF AN AIR RELEASE OR COMBINATION AIR VALVE IS REQUIRED BY THE PUMP DESIGNER, IT SHALL BE PLACED BETWEEN THE PUMP AND THE CHECK VALVE.



2/12/17  
SHEET  
U-26

APPROVED: *KR Cooke*  
ENVIRONMENTAL SERVICES DIRECTOR  
DATE: *12/18/17*

STANDARD  
TYPICAL PUMP CHAMBER  
ASSEMBLY

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