STANDARD

SPECIFICATIONS

AND

DRAWINGS

City of Kennewick – Summary of Revisions - 2015

All changes are marked by black line in the outside borders.

Section 3-1.01 Design and Acceptance

Revised paragraph to no longer allow cleanouts in the right of way or easements.

Section 3-3.04 Trench Safety

Revised section to deleted city crews entering trenches to complete sewer main taps. City crews will no longer perform sewer taps.

Section 3-4.01 General

Revised section to require contractor to tap sewer main and included details for insert a tee's that will be provided by the city. Also added that city crews will CCTV inspect contractor sewer tap when complete.

Section 3-4.02 Construction

Revised section to require 12" minimum spacing between taps and pipe bells on 4-inch sewer service pipe unless approved by the Engineer.

Section 3-4.03 Cleanouts

Added note "All cleanouts shall be the same size as the lateral they serve."

Section 3-5.01 General

Added sentence to paragraph C "Failure to provide protection of said channels will result in high pressure type cleaning of the sewer mainline at the contractor's expense."

Revised paragraph D as follows: Any work performed on existing sewer mains is considered live work. All work that falls under this classification shall require access to the sewer man holes at all times with the exception of paving work. Once the paving work has been completed access to the overlaid manholes shall be provided within a reasonable timeframe not to exceed 5 working days.

Relabeled paragraph D as E

Relabeled paragraph E as F

Section 3-8.01 General

Added sentence and end of paragraph "Whenever feasible the outlet of the existing manhole will be required to have a ball or plug during construction. In the event there is an established flow in the existing manhole the ball or plug will be required on the outlet of the first upstream manhole of the newly installed sewer main.

Section 3-9.01 General

In paragraph 1, deleted “or clean out”

In paragraph 2, deleted “cleanouts”

Section 3-11 High Pressure Cleaning and Testing

Revised section to delete use of stove pipe sand trap and added requirement for use of sewer balls or plugs. Also identified cleaning as high pressure jetting.

Section 4-1.02 Approved Pipe and Fittings

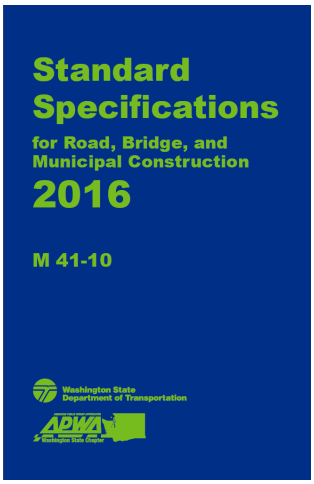
In paragraph A, revised section to require ductile iron pipe for water main diameters greater than 10 inches.

In paragraph B, revised section to allow C900 PVC water main pipe up to 10 inch diameter.

Washington State Department of Transportation

[click below]

Standard Specifications for Road, Bridge, and Municipal Construction



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STANDARD SPECIFICATIONS

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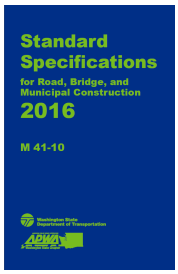

CITY OF KENNEWICK STANDARD DRAWINGS

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CITY OF KENNEWICK

STANDARD BID ITEMS

ITEM	UNIT

ROADWAY – Section 2

Project Temporary Traffic Control	LS
Flaggers and Spotters	HR
Clearing and Grubbing	LS
Roadway Excavation	CY
Embankment in Place	CY
Top Course	Ton
Base Course	Ton
Planing Bituminous Pavement	SY
HMA Class _____ PG _____	Ton
Concrete Curb and Gutter	LF
Concrete Driveway (by L.F. if each width is called)	SY
Concrete Sidewalk (by L.F. if each width is called)	SY
Extruded Concrete Curb	LF
Sidewalk Asphalt Ramp	EA
Asphalt Patching Behind Sidewalk	SY
Install Monument	EA
Curb and Gutter Removal	LF
____" x ____" ADA Truncated Dome	EA
Sidewalk/Driveway Removal	SY
_____ - inch HMA Patching	SY
_____ - inch HMA Patching w/ ____-inch Top Course Rock	SY
_____ - inch Trench Pavement Restoration	LF
Crack Sealant	Mile of Street
Crack Sealing	LF
Lower Existing Manhole	EA
Adjust Manhole	EA
Adjust Valve Box	EA
Adjust Monument	EA
Adjust Catch Basin	EA
Adjust Cleanout	EA
Adjust GTE/PUD Manhole	EA
Remove, Replace and Adjust Existing Valve Box	EA
Remove, Replace and Adjust Existing Manhole Ring and Cover	EA
Roadside Seeding	Acre
Soil/Residual Herbicide	SY
Soil Sterilant	Acre
Install Type III Barricade	EA
Install End-of-Road Marker	EA
PUD Conduit Trench Excavation, Bedding and Backfill	LF

SANITARY SEWER – Section 3

____ Inch Sewer Pipe ..... LF
Trench Excavation and Backfill
0' to 6' ..... LF
6' to 10' ..... LF
10' to 14' ..... LF
14' to 18' ..... LF
over 18' ..... LF
Rock Excavation ..... CY
Imported Pipe Bedding ..... LF
Standard 48-Inch Manhole (10' Deep) ..... EA
Additional Manhole Depth ..... VF
____ Inch Sewer Cleanout ..... EA
Sanitary Sewer Service Cleanout ..... EA
____ Inch Sewer Service Lines ..... LF
____ Inch Sewer Service Wye ..... EA
____ Inch Drop Connection ..... VF
____ Inch End Cap ..... LF
Connect to Existing Manhole ..... EA
Pavement Restoration ..... LF
Sewer Service Backflow Device and Manhole ..... EA
Trench Safety Systems ..... LF

WATER – Section 4

____ Inch Water Line ..... LF
Rock Excavation ..... CY
Imported Pipe Bedding ..... LF
____ Inch Valve ..... EA
____ "x ____ " Tapping Tee ..... EA
____ (Type + Size of Fitting) ..... EA\
Valve Extension ..... EA
Coupling/Flanged Coupling Adapter ..... EA
Temporary 2-Inch Blow-Off Assembly ..... EA
Fire Hydrant Assembly ..... EA
Extra Depth Hydrant (over 4 foot bury) ..... VF
6" Hydrant Vertical Adjustment Assembly ..... EA
12" Hydrant Vertical Adjustment Assembly ..... EA
Fire Hydrant Guard Posts ..... EA
Storz Adapter (retro-fit) ..... EA
Reconnect Existing Water Service ..... EA
___ inch Street Service Assembly ..... EA
___ inch House Service Assembly ..... EA
___ inch Water Service Line ..... LF
Under House Connection ..... EA
Connect to Existing Meter ..... EA
New Meter Box ..... EA
Site Restoration ..... EA
Landscape Restoration ..... LS

Missiling or Tunneling ..... LF
Air and Vacuum Release Assembly ..... EA
____ - Inch Trench Pavement Restoration ..... LF
Trench Safety Systems ..... LS or LF
Digging and Verifying ..... EA
1-Inch to 4-Inch Pressure Cap ..... EA
6-inch to 8-inch Pressure Cap ..... EA
10-inch to 16-inch Pressure Cap ..... EA
Side Sewer Locates ..... EA

STORM DRAINAGE – Section 5

____ Inch Storm Drain Pipe ..... LF
Trench Excavation and Backfill
- 0' to 6' ..... LF
- 6' to 10' ..... LF
- 10' to 14' ..... LF
- 14' to 18' ..... LF
- Over 18' ..... LF

Rock Excavation ..... CY
Imported Pipe Bedding ..... LF
Catch Basin ..... EA
Standard 48-Inch Manhole (up to 10') ..... EA
Additional Manhole Depth ..... VF
Drop Connection ..... VF
Standard Dry Well (Drawing 5-5) ..... EA
Modified Dry Well (Drawing 5-5M) ..... EA
Additional Dry Well Depth ..... VF
Drywell Percolation Test ..... EA
____- Inch Trench Pavement Restoration ..... LF
____- Inch HMA Patching w/ ____-inch Top Course Rock ..... SY or LS
Trench Safety Systems ..... LF
Side Sewer Locates ..... EA

STREET LIGHTING – Section 6

Light Standard, Type ____ ..... EA
____ Watt Luminaire ..... EA
Wiring and Conduit ..... LF
4-inch Spare Electrical Conduit ..... LF
Street Light Pavement Restoration ..... LF

TRAFFIC CONTROL – Section 7

Project Temporary Traffic Control ..... LS
Flaggers and Spotters ..... HR
Traffic Control Supervisor ..... LS
(Each Type & Size of Permanent Sign) ..... EA
Remove and Replace (Each Type & Size of Permanent Sign) ..... EA
Sign Post ..... EA

Pavement Marking and/or Raised Pavement Marker Removal..... LS
4-Inch Pavement Lane Marking (Color) .....LF
8-Inch Stripe (Color) .....LF
18-Inch Stop Bar .....LF
24-Inch Pavement Lane Marking (Color) .....LF
24-Inch x 72-Inch Crosswalk Blocks .....EA
Elongated (_____) Arrow (Preformed0 .....EA
____ - Inch Paint Pavement Marking .....LF
____ - Inch Paint Legend .....EA

IRRIGATION SYSTEMS – Section 8

____ Inch Pipe and Fittings.....LF
____ Inch Automatic Control Valves .....EA
____ (Type + Size of Fittings) .....EA
Full Circle Rotary Sprinkler.....EA
Adjustable Rotary Sprinkler.....EA
Stream Rotary Sprinkler .....EA
Pop Up Sprinkler .....EA
Shrub Spray Sprinkler .....EA
Bubbler Head Sprinkler .....EA
____ - Inch Electric Irrigation Valve.....EA
____ - Inch Battery Operated Electric Irrigation Valve .....EA
____ (Each Type of) Sprinkler .....EA
Gate Valves.....EA
Corporation Stop .....EA
Quick-Coupling Valve.....EA
Double Check Valve.....EA
Pressure Vacuum Breaker .....EA
Atmospheric Vacuum Breaker .....EA
Flow Control Valve .....EA
Air Relief Valve .....EA
Hose Bib .....EA
Pressure Regulator Valve .....EA
Direct Bury Low Voltage Control Wire.....LF or LS
Low Voltage Control Wire in Conduit .....LF or LS
Toro Sentinol Irrigation Controller, Antenna and Power Supply ..... LS
Rainbird ESP-LX Plus Irrigation Controller and Power Supply..... LS

LANDSCAPING – Section 9

Clearing and Grubbing ..... LS
Earthwork ..... LS
Imported Topsoil.....CY
Furnish and Install Seeded Lawn.....ACRE
Furnish and Install Sodded Lawn.....SY
(Type of Tree).....EA
(Type of Shrub) .....EA
Shredded Wood Mulch SY

CITY OF KENNEWICK

INFORMATION TO BIDDERS

1. ADDITIONAL INFORMATION

Additional information may be obtained from the office of the City Engineer, 1010 E. Chemical Drive, Kennewick, Washington 99336, Phone: 585-4247.

2. BID PROCEDURES, EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

Delete SWSS Section 1-02.1 and replace it with the following:
Bidders shall be qualified by experience, financing, equipment, and organization to do the work called for in the Contract Documents. The City of Kennewick reserves the right to take whatever action it deems necessary to ascertain the ability of the bidder to perform the work satisfactorily.

The Bidders attention is called to Section 1-02.4 of the WSDOT Standard Specifications. Bidders shall satisfy themselves by personal examination of the plans, specifications, site of the proposed improvements, and by other examination and investigation which they may desire to make as to the nature of the project and the difficulties to be encountered.

Bidders are required to inform themselves fully of the conditions relating to construction and labor under which the work is to be done; and the successful Bidder must employ, as far as possible, methods and means for carrying out this work to eliminate any interference or interruption of any other contracts. After submissions of the proposal, no complaints or claims construing misunderstanding in regard to the content of the Owner or the estimated quantities of work to be done will be accepted.

The signing of the proposal will be considered as implicitly denoting that the Bidder has a thorough comprehension of the full intent and scope of the specifications and drawings.

3. BID PROPOSAL AND SUBMITTAL

All bid proposal pages shall be completed per the requirements of the WSDOT Standard Specifications Section 1-02.6 and the latest APWA GSP for SWSS Section 1-02.5. Revise the first paragraph of SWSS Section 1-02.9 to read: Bids shall be submitted on the proposal form(s) contained in the contract document and printed by the contractor. If Excel computer programs of the bid proposal are provided by the City, print out copies of the completed bid proposal may be used. The proposal, specifications, and contract are in one volume and this volume shall be submitted on or before the time and at the place specified in the “Invitation to Bid," in a sealed package addressed to the Municipal Services Department, City of Kennewick, and plainly marked with the project name, location, and/or contract number as contained in the Invitation to Bid. Although desired to have the volume submitted intact, to insure that all required parts of the bid are received, the City reserves the right to consider this requirement an informality, provided that all parts of the bid proposal section of the volume are submitted and are acceptable to the City. Proposals will be considered irregular per the provisions of Section 1-02.13 and the latest APWA GSP for said Section 1-02.13.

After the date and hour set for the opening of the bids, no Bidder may withdraw his proposal unless the award of contract is delayed for a period exceeding forty-five (45) calendar days, per the requirements of the WSDOT Standard Specifications Section 1-03.2.

4. WITHDRAWAL OR REVISION OF PROPOSAL

After submitting a bid proposal, the bidder may withdraw or revise it per the requirements of WSDOT Standard Specification Section 1-02.10, which states that the proposal may be withdrawn or revised if:

1. The bidder submits a written request signed by an authorized person, and
2. The Contracting Agency receives the request before the time for opening bids.

The original bid proposal may be revised and resubmitted as the official bid proposal if the Contracting Agency receives it before the time for opening bids.

5. BID SECURITY

The contractor's attention is called to WSDOT Standard Specifications Section 1-02.7 and the latest APWA GSP for said Section 1-02.7. Each bid must be accompanied by a certified check, cashier's check, money order, or a bid bond in favor of the Owner in an amount of not less than five percent (5%) of the total bid. The check, money order, or bid bond will be held as a guarantee that the successful bidder will, within ten (10) days from the date of notification of award, furnish the required contract bonds and enter into a contract with the city.

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

6. NONCOLLUSION DECLARATION AND LOBBYING CERTIFICATION

The contractor is required to complete the forms provided in the bid proposal section of the contract documents, per the provision of the WSDOT Standard Specifications Sections 1-02.8 (1) and 1-02.8 (2).

7. WAGE RATES - FEDERALLY FUNDED PROJECTS

Projects funded or partially funded with federal funds are subject to the provisions of the Washington State Public Works Law and the Federal Davis-Bacon and related acts. The Contractor and every subcontractor on that project must pay the Federal prevailing wage rate and in addition, must substitute and pay the Washington State prevailing wage rates, where they are higher than the Federal prevailing wage rates for any pay classification.

8. LAWS RESTRICTING BID SHOPPING

Every invitation to bid on a contract that is expected to cost one million dollars or more for the construction, alteration, or repair of any public building or public work of the state or a state agency or municipality as defined under RCW 39.04.010, shall require each bidder to submit as part of the bid, or within one hour after the published bid submittal time, the names of the subcontractors with whom the bidder, if awarded the contract, will subcontract for performance of the work of heating, ventilation and air conditioning, plumbing as described in chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW, or to name itself for the work. The bidder shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the bidder must indicate which subcontractor will be used for which alternate. Failure of the bidder to submit the contract form with the names of such subcontractors or to name itself to perform such work or the naming of two or more subcontractors to perform the same work, shall render the bidder's bid nonresponsive and, therefore, void. The requirement of this section to name the bidder's

proposed heating, ventilation and air conditioning, plumbing, and electrical subcontractors, applies only to proposed heating, ventilation and air conditioning, plumbing, and electrical subcontractors who will contract directly with the general contractor submitting the bid to the public entity.

9. MINORITY BUSINESS

The Contractor agrees that he shall actively solicit the employment of minority group members. The Contractor further agrees that he shall actively solicit bids for the subcontracting of goods or services from qualified minority businesses. The Contractor further agrees to consider the grant of subcontracts to said minority bidders on the basis of substantially equal proposals in the light most favorable to said minority businesses. The contractor's signature on the bid proposal shall indicate evidence of compliance as stated in this section. The Owner does hereby retain the right to require further evidence if it so desires.

As used in this section, the term "minority business" means a business at least fifty-one percent of which is owned by minority group members. Minority group members include, but are not limited to, African American, Women, Native Americans, Asians/Pacific Islanders, and Hispanic.

10. CONSIDERATION OF BIDS

The city shall check all bids per the provisions of WSDOT Standard Specifications Section 1-03.1. Claims of bidder error shall meet all provisions of the above-referenced section 1-03.1.

Add the following to the latest APWA GSP for SWSS Section 1-02.15. A contract will not be awarded until the Owner has identified to its full satisfaction, the lowest responsible bidder. When a bid contains alternate bid items, or deductive or additive bid items, award will be made to the lowest responsible bidder of the total bid, after substitution of the alternate(s) of the city's choice. The City reserves the right, in its sole and absolute discretion, to reject any or all bids, to waive any irregularities in any bid, or to accept any bid for award of contract, which will best serve the interest of the City.

After opening and reading proposals, the Contracting Agency will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. If a minimum bid amount has been established for any item and the bidder's unit or lump sum price is less than the minimum specified amount, the Contracting Agency will unilaterally revise the unit or lump sum price, to the minimum specified amount and recalculate the extension. The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the Contracting Agency, will be used by the Contracting Agency for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

On projects that do not utilize federal funding, in addition to price, and per the provisions of City Ordinance 3927, Section 1-2001, the City may consider one or more of the following elements in selecting the lowest responsible bidder:

1. The tax revenue the City would receive from purchasing from a local bidder located within the city limits; or
2. The ability, capability and skill of the bidder to perform the contract or provide the service required; or
3. The character, integrity, reputation, judgment, experience and efficiency of the bidder; or

4. Whether the bidder can perform the contract or provide the service promptly, and within the time specified without delay or interference; or
5. The performance quality of previous contracts or services; or
6. Previous and existing compliance by the bidder with laws relating to the contract or service; or
7. The financial responsibility of the bidder to perform the contract or provide the service; or
8. The limitations of any license the bidder may be required to possess; or
9. The quality, availability, and the adaptability of the product or service; or
10. The ability of the bidder to provide future maintenance and service; or
11. The life cycle, maintenance and performance of the equipment or product being offered; or
12. Other information as may be pertinent and having a bearing on the decision to award the contract; or
13. Compatibility and uniformity with existing equipment, services and procedures.
14. (Ord. 3927, Sec. 1, 2001).

11. RECIPROCAL BID PREFERENCE

A. In accordance with RCW 39.04.380, for a public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a Comparable Percentage Disadvantage (CPD) will be applied to the bid of that nonresident contractor. The CPD is the percent advantage provided by the nonresident contractor's home state. For the purpose of determining the successful Bidder, Owner will multiply the nonresident contractor bid amount by the CPD. The "bid amount" shall be the total of the Base Bid and all accepted Alternate, Additive, and Deductive bid items. The CPD shall be added to the nonresident contractor bid amount to establish the Nonresident Disadvantage Total. The Nonresident Disadvantage Total shall be compared to the Washington State contractor bid amounts, and other nonresident contractors whose states do not provide in-state percentage bidding preferences. The Bidder with the lowest total shall be the successful Bidder. See example below:

Alaska Nonresident Contractor Bid Amount	$100,000
Multiplied by the Alaska CPD	x 0.05
Alaska CPD Total	$ 5,000
Alaska Nonresident Contractor Bid Amount	$100,000
Alaska CPD Total	+ 5,000
Nonresident Disadvantage Total	$105,000

When Nonresident Disadvantage Total is Low: If the Nonresident Disadvantage Total is lower than all other Washington contractor bid amounts, and other nonresident contractors whose states do not provide in-state percentage bidding preferences, the Alaska nonresident contractor is the low bidder and will be awarded a contract for the bid amount of $100,000, provided that they are determined to be a responsible bidder with a responsive bid.

When Nonresident Disadvantage Total is High: If the Nonresident Disadvantage Total is higher than a Washington contractor bid amount, or other nonresident contractors whose states do not provide in-state percentage bidding preferences, the lowest bidder will be awarded a contract for the bid amount, provided that they are determined to be a responsible bidder with a responsive bid.

Definition of Nonresident Contractors: A nonresident contractor from a state that provides a percentage bid preference means a contractor that:

a) Is from a state that provides a percentage bid preference to its resident contractors bidding on public works contracts.

b) At the time of bidding on a public works project, does not have a physical office located in Washington. The state of residence for a nonresident contractor is the state in which the contractor was incorporated or, if not a corporation, the state where the contractor's business entity was formed.

12. DISQUALIFICATION OF BIDDERS (FEDERAL FUNDED CONTRACTS)

A bidder may be deemed not responsible and the proposal rejected per the provisions of Section 1-02.14 of the SWSS and as revised by the latest APWA GSP for Disqualification of Bidders.

13. PERFORMANCE, PAYMENT AND MAINTENANCE BOND

The Bidder to whom a contract is awarded will be required to furnish a performance, payment and maintenance bond, or if federal funding is utilized, a performance and payment bond, in the penal sum of one hundred percent (100%) of the original amount of the contract and otherwise meet all requirements of WSDOT Standard Specification Section 1-03.4 and the latest APWA GSP for SWSS Section 1-03.4. The bond shall be executed on the form included in the contract documents.

In the event that the Contractor and his surety do not use the bond form enclosed with these specifications, each bond form must be accompanied by a check in the amount of $100.00, payable to the City of Kennewick. The check must be attached to the original copy of each bond form used. If the bond is not in proper form as required by these specifications or in harmony with the provisions of the approved form or state law, it will be rejected, and when a new bond form is supplied, it must be accompanied by a second $100.00 check until such time as it is approved. Bonds which in any respect deviate from state law, city ordinance, or these specifications, will not be approved.

14. RETENTION BOND

Unless otherwise provided for in the contract Special Provisions, the contractor on each city contract, other than Small Works Contracts, and contracts under $100,000 will be required to provide an "In Lieu of Retention Bond". With the exception of Small Works Contracts and contracts under $100,000, where standard 5% retainage will typically be withheld, the city will not withhold monetary retainage, unless otherwise provided for in the contract Special Provisions. The "In Lieu of Retention Bond" shall be executed on the form included in the contract documents.

15. RETURN OF BID SECURITY

The certified checks, cashier's checks, money orders, or bid bonds accompanying all proposals, will be held by the owner until the contract and other legal requirements that the successful Bidder must execute, furnish, and/or comply with, have been completed. After completion, the remaining checks, money orders, or bid bonds will be returned to the respective Bidders. If no award has been made within forty-five (45) days after the opening of the bids, the bid security will be returned upon demand of the Bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

16. BUSINESS LICENSE

A business license from the City of Kennewick will be required by any Contractor or Subcontractor prior to commencement of construction.

17. CITY NON-DISCRIMINATION POLICY

The City of Kennewick does not discriminate on the basis of sex, color, religion, national origin, age, or disability in the provision of services, in programs or activities or employment opportunities and benefits. The City of Kennewick does not discriminate on the basis of disability in the programs and activities, which it operates, pursuant to the requirements of the American with Disabilities Act of 1990, PUB L 101-336. This policy extends to the employment by and admission to and participation in the programs, services and activities of the City of Kennewick.

Inquiries concerning the American with Disabilities Act and requests for reasonable accommodations should be directed to the City's ADA Coordinator, Employee and Community Relations, City of Kennewick, P.O. Box 6108, Kennewick, WA 99336, 585-4242.

18. INSURANCE

Prior to issuance of a notice to proceed, the contractor must furnish the city with a certificate of insurance meeting the following provisions. All insurance policies shall include an endorsement naming the City of Kennewick as additional insured. The City of Kennewick shall be additional insured for the full available limits of liability maintained by the Contractor, whether primary, excess, contingent or otherwise, irrespective of whether such limits maintained by the Contractor are greater than those required by this Contract, and irrespective of whether the Certificate of Insurance provided by the Contractor describes limits lower than those maintained by the Contractor.

The Contractor shall deliver to the Contracting Agency a Certificate(s) of Insurance and endorsements for each policy of insurance meeting the requirements set forth herein when the Contractor delivers the signed Contract for the work. The certificate and endorsements must conform to the following requirements:

1. An ACORD certificate or a form determined by the Contracting Agency to be equivalent.

2. Copies of all endorsements naming the City of Kennewick as Additional Insured(s), showing the policy number. The Contractor may submit a copy of any blanket additional insured clause from its policies instead of a separate endorsement. A statement of additional insured status on an ACORD Certificate of Insurance shall not satisfy this requirement.

3. Any other amendatory endorsements to show the coverage required herein.

17.1 Coverages and Limits

The insurance shall provide the minimum coverages and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve the Contractor from liability in excess of such limits. All deductibles and self-insured retentions must be disclosed and are subject to approval by the Contracting Agency. The cost of any claim payments falling within the deductible shall be the responsibility of the Contractor.

17.1.01 Commercial General Liability

A policy of Commercial General Liability Insurance, including:

Per project aggregate
Premises/Operations Liability
Products/Completed Operations – for a period of one year following final acceptance of the work.
Personal/Advertising Injury
Contractual Liability
Independent Contractors Liability
Stop Gap / Employers' Liability
Explosion, Collapse, or Underground Property Damage (XCU)
Blasting (only required when the Contractor's work under this Contract includes exposure to which this specified coverage responds)

Such policy must provide the following minimum limits:

$1,000,000	Each Occurrence
$2,000,000	General Aggregate
$1,000,000	Products & Completed Operations Aggregate
$1,000,000	Personal & Advertising Injury, each offense

Stop Gap / Employer's Liability

$1,000,000	Each Accident
$1,000,000	Disease – Policy Limit
$1,000,000	Disease – Each Employee

17.1.02 Automobile Liability

Automobile Liability for owned, con-owned, hired, and leased vehicles, with an MCS 90 endorsement and a CA 9948 endorsement attached if "pollutants" are to be transported. Such policy(ies) must provide the following minimum limit:

$1,000,000 combined single limit

19. E-VERIFY REQUIREMENTS FOR CONTRACTORS

The contractor and any subcontractors who enter into agreements to provide services or products to the City shall comply with and use the Department of Homeland Security's E-Verify system when hiring new employees for the term of the contract.

E-Verify is an Internet-based system operated by United States Citizenship and Immigration Services in partnership with the Social Security Administration. E-Verify is free to employers and is available in all 50 states. E-Verify provides an automated link to federal databases to help employers determine employment eligibility of new hires and the validity of their Social Security numbers. The Contractor shall enroll in, participate in and document use of E-Verify as a condition of the award of this contract. The Contractor shall continue participation in E-Verify throughout the course of the Contractor's contractual relationship with the City. If the Contractor uses or employs any subcontractor in the performance of work under this contract, or any subsequent renewals, modifications or extension of this contract, the subcontractor shall register in and participate in E-Verify and certify such participation to the Contractor. The Contractor shall show proof of compliance with this section, and/or proof of subcontractor compliance with this section, within three (3) working days of the date of the City's request for such proof.

Who is affected?

- All contractors doing business for the City of Kennewick. There is no minimum dollar value for contracts affected.
- All subcontractors employed by the general contractor on these contracts.

Are there exceptions?

- Contracts for "Commercial-Off-The-Shelf" items are exempted from this requirement.
- Individuals, Companies, or other organizations who do not have employees.

How long must the contractor comply with the E-Verify system?

- For at least the term of the contract.

Are there other stipulations?

- E-Verify must be used ONLY for NEW HIRES during the term of the contract. It is NOT to be used for EXISTING EMPLOYEES.
- E-Verify must be used to verify the documentation of ANY new employee during the term of the contract, not just those directly or indirectly working on deliverables related to the City of Kennewick contract.

How will the City of Kennewick check for compliance?

- All contractors will retain a copy of the E-Verify Memorandum of Understanding that they execute with the Department of Homeland Security AND
- Sign and submit to the City an Affidavit of Compliance with their signed contract.
- All General Contractors will be required to have their subcontractors sign an Affidavit of Compliance and retain that Affidavit for 4 years after end of the contract.
- The City of Kennewick has the right to audit the Contractor's compliance with the E-Verify Ordinance.

Further information on E-Verify can be found at the following website:

http://www.uscis.gov/e-verify

If you have questions about the City's E-Verify Ordinance, please contact the City of Kennewick's legal department prior to contracting with the City.

REVISED 3/04/14

Section 1 Index

General Provisions *[click on number or heading below]*

SECTION 1

CITY OF KENNEWICK

GENERAL PROVISIONS

1-1 INTENT OF SPECIFICATIONS AND DRAWINGS

The intent of these specifications and the contract drawings is that the Contractor shall furnish all materials, tools, labor, equipment, and services, except as may be specifically noted otherwise, which are required or necessary to fully complete the work.

The specifications and drawings are complimentary, and what is called for in one shall be as binding as if called for in both. Conflict in documents shall be resolved per the provisions of Section 1-4 of these specifications.

Any discrepancies, errors, or omissions found in the specifications or drawings shall be promptly reported to the Engineer who will issue a correction in writing. The Contractor shall not take advantage of any such discrepancies, errors, or omissions, but shall comply with any corrective measures regarding the same prescribed by the Engineer.

1-2 PROJECT LOCATION AND SCOPE OF WORK

The project location and scope of work under this contract are as stated in the Invitation to Bid and/or the proposal.

1-3 STANDARD SPECIFICATIONS, ABBREVIATIONS, DEFINITIONS, AND DETAILED DRAWINGS

Except as hereinafter supplemented, revised or superseded by the latest edition, as of the date of the Invitation for Bid, of the City Kennewick Standard Specifications and Details, and/or contract Special Provisions, the work under this contract shall be governed by the latest edition of the State of Washington Standard Specifications for Road and Bridge Construction and the latest version, when referenced herein, or when included in the contract document of the APWA GSP, for the applicable WSDOT Standard Specification Section (www.wsdot.wa.gov/partners/apwa/).

1-3.01 ABBREVIATIONS

American Association of State Highway Transportation Officials ..... AASHTO
American Society for Testing and Materials ..... ASTM
American Waterworks Association ..... AWWA U.S.
Federal Specifications ..... Fed. Specs.

Federal Highway Administration Manual on
Uniform Traffic Control Devices ..... MUTCD
National Electrical Manufacturer's Association ..... NEMA
State of Washington Standard Specifications
for Road and Bridge Construction, (Latest Edition) ..... SWSS
U.S. Department of Transportation..... USDOT

1-3.02 DEFINITIONS

See Division One of the SWSS and the latest APWA GSP for Section 1-01.3 of the SWSS for additional definitions and terms.

Hereinafter, the following references in these specifications shall be applied to mean:

A. City--The City of Kennewick, A Municipal Corporation, in Benton County, Washington, and its appointed or elected officials.

B. Engineer--The City Engineer of the City or his designated representative.

C. Inspector--The City's authorized representative assigned to make all necessary inspections of the work performed or being performed, or of materials furnished by the Contractor, and/or supplier.

D. Traffic Engineer--The City Traffic Engineer or his designated representative.

E. Standard Specifications--State of Washington Standard Specifications for Road and Bridge Construction (Latest Edition) as supplemented by the latest version of any APWA GSP's referenced in the City of Kennewick Standard Specification, or any APWA GSP's included in the contract documents.

F. These specifications--Where used shall mean the City of Kennewick Standard Specifications and Details.

1-3.03 DETAIL DRAWINGS

Any standard detail drawings bound with, or called out within these specifications are hereby made a part of the approved drawings for this project.

1-4 CONFLICT OF DOCUMENTS

For contracts that do not utilize federal funding, the coordination table in Section 1-04.2 of the SWSS shall be revised as follows:

In the event of any conflicting provisions or requirements between the component parts of this contract, the component parts shall take precedence in the following order:

1. The Contract
2. Change Orders
3. Addenda
4. Bid Proposal
5. Special Provisions
6. City of Kennewick Standard Specifications and Details
7. Referenced or included APWA GSP's
8. SWSS
9. Plans

1-5 BEGIN WORK

The Contractor shall not begin work until the issuance of a written notice to proceed, and he shall give at least two working days advance notice to the Engineer prior to beginning each phase of the work.

1-6 TIME OF COMPLETION AND LIQUIDATED DAMAGES

Contract work shall be completed in accordance with SWSS Section 1-08.5.
Liquidated damages for projects that utilize federal funding shall be per the provisions of the WSDOT Standard Specifications Section 1-08.9. For all other projects, the provisions of the referenced Section 1-08.9 shall be modified such that the liquidated damages shall be at the amounts as listed on the bid proposal, or contract contained within the bid document.

1-7 MEASUREMENT AND PAYMENT

Except where provided in the City of Kennewick Standard Specifications or as provided in the contract Special Provisions, measurement and payment shall be in accordance with SWSS, Section 1-09.9 as modified by the latest APWA GSP for said section, except as herein modified.

Payment will be made for only the items listed in the contract proposal. Payment for general construction items which are not listed in the contract proposal are indicative of the fact that no such item of work is required for the project, or that the items of work not listed are considered as incidental to the items listed in that particular proposal, even though the SWSS may call for a separate measurement and payment. Payment for materials on hand will be made only when supported by proof of payment and an inventory certified by the Engineer's representative.

1-8 EXCAVATION AND BORING NEAR EXISTING UTILITIES

1-8.01 GENERAL

The plans are not guaranteed to show the exact locations, size, or depth of all underground utilities. It shall be the responsibility of the Excavator, or boring contractor, to contact the Benton/Franklin County Coordinating Council's ONE CALL LOCATE SYSTEM, 1-800-424-5555, a minimum of forty-eight (48) hours in advance of any digging or boring, to verify the locations of any and all existing underground utilities.

1-8.02 Emergency Procedures

Boring contractors are fully responsible to control boring alignments, as required to maintain an adequate horizontal and vertical spacing, during underground vertical and horizontal jacking and boring operations.

Excavators and boring contractors are to contact the engineer and in addition, notify the pipeline operator immediately, if their work damages a pipeline. In addition, if the damage results in a release of natural gas, or other hazardous substance, or potentially endangers life, health, or property, the contractor shall also immediately call 911.

1-8.03 SUBSURFACE UTILITIES

For contracts that do not utilize federal highways funding, the provisions of SWSS Section 1-07.17 shall be supplemented by the addition of the following paragraph.

On city-administered contracts, the city and the city's consultant(s) have made every effort to approximately indicate the location of subsurface utilities on the construction plans. Where known or identified, the existing utilities are shown on the plans as a general guide to assist the contractor in evaluating the difficulties to be encountered on the contract. Prior to construction excavations, the contractor shall determine the exact location. By signing a contract, or obtaining a construction permit, the contractor agrees to be fully responsible for any and all damages, which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.

On both permit and City administered projects, the contractor must call 1-800-424-5555, a minimum of two work days before commencing any excavations. The contractors are advised that a call for locates will not provide a locate for private sewer services, private irrigation and AC water mains. The city locator will approximately locate the AC water main; however, the contractor is advised that the standard locate tolerances are not applicable and the contractor is required to dig and verify the exact alignment of all AC water mains prior to excavation. All costs for repair and damages, due to failure of the contractor to excavate and locate the AC water mains and private sewer and irrigation facilities, will be the full responsibility of the contractor.

1-9 WATER SUPPLY

On City administered contracts, City water will be supplied at the nearest city-approved source, at no cost to the Contractor for construction purposes. The meter shall be scheduled through the project Field Engineer. The water used shall be accounted for by metering, but not billed to the Contractor. On commercial and developer projects, a water use charge will apply, per Section 4-23 of these standard specifications. The Permit Contractor shall abide by all requirements of the hydrant use policy. The Contractor shall request a city-supplied meter at the one stop permitting office at City Hall located at 210 W. 6th Avenue and then pick up the meter at the City Maintenance Department, at 1010 E. Chemical Drive, stating the requested location and period of use. Upon receipt of a $400.00 deposit and a $50.00 account and service charge on the meter, or the prevailing rate at the time the meter is ordered, the Permit Contractor will install the meter on the hydrant mutually agreed upon.

The Permit Contractor will be required to periodically bring the meter to the city for use readings as required by the Hydrant Meter Procedure, Section 4-23.
On city-administered contracts only, city crews will install and relocate the meter at no charge, provided that a minimum 24 hours notice is provided. The Contractor is not authorized to relocate the hydrant meters on city-administered contracts; however, It is the responsibility of each Contractor to protect the hydrant meter from damage due to freezing conditions by closing the hydrant and opening the meter valve to drain the meter and allowing the hydrant to drain. A hydrant wrench is the only acceptable tool for use on the hydrant. Hydrant valves must be closed slowly to prevent water hammer. When in use, the hydrant must be fully opened at all times in order to prevent hydrant damage. The contractor will be fully responsible for damage to the hydrant, or hydrant meter due to neglect, or improper operation.

When finished with the use of the hydrant on city-administered contracts, the Contractor shall request the city to remove the hydrant and obtain a final meter reading.

1-10 FINISH AND CLEANUP

For projects which do not utilize federal highways funding, finishing and cleanup shall be in accordance with the SWSS Section 1-04.11, Final Clean-up and as herein supplemented.

Where the existing landscape area is above, or below the grade of the new sidewalk and curb, the landscape area shall be cut, or filled and restored, as required to match the grade of the new sidewalk. The contractor will provide a uniform transition to the existing landscaping at a 10:1 or flatter grade, or as approved by the Engineer, regardless of the work limits shown on the plans. The city has, or will obtain, the necessary permits from the adjoining property owner(s).

On-site and nearby drainage facilities, such as inlets, catch basins, culverts, and open ditches shall be cleared of all protective devices and debris, which is the result of the Contractor's operations, unless the contract special provisions provide otherwise. All required on and off site cleanup and restoration costs shall be considered as incidental to the contract, except where a separate measurement and payment has been provided for in the contract for project maintenance.

1-11 DUST CONTROL

The Contractor shall, at all times during construction, maintain proper dust control in accordance with the requirements of the Benton County Clean Air Authority. On City administered contracts, water will be furnished at hydrants designated by the Engineer at no cost to the Contractor. It is required that the Contractor have one person at the job site during construction hours who is responsible for dust control. In addition, one person will be available during non-working hours and at all times, shall have equipment and manpower available to control dust. Any problems caused by dust from the construction site will be cause for immediate shutdown of all operations except dust control.

If water is not available, the Contractor shall be responsible for dust control by any means approved by the Benton County Clean Air Authority and/or the Engineer. No additional payments shall be made for the required dust control measures.

1-12 EXISTING MONUMENTS

On City administered contracts, the City will reference all known existing monuments within the limits of the construction area. The Contractor shall take special care to protect all monuments or reference points. If monuments or reference points outside of the designated construction area, are damaged or destroyed by the Contractor, the Contractor shall have them reset by a licensed land surveyor at no additional cost to the City. On commercial and developer projects, the City will not reference monuments, however, all existing monuments shall be preserved or reset by a licensed land surveyor.

1-13 COMPACTION

1-13.01 GENERAL

Unless stated elsewhere in the City of Kennewick Standard Specifications, all compaction shall be accomplished in such a manner as to preclude future settlement, except that regardless of the estimate of future settlement, all compaction shall provide a minimum dry density of ninety-five percent (95%) of the maximum density as determined by WSDOT test Method No. 698 or for granular materials, by WSDOT Test Method No. 606 in accordance with SWSS Section 2-03.3(14)D. Deviation from minimum density requirements of SWSS Section 2-03.3(14)D. will only be allowed with the written approval of the Engineer.

Unless otherwise provided for in the contract special provisions, the city will order and pay all costs for compaction tests, except that where test holes are required as specified herein, the contractor shall incorporate all costs for excavating and backfilling the required test holes into the unit bid items as provided in the bid proposal and a separate measurement and payment will not be made for the required work.

1-13.02 UTILITY TRENCHES LESS THAN 6-FEET DEEP

During utility line installation, the city will have density tests taken on the backfilled material. Tests will be taken on the subgrade of the trench, prior to placement of gravel, or crushed rock. At a minimum, one test shall be taken within 50 feet from where the main line installation began, then on each side lateral, and then at a maximum of 300 foot intervals. For street crossings and installations ; less than 300 feet, a minimum of two tests are required.

1-13.03 UTILITY TRENCHES GREATER THAN 6-FEET DEEP

In addition to subgrade trenchline testing, when a utility line is constructed and the trench depth exceeds 6 feet, the contractor will be directed to dig one test hole at a minimum of each 500 feet, to a depth of typically 3 feet below subgrade and a sub surface compaction test will be completed at each test hole location. On completion of the test, the contractor will be required to backfill and compact the excavated test hole.

1-13.04 STREET AND STRUCTURES

All subgrade for street and structures, including footings and retaining walls, in both cut and fill areas, shall be compacted or recompacted as specified in Section 1-13.01. In cut sections, compaction tests will be taken on the recompacted subgrade, at maximum 500-foot intervals, randomly across the construction section.

When fill material is required to be placed to construct the roadway section, the contractor shall notify the engineer of the source of the fill, prior to building embankment, so soil sample(s) may be obtained.

In fill areas, compaction tests will initially be taken on each 1 foot lift, at a minimum of every 3,000 square feet, to determine if the methods the contractor is using are sufficient to obtain the required compaction. Tests will then be taken at a minimum of each 3 feet of fill and on the finished subgrade. Compaction tests will be taken randomly across the construction section at locations determined by the engineer.

1-13.05 UNTESTABLE MATERIAL

For trenched installations greater than 300', where the material is considered to be too rocky to test, and for all street construction projects, where the material is considered to be too rocky to test, a laboratory test report to that effect will be placed in the project

file. On shorter trenched sections, the Project Engineer will note in a report to the file, when the material is determined by observation, to be too rocky to test.

1-14 WASTE DISPOSAL SITE

The Contractor shall supply his own off-site waste disposal site. Any costs for supplying permits and operation of the site shall be considered incidental to the contract. Any costs incurred for wasting material from the job site shall also be considered incidental to the cost of the item of work involved. The Contractor will be held liable for any damages resulting from the disposal of waste materials.

1-15 SOIL AND GROUND WATER CONDITIONS

On projects which do not utilize federal funding, the following paragraph shall be inserted and by this reference, made a part of SWSS Section 1-04.7 Differing Site Conditions (changed conditions).

Due to the varying soil and rock composition at different locations in the city and due to variations in surface drainage, and ground water levels encountered in various areas and at different seasons of the year, the City makes no representation of such conditions as they may pertain to each project. The Contractor shall be responsible for any and all excavation equipment and procedures required to complete the work and for all cribbing, sheet piling, dewatering, and/or construction methods or dewatering procedures, which may be necessary to complete the project, and therefore, additional compensation will not be allowed for the above described conditions.

1-16 ONE YEAR WARRANTY

For projects which do not utilize federal funding, the following shall be added to SWSS Section 1-05.10
The work furnished under these specifications shall be guaranteed for a period of one (1) year from the date of acceptance , by the Kennewick City Council, against defective materials, equipment, and workmanship. Upon receipt of notice from the City of failure of any part of the material, equipment or workmanship during the guarantee period, the affected part or parts shall be replaced with new material or equipment by and at the expense of the Contractor.

1-17 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

The following paragraph is hereby added to Section 1-05.7 of the SWSS as modified by the latest APWA GSP for said section.
For projects which do not utilize federal funding, if the City deems it not expedient to require the Contractor to correct work not done in accordance with the contract documents, an equitable deduction from the contract price will be made by agreement between the Contractor and the City.

1-18 PRECONSTRUCTION CONFERENCE

A preconstruction conference is required per the provisions of the latest APWA GSP 1-08-1(1) for SWSS Section 1-08. Upon notification by the Engineer, the successful Bidder will be required to attend a preconstruction conference with his known principal subcontractors. The purpose of the preconstruction conference is to discuss, among other considerations, the responsibility of the successful Bidder and his subcontractors in the prosecution and progress of the work.

1-19 CONSTRUCTION SCHEDULE

A progress schedule is required per the provisions of SWSS Section 1-08.3 and as herein modified. The Contractor shall submit to the Engineer, at the preconstruction conference, two copies of an estimated construction progress schedule in a form satisfactory to the Engineer, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents.

If requested by the Engineer (no later than the tenth (lOth) calendar day of each month), the Contractor shall submit to the Engineer a new construction schedule, which shall show in detail, work completed and whether the Contractor is ahead of schedule or behind schedule on each of the various subdivisions of work. If the contractor fails to provide the schedule when requested, the engineer reserves the right to withhold monthly progress payments until an acceptable schedule is received.

1-20 PROGRESS PAYMENTS

Progress payments will be made in accordance with Section 1-09.9 of the SWSS. Payment under this contract shall be made with the City's cash warrants and/or interest-bearing warrants, and shall be made on the basis of field measurements and/or haul tickets received at the time of delivery. As provided by the Information to Bidders, a bond in lieu of retainage is required on projects, unless otherwise provided for in the Special Provisions, or the Information to Bidders. On small works contracts and on city contracts under $100,000, or when the Special Provisions allow withholding of retainage in lieu of a retainage bond, a sum, not to exceed 5% of the progress payment, will be withheld from the progress payment. Withholding, management, and release of such retained monies shall be in accordance with RCW 60.28. Failure to perform any of the obligations under the contract by the Contractor may be decreed by the Engineer to be adequate reason for withholding any payments until compliance is achieved.

1-21 CONTRACTOR SUPERINTENDENT

Per the provisions of SWSS 1-05.13, the Contractor shall provide at all times, a Superintendent who is familiar with all phases of the work and who has the full authority of the Contractor. The Superintendent shall be assigned prior to starting construction

and shall be on the job at all times until completion. The Superintendent assigned shall be the sole liaison between the Engineer and any subcontractors. Changing of superintendents prior to the project completion will not be allowed without just cause and must have the approval of the Engineer.

1-22 COOPERATION BY CONTRACTOR

The Contractor shall give the work the constant attention necessary to facilitate the progress thereof, and shall allow access to the work site, coordinate activities with and cooperate with the Engineer, his inspectors, other Contractors, and the utility companies and their personnel in every way possible.

1-23 CHANGES IN THE WORK

1-23.01 GENERAL

For all city-administered contracts that do not utilize federal highway funding, the following revisions and modifications to the SWSS Section 1-04.4 and the subsections thereof shall apply.

The City reserves the right to make changes in the work within the general scope of the contract at any time during the progress of work. When so directed, the contractor shall proceed with the changes in the work, as directed by the engineer. The changes may include but are not limited to:

a. deletion of any portion of the work,
b. increases or decreases in quantities,
c. changes in specifications and/or designs,
d. the method or manner of performance of the work,
e. addition of any new work,
f. City-furnished facilities, equipment, materials, services or sites, or
g. directing acceleration or delay in the performance of the work.

Changes will be set forth in a written change order except as provided herein. Deleted work, item "a" above, will be paid for as provided in Section 1-23.05 of these specifications.

Increased or decreased quantities, item "b" above, will be paid for as provided in Section 1-23.03 of these specifications.

If the Engineer determines that any change for items "c, d, e, f, and g" above causes an increase or decrease in the Contractor's cost of, or time required for, the performance of any part of the work, including unchanged work, an equitable adjustment will be made and the contract modified by a written change order per the provisions of SWSS Section 1-04.4.

1-23.02 PROCEDURE AND PROTEST BY THE CONTRACTOR

On all city-administered contracts that do not utilize federal highways funding, the following paragraphs are hereby added to and shall be considered a part of Section 1-04.5 of the SWSS.

The Contractor accepts the terms and conditions of a change order by endorsement of the change order, by acceptance through separate writing, or by failure to protest as provided in SWSS Section 1-04.5. Any change order accepted by the Contractor shall be full and equitable adjustment for any work changed or required by the change order.

The Contractor also accepts any written or oral order, direction, instruction, interpretation, or determination from the Engineer by failure to protest as provided in SWSS Section 1-04.5.

1-23.03 INCREASED OR DECREASED QUANTITIES

On all city-administered contracts that do not utilize federal highways funding, Paragraph 1 of Section 1-04.6 of the SWSS is hereby deleted and replaced with the following:

Adjustments in unit cost for a bid item, due to increases, or decreases in quantity, will only be considered for those bid items where the total cost of the bid item is greater than 10 percent of the total contract price at the time of award, hereby referred to as a "major bid item".

If there is any change that increases or decreases a major bid item by more than 25 percent of the total cost of the bid item , the adjustment for that portion of the work in excess of the 25 percent increase or decrease shall be as follows:

(Increases)

Compensation for increases in excess of 25 percent of the "total cost of the major bid item" as defined in paragraph one, will be determined by agreement of the parties utilizing the remaining provisions of SWSS Section 1-04.6. If the parties are unable to agree, the Engineer will determine the equitable adjustment by using unit contract prices, or by establishing the costs by other appropriate means, or by using force account and adjust the time, as he deems appropriate.

(Decreases)

With the exception of deleted items (see Paragraph 1-23.05), compensation for decreases in excess of 25 percent of the "total cost of the major bid item" as defined in paragraph one, will be determined by agreement of the parties utilizing the remaining provisions of SWSS Section 1-04.6. If the parties are unable to agree, the Engineer will

determine the adjustment, taking into account a redistribution of fixed costs.

Written consent of the surety or sureties will be required for changed work if the costs are in excess of 25 percent of the original contract price or when otherwise specifically requested by the Engineer.

When ordered by the Engineer, the work shall proceed pending determination of the adjustment in costs or time for the change.

1-23.04 PAYMENT FOR CHANGE ORDER WORK

Payment for work pursuant to a change order shall be made as provided in Paragraph 1-23.01, and applicable retained sections of SWSS 1-04.4 and as herein modified. if a negotiated agreement cannot be reached, and when deemed appropriate by the Engineer, the contractor shall immediately proceed with the change order work and compensation will be paid by force account, as provided in Paragraph 1-23.06.

1-23.05 DELETED ITEMS

On all city-administered contracts, which do not utilize federal highways funding, the City reserves the right to cancel all or portions of the contract relating to the construction of any item or items. The City will pay to the Contractor a fair and equitable amount covering all direct project costs incurred prior to the date of cancellation of such work by the Engineer.

No payment will be made for items, which are deleted from the contract and not performed. No payment will be made for any anticipated profits, which would have been earned on work deleted, or on anticipated profits for costs incurred prior to the deletion of the work.

Acceptable materials ordered by the Contractor, or delivered on the work prior to the date of cancellation of the work by the Engineer, will either be purchased from the Contractor by the City at the actual cost and shall become the property of the City, or the City will reimburse the Contractor for his actual costs connected with returning these materials to the suppliers.

1-23.06 FORCE ACCOUNT

If the change order proposal is not acceptable and prompt agreement between the two parties cannot be reached, the Engineer may order the Contractor to proceed with the work on a force account basis as per the SWSS, Section 1-09.6, except as herein modified for projects which do not utilize federal funding.

Reference SWSS Section 1-09.6, Paragraph 3 for force account equipment rental rates. For all City projects that do not utilize federal highways funding, the current

AGC/WSDOT Equipment Rental Agreement shall be utilized for all force account work, except as herein modified. Paragraph 2 of the AGC/WSDOT Equipment Rental Agreement for rental rate, shall be deleted and the following Paragraph 2 inserted:

2. Rental Rate

The hourly rental rate for construction equipment shall be a combination of the following items:

(a) The blue book hourly, daily, weekly or monthly rate, as herein defined, times the equipment year and model rate adjustment factor, times the regional adjustment average of 1.05.

The blue book hourly rate shall apply for equipment used for a time period less than or equal to 4 hours.

The blue book daily rate divided by 8 shall be used for equipment used for a time period greater than 4 hours and less than or equal to 16 hours.

The blue book weekly rate divided by 40 shall be used for equipment used for a time period greater than 16 hours and less than or equal to 40 hours.

The blue book monthly rate divided by 176 shall be used for equipment used for a time period greater than 40 hours.

(b) the hourly operating cost for each hour that the equipment is in use.

(c) Attachments will be included in the rental rate only when deemed applicable and essential to the work. When multiple attachments are approved for use, and the attachments are being used interchangeably for the work, only the attachment having the higher rate will be eligible for payment.

1-24 PREVAILING RATE OF WAGES

On all City administered contracts, the prevailing rate of wages to be paid to all workmen, laborers, or mechanics employed in the performance of any part of this contract shall be in accordance with the provisions of the contract Information to Bidders and SWSS Section 1-07.9. The rules and regulations of the Department of Labor and Industries and the schedule of prevailing wage rates for the locality or localities where this contract will be performed as determined by the Industrial Statistician of the Department of Labor and Industries, are by reference made a part of this contract as though fully set forth herein.

Inasmuch as the Contractor will be held responsible for paying the prevailing wages, it is imperative that all Contractors familiarize themselves with the current wage rates before submitting bids based on these specifications.

The contractors' attention is called to determinations made by Labor & Industries regarding Landscape Wages. When landscape work is required to restore landscaping following, utility work, then the use of Landscape Wages is not allowed. The applicable labor rate for the utility, or street work is required. Landscape wages are typically only allowed by Labor & Industries for landscape related work required to modify, or restore landscaping following a street construction or reconstruction project and for stand alone landscape contracts.

In case any dispute arises as to what are the prevailing rates of wages for work of a similar nature and such dispute cannot be adjusted by the parties of interest including labor and management representatives, the matter shall be referred for arbitration to the Director of the Department of Labor and Industries of the State and his decision therein shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060, as amended.

Before payment is made by or on behalf of the City of any sums due under this contract, the Contractor and each subcontractor shall pay all filing fees and submit a Statement of Intent to Pay Prevailing Wages to L & I, with a copy, or e-mail copy to the city. Before final payment can be made under this contract, the Contractor and each subcontractor shall pay all filing fees and submit an Affidavit of Wages Paid to L & I, with a copy or e-mail copy to the city. The Engineer will obtain the verifications of the Department of Labor and Industries, that the prevailing wage requirements have been satisfied, as required by law. It will be the responsibility of the prime Contractor to require all subcontractors to complete the Statements of Intent to Pay Prevailing Wages and Affidavits of Wages Paid and to make proper filing of these.

The Public Works Contract Division of the Department of Labor and Industries will provide the Contractor with applicable industrial insurance and medical aid classification and premium rates and a copy of Form S.F. 7887-A, "Release for the Protection of Property, City and General Contractor." This form is to be completed and returned to said division of the Department of Labor and Industries after final acceptance of the contract for the purpose of obtaining a release with respect to the payment of industrial insurance and medical aid premium.

When a Public Works project is subject to the provisions of the Washington State Public Works Law and the Federal Davis-Bacon and related acts, the Contractor and every subcontractor on that project shall pay the highest wage rate, which applies.

1-25 REGULATIONS FOR OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR CONSTRUCTION WORK ON THIS CONTRACT

The Contractor's attention is alerted to the strict enforcement and requirements of the "Occupational Safety and Health Act" and "The Washington Industrial Safety and Health Act," which apply to all operations within this contract. The Contractor shall

comply with all provisions thereof and make such reports and maintain such records, as the acts require.

The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.

The duty of the Engineer to conduct construction reviews of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

The City reserves the right to shut down any contractual operations in which it appears to the city representative that there may be a safety code violation which endangers the City's Inspector, Contract Compliance Officer, City's employee, or the public, until corrections are made. The total cost of such shutdowns and corrections will be met by the Contractor.

The latest APWA GSP for SWSS Section 1-07.1 Laws to be Observed, shall apply to all city contracts.

1-26 SPILL PREVENTION, CONTROL, AND COUNTERMEASURES (SPCC) PLAN

1-26.01 DESCRIPTION

This work shall consist of preparing a Spill Prevention, control, and Countermeasures (SPCC) Plan and preparing for implementation of the plan.

1-26.02 SPCC PLAN REQUIREMENTS

The Contractor shall be responsible for the preparation of an SPCC plan to be used for the duration of the project. The plan shall be prepared in accordance with Section 1-07.15(1) of the SWSS and be submitted to the Project Engineer prior to the commencement of any construction activities. A copy of the plan with any updates shall be maintained at the work site by the Contractor.

1-26.03 IMPLEMENTATION REQUIREMENTS

In the event that hazardous material is encountered during the course of the work, regardless of whether or not the material is shown in the Plans, the implementation of the Contractor’s SPCC Plan shall be included in the scope of the contract and shall be carried out by the Contractor.

The Contractor shall maintain, at the job site, the applicable equipment and material designated in the SPCC Plan.

1-26.04 MEASUREMENT AND PAYMENT

The lump sum contract price for the “Spill Prevention, Control, and Countermeasures (SPCC) Plan” shall be full compensation for all labor, equipment, materials and overhead costs associated with the preparation of the SPCC Plan and any coordination and preparation needed prior to implementation.

1- 27 STREET CLOSURE

Per the provisions of SWSS Section 1-07.23 and the latest APWA GSP for said section, unless approved by the City Engineer, the contractor shall maintain two-way traffic during construction operations. Street closures are expressly forbidden without the written consent of the Engineer. The Contractor shall request and receive approval for necessary street closure or detours at least three work days before the closure or detour is to be put into effect.

In an emergency situation as defined by anything that represents an immediate danger to life or personal property, the Contractor shall close off that area of danger in the project and notify as soon as possible the Engineer and all emergency, school, Ben Franklin Transit and Post Office officials, together with adjacent property owners of the closure. In addition, the Contractor shall notify other agencies, media, etc. as determined by the Engineer to be essential to the safety of the closure.

All street closures regardless of their nature shall provide for a minimum of inconvenience to local pedestrian and vehicular traffic. See General Provision Paragraph 1-32 for additional information.

1- 28 CONSTRUCTIONS WITHIN RIGHT-OF-WAY OR EASEMENT LINE

Property lines and easement lines are indicated on the plans. Except as provided for by Section 1-10 of these General Provisions, or unless otherwise provided for by the contract Special Provisions, it shall be the Contractor's responsibility to confine his activities within these limits. Any damage resulting from the Contractor's operations when trespassing beyond these limits, shall be the sole responsibility of the Contractor.

If the Contractor chooses to create waste sites, obstructions, and to otherwise encroach upon privately owned property, he shall give written evidence to the Engineer that such permission for use has been granted by the landowner before commencing work.

With the exception of City administered contracts, a permit is required for all construction within city rights of way or easements. Contact the City Municipal Services Department for permit requirements. All utility companies shall submit a “Notice of Intent” and/or detailed and dimensional construction plans and location drawings prior to applying for a permit. Utility horizontal separation dimensions as required by Standard Drawing 1-3 are required at all times.

1- 29 PERMITS, LICENSES, AND EASEMENTS

On City administered projects, where construction is required to cross public and private property, the City will secure, or has secured from the property owners and/or agencies having jurisdiction, the necessary permits, licenses, and easements. On developer-administered projects, it shall be the full responsibility of the developer to obtain all necessary permits, licenses and easements.

The Contractor shall be required to perform all work within the limits of such permits, licenses, and easements in accordance with their terms and conditions. The regulations and requirements of all agencies and private landowners granting easements and permits shall be strictly adhered to in the performance of the work required under this contract.

The Contractor shall not do any work on public or private property until authority has been granted by the City. After authority has been obtained, the Contractor shall give said party due notice of his intention to begin work and to provide said party with access for inspection and protection of its property and its improvements.

1- 30 REFERENCE TO PROPRIETARY PRODUCTS

Where references to proprietary products appear in the specifications or drawings, it is for the purpose of establishing an acceptable standard of quality or design. With the exception of water and irrigation system components, unless a substitute is expressly prohibited, the Contractor may request approval of a substitute for any such proprietary product. Substitutions for water and irrigation components listed will generally not be allowed except where “or equal” is used. Such request must be in writing and must include descriptive literature, specifications, test reports, or samples, as appropriate, to enable the Engineer to determine the acceptability of the product proposed for substitution. No substitute product shall be used on the work until written approval has been received from the Engineer.

Where the expression "or equal" is used to reference proprietary products, including water and irrigation, it shall be understood to mean that the Contractor may request approval of a substitute for the proprietary product. Such approval will not normally be given by the Engineer prior to the receipt of bids. Following award of the contract, the Contractor may submit a written request for substitution. If substitution is requested as part of a shop drawing submittal, the item(s) proposed for substitution shall be clearly indicated. The Engineer shall have the final authority for approving or rejecting the proposed substitution.

1- 31 WORKING HOURS

Working hours and conditions shall be per Section 1-08.0(2) of the latest APWA/General Special Provisions to said section. The Contractor may use the

equipment specified and necessary to complete the work during the normal weekday working hours; of 7:00 a.m. to 6:00 p.m., Approval to work outside of the specified work hours will be subject to approval of the engineer, per the provisions of the referenced Section 1-08.0(2).

1- 32 VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL MEASURES

Projects involving vehicular and pedestrian travelways shall require a "TRAFFIC CONTROL PLAN" submitted by the Contractor to the Engineer for his approval prior to starting any work. The traffic control plan shall conform to the requirements of Section 7, Traffic Control, of these specifications.

1- 33 SUBCONTRACTING

Subcontracting shall meet all requirements of SWSS, Section 1-08.1. Generally, work completed by the contractor's own organization shall account for at least 30 percent of the awarded contract price, after subtraction of the cost of all designated specialty items.

1- 34 WORK BY UTILITY COMPANIES

The Contractor shall allow utility companies and their agents access to their work within the site of the project and otherwise meet all requirements of SWSS Section 1-07.17.

1- 35 SALVAGE

During construction, all salvaged materials including, but not limited to water, storm sewer, brackets, telespar posts, bases and electrical system components shall be delivered to the appropriate City storage yard by the Contractor. When a fire hydrant is abandoned as the result of a new project, the fire hydrant shall be removed as a complete assembly, including the riser and hydrant shoe. Abandoned manholes shall be backfilled and the casting, cover and cone shall be salvaged. All costs for salvage as required by the new construction project shall be considered incidental to the construction bid items, and a separate payment will not be made for salvage unless items for payment are provided for in the bid proposal. Signs must be returned to the City sign shop at 1010 E. Chemical Drive due to inventory tracking, unless scheduled to be reinstalled for the project.

1- 36 INCENTIVE PAY

Section 1-06.2(2) SubSections A, B, C, and D of the SWSS are hereby deleted.

1- 37 APWA GSP's

All APWA GSP's referenced in the individual sections in the Information to Bidders and these General Provisions, are hereby adopted by the City of Kennewick. In addition,

the latest edition of the following APWA GSP's are hereby adopted. (www.wsdot.wa.gov/partners/apwa/)

1-05.17 Oral Agreements
1-07.1 Laws to be Observed
1-07.2 State Sales Tax
1-07.24 Rights-of-Way
1-08.4 Notice to Proceed and Presentation of Work
1-09.9 Payments

1- 38 CLAIMS RESOLUTION

1-38.01 CONTRACT CLAIMS ADMINISTRATION

The City of Kennewick expressly reserves all rights and defenses it may have relating to the contractor's failure to provide timely notice or adequate documentation in accordance with contract requirements, including, but not limited to, the contractor's protest and claim. The City of Kennewick does not intend, nor is the contractor authorized to interpret, the City of Kennewick's evaluation of a contractor's claim as a waiver or estoppel of any rights or defenses the City of Kennewick now has, or may have in the future, with respect to a contractor claim, or with respect to any other change orders that may have already been paid to the contractor at the time of any subsequent claim.

1.38.02 LITIGATION

In the event that any disputes arising under the terms of, or in connection with the contract are not arbitrated, both parties agree that venue shall be in the Superior Court of Benton County, State of Washington.

In the event of litigation between the parties for the enforcement of any of the covenants, terms or conditions of the Agreement, the prevailing party shall be entitled to recover reasonable attorney fees and costs as may be determined by the Court.

Delete SWSS Section 1-09.13(3) Claims $250,000 or less, and replace it with the following:

The Contractor and the Contracting Agency mutually agree that those claims that total $250,000 or less, submitted in accordance with Section 1-09.11 and not resolved by non-binding ADR processes, shall be resolved through litigation, unless the parties mutually agree in writing to resolve the claim through binding arbitration.

1- 39 RESIDENTIAL DEVELOPMENT CONSTRUCTION PLANS

Construction plans for residential developments shall be submitted at a scale of 1-inch = 20 feet. The requirements of these standard specification and drawings shall be

referenced on the construction plans cover sheet. At a minimum, the construction plans shall incorporate all requirements of the preliminary plat and be acceptable to the City Engineer, prior to a construction permit being issued.

1- 40 CONSTRUCTION STAKING

1- 40.01 GENERAL

Construction staking shall conform to the requirements of SWSS Section 1-05.4 and these standards. On private contracts, the developer shall provide the specified construction staking and other survey control as required to allow proper grade and alignment control for the contractor's operation and verification by the city's inspector. On city-administered contracts, the city will provide construction staking unless otherwise designated in the contract special provisions.

1- 40.02 ROADWAY STAKING

CURB – Top of curb offset control stakes shall be established at maximum 50-foot intervals on tangents and maximum 25 foot intervals in vertical and horizontal curbs.

SUBGRADE:

1. For residential streets, subgrade is to be bluetopped on centerline and curb line. For 40' and wider streets, subgrade shall also include quarter crown stakes.

2. All stakes are to be at 50' intervals on tangents, except stakes shall be at 25' stations for vertical curves and through intersections on the extended curb line.

1- 40.03 BASE COURSE

1. Not required.

1- 40.04 TOP COURSE

1. For residential streets, top course to be redtopped on centerline. For 40' and wider streets, top course stakes shall also include quarter crown stakes.

2. All stakes are to be at intervals as specified for subgrade staking above.

3. All redtops are to be staked to the new curb grade – not the plan elevations. This is required, since the curb may have been adjusted to provide flow or smooth transitions.

1- 40.05 UNDERGROUND UTILITIES

1. PUD, VERIZON, IRRIGATION, ETC. - Coordinate with the installer and provide control as needed to insure that proper alignment and depth is maintained.

2. STORM AND SANITARY SEWER – to be staked for offset centerline and inverts. The minimum staking required is that each manhole shall be staked; with the first offset stake set 25' upstream.

3. WATER – stake, or mark pipe centerline and fire hydrant, blowoff, etc. locations. If subgrade has not been established, provide offset cut stakes to provide a top of pipe at 42 inches below finish grade.

4. WATER SERVICES – stake water service locations, including top of curb, or back of walk location and elevations. Property corner stakes must be established.

5. SEWER SERVICES – in new subdivisions, stake sewer service locations. Sewer service to be installed per the requirements of City Standard Drawing 3-6, Note 3. For sewer extensions and LID's, the homeowner shall be contacted and the desired service location marked and confirmed by the Project Inspector. Services shall typically be installed at a minimum 2% grade. A minimum 1% is allowed if the property could not otherwise be serviced.

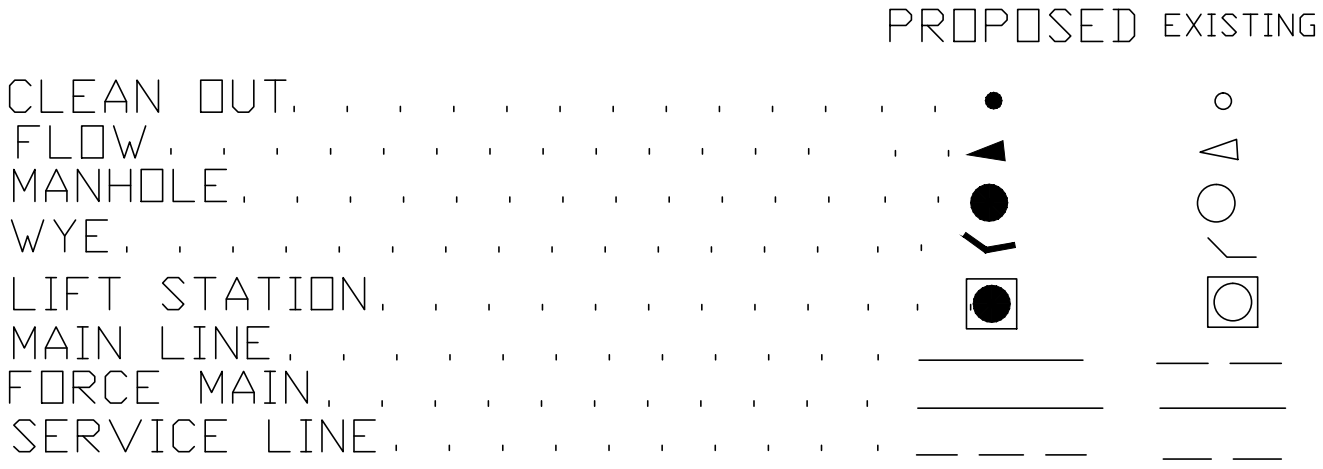
6. STREET LIGHTS AND J-BOXES – stake locations, including top of curb, or back of walk location and elevation.

1- 40.06 RETAINING WALLS

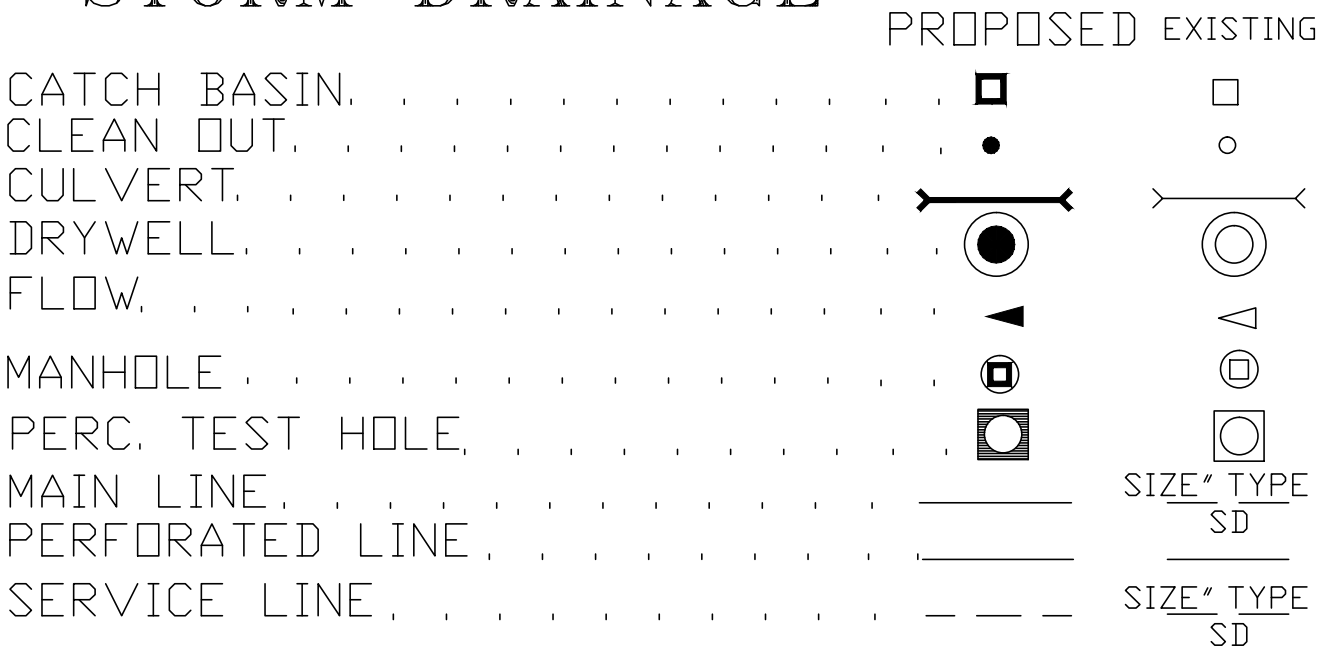
1. On small (less than 3 foot high walls), the inspector shall consult with the adjoining property owner. Generally on each lot, walls should retain a uniform height above the walk, or a uniform slope across the lot. Exceptions may be required in unusual circumstances, where the inspector should consult with the Project Engineer. Avoid trying to match all yard points, resulting in a meandering top of wall. When a design is established, the wall ends and angle points shall be staked and stakes placed at maximum 50-foot intervals.

2. Walls over 3' in height will typically have grades established by design. If not provided for on the plans, the inspector shall consult with the Project Engineer, who may also consult with the designer. Additional design survey control may be required. Once a design grade is established, stakes shall be provided with cuts to bottom of footing and top of wall. With high walls, (over five feet), separate footing and top of wall stakes may be required for proper installation and control by the contractor.

SANITARY SEWER



STORM DRAINAGE



STANDARD SYMBOLS

CITY OF KENNEWICK

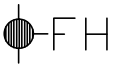
ENGINEERING DEPARTMENT

DATE	2/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

1-1

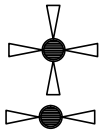
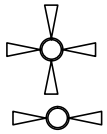
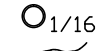
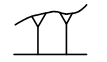
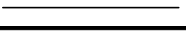
WATER

	PROPOSED	EXISTING
CAP/PLUG		
COUPLING		
GUARD POST		
REDUCER		
THRUST BLOCK		
METER		
2 PORT HYDRANT		
3 PORT HYDRANT		

VALVES

AIR RELIEF		
BLOW-OFF		
BUTTERFLY		
CHECK		
GATE/GENERAL		
MAIN LINE		
SERVICE LINE		

SURVEY

	PROPOSED	EXISTING
MONUMENT (IN CASE)		
SECTION CORNER		
QUARTER CORNER		
SIXTEENTH CORNER		
EMBANKMENT		
SHRUB		
TREE		
PAVEMENT EDGE		
CURB AND WALK		

STANDARD SYMBOLS

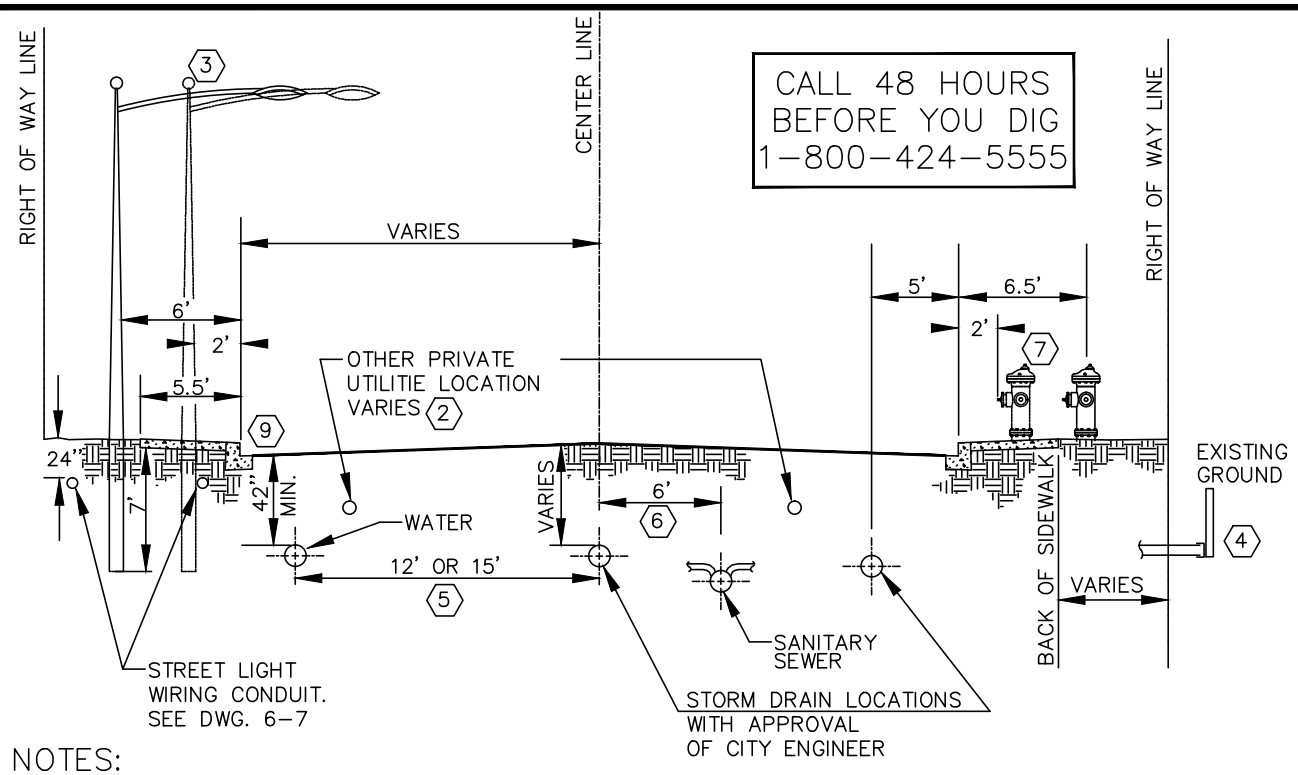
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	2/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

1-2



NOTES:

(1) Developer or Contractor is required to call 1-800-424-5555 a minimum of 48 hours prior to digging within the limits of City right-of-way for the location marking of all underground utilities.

(2) Typical locations for other proposed or existing public utilities shall be verified by the Developer or Contractor. A minimum horizontal separation of 3 foot shall be maintained from city water mains for utilities except that a minimum 5 foot separation is required for KID. A minimum 5 foot horizontal separation shall be maintained from City sewer and storm sewer mains.

(3) Street light poles typically will be installed on alternating sides of the street and spaced as indicated on Standard Drawing No. 6-2. When the sidewalk is separated by a planter strip, place face of pole 2 feet from face of curb.

(4) Water meter boxes will be installed at the back of sidewalks, except that when sidewalks are separated by a planter strip, set AMS at 2 feet from face of curb. Stub water and sewer services to R/W or home side of sidewalk, whichever is greater, cap and mark.

(5) Potable water lines typically shall be installed 12 feet from and parallel to the centerline of the right-of-way on the north or west side of 36' wide street. The water line shall be 15 feet from and parallel to centerline of the right-of-way on the north or west side on 38' or wider streets.

(6) Sanitary sewer line typically shall be installed 6 feet from and parallel to the centerline of the right-of-way on the south or east side.

(7) Fire hydrants typically will be installed on alternating sides of the street on 300 foot spacing in industrial and commercial areas and on 500 foot spacing in residential areas. When sidewalks are separated by a planter strip, set hydrant port at 2' from face of curb.

(8) Gas, power, telephone and other utilities shall maintain a minimum 3 foot horizontal clearance from City water lines, and 5 foot horizontal clearance from City sewer lines.

(9) If conflicts require alternate water or sewer main locations, approval shall be obtained from the City Engineer for the location. A minimum 3 foot separation from the face of curb is required.

TYPICAL CITY UTILITY LOCATION

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/95
DWN	FSG
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
1-3

Section 2 Index

Roadway, Construction and Overlay [click on number or heading below]

SECTION 2

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

ROADWAY CONSTRUCTION AND OVERLAY

2-1 CLEARING AND GRUBBING

2-1.01 GENERAL

Clearing and grubbing shall consist of the removal of all asphaltic concrete pavement and bituminous pavement built upon earth or granular base materials, all trees, brush, stumps, vegetation, mailboxes, extruded curbs, abandoned culverts and miscellaneous concrete boxes, headwalls, sign footings, buildings, lumber, trash piles, rubbish, objectionable materials, and fencing within the project limits. Complete clearing and grubbing well in advance of grading. All fencing and mailboxes shall be salvaged and/or relocated at the direction of the Engineer.

2-1.02 CONSTRUCTION

A. Clearing and grubbing shall be done in accordance with SWSS Sections 2-01.2, 2-01.3, 2-02, and as herein modified.

2-1.03 LOCATION REFERENCE FOR VALVE BOXES AND MANHOLES

Prior to removal of pavement or excavation around existing utilities, the Contractor shall reference valve boxes and manholes with a minimum of two references. A reference drawing and notes shall be prepared, and two copies given to the City representative prior to removal of valve boxes or manhole covers. When new valves or manholes are constructed in conjunction with the street construction, they shall be similarly referenced prior to continuing work over the utility.

2-1.04 MEASUREMENT AND PAYMENT

The unit contract price for "Clearing and Grubbing," per lump sum, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer.

2-2 ROADWAY EXCAVATION

2-2.01 GENERAL

Roadway excavation shall consist of excavation and grading of the roadway and driveway areas as shown on the plans. All excavation shall be unclassified unless a separate bid item is provided for rock excavation. Construction staking shall be provided as specified in Section 1-40 of these specifications.

2-2.02 CONSTRUCTION

Excavation shall be done in accordance with SWSS Section 2-03, Sections 2-03.1 through 2-03.3 (18) and as herein modified by these specifications Section 2-2.03 through 2-5. All unsuitable or excess materials shall be removed from the site and placed in a disposal site provided by the Contractor, unless stated otherwise in the special provisions.

2.2.03 CONTRACTOR PROVIDED WASTE SITE

Unless otherwise specified, the contractor shall provide all disposal and waste sites. Disposal and waste sites shall meet all requirements of the Benton County District Health Department and Chapter 173-304 WAC. When a waste site exceeds two thousand cubic yards of inert waste and demolition waste during the life of the landfill, the contractor shall obtain and pay all costs as required to obtain a solid waste handling facility permit from the Health Department.

2-2.04 MEASUREMENT AND PAYMENT

The measurement for roadway excavation shall be by the cubic yard, measured in place, prior to excavation and shall be based on the quantities listed in the proposal; unless, in the opinion of the Engineer, sufficient change occurs which requires recalculation or remeasurement of the quantities.

The unit contract price for "Roadway Excavation," per cubic yard, shall be full compensation for all labor, equipment, materials, and all other incidentals required to excavate, load, haul, place, or otherwise dispose of the excavated material in accordance with the plans and specifications, or as directed by the Engineer.

2-3 BORROW EXCAVATION

2-3.01 GENERAL

When called for on the plans or where directed by the Engineer, borrow excavation shall consist of suitable material obtained from pits for the construction of embankments, subgrade, planting strips, sidewalk areas or shoulders, and other facilities as directed by

the Engineer. Borrow excavation shall be approved by the Engineer and shall be secured by the Contractor at his own expense and from a source in which the materials are approved by the Engineer.

2-3.02 MEASUREMENT AND PAYMENT

Unless provided in the Special Provisions, a separate measurement and payment will not be made for borrow excavation. If sufficient on-site excavated material is not available, the Contractor shall determine or verify the amount of borrow excavation required, if any.

All costs of providing borrow excavation shall be incorporated into the Embankment In Place bid item(s).

2-4 EMBANKMENT IN PLACE

2-4.01 GENERAL

Excavation materials determined to be suitable for fill material by the Engineer shall be spread and compacted in fill areas as indicated on the plans.

2-4.02 CONSTRUCTION

Embankment shall be accomplished using excavated native material in accordance with SWSS Section 2-03.3(14) C, and as herein modified. Minimum density shall be 95 percent at optimum moisture content when measured in accordance with ASTM D-698 Standard Proctor Density. Testing shall be per City Standard 1-13.04.

2-4.03 MEASUREMENT AND PAYMENT

The measurement for embankment in place shall be by the cubic yard, in place, and based on the quantities listed in the proposal; unless in the opinion of the Engineer, sufficient change occurs which requires recalculation or remeasurement of the quantities.

The unit contract price for "Embankment in Place," per cubic yard, shall be full compensation for all labor, equipment, materials, and all other incidentals required to complete the work in accordance with the plans and specifications or as directed by the Engineer.

2-5 SUBGRADE

2-5.01 GENERAL

Subgrade preparation shall be prepared in accordance with SWSS Section 2-06 and as herein modified.

2-5.02 MEASUREMENT AND PAYMENT

All work required under this section shall be considered as incidental to the placing of "Asphalt Concrete Pavement" and no additional compensation will be made for any work required to accomplish the intent of the plans and specifications.

2-6 TOP COURSE

2-6.01 GENERAL

The Contractor shall furnish and place five-eighths inch (5/8") minus crushed surfacing top course in accordance with SWSS Division 4 and SWSS Section 9-03.9(3) and as herein modified. The five-eighths inch (5/8") minus crushed surfacing top course shall be placed to the depth as indicated on the plans. Crushed surfacing top course shall be constructed in layers not to exceed three inches (3") in depth.

2-6.02 MEASUREMENT AND PAYMENT

Measurement and payment for "Top Course," per ton, shall be full compensation for all labor, equipment, materials, and all other incidentals required to furnish and place top course in accordance with the plans and specifications or as directed by the Engineer.

2-7 BASE COURSE

2-7.01 GENERAL

The Contractor shall furnish and place one and one quarter inch (1-1/4") minus crushed surfacing base course in accordance with SWSS Division 4 and SWSS Section 9-03.9(3) and as herein modified. Crushed surfacing base course shall be constructed in layers not to exceed six inches (6") in depth.

2-7.02 MEASUREMENT AND PAYMENT

Measurement and payment for "Base Course," per ton, shall be full compensation for all labor, equipment, material, and all other incidentals required to furnish and place the base course in accordance with the plans and specifications or as directed by the Engineer.

2-8 HOT MIX ASPHALT

2-8.01 GENERAL

Unless otherwise provided for in the contract Special Provisions, hot mix asphalt shall be as per SWSS Section 5-04, as modified by Section 2-8.02 of these Standard Specifications

Unless otherwise specified in the contract Special Provisions, hot mix asphalt pavement shall be either HMA Class A PG64-28, HMA Class B PG64-28, HMA "Class G PG64-28, and shall be placed at the locations and compacted to the depth as shown on the plans, or as required by the City Standard Drawings. Pavement depths two inches (2") and less shall be placed as a single lift, unless otherwise shown on the plans. Pavement depths greater than two inches (2") shall be placed in two lifts.

2-8.02 HOT MIX ASPHALT

Section 5-04 of the SWSS is revised in its entirety to read:

5-04.1 Description

This work shall consist of providing and placing one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans.

HMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

HMA Class A, Class B, Class D, Class F, and Class G are designated as leveling or wearing courses. HMA Class E is designated as a pavement base course. With the exception of HMA Class D, all mixtures are considered dense graded HMA.

5-04.2 Materials

Materials shall meet the requirements of the following sections:

Asphalt Binder	9-02.1(4)
Cationic Emulsified Asphalt	9-02.1(6)
Anti-Stripping Additive	9-02.4
Aggregates	5-04.3(8)A2
Blending Sand	9-03.8(4)
Mineral Filler	9-03.8(5)

The Contractor shall be required to furnish all materials in the amounts required for the designated mix. Mineral materials include coarse and fine aggregates, blending sand, and mineral filler.

The Contractor shall have the option of utilizing recycled asphalt pavement (RAP) in the amount up to 20 percent of total aggregate weight in combination with new aggregate in the production of HMA. The RAP may be from HMA removed under the contract, if any, or old HMA from an existing stockpile. Recycled materials shall not be used in HMA Class D.

The grade of asphalt binder shall be PG64-28. The contractor shall provide mix design for each class of HMA to be used on the project. The Contractor may propose the substitution of alternate grades of performance grade (PG) asphalt binder at no cost to the Contracting Agency. The proposal will be approved if the proposed alternate asphalt binder has an average 7-day maximum pavement design temperature that is equal to or higher than the specified asphalt binder and has a minimum pavement design temperature that is equal to or lower than the specified asphalt binder. The substituted alternate grade of asphalt binder shall be used in all HMA contract items of the same class and originally specified grade of asphalt binder. Blending of asphalt binder from different sources is not permitted.

Production of aggregates shall comply with the requirements of SWSS Section 3-01.

Preparation of stockpile site, the stockpiling of aggregates, and the removal of aggregates from stockpiles shall comply with the requirements of SWSS Section 3-02.

5-04.3 Construction Requirements

5-04.3(1) HMA Mixing Plant

Plants used for the preparation of HMA shall conform to the following requirements:

1. **Equipment for Preparation of Asphalt Binder.** Tanks for the storage of asphalt binder shall be equipped to heat and hold the material at the required temperatures. The heating shall be accomplished by steam coils, electricity, or other approved means so that no flame shall be in contact with the storage tank. The circulating system for the asphalt binder shall be designed to ensure proper and continuous circulation during the operating period. A valve for the purpose of sampling the asphalt binder shall be placed in either the storage tank or in the supply line to the mixer.

2. **Thermometric Equipment.** An armored thermometer, capable of detecting temperature ranges expected in the HMA mix, shall be fixed

in the asphalt binder feed line at a location near the charging valve at the mixer unit. The thermometer location shall be convenient and safe for access by inspectors.

The plant shall also be equipped with an approved dial-scale thermometer, a mercury actuated thermometer, an electric pyrometer, or another approved thermometric instrument placed at the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates. This device shall be in full view of the plant operator.

3 **Sampling and Testing of Mineral Materials**. The HMA plant shall be equipped with a mechanical sampler for the sampling of the mineral materials. The mechanical sampler shall meet the requirements of SWSS Section1-05.6 for crushing and screening operation.

The contractor shall provide sufficient space as required for the setup and operation of the field testing facilities of the Contracting Agency.

5-04.3(2) Hauling Equipment

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions include (or are forecast to include) during the workshift precipitation or an air temperature less than 45°F, the canvas cover shall be securely attached to protect the HMA.

In order to prevent the HMA mixture from adhering to the hauling equipment, truck beds are to be sprayed with an environmentally benign release agent. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating materials that contaminate or alter the characteristics of the HMA shall not be used. For hopper trucks, the conveyor shall be in operation during the process of applying the release agent.

5-04.3(3) Hot Mix Asphalt Pavers

HMA pavers shall be self-contained, power-propelled units, provided with an internally-heated vibratory screed or strike-off assembly and shall be capable of spreading and finishing courses of HMA plant mix material in lane widths required by the paving section shown in the Plans.

The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. Extensions will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the

primary screed or strike off assembly. Extensions without, augers, vibration and heated screeds shall not be used in the traveled way.

When laying HMA, the paver shall be operated at a uniform forward speed consistent with the plant production rate and roller train capacity to result in a continuous operation. The auger speed and flight gate opening shall be adjusted to coordinate with the operation.

The paver shall be equipped with automatic screed controls with sensors for either or both sides of the paver. The controls shall be capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing automatic signals that operate the screed to maintain the desired grade and transverse slope. The sensor shall be constructed so it will operate from a reference line or a mat-referencing device.

The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. The paver shall be equipped with automatic feeder controls, properly adjusted to maintain a uniform depth of material ahead of the screed.

Manual operation of the screed will be permitted in the construction of irregularly shaped and minor areas. These areas include, but are not limited to, gore areas, road approaches, tapers and left-turn channelization.

When specified in the contract, reference lines for vertical control will be required. Lines shall be placed on both outer edges of the traveled way of each roadway. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a mat referencing device and a slope control device. When the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. A joint matcher may be used subject to the approval of the Engineer. The reference line may be removed after the completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

The Contractor shall furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Project Engineer may suspend work as allowed by Section 1-08.6. Any cleaning or solvent type liquids spilled on the pavement shall be thoroughly removed before paving proceeds.

5-04.3(4) Rollers

Rollers shall be of the steel wheel, vibratory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Project Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of SWSS Section 5-04.3(10). The use of equipment that results in crushing of the aggregate will not be permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results will not be used.

5-04.3(5) Conditioning of Existing Surface

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the plans or approved by the Engineer.

Preleveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

5-04.3(5)A Preparation of Existing Surfaces

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA mix and the surface of the patched area shall be leveled and compacted thoroughly.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots. A heavy application of tack coat will be applied to all joints. For roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

Unless otherwise approved by the Engineer, the tack coat shall be CSS-1, CSS-1h, or STE-1 emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. The emulsified asphalt shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

5-04.3(5)B Preparation of Untreated Roadway

When designated in the plans the existing roadway shall be prepared and the roadway primed as provided in Section 5-02.3(2)A, except that only one application of asphalt and one application of aggregate, which shall conform to aggregate for HMA Class B as listed in Section 5-04.3(8) or other granular materials approved by the Engineer, will be required. All other provisions of Section 5-02 pertaining to bituminous surface treatment Class A shall apply, except as hereinafter modified.

The prime coat shall be applied over the full length of the project, and HMA shall not be placed until the prime coat has cured for 5 days unless otherwise approved by the Engineer.

Should any holes, breaks, or irregularities develop in the roadway surface after the prime coat has been applied, they shall be patched with HMA, as described in Section 5-04.3(5)A, in advance of placing the HMA. The Contractor shall maintain the completed prime coat by blading or brooming with equipment and procedures approved by the Engineer, until the HMA pavement is placed.

After the maintenance, patching or repair work has been completed and immediately prior to placing the HMA, the surface of the prime coat shall be swept clean of all dirt, dust, or other foreign matter.

When the prime coat application is not specified in the Special Provisions or shown in the Plans, the Contractor shall prepare the untreated roadway as described above and shall omit the prime coat treatment. The HMA shall be constructed on the prepared subgrade.

In areas used as turnouts or which will receive heavy service, the Engineer may order a change in the grade to provide a greater depth of pavement.

The Contractor shall prepare untreated shoulders and traffic islands by blading and compacting to provide a sound base for paving and shall omit the prime coat treatment. The HMA shall be constructed on the prepared subgrade.

If the Contractor protects the completed untreated surfacing materials to the degree that the surface meets the requirements of Section 5-02.3(2)A at the time of construction of the prime coat or the construction of the pavement if the prime coat is not required, the Contractor will not be required to perform the work specified in Section 5-02.3(2)A but shall be compensated for the item of work preparation of untreated roadway.

5-04.3(5)C Crack Sealing

When the proposal includes a pay item for crack sealing, all cracks and joints ¼-inch and greater in width shall be cleaned with a stiff-bristled broom and compressed air and then shall be filled completely with sand slurry.

The sand slurry shall consist of approximately 20 percent CSS-1 emulsified asphalt, approximately 2 percent Portland cement, water (if required), and the remainder clean U.S. No. 4-0 paving sand. The components shall be thoroughly mixed and then poured into the cracks and joints until full. The following day, any cracks or joints that are not completely filled shall be topped off with additional sand slurry. After the sand slurry is placed, the filler shall be struck off flush with the existing pavement surface and allowed to cure. The HMA overlay shall not be placed until the slurry has fully cured. The requirements of 1-06 will not apply to the Portland cement and paving sand used in the Sand Slurry.

5-04.3(5)D Soil Residual Herbicide

Where required by the Special Provisions, or where shown in the Plans, the Contractor shall apply one application of an approved soil residual herbicide. Paving shall begin within 24 hours after application of the herbicide. Any area that has not been paved within the time limit or that has been rained on, shall be treated again at the Contractor's expense. The herbicide shall be applied uniformly in accordance with the manufacturer's recommendations.

The material to be used shall be registered with the Washington State Department of Agriculture for use under pavement. Before use, the Contractor shall receive approval of the material to be used and the proposed rate of application, from the Engineer. The following information shall be included in the request for approval of the material: Brand name of the material, manufacturer, Environmental Protection Agency (EPA) registration number, material safety data sheet, and proposed rate of application.

5-04.3(5)E Pavement Repair

The Contractor shall excavate pavement repair areas and shall backfill these with HMA in accordance with the details shown in the Plans and as staked.

The actual excavation depth may vary to a maximum depth of 1-foot maximum, depending upon where stable foundation material is encountered, as determined by the Engineer.

The minimum width of any pavement repair area shall be 3 feet unless shown otherwise in the Plans. All pavement repair areas shall be sawcut before removal, or shall be removed by a pavement grinder approved by the Engineer.

Asphalt for tack coat shall be required as specified in Section 5-04.3(5) A, and shall be applied to all edges of existing pavement in the pavement repair area.

The Contractor shall excavate only within one lane at a time. The areas shall be excavated, backfilled, and compacted within the same day's working shift, in accordance with the details shown in the Plans and to the satisfaction of the Engineer.

Excavated materials will become the property of the Contractor for disposal off the right of way.

The Contractor shall conduct the excavation operations in a manner that will protect the pavement areas not designated to be removed. Pavement not designated to be removed that is damaged as a result of the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Contracting Agency.

Placement of the HMA backfill shall be accomplished in lifts as called for in the plans or Special Provisions, or as herein specified. All new pavement over 2-inches in depth shall be completed in two lifts. Compaction shall be accomplished by mechanical tamper or a roller as approved by the Engineer.

HMA for pavement repair shall be HMA Class A, B, E, or F at the Contractor's option, unless otherwise specified in the contract.

5-04.3(6) Heating of Asphalt Binder

The temperature of the asphalt binder shall not exceed the maximum recommended by the asphalt binder manufacturer. The asphalt binder shall be heated in a manner that will avoid local variations in heating. The heating method shall provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F.

5-04.3(7) Preparation of Aggregates

The aggregates shall be stockpiled according to the requirements of SWSS Section 3-02. Sufficient storage space shall be provided for each size of aggregate. The aggregates shall be removed from stockpile(s) in a manner to ensure a minimum of segregation when being moved to the HMA plant for

processing into the final mixture. Different aggregate sizes shall be kept separated until they have been delivered to the HMA plant.

5-04.3(7)A Mix Design

The Contractor shall obtain representative samples from mineral aggregate stockpiles, and blend sand sources to be used for HMA production and submit them for development of a mix design. The grade of asphalt binder shall be PG64-28. The contractor may propose the substitution of alternate grade (PG) at no cost to the city, provided that the proposal equals or exceeds the upper and lower limits of PG64-28. Sample submittal shall include asphalt binder grade and sources; production mix gradation and combining ratios of mineral aggregate stockpiles and blend sand that will be used in production. This will be the basis for the mix design and job mix formula. The Contractor shall allow 20 calendar days for this approval and design once the aforementioned information and material has been received. Additional time may be required if the proportions will not make an adequate design as determined by the Engineer, or if the Contractor requests more than one asphalt binder source approval. The Contractor is also advised that production of the HMA shall not commence until the job mix formula has been established. Adjustments to the job mix formula may be made per Basis of Acceptance.

The Contractor shall obtain the Engineer's approval prior to changing the source of asphalt binder during the production of HMA. Blending of different asphalt binder grades sources will not be permitted.

5-04.3(8) Mixing

After the required amounts of mineral materials and asphalt binder have been introduced into the mixer the HMA shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt binder throughout the mineral materials is ensured.

When discharged, the temperature of the HMA shall not exceed the maximum temperature recommended by the asphalt binder manufacturer. Maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Project Engineer.

Storing or holding of the HMA in approved storage facilities will be permitted during the daily operation but in no event shall the HMA be held for more than 24 hours. HMA held for more than 24 hours after mixing shall be rejected. Rejected HMA shall be disposed of by the Contractor at no expense to the Contracting Agency. The storage facility shall have an accessible device located at the top of the cone or about the third point. The device shall indicate the amount of material in storage. No HMA shall be accepted from the storage

facility when the HMA in storage is below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift.

5-04.3(8)A Acceptance Sampling and Testing-HMA Mixture

1. General. Acceptance of HMA shall be as provided under statistical evaluation, nonstatistical evaluation or commercial evaluation. Determination of statistical evaluation, nonstatistical evaluation or commercial evaluation shall be based on proposal quantities and shall consider the total of all bid items involving HMA of a specific class.

Dense graded mixes (HMA Classes A, B, E, F, and G) will be evaluated for quality of gradation and asphalt binder content.

Open graded mixes (HMA pavement Class D) will be evaluated for quality of gradation only, based on samples taken from the cold feed.

Nonstatistical Evaluation will be used for HMA.

Statistical Evaluation procedures will apply only to contracts that specify statistical evaluation in the contract Special Provisions.

Statistical Evaluation will be administered under the provisions of Section 5-04.5(1) for Quality Assurance Price Adjustments and evaluation of quality.

Commercial Evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores and other nonstructural applications as approved by the Project Engineer. The contractor shall select a class of HMA appropriate for the required use. The Project Engineer will determine anti-strip requirements for the HMA. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Project Engineer. The proposal quantity of HMA that is accepted by commercial evaluation will be excluded from the quantities used in the determination of statistical and nonstatistical evaluation.

2 Aggregates.

A. General Requirements. Aggregates for HMA shall be manufactured from ledge rock, talus, or gravel in accordance with Section 3-01. The material from which they are made shall meet the following test requirements:

Los Angeles Wear, 500 Revs	30% max
Degradation Factor, Wearing Course	30 min
Degradation Factor, Other Courses	20 min

It shall be uniform in quality, substantially free from wood, roots, bark, extraneous materials, and adherent coatings. The presence of a thin, firmly adhering film of weathered rock will not be considered as coating unless it exists on more than 50% of the surface area of any size between consecutive laboratory sieves.

Aggregate removed from deposits contaminated with various types of wood waste shall be washed, processed, selected or otherwise treated to remove sufficient wood waste so that oven–dried material retained on a U.S. No. 4 sieve shall not contain more than 0.1% by weight of material with a specific gravity less than 1.0.

B. Test Requirements. Aggregate for HMA shall meet the following test requirements:

	Class of HMA					
	A	**B**	**D**	**E**	**F**	**G**
Fracture, by weight (See Note)	1	2	3	4	4	2
Sand Equivalent Min.	45	45	---	45	35	45

[1]The fracture requirements are at least one fractured face on 90 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

[2]The fracture requirements are at least one fractured face on 75 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

[3]The fracture requirements are at least two fractured faces on 75 percent and at least one fractured face on 90 percent of the material retained on each specification sieve, U.S. No. 8 and above, if that sieve retains more than 5 percent of the total sample.

[4]The fracture requirements are at least one fractured face on 50 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

When material is being produced and stockpiled for use on a specific contract or for a future contract, the fracture and sand equivalent requirements shall apply at the time of stockpiling. When material is used from a stockpile that has not been tested as provided above, the requirements for fracture and sand equivalents shall apply at the time of its introduction to the cold feed of the mixing plant.

The properties of the aggregate in a preliminary mix design for HMA shall be such that, when it is combined within the limits set forth in Proportions of Materials and mixed in the laboratory with the designated grade of asphalt binder, HMA mixtures with the following test values can be produced:

	Class of HMA					
	A	**B**	**D**	**E**	**F**	**G**
Stabilometer Value Min.	37	35	---	35	35	35
Cohesiometer Value Min.		100	100	---	100	50 100
Percent Air Voids	2-4.5	2-4.5	---	2-4.5	2-4.5	2-4.5
Modified Lottman Stripping Test	Pass	Pass	Pass	Pass	Pass	Pass

C. Gradation. The materials of which HMA is composed shall be of such sizes, gradings, and quantities that, when proportioned and mixed together, they will produce a well graded mixture within the requirements listed in the table which follows.

The percentages of aggregate refers to completed dry mix, and includes mineral filler when used.

	Grading Requirements				
	Class A and B	**Class D**	**Class E**	**Class F**	**Class G**
Sieve Size	**Percent Passing**				
1-1/4 square	---	---	100	---	---
1 square	---	---	90-100	---	---
¾ square	100	---	---	100	---
⅝ square	---	---	67-86	---	---
½ square	90-100	100	60-80	80-100	100
⅜ square	75-90	97-100	---	---	97-100
U.S. No. 4	46-66	30-50	34-56	38-70	50-78
U.S. No. 8	---	5-15	---	---	---
U.S. No. 10	30-42	---	25-40	30-50	32-53
U.S. No. 40	11-24	---	10-23	---	11-24
U.S. No. 200	3.0-7.0	2.0-5.0	2.0-9.0	2.0-8.0	3.0-7.0

5-04.3(8)B Basis of Acceptance

1. HMA will be accepted based on its conformance to the project mix design.

   Tolerances —The mixture at the time of acceptance shall conform to the range of the proportion specified in the broad band specifications for gradation and the design mix asphalt binder content plus or minus 0.5percent.

2. Hot Mix Asphalt Mixture

   A. Sampling

      1. A sample will not be obtained from either the first or last 25 tons of mix produced in each production shift.

      2. Samples for compliance of gradation and asphalt binder content will be obtained on a random basis from the hauling vehicle. The Contractor shall provide adequate platforms to enable samples to be obtained in accordance with WAQTC FOP for AASHTO T 168. The platforms shall allow the sample to be taken without the Engineer entering the hauling vehicle.

   B. Definition of Sampling Lot and Sublot.

      Sampling and testing for evaluation shall be performed on a random basis at a minimum frequency of one sample for each sublot of 400 tons or each day's production, whichever is least. When proposal quantities exceed 1,200 tons for a class of HMA under nonstatistical evaluation, sublot size shall be determined to the nearest 100 tons to provide not less than three uniform sized sublots, based on proposal quantities, with a maximum sublot size of 800 tons.

   C. Test Results. The Engineer will furnish the Contractor with a copy of the results of all acceptance testing performed in the field at the beginning of the next paving shift.

      1. Rejection by Contractor. The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material at no expense to the Contracting Agency. Any such new material will be sampled, tested, and evaluated for acceptance.

      2. Rejection Without Testing. The Engineer may, without sampling, reject any batch, load, or section of roadway that appears defective in gradation or asphalt binder content. Material rejected

before placement shall not be incorporated into the pavement. Any rejected section of roadway shall be removed.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests that the rejected material be tested. If the contractor elects to have the rejected material tested, a minimum of three representative samples will be obtained and tested. If the mix is found to be within specifications, the city will make payment at the contract unit prices. If the mix is found to be out of specification, no payment will be made and in addition, the contractor will pay all costs for the testing.

3. A Partial Sublot. In addition to the preceding random acceptance sampling and testing, the Engineer may also isolate from a normal sublot any material that is suspected of being defective in gradation or asphalt binder content. Such isolated material will not include an original sample location. A minimum of three random samples of the suspect material will be obtained and tested. Any rejected section of roadway shall be removed, or at the city's option, the roadway may be accepted with a negotiated price adjustment.

5-04.3(9) Spreading and Finishing

The HMA shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) shall be used to distribute the HMA mixture. Unless otherwise directed by the Engineer or specified in the Plans or in the Special Provisions, the nominal compacted depth of any layer of any course shall not exceed the following depths:

HMA Class A and B	0.17	foot (0.25 with engineer approval)
HMA Class G	0.10	foot
HMA Class D	0.08	foot

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

5-04.3(10) Compaction

5-04.3(10)A General

Immediately after the HMA mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted. The

completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, or irregularities and in conformance with the line, grade, and cross-section shown in the Plans or as established by the Engineer. If necessary, the mix design may be altered to achieve desired results.

Compaction shall take place when the HMA is in the proper condition so that no undue displacement, cracking, or shoving occurs. All compaction units shall be operated at the speed, within specification limits, that will produce the required compaction. Areas inaccessible to large compaction equipment shall be compacted by mechanical or hand tampers. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt binder, or is in any way defective, shall be removed and replaced at no additional cost with fresh HMA, which shall be immediately compacted to conform with the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided specification densities are attained. An exception shall be that the pneumatic tired roller shall be used between October 1 and April 1. Coverage's with a vibratory or steel wheel roller must precede pneumatic tired rolling. When HMA Class D is being constructed, the use of pneumatic rollers will not be required.

Vibratory rollers shall not be operated in the vibratory mode when the internal temperature of the HMA is less than 175°F without permission of the Engineer. In no case shall a vibratory roller be operated in a vibratory mode when checking or cracking of the mat occurs at a greater temperature. Vibratory rollers in the vibratory mode are also prohibited on bridge decks.

5-04.3(10)B Control

HMA Classes A, B, E, and F used in traffic lanes, including lanes for ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10 foot, shall be compacted to a minimum of 92 percent of the maximum density as determined by WSDOT Test Method 705.

The city, at its option, may require establishment of a roller pattern. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

5-04.3(12) Joints

The Contractor shall conduct operations such that the placing of the top or wearing course is a continuous operation or as close to continuous as possible.

Unscheduled transverse joints will not be allowed and the roller may pass over the unprotected end of the freshly laid HMA only when the placement of the course must be discontinued for such a length of time that the HMA will cool below compaction temperature. When the work is resumed, the previously compacted HMA shall be cut back to produce a slightly beveled edge for the full thickness of the course.

Where a scheduled transverse joint or when an unscheduled joint that must be left in place after a work shift is being made in the wearing course, strips of heavy wrapping paper shall be used. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course prior to resumption of paving. When the transverse joint will be open to traffic a temporary wedge of HMA shall be constructed 50H: 1V or flatter.

The material that is cut away shall be wasted and new HMA shall be laid against the fresh cut. Rollers or tamping irons shall be used to seal the joint.

The longitudinal joint in any one course shall be offset from the course immediately below by not more than 6 inches nor less than 2 inches. All longitudinal joints constructed in the wearing course shall be located at a lane line or an edge line of the traveled way.
If a hot-lap joint is allowed, two paving machines shall be used; a minimum compacted density in accordance with Section 5-04.3(10) B shall be achieved throughout the traffic lane; and construction equipment other than rollers shall not operate on any uncompacted HMA.

When HMA is placed adjacent to cement concrete pavement, the Contractor shall construct longitudinal joints between the HMA and the cement concrete pavement. The joint shall be sawed to the dimensions shown on Standard Plan A-1 and filled with joint sealant meeting the requirements of Section 9-04.2.

~~***5-04.3(12) Vacant***~~

5-04.3(13) Surface Smoothness

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than [1/8 inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than ¼ inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

1. Removal of material from high places by grinding with an approved grinding machine, or
2. Removal and replacement of the wearing course of HMA, or
3. By other method approved by the Project Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Project Engineer, will not produce satisfactory results, will be removed and replaced. If the Contractor requests, and at the city's option, the roadway may be accepted with a price adjustment. If the city determines that a non-standard section will be retained, the Project Engineer shall deduct from monies due or that may become due to the Contractor, the sum of $500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

When utility appurtenances such as manhole covers and valve boxes are located in the traveled way, the roadway shall be paved before the utility appurtenances are adjusted to the finished grade.

5-04.3(14) Planing Bituminous Pavement

The surface of existing pavements or the top surface of subsurface courses shall be planed to remove irregularities and to produce a smooth surface.

Planing shall be performed in such a manner that the underlying pavement is not torn, broken, or otherwise damaged by the planing operation. The surface of the underlying pavement shall be slightly grooved or roughened sufficiently to ensure a bond when overlaid.

The planings shall become the property of the Contractor and shall be removed from the right-of-way. The planings may be utilized as RAP, within the requirements of Section 5-04.2 or 9-03.21. The Contractor shall dispose of all other debris resulting from the planing operation in a Contractor-provided site off the right-of-way.

For mainline planing operations, the equipment shall have automatic controls, with sensors for either or both sides of the equipment. The controls shall be capable of sensing the proper grade from an outside reference line, or a mat-referencing device. The automatic controls shall also be capable of

maintaining the desired transverse slope. The transverse slope controller shall be capable of maintaining the mandrel at the desired slope (expressed as a percentage) within plus or minus 0.1 percent.

5-04.3(15) HMA Road Approach

HMA approaches shall be constructed at the locations shown in the Plans or where staked by the Project Engineer. The work shall be performed in accordance with Section 5-04.

5-04.3(16) Weather Limitations

HMA for wearing course shall not be placed on any traveled way between October 1 of any year and April 1 of the following year without written approval from the Engineer.

Asphalt for prime coat shall not be applied when the ground temperature is lower than 50°F, without written permission of the Engineer.

HMA Class D shall not be placed when the air temperature is less than 60°F.

HMA shall not be placed on any wet surface, or when the average surface temperatures are less than those specified in the following table, or when weather conditions otherwise prevent the proper handling or finishing of the HMA mixtures:

	Surface Temperature Limitations	
Compacted Thickness (Feet)	**Surface Course**	**Sub-Surface Courses**
Less than 0.10	55 F	55 F
0.10 to 0.20	45 F	35 F
0.21 to 0.35	35 F	35 F
More than 0.35	DNA	25 F*

*Only on dry subgrade, not frozen and when air temperature is rising.

5-04.3(17) Paving Under Traffic

When the roadway being paved is open to traffic, the following requirements shall apply:

Access to business and side streets shall be kept open, except for such time as paving operations require short-term temporary closure. Prior approval of the engineer is required for all scheduled closures and paving procedures.

During paving operations, temporary pavement markings shall be maintained throughout the project. Temporary pavement markings shall

be installed on the roadway prior to opening to traffic. Temporary pavement markings shall be in accordance with Section 8-23.

Unless specified bid items are provided, all costs in connection with performing the work in accordance with these requirements, including the cost of installing and removing temporary pavement markings, shall be included in the unit contract prices for the various bid items involved in the contract.

5-04.3(18) Vacant

5-04.3(19) Sealing of Pavement Surfaces

Where shown in the Plans, the Contractor shall apply a fog seal. Before application of the fog seal all surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. The fog seal shall be CSS-1 or CSS-1h uniformly applied to the pavement free of streaks and bare spots at the rate 0.03 to 0.05 residual gallons per square yard. The emulsified asphalt shall be diluted at a rate of one part water to one part emulsified asphalt unless otherwise directed by the Engineer. The emulsified asphalt shall be applied within the temperature range specified in Section 5-02.3(3). Unless otherwise approved by the Project Engineer, the fog seal shall be applied prior to opening to traffic.

5-04.3(20) Anti-Stripping Additive

When directed by the Engineer, an anti-stripping additive shall be added to the HMA material in accordance with Section 9-02.4.

5-04.4 Measurement

HMA Cl. ___ PG ___ or HMA for ___ Cl. ___ PG ___ or Commercial HMA will be measured by the ton in accordance with Section 1-09.2, with no deduction being made for the weight of asphalt binder, blending sand, mineral filler, or any other component of the HMA. All costs for supply and placement of tack coat, anti-stripping additive, finish grading, water, compaction and all miscellaneous as required to complete the pavement in accordance with the plans and specifications, shall be included in the per ton cost for the HMA.

If the Contractor elects to remove and replace HMA as allowed by Section 5-04.3(8)A, the material removed will not be measured.

No specific unit of measure will apply to the force account item of Crack Sealing.

Soil Residual Herbicide will be measured by the mile for the stated width to the nearest .01 mile or by the square yard, whichever is designated in the proposal.

Pavement Repair. Pavement repair will be completed per the requirements of city standards Section 2-29 or the contract Special Provisions.

Asphalt for Prime Coat will be measured by the ton in accordance with Section 1-09.2.

Prime Coat Aggregate will be measured by the cubic yard, truck measure, or by the ton, whichever is designated in the proposal.

Asphalt For Fog Seal will be measured by the ton, before dilution, in accordance with Section 1-09.2.

Longitudinal joint seals between the HMA and cement concrete pavement will be measured by the linear foot along the line and slope of the completed joint seal.

Planing Bituminous Pavement will be measured by the square yard.

Temporary Pavement Marking installation and removal will not be separately measured unless specifically provided for in the bid proposal, all costs for temporary pavement marking shall be included in the lump sum traffic control bid item.

SWSS Section 8-23.4 and 8-23.5 for measurement and payment of Temporary Pavement Markings is hereby deleted.

No specific unit of measure will apply to the calculated item of Anti-Stripping Additive.

5-04.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following bid items that are included in the proposal:

"HMA Cl. ___ PG ___", per ton.
“HMA for Approach Cl. ___ PG ___", per ton.
“HMA for Preleveling Cl. ___ PG ___", per ton.
“The unit contract price per ton for "HMA Cl. ___ PG ___", “HMA for Approach Cl. ___ PG ___", and “HMA for Preleveling Cl. ___ PG ___", shall be full compensation for all costs incurred to carry out the requirements of Section 5-04 except for those costs included in other items which are included in this sub-section and which are included in the proposal. If a separate bid item is not provided for approach and preleveling pavement, all costs for the required paving shall be included in the unit id item for “HMA Cl. ___ PG ___” per ton.

“Preparation of Untreated Roadway”, per mile.

The unit contract price per mile for “Preparation of Untreated Roadway” shall be full pay for all work described under Section 5-04.3(5)B, with the exception, however, that all costs involved in patching the roadway prior to placement of HMA shall be included in the unit contract price Per square yard for pavement restoration, as provided for in the bid proposal. If the proposal does not include a bid item for “Preparation of Untreated Roadway”, the roadway shall be prepared as specified, but the work shall be included in the contract prices of the other items of work.

All costs for asphalt tack coat shall be included in the unit contract price per ton of the HMA.

“Crack Sealing”,
The linear foot, or lump sum as provided for in the bid proposal.

“Soil Residual Herbicide ____ ft. Wide,” per mile, or
“Soil Residual Herbicide”, per square yard.
The unit contract price per mile or per square yard for “Soil Residual Herbicide” shall be full payment for all costs incurred to obtain, provide and install herbicide in accordance with Section 5-04.3(5)D.

Pavement Repair Excavation Incl. Haul. All costs for “Pavement Repair Excavation Incl. Haul” shall be included in the unit contract price per square yard for “Pavement Restoration”.

“Asphalt for Prime Coat”, per ton.
The unit contract price per ton for “Asphalt for Prime Coat” shall be full payment for all costs incurred to obtain, provide and install the material in accordance with Section 5-04.3(5)B.

“Prime Coat Aggregate”, per cubic yard, or per ton.
The unit contract price per cubic yard or per ton for “Prime Coat Agg.” shall be full pay for furnishing, loading, and hauling aggregate to the place of deposit and spreading the aggregate in the quantities required by the Engineer.
"Asphalt for Fog Seal", per ton.

The unit contract price per ton for "Asphalt for Fog Seal" shall be full pay for all costs of material, labor, tools, and equipment necessary for the application of the fog seal as specified. If there is no bid item and a fog seal is required, it shall be applied and the work shall be included in the unit contract prices of the other work items.
“Longitudinal Joint Seal”, per linear foot.
The unit contract price per linear foot for “Longitudinal Joint Seal” shall be full payment for all costs incurred to perform the work described in Section 5-04.3(12).

"Planing Bituminous Pavement", per square yard.
The unit contract price per square yard for "Planing Bituminous Pavement" shall be full payment for all costs incurred to perform the work described in Section 5-04.3(14).

Temporary Pavement Marking
All costs for supplying, placing and removing Temporary Pavement Marking shall be included in the lump sum bid item for "Traffic Control".

Water
For city-administered contracts, the city will supply water at the nearest source, at no cost to the contractor. All costs for loading, hauling and spreading water shall be incorporated in other bid items as provided for in the bid proposal.
Anti-Stripping Additive Anti-Stripping Additive When the contractor's mix design requires all costs shall be incorporated in the unit bid item for the HMA utilized.

2-9 WEIGHING

Equipment for the weighing of crushed stone surfacing materials and bituminous surfacing materials shall be in accordance with SWSS Section 1-09.2 Weighing Equipment, and shall also include the use of commercially owned scales that are approved by the Engineer.

All scales used shall be tested and sealed at the expense of the Contractor.

For each load, the Contractor shall furnish the Engineer with a weigh ticket at the point of delivery. The Contractor shall furnish a copy of daily bunker sheets on request by the Engineer at the end of each day's operation.

2-10 CONCRETE CURB AND GUTTER

2-10.01 GENERAL

Where shown on the plans, the Contractor shall construct integral curb and gutter as shown on the City of Kennewick Standard Drawing 2-10.

The Contractor shall mark the face of the concrete curb with an "S" for all sewer services, "W" for all water service lines, "C" on all conduit and utility crossings, "I" for irrigation crossings, and "E" on all street lighting conduit at the locations where such newly constructed or known existing underground lines and conduits cross the new curb line. The letters shall be one and one-half inch (1-1/2") minimum size letters and carefully stamped with an embossed tool. The Contractor shall exercise care in preventing the loss of the location of service lines during construction. The cost of marking the water and sewer crossing points on the curb shall be incidental to "Concrete Curb and Gutter".

2-10.02 MATERIALS AND CONSTRUCTION

Concrete materials shall meet the strength requirements as set forth in the City of Kennewick Standard Drawing 2-13, Class 5. Construction shall be in conformance with SWSS Section 8-04.3 and as herein modified. Cement concrete curb and gutter shall be provided with through cut joints at ten (10) foot centers. One-half (1/2") mastic material shall be placed full depth in the curb and gutter at the points of tangency on all curb returns. Cold weather protection shall be provided per SWSS Section 5-05.3(14).

All beginning joints and at all points of terminus on curb and gutter, the contractor shall place a one half-inch (1/2") mastic. A bull nose shall be installed at all terminal end points. The concrete bullnose will be typically 18-inches long with the end sloped at a 45 degree angle.
The commercial mix concrete mix design shall be provided to the engineer a minimum of one work day prior to the proposed use. The mix design will be subject to approval of the Engineer.

Immediately after the finish of operations has been completed, the Contractor shall apply curing compound to the exposed surfaces in accordance with SWSS Section 5-05.3(13) A.
Transparent curing compounds shall meet the following requirements:

> The compound shall be a liquid that, at the time of application, is free from suspended matter. It shall be sufficiently low in viscosity to result in an even, uniform coating when applied by spraying.
>
> The compound shall be sufficiently transparent and free from permanent color to result in no pronounced change in color from that of the natural concrete at the conclusion of the curing period. The compound shall, however, contain a dye of color strength sufficient to render the film distinctly visible on the concrete for a period of at least four hours after application. Application rate and type of compound shall be subject to the approval of the Engineer.

When tested for moisture retaining effectiveness by the WSDOT "Test for Moisture Reading Effectiveness of Concrete Curing Compounds", the loss of moisture shall not exceed two grams per specimen.

2-10.03 MEASUREMENT AND PAYMENT

Measurement shall be made along the length of curb, including driveway depressed curb, radii and ADA ramp curbs.

The unit contract price for "Concrete Curb and Gutter," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals required to

perform the work in accordance with the plans and specifications or as directed by the Engineer.

2-11 CONCRETE DRIVEWAY

2-11.01 GENERAL

The Contractor shall construct cement concrete driveways where shown on the plans or as directed by the Engineer. The concrete driveways are defined as that portion of the concrete sidewalks along the curb, which is depressed for use as a driveway. Driveways will be field staked by the Engineer at the time of construction. All construction shall be in accordance with SWSS Section 8-14., except as modified by City of Kennewick Standard Drawing 2-10.

2-11.02 MEASUREMENT AND PAYMENT

Measurement for "Concrete Driveway", per linear foot, from top of transition to top of transition, shall include the driveway-sidewalk section only. Depressed curb in front of the driveway section will be included under "Concrete Curb and Gutter" bid items.

The unit concrete price for "Concrete Driveway", per linear foot, shall be full compensation for all labor, equipment, and all other incidentals required to construct the driveway in accordance with the plans and specifications or as directed by the Engineer.

2-12 CONCRETE SIDEWALK

2-12.01 GENERAL

Where shown on the plans, the Contractor shall construct cement concrete sidewalks in accordance with SWSS Section 8-14.3, except as modified, by the City of Kennewick Standard Drawings.

At the termination points of new curb, gutter, and sidewalk, the Contractor shall construct an asphalt concrete pavement ramp from the top of the sidewalk to the existing ground surface.

2-12.02 MEASUREMENT AND PAYMENT

Measurement and payment for "Concrete Sidewalk," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer. Sidewalk within concrete driveways and asphalt ramps at terminal end points shall be measured and paid separately, as per Section 2-11.02 and 2-24.02 of these specifications.

2-13 PEDESTRIAN RAMPS

2-13.01 GENERAL

Unless specifically directed otherwise by the Engineer, the Contractor shall construct pedestrian access ramps, in accordance with the City of Kennewick Standard Drawings, and as otherwise required to meet the requirements of the Americans with Disabilities Act (ADA). For access ramp construction on streets with grades steeper than 8% and where unusual obstacles prevent the construction of a standard ramp, the contractor/developer/engineer should reference the following web site, http://www.access-board.gov/prowac/alterations/guide.htm#slope. ADA ramps are required at all curb radii, street crossings, and in traffic islands where the traffic island interferes with normal pedestrian traffic. Unless otherwise provided for in the bid proposal and with the exception of the "Truncated Domes", all costs for ramps shall be incidental to sidewalk and curb construction.

2-13.02 TRUNCATED DOMES

Truncated domes on new concrete construction shall be WSDOT approved and shall be preformed fiberglass, masonry, or concrete tiles, per the applicable portions of SWSS Section 8-14.3(3).
Retrofit truncated domes shall be WSDOT product approved and in addition must meet the following requirements and provide the specified five year product and installation warranty.

Glue down and hot melt products shall be WSDOT approved and in addition shall contain an ultra-violet stabilized coating. The surface applied tiles shall be guaranteed in writing for a period of five (5) years from the date of final contract acceptance (final completion), against defective work, separation, breakage, cracking, deformation, discoloration (fading) and loosening or separation of tiles. Prior to ordering, the contractor shall provide three copies of the product submittals, which will include the manufacturer's product specifications, preparation and installation instructions and verification that the specified five year written warranty will be provided to the city.

2-13.03 INSTALLATION

All preparation of the concrete surface, application procedures, glue, rivets, heat application, perimeter seals and final product installation shall fully meet the requirements of the product manufacturer installation specifications, which must include or exceed the herein minimum requirements.

The installer must be experienced and certified by the product manufacturer for installation of their product. The concrete surface will be cleaned with a diamond cup grinder, or shot blaster and any defects repaired per the manufacturer's requirements. For glue down products, fasteners shall be supplied by the same manufacturer as the tile

product used and installed in full accordance with the manufacturer's spacing and installation requirements.

For hot melt products, temperature gauges and installation support equipment shall be provided that fully comply with the manufacturer's installation, equipment and monitoring requirements.

2-13.04 MEASUREMENT AND PAYMENT

All depressed cement concrete curb and gutter, together with sidewalk required to construct the pedestrian ramp, shall be paid for "Concrete Curb and Gutter", per linear foot, and for "Concrete Sidewalk," per linear foot, respectively, and shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer.

The unit contract price per each, for each designated size of "ADA Truncated Dome", shall be full compensation for all labor, equipment and materials as required to complete the Truncated Dome.

2-14 HMA PATCHING BEHIND THE SIDEWALK

2-14.01 GENERAL

As indicated on the plans or as directed by the Engineer, the Contractor shall grade, slope, and patch between the back of the new sidewalk or driveway section and existing paved private walks, parking areas and driveways with HMA pavement, to ensure a smooth transition between the existing and new installations.

2-14.02 MATERIALS

The top course, base course and HMA pavement shall be as specified under Sections 2-6, 2-7 and 2-8 of these Roadway Specifications.

2-14.03 MEASUREMENT AND PAYMENT

The unit contract price for "HMA Patching Behind Sidewalk," per square yard, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer.

2-15 MONUMENT

2-15.01 GENERAL

The Contractor shall install monuments at the locations indicated on the plans. The monuments shall be in accordance with the City of Kennewick standard Drawing 2-8.

2-15.02 MEASUREMENT AND PAYMENT

The unit contract price for "Install Monument," per each, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer.

2-16 CURB AND GUTTER REMOVAL

2-16.01 GENERAL

Where shown on the plans or as directed by the Engineer, and when required for design changes and for added driveways, the Contractor shall saw cut and remove the existing curb and gutter as identified. All waste materials shall be removed from the project and disposed of at a site provided by the Contractor.

2-16.02 MEASUREMENT AND PAYMENT

The unit contract price for "Curb and Gutter Removal," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications, or as required to make revisions as directed by the Engineer.

2-17 SIDEWALK/DRIVEWAY REMOVAL

2-17.01 GENERAL

Where shown on the plans or as directed by the Engineer and where required for design changes, the Contractor shall saw cut and remove the existing sidewalk and driveways. All waste material shall be removed from the project and disposed of at a site to be provided by the Contractor.

2-17.02 MEASUREMENT AND PAYMENT

The unit contract price for "Sidewalk/Driveway removal," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals required to

perform the work in accordance with the plans and specifications, or as required to make revisions as directed by the Engineer.

2-18 ADJUST NEW AND EXISTING UTILITIES TO GRADE

2-18.01 GENERAL

All new and existing water valve boxes, manhole rings and covers, catch basin rings and grates, sewer cleanouts, and any other castings within the work area shall be referenced by the Contractor per Section 2-1.03 of these specifications. In those instances where existing manholes are required to be lowered, and adequate adjustment rings are not available, the Contractor shall excavate and remove a section of manhole and provide adjustment rings, a replacement section, and cone or flat top as required for lowering. After the placement of the final finished lift of asphalt pavement, adjust all utility covers to the finished pavement grade. When located out of the pavement, the casting shall be adjusted and a concrete collar placed. The casting shall be adjusted in accordance with the City of Kennewick Standard Drawing 3-4, or as directed by the Engineer.

2-18.02 MATERIALS AND CONSTRUCTION

The existing pavement shall be cut neatly around the cast iron frame. The existing asphalt and road base materials shall be removed and the cast iron frame adjusted to finished grade by the use of concrete adjusting rings as shown on the City of Kennewick Standard Drawing 3-4. All road base rock materials and native subgrade materials removed during the adjustment of the castings to grade shall be replaced with concrete. Concrete shall be protected for a minimum of 16 hours prior to placement of the asphaltic concrete pavement patch. A shorter time period may be granted by the Engineer if traffic conditions warrant that a shorter time would be to the benefit of the City. On arterial streets that are open to traffic, a concrete mix, which will obtain a minimum 1000 psi within four hours, shall be used and a minimum four hour cure time provided. On arterial streets, the HMA Class G PG 64-28 patch will be placed and barricades removed prior to the end of the daylight hours.

2-18.03 MEASUREMENT AND PAYMENT

Measurement and payment for "Adjust Monument, Manhole, Water Valve Box, Catch Basin," and any other casting adjustment shall be on a per each basis, and shall be full compensation for cutting and removing asphalt, adjusting blocks or rings, resetting new and existing frames to finished grade, replacing frames damaged during construction, placing concrete, grouting as required, labor, equipment, materials, and all other incidental work required to complete the work in accordance with the plans and specifications or as directed by the Engineer.

When the contractor is directed to supply new materials and remove and replace substandard valve boxes or misaligned existing valve boxes, or to replace substandard

manhole rings and covers, the measurement and payment for “Remove, replace and adjust existing valve box” and “remove, replace and adjust existing manhole ring and cover” shall be full compensation for all costs to supply city standard valve box bottom, top section and cover, or manhole ring and cover, deliver the salvaged materials to the city shops on 10th Avenue, and adjust the casting to finish grade as above specified.

The unit contract price for "Lower Existing Manhole", per each, shall be full compensation for furnishing all labor, materials, equipment, excavation, backfill, salvage and all other incidentals required to lower an existing manhole where adequate adjustment rings are not available, as specified herein and as directed by the Engineer. A separate measurement and payment will be made on completion of paving for adjusting existing casting to grade for those manholes previously lowered.

2-19 PUD CONDUIT TRENCH EXCAVATION AND BACKFILL

2-19.01 GENERAL

When called for in the contract special provisions, or when called for on the contract plans, the Contractor shall provide all trench excavation, bedding and backfill for the Benton County Public Utility District (PUD).

2-19.02 TRENCH EXCAVATION AND BACKFILL

Trench excavation for PUD conduit installations shall provide for a minimum of thirty inches (30") of cover material over the top of the finished conduit grade.

Trench backfill material shall be compacted by means chosen by the Contractor to achieve a minimum of 95 percent maximum density and as herein modified. Compaction shall be completed in such a manner as to preclude future settlement.

2-19.03 MEASUREMENT AND PAYMENT

The unit contract price for "PUD Conduit Trench Excavation, Bedding and Backfill," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer.

2-20 INSTALL BARRICADE

2-20.01 GENERAL

The Contractor shall furnish and install a Type III Barricade when directed by the engineer, or required for traffic safety, in accordance with the current MUTCD, Section 6F-5F.

2-20.02 MEASUREMENT AND PAYMENT

When a separate bid item is included in the bid proposal, the unit contract price for "Install Type III Barricade", per each, shall be full compensation for all labor, equipment, materials, and all other incidentals required to complete the work in accordance with the plans and specifications or as directed by the Engineer.

2-21 INSTALL END-OF-ROAD MARKER

2-21.01 GENERAL

The Contractor shall furnish and install the 18-inch diamond reflectorized red panel end-of-road marker, as directed by the engineer, or as shown on the construction plans. The installation shall be in accordance with the City of Kennewick Standard Drawing 7-4.

2-21.02 MEASUREMENT AND PAYMENT

The unit contract price for "Install End-of-Road Marker," per each, shall be full compensation for all labor, equipment, and materials required to complete the work in accordance with the plans and specifications, or as directed by the Engineer.

2-22 SOIL RESIDUAL HERBICIDE

2-22.01 GENERAL

In all areas where sagebrush, alfalfa and crab grass previously existed, or where called for on the plans, special provisions, or directed by the Engineer, the Contractor shall apply one application of an approved soil residual herbicide to prevent vegetation damage to the asphalt pavement. The soil residual herbicide to be used shall not have a detrimental chemical reaction to the asphalt pavement or damage the pavement. Application of the herbicide shall be a uniform spray in accordance with the manufacturer's recommendations and applied by a certified licensed applicator.

Prior to beginning clearing and grubbing, the Contractor shall investigate the work site to determine whether a direct contact herbicide such as Round-Up will be required in addition to the herbicide, to kill deep rooted foliage, such as alfalfa and sagebrush.

Applications shall be made as needed to kill the vegetation. The specified soil residual herbicide shall be applied to the finish graded top rock, just prior to paving.

The material to be used must be registered for use under pavement in the state of Washington by the Washington State Department of Agriculture. Before use, the Contractor shall submit to the Engineer and obtain approval of the material to be used and the proposed rate of application. The following information shall be included in the request for approval of the material: name of material, state registration number, manufacturer, and proposed rate of application.

Soil residual herbicide placement shall be performed in accordance with SWSS 5-04.3(5)D as herein modified.

2-22.02 MEASUREMENT AND PAYMENT

The unit contract price for "Soil Sterilant," per acre, shall be full compensation for furnishing all materials, labor, equipment, and all other incidentals required to complete the work in accordance with the plans and specifications or as directed by the Engineer.

2-23 EXTRUDED CONCRETE CURB

2-23.01 GENERAL

Extruded concrete curb shall be installed where shown and as detailed on the plans or as directed by the Engineer.

2-23.02 MATERIALS AND CONSTRUCTION

All materials and construction shall be in accordance with the City of Kennewick Standard Drawing 2-11 and SWSS Section 8-04.3 as herein modified.

When required to provide for continuous storm drain passage, construct a two-inch (2”) wide “V” section at twenty (20) foot intervals.

2-23.03 MEASUREMENT AND PAYMENT

The unit contract price for "Extruded Concrete Curb," per linear foot, shall be full compensation for all labor, equipment, materials, and all other incidentals necessary for complete installation in accordance with the plans and specifications or as directed by the Engineer.

2-24 SIDEWALK ASPHALT RAMP

2-24.01 GENERAL

At all terminal end points of concrete sidewalks, the Contractor shall construct an asphaltic concrete ramp as per City of Kennewick Standard Drawing 2-14. Maximum slope on the ramp shall be 12:1.

2-24.02 MEASUREMENT AND PAYMENT

The unit contract price for "Sidewalk Asphalt Ramp", per each, shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to construct the sidewalk asphalt ramps in accordance with the plans and specifications or as directed by the Engineer.

2-25 REMOVAL OF EXISTING STREET SIGNS

2-25.01 GENERAL

Traffic control measures shall be completed per Section 7 of these specifications. Prior to beginning roadway construction, all signing and traffic control shall be in place and approved by the Engineer. Following completion of the installation of all required construction signing, detour signing, temporary stop signs, or other signing required by the traffic control plan or Engineer, the Contractor shall notify the inspector and receive approval for removal of the existing city signs and posts. When approved for removal, the Contractor shall remove all signs and sign posts in the work area. Each sign shall be removed from its post, prior to removal of the post. All Telespar posts and bases, sign faces and mounting hardware shall be delivered to the City sign shop at 1010 E. Chemical Drive for storage, or city salvage. All other materials and sign components shall be disposed of at a contractor provided site. The Contractor shall be fully responsible for all damage to the city signs as a result of his operations.

2-26 PROTECTION OF SEWER AND STORM SEWER MANHOLES

2-26.01 MANHOLE PROTECTION

Prior to beginning street reconstruction, which includes pavement removal, grading or excavation work in the vicinity of City sewer and storm sewer manholes, the Contractor shall install a 3/4-inch plywood, steel plate, or equal, cover at the bottom of the manhole over the channels. The protective manhole channelization cover shall be fully capable of preventing construction debris from entering the sewer or storm sewer channel or piping. This protective measure shall be in addition to covers placed over the upper manhole cover or sections.

All costs for repair and damages as a result of sewer blockages that result from improper protection of the manhole by the contractor, are the responsibility of the contractor and will be billed to the contractor. In addition, when city crews are called and required to clean the sewer main, or manhole(s) as a result of the contractor's improper protection of the manhole, the contractor will be billed for the city's maintenance costs.

Following completion of paving and adjustments, all collected debris and protective covers shall be removed by the Contractor. All labor, equipment and materials as required to complete the specified work shall be considered incidental to the other project work.

2-27 CATCH BASIN PROTECTION

2-27.01 GENERAL

All existing and new catch basins on the project shall be protected by a manufactured sediment trap. The manufactured sediment trap shall be the "ultra drain guard" sediment only model 9226, as manufactured by BMP, or the sediment insert as manufactured by Specialty Products L.L.C., or equals. The trap shall be manufactured for the removal of dirt, sand and other sediment from stormwater using a minimum 8 oz. per square yard 180 EX non-woven polypropylene geotextile fabric, or approved equal. The trap shall have a round, or square shaped top, designed to insert under the catch basin grate, without folding. The sediment trap shall extend into the catch basin a minimum of 24-inches. Following placement, the excess fabric shall be trimmed approximately three inches outside of the grate.

On city administered contracts, the Contractor shall supply and install a manufactured sediment trap in each catch basin and secure the top under the grate of all existing and new catch basins on the project and downstream as directed by the Engineer. The top edges of the fabric shall be firmly sealed under the grate. Following completion of the construction project, the Contractor shall remove the sediment trap from all catch basins and clean the catch basin sumps.

On developer and permit projects, catch basins shall be protected as specified above. Where site work, building construction, home construction, etc. will be proceeding after the street construction is completed, the street contractor shall remove the initial sediment trap and reinstall a clean sediment trap, following cleaning of the catch basin sump. The initial sediment trap may be cleaned and reinstalled, providing that it is free of tears and holes.

Following completion of the street construction and during lot development and building construction, the building contractor(s) will be required to provide silt fences, and place course graded crushed ballast rock at the back of the driveway entrances, as required to keep dirt knocked off of vehicle tires and take other measures as required to maintain a clean street. When dirt does accumulate in the street or parking lot, the contractor will be

required to periodically shovel and sweep the pavement, as his operation requires. Failure of the builder to safeguard the street and other pavement areas, will require the builder to clean and maintain the catch basin filters contaminated by his activities; and in addition, if the builder fails to maintain the site as herein described, a building stop work order may be issued, or if the city crews, or city hired contractor is required to clean up after the builder's activities, the builder will be billed for the city's clean up costs.

Following completion of the majority of the building activity in each development, the city Street Department will remove the filter traps from all catch basins.

2-28 ROADSIDE SEEDING

2-28.01 GENERAL

These specifications cover the furnishing and application of roadside planting materials on construction side slopes, waste site areas, and where directed by the Engineer. The purpose of which is to eliminate wind-born dust and blow-sand problems associated with construction projects and to stabilize and protect such areas.

2-28.02 SEED MIX SPECIFICATION

Grass seed, of the following composition, proportion and quality, shall be applied at the rate of forty-five (45) pounds per acre on all areas requiring roadside seeding within the project:

KIND AND VARIETY OF SEED IN MIXTURE	LBS. PER ACRE	MINIMUM % SEED	MINIMUM % GERMINATION
"Fairway" Crested Wheat Grass (Agropyron Cristatum)	27	54.00	85
"Durar" Hard Fescus (Festuca Ovina Duriuscal)	13.5	28.50	85
Perennial Ryegrass (Lolium Perenne)	4.5	9.80	90
Percent Weed Seed (Max) (Weedy Bromus Species- 1% Max.)		2.00	
Inert and Other Crop		5.70	
TOTAL	45 lbs.	100.00	

The seed supplier's recommendations for planting shall be followed in all work related to the seeding operation. The Contractor shall also be required to follow the appropriate subsections of the SWSS, Section 9-14 that pertain to the general practice of seeding operations of this type.

The Contractor shall be responsible for the case and maintenance of the seeded areas through the duration of the project, and/or until the seed has germinated and is in an active and vigorous state of growth.

2-28.03 FERTILIZER

Fertilizer shall be in accordance with the SWSS, Section 9-14.3 and in addition the SWSS, Section 9-14.3 shall be supplemented with the following:

The Contractor shall apply sufficient quantities of Fertilizer to supply the following amounts of nutrients:

Total Nitrogen as N-30 pounds per acre

Phosphoric Acid as P 0-30 pounds per acre

Soluble Potash as K 0-30 pounds per acre

The fertilizer formulation and application rate shall be approved by the Engineer before use.

2-28.04 MULCH AND SEED APPLICATION

Wood Cellulose fiber shall be applied at a rate of one (1) ton per acre to all areas seeded and fertilized.

2-28.05 MEASUREMENT AND PAYMENT

The unit contract price for "Roadside Seeding," per acre, shall be considered full compensation for all labor, equipment, materials, water, and all other incidentals required to seed, fertilize, and mulch the designated areas complete.

2-29 PAVEMENT REPAIR

2-29.01 PAVEMENT PATCHING

2-29.01.01 General

Pavement patching shall include the removal and replacement of sections of rough or deteriorated paved surfaces, which require repair prior to being overlayed with HMA pavement.

Where shown on the plans or as directed by the Engineer, the Contractor shall neat cut the existing pavement surfacing a minimum of six inches (6") outside the edges of the damaged surface to be removed. All pavement cuts shall be squared up so that the marginal lines of the patch will be defined with typically four straight edges, with vertical faces. Cuts will be made with a concrete saw, cutting wheel, jack hammer, or similar device that will provide neat, straight, vertical edges. The deteriorated asphalt, together with any unsatisfactory native or base materials, shall be broken up, loaded, hauled away, and disposed of by the Contractor at a disposal site secured by the Contractor.

If the base material is acceptable to the engineer, top course shall be added as required and the patch area recompacted to standard specification density. If the base is determined to be contaminated, or structurally unsound, the subgrade within the patch area shall be prepared in accordance with SWSS 2-06 and as herein modified unless otherwise provided by the contract special provisions. When required by the engineer, the contractor will excavate to subgrade and haul and dispose of all excavated material to a contractor provided waste site. The subgrade shall be graded and compacted to standard density and as required to provide for the placement of six inches (6") of five-eighth inch (5/8") minus crushed rock and two inches (2") of HMA Class A PG64-28 pavement, on all neighborhood streets and a minimum of nine inches (9") of 5/8 inch minus crushed rock and three (3") of HMA Class A PG64-28 (2 lifts) on all other streets.

2-29.01.02 Measurement and Payment

The unit contract price for "____-inch HMA patching and for "_____ - inch HMA Patching w/ _____ - inch top course rock", shall be full compensation for furnishing all labor, materials, equipment and all other incidentals required to complete the work as specified or as directed by the Engineer.

2-29.02 TRENCH PATCHING

2-29.02.01 General

Trench patching will consist of the restoration of paved surfaces, where a utility will be installed. The contractor shall cut and dispose of the pavement in the pavement trench

limits as specified in Section 2-29.01.01, to the minimum width as specified in City Standard Drawing 4-7. Following completion of the backfill and placement and compaction of the new rock base, per the requirements of Standard Drawing 2-6, the pavement cuts will be reinspected. Pavement edges that have raveled, broken away, or otherwise been damaged, shall be recut to provide a uniform and straight edge prior to paving. At the determination of the engineer and depending on the length of the trench, small isolated damage areas may be squared up on the edge of the trench without recutting of the entire trench length.

2-29.02.02 Measurement and Payment

Payment for the specified depth of pavement restoration, will be made at the unit contract price, per linear foot for " ____ - inch trench pavement restoration", and shall be full compensation for all labor, equipment and materials as required to remove, dispose of and restore the pavement and rock base, to the width required for the installation and trench pavement repair, in accordance with the specifications and the requirements of City Standard Drawing 2-6.

2-30 CRACK SEALANT

2-30.01 GENERAL

Crack sealant shall be installed in accordance with Section 5-04.3(5) C of the State of Washington Standard Specifications, except as herein modified, and the manufacturers recommendations. Materials shall meet the requirements of Section 9-04.10 of the State When called for in the contract, or when directed by the engineer, sealant shall be applied at all cracks greater than 1/8 – inch, including joints at street-cut patches, utility adjustments and at the joint between the pavement and the concrete curb and gutter. Cracks shall be cleaned using a compressed hot air/propane lance capable of burning off vegetation, heating and blowing the crack clear. The sealant shall be squeegee flushed with the pavement and allowed to cure, prior to removing traffic control. Crack sealant shall not be applied to alligatored pavement, except for minor areas adjoining a crack being sealed, unless alligatored pavement sealing is required by the contract special provisions.

2-30.02 TRAFFIC CONTROL

The contractor shall provide traffic control per City of Kennewick Standard Specifications Section 7. The contractor shall conduct his operations so as to maintain two-way traffic at all times.

2-30.03 NOTIFICATIONS

The contractor shall provide written notification to businesses and property owners a minimum of 24 hours, and a maximum of 72 hours, in advance of commencing crack

sealing operations or blocking parking areas at any of the project locations. The notices shall provide a brief explanation of the scope of work and the name and phone number of a contractor contact person. The Contractor shall provide barricades, cones, etc. as required for parking area closures following distribution of notices. All costs for providing and distributing notices, and for providing and erecting barricades, cones, etc. for parking area closures shall be included in the lump sum contract price for "Traffic Control".

2-30.04 TAXES

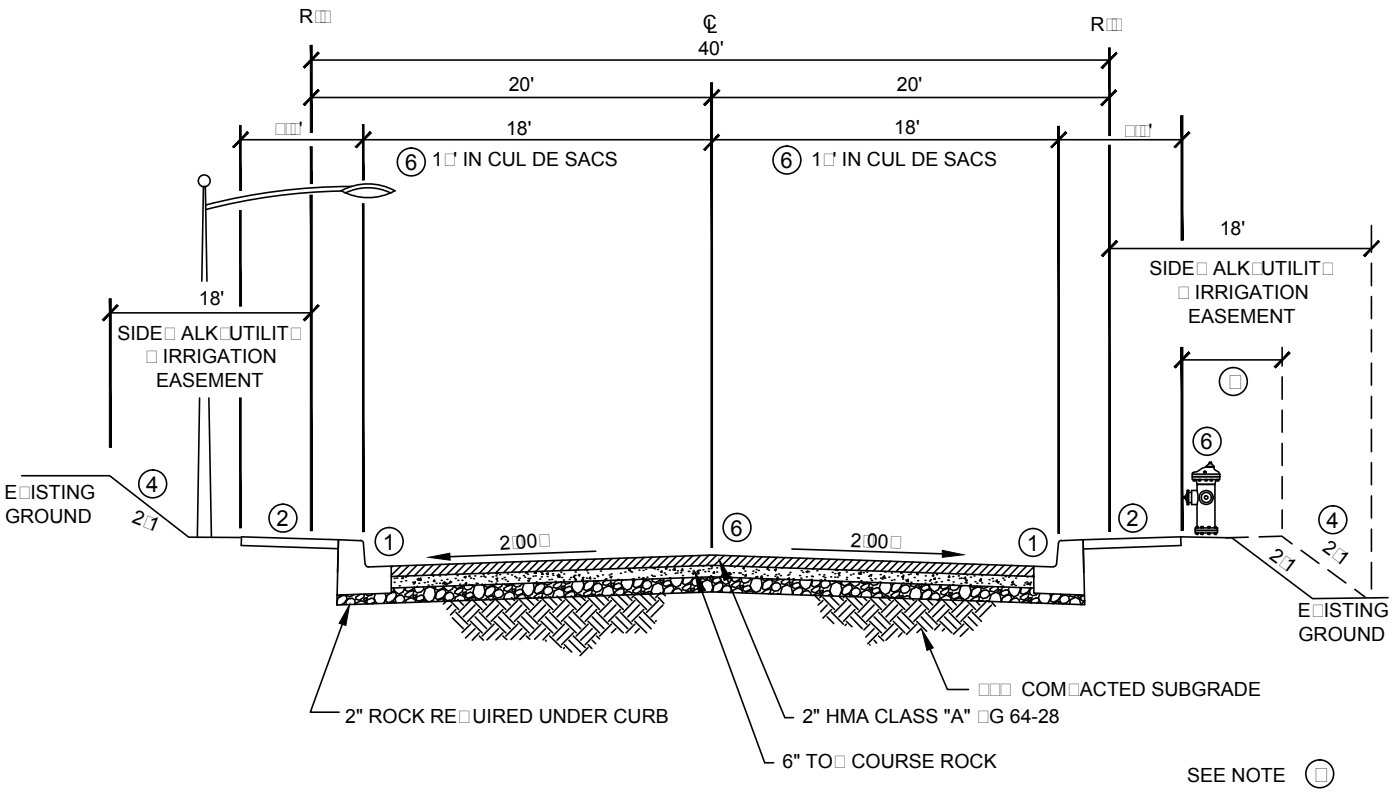
The City of Kennewick is exempt from paying sales tax for crack sealing. The contractor shall include applicable use taxes into the unit bid prices as provided in the bid proposal.

2-30.05 MEASUREMENT

Measurement for "Crack Sealant", shall be made along the centerline of the specified streets. The Contractor shall make all site investigations necessary as to the quantity of crack sealing to be performed at each location.

2-30.06 PAYMENT

The unit contract price, per mile of street for "Crack Sealant" shall be full compensation for all labor, equipment, materials and all incidentals required to install crack sealant in accordance with the manufacturers recommendations, the State of Washington Standard Specifications and these special provisions.



NOTES□

① CONCRETE CURB □ GUTTER

② CONCRETE SIDE□ ALK

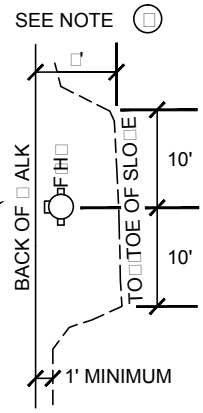
□ MINIMUM 1' FROM BACK OF □ ALK AT FIRE H□DRANTS□INCREASE TOE OR TO□ OF SLO□E TO □' FOR A DISTANCE OF 10' ON EACH SIDE OF FIRE H□DRANT □SEE D□ G□

④ SLO□E TO BE FLATTENED TO A MINIMUM OF 6:1 □OR AS DIRECTED B□ ENGINEER□IN DEVELO□ED LANDSCA□E AREAS

□ DESIGN ON ALL STREETS□OTHER THAN MINOR LOO□ STREETS□THE MINIMUM CENTERLINE RADIUS SHALL BE 200' UNLESS OTHER□ ISE A□□ROVED B□ THE CIT□ ENGINEER□ON MINOR LOO□ STREETS□□ HERE THE STREET MAKES A 90° PLUS OR MINUS 5° TURN, THE MINIMUM CENTERLINE RADIUS SHALL BE □0'□ON ALL OTHER MINOR LOO□ STREET CURVES□THE MINIMUM CENTERLINE RADIUS SHALL BE 1□0'□THE MA□IMUM STREET GRADE SHALL NOT E□CEED 12□ UNLESS A□□ROVED B□ THE CIT□ ENGINEER□

⑥ FOR CUL-DE-SACS□SEE SHEET □□

□ FOR STREET TREES□SEE SHEET 2□NOTE 2□



RESIDENTIAL/LOCAL STREETS
ALTERNATIVE 1

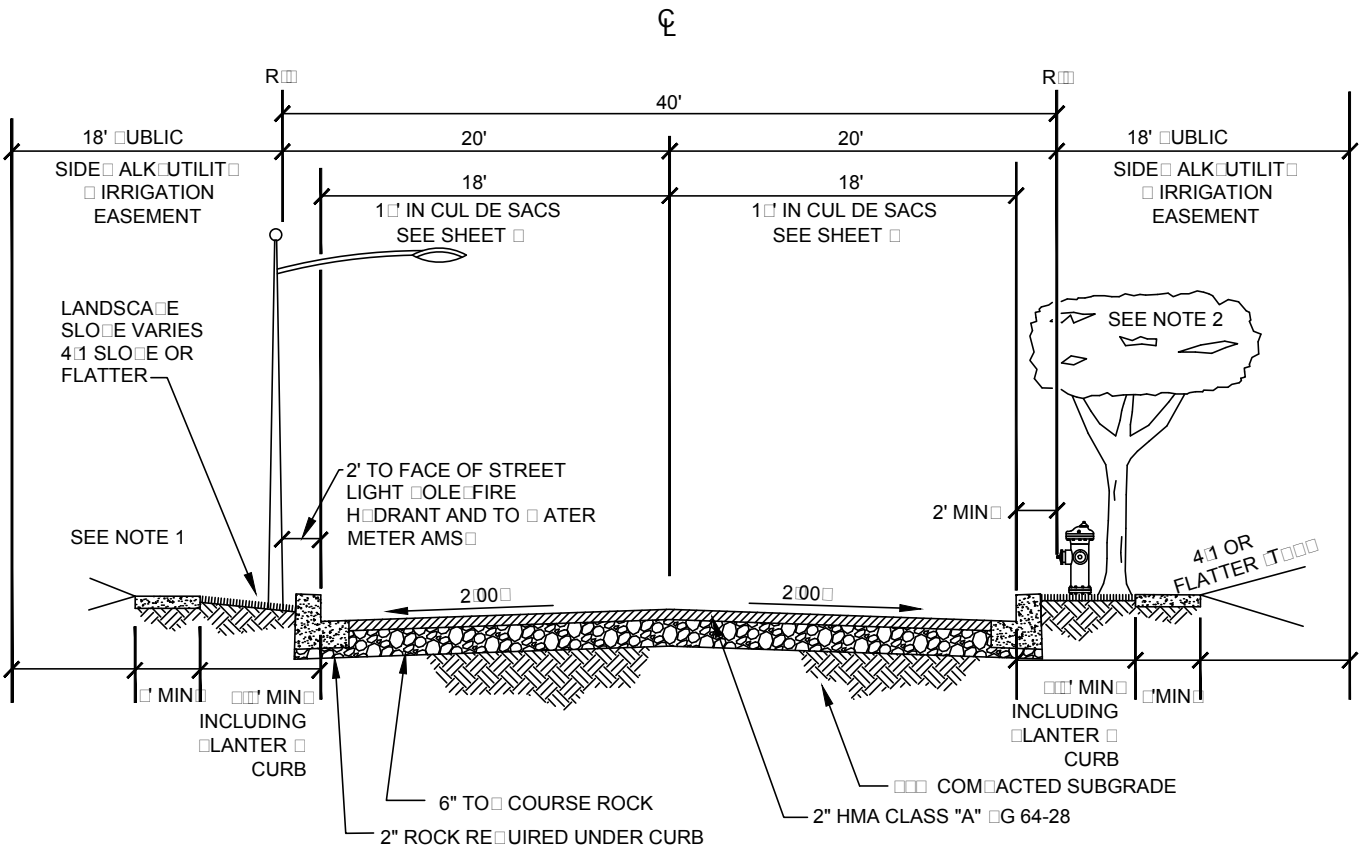
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2□□□
DWN	D□□
REV	□□14
CHK	B□ B
SCALE	NTS

DWG. NO.

2-1

SHEET 1 OF 4



NOTES□

1. SIDEWALK AND DRIVEWAY CONSTRUCTION. IN CON□UNCTION □ ITH THE STREET DESIGN□THE DESIGNER □ ILL INCLUDE A SIDE□ ALK □ROFILE□IF THE GRADE OF THE SIDE□ ALK □ ILL DIFFER FROM A DESIGNATED STANDARD VERTICAL OFFSET FROM THE CURB□ALL ADA CURB RAM□S SHALL BE SLO□ED AT 12□1 OR FLATTER□SIDE□ ALKS AD□OINING A □ ALL OR FENCE SHALL BE A MIN□6-1□2' □ IDE□THE LAND DEVELO□ER □ ILL BE RE□UIRED TO INSTALL CURB CUTS□IRRIGATION CONDUIT AND CONSTRUCT THE SIDE□ ALK TO THE A□□ROVED SIDE□ ALK DESIGN GRADE□ THE SIDE□ ALK□FOR THE □ IDTH ALIGNING □ ITH THE TO□ OF THE DRIVE□ A□ CURB CUTS SHALL BE 6 INCHES THICK □ER STANDARD DRA□ ING 2-10□ INSTALL 1 1□2" CL 160 □VC CA□□ED AND MARKED IRRIGATION□ CONDUIT 12" UNDER SIDE□ ALK ON EACH SIDE OF DRIVE□ A□□THE HOME BUILDER □ ILL BE RE□UIRED TO CONSTRUCT THE CONCRETE DRIVE□ A□ FROM THE CURB TO THE SIDE□ ALK□MEANDERING SIDE□ ALKS ALLO□ ED □ ITH A□□ROVAL□

2. PLANTING AREA □ LANDSCA□E ELEMENTS□IRRIGATION S□STEM□AND □LANT MATERIALS□AND STREET TREES SHALL BE COM□LETED B□ THE HOME BUILDER AND MAINTAINED B□ THE INDIVIDUAL □RO□ERT□ O□ NER □ER KMC □□6□60□ ALL IRRIGATION AND LANDSCA□E IM□ROVEMENTS SHALL MEET THE A□□ROVAL OF THE COMMUNIT□ □LANNING DE□ARTMENT DIRECTOR□ STREET TREES MUST BE SELECTED FROM THE CIT□'S "RECOMMENDED TREES FOR THE MID-COLUMBIA REGION"□ ALTERNATIVE S□ECIES □ ILL BE CONSIDERED □KMC 18□21□0□0□INSTALLATION OF TREES AND LANDSCA□ING MATERIAL MUST MEET THE □ROVISIONS OF KMC 18□21□

3. □ ATER AND SE□ ER TO BE STUBBED TO THE HOME SIDE OF THE SIDE□ ALK□ SEE STANDARD DRA□ ING 1-□□NOTE 4□

4. FOR CONSTRUCTION NOTES AND DETAILS NOT SHO□ N□SEE SHEET 1□

RESIDENTIAL/LOCAL STREETS
ALTERNATIVE 2

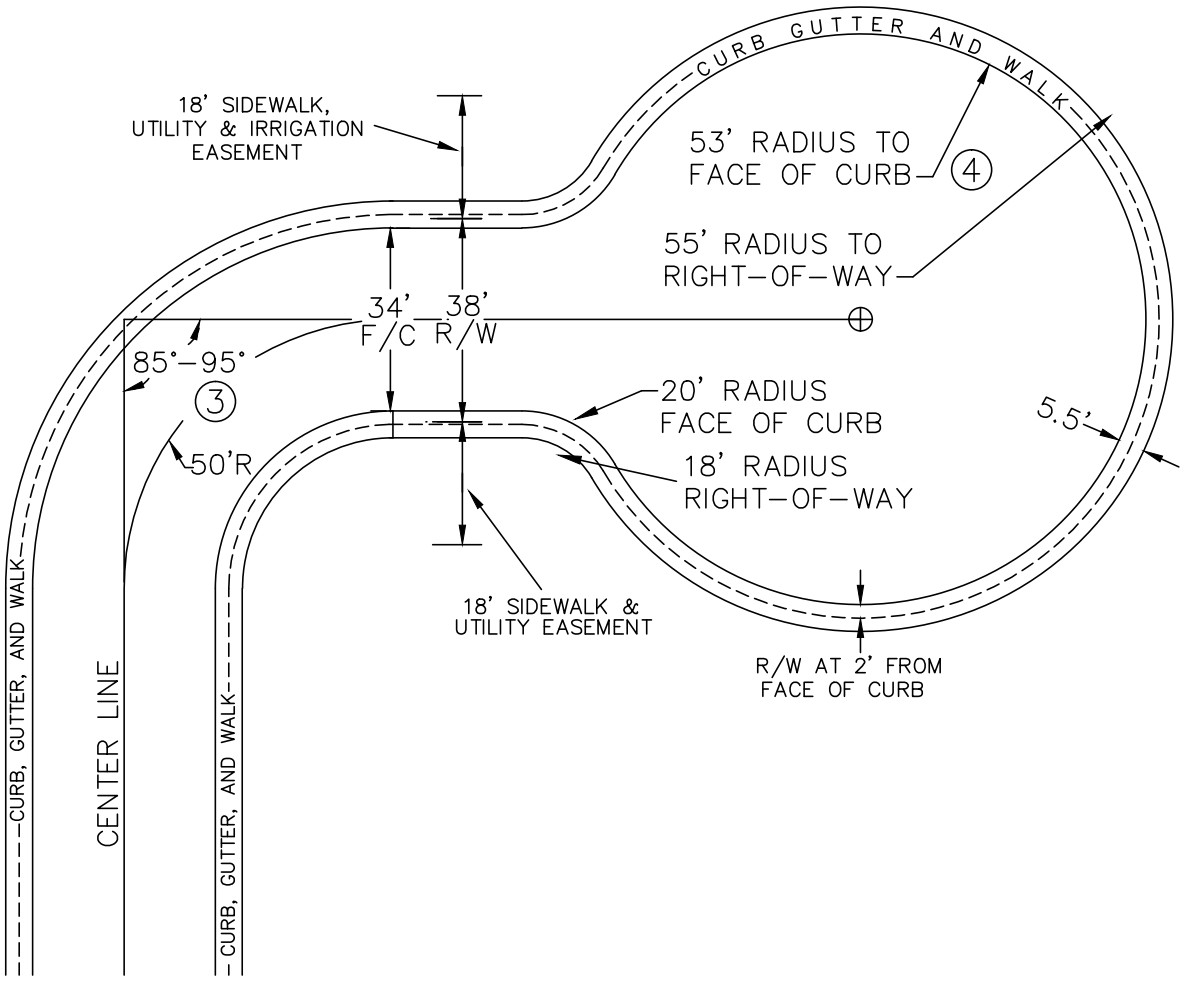
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2□□□
DWN	C□D
REV	□□14
REV. BY	D□□
CHK	B□ B
SCALE	NTS

DWG. NO.

2-1

SHEET 2 OF 4



NOTES:

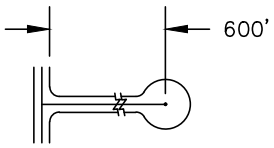
1. SEE SHEET 1 OR 2 FOR TYPICAL SECTION.

2. FOR COMMERCIAL STREETS, SEE STANDARD DWG 2-3 FOR MINIMUM ACCESS STREET TYPICAL SECTION AND WIDTH, OR DWG 2-4 WHEN WB50 OR GREATER TRUCK USAGE CAN BE ANTICIPATED.

3. ON CUL-DE-SAC STREETS, WHERE THE STREET MAKES A 90° (PLUS OR MINUS 5°) TURN, THE MINIMUM CENTERLINE RADIUS SHALL BE 50'. ON ALL OTHER CUL-DE-SAC STREET CURVES, THE MINIMUM CENTERLINE RADIUS SHALL BE 150'. THE MAXIMUM GRADE SHALL NOT EXCEED 12% UNLESS APPROVED BY THE CITY ENGINEER.

4. WHERE THE LENGTH FROM THE EXTENDED MAIN STREET CURB TO END OF CUL-DE-SAC BULB IS LESS THAN 150 FEET, THE BULB CURB RADIUS MAY BE REDUCED TO 45 FEET AND R/W RADIUS TO 47 FEET.

5. THE MAXIMUM CUL-DE-SAC LENGTH IS 600 FEET MEASURED AS SHOWN HERE.

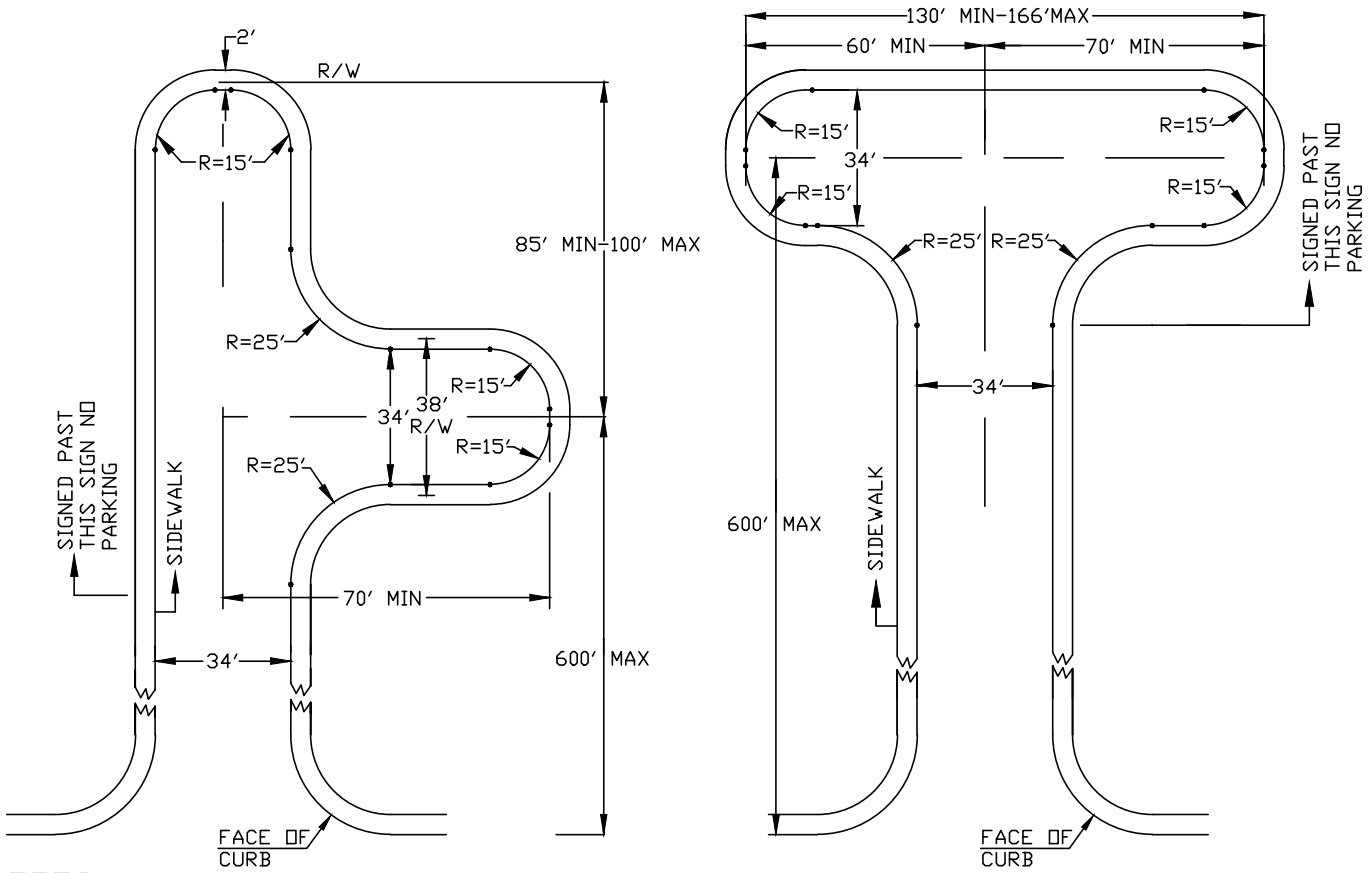


CUL-DE-SAC

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	12/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
2-1
SHEET 3 OF 4



NOTES:

WITH THE PRIOR APPROVAL OF BOTH THE CITY ENGINEER AND FIRE MARSHAL, AN ALTERNATE TURN–AROUND MAY BE USED. APPROVAL WILL BE CONSIDERED ONLY WHEN THE FOLLOWING MINIMUM CRITERIAS ARE MET.

1. RIGHT–OF–WAY AND SIDEWALK & UTILITY EASEMENENT SHALL BE THE SAME AS SHOWN ON 2–1 SHEET 3 OF 4 FOR CUL–DE–SACS.

2. MUST BE AN IN–FILL AREA BETWEEN DEVELOPED RESIDENTIAL LOTS WHERE, A FULL SIZE CUL–DE–SAC WOULD NOT BE PRACTICAL AS DETERMINED BY THE CITY ENGINEER AND FIRE MARSHAL; OR MUST BE AN IN–FILL AREA BETWEEN LOTS ZONED FOR OTHER THAN RESIDENTIAL USE, WHERE A FULL SIZED CUL–DE–SAC WOULD NOT BE PRACTICAL, AS DETERMINED BY THE CITY ENGINEER AND FIRE MARSHAL: AND

3. THE UNDEVELOPED LOT MUST HAVE A MAXIMUM LOT WIDTH OF 180 FEET; AND,

4. THE MAXIMUM LENGTH OF THE DEAD END STREET WILL BE 600 FEET.

5. AN ALTERNATE DESIGN, SIMILAR TO THIS DRAWING, MAY BE SUBMITTED FOR CONSIDERATION OF APPROVAL BY BOTH THE CITY ENGINEER AND FIRE MARSHAL.

6. THE TURN AROUND AREA SHALL BE SIGNED FOR NO PARKING.

ALTERNATE RESIDENTIAL STREET TURN–AROUND

CITY OF KENNEWICK

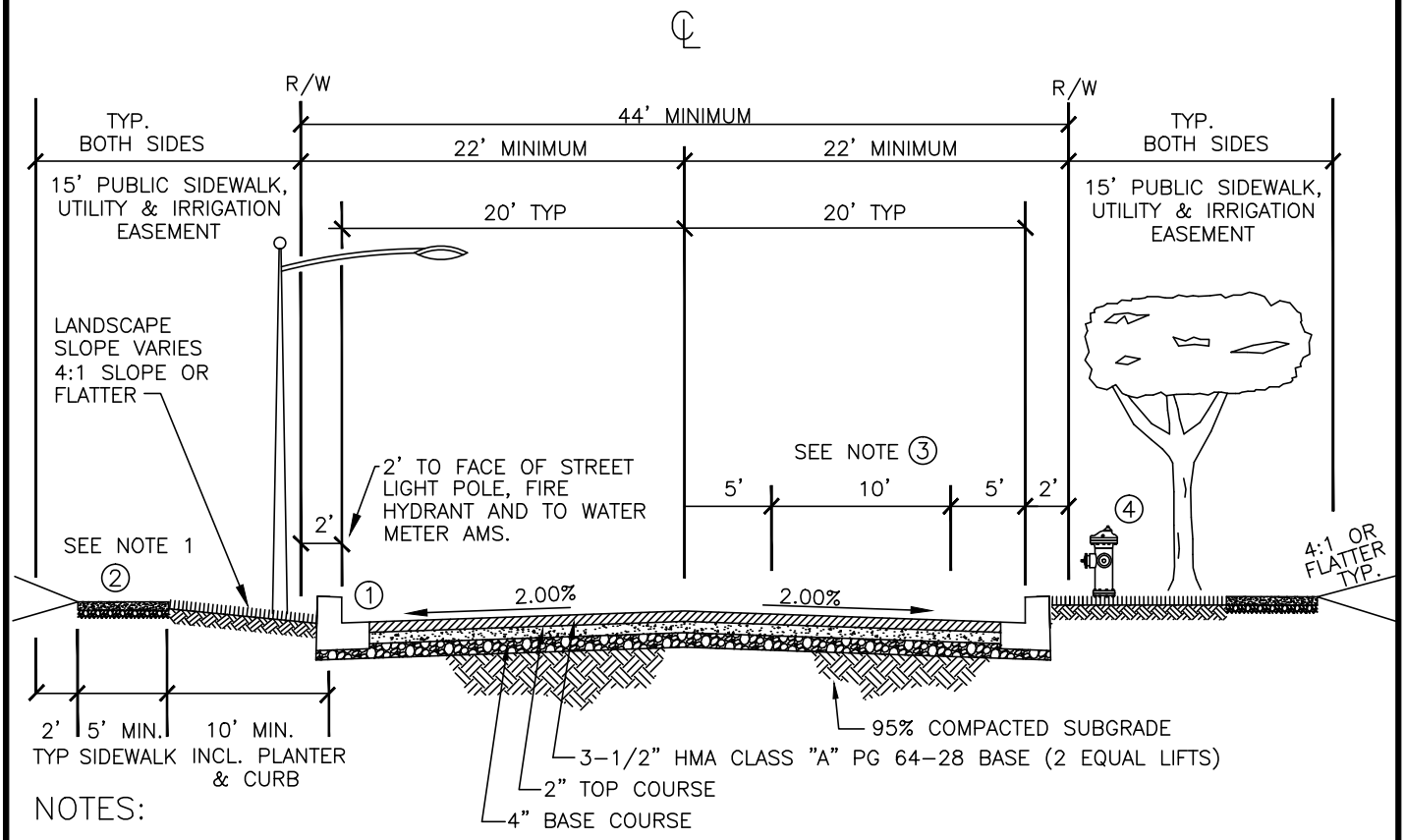
ENGINEERING DEPARTMENT

DATE	12/97
DWN	CLJ
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-1

SHEET 4 OF 4



NOTES:

1. **SIDEWALK AND DRIVEWAY CONSTRUCTION.** IN CONJUNCTION WITH THE STREET DESIGN, THE DESIGNER WILL INCLUDE A SIDEWALK PROFILE, IF THE GRADE OF THE SIDEWALK WILL DIFFER FROM A DESIGNATED STANDARD VERTICAL OFFSET FROM THE CURB. ALL ADA CURB RAMPS SHALL BE SLOPED AT 12:1 OR FLATTER. ON ALL RESIDENTIAL DEVELOPMENTS AND WHEN REQUIRED BY THE PLANNING REVIEW ON COMMERCIAL DEVELOPMENTS, THE DEVELOPER WILL BE REQUIRED TO CONSTRUCT ALL SIDEWALKS. SIDEWALKS ADJOINING A WALL OR FENCE SHALL BE A MINIMUM OF 6.5' WIDE.

2. **PLANTING AREA.** LANDSCAPE ELEMENTS, IRRIGATION SYSTEM, PLANT MATERIALS, AND STREET TREES SHALL BE COMPLETED BY THE DEVELOPER AND MAINTAINED BY THE HOME OWNERS ASSOCIATION. IN ABSENCE OF A HOMEOWNERS ASSOCIATION, LANDSCAPING SHALL BE PLANTED AND MAINTAINED BY THE INDIVIDUAL PROPERTY OWNER PER KMC 5.56.360. ALL IRRIGATION AND LANDSCAPE IMPROVEMENTS SHALL MEET THE APPROVAL OF THE COMMUNITY PLANNING DEPARTMENT DIRECTOR. STREET TREES MUST BE SELECTED FROM THE CITY'S RECOMMENDED STREET TREE LIST (KAC 10.90.070). ALTERNATIVE SPECIES WILL BE CONSIDERED (KMC 18.64.090 (20). INSTALLATION OF TREES AND LANDSCAPING MATERIAL MUST MEET THE PROVISIONS OF KMC 18.64.

3. ON STREET PARKING PROHIBITED & ACCESS LIMITED.

4. FOR INFILL ONLY AND REQUIRES APPROVAL OF THE PLANNING DIRECTOR AND THE CITY OR TRAFFIC ENGINEER.

① CONCRETE CURB & GUTTER

② CONCRETE SIDEWALK

③ TYPICAL LANE WIDTHS SHOWN, SUBJECT TO TRAFFIC ENGINEER REVIEW.

④ SEE STD. DWG. 1-3 FOR HYDRANT AND ST. LIGHT LOCATION

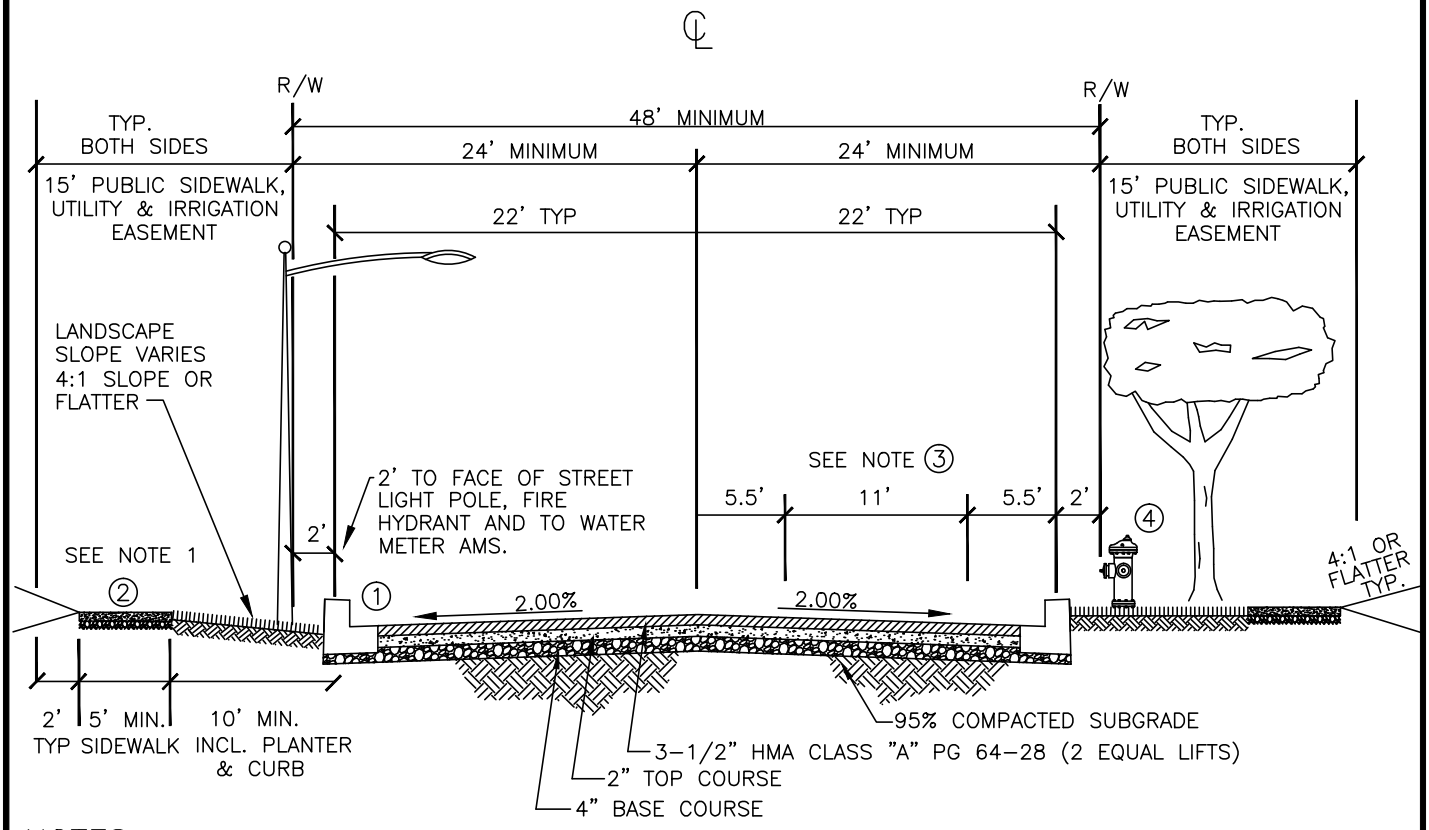
COLLECTOR STREET-(INFILL)

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/05
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-2



NOTES:

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2. PLANTING AREA: LANDSCAPE ELEMENTS, IRRIGATION SYSTEM, PLANT MATERIALS, AND STREET TREES SHALL BE COMPLETED BY THE DEVELOPER AND MAINTAINED BY THE HOME OWNERS ASSOCIATION. IN ABSENCE OF A HOMEOWNERS ASSOCIATION, LANDSCAPING SHALL BE PLANTED AND MAINTAINED BY THE INDIVIDUAL PROPERTY OWNER PER KMC 5.56.360. ALL IRRIGATION AND LANDSCAPE IMPROVEMENTS SHALL MEET THE APPROVAL OF THE COMMUNITY PLANNING DEPARTMENT DIRECTOR. STREET TREES MUST BE SELECTED FROM THE CITY'S RECOMMENDED STREET TREE LIST (KAC 10.90.070). ALTERNATIVE SPECIES WILL BE CONSIDERED (KMC 18.64.090 (20). INSTALLATION OF TREES AND LANDSCAPING MATERIAL MUST MEET THE PROVISIONS OF KMC 18.64.

① CONCRETE CURB & GUTTER

② CONCRETE SIDEWALK

③ TYPICAL LANE WIDTHS SHOWN, SUBJECT TO TRAFFIC ENGINEER REVIEW.

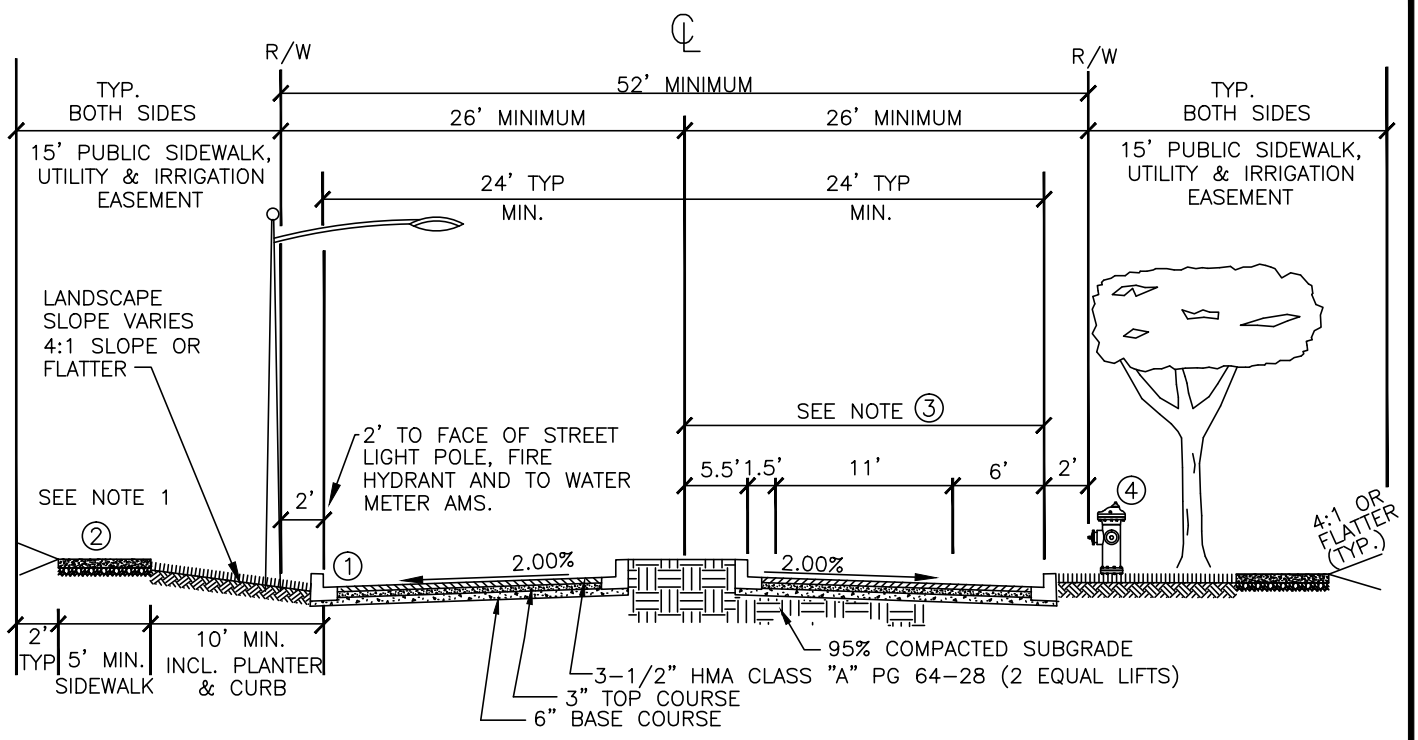
④ SEE STD. DWG. 1-3 FOR HYDRANT AND ST. LIGHT LOCATION

COLLECTOR STREET

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/05
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
2-3



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2. **PLANTING AREA.** LANDSCAPE ELEMENTS, IRRIGATION SYSTEM, PLANT MATERIALS, AND STREET TREES SHALL BE COMPLETED BY THE LAND DEVELOPER AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION. IN ABSENCE OF A HOMEOWNERS ASSOCIATION. LANDSCAPING SHALL BE PLANTED AND MAINTAINED BY THE INDIVIDUAL PROPERTY OWNER PER KMC 5.56.360. ALL IRRIGATION AND LANDSCAPE IMPROVEMENTS SHALL MEET THE APPROVAL OF THE COMMUNITY PLANNNING DEPARTMENT DIRECTOR. STREET TREES MUST BE SELECTED FROM THE CITY'S RECOMMENDED STREET TREE LIST (KAC 10.90.070). ALTERNATIVE SPECIES WILL BE CONSIDERED [KMC 18.64.090 (20)]. INSTALLATION OF TREES AND LANDSCAPING MATERIAL MUST MEET THE PROVISIONS OF KMC 18.64.
3. **RAISED MEDIAN**. A RAISED MEDIAN WITH XERISCAPE LANDSCAPING AND A WATER EFFICIENT IRRIGATION SYSTEM SHALL BE PROVIDED. ALTERNATIVES MAY BE CONSIDERED DURING THE DEVELOPMENT AND PLAN REVIEW PROCESS. MEDIAN BREAKS WILL NORMALLY BE PROVIDED FOR INTERSECTING PUBLIC STREETS AND HIGH VOLUME COMMERCIAL, INDUSTRIAL OR BUSINESS ACCESSESS AS DETERMINED BY THE TRAFFIC ENGINEER.
4. DWG. SHALL BE USED FOR STREETS IN COMMERCIAL OR INDUSTRIAL AREA WITH EITHER HIGH VOLUMES AND/OR USED BY LARGE (WB-50 OR GREATER) TRUCKS. USE OF RAISED MEDIANS IN THESE CASES WILL DETERMINED BY THE CITY ENGINEER AND/OR PLANNING DIRECTOR.
5. ON STREET PARKING PROHIBITED & ACCESS LIMITED

① CONCRETE CURB & GUTTER

② CONCRETE SIDEWALK

③ TYPICAL LANE WIDTHS SHOWN, SUBJECT TO TRAFFIC ENGINEER REVIEW.

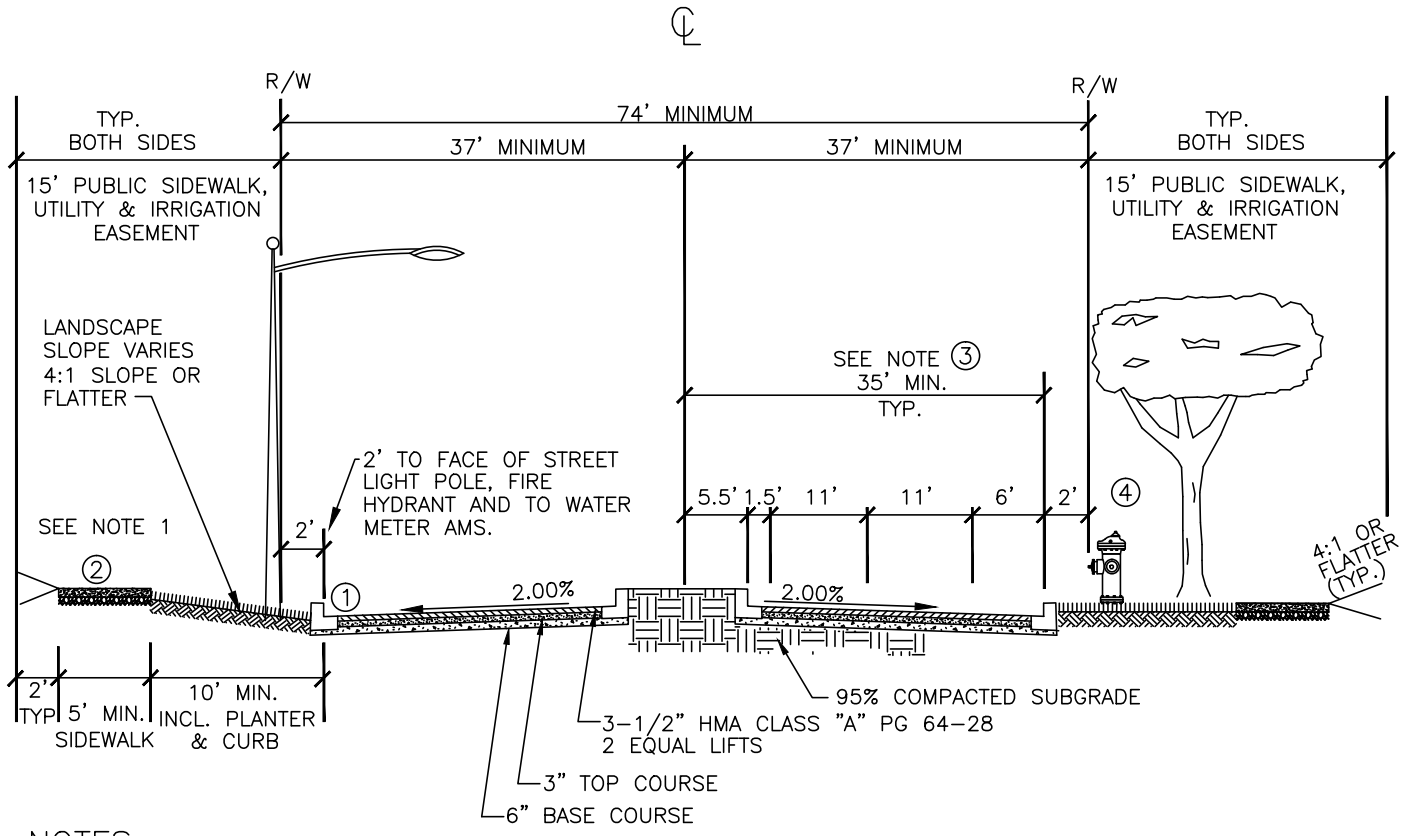
④ SEE STD. DWG. 1-3 FOR HYDRANT AND ST. LIGHT LOCATION

MINOR ARTERIAL STREET/COMMERCIAL AND INDUSTRIAL COLLECTORS

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/05
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
2-4



NOTES:

1. **SIDEWALK CONSTRUCTION.** IN CONJUNCTION WITH THE STREET DESIGN, THE DESIGNER WILL INCLUDE A SIDEWALK PROFILE, IF THE GRADE OF THE SIDEWALK WILL DIFFER FROM A DESIGNATED STANDARD VERTICAL OFFSET FROM THE CURB. ALL ADA CURB RAMPS SHALL BE SLOPED AT 12:1 OR FLATTER. THE LAND DEVELOPER, OR BUILDER, AS DESIGNATED BY THE DEVELOPMENT APPROVAL, WILL BE REQUIRED TO PROVIDE ELEVATION CONTROL AND CONSTRUCT THE SIDEWALK TO THE APPROVED SIDEWALK DESIGN GRADE. SIDEWALKS ADJOINING A WALL OR FENCE SHALL BE A MINIMUM OF 6.5' WIDE.
2. **PLANTING AREA.** LANDSCAPE ELEMENTS, IRRIGATION SYSTEM, PLANT MATERIALS, AND STREET TREES SHALL BE COMPLETED BY THE LAND DEVELOPER AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION. IN ABSENCE OF A HOMEOWNERS ASSOCIATION. LANDSCAPING SHALL BE PLANTED AND MAINTAINED BY THE INDIVIDUAL PROPERTY OWNER PER KMC 5.56.360. ALL IRRIGATION AND LANDSCAPE IMPROVEMENTS SHALL MEET THE APPROVAL OF THE COMMUNITY PLANNNING DEPARTMENT DIRECTOR. STREET TREES MUST BE SELECTED FROM THE CITY'S RECOMMENDED STREET TREE LIST (KAC 10.90.070). ALTERNATIVE SPECIES WILL BE CONSIDERED [KMC 18.64.090 (20)]. INSTALLATION OF TREES AND LANDSCAPING MATERIAL MUST MEET THE PROVISIONS OF KMC 18.64.
3. **RAISED MEDIAN.** USE OF MEDIAN IS DETERMINED BY PLANNING DIRECTOR AND/OR CITY ENGINEER. A RAISED MEDIAN WITH XERISCAPE LANDSCAPING AND A WATER EFFICIENT IRRIGATION SYSTEM SHALL BE PROVIDED. ALTERNATIVES MAY BE CONSIDERED DURING THE DEVELOPMENT AND PLAN REVIEW PROCESS. MEDIAN BREAKS WILL NORMALLY BE PROVIDED FOR INTERSECTING PUBLIC STREETS AND HIGH VOLUME COMMERCIAL, INDUSTRIAL OR BUSINESS ACCESSESS AS DETERMINED BY THE TRAFFIC ENGINEER.
4. ON STREET PARKING PROHIBITED & ACCESS LIMITED

① CONCRETE CURB & GUTTER

② CONCRETE SIDEWALK

③ TYPICAL LANE WIDTHS SHOWN, SUBJECT TO TRAFFIC ENGINEER REVIEW.

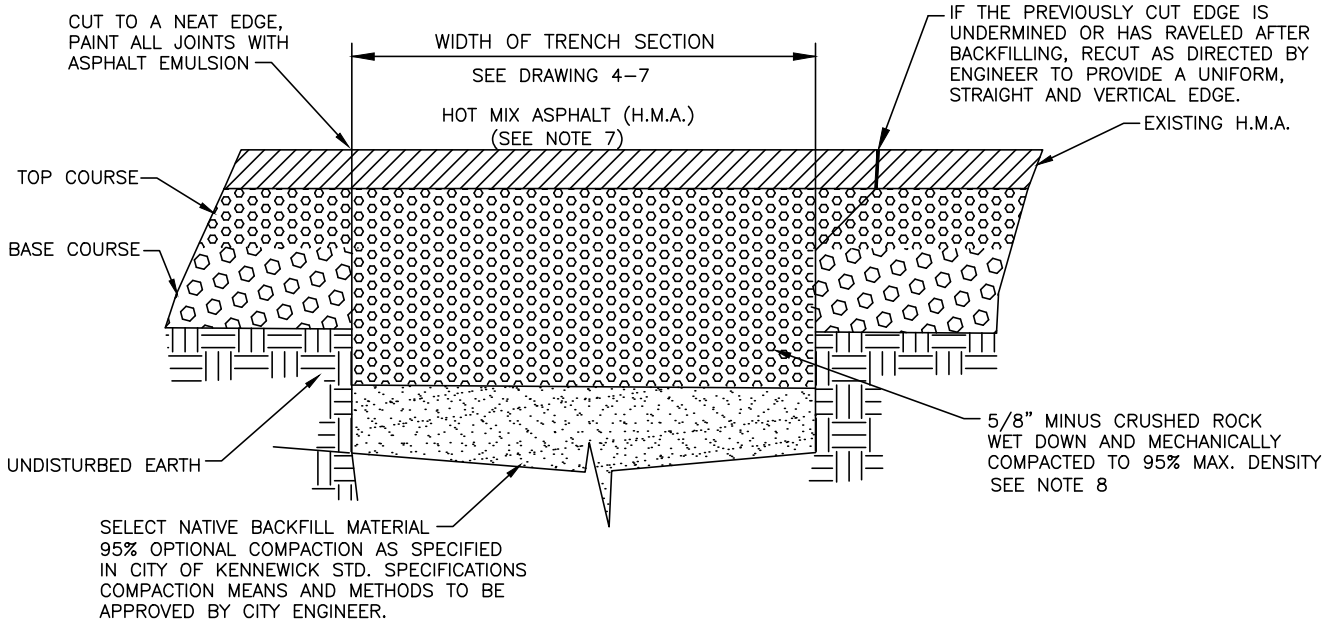
④ SEE STD. DWG. 1-3 FOR HYDRANT AND ST. LIGHT LOCATION

PRINCIPAL ARTERIAL STREET

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/05
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
2-5



ASPHALT CONCRETE PAVEMENT REQUIREMENTS

1) ARTERIAL STREETS: HOT MIX ASPHALT (HMA) CLASS "A" PG 64-28

2) RESIDENTIAL STREETS: HOT MIX ASPHALT (HMA) CLASS "A" PG 64-28

3) HOT MIX ASPHALT SHALL BE PLACED IN LIFTS NOT TO EXCEED 2" IN DEPTH.

NOTES:

1) ALL ROADWAY ACCESSORIES, INCLUDING SIGNS, ARE TO REMAIN IN PLACE AND TO BE PROTECTED. ONE WAY TRAFFIC IS TO BE MAINTAINED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CONTRACTOR SHALL INSTALL TEMPORARY LANE STRIPING AS PER STD. SPEC. 5-04.3(7) WHERE DIRECTED BY CITY ENGINEER. DISTURBED STRIPING SHALL BE REPLACED WITH PAINT, OR PLASTIC AS PREVIOUSLY EXISTED.

2) DO NOT BEGIN STREET CUT UNTIL COMPACTION EQUIPMENT IS ON SITE.

3) DO NOT BEGIN STREET CUT UNTIL WATER (TRUCK OR HOSE) IS ON SITE.

4) WATER SETTLING PERMITTED ONLY WITH APPROVAL OF THE ENGINEER.

5) ROCKS LARGER THAN 6 INCHES AND NATIVE BACKFILL MATERIAL, WHICH CANNOT BE IMMEDIATELY COMPACTED AS REQUIRED TO RESTORE TRAFFIC, ARE TO BE REMOVED AND REPLACED WITH IMPORTED BACKFILL MATERIAL.

6) IF PERMANENT PATCH CANNOT BE PLACED, AND IF DIRECTED BY THE ENGINEER, A TEMPORARY COLD MIX PATCH SHALL BE PLACED IMMEDIATELY AFTER BACKFILLING AND COMPACTION OPERATIONS. THE COLD MIX PATCH SHALL BE REMOVED AND A PERMANENT PATCH PLACED AS SOON AS CONSTRUCTION AND WEATHER CONDITIONS PERMIT, UNLESS STATED OTHERWISE IN THE SPECIAL PROVISIONS, OR DIRECTED BY THE ENGINEER.

7) THE DEPTH OF THE ASPHALT PATCH SHALL BE TWO INCHES (2") DEEP ON ALL STREETS 40' AND LESS IN WIDTH, THREE INCHES (3") DEEP ON ALL STREETS GREATER THAN 40' IN WIDTH AND THREE INCHES (3") DEEP ON 38' WIDE COMMERCIAL AND SECONDARY ARTERIALS.

8) ROCK DEPTH SHALL BE 6" DEEP ON ALL RESIDENTIAL STREETS AND 9" DEEP ON ALL STREETS 40' WIDE AND GREATER. 9" ROCK DEPTH ON 38' WIDE COMMERCIAL AND MINOR ARTERIAL STREETS.

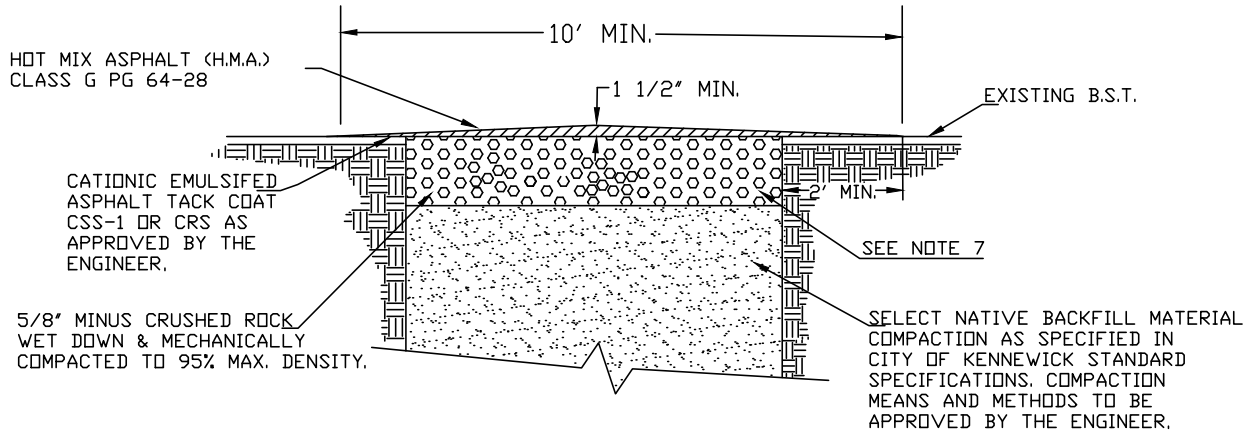
TYPICAL
TRENCH PAVEMENT RESTORATION

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-6



HOT MIX ASPHALT PAVEMENT REQUIREMENTS

ALL PAVEMENT RESTORATION SHALL BE IN ACCORDANCE WITH SECTION 4 OF CITY OF KENNEWICK STANDARD SPECIFICATIONS.

NOTES:

1) ALL ROADWAY APPURTENANCES, INCLUDING SIGNS, ARE TO REMAIN IN PLACE AND TO BE PROTECTED. ONE-WAY TRAFFIC IS TO BE MAINTAINED UNLESS OTHERWISE DIRECTED BY THE ENGINEER. CONTRACTOR SHALL INSTALL TEMPORARY LANE STRIPING AS PER SWSS. 5-04.3(17) WHERE DIRECTED BY THE ENGINEER.

2) DO NOT BEGIN STREET CUT UNTIL COMPACTION EQUIPMENT IS ON SITE.

3) DO NOT BEGIN STREET CUT UNTIL WATER (TRUCK OR HOSE) IS ON SITE.

4) WATER SETTLING PERMITTED ONLY WITH APPROVAL OF THE ENGINEER.

5) UNSATISFACTORY NATIVE BACKFILL MATERIAL, AS DETERMINED BY THE ENGINEER, TO BE REMOVED AND REPLACED WITH IMPORTED MATERIAL.

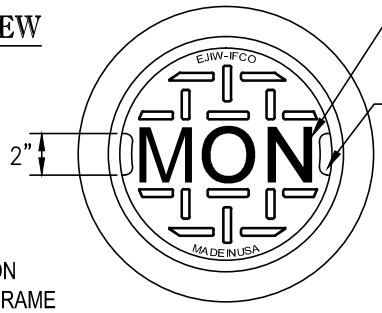
6) IF PERMANENT PATCH CANNOT BE PLACED WITHIN 48 HOURS OF PROJECT COMPLETION, AND IF IN THE OPINION OF THE ENGINEER, CONSTRUCTION AND TRAFFIC CONDITIONS WARRANT, A TEMPORARY COLD MIX PATCH SHALL BE PLACED IMMEDIATELY AFTER BACKFILLING AND COMPACTION OPERATIONS. THE COLD MIX PATCH SHALL BE REMOVED AND A PERMANENT PATCH PLACED AS SOON AS CONSTRUCTION AND WEATHER CONDITIONS PERMIT, UNLESS STATED OTHERWISE IN THE SPECIAL PROVISIONS, OR DIRECTED BY THE ENGINEER

7) ROCK DEPTH SHALL BE 4" ON ALL STREETS

BITUMINOUS SURFACE TREATMENT RESTORATION

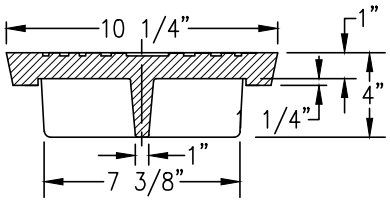
CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 5/83 DWN CJD REV 3/14 CHK BWB SCALE NTS	DWG. NO. **2-7**

COVER-PLAN VIEW

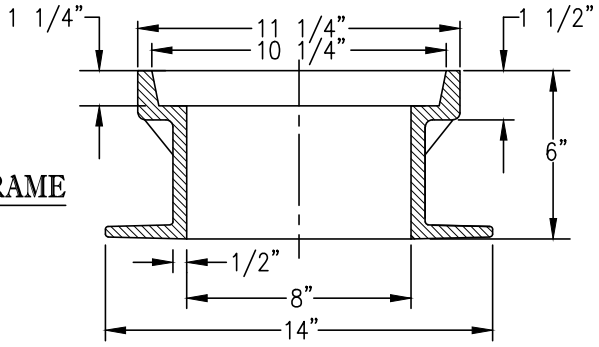


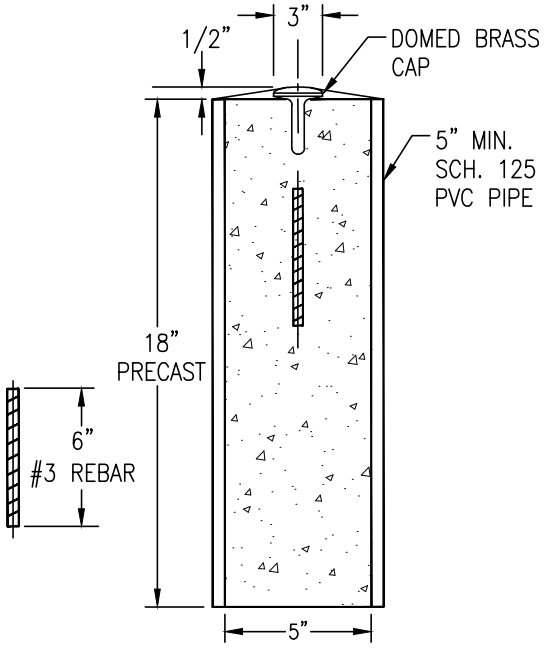
(EAST JORDAN IRON
WORKS COVER & FRAME
PRODUCT #00368004

SECTION-COVER



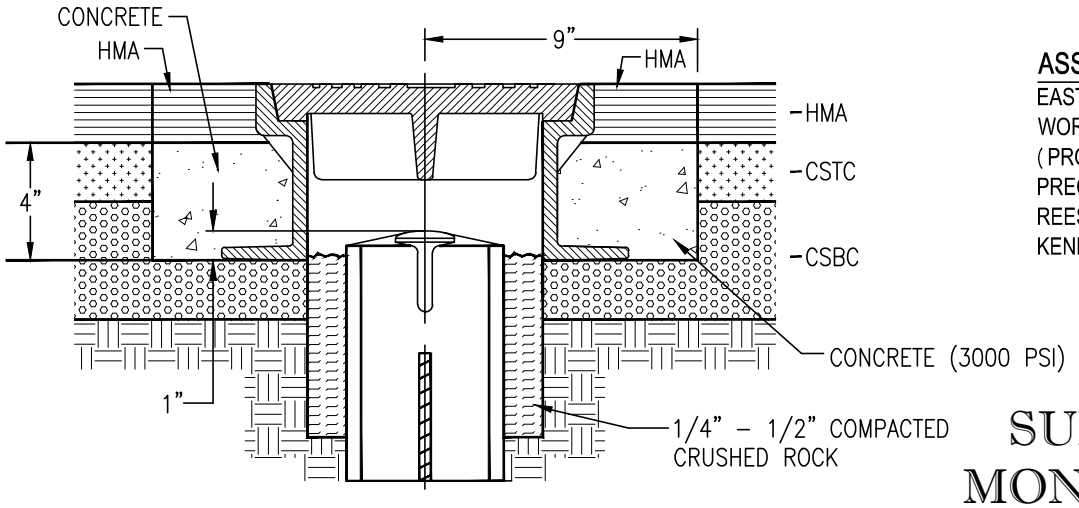
SECTION-FRAME





CONCRETE MONUMENT

(REESE CONCRETE)



ASSEMBLY

EAST JORDAN IRON
WORKS COVER & FRAME
(PRODUCT #00368004)
PRECAST MONUMENT
REESE CONCRETE
KENNEWICK, WA

SURVEY MONUMENT

1. MONUMENT TO BE SET AT ALL STREET CENTERLINE CONTROL POINTS.
2. WASHINGTON LICENSED PROFESSIONAL LAND SURVEYOR OR PARTY UNDER THE LICENSED LAND SURVEYOR'S DIRECT SUPERVISION TO REFERENCE MONUMENT LOCATION FOR INSTALLATION AND PUNCH BRASS CAP AFTER INSTALLATION.
3. AT THE CONTRACTORS OPTION, THE CONCRETE MAY BE LEFT 1 1/2" BELOW FINISH GRADE, AND THE TOP FINISHED WITH 1 1/2" HMA GLASS 'G' PG 64–28.

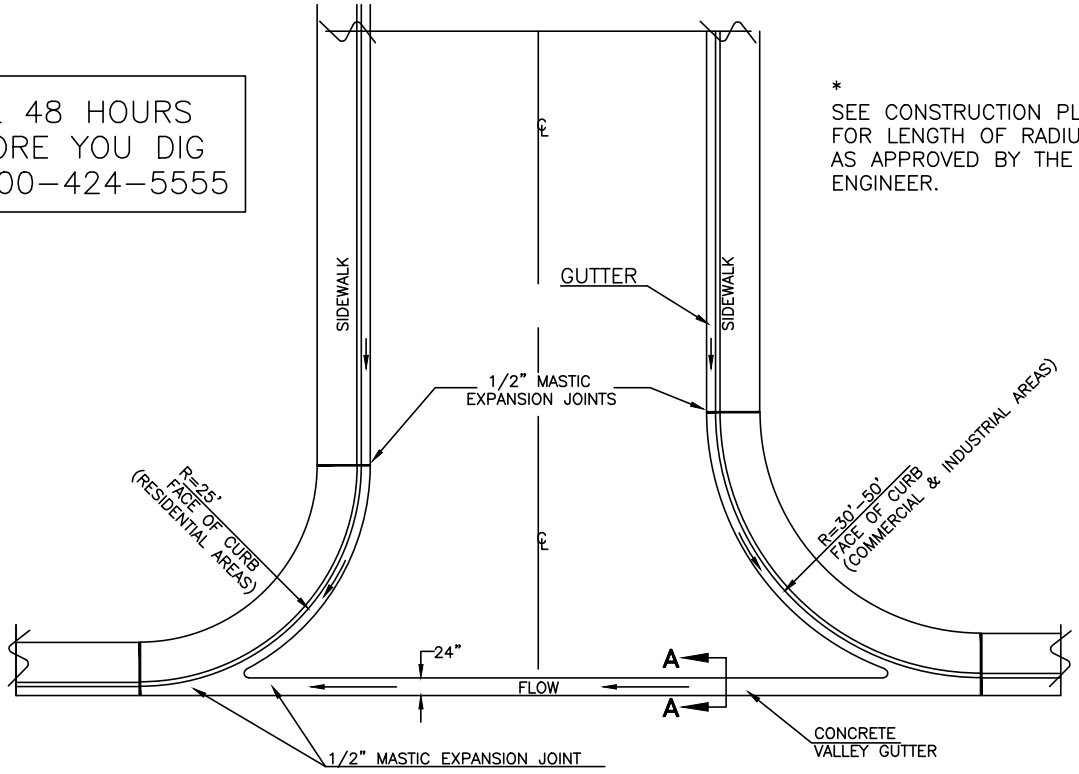
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	11/13
DWN	SLG
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

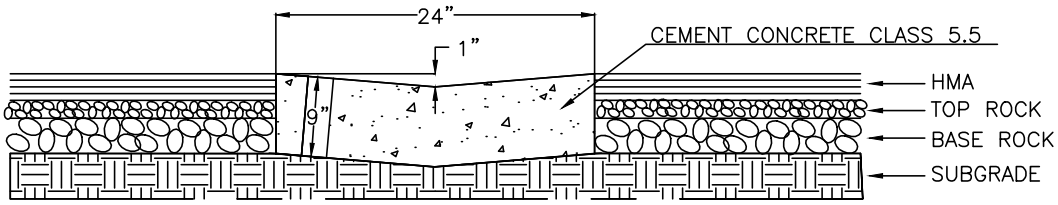
2-8

CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555



*
SEE CONSTRUCTION PLANS FOR LENGTH OF RADIUS OR AS APPROVED BY THE CITY ENGINEER.

NOTE: SEE CITY OF KENNEWICK STD. DWG. No.2-12 OR 2-12A FOR WHEELCHAIR RAMP DETAILS AND LOCATIONS.



SECTION A-A

CONCRETE VALLEY GUTTER

NOTE: REQUIRES APPROVAL OF CITY ENGINEER.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

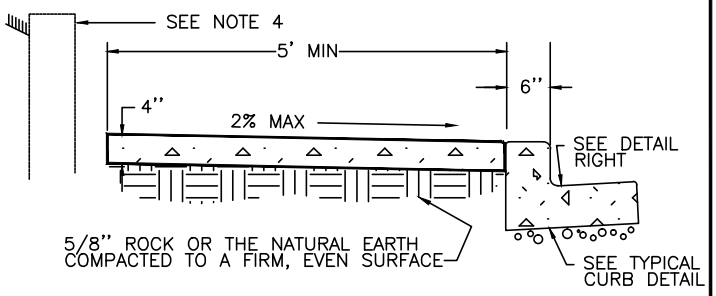
DATE	1/95
DWN	CLJ
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
2-9

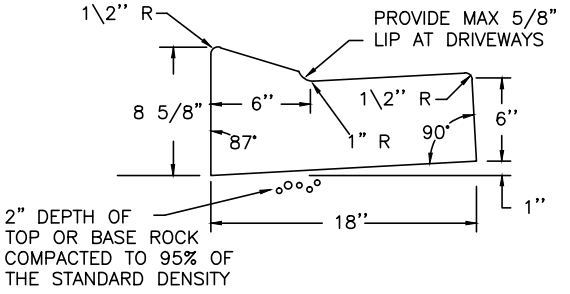
NOTES:

1. FULL STAB JOINTS ON 10' CENTERS FOR CURBS. DUMMY JOINTS ON 5' CENTERS FOR SIDEWALKS.
2. 1/2" MASTIC MATERIAL AT POINTS OF TANGENCY ON ALL CURB RETURNS AND AT ALL POINTS OF TERMINUS.
3. 5 SACK CONCRETE (SEE C.O.K. STD. DWG. 2–13).
4. WIDEN SIDEWALK AN ADDITIONAL 18" WHEN ADJOINING A WALL OR FENCE.

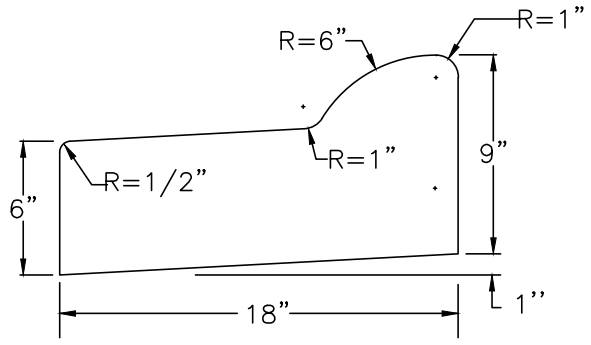
TYPICAL SECTION FOR SIDEWALK @ CURB



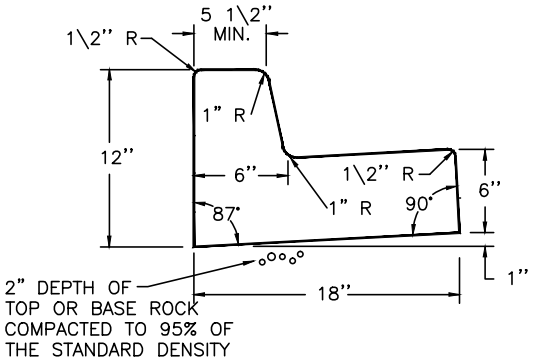
TYPICAL CURB @ DRIVEWAY



ROUNDABOUT OR TRAFFIC CIRCLE



TYPICAL VERTICAL CURB



CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	8/13
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

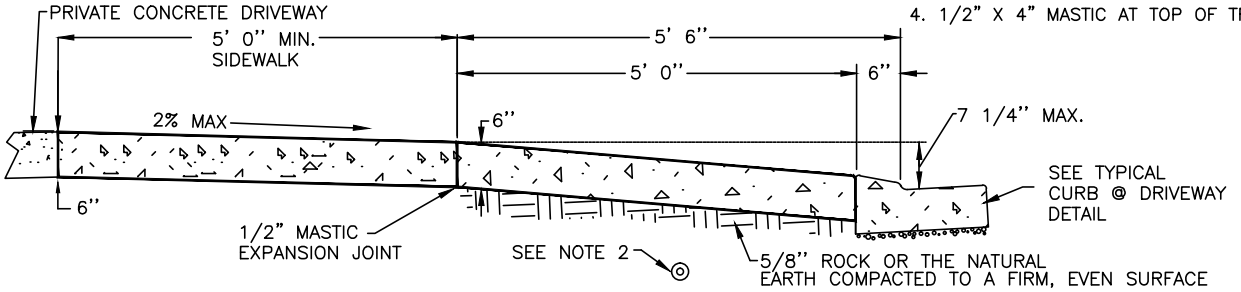
DWG. NO.

2-10

SHEET 1 OF 8

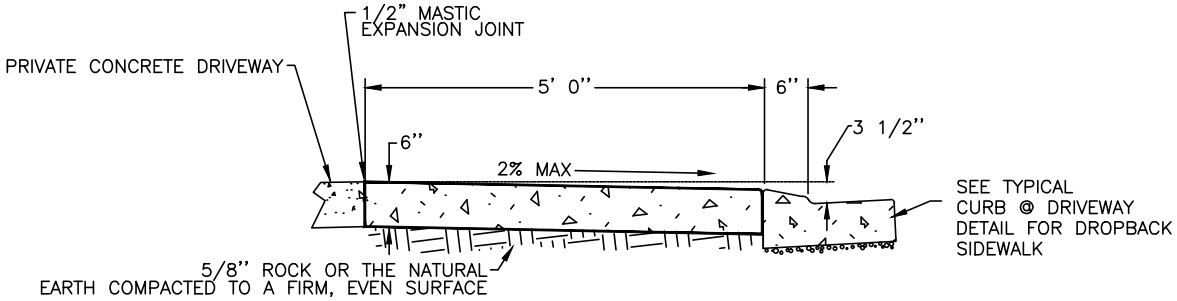
TYPICAL SECTION FOR DRIVEWAY WITH SIDEWALK SEPARATED FROM CURB BY LANDSCAPE STRIP

1. FOR LANDSCAPE GRADE, WIDTH AND SIDEWALK LOCATIONS, SEE DRAWINGS 2–1 THROUGH 2–5.
2. IRRIGATION SYSTEMS UNDER CONCRETE DRIVEWAY AND SIDEWALK TO BE PLACED IN CL 160 PVC CONDUIT.
3. 5 SACK CONCRETE (SEE C.O.K. STD. DWG. 2–13
4. 1/2" X 4" MASTIC AT TOP OF TRANSITIONS



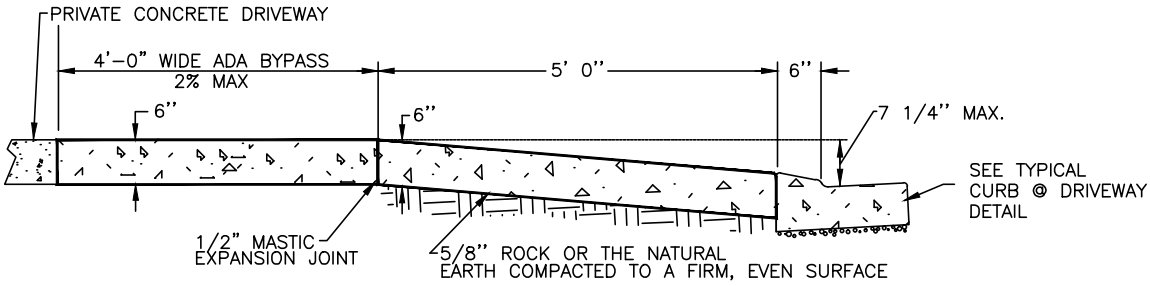
TYPICAL SECTION FOR DROPBACK DRIVEWAY REQUIRES CITY ENGINEER APPROVAL.

1. DRIVEWAY SIDEWALK DUMMY JOINTS ON 5' CENTERS.
2. 5 SACK CONCRETE (SEE C.O.K. STD. DWG. 2–13
3. 1/2" X 4" MASTIC AT TOP OF TRANSITIONS
4. DROP BACK SIDEWALK ONLY WITH PRIOR CITY ENGINEER APPROVAL. REQUIRED MINIMUM RISE OF 3 1/2"



TYPICAL SECTION FOR DRIVEWAY WITH SIDEWALK AT CURBS

1. DRIVEWAY SIDEWALK DUMMY JOINTS ON 5' CENTERS.
2. 5 SACK CONCRETE (SEE C.O.K. STD. DWG. 2–13
3. 1/2" X 4" MASTIC AT TOP OF TRANSITIONS



CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

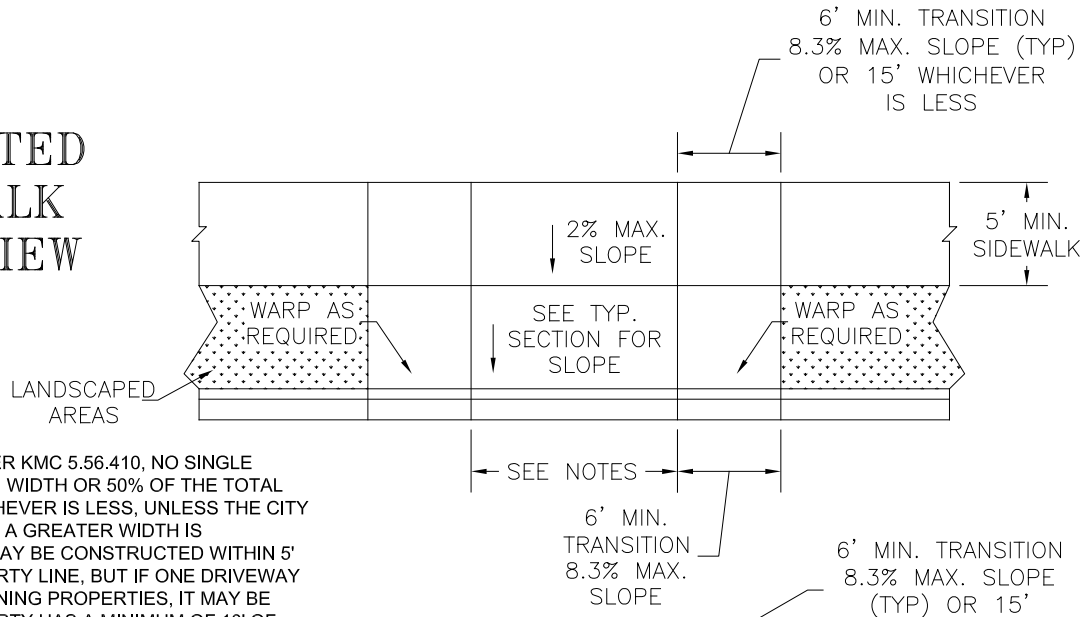
DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-10

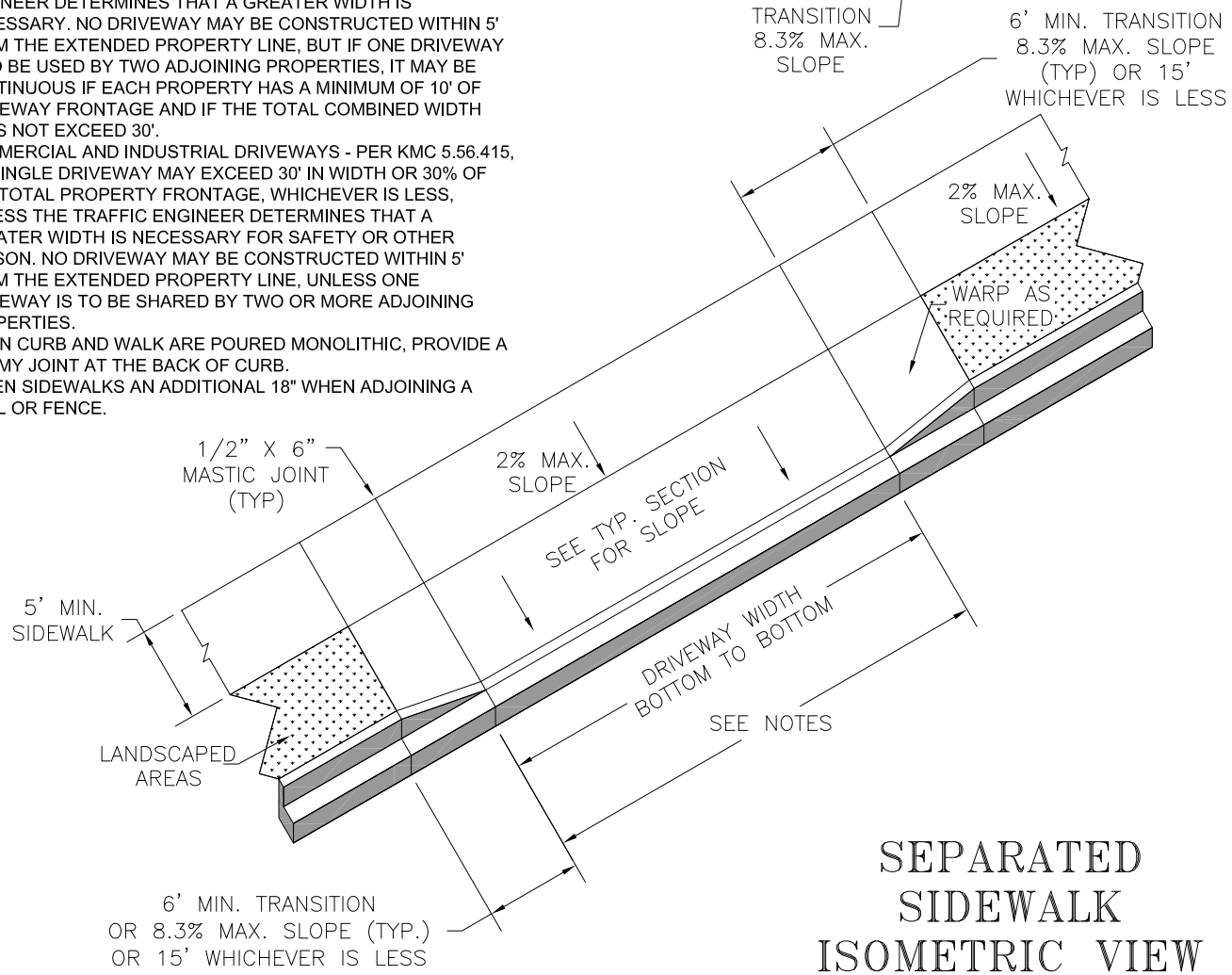
SHEET 2 OF 8

SEPARATED SIDEWALK PLAN VIEW



NOTES:

1. RESIDENTIAL DRIVEWAYS - PER KMC 5.56.410, NO SINGLE DRIVEWAY MAY EXCEED 24' IN WIDTH OR 50% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE CITY ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, BUT IF ONE DRIVEWAY IS TO BE USED BY TWO ADJOINING PROPERTIES, IT MAY BE CONTINUOUS IF EACH PROPERTY HAS A MINIMUM OF 10' OF DRIVEWAY FRONTAGE AND IF THE TOTAL COMBINED WIDTH DOES NOT EXCEED 30'.
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS - PER KMC 5.56.415, NO SINGLE DRIVEWAY MAY EXCEED 30' IN WIDTH OR 30% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE TRAFFIC ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY FOR SAFETY OR OTHER REASON. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, UNLESS ONE DRIVEWAY IS TO BE SHARED BY TWO OR MORE ADJOINING PROPERTIES.
3. WHEN CURB AND WALK ARE POURED MONOLITHIC, PROVIDE A DUMMY JOINT AT THE BACK OF CURB.
4. WIDEN SIDEWALKS AN ADDITIONAL 18" WHEN ADJOINING A WALL OR FENCE.



SEPARATED SIDEWALK ISOMETRIC VIEW

CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

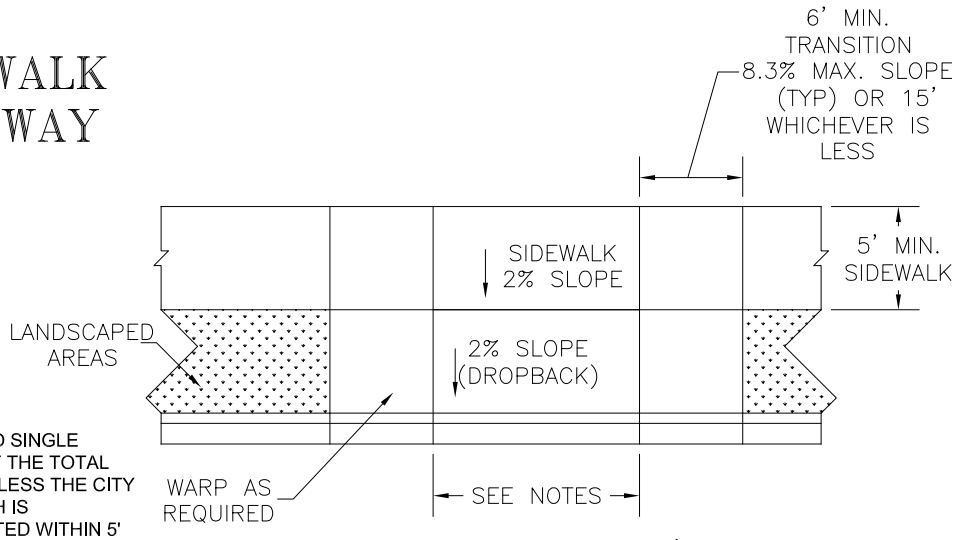
DWG. NO.

2-10

SHEET 3 OF 8

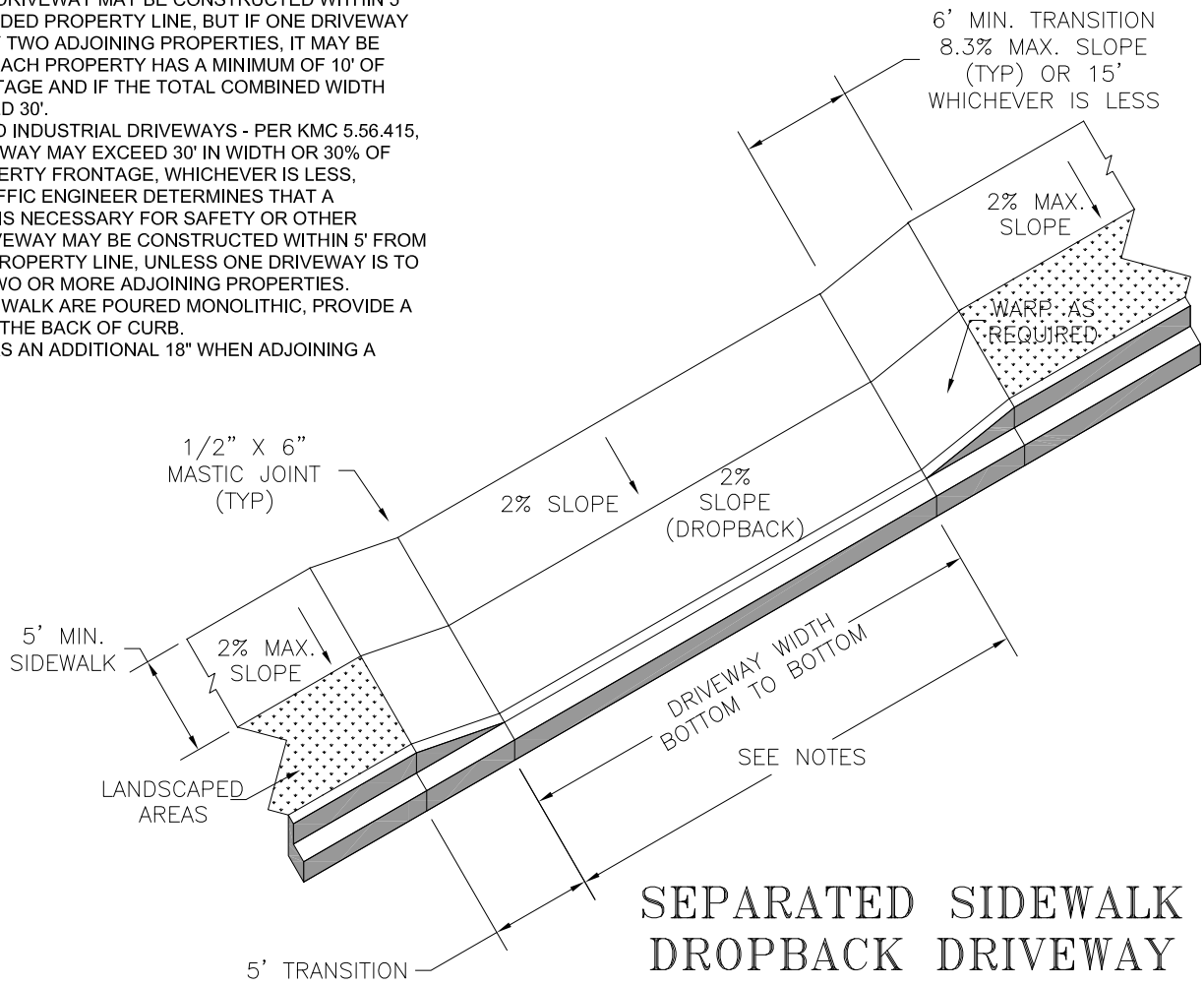
SEPARATED SIDEWALK DROPBACK DRIVEWAY PLAN VIEW

(ONLY ALLOWED WHEN FINISH GRADE OF GARAGE SLAB AND BUILDING FOUNDATION IS A MIN. OF 8" ABOVE GUTTER)



NOTES:

1. RESIDENTIAL DRIVEWAYS - PER KMC 5.56.410, NO SINGLE DRIVEWAY MAY EXCEED 24' IN WIDTH OR 50% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE CITY ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, BUT IF ONE DRIVEWAY IS TO BE USED BY TWO ADJOINING PROPERTIES, IT MAY BE CONTINUOUS IF EACH PROPERTY HAS A MINIMUM OF 10' OF DRIVEWAY FRONTAGE AND IF THE TOTAL COMBINED WIDTH DOES NOT EXCEED 30'.
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS - PER KMC 5.56.415, NO SINGLE DRIVEWAY MAY EXCEED 30' IN WIDTH OR 30% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE TRAFFIC ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY FOR SAFETY OR OTHER REASON. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, UNLESS ONE DRIVEWAY IS TO BE SHARED BY TWO OR MORE ADJOINING PROPERTIES.
3. WHEN CURB AND WALK ARE POURED MONOLITHIC, PROVIDE A DUMMY JOINT AT THE BACK OF CURB.
4. WIDEN SIDEWALKS AN ADDITIONAL 18" WHEN ADJOINING A WALL OR FENCE.



SEPARATED SIDEWALK DROPBACK DRIVEWAY ISOMETRIC VIEW

CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-10

SHEET 4 OF 8

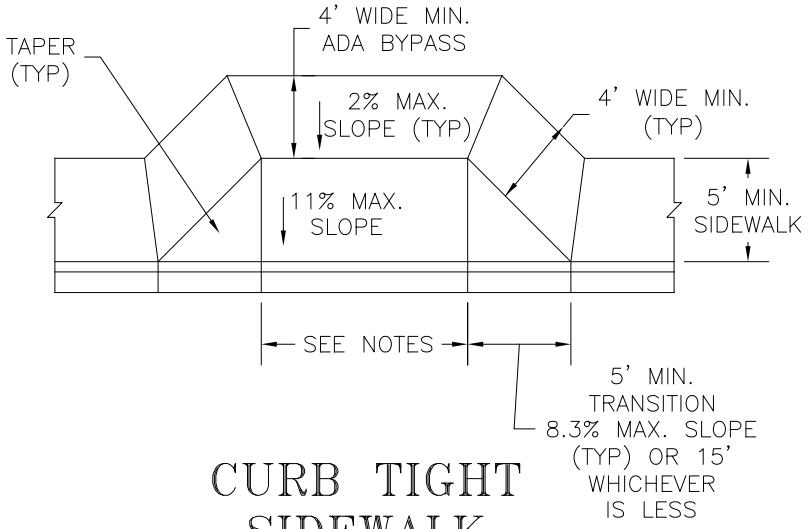
NOTES:

1. RESIDENTIAL DRIVEWAYS - PER KMC 5.56.410, NO SINGLE DRIVEWAY MAY EXCEED 24' IN WIDTH OR 50% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE CITY ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, BUT IF ONE DRIVEWAY IS TO BE USED BY TWO ADJOINING PROPERTIES, IT MAY BE CONTINUOUS IF EACH PROPERTY HAS A MINIMUM OF 10' OF DRIVEWAY FRONTAGE AND IF THE TOTAL COMBINED WIDTH DOES NOT EXCEED 30'.

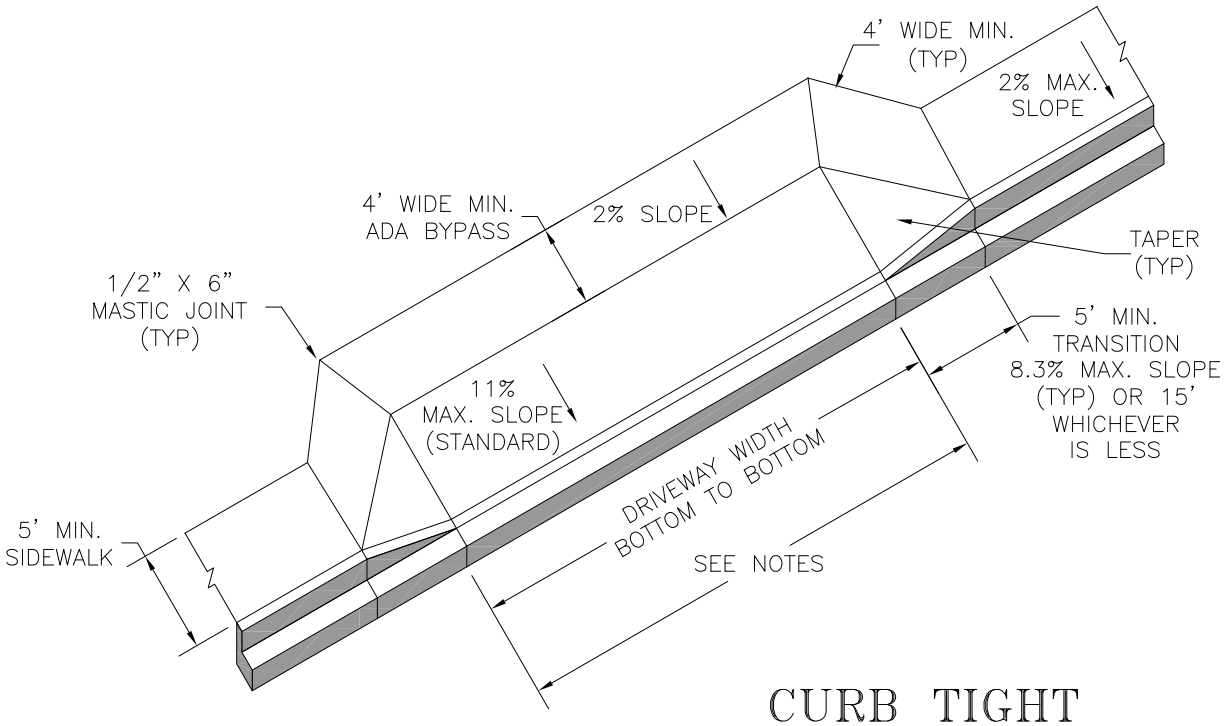
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS - PER KMC 5.56.415, NO SINGLE DRIVEWAY MAY EXCEED 30' IN WIDTH OR 30% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE TRAFFIC ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY FOR SAFETY OR OTHER REASON. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, UNLESS ONE DRIVEWAY IS TO BE SHARED BY TWO OR MORE ADJOINING PROPERTIES.

3. WHEN CURB AND WALK ARE POURED MONOLITHIC, PROVIDE A DUMMY JOINT AT THE BACK OF CURB.

4. WIDEN SIDEWALKS AN ADDITIONAL 18" WHEN ADJOINING A WALL OR FENCE.



CURB TIGHT SIDEWALK PLAN VIEW



CURB TIGHT SIDEWALK ISOMETRIC VIEW

CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK

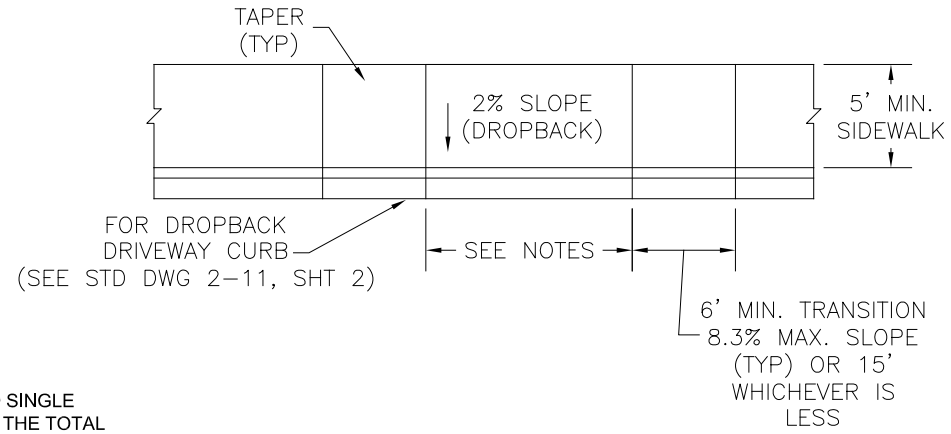
ENGINEERING DEPARTMENT

DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-10

SHEET 5 OF 8

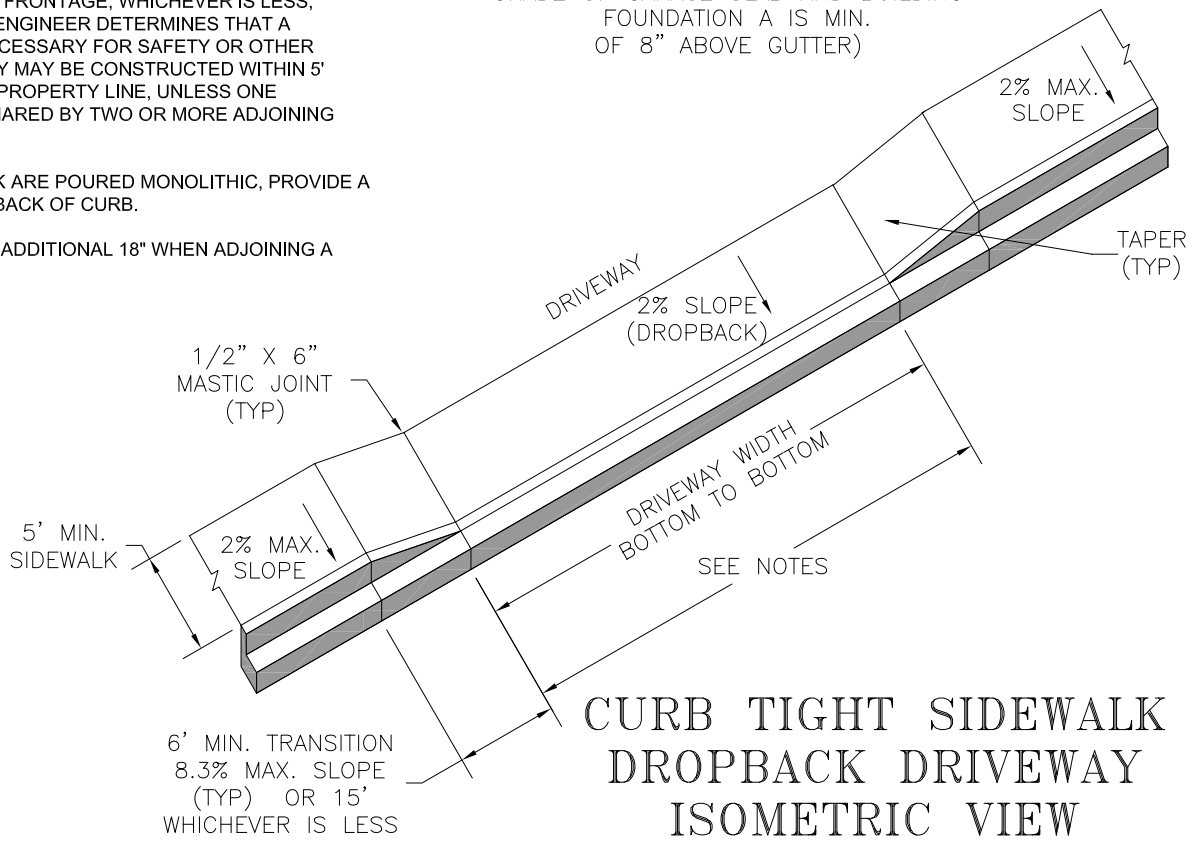


NOTES:

1. RESIDENTIAL DRIVEWAYS - PER KMC 5.56.410, NO SINGLE DRIVEWAY MAY EXCEED 24' IN WIDTH OR 50% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE CITY ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, BUT IF ONE DRIVEWAY IS TO BE USED BY TWO ADJOINING PROPERTIES, IT MAY BE CONTINUOUS IF EACH PROPERTY HAS A MINIMUM OF 10' OF DRIVEWAY FRONTAGE AND IF THE TOTAL COMBINED WIDTH DOES NOT EXCEED 30'.
2. COMMERCIAL AND INDUSTRIAL DRIVEWAYS - PER KMC 5.56.415, NO SINGLE DRIVEWAY MAY EXCEED 30' IN WIDTH OR 30% OF THE TOTAL PROPERTY FRONTAGE, WHICHEVER IS LESS, UNLESS THE TRAFFIC ENGINEER DETERMINES THAT A GREATER WIDTH IS NECESSARY FOR SAFETY OR OTHER REASON. NO DRIVEWAY MAY BE CONSTRUCTED WITHIN 5' FROM THE EXTENDED PROPERTY LINE, UNLESS ONE DRIVEWAY IS TO BE SHARED BY TWO OR MORE ADJOINING PROPERTIES.
3. WHEN CURB AND WALK ARE POURED MONOLITHIC, PROVIDE A DUMMY JOINT AT THE BACK OF CURB.
4. WIDEN SIDEWALKS AN ADDITIONAL 18" WHEN ADJOINING A WALL OR FENCE.

CURB TIGHT SIDEWALK DROPBACK DRIVEWAY PLAN VIEW

(ONLY ALLOWED WHEN FINISHED GRADE OF GARAGE SLAB AND BUILDING FOUNDATION A IS MIN. OF 8" ABOVE GUTTER)



CURB TIGHT SIDEWALK DROPBACK DRIVEWAY ISOMETRIC VIEW

CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

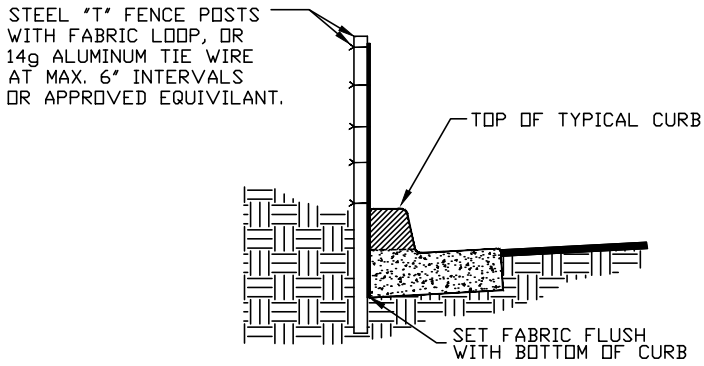
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

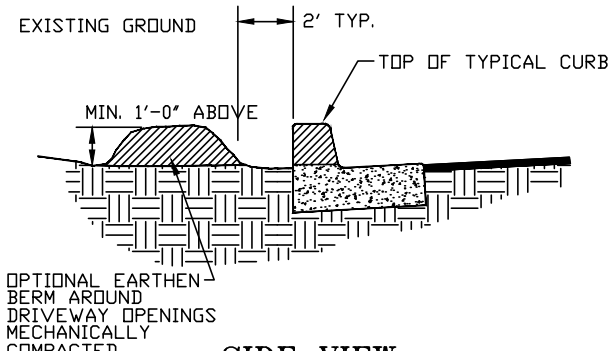
DWG. NO.

2-10

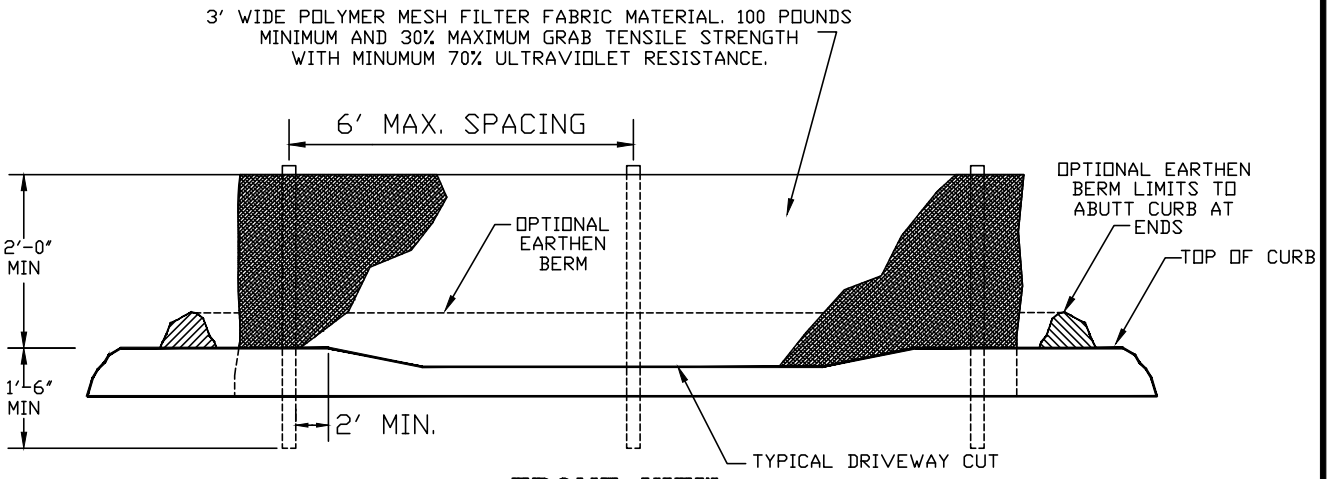
SHEET 6 OF 8



SIDE VIEW
MESH BARRIER



SIDE VIEW
OPTIONAL EARTHEN BERM



FRONT VIEW

1. WHEN DRIVEWAY CURB CUTS ARE INSTALLED AND NOT USED, OR RELOCATED AT THE TIME OF HOME CONSTRUCTION, THE ABANDONED CURB CUT SHALL BE REMOVED AND RECONSTRUCTED WITH STANDARD CURB AND GUTTER.
2. THE EROSION CONTROL SHALL BE INSTALLED WITHIN FIVE WORK DAYS AFTER COMPLETION OF THE CURB CUT, ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE STATE D.E.Q. PERMIT.
3. BACKFILL CURB AS REQUIRED TO BURY BOTTOM OF FILTER FABRIC FLUSH WITH BOTTOM OF CURB.
4. STEEL "T" FENCE POSTS ARE REQUIRED. WOOD POSTS ARE NOT ACCEPTABLE.
5. COMPACT ALL AREAS OF FILTER FABRIC TRENCH.
6. EARTH BERMS TO BE MECHANICALLY COMPACTED/WHEEL ROLLED.
7. THE BARRIER SHALL ONLY BE REMOVED WHEN THE ACTUAL HOME CONSTRUCTION IS STARTED. DURING CONSTRUCTION OF THE HOME, THE BUILDER SHALL BE FULLY RESPONSIBLE TO CONTROL EROSION AND THE TRACKING OF DIRT AND DEBRIS INTO THE CITY STREET.
8. WHEN THE CONCRETE SIDEWALK PORTION OF THE DRIVEWAY IS CONSTRUCTED IN CONJUNCTION WITH THE STREET CONSTRUCTION, BARRIERS ARE NOT REQUIRED. PROVIDE LOT EROSION CONTROL AS REQUIRED BY THE DEVELOPMENT STATE D.E.Q. PERMIT.
9. CURB CUT PLANS ON FUTURE DEVELOPMENTS MAY BE DENIED IF A DEVELOPER FAILS TO INSTALL AND MAINTAIN THE DESIGNATED EROSION CONTROL, WITHIN THE DESIGNATED TIME OR FAILS TO REASONABLY MAINTAIN THE STREET IN FRONT OF A CONSTRUCTION SITE ONCE THE EROSION BARRIER IS REMOVED.
10. WHEN CONSTRUCTION BEGINS AND THE BARRIER IS REMOVED, A BALLAST ROCK ENTRANCE WILL BE INSTALLED AS REQUIRED BY SECTION 2-27.01.

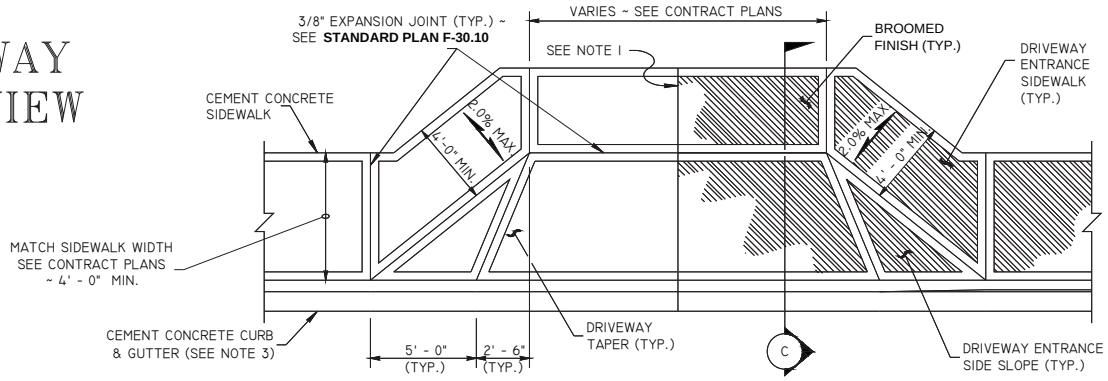
CURB CUT - EROSION CONTROL

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/94
DWN	DDS
REV	3/14
CHK	BWB
SCALE	NTS

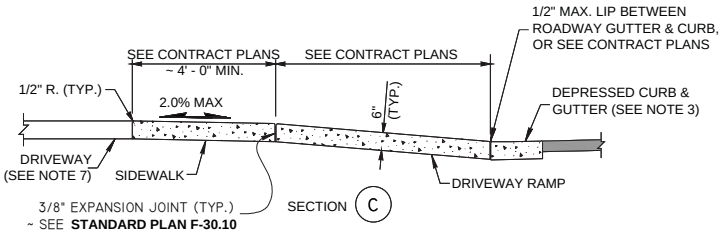
DWG. NO.
2-10
SHEET 7 OF 8

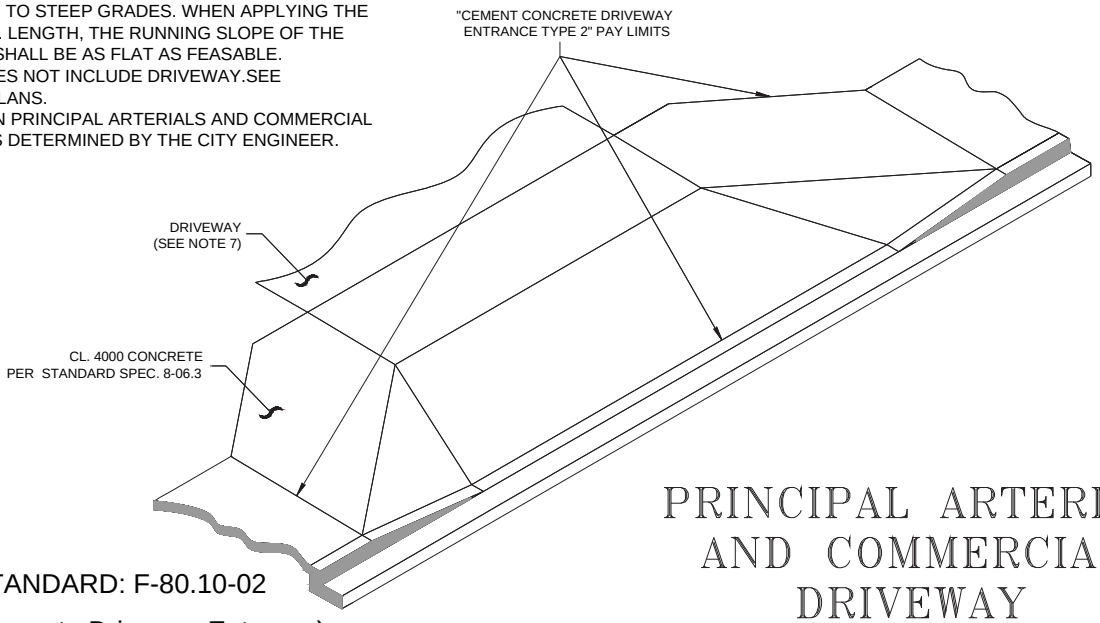
DRIVEWAY PLAN VIEW



NOTES:

1. WHEN THE DRIVEWAY WIDTH EXCEEDS 15 FEET, CONSTRUCT A FULL DEPTH EXPANSION JOINT WITH 3/8" JOINT FILLER ALONG THE DRIVEWAY CENTERLINE. SEE STANDARD PLAN F-30.10. CONSTRUCT EXPANSION JOINTS PARALLEL WITH THE CENTERLINE AS REQUIRED AT 15 FEET MAXIMUM SPACING WHEN DRIVEWAY WIDTHS EXCEED 30 FEET.
2. SEE STANDARD PLAN F-30.10 FOR SIDEWALK DETAILS.
3. CURB AND GUTTER SHOWN; SEE THE CONTRACT PLANS FOR THE CURB DESIGN SPECIFIED. SEE STANDARD PLAN F-10.12 FOR CURB DETAILS.
4. AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF DRIVEWAY ENTRANCES.
5. WHERE "GRADE BREAK" IS CALLED OUT, THE ENTIRE LENGTH OF THE LINE BETWEEN THE TWO ADJACENT SURFACE PLANES SHALL BE FLUSH.
6. THE CURB RAMP MAXIMUM RUNNING SLOPE SHALL NOT REQUIRE THE RAMP LENGTH TO EXCEED 15 FEET TO AVOID CHASING THE SLOPE INDEFINITELY WHEN CONNECTING TO STEEP GRADES. WHEN APPLYING THE 15 FOOT MAX. LENGTH, THE RUNNING SLOPE OF THE CURB RAMP SHALL BE AS FLAT AS FEASABLE.
7. PAY ITEM DOES NOT INCLUDE DRIVEWAY.SEE CONTRACT PLANS.
8. REQUIRED ON PRINCIPAL ARTERIALS AND COMMERCIAL AREAS OR AS DETERMINED BY THE CITY ENGINEER.





PRINCIPAL ARTERIAL AND COMMERCIAL DRIVEWAY

WSDOT STANDARD: F-80.10-02

(Cement Concrete Driveway Entrance)

CURB, GUTTER, SIDEWALK & DRIVEWAY STANDARD

CITY OF KENNEWICK

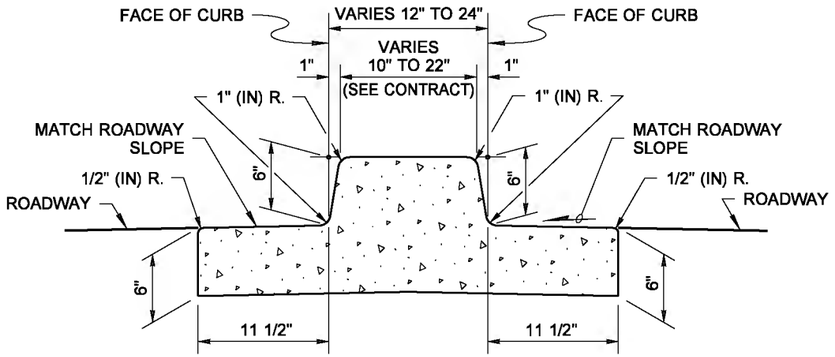
ENGINEERING DEPARTMENT

DATE	2/93
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

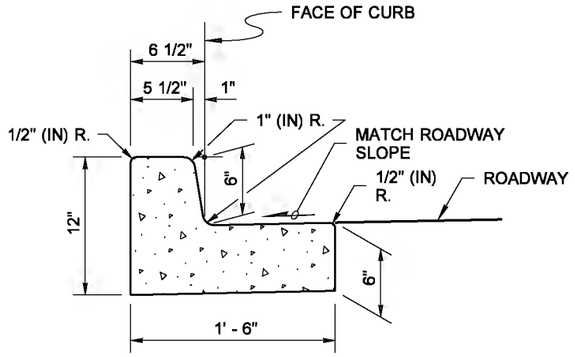
DWG. NO.

2-10

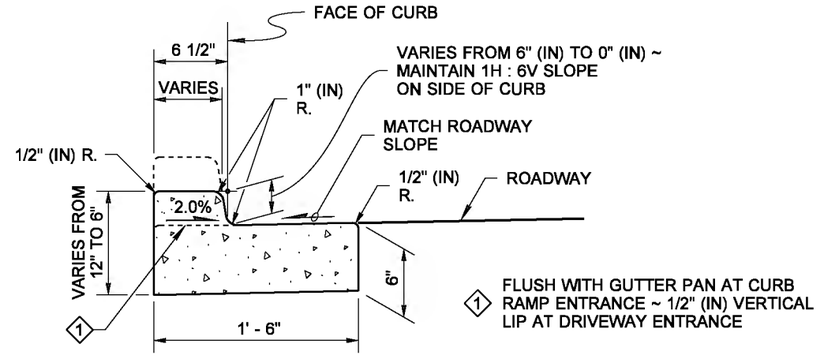
SHEET 8 OF 8



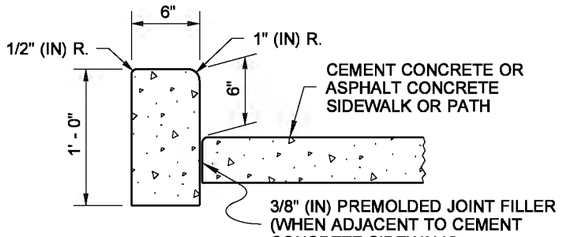
DUAL-FACED CEMENT CONCRETE TRAFFIC CURB AND GUTTER



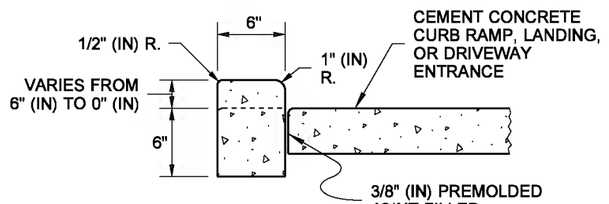
CEMENT CONCRETE TRAFFIC CURB AND GUTTER



DEPRESSED CURB SECTION
AT CURB RAMPS AND DRIVEWAY ENTRANCES



CEMENT CONCRETE PEDESTRIAN CURB

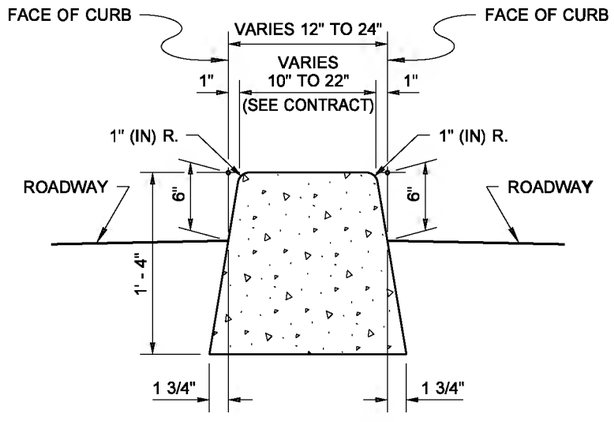


CEMENT CONCRETE PEDESTRIAN CURB
AT CURB RAMPS, LANDINGS, AND DRIVEWAY ENTRANCES

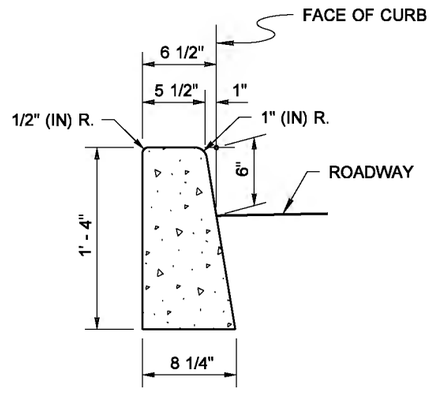
NOTE

1. See **Standard Plan F-30.10** for Curb Expansion and Contraction Joint spacing and see **Standard Specification Sections 8-04 and 9-04** for additional requirements.

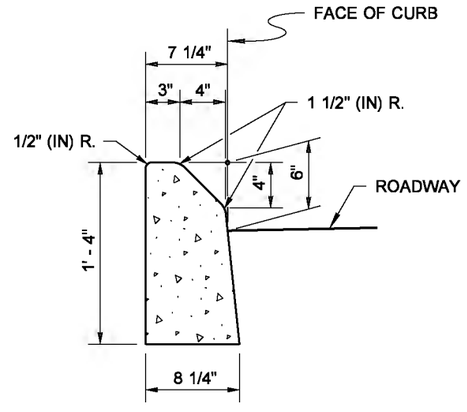
DRAWN BY: FERN LIDDELL



DUAL-FACED CEMENT CONCRETE TRAFFIC CURB



CEMENT CONCRETE TRAFFIC CURB



MOUNTABLE CEMENT CONCRETE TRAFFIC CURB

CEMENT CONCRETE CURBS

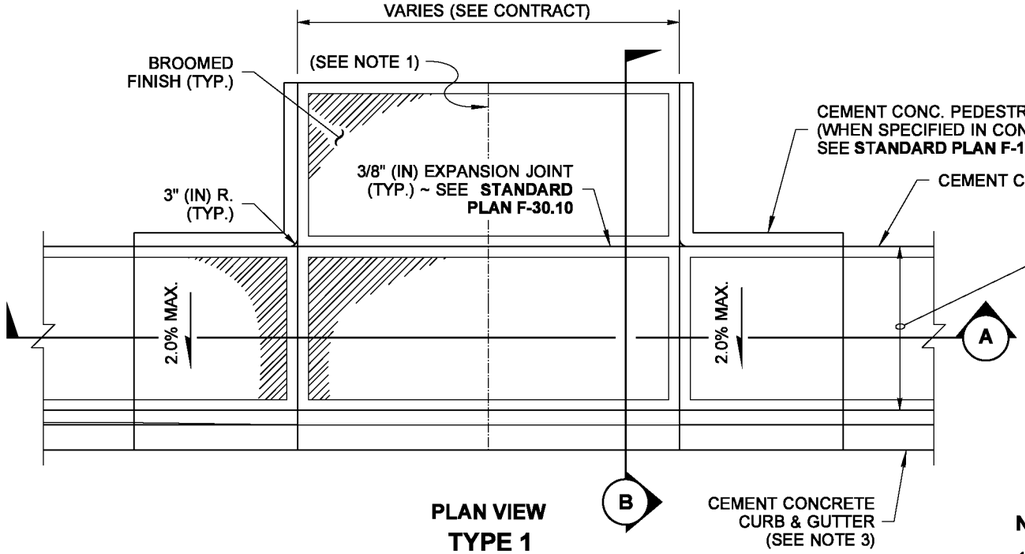
STANDARD PLAN F-10.12-03

SHEET 1 OF 1 SHEET

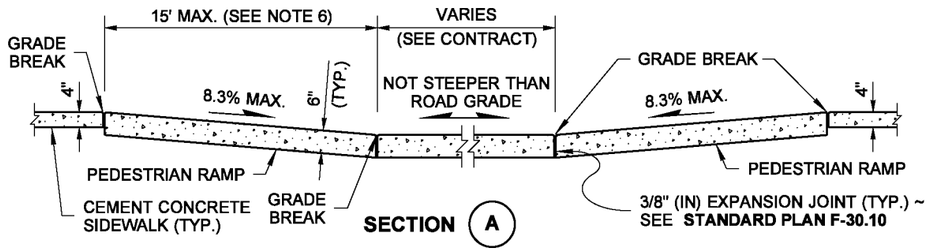
APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

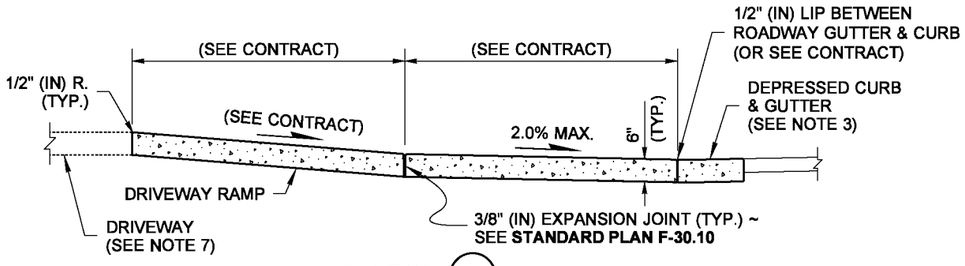
Washington State Department of Transportation



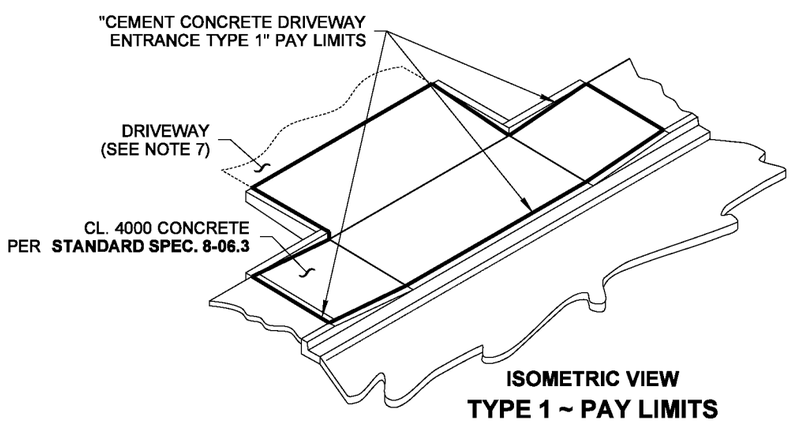
PLAN VIEW
TYPE 1



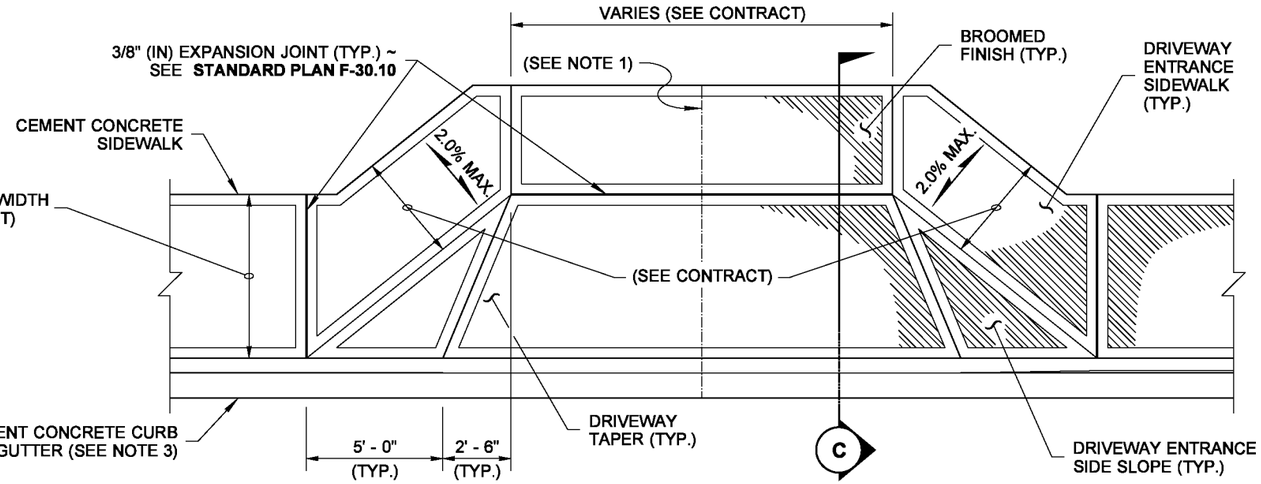
SECTION (A)



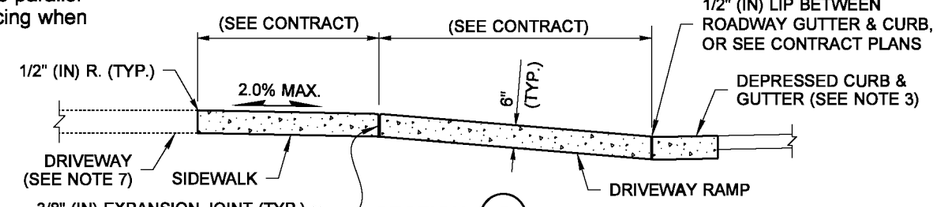
SECTION (B)



ISOMETRIC VIEW
TYPE 1 ~ PAY LIMITS



PLAN VIEW
TYPE 2



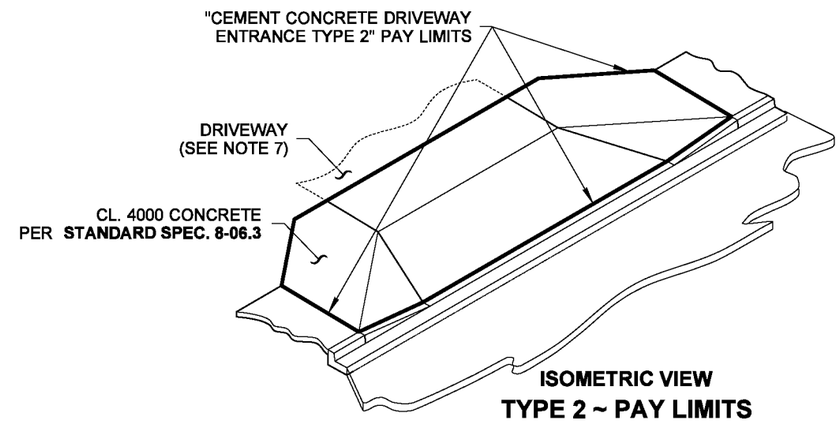
SECTION (C)

NOTES

1. When the driveway width exceeds 15' (ft), construct a full depth expansion joint with 3/8" (in) joint filler along the driveway centerline. See **Standard Plan F-30.10.** Construct expansion joints parallel with the centerline as required at 15' (ft) maximum spacing when driveway widths exceed 30' (ft).
2. See **Standard Plan F-30.10** for sidewalk details.
3. Curb and gutter shown; see the Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb Details.
4. Avoid placing drainage structures, junction boxes or other obstructions in front of driveway entrances.
5. Where "GRADE BREAK" is called out, the entire length of the line between the two adjacent surface planes shall be flush.
6. The curb ramp maximum running slope shall not require the ramp length to exceed 15' (ft) to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15' (ft) max. length, the running slope of the curb ramp shall be as flat as feasable.
7. Beyond limits shown. Pay item does not include driveway. See Contract Plans.

LEGEND

SLOPE IN EITHER DIRECTION



ISOMETRIC VIEW
TYPE 2 ~ PAY LIMITS

CEMENT CONCRETE DRIVEWAY ENTRANCE TYPES 1, 2, 3, & 4
STANDARD PLAN F-80.10-03

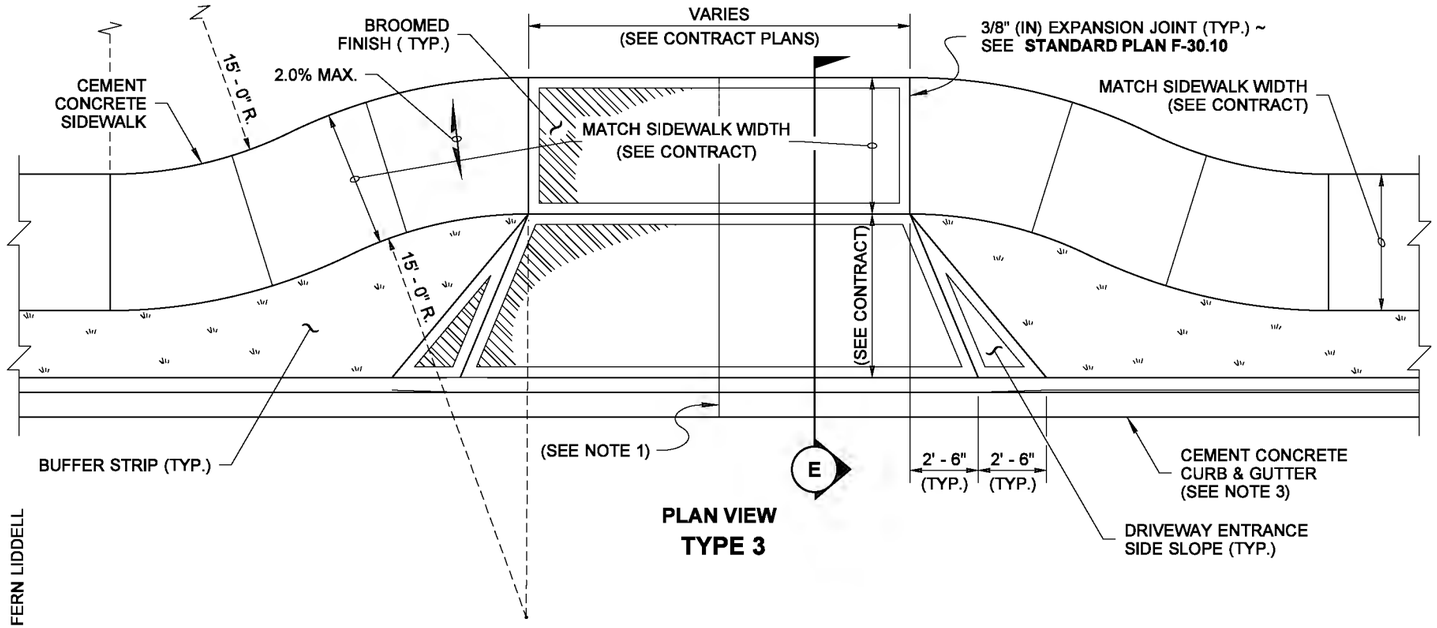
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

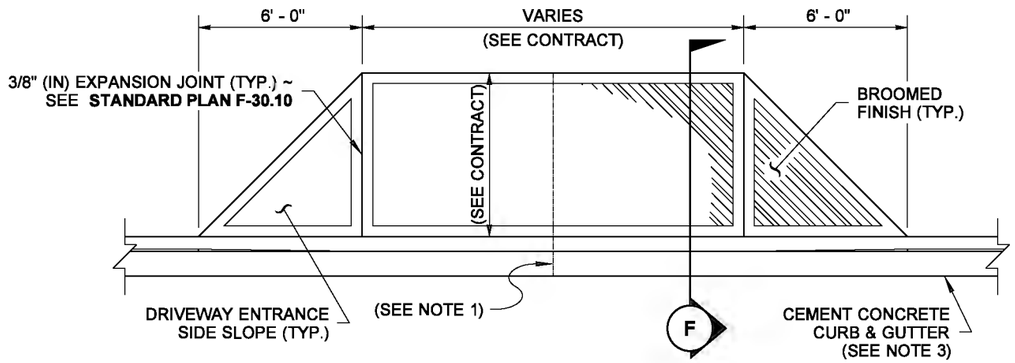
STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: FERN LIDDELL



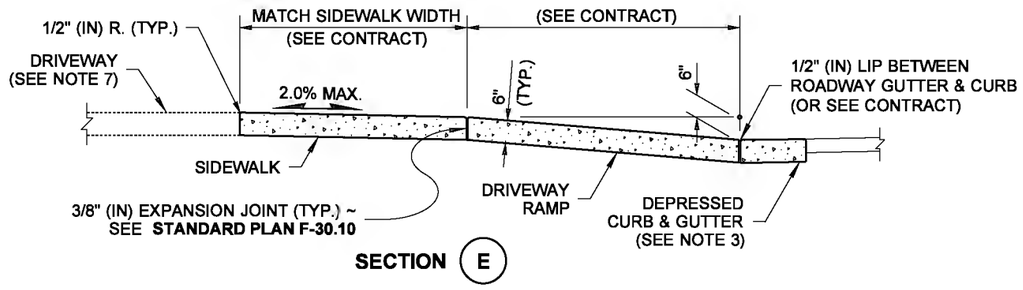
PLAN VIEW
TYPE 3



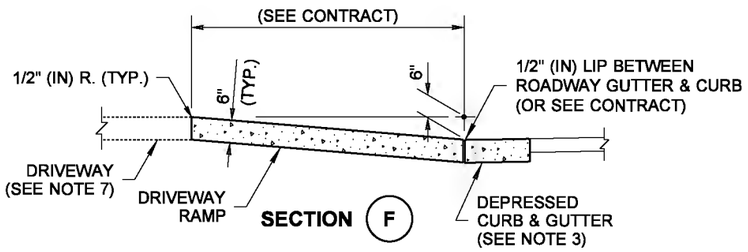
PLAN VIEW
TYPE 4*

*THIS ENTRANCE TYPE SHALL NOT BE USED ALONG A PEDESTRIAN ROUTE

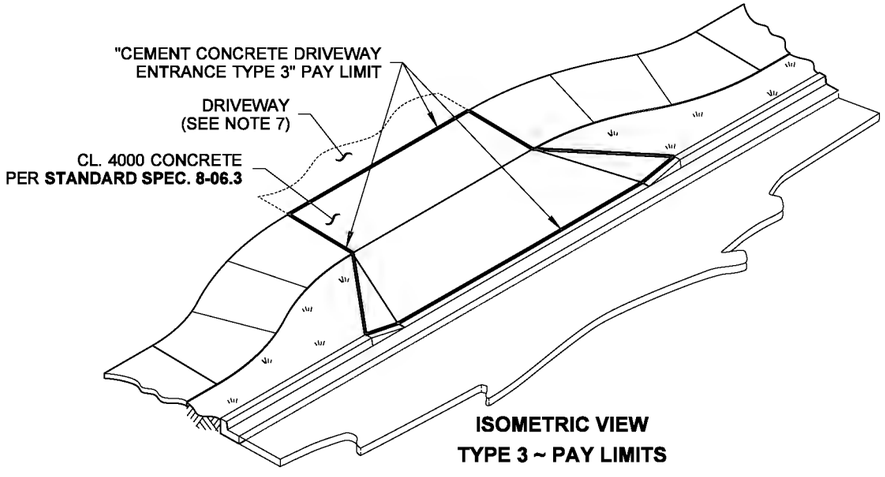
DRAWN BY: FERN LIDDELL



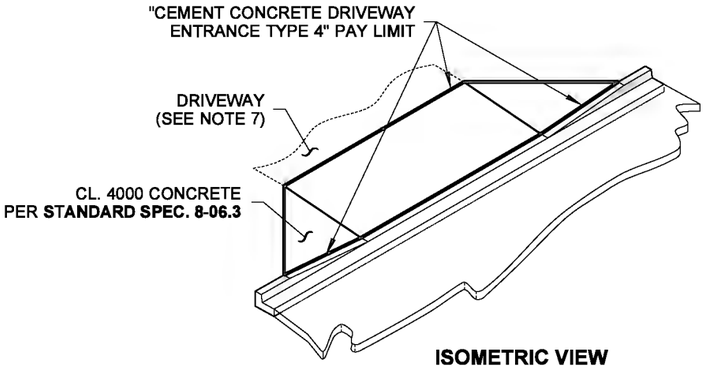
SECTION (E)



SECTION (F)



ISOMETRIC VIEW
TYPE 3 ~ PAY LIMITS



ISOMETRIC VIEW
TYPE 4 ~ PAY LIMITS

EDWARD PATRICK BARRY
STATE OF WASHINGTON
34363
REGISTERED
PROFESSIONAL ENGINEER

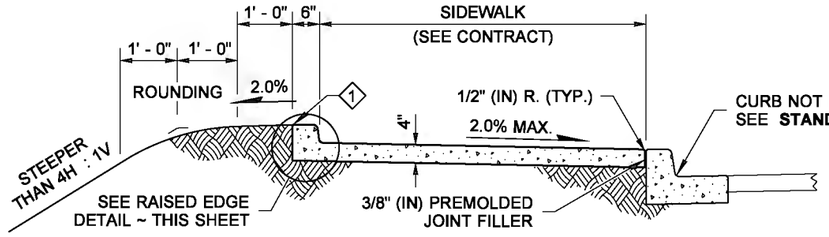
CEMENT CONCRETE DRIVEWAY ENTRANCE TYPES 1, 2, 3, & 4
STANDARD PLAN F-80.10-03

SHEET 2 OF 2 SHEETS

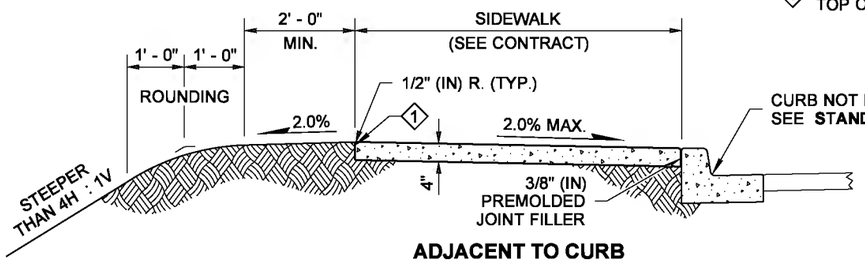
APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

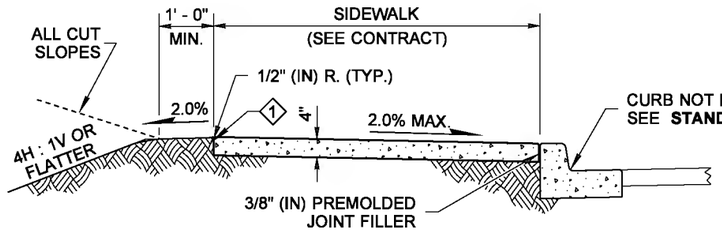
Washington State Department of Transportation



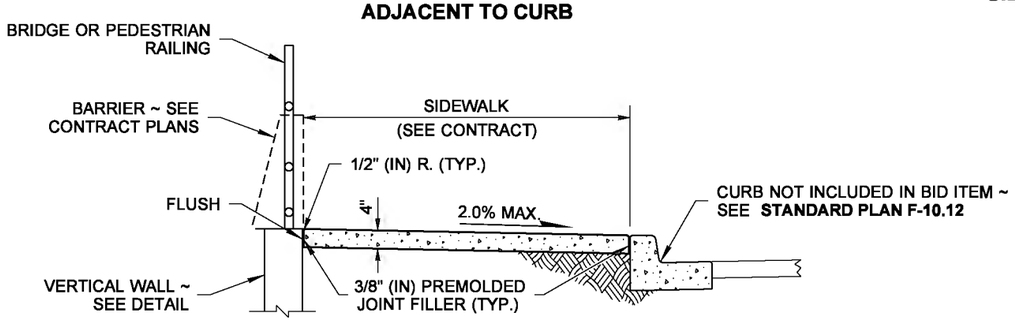
WITH RAISED EDGE



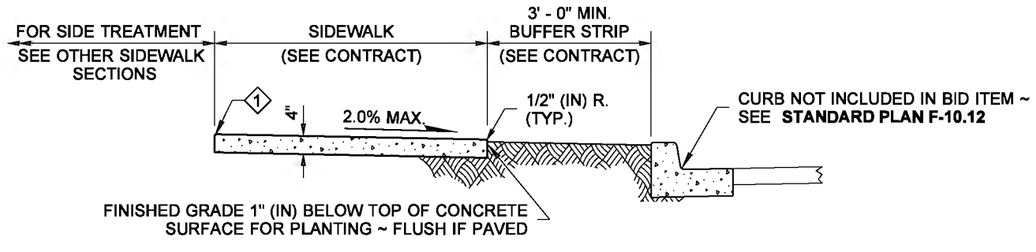
ADJACENT TO CURB
(STEEP FILL SLOPES)



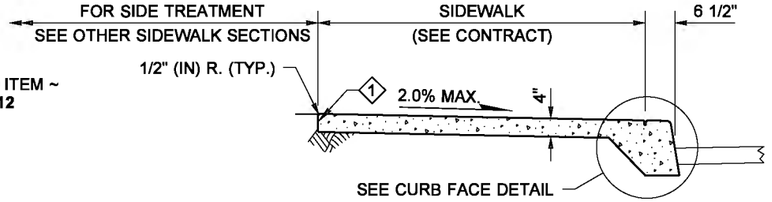
ADJACENT TO CURB



ADJACENT TO CURB AND RAILING OR WALL



ADJACENT TO BUFFER STRIP

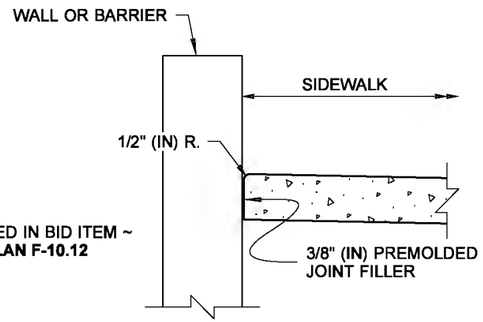


MONOLITHIC CEMENT CONCRETE CURB AND SIDEWALK

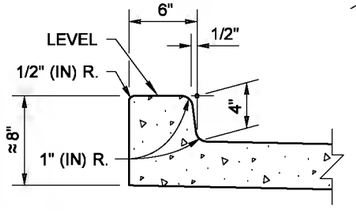
1 FINISHED GRADE 1" (IN) BELOW TOP OF CONCRETE SURFACE

NOTE

1. Four feet of the sidewalk width shall be the minimum pedestrian accessible route free of vertical and horizontal obstructions. Gratings, Access Covers, Junction Boxes, Cable Vaults, Pull Boxes and other appurtenances within the sidewalk must have slip resistant surfaces, be flush with surface, and match grade of the sidewalk.

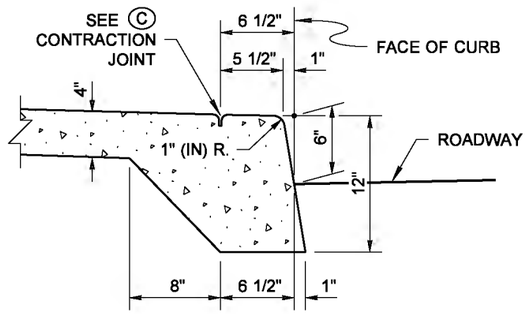


SIDEWALK ADJACENT TO WALL DETAIL



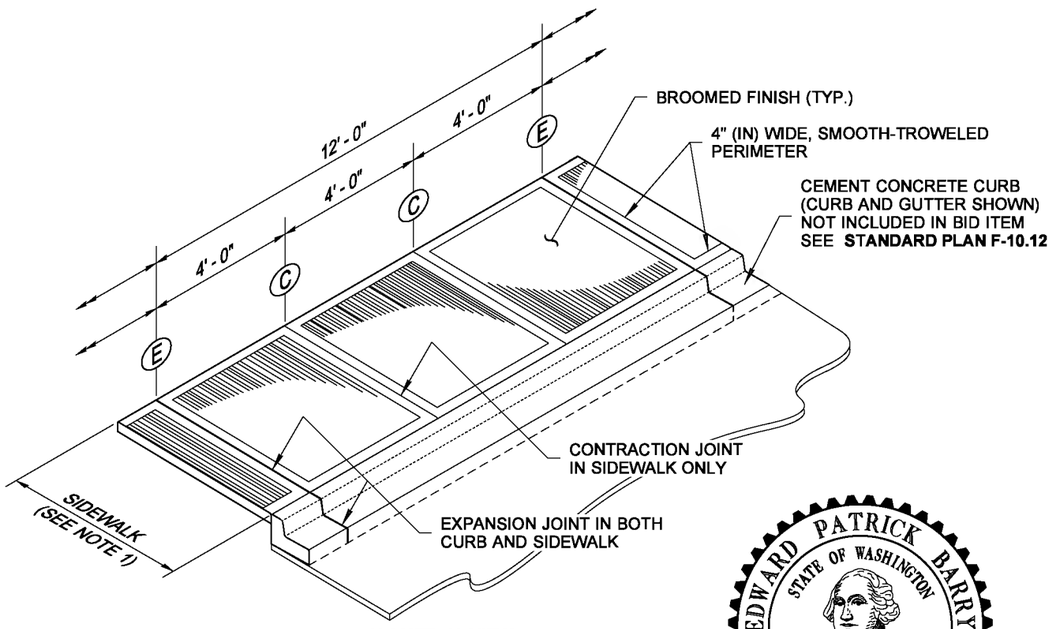
RAISED EDGE DETAIL

EXTEND SIDEWALK TRANSVERSE JOINTS TO INCLUDE RAISED EDGE



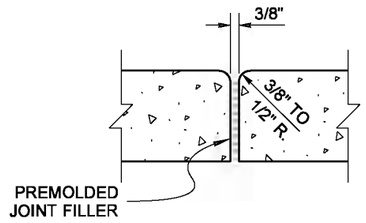
CURB FACE DETAIL

EXTEND SIDEWALK TRANSVERSE EXPANSION JOINTS TO INCLUDE CURB (FULL DEPTH)

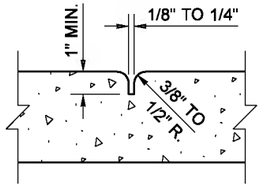


ISOMETRIC VIEW

JOINT AND FINISH DETAIL



E EXPANSION JOINT



C CONTRACTION JOINT

CEMENT CONCRETE SIDEWALK

STANDARD PLAN F-30.10-03

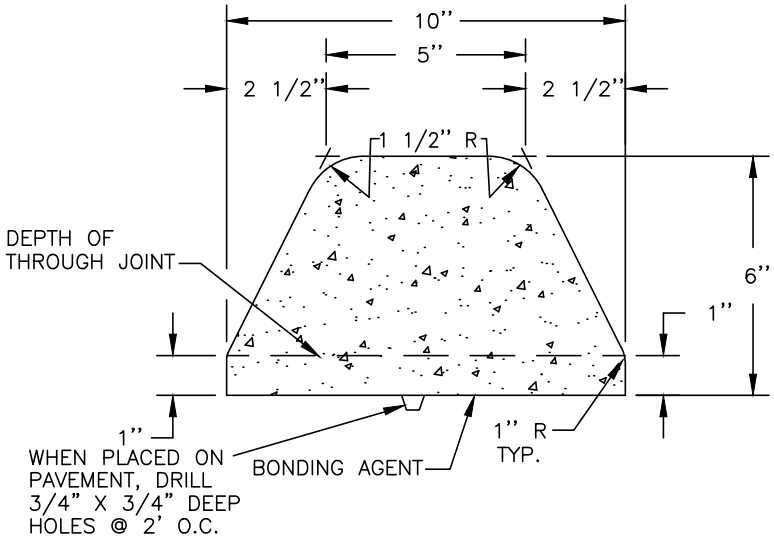
SHEET 1 OF 1 SHEET

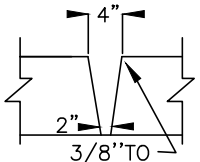
APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation

DRAWN BY: LISA CYFORD



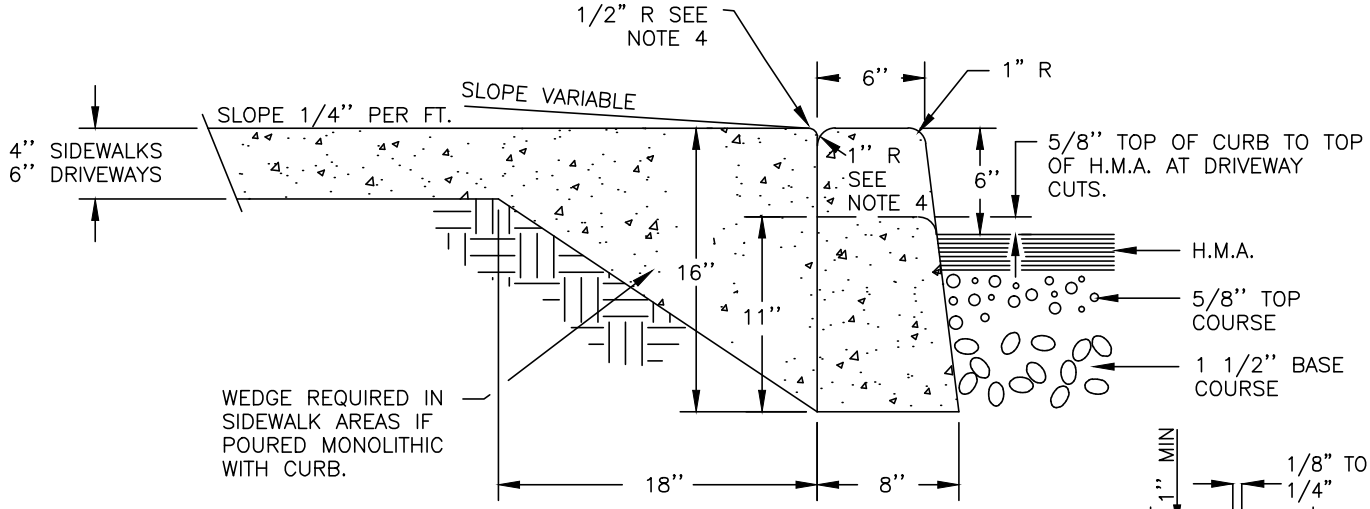


V–JOINT

WHEN REQUIRED TO PASS DRAINAGE, CONSTRUCT 2"–"V" JOINT AT 20' INTERVALS.

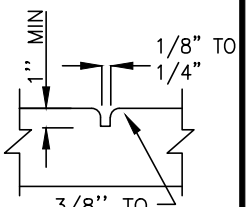
EXTRUDED CEMENT CONCRETE CURB

SEE STANDARDS SECTION 2–23



TYPE E–1 CEMENT CONCRETE CURB

SEE DWG. 2–10 FOR DETAILS NOT SHOWN.



CONTRACTION JOINT

NOTE:

1. CONCRETE SHALL BE CEMENT CONCRETE 5 SACK, SEE DRAWING 2–13. EXTRUDED CURB TO BE PAINTED PER SWSS SECTION 8–07 (IF BEING USED FOR TRAFFIC BARRIER)
2. CONTRACTION JOINT SHALL BE 10'–0'' C/C. ALSO SEE NOTE 5.
3. EXPANSION MATERIAL (1/2'' MASTIC) SHALL BE PLACED AT ALL CURB RETURNS.
4. WHEN SIDEWALK IS REQUIRED, POUR MONOLITHIC WITH SCRIBED JOINT. AT BACK OF CURB.
5. WHEN EXTRUDED CURB REQUIRES PASS THROUGH DRAINAGE, CONSTRUCT A "V" JOINT AT 20' INTERVALS.

EXTRUDED AND TYPE E–1 CURBING

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-11

CITY OF KENNEWICK

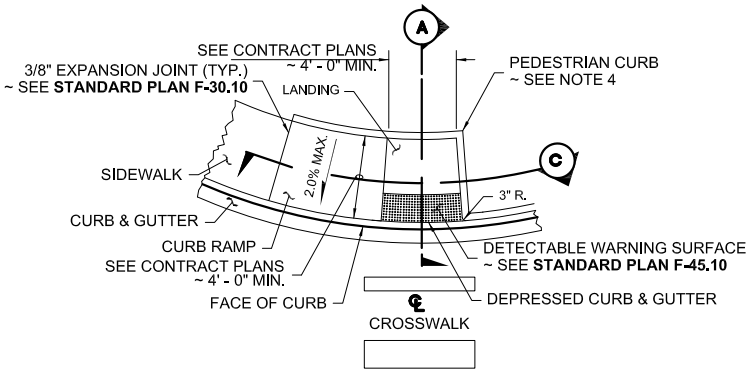
ENGINEERING DEPARTMENT

PARALLEL CURB RAMP
STANDARD F-40.12-02

DATE 6/3/10
DWN WSDOT
REV 3/14
CHK BWB
SCALE NTS

DWG. NO. **2-12**

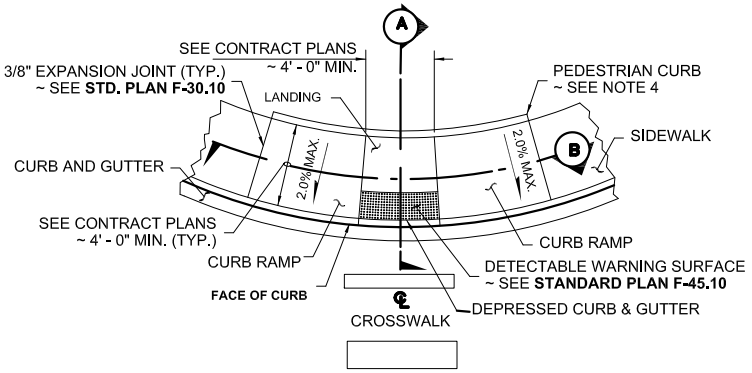
SHEET 1 OF 4



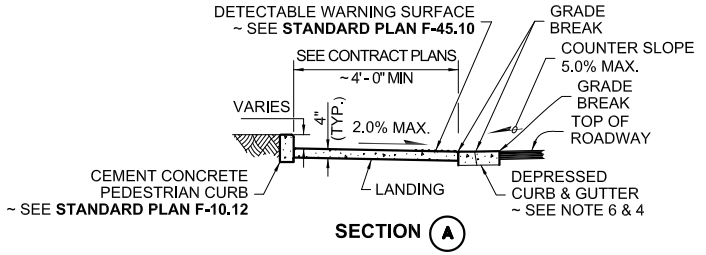
PLAN VIEW TYPE PARALLEL B

1. Provide a separate curb ramp for each marked or unmarked crosswalk. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place gratings, junction boxes, access covers, or other appurtenances in front of thre curb ramp or on any part of the curb ramp or landing.
4. See Contract Plans for the curb design specified. See Standard Plan F-10.12 for Curb, Curb and Gutter, and Pedestrian Curb Details.
5. See Standard Plan F-30.10 for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adacent Curb, Curb and Gutter, Pedestrian Curb or Sidewalks.
7. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot max. length, the running slope of the curb ramp shall be as flat as feasable.
8. Curb ramp, landing, & flares shall receive broom finish. See Standard Specifications 8-14.

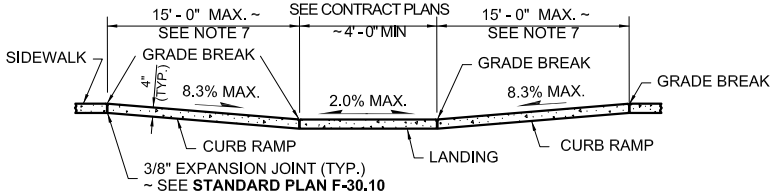
SLOPE IN EITHER DIRECTION



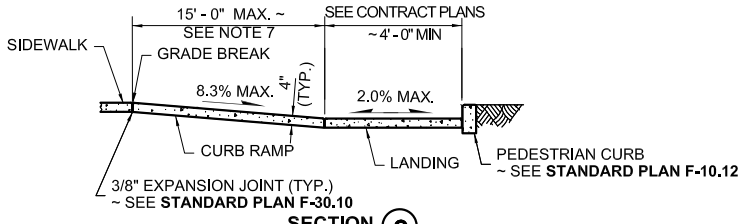
PLAN VIEW TYPE PARALLEL A



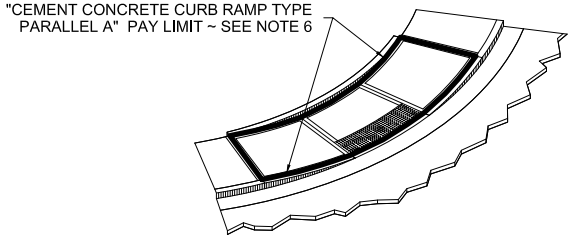
SECTION (A)



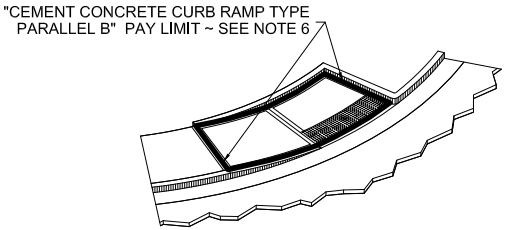
SECTION (B)



SECTION (C)



ISOMETRIC VIEW TYPE PARALLEL A PAY LIMIT



ISOMETRIC VIEW TYPE PARALLEL B PAY LIMIT

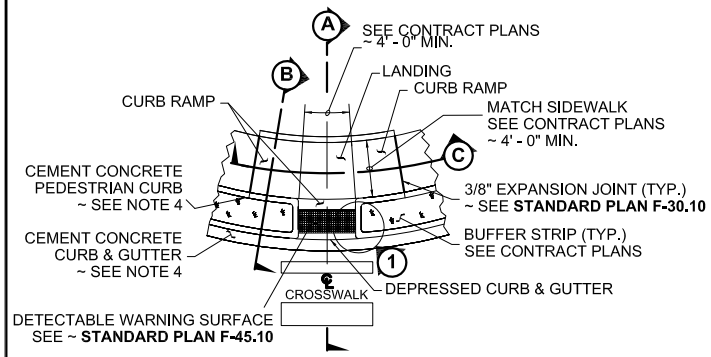
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

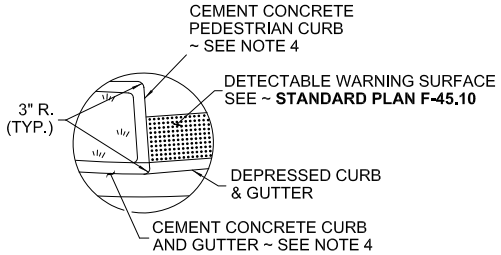
COMBINATION CURB RAMP
STANDARD PLAN F-40.14-02

DATE 6/3/10
DWN WSDOT
REV 3/14
CHK BWB
SCALE NTS

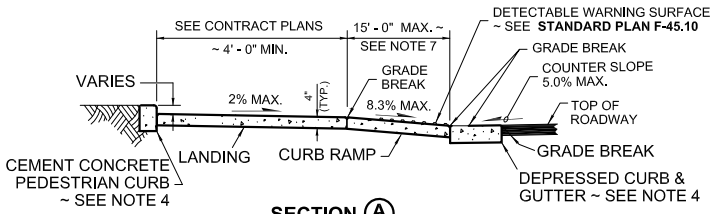
DWG. NO.
2-12
SHEET 2 OF 4



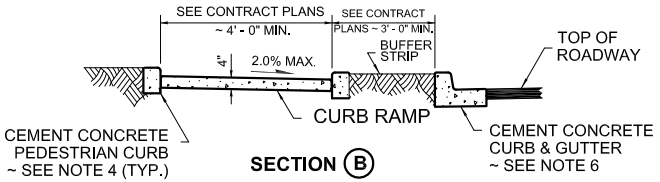
PLAN VIEW
TYPE COMBINATION
WITH BUFFER



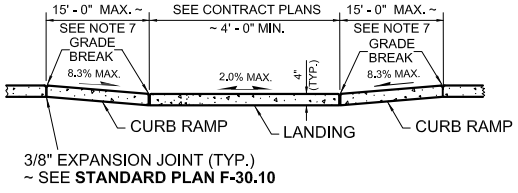
CURB RADIUS DETAIL (1)



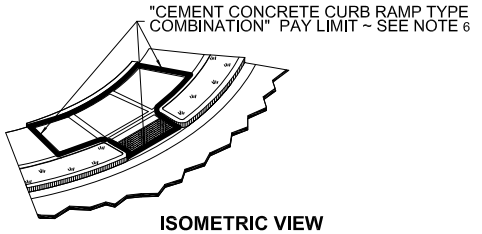
SECTION (A)



SECTION (B)



SECTION (C)



ISOMETRIC VIEW
TYPE COMBINATION PAY LIMIT

1. Provide a separate curb ramp for each marked or unmarked crosswalk. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place gratings, junction boxes, access covers, or other appurtenances in front of thre curb ramp or on any part of the curb ramp or landing.
4. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, and Pedestrian Curb Details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adacent Curb, Curb and Gutter, Pedestrian Curb or Sidewalks.
7. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot max. length, the running slope of the curb ramp shall be as flat as feasable.
8. Curb ramp, landing & flares shall receive broom finish. See **Standard Specifications 8-14.**

LEGEND

SLOPE IN EITHER DIRECTION

CITY OF KENNEWICK

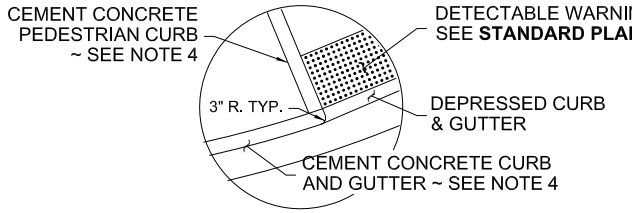
ENGINEERING DEPARTMENT

PERPENDICULAR CURB RAMP
STANDARD PLAN F-40.15-02

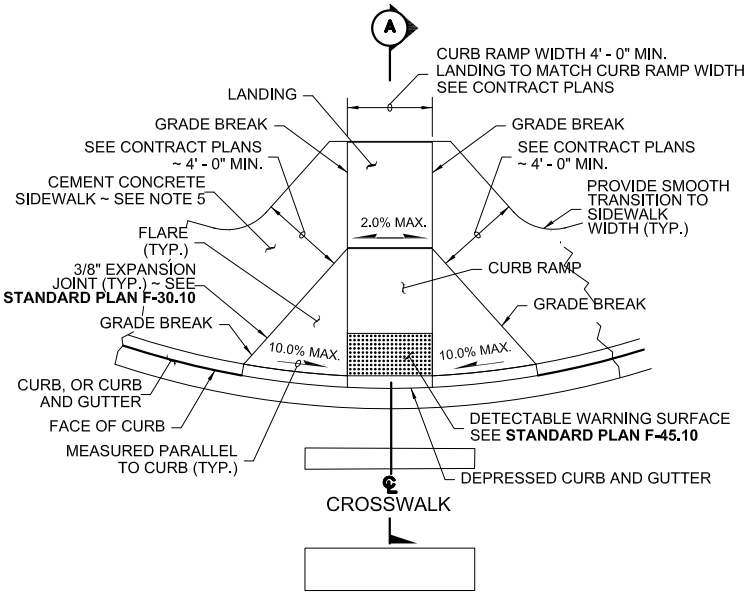
DATE 6/3/10
DWN WSDOT
REV 3/14
CHK BWB
SCALE NTS

DWG. NO. **2-12**

SHEET 3 OF 4

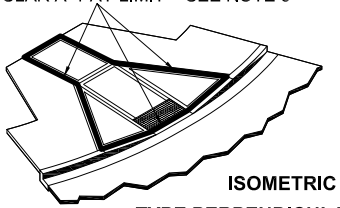


CURB RADIUS DETAIL (1)



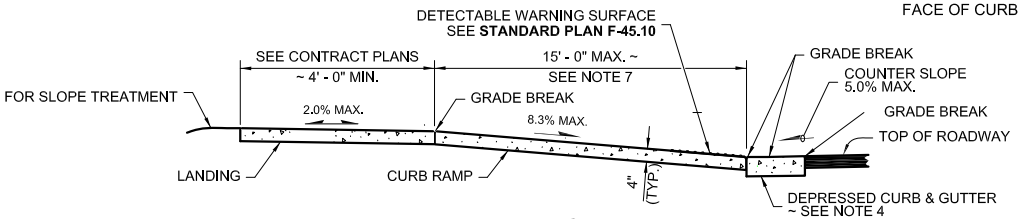
PLAN VIEW
TYPE PERPENDICULAR A

CEMENT CONCRETE CURB RAMP "TYPE PERPENDICULAR A" PAY LIMIT ~ SEE NOTE 6



ISOMETRIC VIEW

TYPE PERPENDICULAR A PAY LIMIT



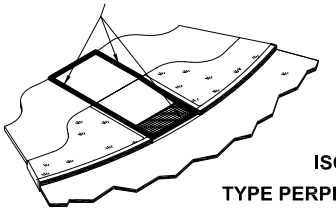
SECTION (A)

NOTES

1. Provide a separate curb ramp for each marked or unmarked crosswalk. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface plans shall be flush.
3. Do not place gratings, junction boxes, access covers, or other appurtences
in front of the curb ramp or on any part of the curb ramp or landing.
4. See the Contract plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, and Pedestrian Curb details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk details. See Contract plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type_" does not include the adjacent Curb, Curb and Gutter, Pedestrian Curb or Sidewalk.
7. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot maximum length, the running slope of the curb ramp shall as flat as possible.
8. Curb ramp, landing, & flares shall receive broom finish. **See Standard Specifications 8-14.**

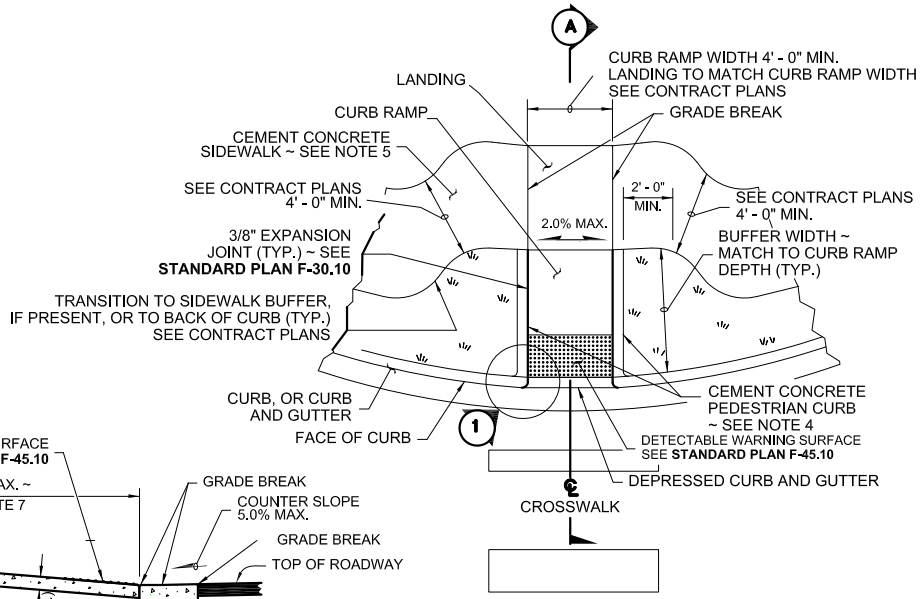
SLOPE IN EITHER DIRECTION

CEMENT CONCRETE CURB RAMP "TYPE PERPENDICULAR B" PAY LIMIT ~ SEE NOTE 6



ISOMETRIC VIEW

TYPE PERPENDICULAR B PAY LIMIT



PLAN VIEW
TYPE PERPENDICULAR B
(SHOWN WITH BUFFER)

CITY OF KENNEWICK

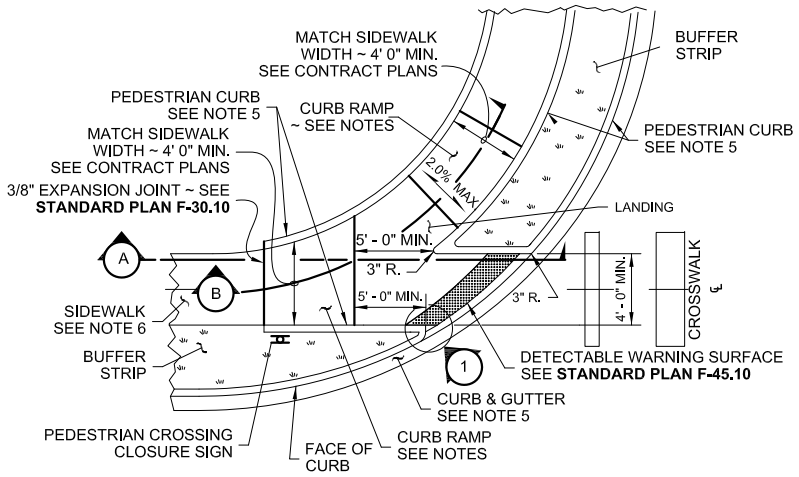
ENGINEERING DEPARTMENT

SINGLE DIRECTION CURB RAMP
STANDARD PLAN F-40.16-02

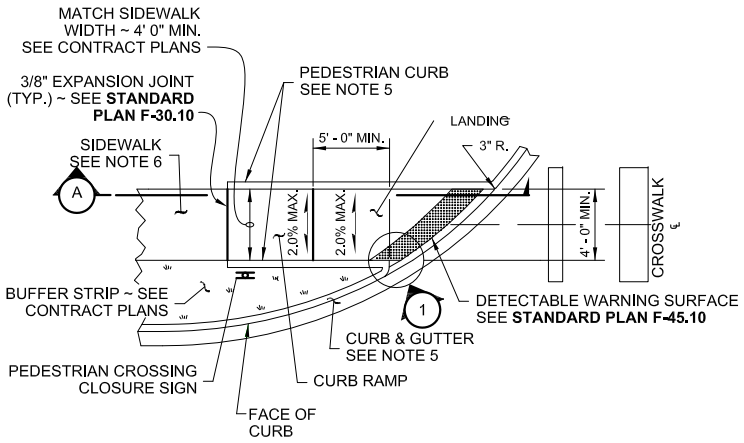
DATE 6/3/10
DWN WSDOT
REV 3/14
CHK BWB
SCALE NTS

DWG. NO. **2-12**

SHEET 4 OF 4



PLAN VIEW
TYPE SINGLE DIRECTION B

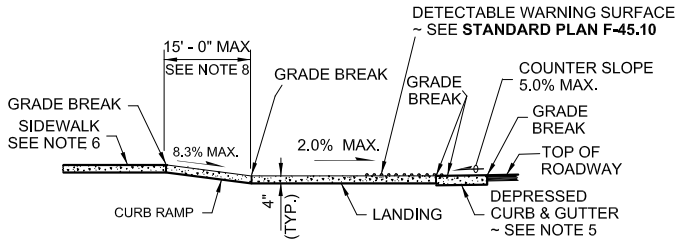


PLAN VIEW
TYPE SINGLE DIRECTION A

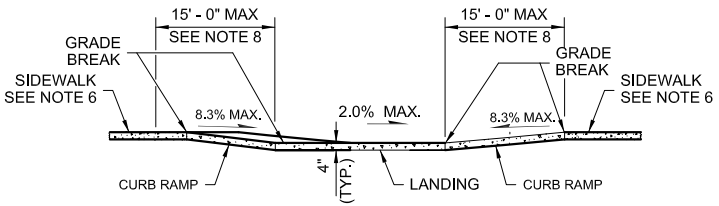
NOTES

1. This plan is to be used when pedestrian crossing in one direction is not permitted.
2. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
3. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface plans shall be flush.
4. Do not place gratings, junction boxes, access covers or other appurtanences in front of the curb ramp or on any part of the curb ramp or landing.
5. See the Contract Documents for the curb design specified. See Standard Plan F-10.12 for Curb, Curb and Gutter, and Pedestrian Curb details.
6. See Standard Plan F-30.10 for Cement Concrete Sidewalk Details. See contract plans for width and placement of sidewalk.
7. The bid item "Cement Concrete Curb Ramp Type_" does not include the adjacent Curb or (Curb and Gutter), Pedestrian Curb or Sidewalk, or the pedestrian crossing closure sign.
8. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot maximum, the running slope of the curb ramp shall be as flat as possible.

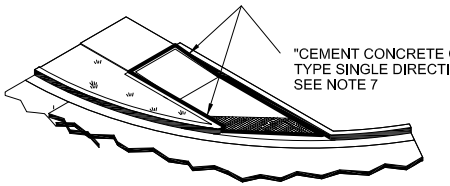
SLOPE IN EITHER DIRECTION



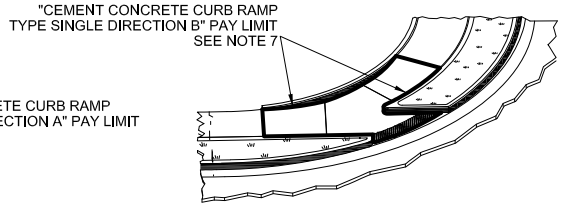
SECTION (A)



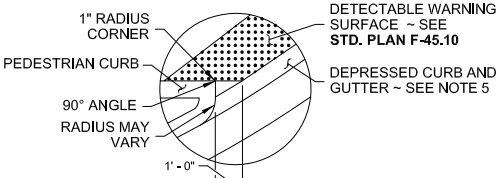
SECTION (B)



ISOMETRIC VIEW
TYPE SINGLE DIRECTION A
PAY LIMIT

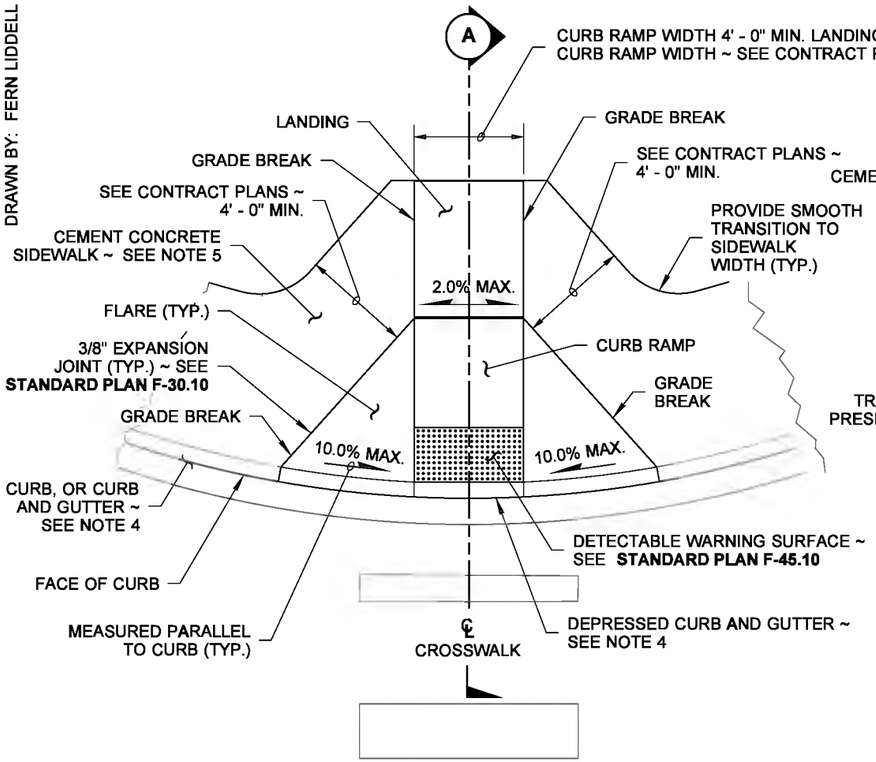


ISOMETRIC VIEW
TYPE SINGLE DIRECTION B
PAY LIMIT



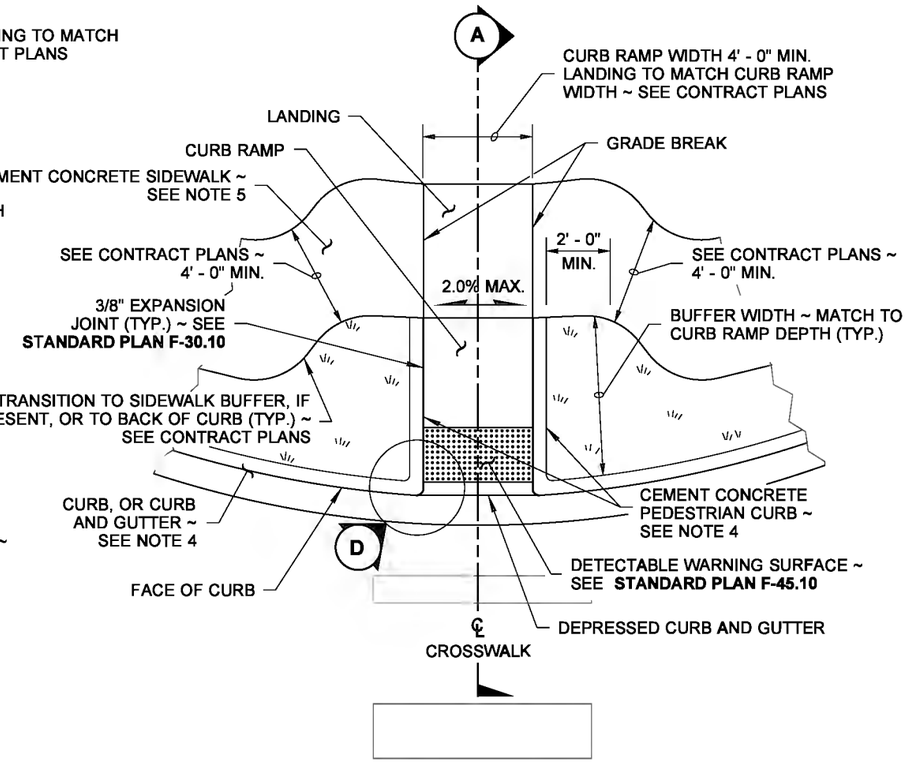
DETAIL (1)

DRAWN BY: FERN LIDDELL



PLAN VIEW

TYPE PERPENDICULAR A



PLAN VIEW

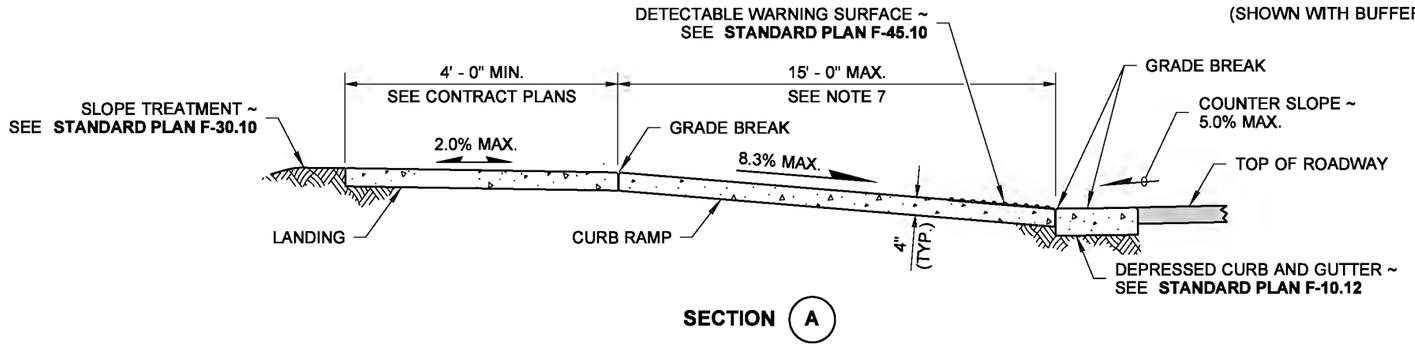
TYPE PERPENDICULAR B
(SHOWN WITH BUFFER)

NOTES

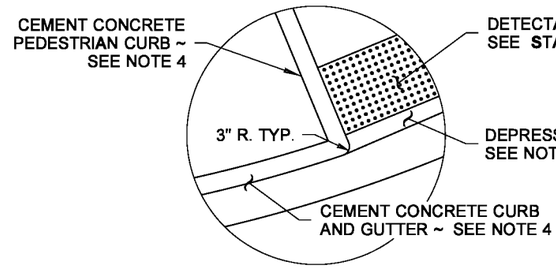
1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See the Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter, and Pedestrian Curb details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalk.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15-feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot maximum length, the running slope of the Curb Ramp shall as flat as feasible.
8. Curb Ramp, Landing, and Flares shall receive broom finish. See **Standard Specifications 8-14.**

LEGEND

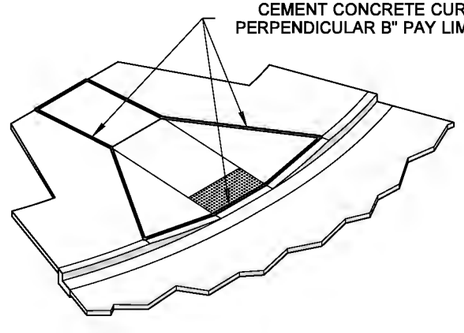
SLOPE IN EITHER DIRECTION



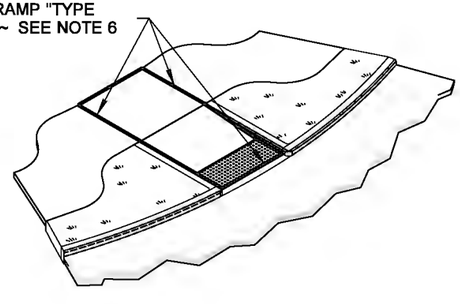
SECTION (A)



CURB RADIUS DETAIL (D)



ISOMETRIC VIEW
TYPE PERPENDICULAR A PAY LIMIT



ISOMETRIC VIEW
TYPE PERPENDICULAR B PAY LIMIT

EDWARD PATRICK BARRY
STATE OF WASHINGTON
34363
REGISTERED
PROFESSIONAL ENGINEER

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

PERPENDICULAR CURB RAMP

STANDARD PLAN F-40.15-02

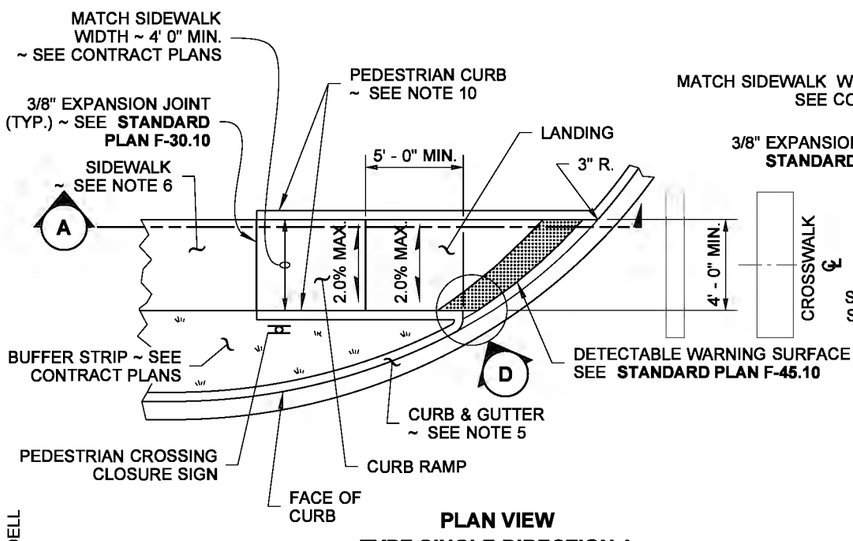
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

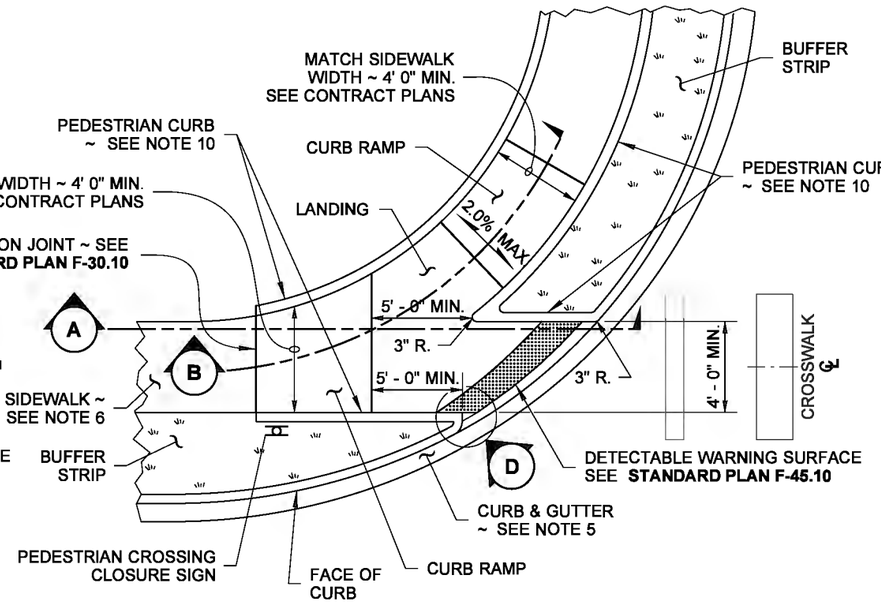
Pasco Bakotich III — STATE DESIGN ENGINEER

6/20/13 — DATE

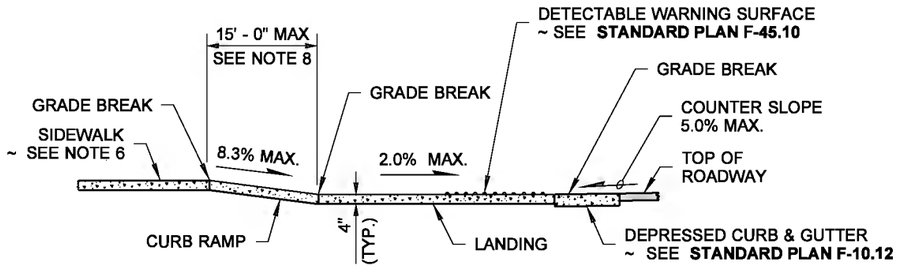
Washington State Department of Transportation



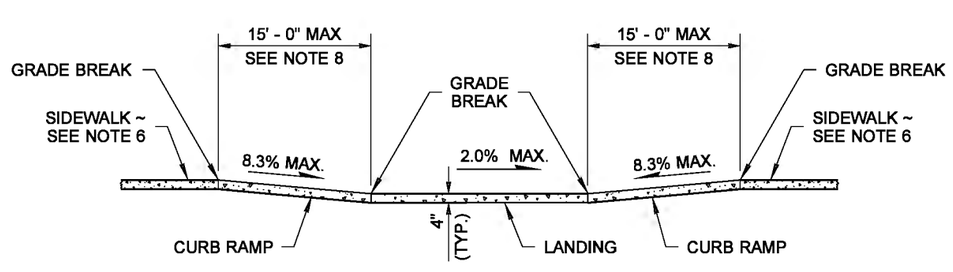
PLAN VIEW
TYPE SINGLE DIRECTION A



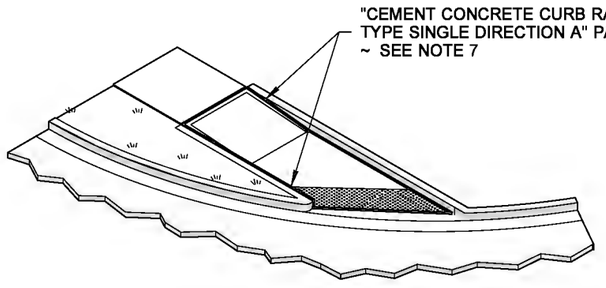
PLAN VIEW
TYPE SINGLE DIRECTION B



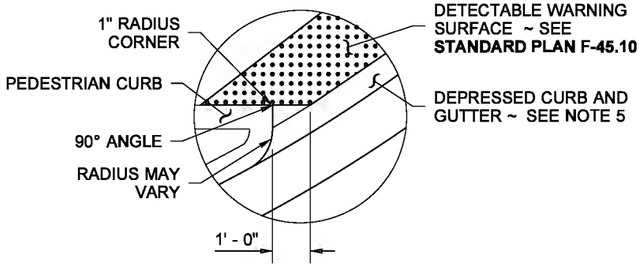
SECTION (A)



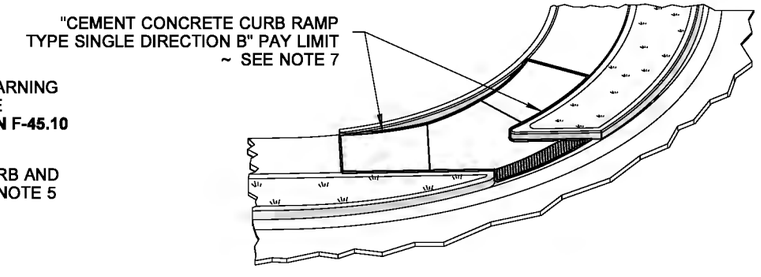
SECTION (B)



ISOMETRIC VIEW
TYPE SINGLE DIRECTION A
PAY LIMIT



DETAIL (D)



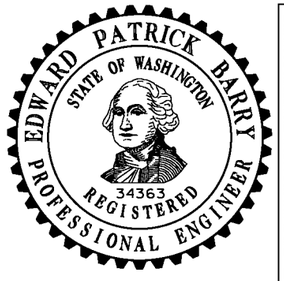
ISOMETRIC VIEW
TYPE SINGLE DIRECTION B
PAY LIMIT

NOTES

1. This plan is to be used where pedestrian crossing in one direction is not permitted.
2. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
3. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
4. Do not place gratings, junction boxes, access covers or other appurtenances in front of the curb ramp or on any part of the curb ramp or landing.
5. See the Contract Documents for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter and Pedestrian Curb details.
6. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See contract plans for width and placement of sidewalk.
7. The bid item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb or (Curb and Gutter), Depressed Curb and Gutter, Pedestrian Curb or Sidewalk, or the pedestrian crossing closure sign.
8. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15 foot maximum length, the running slope of the curb ramp shall be as flat as feasible.
9. Curb ramps and landings shall receive broom finish. See **Standard Specifications 8-14.**
10. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.

LEGEND

↔ SLOPE IN EITHER DIRECTION



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SINGLE DIRECTION CURB RAMP

STANDARD PLAN F-40.16-02

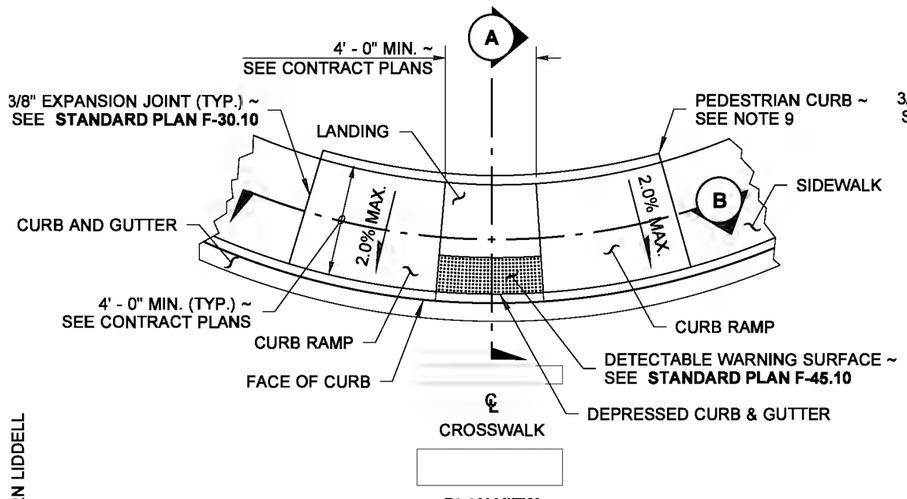
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

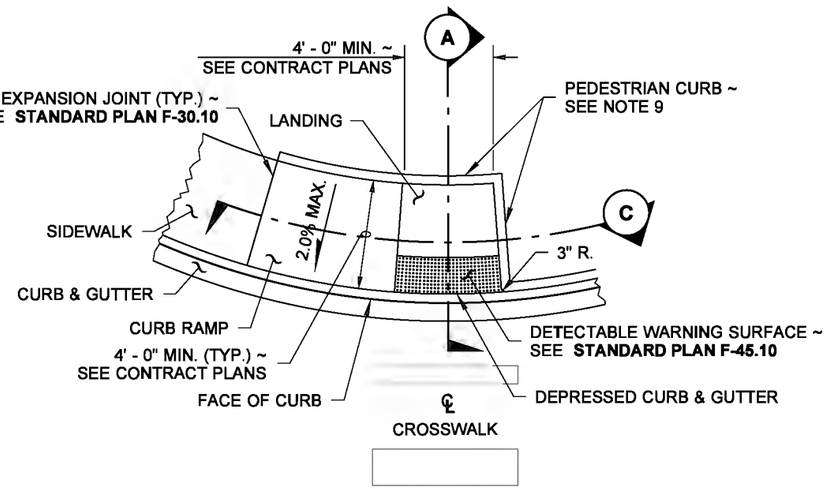
Pasco Bakotich III — STATE DESIGN ENGINEER — *6/20/13* — DATE

Washington State Department of Transportation

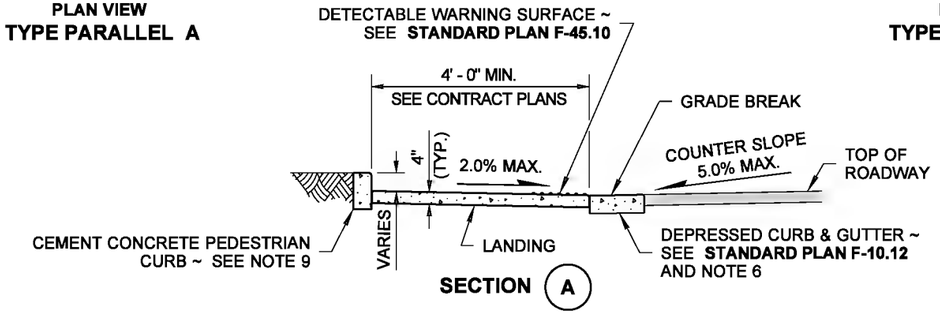
DRAWN BY: FERN LIDDELL



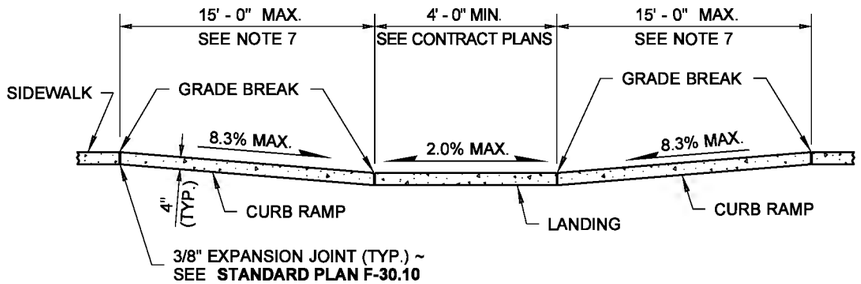
PLAN VIEW
TYPE PARALLEL A



PLAN VIEW
TYPE PARALLEL B



SECTION (A)



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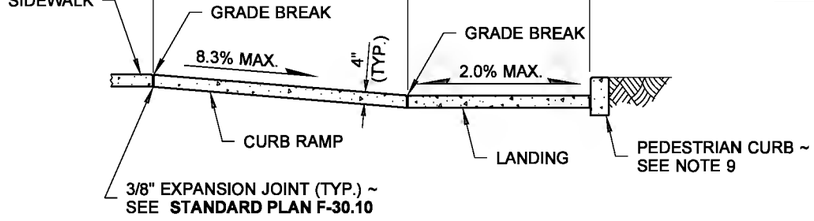
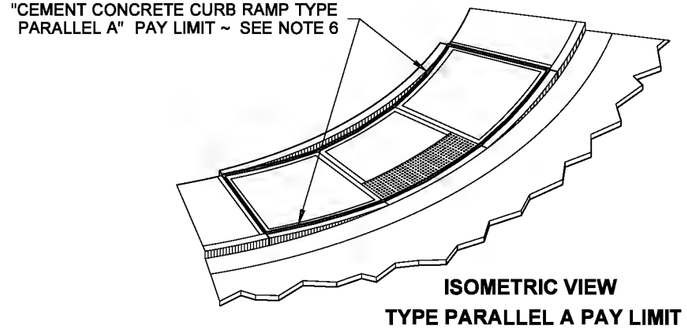
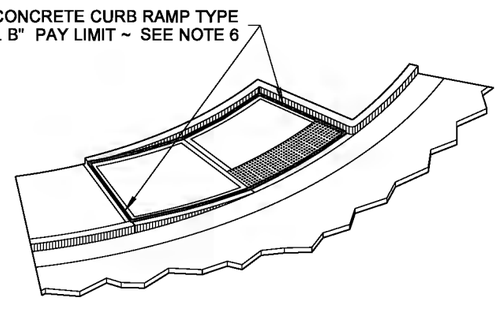


SECTION (C)



ISOMETRIC VIEW
TYPE PARALLEL A PAY LIMIT



ISOMETRIC VIEW
TYPE PARALLEL B PAY LIMIT

NOTES

1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk, or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter, and Pedestrian Curb details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot max. length, the running slope of the curb ramp shall be as flat as feasible.
8. Curb Ramp, Landing, and Flares shall receive broom finish. See **Standard Specifications 8-14.**
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.

LEGEND

SLOPE IN EITHER DIRECTION

DRAWN BY: FERN LIDDELL

EDWARD PATRICK BARRY
STATE OF WASHINGTON
34363
REGISTERED
PROFESSIONAL ENGINEER

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PARALLEL CURB RAMP

STANDARD PLAN F-40.12-02

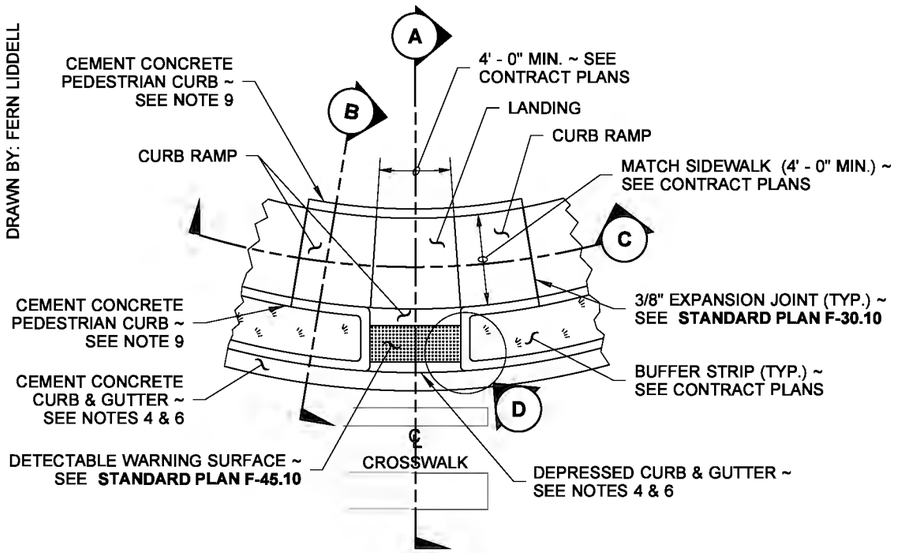
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER
6/20/13 — DATE

Washington State Department of Transportation

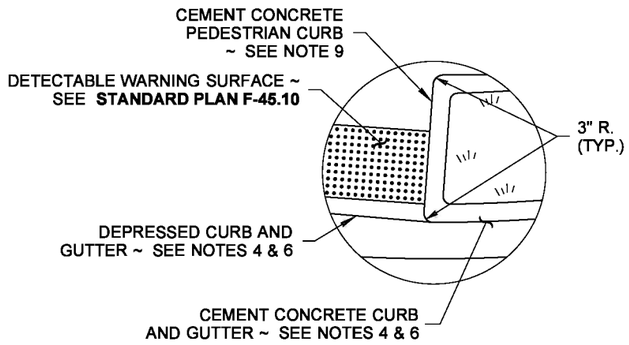
DRAWN BY: FERN LIDDELL



PLAN VIEW

TYPE COMBINATION

WITH BUFFER



DETAIL (D)

CURB RADIUS DETAIL

NOTES

1. Provide a separate Curb Ramp for each marked or unmarked crosswalk. Curb Ramp location shall be placed within the width of the associated crosswalk or as shown in the Contract Plans.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances in front of the Curb Ramp or on any part of the Curb Ramp or Landing.
4. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb, Gutter and Pedestrian Curb details.
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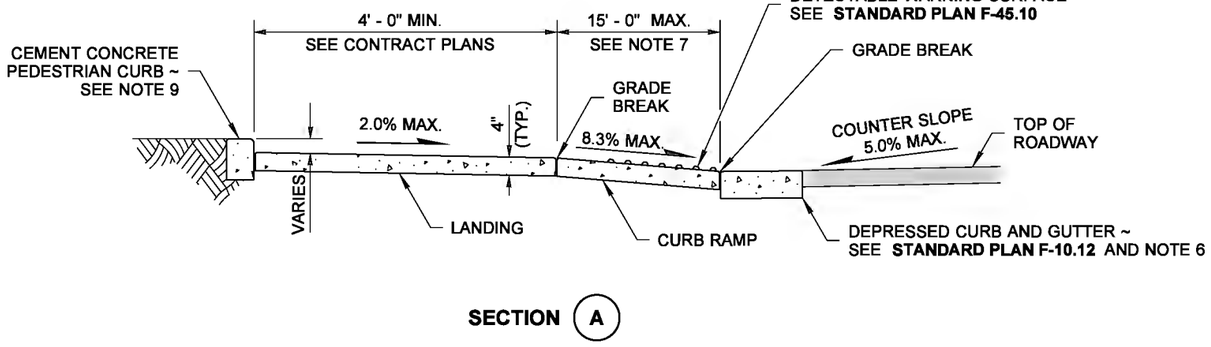
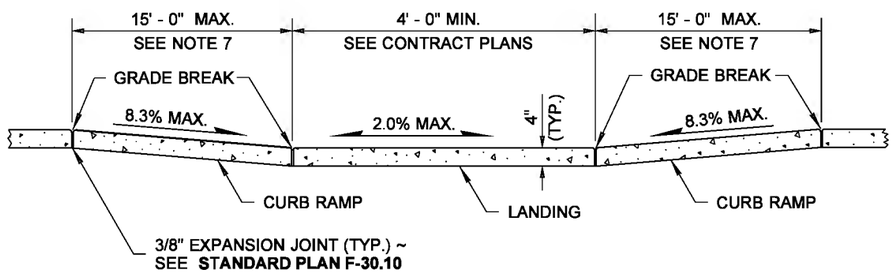
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades. When applying the 15-foot max. length, the running slope of the Curb Ramp shall be as flat as feasible.
8. Curb Ramp, Landing and Flares shall receive broom finish. See **Standard Specifications 8-14.**
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will not be material to retain.

LEGEND

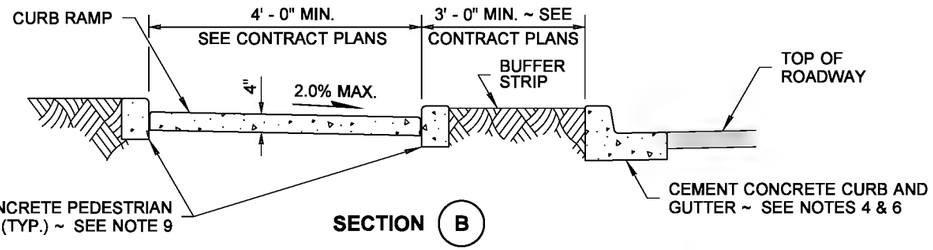
SLOPE IN EITHER DIRECTION



SECTION (A)



SECTION (C)



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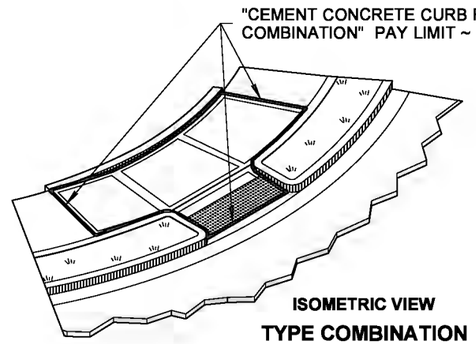

ISOMETRIC VIEW

TYPE COMBINATION PAY LIMIT

EDWARD PATRICK BARRY
STATE OF WASHINGTON
34363
REGISTERED
PROFESSIONAL ENGINEER

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COMBINATION CURB RAMP

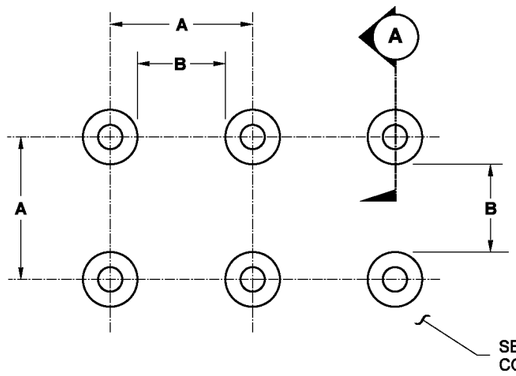
STANDARD PLAN F-40.14-02

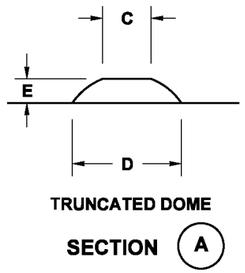
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER — *6/20/13* — DATE

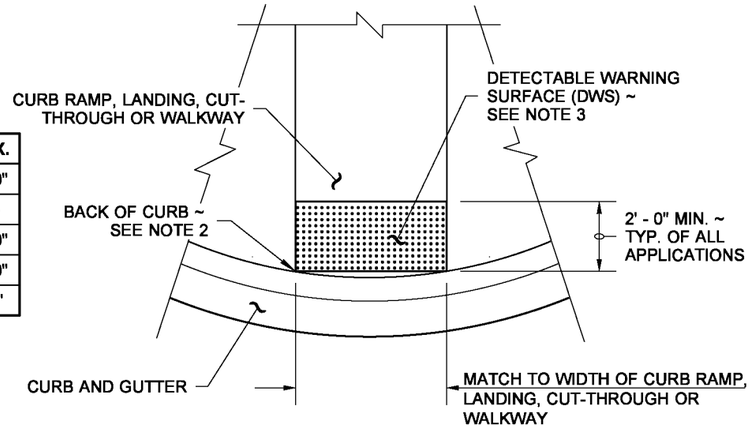
Washington State Department of Transportation





	MIN.	MAX.
A	1.60"	2.40"
B	0.65"	—
C	0.45"	0.90"
D	0.9"	1.40"
E	0.2"	0.2"

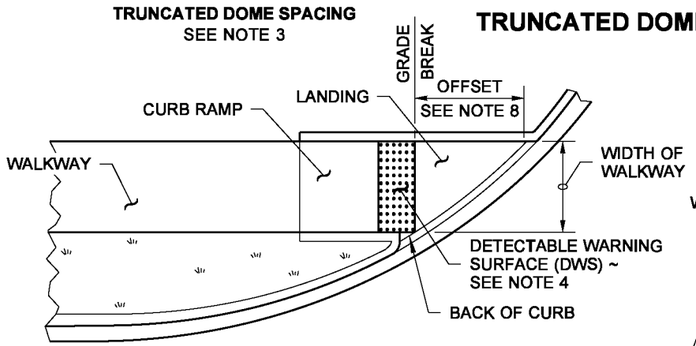
TRUNCATED DOME DETAILS



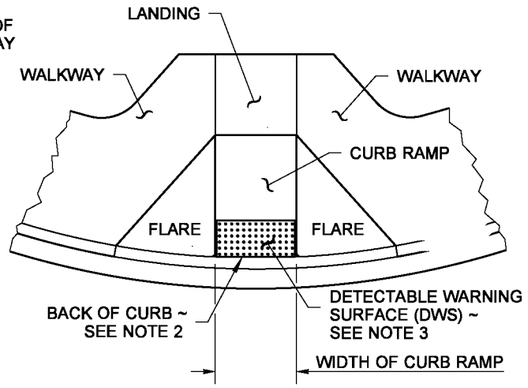
DETECTABLE WARNING SURFACE DETAIL

NOTES

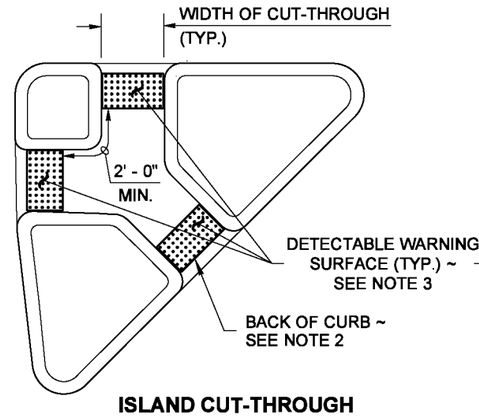
1. The Detectable Warning Surface (DWS) shall extend the full width of the curb ramp (exclusive of flares) or the landing.
2. The Detectable Warning Surface shall be placed at the back of curb, and need not follow the radius.
3. The rows of truncated domes shall be aligned to be perpendicular to the grade break at the back of curb.
4. The rows of truncated domes shall be aligned to be parallel to the direction of travel.
5. If curb and gutter are not present, such as a shared-use path connection, the Detectable Warning Surface shall be placed at the pavement edge.
6. See **Standard Plans** for sidewalk and curb ramp details.
7. If a curb ramp is required, the location of the Detectable Warning Surface must be at the bottom of the ramp and within the required distance from the rail.
8. When the grade break between the curb ramp and the landing is less than or equal to 5 ft. from the back of curb at all points, place the Detectable Warning Surface on the bottom of the curb ramp.



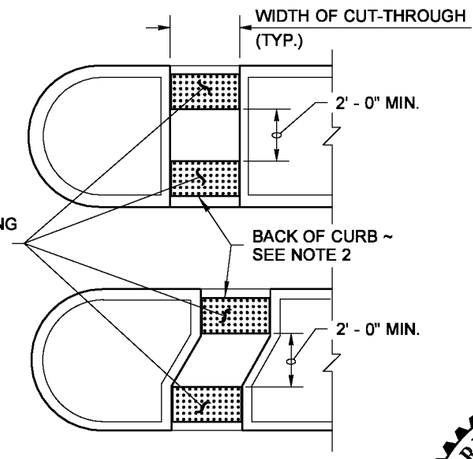
SINGLE DIRECTION CURB RAMP
(GRADE BREAK BETWEEN CURB AND LANDING ≤ 5 FT. FROM BACK OF CURB)
(SEE NOTE 6)



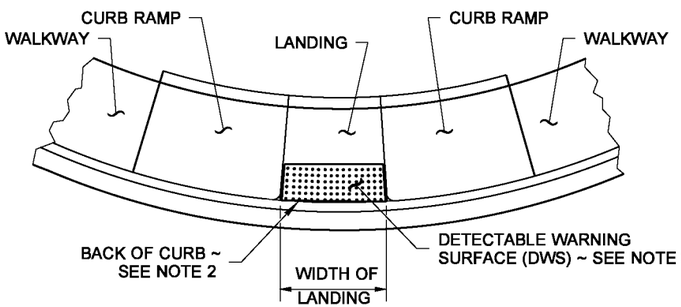
PERPENDICULAR CURB RAMP
(SEE NOTE 6)



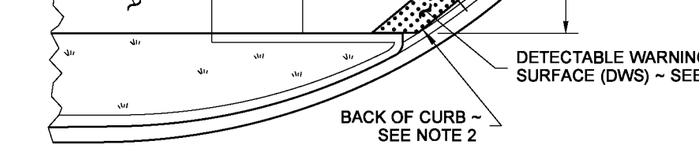
ISLAND CUT-THROUGH



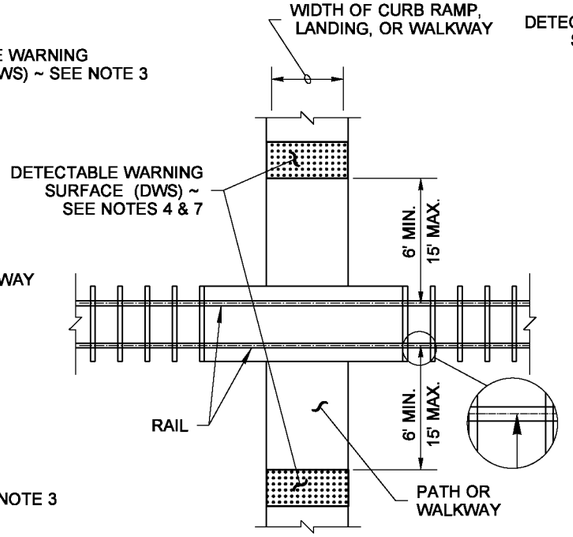
MEDIAN CUT-THROUGH



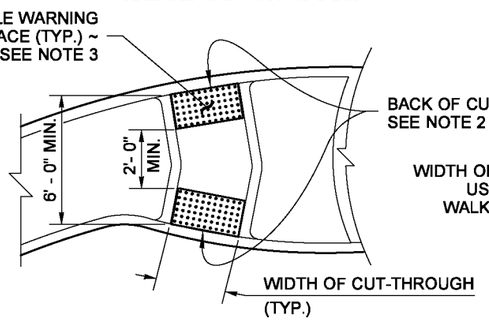
PARALLEL CURB RAMP
(SEE NOTE 6)



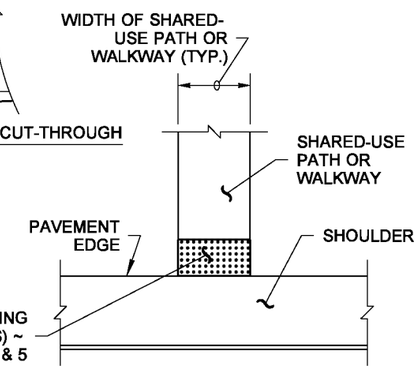
SINGLE DIRECTION CURB RAMP
(GRADE BREAK BETWEEN CURB AND LANDING > 5 FT. FROM BACK OF CURB)
(SEE NOTE 6)



PEDESTRIAN RAILROAD CROSSING



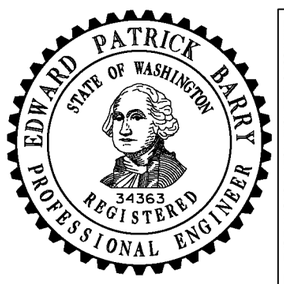
ROUNDABOUT SPLITTER ISLAND



SHARED-USE PATH CONNECTION

PLACEMENT GUIDELINES

DRAWN BY: FERN LIDDELL



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DETECTABLE WARNING SURFACE

STANDARD PLAN F-45.10-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III — STATE DESIGN ENGINEER — *06/21/12* — DATE

Washington State Department of Transportation

CLASSIFICATION AND USE

THE CLASS OF CONCRETE REFERS TO THE NOMINAL NUMBER OF SACKS OF CEMENT PER CUBIC YARD, ALTHOUGH THIS DESIGNATION DOES NOT CONSTITUTE A GUARENTEE OF YIELD.

H.E.S. INDICATES HIGH EARLY–STRENGTH CEMENT AND MAY BE REQUIRED AT THE OPTION OF THE ENGINEER FOR ANY OF THE CLASSES OF MIX. WHENEVER IT IS CALLED FOR, IT WILL BE MEASURED AND PAYEMENT WILL BE MADE AS PROVIDED.

THE CONTRACTOR MAY, WITH APPROVAL OF THE ENGINEER, ELECT TO USE HIGH EARLY–STRENGTH CEMENT IN ANY OF THE MIXES, BUT NO EXTRA COMPENSATION WILL BE MADE FOR THE HIGH EARLY–STRENGTH CEMENT.

MINIMUM 28–DAY COMPRESSIVE STRENGTH SHALL BE 3,000 P.S.I. AIR–ENTRAINMENT ADMIXTURE SHALL NOT BE LESS THAN 4% OR MORE THAN 6% BY VOLUME.

HOT OR COLD WEATHER, PROTECTION WILL BE REQUIRED FOR A MINIMUM OF 7 DAYS PER THE REQUIREMENTS OF SWSS 5–05.3(13), 5–05.3(14) AND 6–02.3(6)A.

CLASS OF CONCRETE	3	4	5	5.5	6	6.5
SACKS PER CUBIC YARD	3	4	5	5.5	6	6.5

COMMERCIAL CONCRETE MIXES

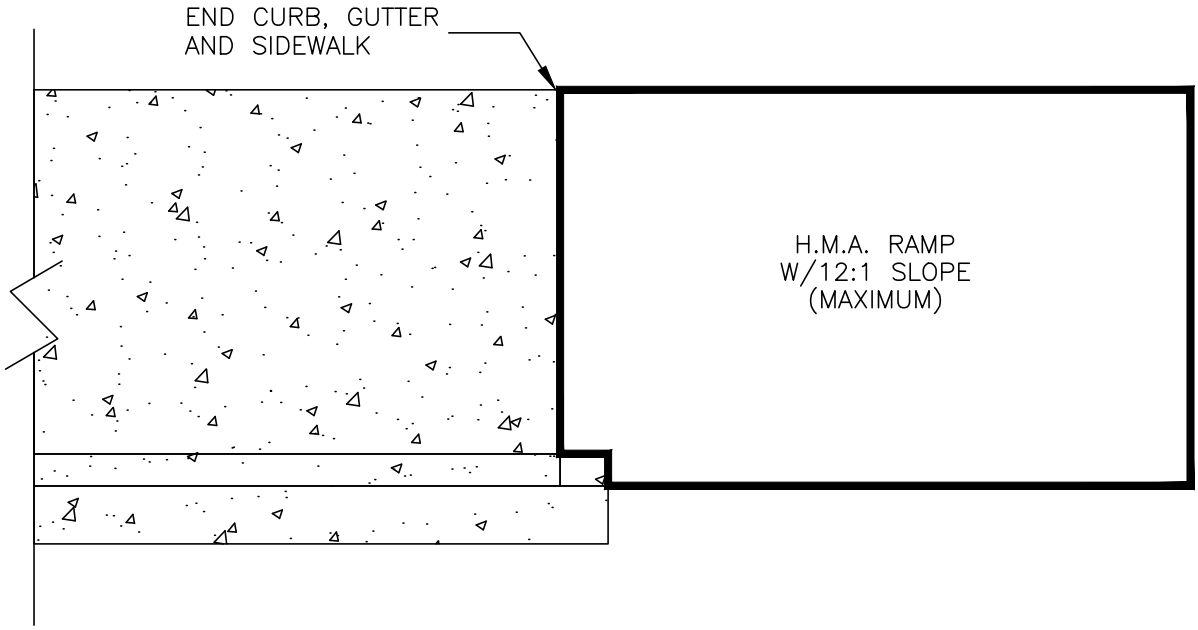
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

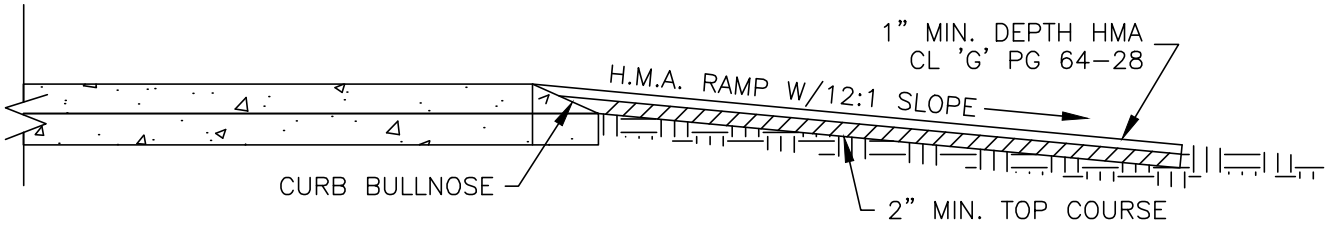
DATE	1/05
DWN	TOH
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-13



TOP VIEW

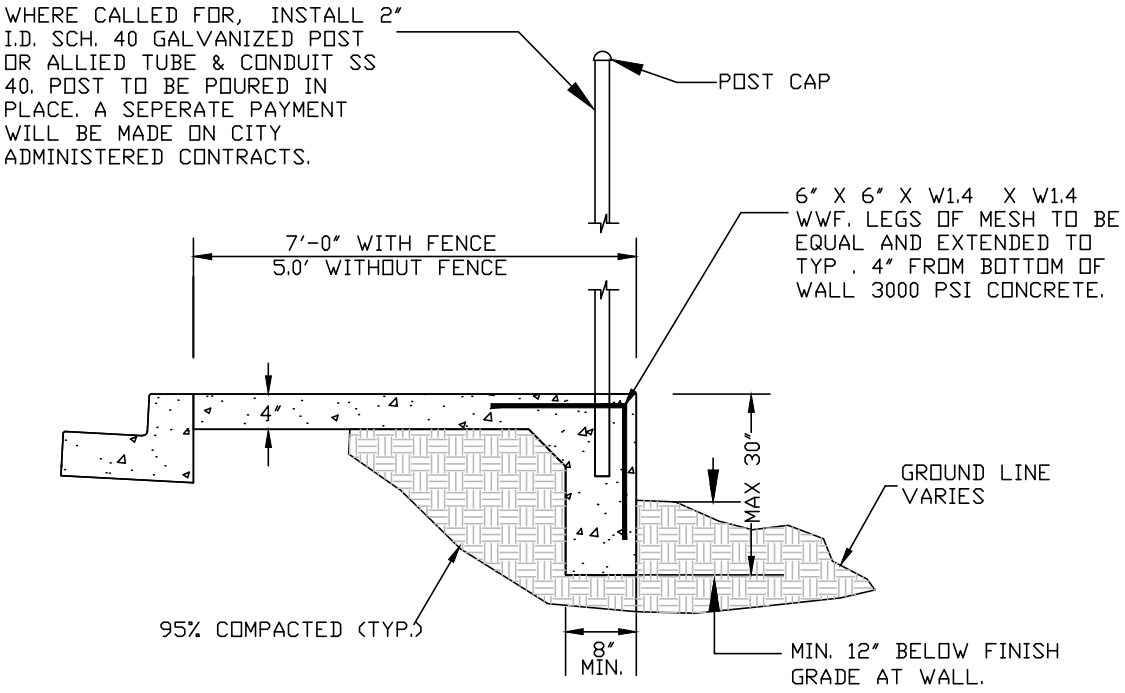


SIDE VIEW

CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555

SIDEWALK HMA RAMP

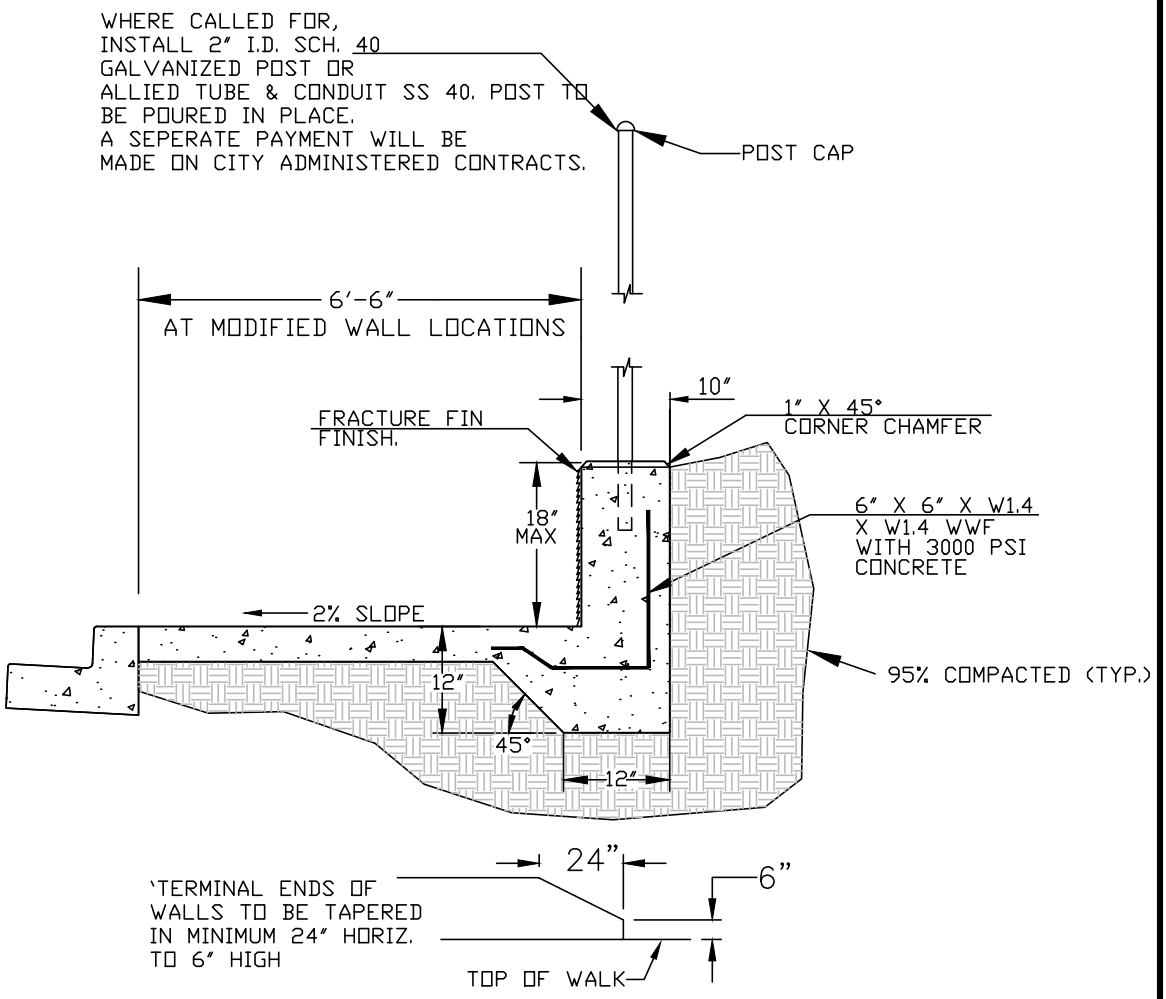
CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 4/85 DWN ADD REV 3/14 CHK BWB SCALE NTS	DWG. NO. **2-14**



1) ON CITY ADMINISTERED CONTRACTS, DROP BACK SIDEWALK LOCATIONS WILL BE STAKED IN THE FIELD BY THE ENGINEER IN AREAS WHERE A SLOPED YARD TRANSITION IS DETERMINED TO BE UNDESIREABLE.

DROPPED BACK SIDEWALK

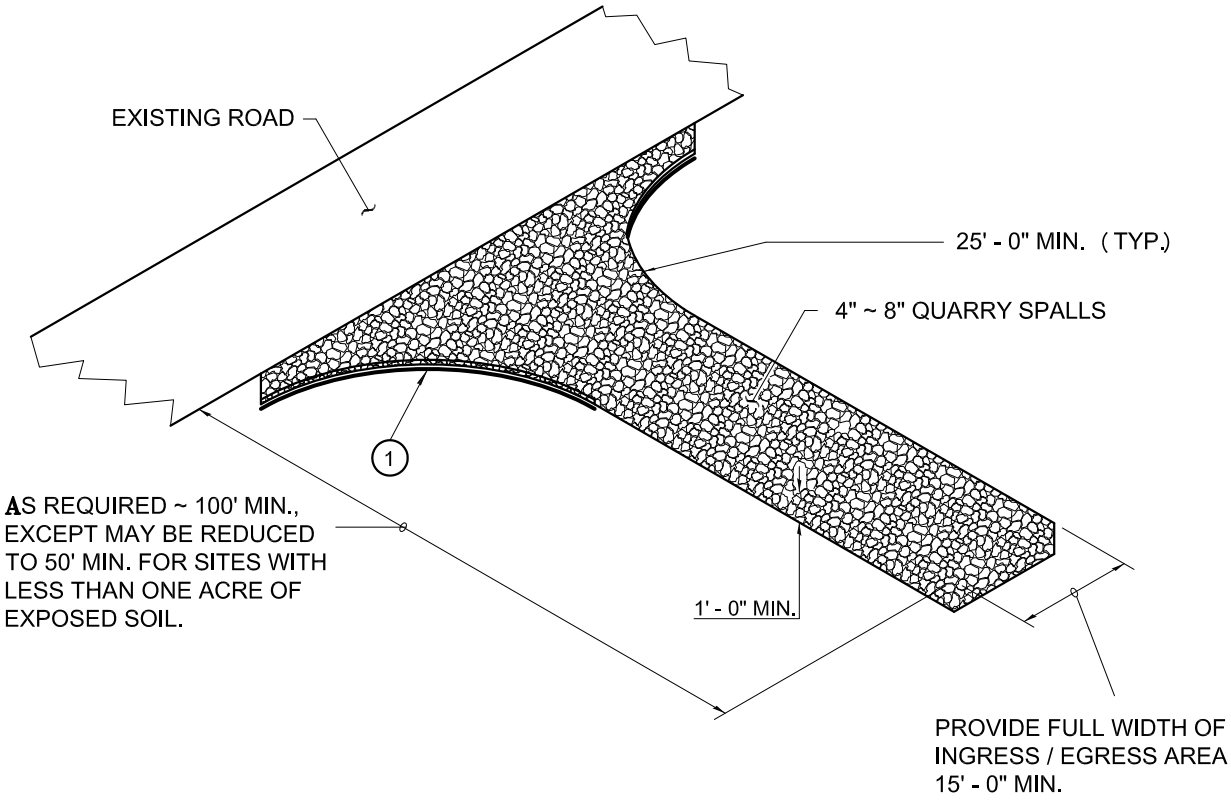
CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 1/02 DWN DDS REV 3/14 CHK BWB SCALE NTS	DWG. NO. **2-15**



1) ON CITY ADMINISTERED CONTRACTS, MODIFIED RETAINING WALL LOCATIONS WILL BE STAKED IN THE FIELD BY THE ENGINEER IN AREAS WHERE A SLOPED YARD TRANSITION IS DETERMINED TO BE UNDESIREABLE.

MODIFIED RETAINING WALL

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 1/02 DWN DDS REV 3/14 CHK BWB SCALE NTS	DWG. NO. **2-16**



ISOMETRIC VIEW
STABILIZED CONSTRUCTION
ENTRANCE

NOTES:

(1) PLACE CONSTRUCTION GEOTEXTILE FOR SOIL STABILIZATION AND A MINIMUM OF 0.15' CRUSHED ROCK UNDER THE SPALLS, FROM THE EDGE OF THE EXISTING ROADWAY TO THE RADIUS RETURNS, OR AS DIRECTED BY THE ENGINEER.

MISCELLANEOUS EROSION CONTROL STANDARD PLAN I-80.10-01

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	8/09
DWN	WSDOT
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

2-17

Section 3 Index

Sanitary Sewer [click on number or heading below]

SECTION 3

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

SANITARY SEWER

3-1 SANITARY SEWER

3-1.01 DESIGN AND ACCEPTANCE

These specifications cover the furnishing and installation of sanitary sewer pipe, manholes, cleanouts, and other appurtenances as shown on the plans or as directed by the Engineer. Sewer related standard drawings are contained in standard drawings Section 3 of these standard specifications. All construction shall be in conformance with SWSS Section 7–17, the Washington Department of Ecology Sewage Works Design Manual and these specifications. Where the existing mains will not support the service depth, required by Standard Drawing 3-6, the main line extension shall be kept as deep as possible. All extensions of sewer mains will be designed to a depth as required to serve all future areas that will be serviced by the main line, except that where existing sewer depths allow, the minimum sewer main line invert depth will be eight (8) feet. Sewers shall provide a uniform slope at the design grade and meet all test requirements. Manholes shall be spaced at a maximum 400 feet. Main line cleanouts are no longer authorized for use in the right-of-way or easement areas. For maintenance purposes, all sewer main line "end of runs" will require a standard 48" manhole installation. The engineer may accept isolated "belly's" not to exceed 3/4-inch in depth. All variations from the above design requirements will be subject to approval of the City Engineer.

3-1.02 APPROVED PIPE AND JOINT MATERIALS

The sanitary sewer pipe shall be one of the type as indicated unless a different type and class of pipe is called for in the contract special provisions.

A. ACRYLONITRILE-BUTADIENE-STYRENE (ABS) PIPE shall conform to the requirements of SWSS Section 9-05.14.

B. POLYVINYL CHLORIDE (PVC) PIPE shall conform to the requirements of ASTM D3034, SDR35. The pipe laying length shall not exceed 14.0 feet.

C. DUCTILE IRON PIPE shall conform to the requirements of ASTM A 21.51 or AWWA C-151 and shall be cement mortar lined, push-on joint and shall be Class 50.

D. Jointing materials and fittings shall conform to the requirements of SWSS Section 9-05 for the type of pipe material installed. All repairs to PVC sewer pipe shall be made using gasketed PVC SDR35, ASTM D3034 couplings only.

E. Piping material to be installed by the Contractor shall be one of the above unless otherwise specified in the contract Special Provisions.

3-1.03 MEASUREMENT AND PAYMENT

The unit contract price for each size of "Sewer Pipe", per linear foot, shall be full compensation for furnishing all labor, materials, 5/8-inch minus crushed rock bedding under the pipe, equipment, testing, connections to existing lines and all other incidentals necessary to perform the work in accordance with the plans and specifications or as directed by the Engineer.

3-2 PIPE BEDDING

3-2.01 GENERAL

It is the intent of this contract to use select native material from the site for backfill around the sanitary sewer pipe. When unsuitable native material exists or is encountered during trench excavation, imported bedding material may be required by the Engineer, depending on type of pipe being installed and the type of materials encountered. Where directed by the Engineer, the Contractor shall furnish and place imported bedding material per Section 3-2.04. Bedding material below the bottom of the pipe shall be 5/8-inch minus crushed rock, per Standard Drawing 4-7.

3-2.02 5/8-INCH MINUS CRUSHED ROCK BEDDING

All sewer pipe shall be bedded below the bottom of the pipe with 5/8-inch minus crushed rock as per the City of Kennewick Standard Drawing 4-7. Crushed rock shall be clean, 5/8-inch minus, well-graded, crushed rock and shall be subject to acceptance by the Engineer.

3-2.03 OVEREXCAVATION

Where over excavation occurs, the Contractor shall be required to bring the over excavated trench bottom back to grade with 5/8-inch minus crushed rock.

3-2.04 COMPACTION

The bedding material shall be placed and compacted in lifts not to exceed six inches (6”). The pipe bedding shall be compacted to not less than 95 percent of maximum density. Compaction shall be done in such a manner as to preclude future settlement.

3-2.05 MEASUREMENT AND PAYMENT

Select native materials which are acceptable and utilized as bedding and do not require truck haul, shall be considered as incidental and included in the "Trench Excavation and

Backfill" pay item, and no additional payment will be made for their use as "Imported Pipe Bedding."

The unit contract price for "Imported Pipe Bedding", per linear foot, shall be full compensation for furnishing all labor, materials, equipment, and all other incidentals required to supply and place imported pipe, bedding material in accordance with the plans and specifications, or as directed by the Engineer.

5-8-inch minus crushed rock required to bring an over-excavated trench back to grade and 5/8-inch minus crushed rock used in Zone A as per City of Kennewick Standard Drawing 4-7, shall be considered as in incidental and included in the "Sewer Pipe", per linear foot pay item, and no additional payment will be made for its use as "Imported Pipe Bedding."

3-3 TRENCH EXCAVATION AND BACKFILL

3-3.01 GENERAL

Trench excavation for sanitary sewer pipe shall be in accordance with SWSS Section 7-08.3(1)A, except as herein modified and shall be to the depth as shown on the plans and as indicated in the proposal for the various depths required. Pipe zone and bedding shall be per City Standard Drawing 4-7 and Section 3-2. Pavement restoration shall be per City Standard Drawing 2-6 and Section 2-29 of these standards.

Trench excavation shall be unclassified unless rock excavation is listed as a pay item. Trench excavation shall include all excavation, disposal of surplus and unsuitable material, and all other work incidental to the construction of the trenches for gravity sewers, force mains, including manholes or other appurtenances, which are part of the pipeline.

The Contractor is advised that all water main lines have thrust blocks, typically located as shown on Standard Drawing 4-6. These thrust blocks have been found to be constructed of rocks, blocks, concrete or other materials. The Contractor shall take such precautions, shoring, etc. as required to protect and not disturb the existing thrust blocks.

3-3.02 ROCK EXCAVATION

Rock excavation shall include solid rock formations requiring systematic drilling and blasting with explosives and any boulders or broken rock larger than one-half (1/2) cubic yard in volume. Hardpan or cemented gravel, even though it may be advantageous to use explosives in its removal, shall not be classified as solid rock excavation.

The Contractor shall notify the Engineer at least 24 hours prior to any blasting. All blasting shall be done in accordance with local, county, and state regulations governing this class of

work. Any damage to persons or property resulting from blasting operations shall be the sole responsibility of the Contractor and his surety.

3-3.03 COMPACTION

Trench backfill material shall be compacted per the requirements of City Standard 1-13, by means approved by the Engineer as required to preclude future settlement and to achieve a minimum of 95 percent maximum density when tested in accordance with SWSS Section 7-08.3(1)A as herein modified.

As a minimum, all trenches which parallel the street centerline shall be compacted with a hoe-mounted or double drum, vibratory mechanical compactor.

Hand-operated jumping jacks or shoe-type mechanical tampers will not be approved.

3-3.04 TRENCH SAFETY

All trench excavation shall have adequate safety systems for the trench excavation that meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor shall be fully responsible for providing the necessary back sloping, cribbing, trench boxes, etc., as required to meet the specified safety requirements for the trench, manhole, dry well and related excavation, and includes providing trench safety for City crews when the need arises to enter a trench site in the performance of their duties. Sloping will not be allowed as an option to trench boxes and shoring, when the trench is within paved areas, or when sloping would damage adjoining paved areas.

3-3.05 AC WATER MAIN CROSSING REPAIR

When a sanitary sewer main line, storm sewer main line, sewer side service, catch basin service storm line or utility, crosses under a 6-inch or 8-inch AC water main, then after completion of the excavation and installation of the pipe or utility, a 2 sack CDF sand slurry shall be used as the backfill. The CDF backfill will be placed from the trench bottom to a minimum of 2 feet above the AC water main or to sub-grade, whichever is greater, and 2 feet either side measured perpendicularly from the outside edge of the AC water main. Additionally the AC water main will be exposed to a distance of 2 feet outside of the trench on each side and filled with the CDF backfill to a minimum of 2 feet above the AC water main or to sub-grade, whichever is greater. When any utility trench excavation crosses under a 6-inch AC water main and exposes a joint, the AC main shall be removed and replaced with City Standard C900 water main to a point 3 feet outside of the trench on both sides.

3-3.06 MEASUREMENT

A. TRENCH EXCAVATION AND BACKFILL

Measurement for payment for "Trench Excavation and Backfill," shall be by the linear foot for the appropriate depth increment of trench excavation and backfill, including measurement through manholes.

Measurement shall be the depth from the pipe design invert to original grade, except that where the sewer is constructed in conjunction with street construction, and unless excavation to subgrade is not allowed by the contract Special Provisions, measurement shall be from the pipe invert to the street design subgrade, regardless of when the Contractor chooses to excavate the street to subgrade.

B. TRENCH SAFETY SYSTEMS

The unit contract price for "Trench Safety Systems", per linear foot, shall be measured along the trench length through manholes, dry wells and catch basins.

C. ROCK EXCAVATION

When provided for in the bid proposal, Measurement for Payment for "Rock Excavation" shall include boulders exceeding one-half cubic yard in volume and solid rock, which requires systematic drilling and blasting. Rock Excavation will be measured on a cubic yard basis computed as follows:

a. <u>Length</u>

Length will be the entire horizontal distance where rock is encountered, measured on a linear foot basis along centerline of the trench.

b. <u>Width</u>

The trench width for payment of Rock Trench Excavation shall be as follows:

Size of Pipe	Pay Width of Trench
4" - 15"	2.5 feet
18" - 36"	Outside pipe diameter plus 12"
42" & larger	Outside pipe diameter plus 24"

c. <u>Depth</u>

Measurement for depth will be the vertical distance from six inches (6") below the pipe invert to the top of the solid rock strata. Depth will be measured at intervals of 25 feet along centerline of trench, beginning at the

first location that solid rock is encountered, and the average depth between measuring points will be the depth used for computing depth of rock.

D. ROCK EXCAVATION FOR STRUCTURES

Rock excavation quantities for sewer manholes and other sewer structures shall be computed on a cubic yard basis from the actual profile depth as above, multiplied by the area within a line parallel to and one-foot (1') outside of the actual dimensions of the manhole or structure base.

3-3.07 PAYMENT

A. TRENCH EXCAVATION AND BACKFILL

The unit contract price for "Trench Excavation and Backfill", per linear foot, for the various depths indicated in the proposal, shall be full compensation for the cost of excavation, backfill, furnishing all labor, equipment, and all other incidentals necessary to perform the work in accordance with the plans and specifications or as directed by the Engineer. All costs to complete the required extra trench depth below the pipe invert, as required to place the specified 5/8-inch minus crushed rock, shall be incidental to the trench excavation items included in the bid proposal. Unless provided for in the contract special provisions, all costs for labor, equipment and materials as required to replace sections of 6-inch and 8-inch AC water mains at all main line trench crossings, shall be considered incidental to the “Trench Excavation and Backfill” bid items as provided in the bid proposal.

B. TRENCH SAFETY

The unit contract price, as provided in the bid proposal, for "Trench Safety Systems", per linear foot, or per lump sum, shall be full compensation for furnishing all labor, equipment, materials and all other incidentals to meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW, including all requirements at manholes.

C. ROCK EXCAVATION

When provided for in the bid proposal, the unit contract price for "Rock Excavation" will be based on the unit price, per cubic yard, and will be paid in addition to the payment for trench excavation and backfill at the various depths indicated in the proposal in which the rock is encountered. Payment for rock excavation shall be full compensation for all work required to excavate and dispose of the solid rock material. No payment will be made for rock excavated below required grade or outside the widths mentioned above.

3-4 SEWER SERVICE LINES

3-4.01 GENERAL

Side sewer service lines shall be installed and tested in accordance with the requirements of SWSS Section 7-18 as herein modified and City of Kennewick Standard Drawing 3-6. On existing sewer mains, the contractor will tap the main and install the sewer service. The City will supply insert a tee's that are maintained in the City's inventory. Any insert a tee not maintained in the City's inventory will be the responsibility of the contractor to provide and must be approved by the City Engineer prior to purchasing/installing. All insert a tee's must be conducive to the size and type of the existing sewer main. The following insert a tee's will be provided by the City:

4" Truss
4" x 8" Concrete, AC, PVC, and Clay
4" x 10" PVC
4" x 12" Concrete, AC
4" x 15" Concrete, and PVC
4" x 18" PVC

City crews will CCTV inspect the tap once the service connection and backfill have been completed.

3-4.02 CONSTRUCTION

Construction of sewer service lines shall conform to SWSS Section 7-18.3 and as herein modified. Wyes shall be gasket fitted and shall be installed at the 2:00 o'clock or 10:00 o'clock position. Other bends and fittings on 4-inch services shall be gasket or glue joint fitted for the manufacturer's pipe. No bends greater than 45° shall be used within the city right-of-way. All fittings shall be SDR 35 rated for use with SDR 35 sewer pipe. All service pipe joints and 6-inch and larger fittings shall be gasket- jointed. For 4-inch services, wye taps only will be permitted into the main sewer line, with 12" minimum spacing between taps and pipe bells, unless written approval is obtained from the Engineer. All services larger than 4- inches shall connect into a sewer manhole at the mainline connection. Where an existing service is being replaced, the alignment and grade of the replacement sewer may be revised from the old position as conditions require, provided that the existing abandoned wye is plugged or capped at the sewer main and that the new service alignment and grade otherwise meet the approval of the Engineer and the requirements of these specifications.

The minimum required pipe bury is one (1) foot and the minimum required pipe grade is 2 percent. (One-quarter inch (1/4") per linear foot or two feet (2') of drop per 100 feet of pipe.) With the approval of the engineer or building official, the grade may be flattened to 1%, if gravity sewer service could not otherwise be provided.

3-4.03 CLEANOUTS

Cleanouts are required on service laterals as required to meet the following requirements.

A: At each 90° elbow (not required if two 45° elbows are used.)
B. When a total of 135° bends have been made in the installation (after 3-45° bends.)
C. Not more than 100 feet of line can be run without a cleanout being installed.
D. A cleanout will be required where the connection is made near the building, unless an existing cleanout already exists just outside or just inside the foundation or basement.
E. A cleanout is required immediately downstream of the sewer backflow device if a backflow device is required.
F. All cleanouts shall be same size as the lateral they serve.

3-4.04 STUB MARKERS AND CAP

At all sewer service locations, the Contractor shall tie a 2-inch locator ribbon to the end of the stub and extend the tape vertically to the ground surface. The ends of new sewer service line stubs shall be capped to provide a watertight seal and shall be referenced with a two-inch by four-inch (2" x 4") eight (8) foot long steel stud reinforced with a ground contact pressure treated wood 2 x 4, inserted in the steel stud. When the depth of the service exceeds the reach of the reinforced steel post, then pressure treated 2 x 4's shall be used in the lower section of the trench as required to the service depth. In vacant lots, the post is to be painted green and left protruding two (2) foot above finished grade at the property line. In existing yards, bury the top of the steel post flush with the finish yard or landscape grade.

After back-filling and compacting the trench to within 24 inches of the top of the finished ground grade, the Contractor shall install a continuous two-inch (2") minimum width green plastic coated aluminum pipe locator ribbon over the top of the sewer service which shall be clearly marked, "CAUTION BURIED SEWER LINE," continuously along the length of the stubbed service. Curbs shall be marked with an "S". Services shall be stubbed to a depth as required by City of Kennewick Standard Drawing 3-6.

3-4.05 MEASUREMENT AND PAYMENT FOR SEWER SERVICE LINE

Measurement shall be per linear foot horizontal measure, for each size of sewer service. Wye taps shall be measured per each for each size of wye, cleanouts will be measured per each.

The unit contract price for "Sewer Service Lines," per linear foot, for "Service Wye," per each, and for "sanitary sewer service cleanout" per each, shall be full compensation for furnishing all trench excavation and backfill, materials, labor, equipment, pipe bedding, end plugs, marker posts, cleanouts, testing, and all other incidentals required to construct side services in accordance with the plans and specifications or as directed by the

Engineer. A separate measurement and payment will be made for pavement and concrete curb and sidewalk restorations and for "Trench Safety Systems".

3-5 STANDARD MANHOLE

3-5.01 GENERAL

Manholes are to be furnished and installed in accordance with the City of Kennewick Standard Drawings 3-2, 3-3 and 3-5 and may have either a poured-in-place base or a precast base. Prior to construction, or placing excavated material in the street, impacted storm drain catch basins shall be protected with the City Standard Catch Basin Fabric Sock Protection. When in conjunction with street construction, sewer manhole channels shall be protected as required by Section 2-26 of these specifications.

Construction of manholes shall conform to SWSS Section 7-05, except as herein modified. The following provisions shall apply to the construction of all manholes:

A. Precast concrete cones shall be eccentric.

B. All manhole joints shall be made with flexible gaskets or a positive self-sealing mastic.

C. Where installed in conjunction with street construction, the channelization and manhole bases shall be covered by a rigid material such as 3/4-inch plywood or better. This cover shall remain in place until street construction is complete and the manhole castings are grouted and then shall be removed along with all the debris prior to acceptance of construction. Failure to provide protection of said channels will result in high pressure type cleaning of the sewer mainline at the contractor's expense.

D. Any work performed on existing sewer mains is considered live work. All work that falls under this classification shall require access to the sewer manholes at all times with the exception of paving work. Once the paving work has been completed access to the overlaid manholes shall be within a reasonable timeframe not to exceed five (5) working days.

E. Pipe to new and existing manhole connections shall be made in accordance with the requirements of SWSS Section 7-05.3 and 7-05.3(3).

F. Manhole sections installed below the high static groundwater level shall be infiltration tested. A water infiltration allowance of 0.20 gallons per hour, per foot of static head above the lowest manhole invert, shall be considered as a satisfactory manhole test.

3-5.02 MEASUREMENT AND PAYMENT

3-5.02.01 STANDARD 48-INCH MANHOLE

The unit contract price for "Standard 48-Inch Manhole, (10’ deep)” per each, shall be full compensation for furnishing all labor, materials, frames, covers, including adjusting the manhole ring and cover to finished grade, and all incidental work required to construct a standard manhole up to a depth of ten (10) feet, complete and in place in accordance with the plans and specifications. When constructed in conjunction with a paving project, a separate payment will be made for adjusting to grade, after completion of paving, as per Standard Drawing 3-4.

3-5.02.02 ADDITIONAL MANHOLE DEPTH

The unit contract price for "Additional Manhole Depth," per vertical foot, shall be full compensation for all labor, equipment and materials as required to construct the manhole section, which exceeds ten feet in depth. Measurement for “Extra Depth Manhole” will be from the sewer invert to the cover finish grade, less ten feet (10').

3-5.02.03 DROP CONNECTIONS

Payment for drop connections shall be in accordance with the unit contract price for " inch Drop Connection", per vertical foot, as measured from the cleanout rim to the invert in near the manhole base , and shall be full compensation for furnishing all labor, materials, and equipment required to construct the drop connection in accordance with the plans and specifications or as directed by the Engineer.

3-6 CLEANOUT

3-6.01 GENERAL

Where shown on the plans, the Contractor shall install cleanouts in accordance with SWSS Section 7-19 as herein modified, and the City of Kennewick Standard Drawing 3-1.

3-6.02 MEASUREMENT AND PAYMENT

Measurement and payment for each size of "Sewer Cleanout," per each, shall be full compensation for furnishing all labor, materials, equipment, and all other incidentals required to install the cleanout, complete and in place, in accordance with the plans and specifications including adjusting the cleanout cover to the finished grade or as directed by the Engineer.

3-7 SANITARY SEWER PIPE PLUGS

3-7.01 GENERAL

All stubbed out sewer main lines shall be closed with a watertight stopper or plug fastened in place. The end of the plug shall be referenced as specified for sewer services, Section 3-4.04.

3-7.02 MEASUREMENT AND PAYMENT

The unit contract price per each, for each size of end cap, shall be full compensation for all labor, equipment and materials to complete the end cap and marker, as required to supply, install and mark the mainline sewer stub as specified.

3-8 CONNECT TO EXISTING MANHOLE

3-8.01 GENERAL

Where shown on the plans, the Contractor shall connect the new sewer line into the existing manholes by core drilling the manhole wall. Hammering, chipping and similar wall penetration procedures will not be used. Connection will be by an “O” ring rubber gasket meeting ASTM C-478 in a manhole coupling equal to the Johns-Manville asbestos-cement collar, or utilizing a conical type flexible seal equal to Kore-N-Seal. The existing base shall be chipped out and new channels formed as required to form channels similar to those shown in Standard Drawing 3-2. The new channel shall provide a smooth uniform transition for the new sewer pipe into the existing channel flows. The connection shall be completed in accordance with the requirements of Section 3-5 of these specifications. Whenever feasible, the outlet of the existing manhole will be required to have a ball or plug during construction. In the event there is an established flow in the existing manhole, the ball or plug will be required on the outlet of the first upstream manhole of the newly installed sewer main.

3-8.02 MEASUREMENT AND PAYMENT

The unit contract price for "Connect to Existing Manhole," per each, shall be full compensation for furnishing all labor, equipment, materials, and all other incidentals as required to core drill, connection seal, connect to and rechannel the existing manhole in accordance with the specifications or as directed by the Engineer.

3-9 ADJUST EXISTING CASTING TO GRADE

3-9.01 GENERAL

When the sewer construction is proceeding as a separate project, all manholes in pavement restoration areas shall be set to finish grade prior to patching the trench. Adjustment rings shall be grouted between each ring and finished smooth in and out. In lieu of grouting between each adjustment ring, a concrete collar encasing all adjustment rings may be poured per the requirements of Standard Drawing 3-4. All manholes located outside of the pavement area shall be adjusted in accordance to the requirements of Standard Drawing 3-4. Unless otherwise provided for in the contract bid proposal, a separate measurement and payment will not be made for adjustments and all costs shall be incorporated into the unit price per each for the sewer manhole.

When the sewer system is constructed in conjunction with a street construction project, all new and existing manholes, and all other such sewer structure castings, which are required to be adjusted to finished grade, shall be adjusted, measured and paid in accordance with the requirements of Section 2-18 of the City of Kennewick's Standard

Specifications for Roadway, to which the Contractor's attention is hereby directed.

3-10 ABANDONED CONDUITS

All pipes, conduits, and other openings determined to be abandoned, which are cut or opened during the sewer installation, shall be capped or concrete plugged prior to backfilling of the trench. Measurement and payment for required pipe cuts, and all labor, equipment and materials required to complete the specified plugs shall be included in the unit bid price for the pipe installation pay items.

3-11 HIGH PRESSURE CLEANING AND TESTING

Sewer lines shall be tested for acceptance in accordance with SWSS Section 7-17.3(2). The Contractor may, at his option, either air test or water test the sewer lines. The Engineer shall be notified prior to testing and be present during testing. All sewer lines will be subject to television inspection by the City, prior to acceptance. Sewer lines shall be televised prior to paving.

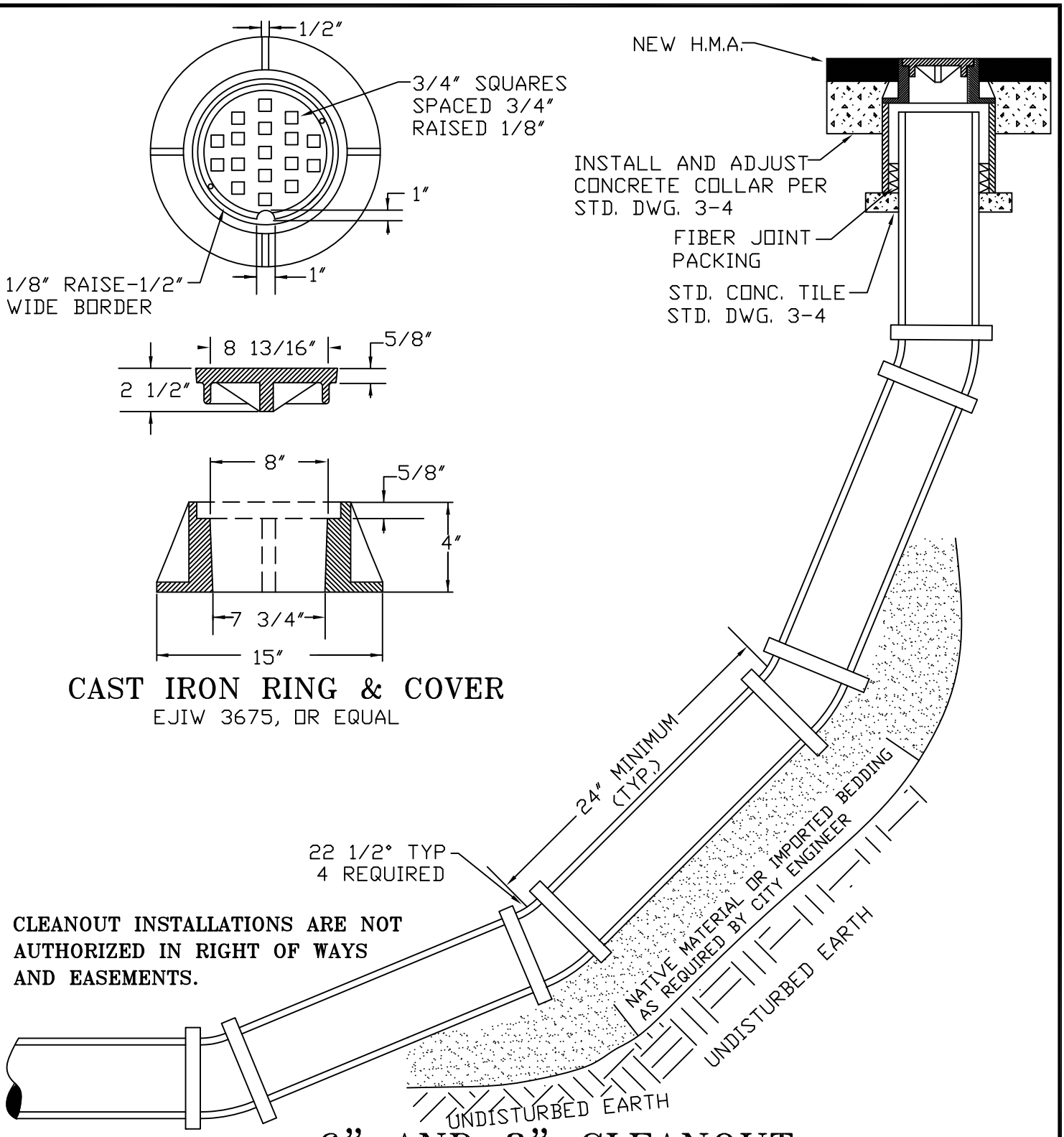
Prior to televising by the City, the Contractor shall place a sewer ball or plug, the same size as the sewer main line to prevent any debris, sand, or silt from entering any existing infrastructure. Sewer balls or plugs shall be placed in the downstream invert of the first downstream existing manhole that the newly constructed sewer main is connected to, and high pressure clean the new sewer main until it is clear of debris. Cleaning is identified as high pressure jetting. Following high pressure cleaning, the Contractor shall visually inspect the sewer by "lamping" to assure that the sewer main is clean and ready for televising. Twenty-four (24) hours prior to City inspection, the contractor shall remove the sewer ball or plug and introduce water in a non-cleaning fashion into the farthest upstream manhole to be inspected and allow water to gravity flow through the newly installed sewer main. The City crew requires a minimum two-work day notice in order to schedule televising.

The cost of one television inspection of new sewer lines has been included in the permit fee or contract schedule. If City crews are scheduled and are unable to complete the inspection, due to debris in the pipe, buried or inaccessible manholes or other causes attributable to lack of preparation by the Contractor, the cost of all subsequent television inspections will be billed to the Contractor. Upon completion of paving and utility raises sewer utility checks will be conducted by city crews. Any mainline or manholes found to have debris from said work, will result in the recleaning of sewer mainlines and manholes at the contractor’s expense.

Within the one year project warranty period, the city reserves the right to reinspect the sewer lines by televising, or other means. When identified within the warranty period, all sewer lines found to be defective through pipe foundation settlement, material defects, or workmanship shall be removed, replaced, or repaired by the Contractor at the option of the Engineer. The costs for such removal, replacement, or repair will be borne by the Contractor.

3-11.01 MEASUREMENT

All costs for labor, equipment and materials as required to complete the cleaning and testing as specified, shall be incorporated into the linear foot measurement and payment for each size of pipe installed.



CAST IRON RING & COVER

EJIW 3675, OR EQUAL

CLEANOUT INSTALLATIONS ARE NOT AUTHORIZED IN RIGHT OF WAYS AND EASEMENTS.

6" AND 8" CLEANOUT

CLEANOUT PIPE TO BE SAME SIZE AS MAIN LINE.

TO BE USED ON PRIVATE PROPERTY ONLY.

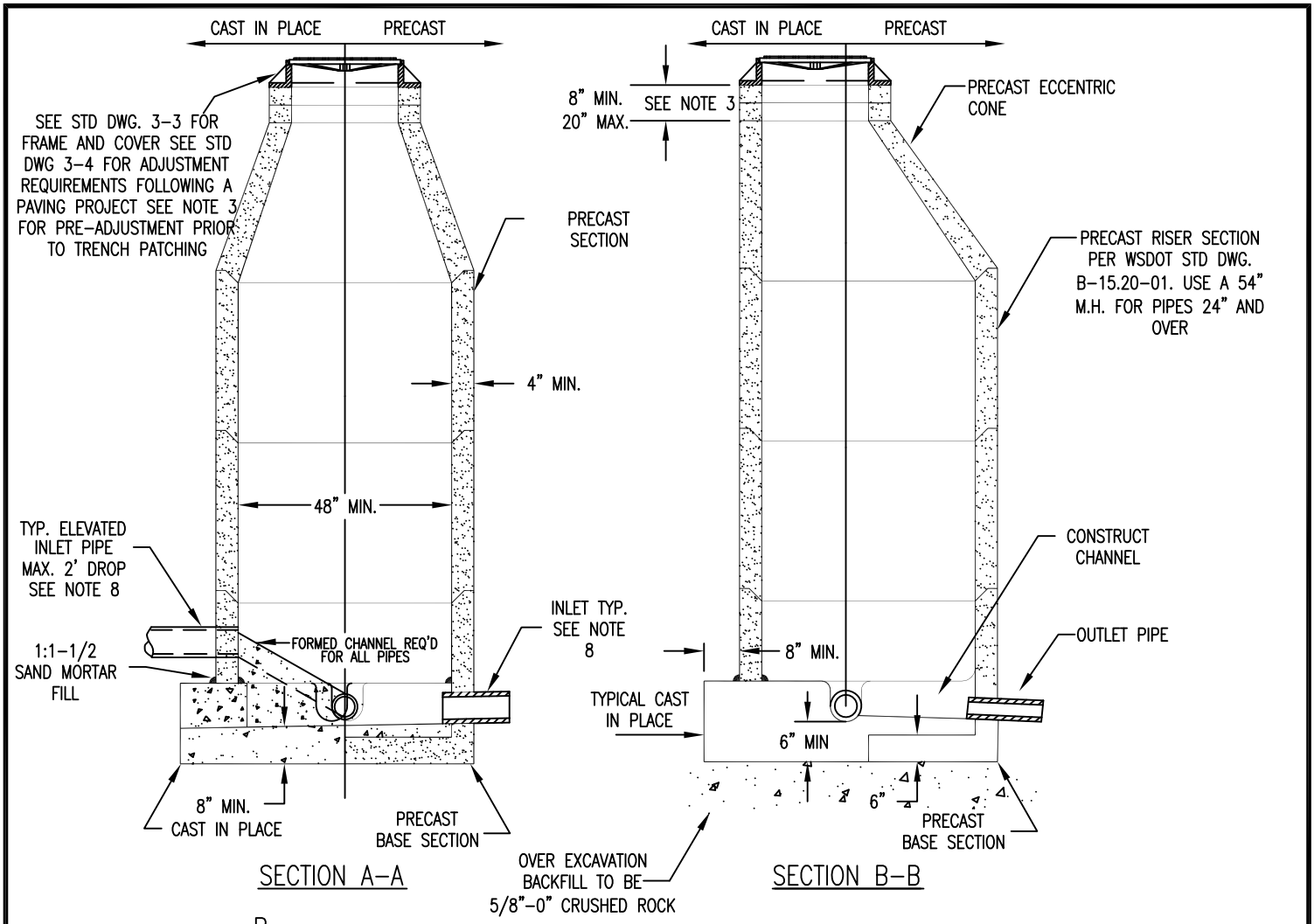
CITY OF KENNEWICK

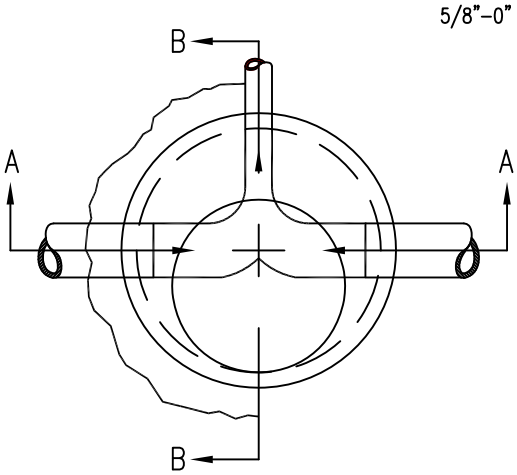
ENGINEERING DEPARTMENT

DATE	2/07
DWN	CJD
REV	5/15
CHK	BWB
SCALE	NTS

DWG. NO.

3-1





NOTE:

1. A RUBBER RING ENTRY COUPLING SHALL BE USED WITH P.V.C. PIPE.
2. ALL MANHOLE JOINTS SHALL BE MADE USING A CONTINUOUS FLEXIBLE RUBBER MANHOLE GASKET, OR FULL BED GROUT JOINT.
3. ADJUSTMENTS OVER 2" UTILIZE PRECAST CONCRETE RINGS. GROUT OR PLACE SEALANT (SONNEBORN – SONOLASTIC NPI, OR EQUAL) BETWEEN EACH RING AND AT FRAME. REMOVE ALL WOOD SHIMS AND FINISH GROUT (WIPE) INSIDE OF ADJUSTMENT RING.
4. ALL CHANNELIZATION OF MANHOLE BASES SHALL BE COVERED BY A RIGID MATERIAL DURING CONSTRUCTION OF ROAD SURFACES TO PREVENT FOREIGN MATERIALS FROM ENTERING SYSTEM PER SECTION 2-27 OF THESE SPECIFICATIONS.
5. PRIOR TO HIGH PRESSURE CLEANING THE SEWER MAIN, INSTALL A SEWER BALL OR PLUG, THE SAME DIAMETER AS THE SEWER MAIN, IN THE DOWN STREAM INVERT OF THE NEXT MANHOLE.
6. WHEN CONSTRUCTING MANHOLE OVER AN EXISTING MAIN, SUPPORT PIPE(S) WITH CONCRETE BLOCK AND POUR BASE AS SHOWN. REMOVE TOP 1/2 OF MAIN PIPE AND FORM SIDE CHANNEL(S) AS REQUIRED.
7. PROVIDE A MINIMUM 0.1 FOOT IN-OUT DROP FOR STRAIGHT RUNS AND 0.2 FOOT IN-OUT DROP FOR ANGLE RUNS.
8. WHEN CONNECTING TO AN EXISTING MANHOLE, PIPE HOLE TO BE CORE DRILLED.
9. NO PIPE JOINT SHALL BE PLACED WITHIN 10 FEET OF THE MANHOLE.

STANDARD MANHOLE

MINIMUM 5' INVERT TO COVER. SEE SHEET 2 FOR SHALLOW MANHOLES

CITY OF KENNEWICK

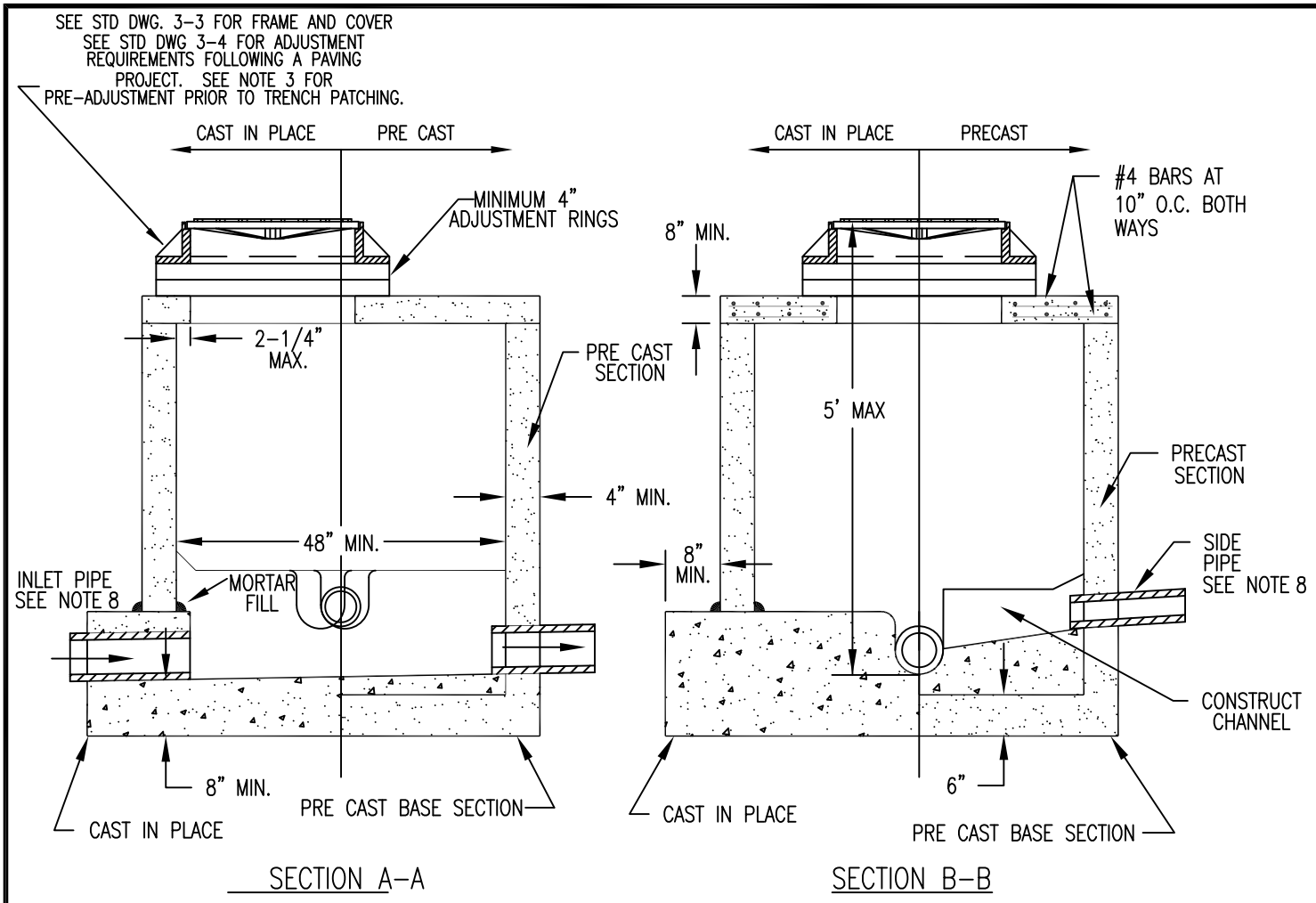
ENGINEERING DEPARTMENT

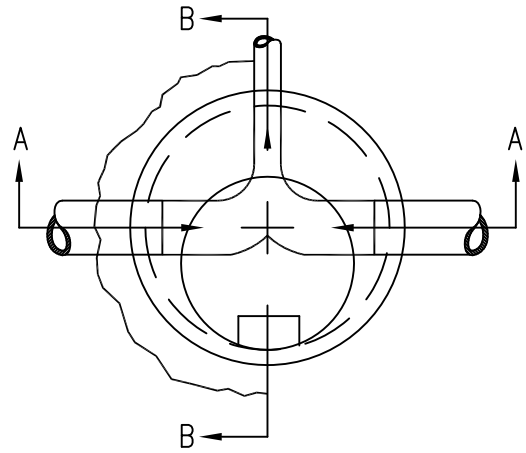
DATE	7/13
DWN	KDS
REV	5/15
CHK	BWB
SCALE	NTS

DWG. NO.

3-2

SHEET 1 OF 2





NOTE:

1. A RUBBER RING ENTRY COUPLING SHALL BE USED WITH P.V.C. PIPE.
2. PRE CAST MANHOLE SECTION AND FLAT SLAB COVER SHALL CONFORM TO WSDOT STD DWG B-15.60-01.
3. ADJUSTMENTS OVER 2" UTILIZE PRECAST CONCRETE RINGS. GROUT OR PLACE SEALANT (SONNEBORN - SONOLASTIC NPI, OR EQUAL) BETWEEN EACH RING AND AT FRAME. REMOVE ALL WOOD SHIMS AND FINISH GROUT (WIPE) INSIDE OF ADJUSTMENT RING.
4. ALL MANHOLE JOINTS SHALL BE GROUTED INSIDE AND THE JOINTS TROWELED.
5. ALL CHANNELIZATION OF MANHOLE BASES SHALL BE COVERED BY A RIGID MATERIAL DURING CONSTRUCTION OF ROAD SURFACES TO PREVENT FOREIGN MATERIALS FROM ENTERING SYSTEM PER SECTION 2-27 OF THESE SPECIFICATIONS.
6. PRIOR TO HIGH PRESSURE CLEANING THE SEWER MAIN, INSTALL A SEWER BALL OR PLUG, THE SAME DIAMETER AS THE SEWER MAIN, IN THE DOWN STREAM INVERT OF THE NEXT MANHOLE.
7. WHEN CONSTRUCTING MANHOLE OVER AN EXISTING MAIN, SUPPORT PIPE(S) WITH CONCRETE BLOCK AND POUR BASE AS SHOWN. REMOVE TOP 1/2 OF MAIN PIPE AND FORM SIDE CHANNEL(S) AS REQUIRED.
8. WHEN CONNECTING TO AN EXISTING MANHOLE, PIPE HOLE TO BE SAW CUT.
9. NO PIPE JOINT SHALL BE PLACED WITHIN 10 FEET OF THE MANHOLE.

SHALLOW MANHOLE

UNDER 5' INVERT TO COVER

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

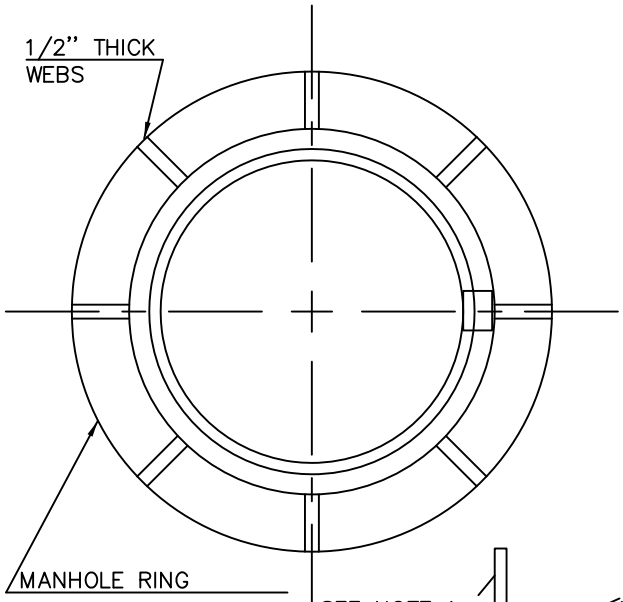
DATE	2/94
DWN	DDS
REV	5/15
CHK	BWB
SCALE	NTS

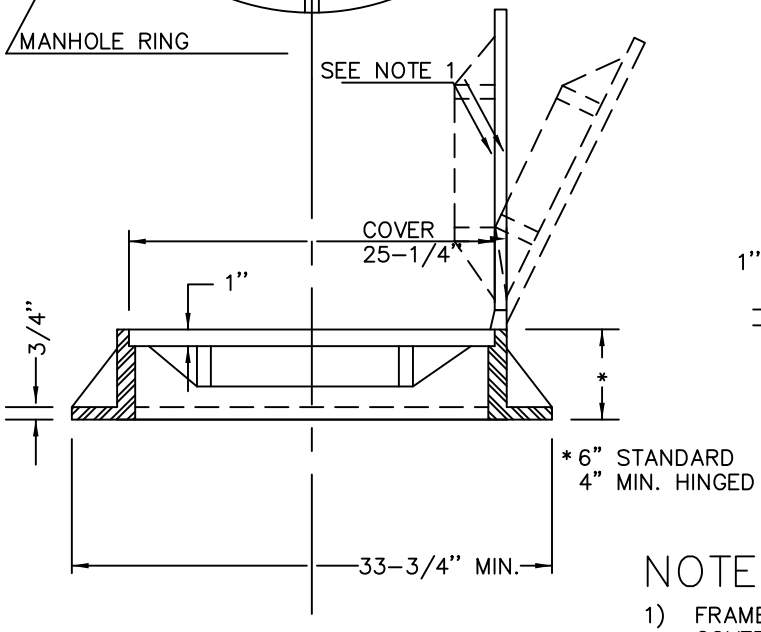
DWG. NO.

3-2

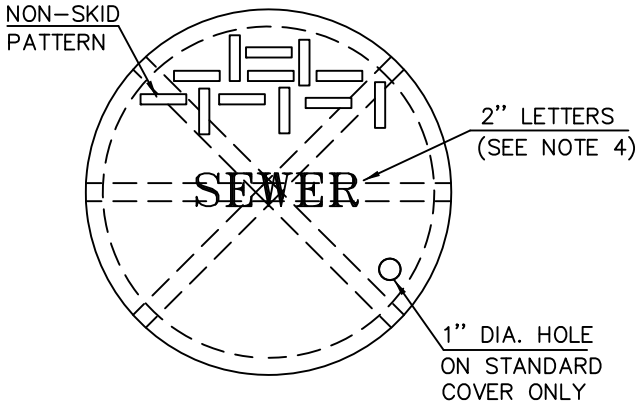
SHEET 2 OF 2

FRAME





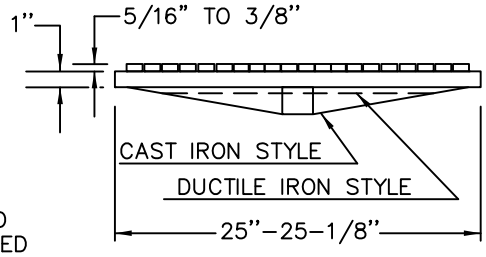
COVER



STANDARD FRAME AND COVER
SEE NOTE 1
EJIW CAT. NO.
3715Z OR 3717Z (FRAME)
3717C (COVER) OR
APPROVED EQUAL.

HINGED FRAME AND COVER
SEE NOTE 1

PAM-PAMREX 24" MIN. 195 LBS
INCLUDING 122 LB COVER



NOTE:

1) FRAME AND COVER SHALL BE CAST OR DUCTILE IRON. COVERS ON RESIDENTIAL STREETS MAY BE STANDARD, OR HINGED. ALL STREETS WIDER THAN 38 FEET, THE COVER SHALL BE HINGED.
HINGE TO FACE INTO ONCOMING TRAFFIC.
OPENS TO 130°, BLOCKS AT 90° WHEN CLOSING.

2) MACHINE COVER SEAT & COVER FACE.

3) LOADING-MINIMUM AASHTO H20

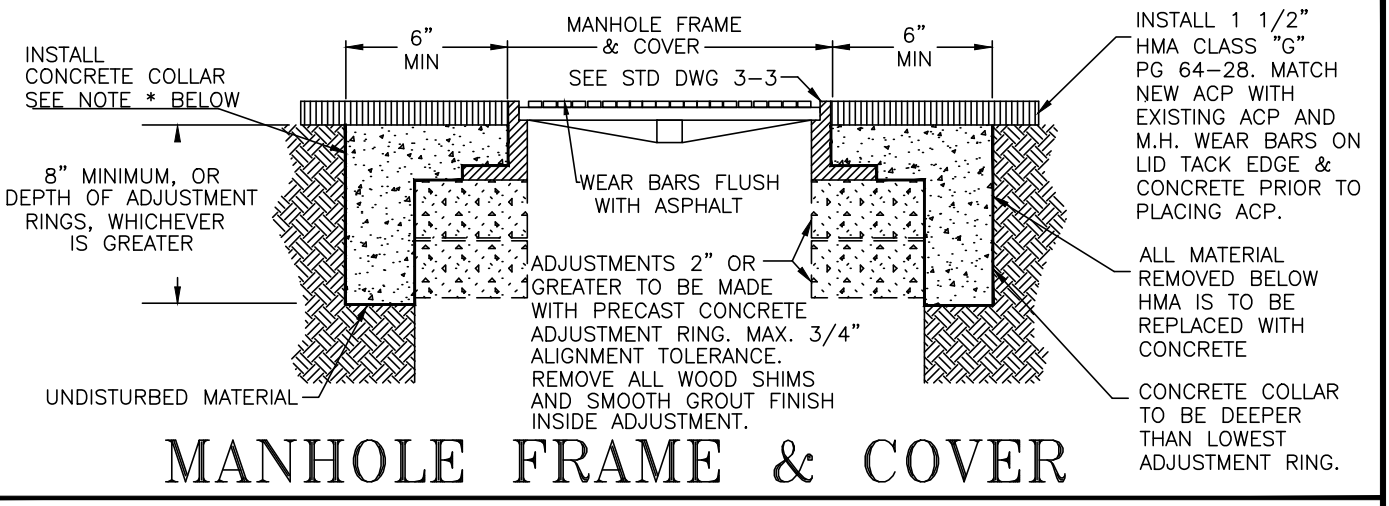
4) MANHOLE COVERS TO BE LETTERED AS "WATER," "SEWER," OR "STORM" AS REQUIRED BY TYPE OF APPLICATION.

MANHOLE FRAME & COVER

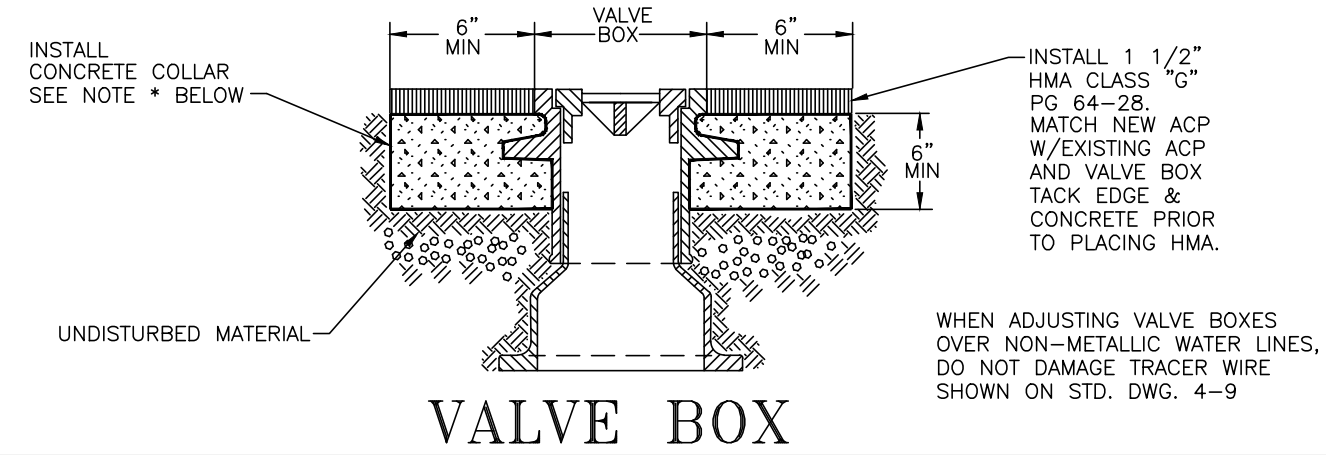
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/07
DWN	FSG
REV	5/15
CHK	BWB
SCALE	NTS

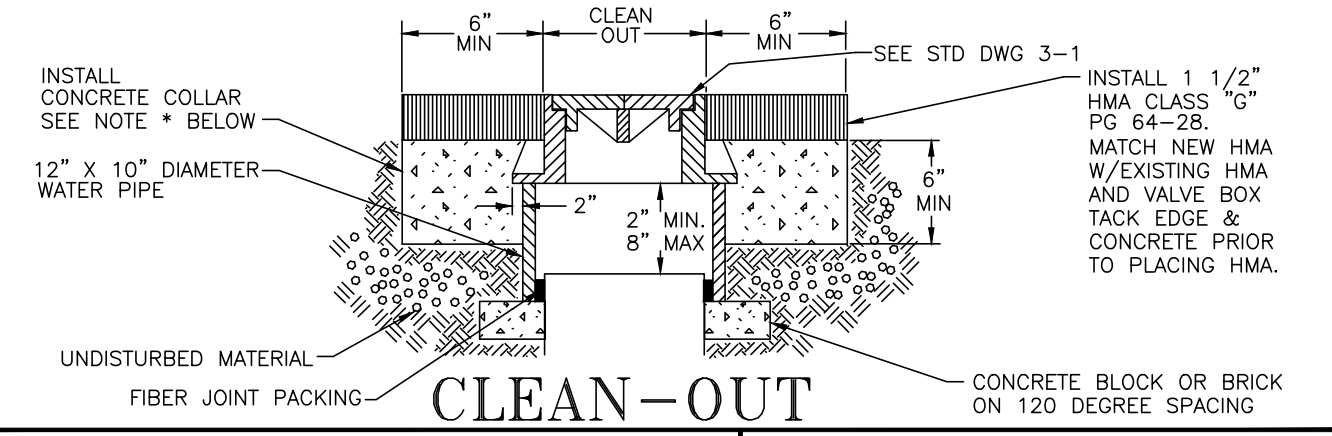
DWG. NO.
3-3



MANHOLE FRAME & COVER



VALVE BOX



CLEAN-OUT

* NOTE:

A CONCRETE COLLAR IS REQUIRED ON ALL INSTALLATIONS. IN UNIMPROVED OR UNPAVED AREAS, INSTALL THE CONCRETE COLLAR AS FOLLOWS: 30"X30"X8" FOR VALVE AND CLEANOUT COVERS 42"X42"X8" MINIMUM, OR DEPTH OF ADJUSTMENT RINGS FOR MANHOLE COVERS, WHICHEVER IS GREATER. CONCRETE MIX SHALL CONFORM TO STANDARD DRAWING 2-13

ADJUSTMENTS

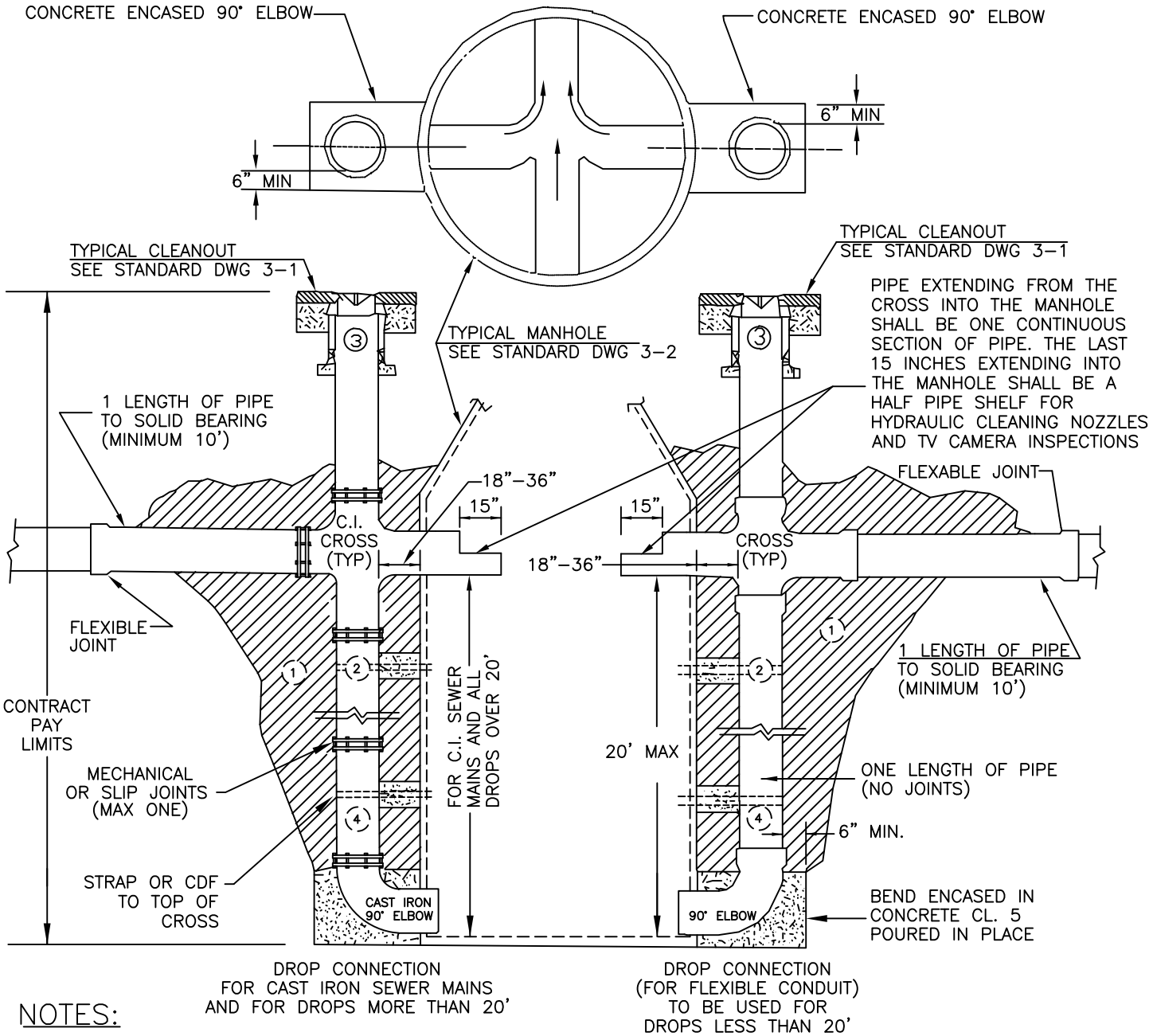
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	2/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

3-4



NOTES:

1. SELECT NATIVE BACKFILL MATERIAL OR IMPORTED BACKFILL MATERIAL COMPACTED PER SPECIFICATIONS
2. STAINLESS BANDS WITH CONCRETE SPACER TO MANHOLE (5' MAX. SPACING, 1' MIN.) OR CDF FILL TO TOP OF CROSS.
3. SEE STD DWG 3-1 FOR CLEANOUT DETAILS (NOT SHOWN)
4. DROP CONNECTION PIPE DIAMETER AND FITTINGS SHALL BE EQUAL TO OR GREATER THAN THE DIAMETER OF THE SEWER MAIN.

OUTSIDE DROP CONNECTION

REQUIRED FOR INVERT DROPS OF OVER 2 FEET

CITY OF KENNEWICK

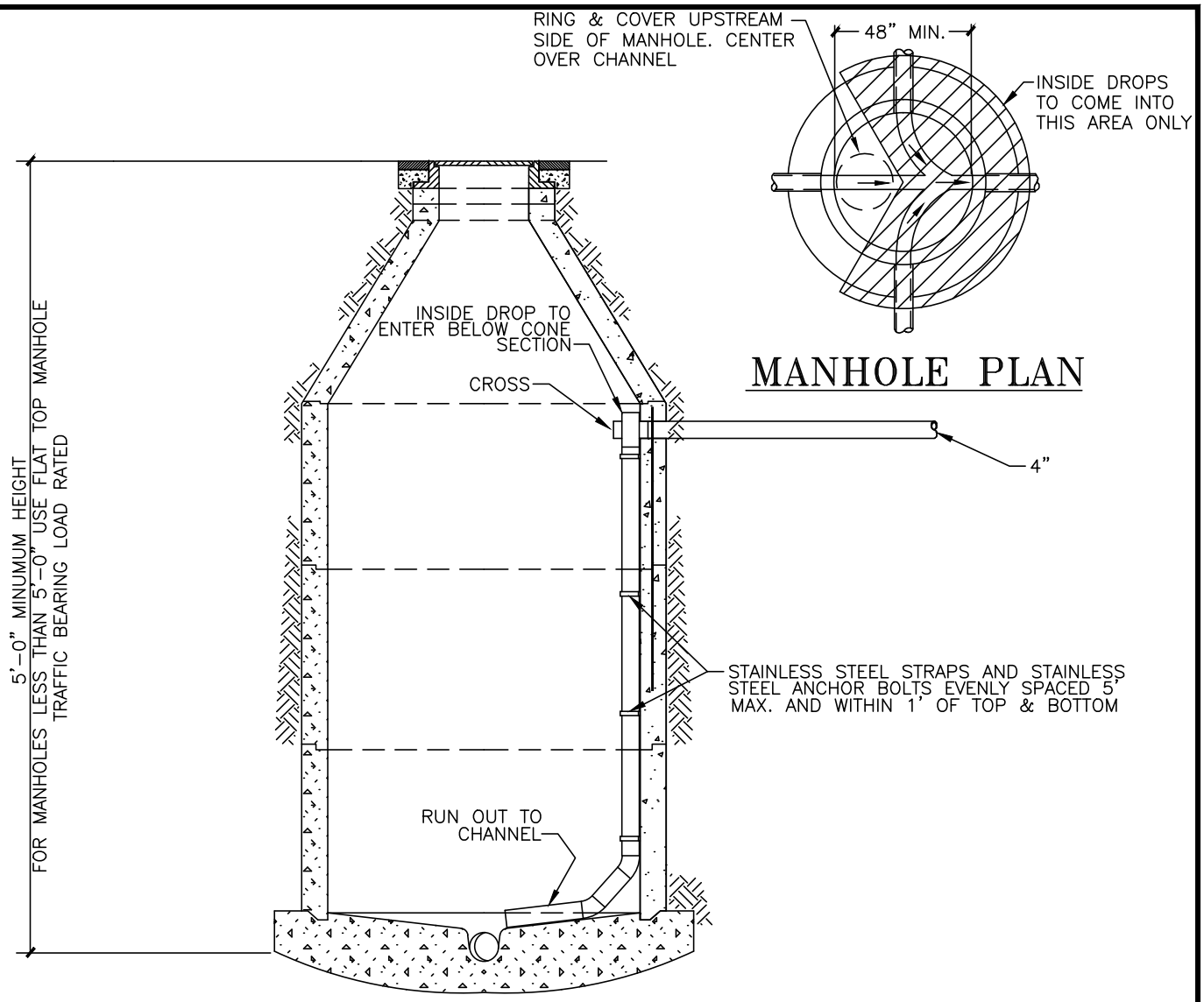
ENGINEERING DEPARTMENT

DATE	2/97
DWN	DDS
REV	2/15
CHK	BWB
SCALE	NTS

DWG. NO.

3-5

SHEET 1 OF 2



NOTES:

① INSIDE DROP CONNECTION WILL TYPICALLY NOT BE ALLOWED. WHEN EXTENUATING CIRCUMSTANCES OR UNUSUALLY DEEP SEWER MAINS ARE ENCOUNTERED, THE CITY ENGINEER MAY APPROVE. IF APPROVED, ALL CONSTRUCTION MUST BE COMPLETED PER THIS DETAIL AND AS DIRECTED BY THE ENGINEER.

② DROP CONNECTION PIPE DIAMETER AND FITTINGS SHALL BE EQUAL TO OR GREATER THAN THE DIAMETER OF THE SEWER SERVICE. PIPE MATERIALS AND FITTINGS SHALL MEET THE REQUIREMENTS OF THE CITY STANDARD SPECIFICATION 3-4 FOR SEWER SERVICE LINES.

INSIDE DROP CONNECTION

CITY OF KENNEWICK

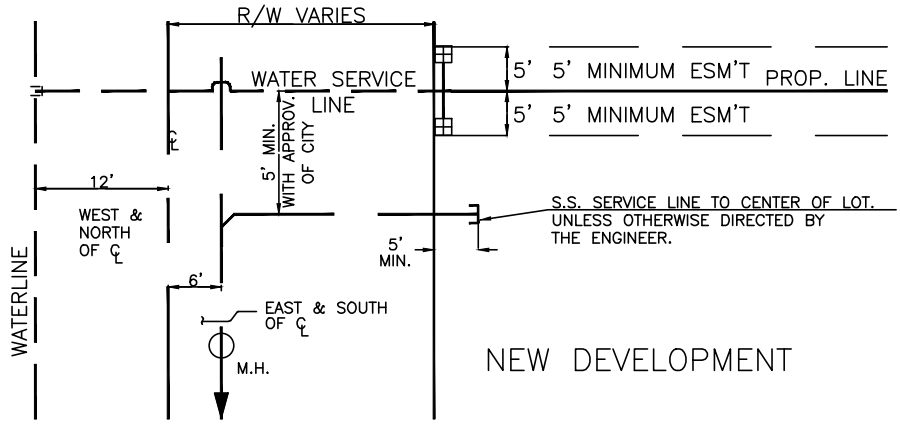
ENGINEERING DEPARTMENT

DATE	12/97
DWN	KWM
REV	3/14
CHK	BWB
SCALE	NTS

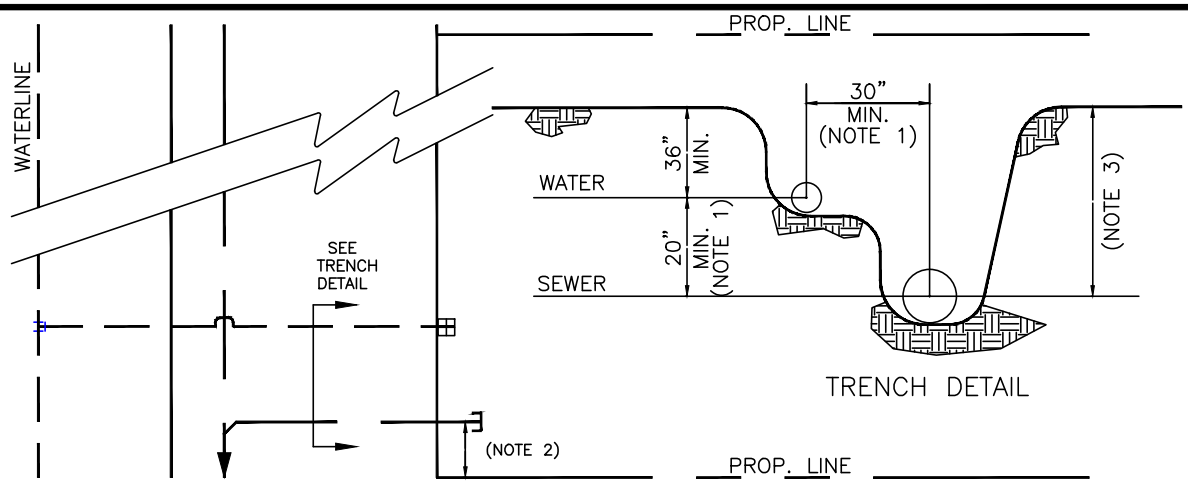
DWG. NO.

3-5

SHEET 2 OF 2



NEW DEVELOPMENT



TRENCH DETAIL

EXISTING DEVELOPMENT

NOTE 1 : WHEN MINIMUM HORIZONTAL & VERTICAL SEPARATIONS CANNOT BE MAINTAINED DUE TO SHALLOW SEWER SERVICE LINES AT PROPERTY LINE, THE WATER AND SEWER SERVICE LINES SHALL HAVE A MIN. HORIZONTAL SEPARATION OF AT LEAST 5' AND MAY REQUIRE TWO SEPARATE TRENCHES, OR THEY SHALL BE SEPARATED AS DIRECTED BY THE CITY ENGINNEER.

NOTE 2 : DISTANCES FROM PROPERTY LINES TO EXIST. WATER OR SEWER SERVICE LINES MAY VARY DUE TO FIELD CONDITIONS. WHENEVER A NEW WATER/SEWER SERVICE LINE IS INSTALLED IT SHALL NOT BE PLACED ANY CLOSER TO AN EXISTING WATER/SEWER SERVICE LINE THAN AS INDICATED BY THE TRENCH DETAIL WITHOUT WRITTEN PERMISSION BY THE CITY ENGINEER.

NOTE 3 : SEWER SERVICE MINIMUM DEPTH.
WHERE THE SEWER MAIN DEPTH ALLOWS, SEWER SERVICE TO EXISTING BUILDING SHALL BE A MINIMUM 6 FEET BURY WITHIN THE STREET RIGHT-OF-WAY OR 4 FOOT BELOW THE LOWEST FLOOR ELEVATION, WHICHEVER IS DEEPER. WHERE THE DEPTH OF THE SEWER MAIN ALLOWS, SEWER SERVICES TO VACANT LOTS SHALL BE AS DEEP AS POSSIBLE OR PRACTICAL TO PROVIDE FULL BASEMENT SERVICE TO THE PROPERTY. TYPICALLY THE INVERT SHALL BE 12 FEET BELOW THE PROPERTY GROUND ELEVATION AT A 25 FOOT FRONT SETBACK, PROVIDING HOWEVER , THAT THE MINIMUM DEPTH IN THE RIGHT-OF-WAY EVEN FOR UPHILL LOTS, SHALL BE 6 FEET BURY."

NOTE 4 : THE REQUIREMENTS OF THIS STANDARD CITY OF KENNEWICK DRAWING SHALL BE BINDING UPON ALL PUBLIC OR PRIVATE WATER/SEWER SERVICE LINES THAT CONNECT INTO A CITY WATER OR SEWER MAIN AND IS INTENDED FOR THE SOLE PURPOSE OF PROVIDING PROTECTION FROM CONTAMINATION TO THE POTABLE WATER DISTRIBUTION SYSTEM.

NOTE 5 : SEE STANDARD DRAWING 4-7 AND STANDARD SPECIFICATIONS SECTION 3 FOR SEWER MAINLINE,TRENCH, BEDDING, AND CONSTRUCTION REQUIREMENTS.

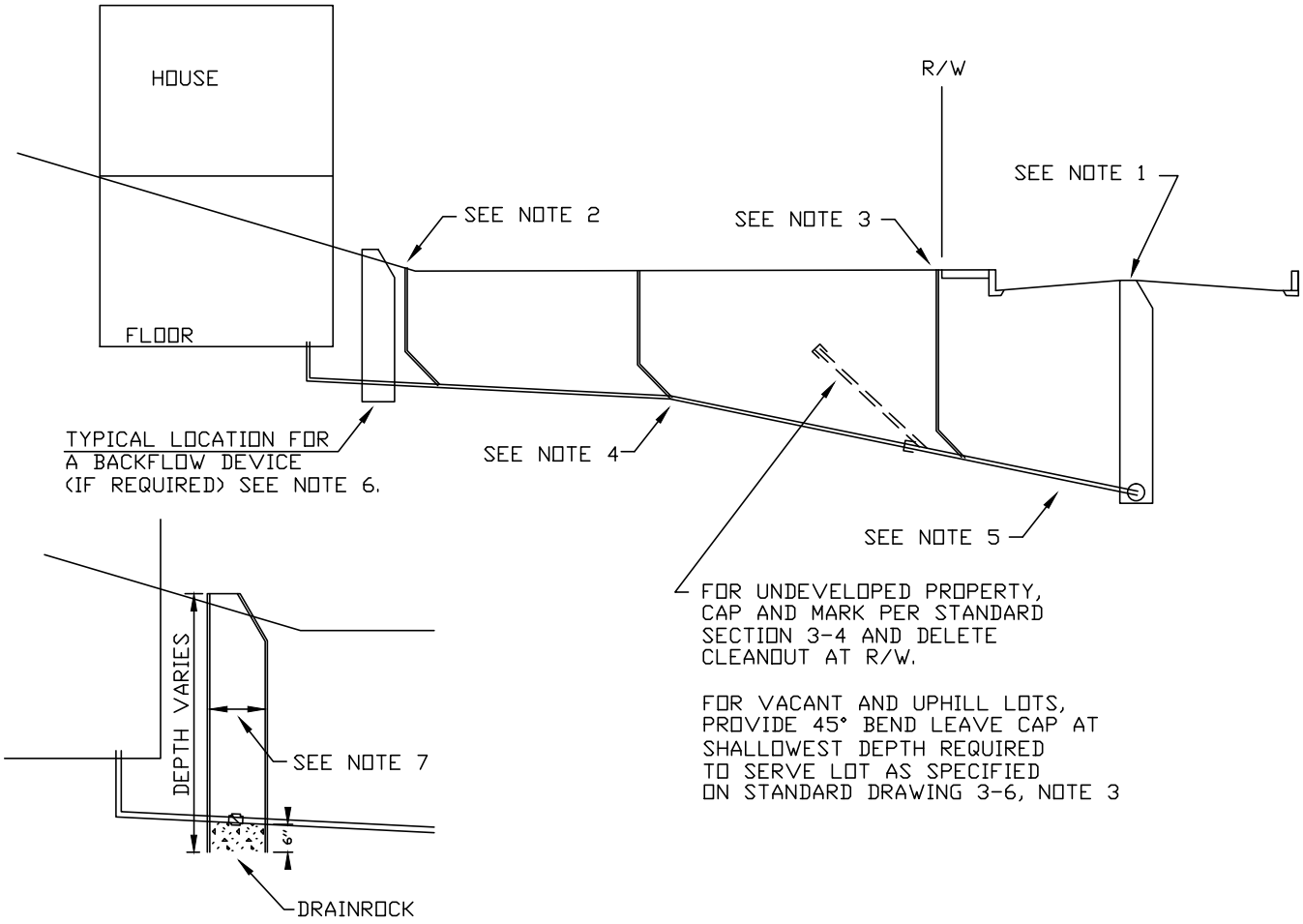
NOTE 6 : SEE STANDARD DRAWING 3-7 FOR SEWER SERVICE CLEANOUT AND BACKFLOW REQUIREMENTS.

SEWER SERVICE INSTALLATION

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/95
DWN	CLJ
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
3-6



1) IF RIM (LID) OF THE NEAREST UPSTREAM MANHOLE IS HIGHER THAN THE HOUSE OR THE BASEMENT FLOOR, THEN A BACKFLOW PREVENTION DEVICE IS REQUIRED.

2) IF A BACKFLOW MANHOLE IS REQUIRED, A CLEANOUT IS REQUIRED EITHER IN THE VAULT OR AS SHOWN.

3) AT ALL INSTALLATIONS, EXCEPT NEW HOME CONSTRUCTION, INSTALL A CLEANOUT AT THE RIGHT OF WAY LINE.

4) INSTALL ADDITIONAL CLEANOUTS AS REQUIRED BY CITY STANDARD SPECIFICATIONS SECTION 3-4.03.

5) TYPICAL SEWER SERVICE INSTALLED PER THE REQUIREMENTS OF CITY STANDARD SPECIFICATIONS SECTION 3-4.

6) ALTERNATE LOCATION IS IN BASEMENT FLOOR OR IN CRAWLSPACE. IF INSTALLED IN CRAWL SPACE A MINIMUM 10" X 15" ACCESS MUST BE PROVIDED. SEE DETAIL THIS SHEET FOR TYPICAL MANHOLE.

7) IF THE TOTAL DEPTH IS LESS THAN 30", A METER BOX OR MINIMUM 18" DIAMETER ACCESS WITH LID MAY BE USED. IF DEPTH IS OVER 30", MINIMUM DIAMETER WILL BE 42" WITH A MINIMUM 24" ACCESS COVER. MANHOLE TO BE CONCRETE BLOCK, CULVERT PIPE OR CONCRETE.

8) A SELF CONTAINED BACKFLOW DEVICE MAY BE USED WHICH DOES NOT REQUIRE A MANHOLE, DESIGNED OF CULVERT PIPE, OR CONCRETE FOR ACCESS.

TYPICAL SANITARY SEWER SERVICE AND BACKFLOW REQUIREMENT

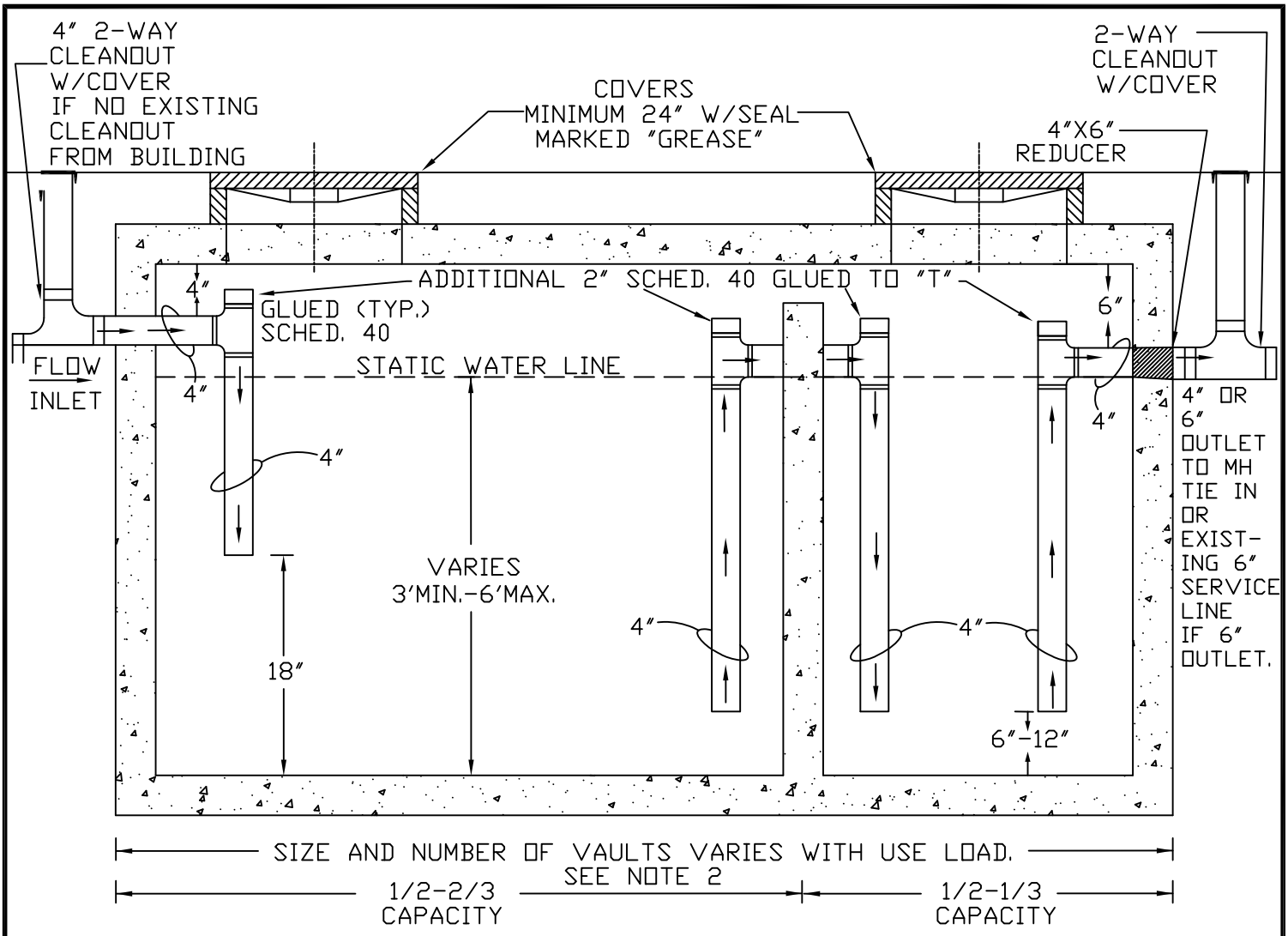
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

3-7



1. ALL GREASE INTERCEPTORS SHALL CONFORM IN SIZE AND COMPONENTS TO WAC 246-272C -0230 CHAPTER 10 OF THE UNIFORM PLUMBING CODE, KMC 14.23, OR ANY CITY STANDARD SPECIFICATION AND SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE LATEST PUBLICATION.
2. ALL GREASE INTERCEPTORS SHALL BE SIZED IN ACCORDANCE TO THE REQUIREMENTS AS OUTLINED IN THE UNIFORM PLUMBING CODE AND CALCULATIONS SHALL BE SUBMITTED TO THE AUTHORITY HAVING JURISDICTION FOR APPROVAL PRIOR TO INSTALLATION.
3. TRAFFIC RATED TANKS REQUIRED WHEN LOCATED IN TRAFFIC AREAS.
4. GREASE INTERCEPTORS SHALL BE LOCATED SO AS TO BE ACCESSIBLE FOR CLEANING AND INSPECTION INSTALLATION OF GREASE INTERCEPTORS IN DRIVE THRU AND PARKING STALLS IS PROHIBITED
5. TANK LENGTH SHALL BE GREATER THAN TANK WIDTH.
6. INSTALLATION OF GREASE TRAPS IN DRIVE THRU AND PARKING STALLS PROHIBITED.
7. NO SEWAGE, DISH WASHERS, OR GARBAGE DISPOSALS SHALL BE CONNECTED TO GREASE INTERCEPTORS.
8. ANY VARIANCE FROM THIS DETAIL MUST HAVE PRIOR APPROVAL FROM THE AUTHORITY HAVING JURISDICTION.

GREASE INTERCEPTOR

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	5/15
CHK	BWB
SCALE	NTS

DWG. NO.

3-8

Section 4 Index

Water [click on number or heading below]

SECTION 4

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

WATER

4-1 WATER PIPE

4-1.01 GENERAL

The work covered in this section shall include the furnishing, installation, and testing of the water piping, valves, tees, fittings, and other appurtenances and incidental work required to construct the water facility as shown on the plans and in accordance with SWSS Section 7-09 through 7-15, as herein modified.

4-1.02 APPROVED PIPE AND FITTINGS

The water pipe shall be one of the types as indicated below unless a specific type and class of pipe is otherwise called out in the contract special provisions.

A. WATER PIPE, GREATER THAN 10 INCHES, shall be Class 50 Ductile Iron Pipe. Ductile iron pipe shall conform to all requirements of ANSI A21.51 (AWWA C151). Pipe shall be cement-mortar lined and seal coated, conforming to ANSI A21.4 (AWWA C104). Pipe joints shall be push-on joint or as specifically specified or shown on the plans. Gaskets suitable for the designated pipe joint, pipe size, and pressures shall be furnished with the pipe and conform to ANSI A21.11 (AWWA C111).

B. WATER PIPE – 4 INCHES TO 10 INCHES, shall be Class 150, DR18 Polyvinyl Chloride (PVC) Pipe. Pipe shall be push-on joint or coupled joint conforming to ASTM D1784 Class 12454-A or 12454-B. Pipe shall meet all the material, performance, and test requirements of AWWA C900.

C. PIPE FITTINGS shall be Class 250, unless specified otherwise. Fitting joints shall be compatible with adjacent pipe.

All fittings shown on the plans adjacent to a valve shall be flange connected to the valve.

1. <u>Fittings for Ductile Iron and PVC Pipe</u>
Fittings shall be Class 250, cement-mortar lined cast or ductile iron and shall conform to ANSI A21.1 (AWWA C110), ASTM 377 and ASTM 536. Mortar

lining for fittings shall be the same thickness specified for cast and/or ductile iron pipe and shall conform to ANSI 21.4 (AWWA C104). Rubber gasket joints shall conform to ANSI A21.11 (AWWA C111).

D. NUTS AND BOLTS shall be of sizes, material and quantities recommended in ANSI 21.11 (AWWA C111) and AWWA C207. Nuts and bolts shall be ductile iron or alloy steel A303, Grade B. Nuts and bolts for flanges shall conform to ANSI B16.1.

E. JOINT LUBRICANT shall be furnished with the pipe, in the amount and type recommended by the pipe manufacturer. The lubricant shall be a water-soluble, nontoxic, vegetable soap compound conforming to United States Pharmacopoeia No. P39.

4-1.03 INSTALLATION

Pipe shall be installed in accordance with the manufacturer's specifications for the type of pipe used. The Contractor shall construct the pipeline in accordance with Standard Drawings Section 4 and the requirements of SWSS Section 7-09 as herein modified.

Prior to beginning excavation and where directed by the Engineer, storm drainage catch basins shall be protected per Section 2-27 of these specifications.

4-1.04 TRENCH EXCAVATION AND BACKFILL

Trench excavation for water line construction shall be in accordance with SWSS Section 7-09.3(7) except as herein modified. Trench excavation shall provide for a minimum of 42 inches of cover material over the top of the finished pipe grade. Trench backfill material shall be compacted by means approved by the Engineer, per the requirements of City Standard 1-13, as required to preclude future settlement and to achieve a minimum of 95 percent maximum density when tested in accordance with SWSS Section 7-09.3(11). In addition, the contractor is directed to Section 1-13 of these specifications.

Delete SWSS Section 7-09.3(7) B. Trench excavation shall be unclassified unless rock excavation is listed as a separate pay item.

As a minimum, all trenches which parallel the street centerline shall be water settled and compacted with a hoe-mounted or double drum vibratory mechanical compactor. Hand operated jumping jacks or shoe-type mechanical tampers will not be approved.

Pavement restoration shall be completed per the requirements of City Standard Drawing 2-6 and Section 2-29 of these standards.

The Contractor is advised that all existing water main lines have thrust blocks typically located as shown on Standard Drawing 4-6. These thrust blocks have been found to be

constructed of rocks, blocks, concrete or other materials. The Contractor shall take such precautions, shoring, etc. as required to protect and not disturb the existing thrust blocks.

4-1.05 PIPE LOCATOR RIBBON

The Contractor shall, after backfilling and compacting the trench to within 12 inches of the top of the finished ground grade, install a continuous two-inch (2") minimum width blue plastic coated aluminum pipe locator ribbon over the top of the pipeline, which shall be clearly marked "CAUTION BURIED WATER LINE" continuously along the length of the ribbon.

4-1.06 TRACER WIRE

The Contractor shall install a tracer wire, in addition to the location ribbon, over all non-metallic water mains. the Tracer wire shall be 14 gauge copper wire with blue coded UF insulation. The tracer wire shall be installed as shown on the City of Kennewick Standard Drawing 4-9. Bare wire contact points shall be provided at valve boxes, air release and blow off installations.

4-1.07 DISINFECTION AND FLUSHING

The Contractor shall flush water lines scheduled for testing per the provisions of Section 4-13 of these specifications. The disinfection of new water lines, including all connections and appurtenances, shall be in accordance with SWSS Section 7-09.3(24) as herein modified. Water health test points shall be provided at typical intervals of 500 to a maximum of 800 feet, or as approved by the Engineer. The Contractor will be required to notify the inspector up to 48 hours prior to the need for health testing. The Contractor shall then obtain health samples according to the procedure outlined in Section 4-22 of these specifications. Samples may be taken at fire hydrants and temporary blow-offs when available. When test points within the specified interval are not available, a saddle and corp stop shall be supplied and installed by the Contractor. Where applicable, the corporation stop shall be installed at the nearest service location.

Following acceptance of the health test, the water line shall be thoroughly flushed. City crews will operate all valves during the flushing procedure per the provisions of Section 4-13 of these specifications. The Contractor may operate valves which are installed by the Contractor and control the supply to the water mains being installed by the Contractor, for the purpose of filling installed water lines, pressurizing to line pressure prior to pressure tests and for final flushing prior to obtaining health samples. Prior to operating any valve, including valves installed by the Contractor, the City Engineering Department inspector must be on site and approval of the inspector must be obtained for the Contractor's proposed operation. The above specified valves, and herein specified procedures, constitutes the only approved operation of main line valves by personnel other than the City

Water Department personnel. Non conformance with the provisions of this standard specification and identified policy shall be treated as "tampering" and enforcement will be in conformance with the provisions of City Ordinance: (KMC 14.01.240 and 14.09.010)

The Contractor shall provide temporary or permanent blow off access points where fire hydrants are not available. During flushing, the Contractor shall provide piping, ditches, ponds or other measures as required to control or discharge flushed water in a safe manner. The Contractor shall be fully responsible for damage resulting from flushing water.

4-1.08 PRESSURE TESTING

4-1.08.01 WATER MAIN LINES

With the exception of building fire system lines, the pressure testing of new water lines, including all connections and appurtenances, shall be in accordance with SWSS Section 7-09.3(23) as herein modified. The hydrostatic test pressure for all types of pipe shall be 150 PSI for a length of one hour. The Contractor shall provide and install saddles and corporation stops as required to provide test points.

When the contractor is required to connect to an existing water main stub, or extend an existing water main, the city does not warrant that the existing valve or pipe will meet pressure test requirements. The contractor shall have the option of installing a valve at the point of connection or the contractor may attempt to pressure test, utilizing the existing installations at his sole risk and expense. Where water services are presently connected to the existing water main, the contractor shall install a mainline valve at the point of connection.

4-1.08.02 BUILDING FIRE LINE TEST PROCEDURES

The City Inspector must be present during the following:

1. PRESSURE TEST - Test for 2 hours at 200 P.S.I.

If a loss, refer to allowable leakage description on contractor's Material and Test Certificate for underground piping form as required by the latest edition of the NFPA Standard.

2. FLUSH - After the underground fire line passes the pressure test the flushing of the pipe from the main to the flange can be scheduled.

All debris that is in the underground pipe must be flushed clear (1-1/2 Minutes Min.), a burlap bag will be required to collect debris from the pipe.

3. FLOW TEST - When all debris has been flushed and the pipe is flowing clear, flow test must be taken to assure the pipe is flowing the minimum gallons per minute.

4” Pipe - - 390 G.P.M.
6” Pipe - - 880 G.P.M.
8” Pipe - - 1560 G.P.M.

Flow from the flange must be directed in a safe manner as not to flood the surrounding area. The contractor will conduct the flow test with a city representative present. The Contractor shall supply a pedo gauge and measure the flow.

If the flushing can be completed without reducing the pipe size and the P.I. valve opened completely, then gauging the flow for gallons per minute will not be required.

4. HEALTH SAMPLE - The Contractor shall obtain a health sample per the requirements of City Standard Specifications, Section 4-22.

5. SOFT SEAT CHECK VALVE - If a soft seat check valve is required, contact the City’s Cross Connection Specialist to inspect the valve prior to installation.

4-1.09 TRENCH SAFETY SYSTEMS

All trench excavations shall have adequate safety systems for the trench excavation that meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor shall be fully responsible for providing the necessary back sloping, cribbing, trench boxes, etc., as required to meet the specified safety requirements for the trench. When city crews will be making the main line tap, as provided by Section 4-8.02(C), the contractor shall provide all trench safety measures, prior to city personnel entering the trench.

4-1.10 MEASUREMENT AND PAYMENT

Measurement and payment will be made per the provisions of SWSS 7.09.4 and 7-09.5 and as modified by these specifications. The unit contract price for each size of "Water Line", per linear foot, when measured continuously along the pipe centerline, including the distances through structures, valves, and fittings, shall be full compensation for furnishing all labor, equipment, and materials, to trench, dewater, compact and backfill, lay and joint the pipe, make connections to existing stub lines, specified or required salvage, test, disinfect, flush, provide and install corporation stop test points, and all other incidentals required to perform the work in accordance with the plans and specifications or as directed by the Engineer. Where temporary 2-inch blow off assemblies are required for

installation and testing, measurement and payment will be made per section 4-6.03 of these specifications.

"Trench Safety Systems", per linear foot, shall be measured along the main line trench length through valves and vaults. The unit contract price, per linear foot, shall be full compensation for furnishing all labor, equipment, materials and all other incidentals necessary to meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. All costs for trench safety systems for water service trenches shall be incidental to the water system main line measurement and payment.

4-2 ROCK EXCAVATION

4-2.01 GENERAL

When provided for in the bid proposal, a separate measurement and payment will be made for rock excavation. Rock excavation shall include solid rock formations requiring systematic drilling and blasting with explosives and any boulders or broken rock larger than one-half cubic yard in volume. Hardpan or cemented gravel, even though it may be advantageous to use explosives in its removal, shall not be classified as solid rock excavation. The bottom of the trench shall be brought up to grade by backfilling with selected backfill material and be compacted to the satisfaction of the Engineer.

The Contractor shall notify the Engineer at least 24 hours prior to any blasting. All blasting shall be done in accordance with local, county, and state regulations governing this class of work. Any damage to persons or property resulting from blasting operations shall be the sole responsibility of the Contractor and his surety.

4-2.02 MEASUREMENT

The measurement for "Rock Excavation" shall be made as follows:

A. LENGTH

Length will be the entire horizontal distance where rock is encountered, measured on a linear foot basis along centerline of trench.

All water line structures; i.e., valve pits, transmission line blow-offs, pressure reducing stations, etc., will be excluded and will be measured separately. Measurement will commence at the first location where rock is encountered and continue to the point where rock terminates.

B. WIDTH

The trench width for payment of rock excavation shall be as follows:

Size of Pipe	Pay Width of Trench
4" - 15"	2.5 feet
18" - 36"	Outside pipe diameter plus 12"
42" & larger	Outside pipe diameter plus 24"

C. DEPTH

Measurement for depth will be the vertical distance from six inches (6") below the pipe invert to the top of the solid rock strata. Depth will be measured at intervals of 25 feet along centerline of trench, beginning at the first location that solid rock is encountered, and the average depth between measuring points will be the depth used for computing depth of rock.

D. ROCK EXCAVATION FOR STRUCTURES

Rock excavation quantities for water line structures; i.e., valve pits, transmission line blow-offs, pressure reducing stations, etc., shall be computed on a cubic yard basis from the actual profile depth as noted above, multiplied by the area within a line parallel to and one foot (1') outside of the actual dimensions of the structure base.

4-2.03 PAYMENT

The unit contract price for "Rock Excavation," per cubic yard, shall be paid in addition to the payment for "Water Line Pipe," per linear foot. Payment for rock excavation shall be full compensation for all work necessary to excavate and dispose of the rock material. No payment will be made for rock excavated below required grade or outside the widths mentioned above.

4-3 WATER SERVICES

4-3.01 GENERAL

Where shown on the plans or indicated in the proposal, the Contractor shall provide the materials, trench excavation, necessary bedding, and backfill for the water service line from the main to the property line and the Contractor shall install the water service per Standard Drawings 4-26 through 4-31, including the required service taps to existing water main lines. Where existing water mains with existing services are replaced, the Contractor shall relocate the water meter and reconnect the private service as construction requires for new developments. Water services will not be located on the same property lines as the other utilities.

When a property is developed that has an existing water service(s), or mainline stubbed and the development will not utilize the existing service or stub, the developer's contractor shall expose the water main and remove the abandoned corporation stop and install a plug, or remove the abandoned valve and install a blind flange.

The Contractor shall provide extra width trench at the mainline as required to install the saddle a minimum two feet from all hubs, bells or joints.

The construction plans typically do not show the existing improvements behind the curb and walk. The Contractor shall make himself aware of the general conditions and any special conditions that may exist. All fence, lawn, irrigation systems, rock and gravel areas and all miscellaneous landscaping, shall be restored in accordance with industry standards and shall be of equal or better quality than the existing improvements. The Contractor shall take necessary measures to limit the impact to the existing improvements as much as possible, including tunneling or missiling under major tree roots, curbs, walks, fences, and similar obstructions.

Trench compaction and rock excavation shall be completed in accordance with Section 4-1.04 and 4-2 of these specifications. Pipe bedding material shall meet the requirements of Section 4-4.02 and 4-4.03 of these specifications.

Following installation of new concrete curb and gutter which crosses over a newly installed water service line, the Contractor shall mark the face of the concrete curb with a "W" in accordance with the requirements of Section 2-10.01 of these specifications.

4-3.02 INSTALLATION

When the new waterlines have been approved for service, the Contractor shall install water services per the City Standard Drawings No's. 4-26 through 4-31. Where new services are being installed to existing homes, the Contractor shall reinstall the existing meter box and meter and complete connections to the existing homes as required to restore the water service as specified. The existing meter box and meter shall be removed undamaged by the Contractor. Where an existing meter box is substandard or damaged due to no fault of the Contractor, the Contractor shall supply and install a new meter box at the contract unit price. On City contracts, the meter box grade will be staked by the City, prior to installation; however, each box will require adjustment to the final slope, yard or wall grade after completion of the street work. Meter boxes shall be installed per Standard drawing 4-31. Boxes which require adjustment to grade shall be excavated, removed and reset to grade. Adjustments between box sections shall not be made with bricks, boards, cement grout or other measures. Properly installed manufacturer supplied extension rings may be utilized when extra deep installations require and when approved by the Engineer.

Where existing customer water services are galvanized, the Contractor shall thread the service and install a dielectric union between the copper tailpiece and galvanized connection. Where the existing service to the home is found to be deteriorated, the owner shall be notified in writing by the Contractor of the condition of the existing service and the limits of responsibilities as noted herein. The water service pipe shall be left exposed until the owner is shown the condition of the pipe. The Contractor shall then carefully bed and backfill the connection. The Contractor shall be fully responsible for all leaks in the existing owner service within five feet of his work connection for a period of one year and within 20 feet for a period of five days. Other leaks shall be the responsibility of the homeowner.

1-1/2-inch, 3-inch and other odd size water service taps will not be allowed. 1-1/2 inch services shall be served from the mainline by a 2-inch corporation stop and a 2-inch service line. Three-inch services shall be served from the mainline by a 4-inch flanged tee or flanged tapping saddle, a 4-inch flanged gate valve and 4-inch service line.

Polyethylene tubing shall be cut with square ends, beveled with beveling tool, and cleaned. Insert stainless steel insert without scarring or damaging tubing or insert. Hot water may be used for making tubing flexible. Tubing shall not be exposed to direct radiant heat or a flame. Make connection up tightly.

Copper and polyethylene service pipe shall be laid without kinking or buckling on short radius bends. Tubing shall be laid as a continuous piece from service saddle or corporation stop to the A.M.S. Splices shall not be allowed unless approved by the Engineer. Tubing that shows signs of damage, out of round, or laid with kinks or buckling shall be rejected.

Taps into the water main to provide for 1 and 2 inch water services shall be made as herein specified.

1. Prior to the water main being installed in the trench, the main may be tapped using a hole saw. After the tap is completed, all debris left from making the tap must be cleaned from the pipe.

2. When tapping a new, or an existing PVC water main, the main shall be filled and brought to operating pressure, prior to tapping. A live tapping machine must be used (example: 1" taps, Mueller E-5 machine. 2", Mueller D-5 machine).

3. When tapping C-900 (plastic pipe) the boring tool must be a shell cutter designed specifically for tapping plastic pipe. The coupon must be retained in the shell cutter eliminating the possibility of it being left inside the water main.

4. All other main types (AC, Steel, Ductile iron, etc.) may be tapped using a drill bit made for the type of pipe being tapped.

Where existing customer water services are galvanized, the Contractor shall thread the service and install a dielectric union between the copper tailpiece and galvanized connection. Where the existing service to the home is found to be deteriorated, the owner shall be notified in writing by the Contractor of the condition of the existing service and the limits of responsibilities as noted herein. The water service pipe shall be left exposed until the owner is shown the condition of the pipe. The Contractor shall then carefully bed and backfill the connection. The Contractor shall be fully responsible for all leaks in the existing owner service within five feet of his work connection for a period of one year and within 20 feet for a period of five days. Other leaks shall be the responsibility of the homeowner.

1-1/2-inch, 3-inch and other odd size water service taps will not be allowed. 1-1/2 inch services shall be served from the mainline by a 2-inch corporation stop and a 2-inch service line. Three-inch services shall be served from the mainline by a 4-inch flanged tee or flanged tapping saddle, a 4-inch flanged gate valve and 4-inch service line.

Polyethylene tubing shall be cut with square ends, beveled with beveling tool, and cleaned. Insert stainless steel insert without scarring or damaging tubing or insert. Hot water may be used for making tubing flexible. Tubing shall not be exposed to direct radiant heat or a flame. Make connection up tightly.

Copper and polyethylene service pipe shall be laid without kinking or buckling on short radius bends. Tubing shall be laid as a continuous piece from service saddle or corporation stop to the A.M.S. Splices shall not be allowed unless approved by the Engineer. Tubing that shows signs of damage, out of round, or laid with kinks or buckling shall be rejected.

Taps into the water main to provide for 1 and 2 inch water services shall be made as herein specified.

1. Prior to the water main being installed in the trench, the main may be tapped using a hole saw. After the tap is completed, all debris left from making the tap must be cleaned from the pipe.

2. When tapping a new, or an existing PVC water main, the main shall be filled and brought to operating pressure, prior to tapping. A live tapping machine must be used (example: 1" taps, Mueller E-5 machine. 2", Mueller D-5 machine).

3. When tapping C-900 (plastic pipe) the boring tool must be a shell cutter designed specifically for tapping plastic pipe. The coupon must be retained in the shell cutter eliminating the possibility of it being left inside the water main.

4. All other main types (AC, Steel, Ductile iron, etc.) may be tapped using a drill bit made for the type of pipe being tapped.

4-3.03 MATERIALS

In addition to the materials listed, the Contractor shall provide and install miscellaneous fittings and connections as required to provide a complete replacement water service. Only listed materials are approved. All materials shall meet the approval of the City Water Dept. representative. The Contractor shall replace all corporation stops, ball angle meter valves, angle meter couplings etc. with new replacement parts. Only the meter and meter box shall be reused. All removed corporation stops, angle meter valves and copper fittings shall be delivered to the Water Department representative and shall remain the property of the City. All brass fittings shall be labeled “no lead”.

4-3.04 PIPE

The following pipe materials are approved for water services: 1 inch - U.S. Made Type K Soft Copper.

2 inch: Polyethylene tubing (PE) Phillips driscopipe 5100 ultra-high molecular weight, 200 psi, with copper tubing outside diameter, or approved equal. For service requirements over 1 inch, the next acceptable size is 2 inch. For service requirements over 2-inch, the next acceptable size is 4-inch. Provide reducers and fittings as required. See tapping requirements in Section 4-3.02.

4 inch and larger: Per Section 4-1.02

4-3.05 SADDLES - Ford FS202, Smith Blair 317 or Romac 202S stainless steel double strap, 3/4" & 1" have CC thread. 2" have iron pipe thread.

4-3.06 CORPORATION STOPS - CC thread, Quick Joint, 360 degree ball valve.

Ford FB1000Q - 1"
FB1100 - Q: 2” male iron pipe x Quick Joint
Mueller: 1”: Mueller 300 #110 compression connection #B25008
2”: H-15023 I.P. Thread x compression connection

4-3.07 BALL ANGLE METER VALVE - Quick Joint, 360 degree rotation with lock wings to allow lock to be installed.

Ford: BA 43-444 WRG, Full 1"
BF A43-777W for 2” flanged meter
Mueller: 300 Ball angle meter valve

B24258 1" 110 compression
B-24276-3 for 2" meter

4-3.08 ANGLE METER COUPLINGS - Quick Joint

Ford: L34-44Q 1" Meter to copper

4-3.09 COPPER TO COPPER - Quick Joint

Ford: C44-33Q 3/4"
C44-44Q 1"
For 2": Ford Brass Quick Joint with stainless steel liner
Mueller: 10 Compression Connection
H15403 1"
For 2": Mueller Brass 110 Compression Connection with stainless steel liner

4-3.10 DIELECTRIC PIPE FITTINGS/UNIONS

250 psi rated Watts dielectric unions Anst B1634 Series 3003 Female iron pipe thread to female brass pipe or approved equal.

4-3.11 METER BOX

For 3/4 inch and 1 inch meters

Mid States Plastics, Inc. BCF style meter box Series Part Number MSBCF-1324-12, or Raven Products RMB 13 x 24-12 with Poly Lid approved equal.

For 1-1/2" and 2" Meters

Raven Meter Boxes (RMB) – 17" x 30" x 18" – tops and bottoms are the same

Polyethylene RMB 17" x 30" x 12" – top and bottoms are the same
RMB 17" x 30" – R-Lid – Polyethylene (non-traffic areas)
C.I. 17" x 30" –R-Lid – Cast Iron Traffic Lid (Traffic areas)

4-3.12 MEASUREMENT AND PAYMENT

When provided for in the bid proposal, measurement and payment will be made for:

Reconnect existing water service – per each

1-inch street service assembly – per each
2-inch street service assembly – per each
¾-inch house service assembly – per each
1-inch house service assembly – per each
2-inch house service assembly – per each
Under house connection – per each
¾-inch water service line – per linear foot
1-inch water service line – per linear foot
2-inch water service line - -per linear foot

Connect to existing meter – per each
New meter box – per each
Site restoration – per each
Landscape restoration – lump sum
Missiling or tunneling – per linear foot

4-3.12.01 RECONNECT EXISTING WATER SERVICE

Where the existing water service is copper and is in good condition, the Contractor shall make the connection to the existing copper pipe and complete the connection to the new water main. The measurement and payment for "Reconnect existing water service" per each shall be full compensation for all costs for labor, equipment and materials as required to make the reconnection, including but not limited to, yard restoration, trench excavation, bedding, backfill, corporation saddle, corporation stop, copper pipe and fittings. A separate measurement and payment will be made for pavement restoration.

4-3.12.02 STREET SERVICE ASSEMBLY

The street service assembly shall include the service saddle, corporation stop, angle meter stop, electronic marker at stub locations and all adapters necessary for the installation of the new service line from the new water main in the street, to the meter location.

Payment for, “1-inch Street Service Assembly” or “2-inch Street Service Assembly”, per each, shall be full compensation for all labor, equipment, materials and all incidentals required for the street service assembly as specified. A separate measurement and payment will be made for the service pipe, pavement restoration and removal and replacement of concrete sidewalk where applicable and as provided in the bid proposal.

4-3.12.03 HOUSE SERVICE ASSEMBLY

The House Service Assemblys shall include the dielectric union (UP-approved) for the new ¾-inch or 1-inch copper service connection to the existing house service, or 2-inch connection as applicable, the meter tail piece per City Standard Drawing 4-31, all pipe

couplings, adapters or reducers necessary for the installation of the new service line from the meter to the house service connection, cap and abandonment of the existing service line where applicable, removal of the existing meter and reinstallation in the angle meter stop, at the new location, including vertical adjustment if required, except that if it is determined by the City Water Dept. representative, that the existing meter should be replaced, the Contractor shall remove the old meter and install the new city supplied meter when a meter box is to be relocated. Work shall also include removal and salvage

of the existing meter box, or crushing of the top section of the existing substandard or damaged meter box to a minimum six inches below finished grade, backfill the old meter box and prepare the vicinity for site restoration. All salvaged meter box materials and replaced meters, shall be delivered to the city shops located at 1010 E. Chemical Drive for city salvage. Broken and unusable components shall be disposed of at a Contractor provided waste site.

At each location, the contractor shall reinstall the salvaged city standard meter box, or supply and install a complete new meter box assembly per City Standard Specification 4-3.14 and Standard Drawing 4-30 or 4-31 as applicable.

Measurement and Payment for, “3/4-inch House Service Assembly”, “1-inch House Service Assembly”, and 2-inch House Service Assembly”, per each, shall be full compensation for all labor, equipment and materials as required for the House Service Assembly as specified. When a new meter box assembly is required, a separate measurement and payment will be made for “New Meter Box”, per each, and shall be full compensation for all labor, equipment and materials as required to supply and install a new meter box assembly at each meter location. A separate measurement and payment will be made for the service line pipe per linear foot.

4-3.12.04 UNDER HOUSE CONNECTION

When the property water service is scheduled for replacement, the contractor may at his option and when approved by the homeowner, replumb the water service under the house rather than routing around the home. Code requires that all work performed in or under the house must be completed by a licensed plumber. The contractor shall obtain applicable plumbing permits from the Building Department and all work under the house will be inspected by the City Building Department.

Measurement and payment, per each, for “Under House Connection” shall be full compensation for all labor, equipment, materials and all incidentals required to obtain all applicable plumbing permits, excavate under the house foundation, and furnish and install all pipe and fittings as required to re-route the plumbing in accordance with all applicable codes. A separate measurement and payment will be made per each for “3/4-inch House Service

Assembly". When an under house connection is made, measurement for "3/4-inch Water Service Line" shall only be made from the AMS to the outside of the house foundation.

4-3.12.05 SERVICE LINE

Service pipe shall be supplied and installed per City of Kennewick Standard Specification Section 4-3. The ¾-inch and 1-inch service line shall be "Type K" copper piping U.S. made. Two-inch service pipe shall be polyethylene tubing (PE) Philips Driscopipe 5100 ultra high molecular weight, 200 psi with copper tubing outside diameter or approved equal. Fittings shall be per City of Kennewick Standard Specifications Section 4-3.

Measurement and payment for "3/4-inch Water Service Line", "1-inch Water Service Line" and "2-inch Water Service Line", per linear foot, shall be full compensation for all labor, equipment, materials and all incidentals required to provide a complete service line installation, including trench excavation, bedding, backfill, compression couplings and all miscellaneous items necessary to complete the installation as shown on the plans and as directed by the Engineer. Measurement shall be the actual linear foot of water service pipe of each size used at each location.

4-3.12.06 CONNECT TO EXISTING METER

Where a new service is provided to an existing meter location, measurement and payment shall be made for " ___ inch street service assembly" per each and " ___ inch water service line" per linear foot and when applicable, "new meter box", per each. The assembly shall be installed per Standard Drawing 4-30 or 4-31, with the tailpiece set at a depth of 36-inches. After the water main is placed into service, the existing AMS shall be removed, and a new AMS shall be connected to the existing water meter. The bid item for "connect to existing meter" per each, shall be full compensation for all labor, equipment and materials as required to complete the connection to the existing water meter as specified.

4-3.12.07 NEW METER BOX

Where the existing meter box is damaged during removal, at no fault of the contractor, as determined by the Engineer, and where the existing meter box is substandard, the contractor shall install a complete new replacement meter box top and bottom section and lid.

Measurement and payment for "New Meter Box", per each shall be full compensation for all costs for labor, equipment and materials as required to supply and install a complete replacement meter box assembly.

4-3.12.08 SITE RESTORATION/LANDSCAPE RESTORATION

Measurement and payment will be made for the bid items as provided in the bid proposal. Measurement and payment for "Landscape Restoration" per lump sum, shall include all

costs for labor, equipment and materials for all disturbed site restoration, unless a separate bid item is provided for "Site Restoration" per each site.

When included in the bid proposal, measurement and payment for "Site Restoration", per each site, shall include all labor, equipment and materials necessary for the restoration of all disturbed site improvements, not covered by other bid items, at the per each site price shown in the bid proposal for "Site Restoration". Each site is defined as each property address, where a new service is installed. Separate measurements and payment will be made for concrete and asphalt pavement removal and replacement and missiling when provided for in the bid proposal.

4-3.12.09 MISSILING OR TUNNELING

Measurement and payment for "Missiling or Tunneling", per linear foot, shall be full compensation for all labor, equipment and materials as required to bore under existing improvements such as asphalt or concrete pavements, walls, tree root areas, sensitive landscaping, and similar obstructions. The missiling bid item shall be in addition to the other bid items contained in the bid proposal. For instance, 20 foot of 1-inch service missiled under a concrete slab, would be paid for as 20 LF of "1-inch Water Service", plus 20 LF for "Missiling or Tunneling". Where fences, curbs and similar narrow objects are crossed under, the minimum pay length at each location will be 5 LF, except where the contract contains a site field notes special provision, then measurement will be made as provided in the contract special provisions.

4-4 PIPE BEDDING

4-4.01 GENERAL

It is the intent of this contract to use select native material from the site for backfill around the water main pipe. When unsuitable native material exists or is encountered during trench excavation, imported bedding material may be required by the Engineer, depending on the type of pipe being installed and the type of materials encountered. Where directed by the Engineer, the Contractor shall furnish and place imported pipe bedding.

4-4.02 NATIVE BEDDING MATERIALS

Select native material used for bedding flexible and rigid pipe shall be free of wood waste, organic material and other extraneous or objectionable material and shall have a maximum dimension of one-inch (1") for all pipe materials. The trench typical section shall be per City Standard Drawing 4-7.

4-4.03 IMPORTED BEDDING MATERIALS

Imported pipe bedding for both rigid and flexible pipe shall be imported material in accordance with Section 4-4.02 above and the City of Kennewick Standard Drawing 4-7. Imported bedding material will be subject to approval of the engineer.

4-4.04 COMPACTION

The bedding material shall be placed and compacted in lifts not to exceed six inches (6"). The pipe bedding shall be compacted to not less than 95 percent of maximum density. Compaction shall be done in such a manner as to preclude future settlement.

4-4.05 MEASUREMENT

Measurement for payment shall be by the linear foot for imported bedding material incorporated in the project.

4-4.06 PAYMENT

The unit contract price for "Imported Pipe Bedding," per linear foot, shall be full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary to supply, haul and place the imported bedding material in accordance with the plans and specifications or as directed by the Engineer.

Select native materials, which do not require truck haul and which are acceptable as bedding and utilized as bedding, shall be considered as incidental to the pipe installation and no additional payment will be made for its use as imported pipe bedding.

4-5 FIRE HYDRANT ASSEMBLIES

4-5.01 GENERAL

Installation of fire hydrants shall conform to the requirements of City of Kennewick Standard Drawing 4-4, 4-4A and SWSS Section 7-14 as herein modified. Hydrants in all areas of the city shall be three (3) port fire hydrants, as described in Section 4-5.02 of these specifications.

4-5.02 MATERIALS

Fire hydrants shall be one of the following types: Clow Medallion, M&H Model 929, Mueller Centurion, or East Jordan Water Master 5CD 250 with operating cap dust shield . The fire hydrant model that is selected by the Contractor for installation will be used exclusively within the project limits unless otherwise directed by the Engineer. The 6-inch and 12-inch flange vertical adjustment shall be manufactured specifically for the hydrant used. When

not protected by a curb, hydrants shall be protected by guard posts per Standard Drawing 4-4, Sheet 2.

Fire hydrants shall be painted OSHA Safety Yellow above ground line. Hydrant paint shall be Quickset Enamel No. 3472 Hydrant Yellow as manufactured by Farwest Paint Manufacturing Company, 4522 South 133nd, Tukwila, WA 98168, or equal. The main valve opening shall be five and one-quarter inches (5-1/4") with two 2-1/2 inch hose nozzles with four (4) NST per inch and one 4-1/2 inch Steamer Port with four (4) NST per inch. The hydrant waste orifice at the base of the hydrant shall be bronze and connected to the hydrant by means of a bronze on bronze fitting to prevent rust and normal soil corrosion from plugging or interfering with its operation. Hydrants shall be of standard manufacture and of a pattern approved by the Owner. The name or mark of the manufacture, size of the valve opening, and year made shall be plainly cast in raised letters and so placed on the hydrant barrel as to be visible after the hydrant has been installed. Hydrants shall be a standard 4'-0" bury or deeper where conditions or conflicts require.

The hydrant shall be fitted with a permanent hydrant adapter, designed with metal sealing surfaces for permanent mounting. The adapter shall be a 5-inch Storz x 4-1/2-inch NH, equipped with cap and connector cable. The permanent hydrant adapter shall be Harrington, Inc., HPHA 50-45 NH or approved equal

The 6-inch and 12-inch vertical adjustment assemblies shall be complete, including the flanged riser, stem and all required components to provide a complete adjustment kit.

All associated valves, valve boxes, fittings and thrust blocks installed under the "Fire Hydrant Assembly" shall be in conformance with Section 4-8 of these specifications.

4-5.03 INSTALLATION

Fire hydrants shall be installed according to SWSS Section 7-14 as herein modified, and the City of Kennewick Standard Drawing 4-4. Fire hydrants shall be located as shown on the plans. Where conflicts or conditions require deeper than standard bury, the Contractor shall provide an extra deep hydrant or add an adjustment to the standard hydrant. The following requirements shall prevail for the installation of the fire hydrant:

A. The hydrant shall be set at a standard height per Standard Drawing 4-4.

B. Hydrants are to be free of vegetation and barriers for a three-foot (3') radius circle measured from the operating nut.

C. Fire hydrants are to be hooded until operable and accepted.

D. Valves on mains to hydrants shall be bolted directly to the tee serving the hydrant.

E. Valves servicing fire hydrants on any fire line shall be installed as per City of Kennewick Standard Drawing 4-4.

F. Guard post shall be installed as per Drawing 4-4 Sheet 2.

G. Salvage shall be completed per Section 1-35 of these specifications.

H. A standard bury hydrant shall be 4'-0". Where design or conditions at the time of installation requires a hydrant with a bury greater than 4'-0", the Contractor shall install a hydrant with a deeper bury when directed by the Engineer.

4-5.04 MEASUREMENT

Measurement for fire hydrant assembly shall be per each assembly. An assembly shall include: the hydrant with Storz Adapter, main line tee with flanged coupling adapters (when required), blocking for tee and hydrant, six-inch (6") gate valve and valve box, six-inch (6") connecting pipe, shackles, tie rods, pier blocks, coarse gravel, painting, and any other items that are required for the complete installation of the hydrant assembly as specified.

A separate measurement and payment will be made for "Fire Hydrant Guard Post" per each.

Where a hydrant is installed with a bury greater than 4'-0" as required per Section 4-5.03 H above, a separate measurement and payment will be made for "Extra Depth Hydrant" per vertical foot, for the depth greater than 4'0".

A separate measurement and payment will be made for add-on hydrant vertical adjustment assemblies, per each, only when design or grade revisions require that a hydrant, which was initially installed per Standard Specification Section 4-5.03 H is adjusted with the installation of an add-on vertical adjustment assembly.

A separate measurement will be made for "Storz Adapter" per each, only when an existing hydrant is retrofitted with a Storz Adapter. Payment shall include contractor removal and disposal of the existing nozzle chain and cap.

4-5.05 PAYMENT

The unit contract price for "Extra Depth Hydrant", per vertical foot", "6-inch or 12-inch Hydrant Vertical Adjustment Assembly," per each, "Fire Hydrant Guard Post", per each, "Fire Hydrant Assembly," per each, and Storz Adapter" per each shall be full compensation for all necessary labor, materials, tools, and equipment as required to complete the specified installation.

4-6 BLOW-OFF ASSEMBLY

4-6.01 GENERAL

This specification covers the construction and installation of a two-inch (2") blow-off assembly to allow for the controlled flushing of water from the water distribution system.

4-6.02 MATERIALS AND CONSTRUCTION

All materials used shall be assembled in accordance to the requirements of the City of Kennewick Standard Drawings 4-1, and the following requirements:

A. Pipe shall be Galvanized Steel.

B. Fittings shall be as called for on Standard Drawing 4-1.

C. Gate valve shall be flanged with a non-rising two-inch square operating nut, counter-clockwise opening, similar or equal to the M & H Style 67-02.

D. Valve boxes shall be as specified in Section 4-8.02E of the City of Kennewick Standard Specifications.

4-6.03 MEASUREMENT AND PAYMENT

The unit contract price for "Temporary Two-Inch Blow-Off Assembly", per each, shall be full compensation for furnishing all labor, materials, equipment, trenching and backfill, valves, fittings, thrust blocks, adjusting the valve boxes to finished grade, all other incidentals required to install the complete blow-off assembly in place, including connection to water main.

4-7 AIR AND VACUUM RELEASE ASSEMBLY

4-7.01 GENERAL

This specification covers the construction and installation of an air and vacuum release assembly to allow for the automatic venting of air into and out of a water line during times when the line is being emptied or filled with water.

4-7.02 MATERIALS AND CONSTRUCTION

All materials used shall be new and assembled in accordance to the requirements of the City of Kennewick Standard Drawing 4-8, and the following requirements:

A. Pipe shall be galvanized steel, Schedule 40, threaded by couple ends, and shall meet the requirements of ASTM designation A53/A53M.

B. Street elbows shall be standard dimension, galvanized, malleable iron, manufactured in accordance with the requirements of ASTM 197, and capable of withstanding a working pressure of 150 PSI.

C. Tapping saddle shall be a stainless steel, double strap saddle similar and equal to the Smith Blair 317.

D. Gate valve shall be flanged with non-rising two-inch (2") square operating nut, counter-clockwise opening similar and equal to the M & H Style 67-02.

E. Pipe coupling device shall be similar and equal to the Dresser Style 38.

F. Air and vacuum valve shall have a cast iron body, cover and baffle with a stainless steel float and Buna N seat. All internal parts such as float guides, bushings, and baffle retaining screws shall be either stainless steel or bronze. The valve shall be similar and equal to APCO No. 144, and shall be capable of handling operating pressures of 150 PSI.

G. Manhole ring and cover shall be in accordance with the requirements of the City of Kennewick Standard Drawing 3-3 with the cover marked "Water."

H. Precast manhole section shall be in accordance with the requirements of SWSS Section 9-05.50(2).

I. Top slab shall be reinforced concrete in accordance with the requirements of Standard Drawing 4-8, designed for loading as specified by AASHTO for HS20 trucks.

4-7.03 MEASUREMENT AND PAYMENT

The unit contract price for "Air and Vacuum Release Assembly", per each, shall be full compensation for furnishing all labor, materials, equipment, trenching and backfill, valves, fittings, valve chamber, adjusting the valve chamber ring and cover to finished grade, and all other incidentals required to install the complete air and vacuum assembly in place, including tapping into the water main.

4-8 VALVES, VALVE BOXES AND FITTINGS

4-8.01 GENERAL

This specification covers all valves, valve boxes, and water line fittings (tees, elbows, crosses, blocks, etc.) necessary as indicated on the plan. All valves shall be bolted to tees and fittings unless otherwise specified.

4-8.02 MATERIALS

A. BUTTERFLY VALVES

Valves twelve inches (12") and larger, shall be butterfly valves.
All butterfly valves shall be Mueller Lineseal III, Class 150B, or "Pratt Groundhog", as distributed by Mueller Company, or the Mueller stamped “casting” utilizing the Pratt Groundhog valve design, or approved equal and conform to the AWWA Standard for "Rubber Seated Butterfly Valves", (AWWA C504) and at a minimum shall meet the following requirements:

1. Valves shall be Class 150-B and shall open counter-clockwise with a standard two-inch (2") square non-rising operator nut.

2. Flanged valves shall be furnished with flanges faced and drilled to 150 pound American Standard dimensions and, unless otherwise specified or shown on the drawings, may be either short-bodied or long-bodied.

3. Shaft seals shall be designed for use with standard split V type packing.

4. Valve discs shall be manufactured from material listed in 7.2 of the above referenced AWWA Standard.

Prior to the installation of all rubber-seated valves, the Contractor shall lubricate the seat with Molykote Valve Seal, Catalog No. 98750-56, as manufactured by Dow-Corning, or approved equal.

B. RESILIENT SEATED GATE VALVES

All 4-inch, 6-inch, 8-inch and 10-inch valves shall be resilient seated gate valves.

The resilient seated gate valves shall conform to the requirements of AWWA C515. The valve shall open counter-clockwise with a two-inch (2") square non-rising operator nut. The ductile iron gate valve wedge or gate member shall be fully encapsulated in synthetic rubber. All seating surfaces within the valve body shall be

inclined to the vertical, the valve stem shall be sealed by a minimum of two (2) O-rings and all stem seals shall be replaceable with the valve wide open and subjected to full rated pressure.

The valve body and bonnet shall be epoxy coated inside and out.

The waterway shall be smooth and shall have no depressions or cavities in the gate seating area.
Resilient seated gate valves shall meet the above specifications and shall be Clow R/W, Waterous Series 500, Kennedy Ken-Seal, Mueller, Dresser M & H Style 3067, unless otherwise specified in the contract Special Provisions.

C. TAPPING

The Contractor will be required to install and pressure test the resilient seated gate valves and tapping sleeves when making 4-inch to 10-inch live taps on mains. The resilient seated gate valves shall be in accordance with the requirements of Section 4-8.02B of these specifications and shall be installed in accordance with the City of Kennewick Standard Drawing 4-5 and Sections 4-12, 13, and 14 of these specifications.

The Contractor shall notify the City Inspector to schedule the water tap by the Water Department crews. The contractor will be required to provide safety measures per the requirements of Section 4-1.09, prior to city personnel entering the trench.

D. VALVE BOXES

Cast iron sliding type adjustable valve boxes with covers shall be provided for all buried valves. Valve boxes shall consist of top and bottom section with slide type extensions and large bottom base where specified. Drop type cover shall be marked "WATER." In unpaved areas, valve boxes shall be provided with a six-inch (6") thick concrete collar, 30 inches square at the ground surface. Valve boxes and covers shall be "Tyler No. 6855" series or East Jordan 6800 Series valve box cover, 8555 valve box bottom and valve box top. The cover shall have a skirt length of 1-1/2 inches minimum, a total lid depth of 3-1/2 inches minimum, and a lid weight of minimum 13 pounds. Valve boxes shall be installed as shown on City of Kennewick Standard Drawing 3-4. Valve box materials shall be manufactured in the USA.

E. FITTINGS

Fittings for ductile iron and PVC pipe shall be cast or ductile iron. Cast iron fittings shall conform to the quality and wall thickness specified in the American Standard for "Gray Iron and Ductile Iron Fittings, 3-inch through 48-inch for Water and Other Liquid" (AWWA C110), for "Fluid-Tite" joints specified in Section 1. All cast iron fittings, twelve inches (12") in diameter or larger, shall be lined with cement mortar in

accordance with the requirements of the American Standard for "Cement Mortar Lining for Cast Iron and Ductile Iron Pipe and Fittings for Water" (AWWA C104).

Ductile iron fittings shall be compact or standard bell and spigot, mechanical joint, or flanged as required on the plans. Standard fittings shall be in accordance with AWWA C110,"Gray Iron and Ductile Iron Fittings, 3-inch through 48-inch for Water and Other Liquids." Ductile iron compact fittings may be used in sizes 4 through 12-inches. The fittings shall conform to all requirements of AWWA Standard C153 for ductile iron compact fittings 3-inch through 12-inch. The bell and spigot joints shall be rubber gasket sealed joints in accordance with AWWA C111. Ductile iron fittings, twelve inches (12") inside diameter or greater, shall be mortar lined in accordance with AWWA C104.

Cut-in tees and live tap tapping sleeves shall be in accordance with the requirements of the City of Kennewick Standard Drawing 4-5 unless otherwise directed by the Engineer.

All fittings and valves shall be restrained by a thrust block, or restrained joints, in conformance with Sections F and G.

F. THRUST BLOCKING

Concrete blocking shall be installed in accordance with City of Kennewick Standard Drawing, 4-6 Sheet 1 and shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as not to obstruct access to the joints of pipe or fitting. An 8-mil polyethylene sheet, or two layers of 4 mil, shall be placed between the fitting and the thrust block prior to loading or pressurizing a water main. The concrete thrust blocking shall be allowed to cure as required to eliminate deformation of the block or blowoff of the fitting.

Unless the contract special provisions, or drawings designate the type of fitting restraint, the contractor may at his option, utilize restraint joints when the conditions of Section 4-8.02 G and Standard Drawing 4-6, Sheet 2 are met.

Unless the restrained joint requirements are met, including restrained joints within the lengths specified in Standard Drawing 4-6, Sheet 2, a thrust block shall be used. Thrust blocks are required if AC pipe exists anywhere within the required restrained joint limits and at all locations where connections are made to AC pipe. Due to the intermix of the various types of pipe throughout the City when a fitting, tee or tap is installed on an existing water main, a thrust block is required at the fitting, tee, or tap connection to the existing main. Thrust blocks are required for all installations where the pipe run length does not allow for the designated restraint length. Special notice and review should be made when restrained joints are considered for use on fire hydrant run installations. Hydrant pipe runs shorter than the designated “dead end

valve" restraint length, required by Standard Drawing 4-6, Sheet 2, require a thrust block at the Fire hydrant and at the connection tee.

G. RESTRAINED JOINTS

Unless otherwise required by the contract special provision, or standard drawings and as restricted by these provisions, when the conditions of this section and Standard Drawing 4-6, Sheet 2 are met, the contractor may utilize restrained joints in lieu of thrust blocks on the water system fittings, valves and fire hydrants. The conditions and restrictions of Section 4-8.02 F shall apply. When connecting a tee, or fitting to an existing AC water main, or if AC pipe exists anywhere within the required restrained joint limits, standard thrust blocks are required. When a fitting, tee, or tap is installed on an existing water main, a thrust block is required at the tee, fitting, or tap. Hydrant connection pipe lengths shorter than the designated "dead end valve" restraint length that is required by Standard Drawing 4-6, Sheet 2, will require a thrust block at the tee and at the hydrant for the installation.

Approved methods of restrained pipe joints and fittings shall be:

a. For C-900 PVC pipe, Series 2000 Megalug restraints, or equal and for slip joint pipe, series 1500 Bell restraint Harness, or equal. Restraints shall be specifically designed and approved for use on C-900 PVC pipe and shall be installed in full conformance with the manufacturers requirements.

b. For Ductile iron pipe, Series 1100 Megalug restraints, or equal, on mechanical joint connections, or Series 1500 restraint harness for DIP, through 12 inch, or series 1700 restraint harness for DIP, or equals, on push joint pipe. Restraints shall be specifically designed for use on DIP and shall be installed in full conformance with the manufacturer's requirements.

Unless specifically provided for in the contract bid proposal, all costs for the use of restrained joints, including restraints required to restrain all slip and mechanical pipe joints within the restrained pipe limits, shall be incorporated into the unit contract price for the pipe and fittings, as provided for in the bid proposal and a separate measurement and payment will not be made for the mechanical restraints.

4-8.03 INSTALLATION

Installation of valves, boxes, and fittings shall be in accordance with City Standard Drawings 4–5 through 4–9 and SWSS Section 7-09 except as herein modified.

A. All valves are to be bolted directly to the tees or crosses as indicated in the plan. The flanges on valves and tee (or crosses) shall be plain faced. Flanges shall be faced and drilled to 150 pound American Standard dimensions.

B. All other connections between pipe and fittings, or pipe and valve shall be flexible coupling, "Ring-Tite," "Fluid-Tite," or approved equal, except as noted on City of Kennewick Standard Drawing 4-5 for installation of a cut-in tee where flanged coupling adapters shall be used to connect the tee to the existing main. The provisions of Section 4-8.02 F and G will apply.

C. Valve extensions are required per City Standard Drawing 4-9, when the depth to the valve nut exceeds five (5) feet.

4-8.04 MEASUREMENT

Valves and associated valve boxes, including their adjustment to finished grade, shall be considered as one item and shall be measured per each according to size of valve. All fittings shall be measured per each according to size and type. All valves, thrust blocks and fittings which are included in the unit items for "Fire Hydrant Assembly," "Blow-off Assembly," etc., shall be measured and paid as incidental to those unit items and no additional payment will be made for them. Valve extensions, when required, will be measured per each.

4-8.05 PAYMENT

The unit contract price for each size of "Valve", per each, and each type and size of "Fitting" or “Valve Extension”, per each, shall be full compensation for furnishing all necessary labor, equipment, materials, concrete thrust blocks, or restrained joints and all other incidentals required to install all valves and fittings in place in accordance with the plans and specifications or as directed by the Engineer.

When constructed in conjunction with a paving project, a separate measurement and payment will be made for adjusting to grade, after completion of paving, as per Section 4-10.

4-9 ADJUST EXISTING AND NEW CASTING TO GRADE

4-9.01 GENERAL

When constructed in conjunction with a street construction project or pavement overlay, existing and new water valve boxes, air release and blow-off assembly castings, which are required to be adjusted to finished grade, shall be adjusted in accordance with the requirements of Section 2-18 of the City of Kennewick Standard Specifications for Roadway and Standard Drawing 3-4 to which the Contractor's attention is hereby directed.

On water line projects which do not include new street construction or pavement overlays, the existing and new valve boxes and utility boxes within the pavement restoration limits shall be adjusted prior to pavement restoration. Where the new water valve boxes fall

outside of the pavement restoration limits and in unpaved areas, the box shall be adjusted to conform to the adjoining grade and set in a 30" x 30" x 8"-thick concrete collar.

4-9.02 MEASUREMENT AND PAYMENT

When constructed in conjunction with a street construction of pavement or overlay project, measurement and payment shall be made in accordance with the requirements of Section 2-18 of the City of Kennewick Standard Specifications.

On installations which do not include new street construction or pavement overlays, a separate measurement and payment will not be made for the specified water valve box and utility adjustments, unless the Contractor is directed to replace an existing substandard valve box. All costs for the specified adjustments shall be considered incidental to the water line installation pay items provided in the bid proposal. When the Contractor is directed to replace an existing substandard valve box, measurement and payment will be made as specified in Section 2-19.03 of these specifications.

4-10 SALVAGE

4-10.01 GENERAL

All existing tees, valves and miscellaneous fittings removed during construction and all abandoned valve boxes and fire hydrants, shall be removed by the Contractor and delivered to the city shops located at 1010 E. Chemical Drive, for City salvage. Prior to removal from the trench, all AC pipe shall be removed from the salvaged component and left in the trench.

4-10.02 MEASUREMENT AND PAYMENT

Salvage of existing water line appurtenances shall be considered incidental to the unit contract price for "Water Line" and no additional compensation shall be allowed.

4-11 SCHEDULED WATER LINE SHUT DOWN

4-11.01 GENERAL

The Contractor shall give the City a minimum three (3) work days notice of required water line shut down. Additional notice may be required for shut downs which will put a large number of residents out of service and in some commercial areas. Water line shut downs shall be scheduled for morning hours, except for special circumstances which must be preapproved by the Water Services Supervisor and except for emergencies. The City Inspector shall verify that all required fittings necessary for connection are secured and on the job site prior to scheduling shut downs. The Contractor shall be billed for canceled shut

downs, unless circumstances beyond the Contractor's control (as determined by the Engineer), have caused the Contractor to cancel the shutdown.

4-12 VALVE OPEN/CLOSE POLICY

4-12.01 GENERAL

Once a water main has been placed into service, only the City of Kennewick Water Department shall open/close the water line valves, except that the Contractor may open/close a valve that controls a water main stub, which will be extended by the Contractor, provided that no water services are connected to the stub.

4-12.02 VALVE OPEN CLOSE PROCEDURE

The Contractor shall operate valves in strict conformance with this policy. A no-tolerance position will be taken if any valve is operated without an inspector on site and prior to specific approval and direction by the City Engineering Department Inspector. Nonconformance with this provision shall be considered as tampering and subject to enforcement in accordance with City ordinance (KMC 14.09.010 and KMC 14.01.240).

4-12.02.01 FILLING NEW WATER MAIN

1. The City inspector must be on site prior to beginning of line filling. The Contractor's proposed procedure must be reviewed and approved by the inspector, prior to operation of any valves.

2. The Contractor shall check all valves on the new system, to verify that they are open, including in line valves, fire hydrant valves, etc.

3. Open fire hydrant or blow off at the opposite end of the new main to be loaded and have personnel stand by at the air release location.

4. The Contractor shall then open the supply valve no more than three (3) turns and monitor while the line is filled. The line must be loaded slow to prevent flushing of chlorine to one end, to allow release of air and to prevent high velocities in the City main.

5. The Contractor shall close the main line feeder valve as soon as water begins to come out of the blowoff or fire hydrant.

6. The Contractor shall then cap the blow off or fire hydrant and let the system sit for a minimum of 24 hours.

4-12.02.02 PRESSURIZING MAIN PRIOR TO PRESSURE TEST

At the Contractor's option, the new main may be brought to City line pressure, prior to beginning pressure testing as required by Section 4-1.08.

1. The procedure specified for Section 4-13.02.01 shall be strictly followed, except that the blow off or fire hydrant shall be opened only enough to allow the release of air and the main line valve shall be opened approximately one turn and closed as soon as water quits flowing.

4-12.02.03 FLUSHING OF NEW MAINS

After acceptance of the pressure test(s), and after a minimum 24-hour waiting period, all new water mains shall be flushed until clear of the sanitized chlorine, water per the requirements of Section 4-1.07 of these specifications.

1. The City inspector must be on site prior to beginning of flushing of new mains. The Contractor's proposed procedure must be reviewed and approved by the inspector, prior to operation of any valves.

2. The Contractor shall provide all discharge hoses, holding ponds, channel to his ditches for compaction, or other methods as required to control flushed water. The Contractor shall be fully responsible for any damages resulting from failure to control water during the flushing operation.

3. The Contractor shall open a fire hydrant or blow off at the end of the line to be flushed and then slowly open the control valve to provide a full 2 inch stream. The line shall be flushed until no odor of chlorine is present. The Contractor shall then test the chlorine level to assure that the chlorine residual is not more than the adjoining City water system.

4. When satisfied that the line is flushed, the main line valve shall be slowly closed and then the fire hydrant or blow off valve shall be slowly closed.

5. The contractor shall take health samples per the procedure specified in Section 4-22 of these specifications.

Sample location points shall be provided by the contractor at the specified 500 to 800 foot interval.

4-13 TIE-IN TO EXISTING WATER LINES

4-13.01 GENERAL

Tie-in to the existing water lines and the installation of the required fittings and water line shall be under the direct supervision of the Water Department and the Engineer. Extreme care shall be taken by the Contractor to keep the existing water lines and new fittings and water line clean and free from contaminates. The inside surfaces of the valve, pipe and fittings shall be thoroughly swabbed with, or filled with, a 75-parts per million chlorine solution 24 hours prior to the installation of all fittings. The fittings and water line shall be kept in a clean environment and delivered to the site within a protective covering. If a shutdown has been scheduled and the Contractor has not chlorinated and bagged valves and fittings 24 hours prior to the shut down, the Inspector will notify the City Water Department and City crews will chlorinate and bag the fittings and valves and bill the Contractor. The fittings and water line shall be swabbed again with the 75-parts per million chlorine solution just prior to their installation.

4-13.02 MEASUREMENT AND PAYMENT

All necessary labor, tools, dewatering, chlorine swabbing and incidentals as required to cut into existing water mains or remove existing fittings and valves as called for on the plans, shall be considered incidental to the unit contract price for water line, per linear foot, or fittings as allowed in the bid proposal.

4-14 COUPLINGS AND FLANGE COUPLING ADAPTERS

4-14.01 GENERAL

Couplings and flange coupling adapters shall be manufactured from cast iron and rated at a minimum 150 PSI. The minimum middle ring length shall be five (5) inches.
Bolts shall be galvanized steel or cast-iron protected.

4-15 DIG AND VERIFY

4-15.01 GENERAL

At the connection with existing water lines where shown and directed on the plans and as otherwise directed by the Engineer, the Contractor shall expose and verify the exact pipe location, type, size and fittings required prior to ordering the fittings. The Contractor is advised that all existing water mains have thrust blocks typically located as shown on Standard Drawing 4-6. These thrust blocks have been found to be constructed of rocks, blocks, concrete or other materials. The Contractor shall stay an adequate distance away from all thrust blocks and shall take such precautions as required to not disturb the existing block(s). After digging and verifying, the Contractor shall backfill, compact and temporarily

cold patch the surfacing where applicable. Work and materials shall be in accordance with Section 2 and Section 7 of the City of Kennewick Standard Specifications.

4-16 ADDITIONAL/ALTERNATE FITTINGS

4-16.01 GENERAL

Where a standard or specified fitting cannot be obtained or is not readily available, and the Contractor is required to add an MJ adapter or reducer to the fitting, the MJ adapter or reducer shall be separately paid for under the bid items for "Flange Coupling Adapter" or " __x __ reducer" per each. The reducer or adapter shall be flange connected to the tee or fitting as applicable.

Bends where noted on the plan sheet are indicated to the degree of bend that appears to fit best. The Contractor shall have the same diameter bends of various degrees available for installation. If actual field conditions dictate that a degree of bend other than the one noted should be installed, the Contractor shall install the required fitting. Measurement and payment for "**-inch Bend", per each, shall be full compensation for the actual degree of bend installed as specified.

If fittings specified for an installation are not readily available, and involve revisions other than the addition of an MJ adapter, the Contractor may, when approved by the Engineer, install alternate fittings that complete the installation in the same manner. Alternate fittings, if used, will be measured and paid for by the unit bid price for the fittings that were specified for the installation.

All flanged fittings shall be cast with the fitting. Bolt on or threaded type flanges are not acceptable.

4-16.02 TEMPORARY AND MECHANICAL FITTING RESTRAINT

At all connections to active city main water lines and in other situations where the engineer determines that pressure must be returned to a mechanical joint or slip joint fitting, prior to a 24 hour cure time on a thrust block, the contractor may, at his option, install pipe and fitting restraints in accordance with Section 4-8.02 G and Standard Drawing 4-6, Sheet 2.

A thrust block shall be used in addition to the restrained joints for all fittings, directly connected to an existing water main.

4-17 PRESSURE CAPS

4-17.01 GENERAL

Where specified on the construction plans or where directed by the Engineer as required by construction, the Contractor shall pressure cap, thrust block or restrain the end of the existing or new water line. All work and materials shall be in accordance with Section 4 of the City of Kennewick Standard Specifications and Drawings.

4-17.02 MEASUREMENT AND PAYMENT

The unit contract price for "1-Inch to 4-Inch Pressure Cap", or "6-Inch to 8-Inch Pressure Cap", or "10-Inch to 16-Inch Pressure Cap", per each, shall be full compensation for all labor, equipment, materials and incidentals necessary to complete the pressure cap in accordance with the plans and specifications or as directed by the Engineer.

4-18 SIDE SEWER LOCATION AND REPAIR

4-18.01 GENERAL

Although every effort has been made to show potential conflict with sewer services, the exact depth and location of sewer services are not known. The Contractor shall make every effort to prevent damage to sewer services. The services in the City of Kennewick
are owned and maintained by the property owner and they will not be located by the City by a standard call for utility locates.

Prior to excavating in the vicinity of homes connected to existing sewer systems on all projects under contract to the City, the Contractor shall locate the sewer service. Location shall be made by inserting a locatable cable or signal transmitting cable into the sewer service either at a clean out or point of entry in the home. The Contractor is fully responsible for contacting the owner and making arrangements as necessary to complete the service locate. After the service is located, the Contractor shall reference the location as required to allow relocation of the service during all phased excavation work. On all private contracts the Contractor may locate each sewer service at his option; however, damaged services shall be repaired by the Contractor in all cases, at no additional cost to the City.

When sewer services are inadvertently broken or damaged, the Contractor shall repair the side sewer by installing a section of Schedule 40 ABS sewer pipe. The repair section of pipe shall be placed a minimum of one foot into the trench walls to provide a solid foundation for the crossing of the new trench. The pipe ends shall be connected using repair clamps. Repair clamps shall be a flexible coupling with stainless steel clamps and shall be Fernco flexible couplings or equal. The area under the side service connection shall be bedded with compacted 5/8-inch minus top course rock. When directed by the Engineer or where rocky soils, unstable soils, or other conditions exist, where it may be difficult to detect a damaged

side service, water shall be run from the home toilet or other source, to insure that all of the side services are undamaged, prior to beginning backfill operations.

4-18.02 MEASUREMENT AND PAYMENT

When provided for in the bid proposal, a separate measurement and payment will be made for "side sewer locates" per each at the unit price as provided in the bid proposal. If the Contractor determines that actual unit cost for locates is greater than that provided, all additional costs for labor, equipment and materials as required to complete the locates, which exceeds the allowable unit price shall be incorporated into other bid items as provided in the bid proposal. If a separate bid item is not provided, the Contractor shall incorporate all costs for the required side sewer locates into the bid items provided.

If the Contractor damages sewer services during construction, no additional compensation will be made for damages resulting from the service damage or for the cost of labor, equipment and materials as required to complete the sewer service repair as specified.

4-19 ABANDONED CONDUITS

All pipes, conduits and other openings determined to be abandoned, which are cut or opened during the water line installation, shall be capped or concrete plugged prior to backfilling of the trench. Measurement and payment for required pipe cuts, labor, equipment, work and materials required to complete the specified plug shall be incidental to the pipe installation pay items.

4-20 ABANDONED FIRE HYDRANT REMOVAL

All fire hydrants connected to water mains scheduled for abandonment shall be removed by the Contractor and delivered to the City storage yard for City salvage. Fire hydrants shall be removed intact, including the shoe and all AC pipe shall be removed and left in the trench. When a fire hydrant is abandoned and the water main will remain in service, the valve shall be removed at the main line and a blind flange installed. Unless provided for in the special provisions, a separate measurement and payment will not be made for fire hydrant removal and all costs for removal and delivery shall be incidental to other bid items provided for in the bid proposal.

4-21 BACTERIA SAMPLING PROCEDURE POLICY

The following is the policy for bacterial sampling of new water mains by contractors. Samples shall be taken by the contractor at 500 to 800 foot intervals. One sample will be required for lines less than 500 feet and will be taken at the end of the new line. A city inspector is required to be on site prior to the contractor operating any valves and to witness the test.

1. Prior to sampling the following shall be completed in the order they appear.
   A. New water main loaded
   B. Water main shall sit with appropriate chlorine solution for a period of not less than 24 hours.
   C. Pressure test completed.
   D. New water main flushed until chlorine level is equal to the existing water main feeding new line.

2. Run water for a short period. Reduce flow to a small stream.

3. Test chlorine level with a DPD test kit and record residual on bacteria sample report form. Test kits must be capable of measuring chlorine residuals in minimum 0.1 increments from 0 to 2.0.

4. Turn off water flow and sterilize area where sample is being taken with heat or disinfectant spray similar or equal to BacDown Detergent Disinfectant.

5. Turn on water for one minute, slowly reducing water flow as time progresses.

6. Remove the sample container's top very carefully.
   A. Do not touch underside of cap with fingers or wave cap in the air.
   B. Do not rinse bottle out and refill, it contains thiosulphate (a dechlorination agent) that must be present.
   C. Do not overfill bottle (the bottle neck is sufficient).
   D. Put cap back on bottle very carefully to avoid any possible contamination.
   E. Label the sample with the project name & location sample was taken.
   F. The cap shall be sealed by the City Inspector immediately after sample is taken.

7. Turn off the sample water flow.

8. Shut off main valve feeding new water main. The new main shall be left off until bacteria sample results have been reported by the Health Department to Water Services Supervisor or Water Distribution. Crewleader.

9. The Contractor shall deliver the sample to the Health Department office at 7102 W. Okanogan Place, Kennewick, WA 99336. The Health Department hours are 8:00 a.m. to noon and 1:00 p.m. to 5:00 p.m, Monday through Friday.

10. Complete filling out paper work for sample. The following information will be needed.

    A. Type of system: Public

    B. System ID# 38100Q

    C. Circle Group "A"

    D. Name of system: City of Kennewick

    E. Record specific location:

    F. Telephone Number: (509) 585-4319

    G. System owner/Manager: Utility Services Manager

    H. Send report to: City of Kennewick, Water Filter Plant Crew Leader, P.O. Box 6108, Kennewick, WA 99336

    I. Type of sample: Mark "New construction"

    J. Check box "Chlorinated" and record residual

4-22 HYDRANT METER – WATER SUPPLY

4-22.01 GENERAL

The City of Kennewick makes available the use of temporary fire hydrant meters for the contractor's use of city water during construction activities. This standard specification contains the terms and conditions for obtaining a hydrant meter and using city water on permit projects.

Water for city construction contracts is not provided through this procedure. Water for city-administered construction contracts is obtained at no cost to the contractor, by contacting the City Project Inspector. On city-administered contracts only, the city supplies, installs and relocates the meters per the provisions of City Standard Specifications Section 1-9.

4-22.02 TEMPORARY FIRE HYDRANT METER AND WATER USE COSTS

On all permit contracts, the contractor or owner is required to place a deposit, pay a service charge and pay for all water usage as follows:

Hydrant Meter	$400.00	Deposit
Water Use	$ 70.00	New Account Service Charge
Water Use	$1.140	Per 100 cu foot (748 gallons)

There is a minimum billing based on the meter size, even if there is no usage during the 2 month billing cycle. Base meter fee is $206.62 + usage.

4-22.03 USE REQUIREMENTS AND RESTRICTIONS

1. **To obtain a fire hydrant meter** – contact Municipal Services at 585-4246 or 4419. You will need to provide: $400 deposit, $70 service charge, contact person, e-mail address, phone number, location where the meter will be installed and refund information (address, phone number and e-mail).

2. **Fire hydrant meter readings -** fire hydrant meters will be returned between 0730 and 1130 hours, Monday through Friday (except holidays) between the 1st and 15th in June and December for inspection and reading at the Water Distribution Division in the Municipal Services Building at 1010 E. Chemical Drive (west side of SR397 at E. 3rd Avenue). You may contact 727-5295 to schedule a time for delivery of your hydrant meter. If the hydrant meter is not received by the bimonthly due date, the account will be billed based on the highest estimated consumption and the customer will be sent a warning letter. Any applicable adjustments to the account will be made during the next billing cycle and only after a current reading has been determined by the city. If the customer fails to bring in their hydrant meter for a second time within a 12-month period, all fire hydrant meters that have been issued to the Customer will be locked off/relocated by city personnel for a period of one year. Each relocation of the meter during the one-year period shall require a minimum of one working day notice to the Water Distribution Division.

3. **When finished with the fire hydrant meter** –Fire hydrant meters are to be returned immediately following the last day of use. The fire hydrant meter shall be returned to the Water Distribution Division at 1010 E. Chemical Drive. All final charges for water usage and any meter damage* will be deducted from the deposit amount and the balance refunded to the customer. If charges exceed the amount deposited, the customer will be billed for the remaining balance.

4, **Illegal water usage –** Fire hydrant meter users caught taking water from fire hydrant, curb stops or other water valves without proper authorization or metering are subject to an administrative fine from the city of $500.00. Full payment shall be made before the city will provide authorized water service under any circumstances. City-administered contract projects have separate meters that will

have a locking collar painted orange. The water from these fire hydrant meters may only be used on city construction contracts. Use of water from these meters for purposes other than approved city construction projects will be considered water theft punishable under Kennewick Municipal Code Title 10.

5. **Responsibility of fire hydrant meter customer -** Each customer shall protect the fire hydrant meter from damage due to freezing conditions, negligence or abuse. Any damage, other than from normal usage, shall be billed to the customer*. All meters are not transferable and shall be returned when use ends.

* Repair Parts Lists (includes labor for repair) for all fire hydrant meters checked out in 2007. Prices subject to change yearly.

Meter Body	$1,580.00	Gate Valve	$ 99.00
3" GAV Nipple	$ 16.00	Locking Cap	$ 25.00
Support Bar	$ 35.00	Meter Lid	$ 10.00
2-1/2 " Female x 3" Male Swivel Adapter			$230.00
3" x 2-1/2" Double Male Hex Nipple			$ 95.00
Damaged locking devices			$ 25.00

6. Installation and Location of Fire Hydrant Meter: - When issued a fire hydrant meter from the city of Kennewick, the contractor shall be responsible for installing, locking and relocating the city issued fire hydrant meter and opening/closing the fire hydrant.
DO NOT operate the fire hydrant with the top control nut, unless cold/freezing conditions apply (see No. 7). Use the hydrant gate valve to control the volume of water.

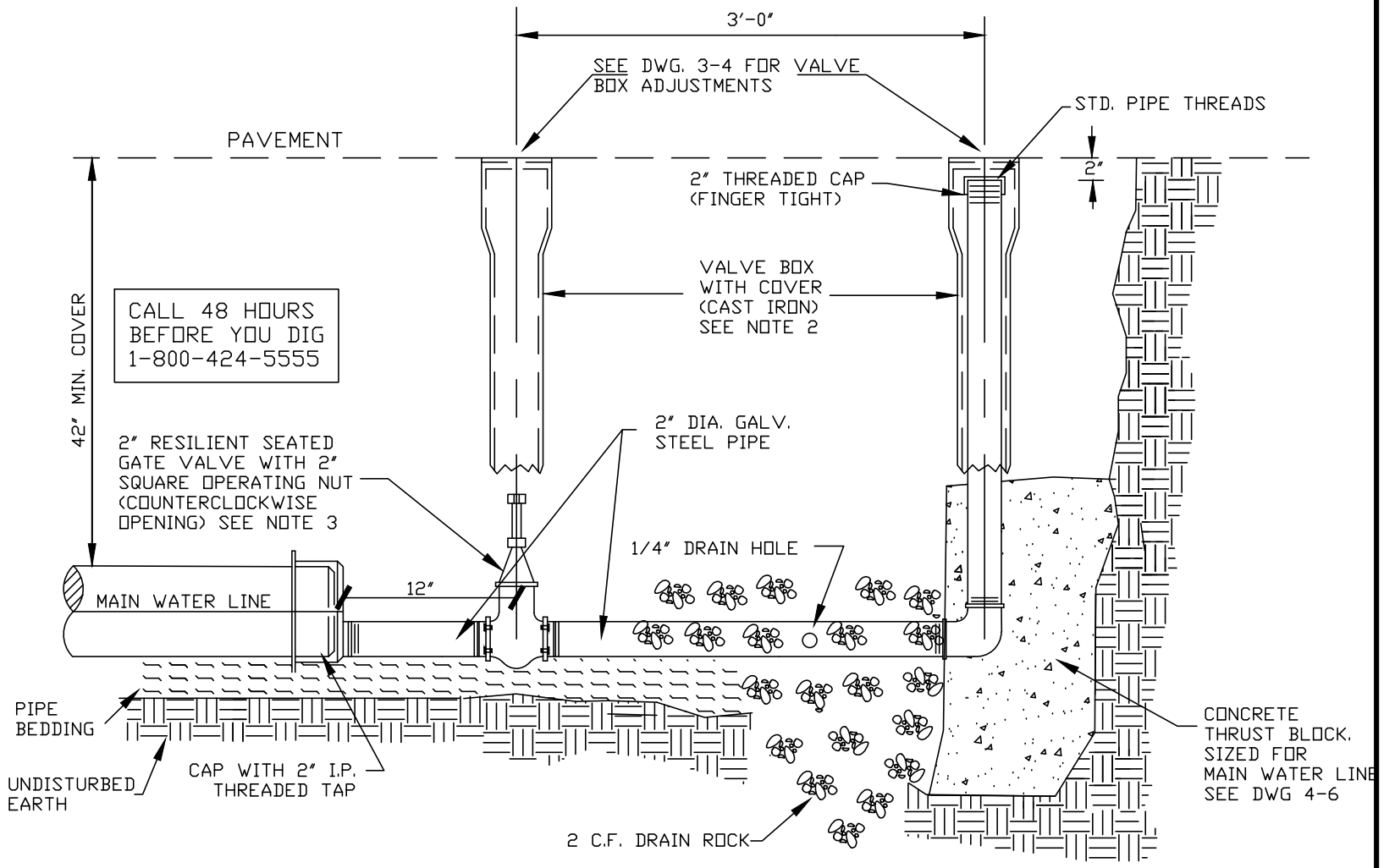
7. Cold/Freezing Weather Conditions - When the fire hydrant is open and the meter valve is closed, the fire hydrant base is constantly filled with water. In freezing weather, this could damage the fire hydrant and the meter. It is the responsibility of the contractor to close the fire hydrant and open the gate valve to drain the water from the meter when it is not being used. A fire hydrant wrench is the **only** acceptable tool to operate a fire hydrant.

8. Fire Hydrant/Meter Damage - The contractor will be responsible for any damage to the fire hydrant and/or meter due to circumstances beyond normal wear. A few examples are, but not limited to, breaking the fire hydrant stem by using too much torque, not using a fire hydrant wrench, damage to weep holes, cutting the lock on the meter, breaking any part of meter, etc.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE 7/13
DWN KDS
REV 3/14
CHK BWB
SCALE N.T.S.

DWG. NO. 4-1



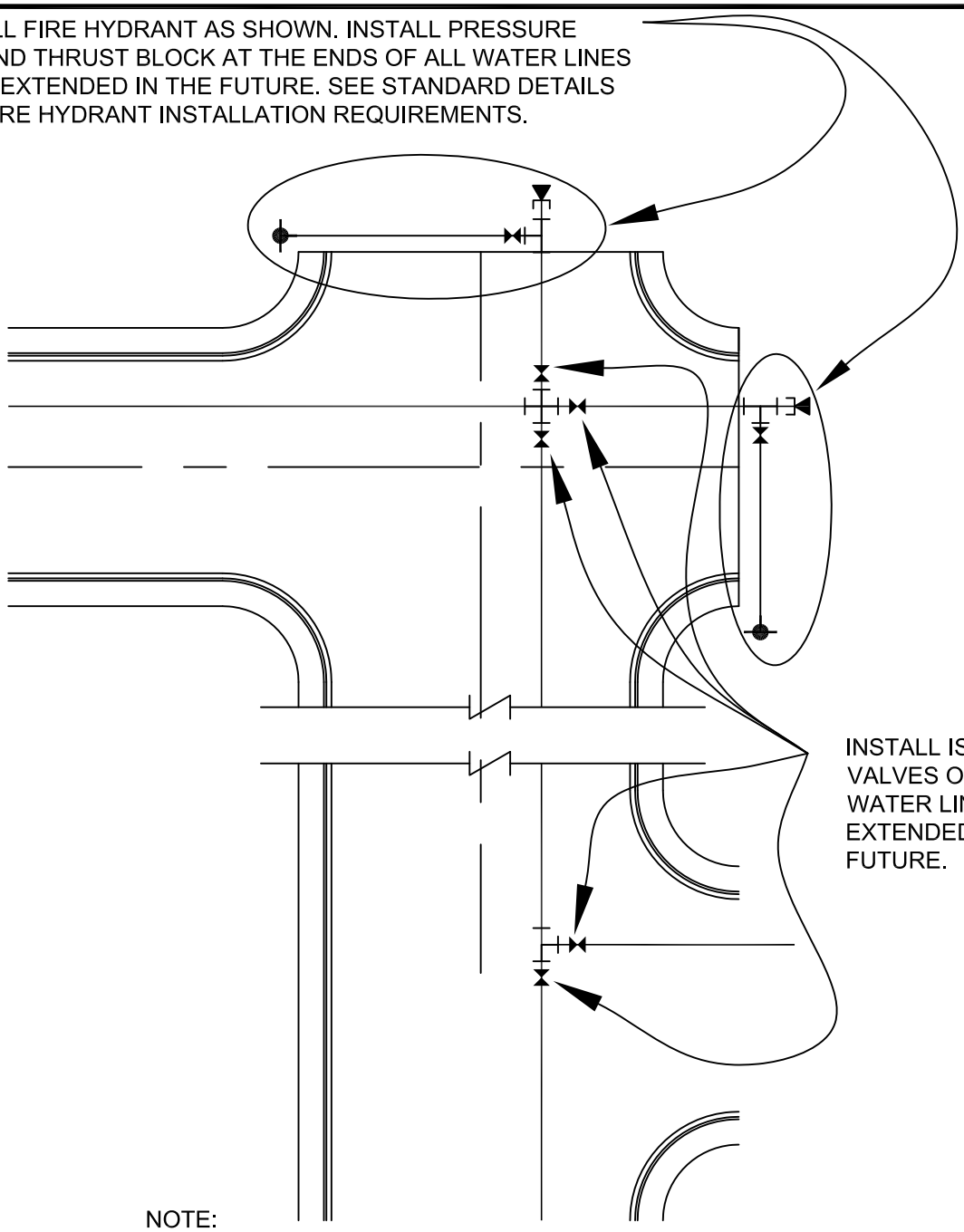
1) TO BE USED FOR INSTALLATIONS WHERE THE BLOW OFF WILL REMAIN IN PLACE FOR LESS THAN 10 DAYS AND AT THE ENDS OF LATERAL STUBS ONLY. FOR LATERALS, THE BLOW OFF MUST BE LOCATED OUT OF THE PAVEMENT. FOR MAINLINE BLOWOFFS THAT WILL BE IN PLACE FOR LONGER THAN 10 DAYS, SEE DWG 4-1, SHEET 1, OR 4-3.

2) ON LATERAL STUBS, THE VALVE BOX & COVER SHALL BE PER SECTION 4-8 OF THESE SPECIFICATIONS.

3) FOR LATERALS PROVIDE A CONCRETE THRUST BLOCK. ALL VALVES SHALL BE IN ACCORDANCE WITH CITY OF KENNEWICK STD. WATERMAIN SPECIFICATIONS.

TEMPORARY 2" BLOW-OFF ASSEMBLY

INSTALL FIRE HYDRANT AS SHOWN. INSTALL PRESSURE CAP AND THRUST BLOCK AT THE ENDS OF ALL WATER LINES TO BE EXTENDED IN THE FUTURE. SEE STANDARD DETAILS FOR FIRE HYDRANT INSTALLATION REQUIREMENTS.



INSTALL ISOLATION VALVES ON ALL WATER LINES TO BE EXTENDED IN THE FUTURE.

NOTE:
NEW CONSTRUCTION SHALL HAVE 2 VALVES PER TEE (EXCEPT FIRE HYDRANT TEES), AND 3 VALVES PER CROSS.
CUT IN TEES TO EXISTING WATER MAINS SHALL HAVE 2 VALVES PER TEE AND 3 VALVES PER CROSS.
TAPPING TEES SHALL ONLY REQUIRE 1 VALVE.

WATER STUB REQUIREMENTS AT FUTURE STREET LOCATIONS

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/99
DWN	DDS
REV	3/15
CHK	BWB
SCALE	NTS

DWG. NO.

4-2

CITY OF KENNEWICK

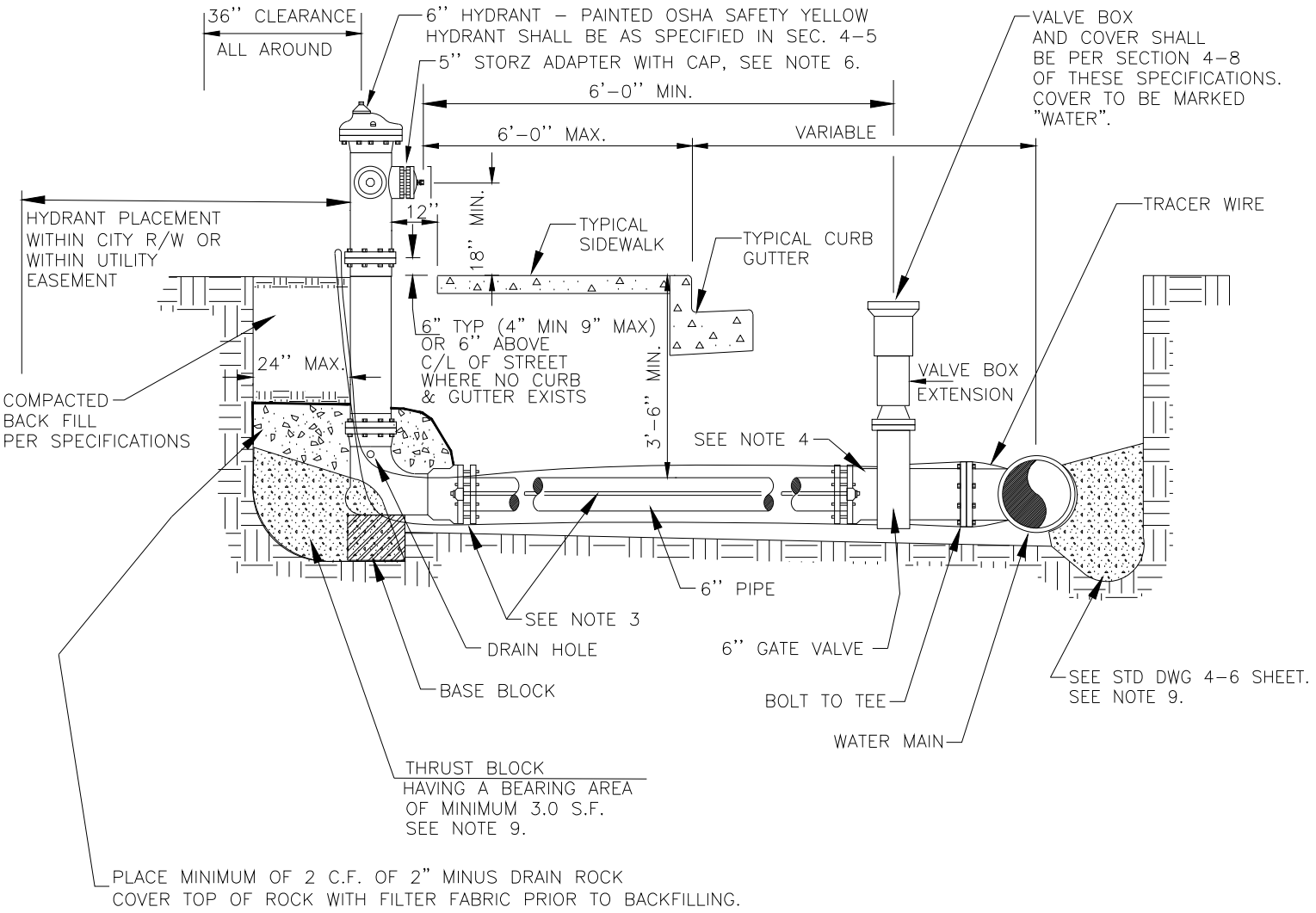
ENGINEERING DEPARTMENT

TYPICAL FIRE HYDRANT INSTALLATION

CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555

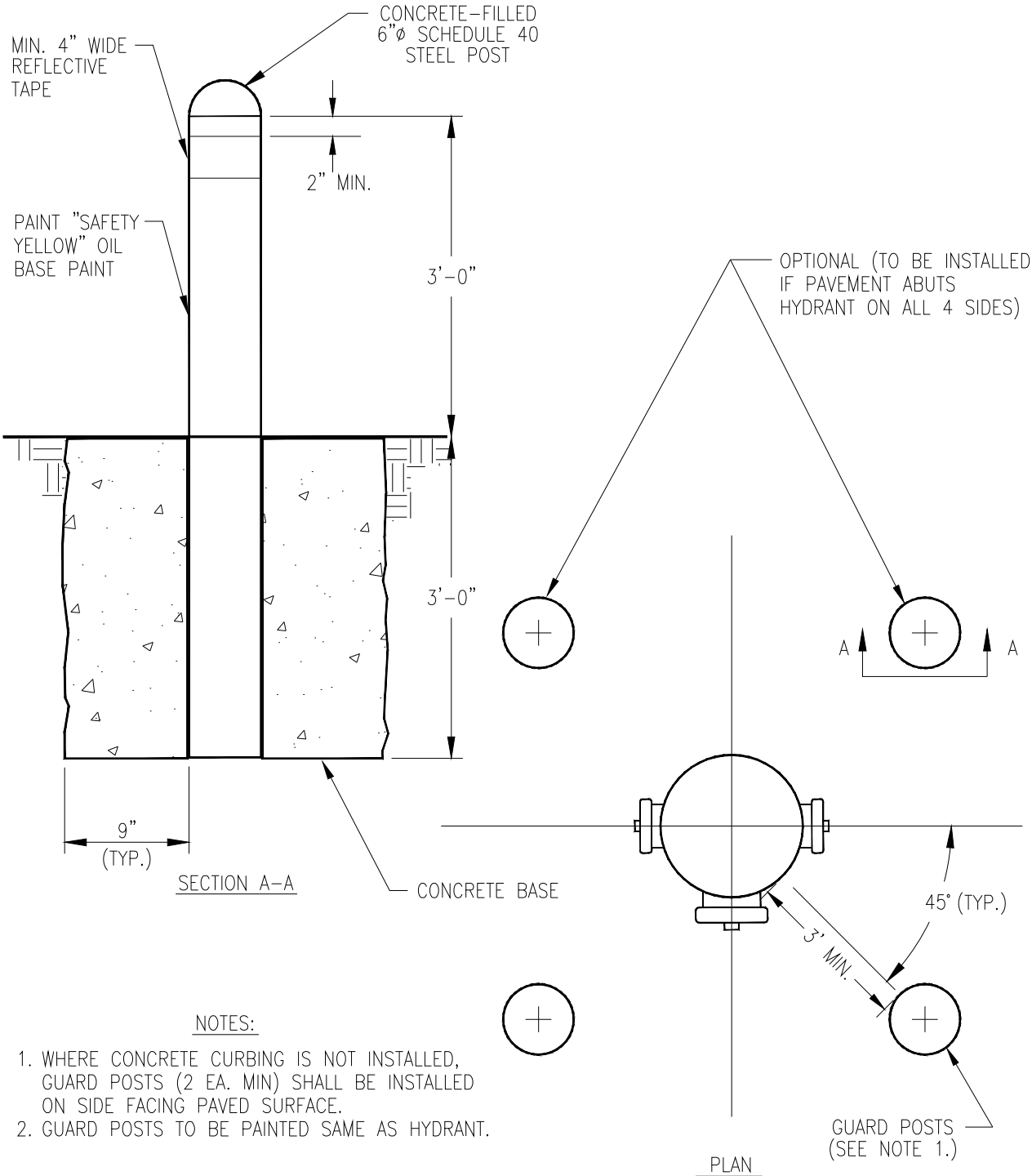
NOTES:

1) HYDRANTS SHALL BE 3 PORT.
2) HYDRANTS SHALL BE PER SECTION 4-5 OF THE STANDARD SPECIFICATIONS.
3) 2 EA. 3/4" SHACKLE RODS MAY BE REQUIRED IN SPECIAL CIRCUMSTANCES, AS DIRECTED BY THE ENGINEER.
4) HUB & FLANGE CASTING. (SEE NOTE 2)
5) HYDRANTS SHALL BE HOODED UNTIL OPERATIONAL.
6) REMOVE CHAINS ON SIDE PORTS AND REMOVE CHAIN AND CAP ON MAIN PORT.
7) SEE DWG 1-3 FOR HYDRANT LOCATION W/LANDSCAPE STRIP.
8) SEE DWG 4-4 SHEET 2 FOR GUARD POST REQUIREMENTS SEE NOTE 6.
9) SEE DWG 4-6 SHEET 2 FOR OPTIONAL MECHANICAL RESTRAINT.



DATE 12/90
DWN SRP
REV 3/14
CHK BWB
SCALE NTS

DWG. NO.
4-4
SHEET 1 OF 2



NOTES:

1. WHERE CONCRETE CURBING IS NOT INSTALLED, GUARD POSTS (2 EA. MIN) SHALL BE INSTALLED ON SIDE FACING PAVED SURFACE.
2. GUARD POSTS TO BE PAINTED SAME AS HYDRANT.

HYDRANT GUARD POSTS

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

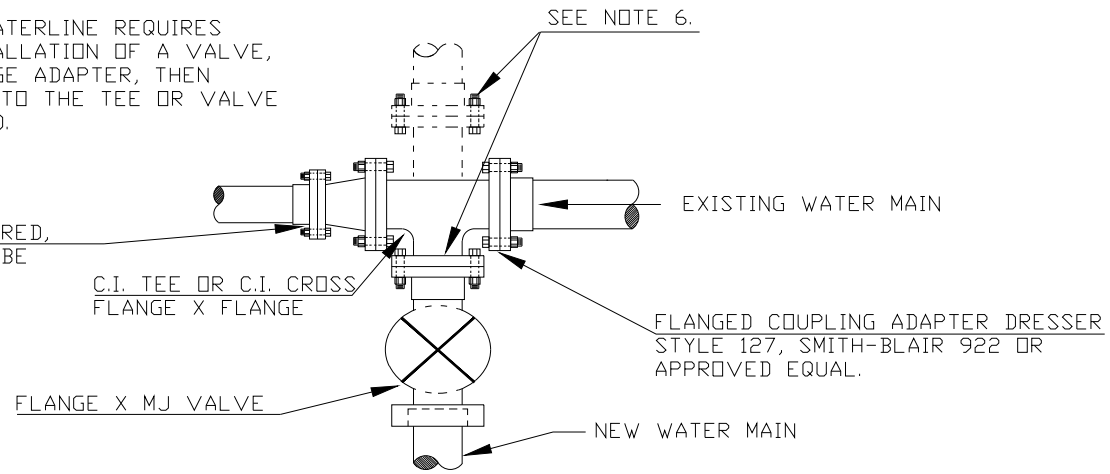
DATE	1/99
DWN	DDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-4

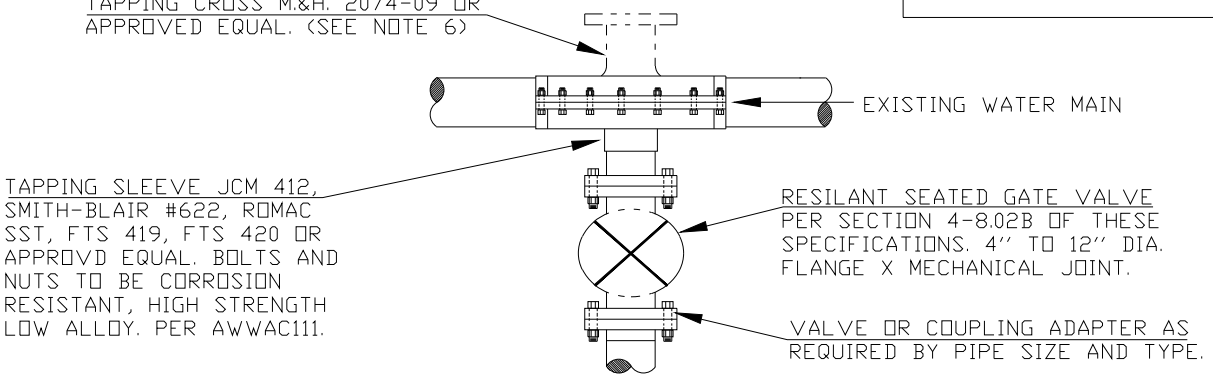
SHEET 2 OF 2

WHEN EXISTING WATERLINE REQUIRES THE IN-LINE INSTALLATION OF A VALVE, REDUCER OR FLANGE ADAPTER, THEN ALL CONNECTIONS TO THE TEE OR VALVE SHALL BE FLANGED.



CUT-IN TEE

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555



TAPPING SLEEVE AND VALVE

NOTES:

1. CONTRACTOR TO DIG & VERIFY MAIN SIZE AND PIPE PRIOR TO ORDERING MATERIALS.
2. CHLORINATE AND TAG VALVE & FITTINGS PER SECTION 4-14 OF THESE SPECIFICATIONS.
3. MATERIALS TO BE ON THE THE JOB PRIOR TO SCHEDULING SHUTDOWNS OR TAPS. UP TO 3 WORK DAYS NOTICE MAY BE REQUIRED TO SCHEDULE CITY CREWS FOR TAP.
4. MAXIMUM TAP TO EXISTING LINE NOT TO EXCEED 50% OF MAIN DIAMETER ON A.C. OR P.V.C. PIPE; OR MORE THEN 75% OF THE MAIN DIAMETER FOR STEEL OR DUCTILE IRON PIPE. MAX. TAP FOR CROSS NOT TO EXCEED 50% OF MAIN.
5. INSTALL THRUST BLOCKS PER STD. DRAWING 4-6
6. CITY CREWS WILL COMPLETE TAP PER SECTION 4-8.02 OF THESE SPECIFICATIONS.
7. ON STEEL PIPE, CONTRACTOR TO RESTORE ALL DISTURBED COAL TAR AND WRAPPING.

DETAILS FOR TAPPING WATER MAINS

(TYPICAL)

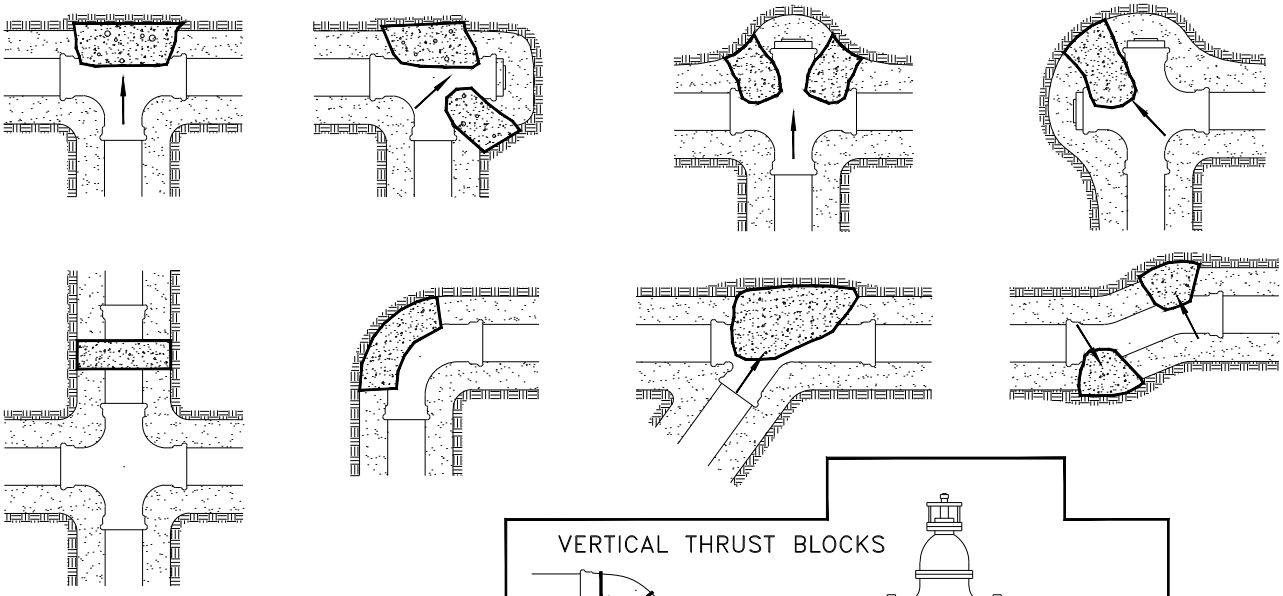
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

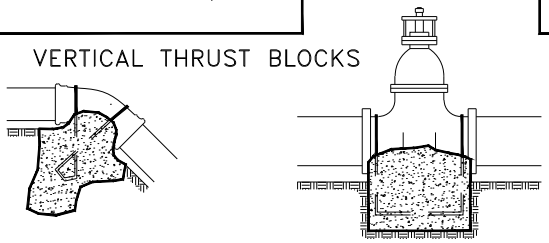
DATE	2/93
DWN	FSG
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-5



VERTICAL THRUST BLOCKS



Pipe Size in Inches	HORIZONTAL THRUST BLOCKS MIN. BEARING AREA IN SQUARE FEET				VERTICAL THRUST BLOCKS MIN. VOLUME IN CUBIC YARDS		
	Tees, Wyes & Dead Ends	90° Bend	45° Bend	11 1/4° 22 1/2° Bend	45° Vertical Bend	11-1/4° 22-1/2° Vert. Bend	Restrained Valve (see note 5)
4 & Smaller	0.94	1.33	0.72	0.37	0.37	0.19	0.48
6	2.12	3.00	1.62	0.83	0.83	0.42	1.08
8	3.77	5.33	2.89	1.47	1.47	0.75	1.93
10	5.89	8.33	4.51	2.30	2.30	1.17	3.01
12	8.48	12.00	6.49	3.31	3.32	1.69	4.33
14	11.55	16.33	8.84	4.50	4.51	2.30	5.90
16	15.08	21.33	11.54	5.88	5.90	3.01	7.70
18	19.09	26.99	14.61	7.45	7.46	3.80	9.75
20	23.56	33.32	18.03	9.19	9.21	4.70	12.04
24	33.93	47.98	25.97	13.24	13.27	6.76	17.33

NOTES:

1. Concrete thrust blocking to be poured against undisturbed earth.
2. Keep concrete clear of joint and accessories.
3. Above bearing areas and volumes are calculated at a soil bearing capacity of 2000 PSF and a test pressure of 150 PSI.
4. Thrust blocks for vertical upward bends shall be the same as for horizontal bends.
5. When called for on the construction drawings or contract special provisions, valves shall have concrete restraint blocks as specified above, unless the valve is flanged to a tee, cross or similar fitting or another method of restraint acceptable to the engineer is provided.

THRUST BLOCKING

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	2/99
DWN	DDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-6

SHEET 1 OF 2

RESTRAINED PIPE LENGTH (FEET)

TEE BRANCH AND LENGTH EACH SIDE OF BEND

PIPE DIAMETER		TYPE OF FITTINGS											
		TEE BRANCH		90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		DEAD END VALVE OR PLUG, AND FIRE HYDRANTS	
STATIC TEST PRESSURE (PSI)		150	200	150	200	150	200	150	200	150	200	150	200
6 INCH	PVC	60	84	27	36	11	15	5	7	3	4	65	87
	D.I.P.	46	63	23	31	10	13	5	6	2	3	49	65
8 INCH	PVC	81	110	34	46	14	19	7	9	3	5	84	112
	D.I.P.	61	82	30	40	12	17	6	8	3	4	63	84
12 INCH	PVC	118	158	48	64	20	26	10	13	5	6	120	159
	D.I.P.	88	118	42	56	18	23	8	11	4	6	90	119
16 INCH	DUCTILE IRON	113	152	54	71	22	30	11	14	5	2	THRUST BLOCK	THRUST BLOCK
20 INCH	DUCTILE IRON	137	184	64	85	26	35	13	17	6	8		
24 INCH	DUCTILE IRON	161	216	74	98	30	41	15	20	7	10		
30 INCH	DUCTILE IRON	149	260	87	116	36	48	17	23	9	12		
36 INCH	DUCTILE IRON	223	300	100	132	41	55	20	26	10	13		

CALCULATIONS ARE BASED ON INSTALLATION IN POORLY GRADED SANDS, GRAVEL AND GRAVEL –SAND MIXTURES (GM & SM), TYPE 3 TRENCH – PIPE BEDDED IN SELECT NATIVE, OR IMPORTED EARTH BEDDING, TO A DEPTH OF 6–INCHES OVER THE PIPE (STD. DWG. 4–7) A MINIMUM 3 FEET OF COMPACTED PIPE BURY AT THE TIME OF THE PRESSURE TEST AND A SAFETY FACTOR OF 1.5 : 1 TO ALLOW FOR SITE CONDITION VARIABLES

NOTES:

1. FOR DESIGN FORMULAS, CALCULATIONS AND ADDITIONAL INFORMATION, THE TABLE IS BASED ON THE RESTRAINT CALCULATIONS FOUND AT WWW.ROMAC.COM/RESTRAINT/INDEX.HTM FOR ADDITIONAL RESTRAINT REQUIREMENTS AND SPECIFICATIONS, SEE CITY STANDARD SPECIFICATION SECTION 4–8.02 G. THE RESTRAINED PIPE LENGTH APPLIES TO CONDITIONS WHERE A CONCRETE THRUST BLOCK IS NOT USED.
2. IF POLYETHYLENE WRAPPED D.I.P. IS SPECIFIED, INDEPENDENT CALCULATIONS ARE REQUIRED. DO NOT USE THE ABOVE TABLE, WHICH IS FOR STANDARD DIP ONLY.
3. EVERY JOINT WITHIN THE DESIGNATED RESTRAINT LENGTH MUST BE RESTRAINED. IF THE REQUIRED RESTRAINT LENGTH IS SHORTER THAN A SINGLE SECTION OF PIPE BEING USED, ONLY THE FITTING CONNECTION REQUIRES RESTRAINT. THE RESTRAINT LENGTH GIVEN IN THE TABLE, IS THE REQUIRED LENGTH ON EACH SIDE OF THE BEND, OR ON THE TEE BRANCH AS APPLICABLE.
4. THRUST BLOCKS ARE REQUIRED FOR ALL CONNECTIONS TO AC PIPE AND WHEN AN AC PIPE CONNECTION IS LOCATED ANYWHERE WITHIN THE DESIGNATED RESTRAINT LENGTH.
5. THRUST BLOCKS ARE REQUIRED IF THE DESIGNATED RESTRAINT LENGTH CANNOT BE OBTAINED. SPECIAL ATTENTION NEEDS TO BE GIVEN TO DEAD END STUBS AND FIRE HYDRANT INSTALLATIONS. IF THE LENGTH OF THE FEEDER PIPE, FROM THE MAIN LINE TEE TO THE END CAP, OR HYDRANT, IS LESS THAN THE DESIGNATED DEAD END RESTRAINT LENGTH, THRUST BLOCKS ARE REQUIRED AT BOTH THE TEE AND AT THE END CAP, OR HYDRANT. WHEN THE SPECIFIED CONDITIONS ALLOW THE USE OF MECHANICAL RESTRAINTS, THE RESTRAINT LENGTH REQUIREMENTS FOR BOTH THE TEE AND THE END CAP, OR HYDRANT MUST BE MET.
6. APPROVED METHODS OF RESTRAINED PIPE SHALL BE :
   a. FOR PVC PIPE, SERIES 2000PV MEGALUG RESTRAINTS AND FOR SLIP JOINTS, SERIES 1500TD BELL RESTRAINT HARNESS, OR EQUALS.
   b. FOR DUCTILE IRON PIPE, SERIES 1100 MEGALUG RESTRAINTS AND FOR SLIP JOINTS, SERIES 1500 RESTRAINT HARNESS THROUGH 12 INCH, OR SERIES 1700 RESTRAINT HARNESS FOR LARGER PIPE, OR EQUALS.

MECHANICAL RESTRAINT

CITY OF KENNEWICK

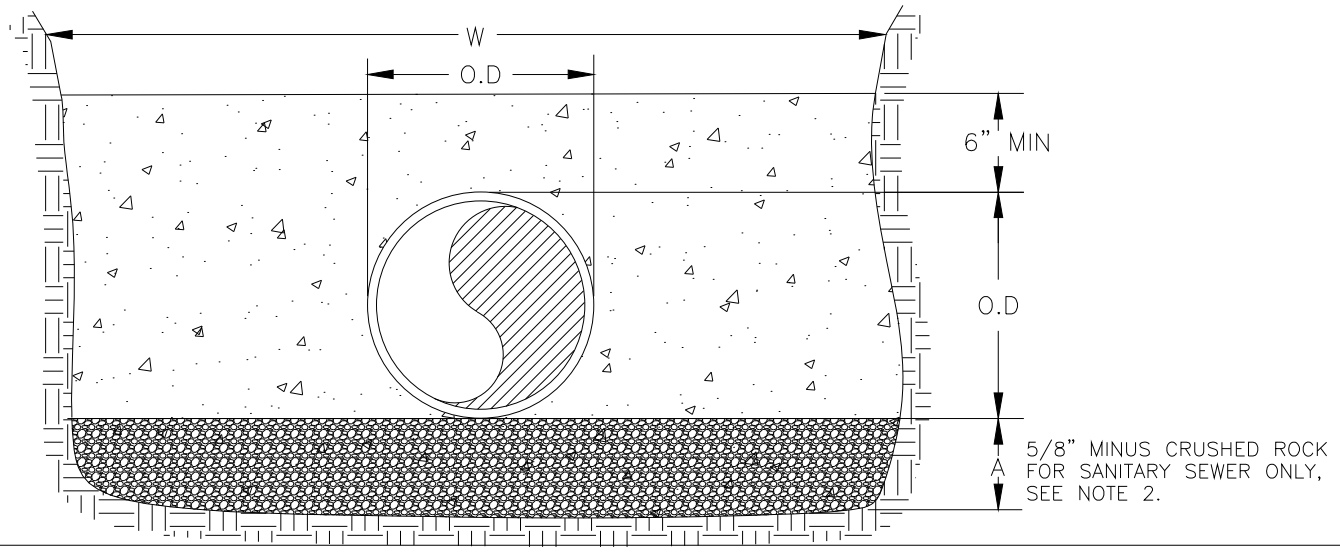
ENGINEERING DEPARTMENT

DATE	6/11
DWN	RJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-6

SHEET 2 OF 2



A=4" FOR 27" PIPE & SMALLER;
6" FOR ALL PIPE 30" DIA. & LARGER

1. SELECT EXCAVATED AND IMPORTED BEDDING MATERIAL ABOVE THE BOTTOM OF PIPE FOR STORM DRAINAGE PIPE, SANITARY SEWER AND WATER MAINS SHALL BE WELL GRADED SELECT EXCAVATED, OR IMPORTED MATERIAL, FREE OF ROCKS GREATER THAN 1-INCH DIAMETER.
2. BEDDING MATERIAL BELOW THE PIPE (ZONE A) SHALL BE 5/8" MINUS CRUSHED ROCK FOR SANITARY SEWER PIPES. BEDDING MATERIAL IN ZONE A FOR STORM DRAINAGE PIPE AND WATER MAINS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NOTE 1.
3. TRENCH WIDTH SHALL BE KEPT AS NARROW AS CONDITIONS ALLOW, EXCEPT THAT "W" SHALL BE 36 INCHES MINIMUM FOR PIPE 15 INCHES I.D. OR SMALLER AND MINIMUM 1 1/2 TIMES THE I.D. IN INCHES PLUS 18 INCHES, FOR PIPE 18 INCHES OR LARGER.
4. HAND TAMP UNDER PIPE HAUNCHES.
5. PROVIDE UNIFORM SUPPORT UNDER PIPE BARREL.
6. COMPACT BEDDING MATERIAL TO 95% MAXIMUM DENSITY EXCEPT DIRECTLY OVER THE PIPE, WHERE BEDDING MATERIAL SHALL BE HAND TAMPED ONLY.
7. FOR PAVEMENT RESTORATION REQUIREMENTS. SEE CITY OF KENNEWICK STANDARD DRAWINGS 2-6 AND 2-7.

PIPE BEDDING DETAIL FOR SANITARY SEWER, STORM, AND WATER MAINS

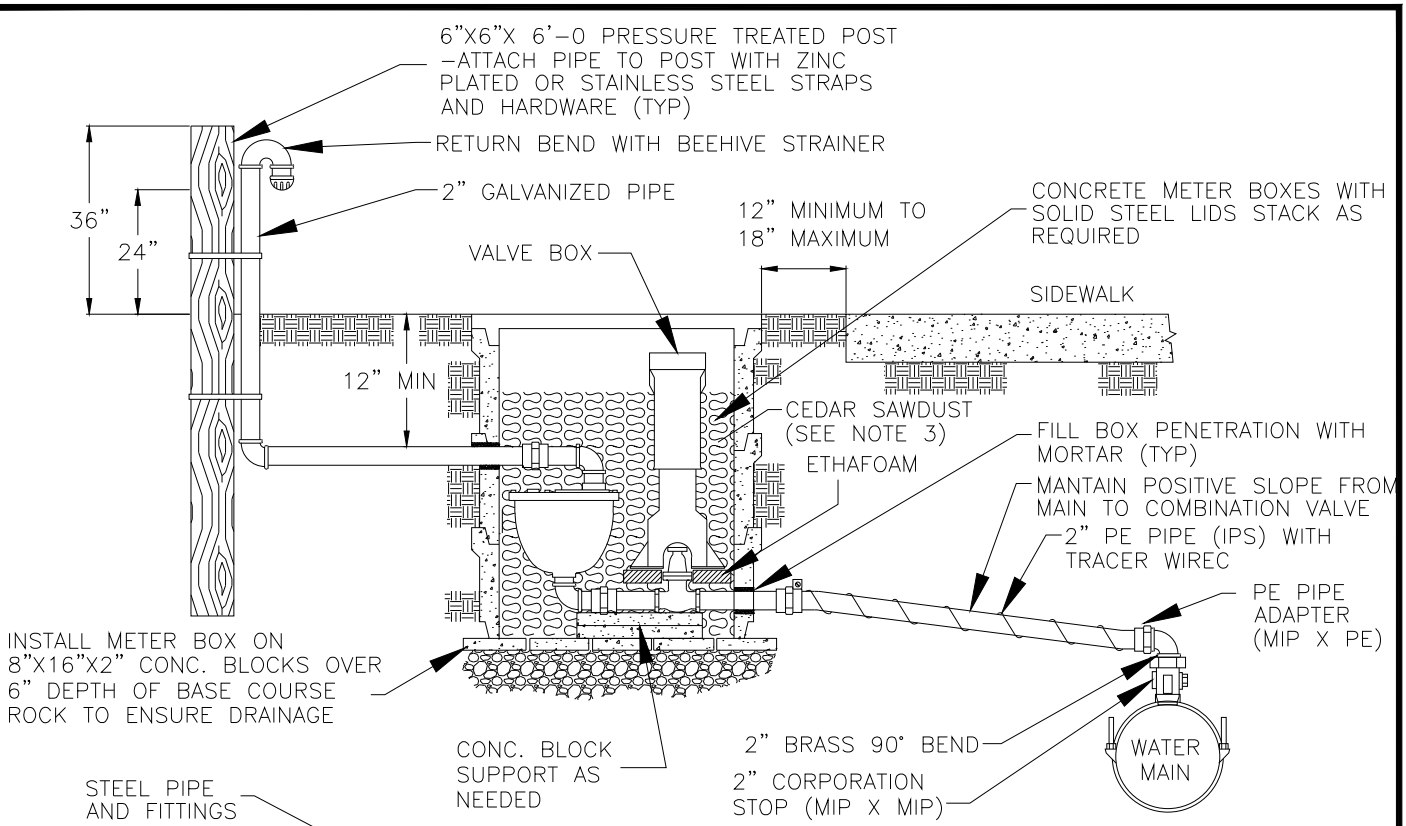
CITY OF KENNEWICK

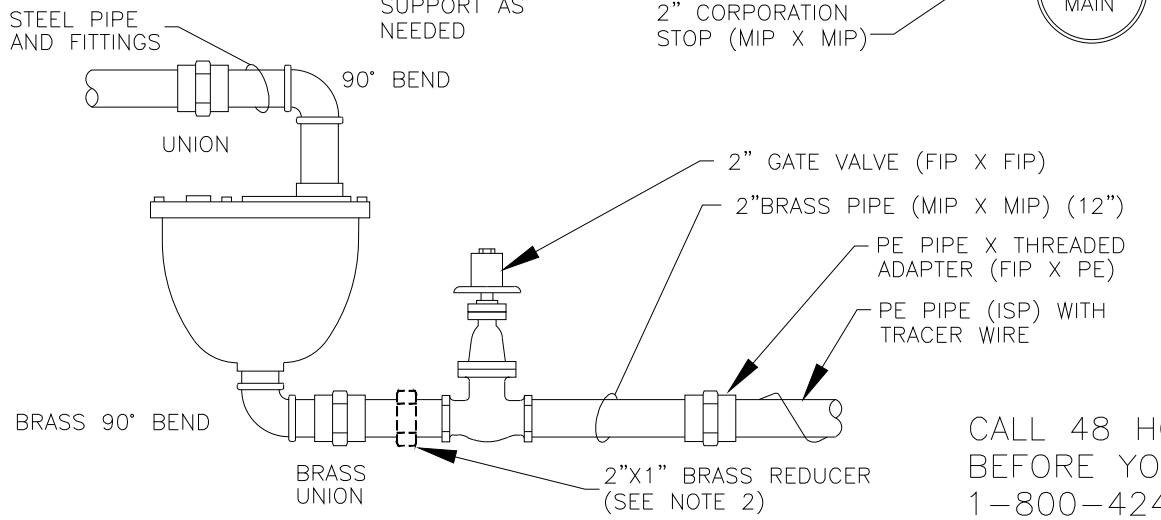
ENGINEERING DEPARTMENT

DATE	2/07
DWN	MJL
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-7





CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

AIR VACUUM RELEASE VALVE

NOTES:

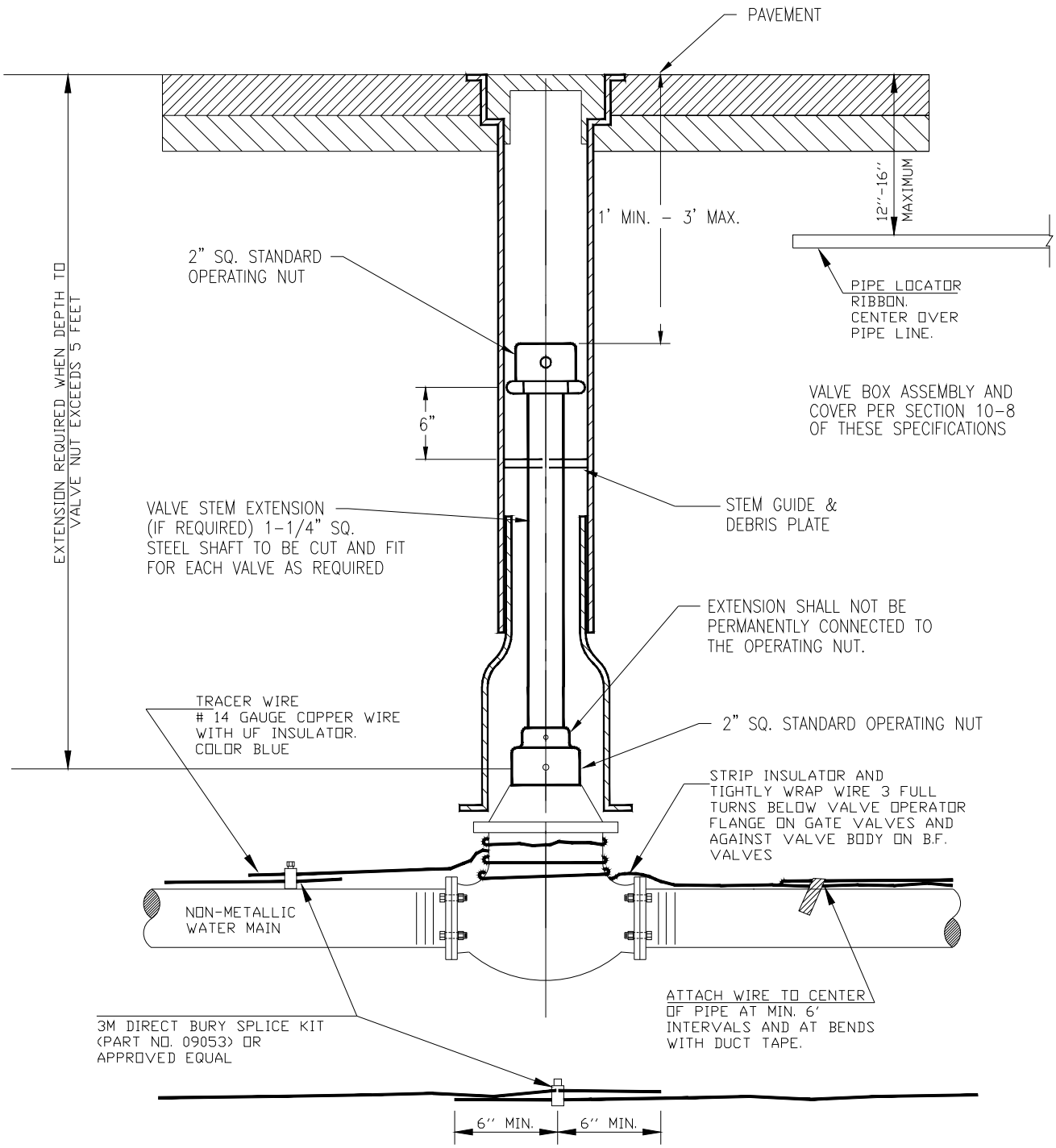
1. COMBINATION AIR RELEASE AND VACUUM VALVE SHALL BE A 2" SIZE MINIMUM -UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
2. FOR 1" COMBINATION VALVE INSTALL 2"X1" REDUCER BETWEEN GATE VALVE AND UNION.
3. FILL METER BOX WITH SAWDUST AFTER TESTING AND INSPECTION.
4. SET METER BOX FLUSH WITH SIDEWALK OR CURB ELEVATION. WHEN LOCATED IN LAWN OR LANDSCAPE AREA. SET METER BOX APPROXIMATELY 2 INCHES ABOVE FINISHED GRADE.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/10
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-8



TRACER WIRE INSTALLATION

(NON-METALLIC WATER MAINS)

AND VALVE STEM EXTENSION

CITY OF KENNEWICK

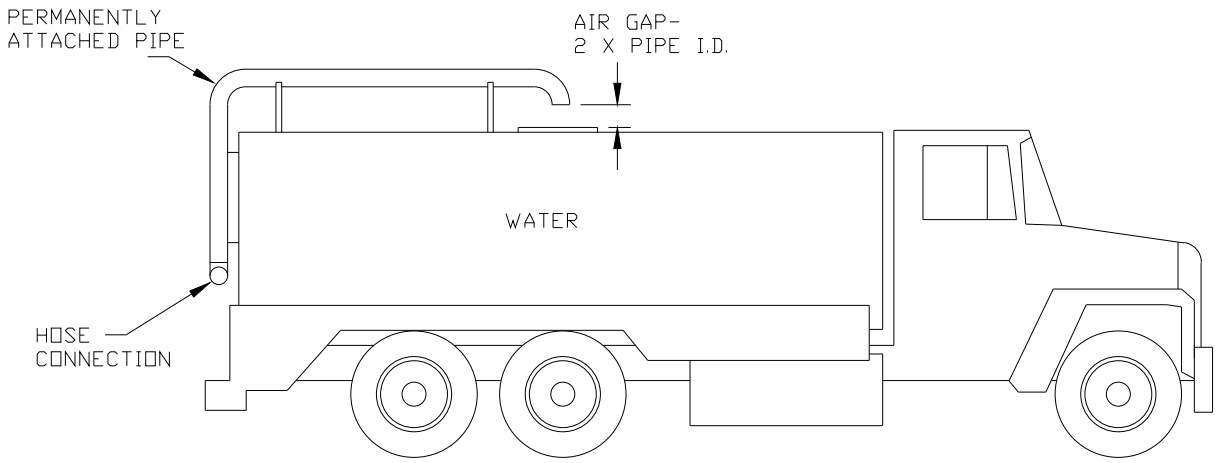
ENGINEERING DEPARTMENT

DATE	1/99
DWN	DDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-9

WATER TRUCK WITH AIR GAP



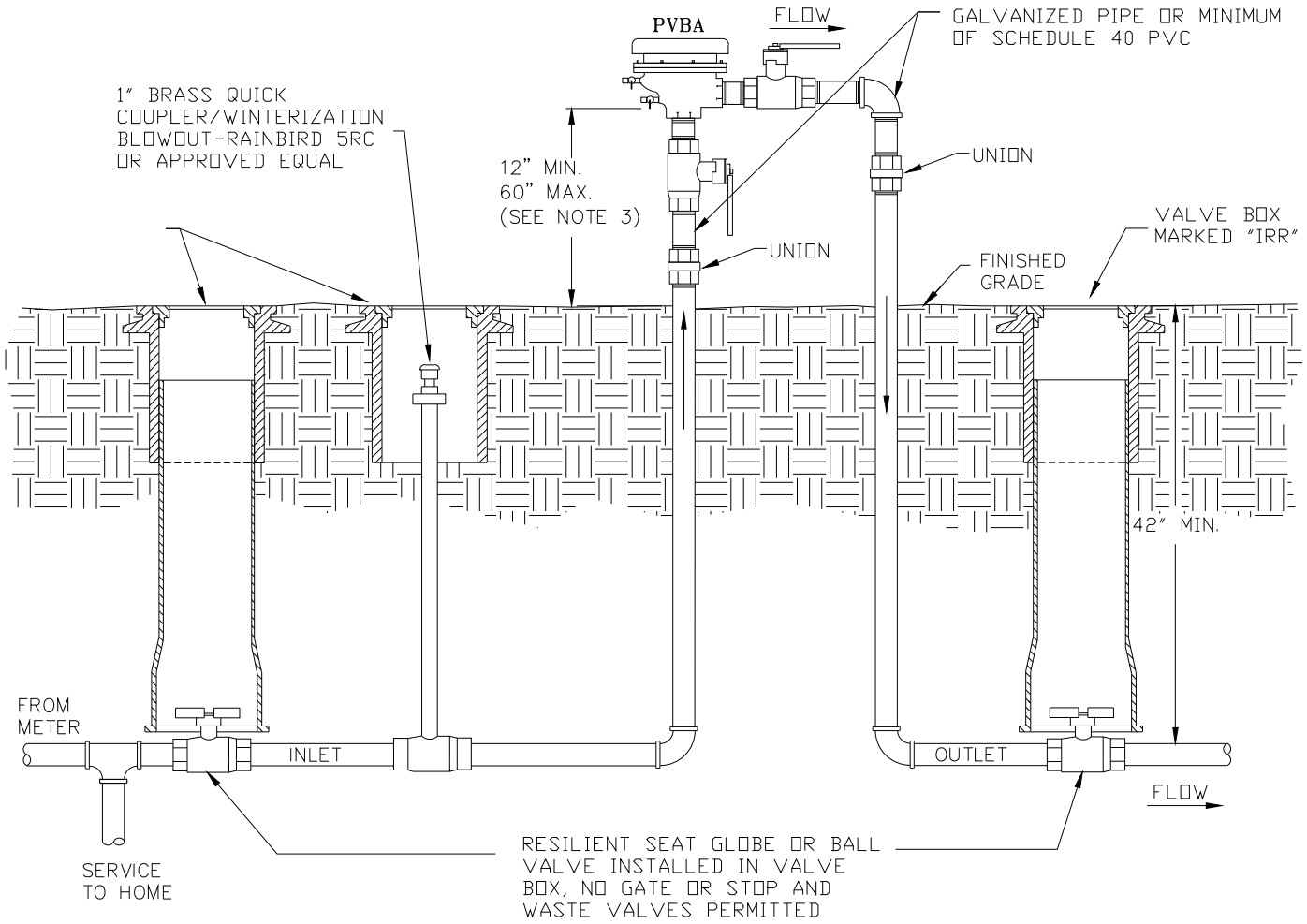
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	1/91
DWN	JSF
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-10



PVBA INSTALLATION

NOTES:

1) PRESSURE VACUUM BREAKER ASSEMBLY (PVBA) MAY BE INSTALLED ON LOW HAZARD POTABLE WATER SUPPLY SYSTEMS ONLY.

2) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.

3) PVBA MUST BE INSTALLED NOT LESS THAN 12'' ABOVE THE HIGHEST POINT OF USE AND NOT MORE THAN 60'' ABOVE FINISH GRADE.

PRESSURE VACUUM BREAKER ASSEMBLY

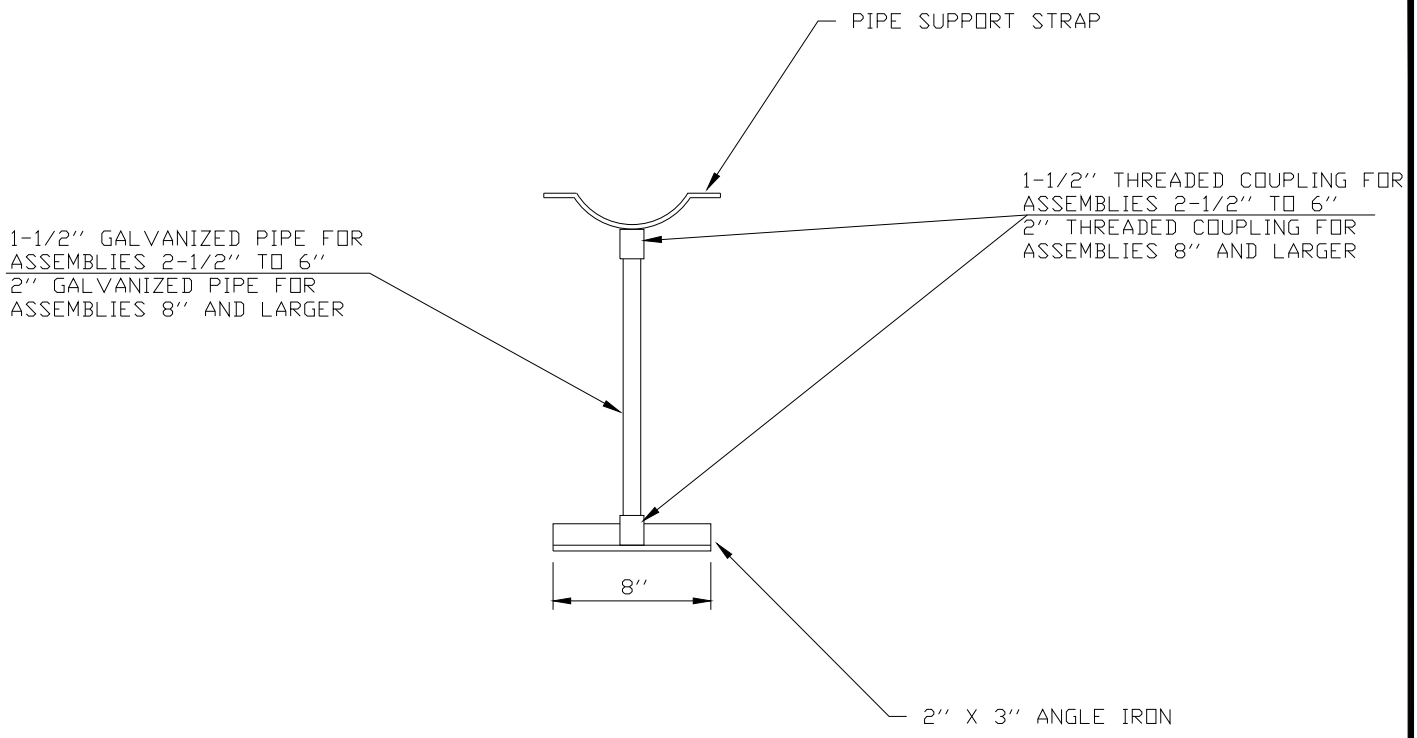
CITY OF KENNEWICK

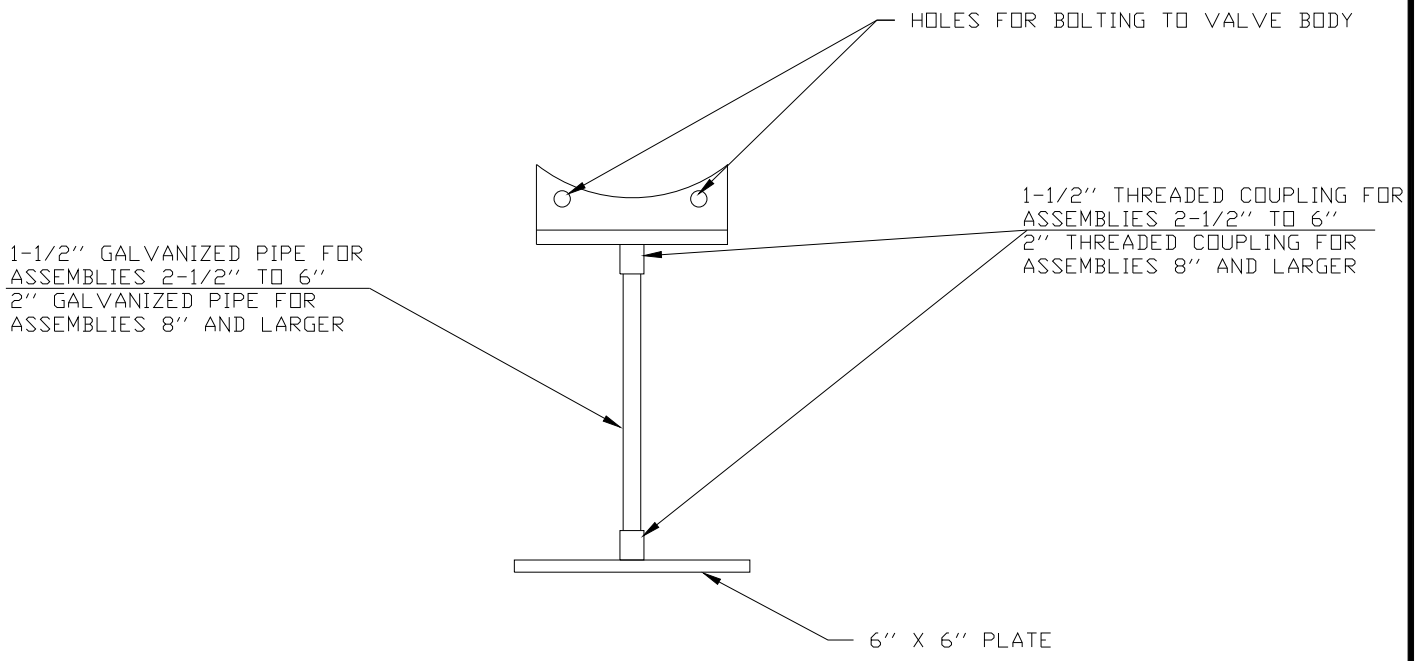
ENGINEERING DEPARTMENT

DATE	1/10
DWN	DJW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-11



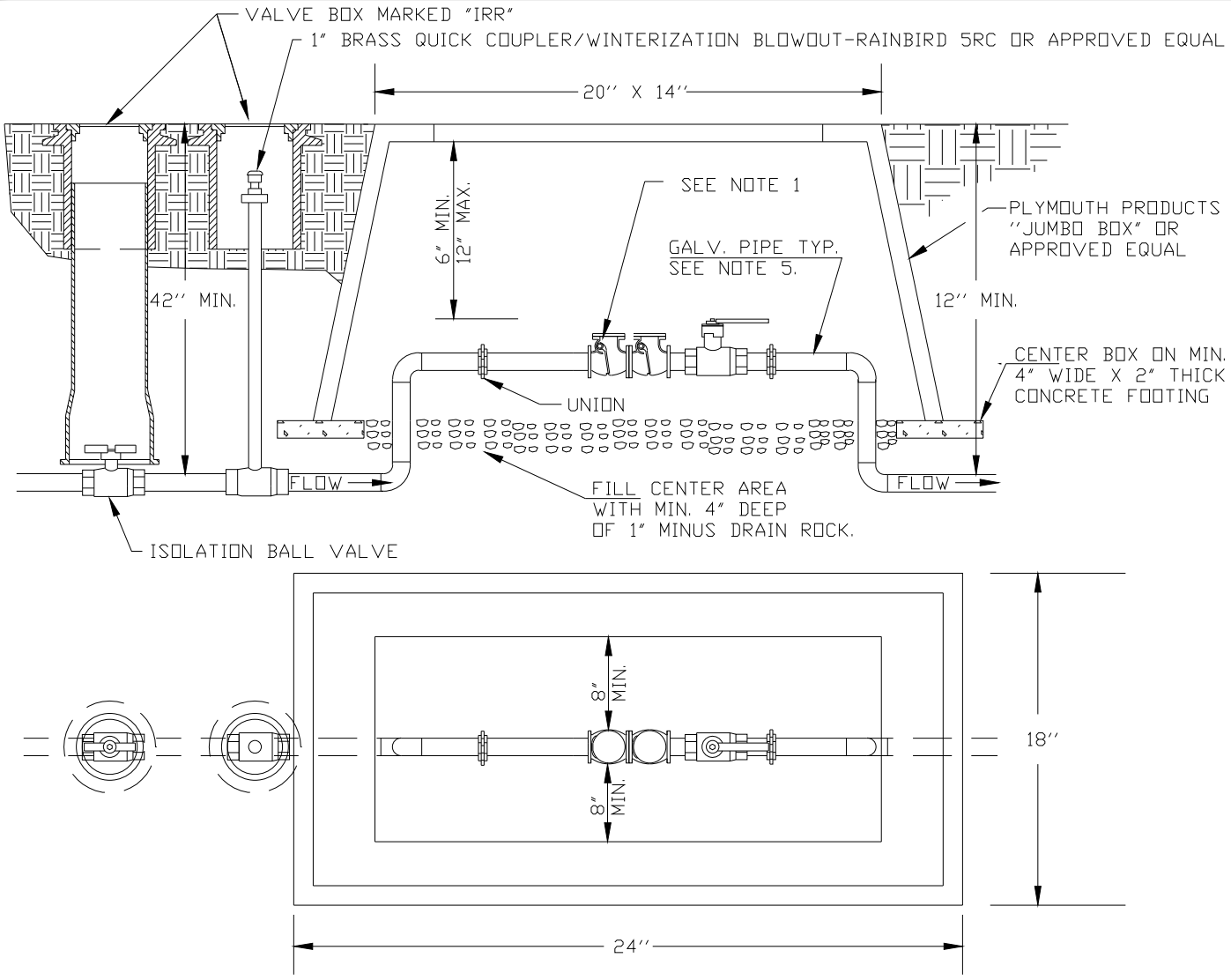


PIPE SUPPORTS

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 12/90 DWN SRP REV 3/14 CHK BWB SCALE NTS

DWG. NO.

4-12



DCVA INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 3/4'' TO 1''

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MAY BE INSTALLED BELOW GROUND IN AN APPROVED VAULT.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) RISERS AND ALL PIPE IN BOX TO BE GALVANIZED.
6) A LADDER IS REQUIRED IF ACCESS OPENING TO FLOOR EXCEEDS 36''

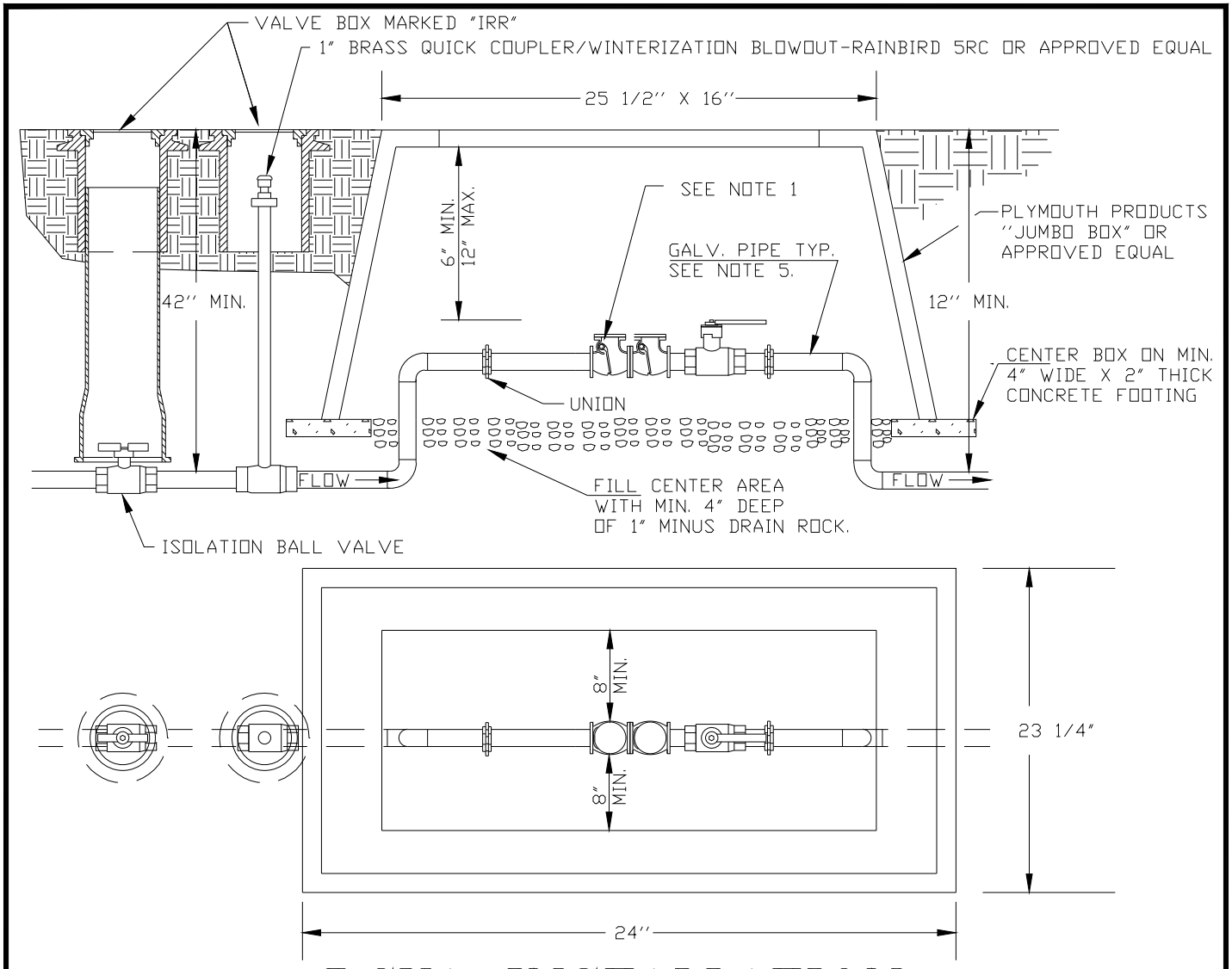
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3\14
CHK	BWB
SCALE	NTS

DWG. NO.

4-13



DCVA INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 1 1/4'' TO 2 1/2''

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MAY BE INSTALLED BELOW GROUND IN AN APPROVED VAULT.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) RISERS AND ALL PIPE IN BOX TO BE GALVANIZED.
6) A LADDER IS REQUIRED IF ACCESS OPENING TO FLOOR EXCEEDS 36''

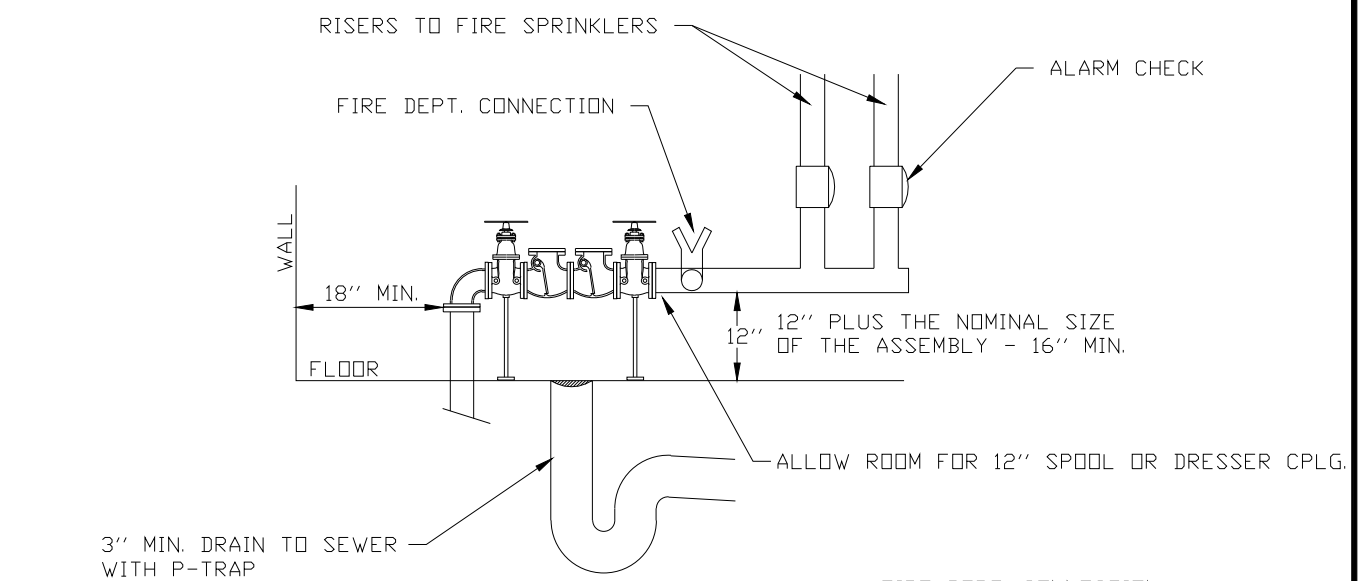
CITY OF KENNEWICK

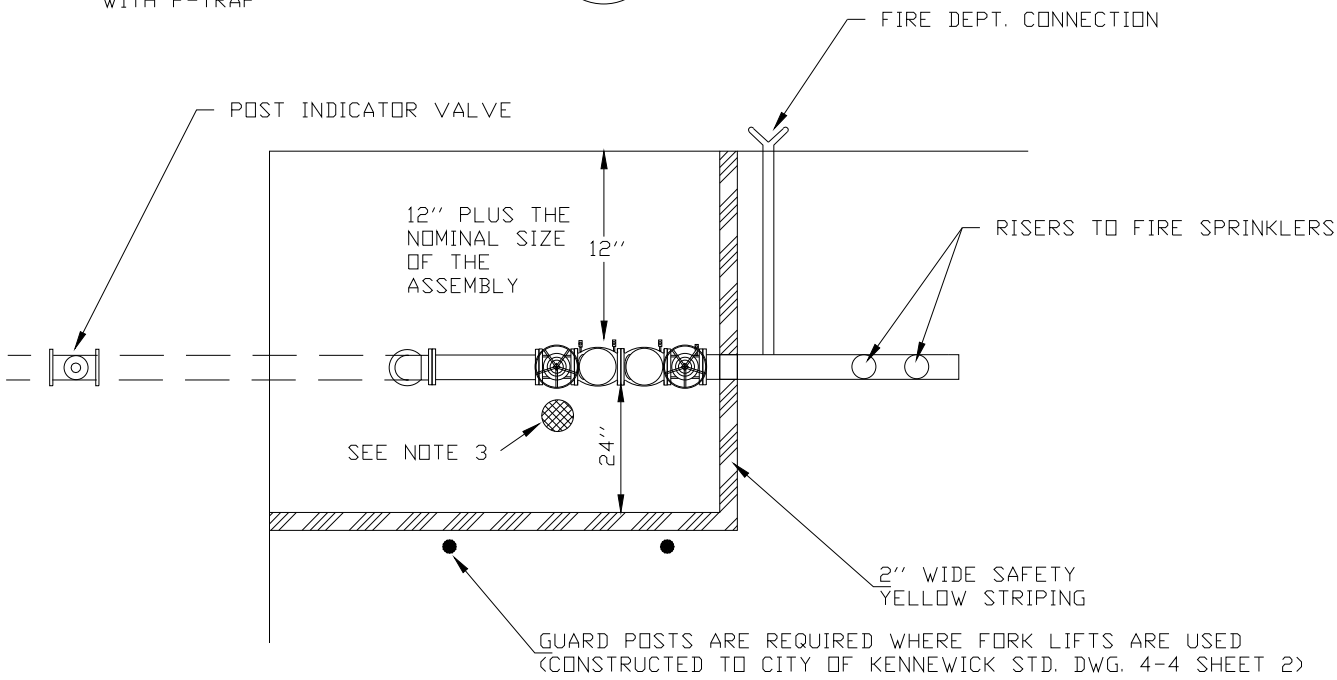
ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3\14
CHK	BWB
SCALE	NTS

DWG. NO.

4-14





DCVA INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 3'' AND LARGER INSTALLED INSIDE A BUILDING

NOTES:

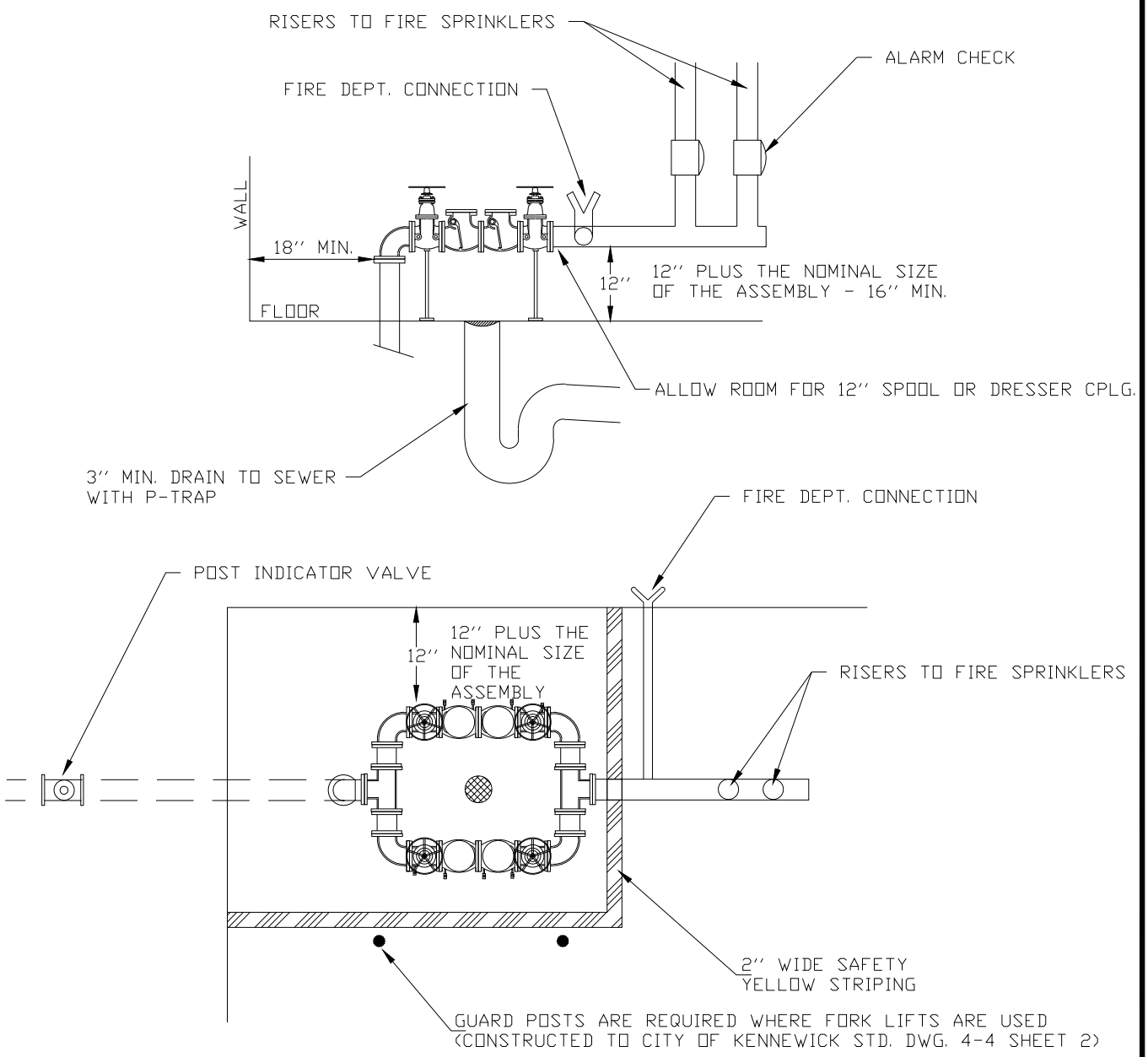
1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
3) A MIN. 3" DIA. FLOOR DRAIN IS REQUIRED.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-15



DCVA DUAL INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 3'' AND LARGER INSTALLED INSIDE A BUILDING

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
3) A MIN. 3" DIA. FLOOR DRAIN IS REQUIRED.

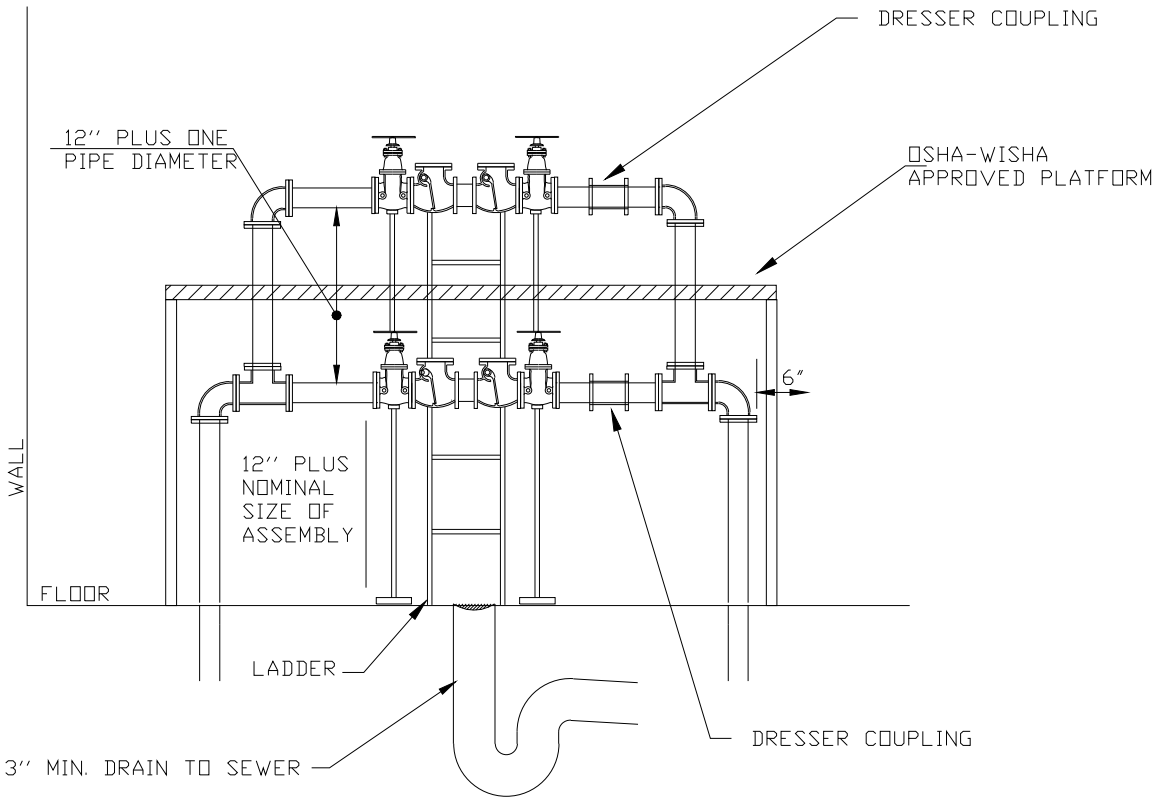
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-16



DCVA DUAL INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 3'' AND LARGER INSTALLED INSIDE A BUILDING

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MAY BE INSTALLED BELOW GROUND IN AN APPROVED VAULT.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) A MIN. 3" DIA. FLOOR DRAIN IS REQUIRED.
6) A LADDER IS REQUIRED IF THE DISTANCE FROM THE ACCESS OPENING TO THE FLOOR EXCEEDS 36''.
7) A SPACE EQUALING 12'' PLUS ONE PIPE DIAMETER IS REQUIRED BETWEEN ASSEMBLIES.
8) AN OSHA-WISHA APPROVED PLATFORM MUST BE ERECTED FOR MAINTENANCE AND TESTING WHEN INSTALLED 60'' ABOVE FLOOR LEVEL.
9) GUARD POST ARE REQUIRED IN AREAS WHERE FORK LIFTS ARE USED (CITY OF KENNIWICK STANDARD DWG 4-4 SHEET 2).

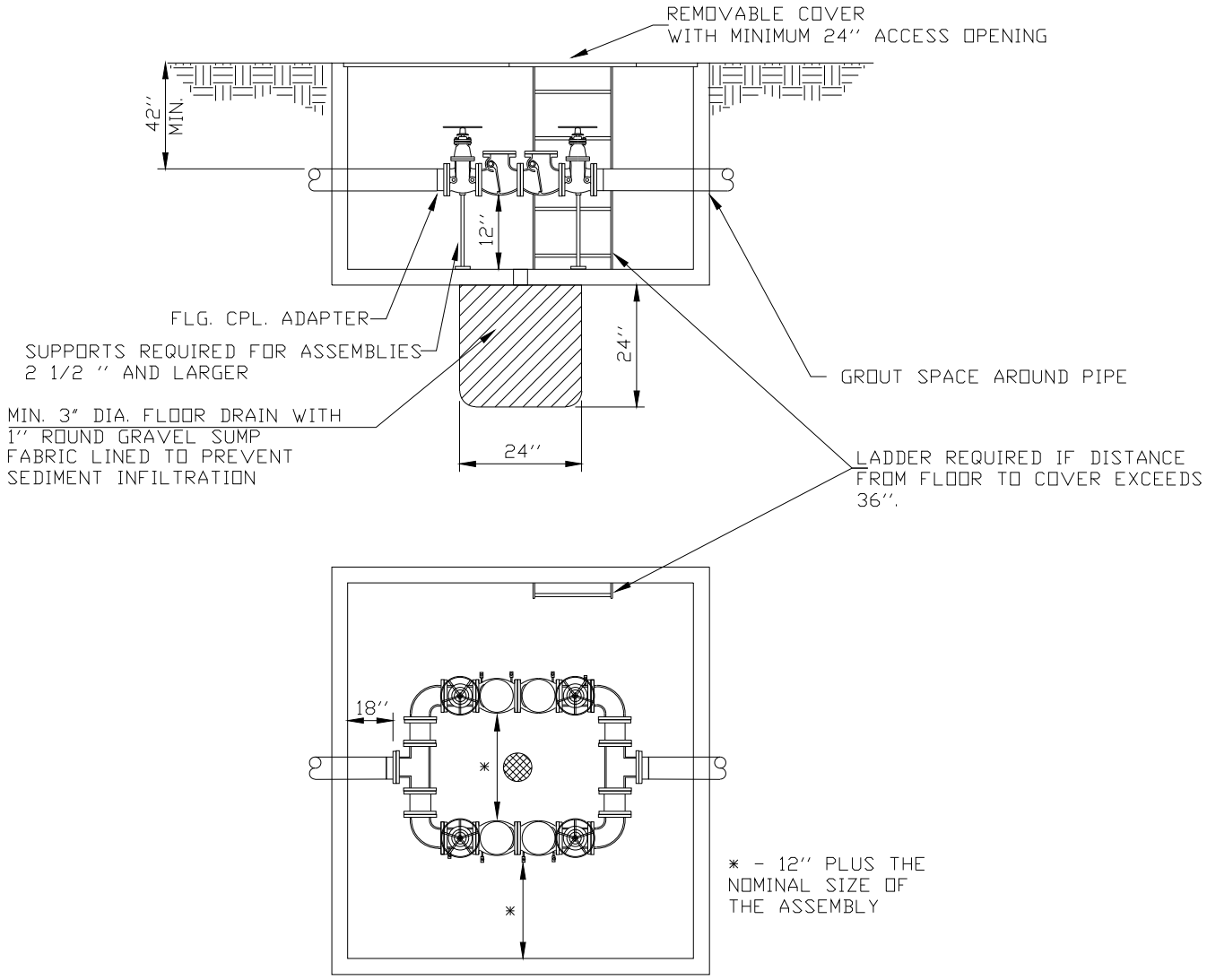
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-17



DCVA DUAL INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY
FOR ASSEMBLIES 3'' AND LARGER

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MAY BE INSTALLED BELOW GROUND IN AN APPROVED VAULT.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) A MIN. 3" DIA. FLOOR DRAIN IS REQUIRED.
6) A LADDER IS REQUIRED IF ACCESS OPENING TO FLOOR EXCEEDS 36''

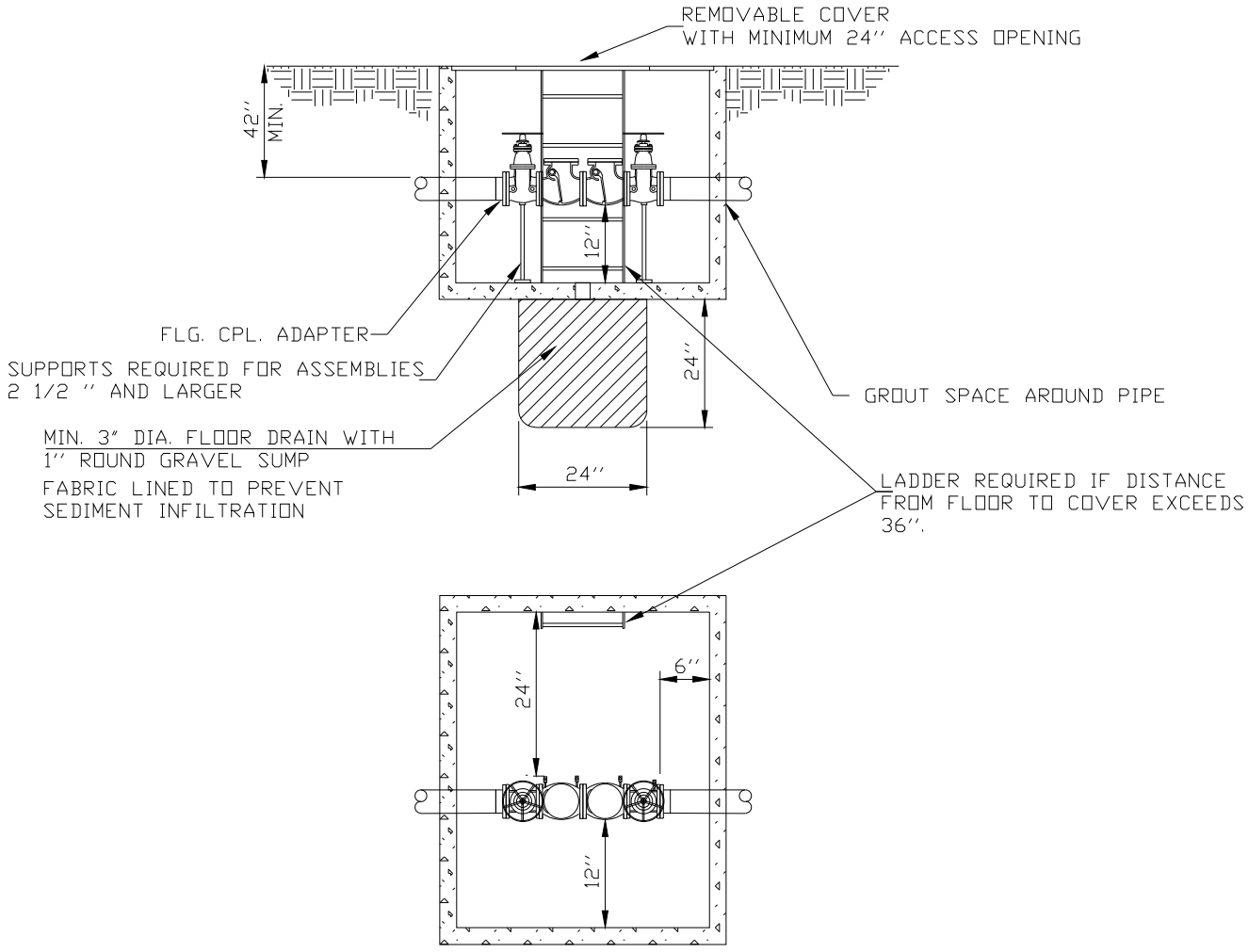
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-18



DCVA INSTALLATION

DOUBLE CHECK VALVE ASSEMBLY FOR ASSEMBLIES 3'' AND LARGER

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MAY BE INSTALLED BELOW GROUND IN AN APPROVED VAULT.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION
4) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
5) A MIN. 3" DIA. FLOOR DRAIN IS REQUIRED.
6) A LADDER IS REQUIRED IF ACCESS OPENING TO FLOOR EXCEEDS 36''

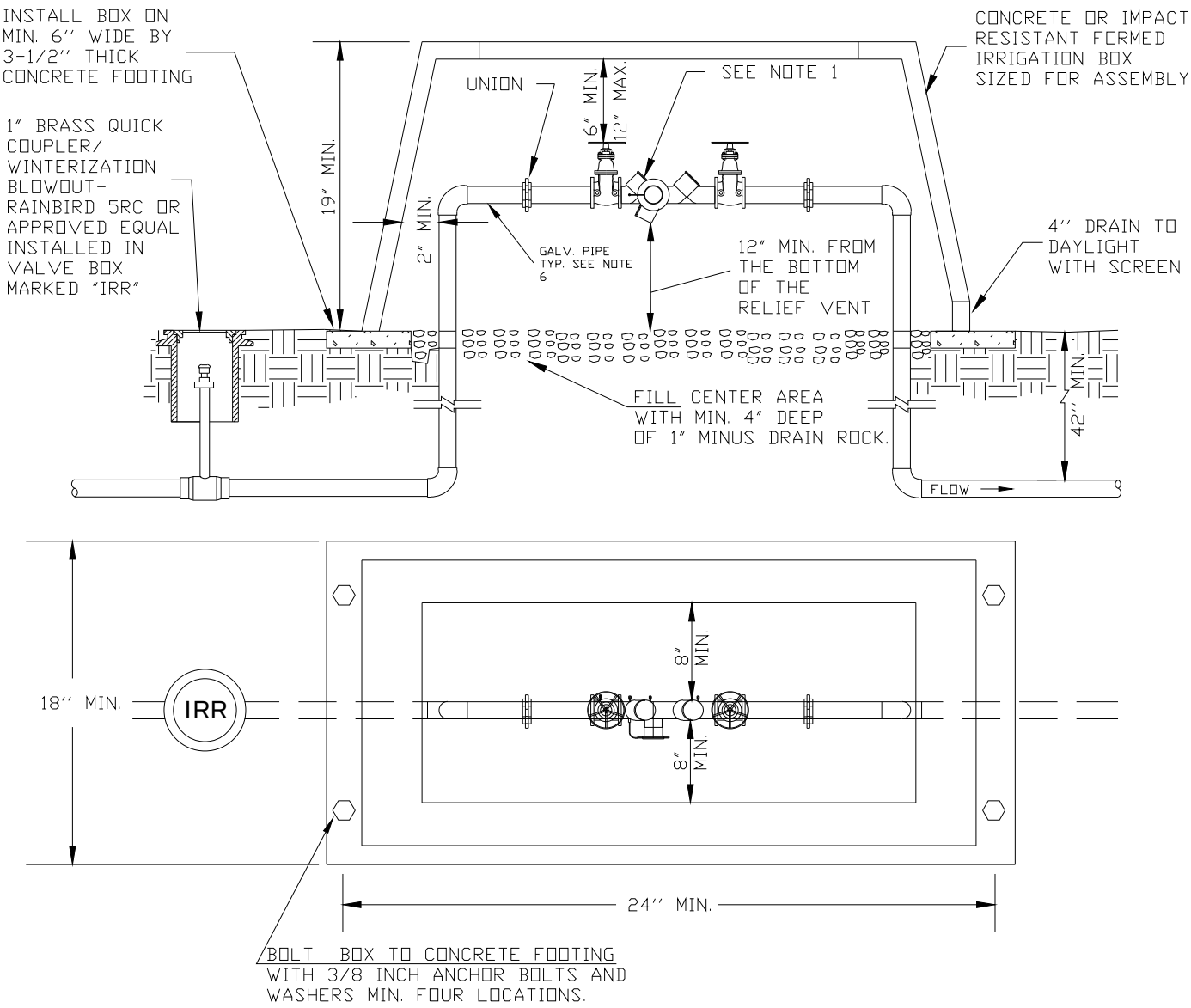
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	12/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-19



RPBA INSTALLATION

REDUCED PRESSURE BACKFLOW
ASSEMBLY FOR ASSEMBLIES 3/4" TO 1"

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.

2) MUST BE INSTALLED ABOVE GROUND MIN. 12 INCHES.

3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.

4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.

5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.

6) RISERS AND ALL PIPE IN BOX TO BE GALVANIZED STEEL OR MINIMUM SCH. 40 PVC.

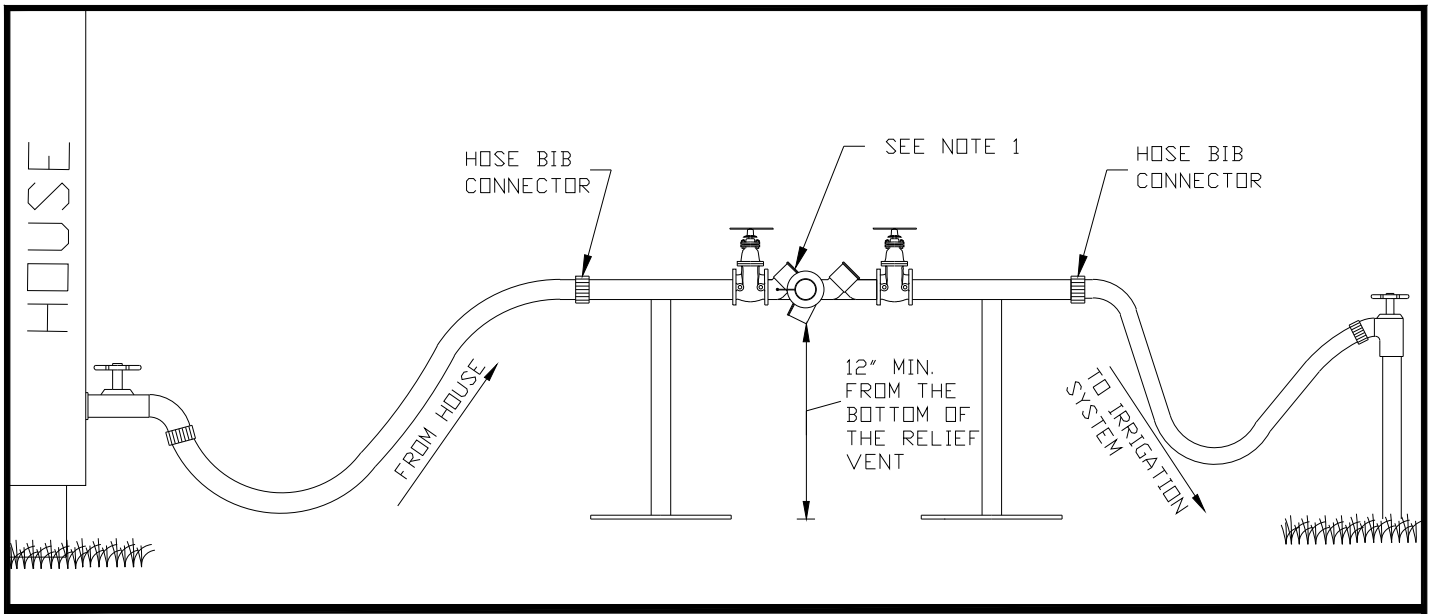
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

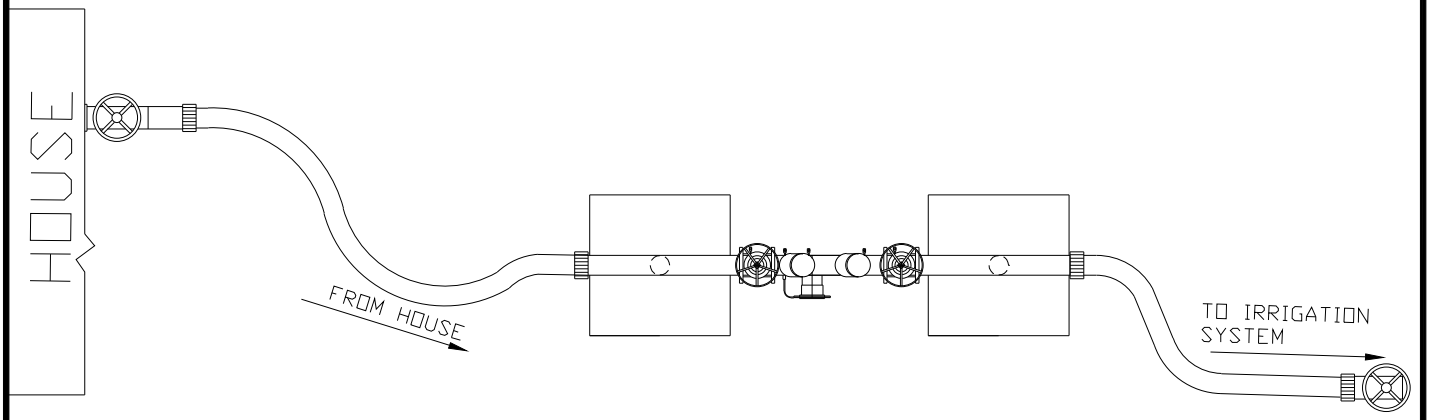
DATE	07/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-20

SHEET 1 OF 2





ALTERNATE RPBA INSTALLATION

REDUCED PRESSURE BACKFLOW ASSEMBLY
FOR ASSEMBLIES 3/4'' TO 1''

NOTES:

1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND MIN. 12 INCHES.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST TEST ASSEMBLY UPON COMPLETION OF INSTALLATION.
4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.
5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
6) INSTALL USING THREAD TAPE ONLY.

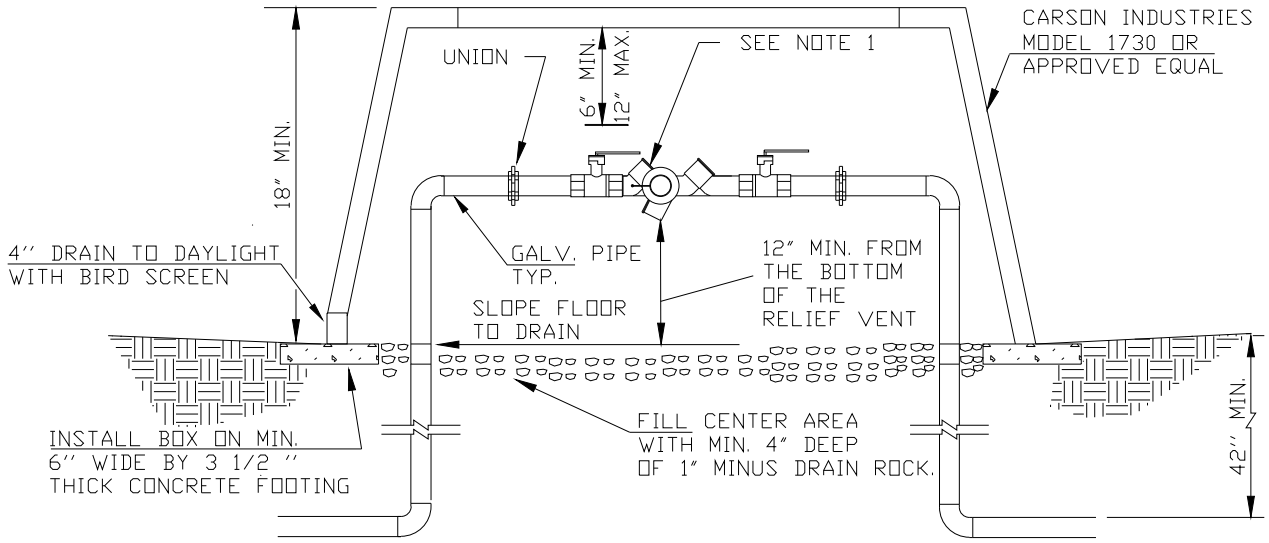
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

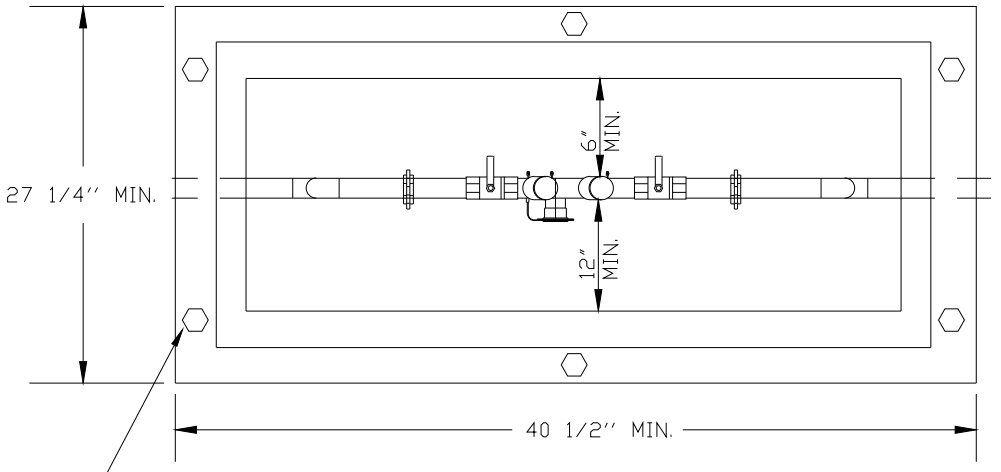
DATE	07/01
DWN	DDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-20

SHEET 2 OF 2





RPBA INSTALLATION

REDUCED PRESSURE BACKFLOW ASSEMBLY
FOR ASSEMBLIES 1 1/4'' TO 2''

NOTES:

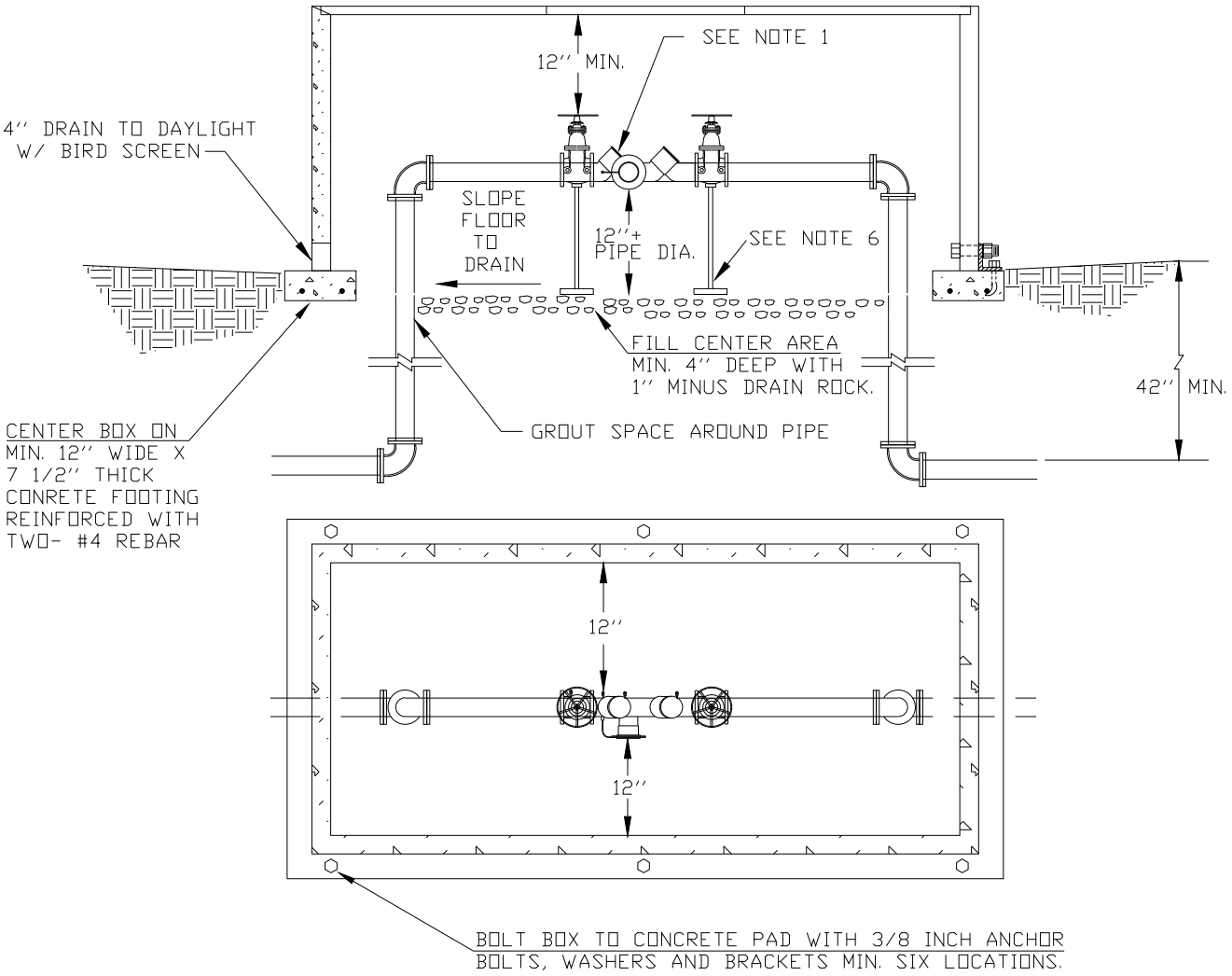
1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND MIN. 12 INCHES.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.
5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
6) INSTALL USING THREAD TAPE ONLY.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	11/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-21



RPBA INSTALLATION

REDUCED PRESSURE BACKFLOW ASSEMBLY
FOR ASSEMBLIES 2 1/2'' AND LARGER

NOTES:

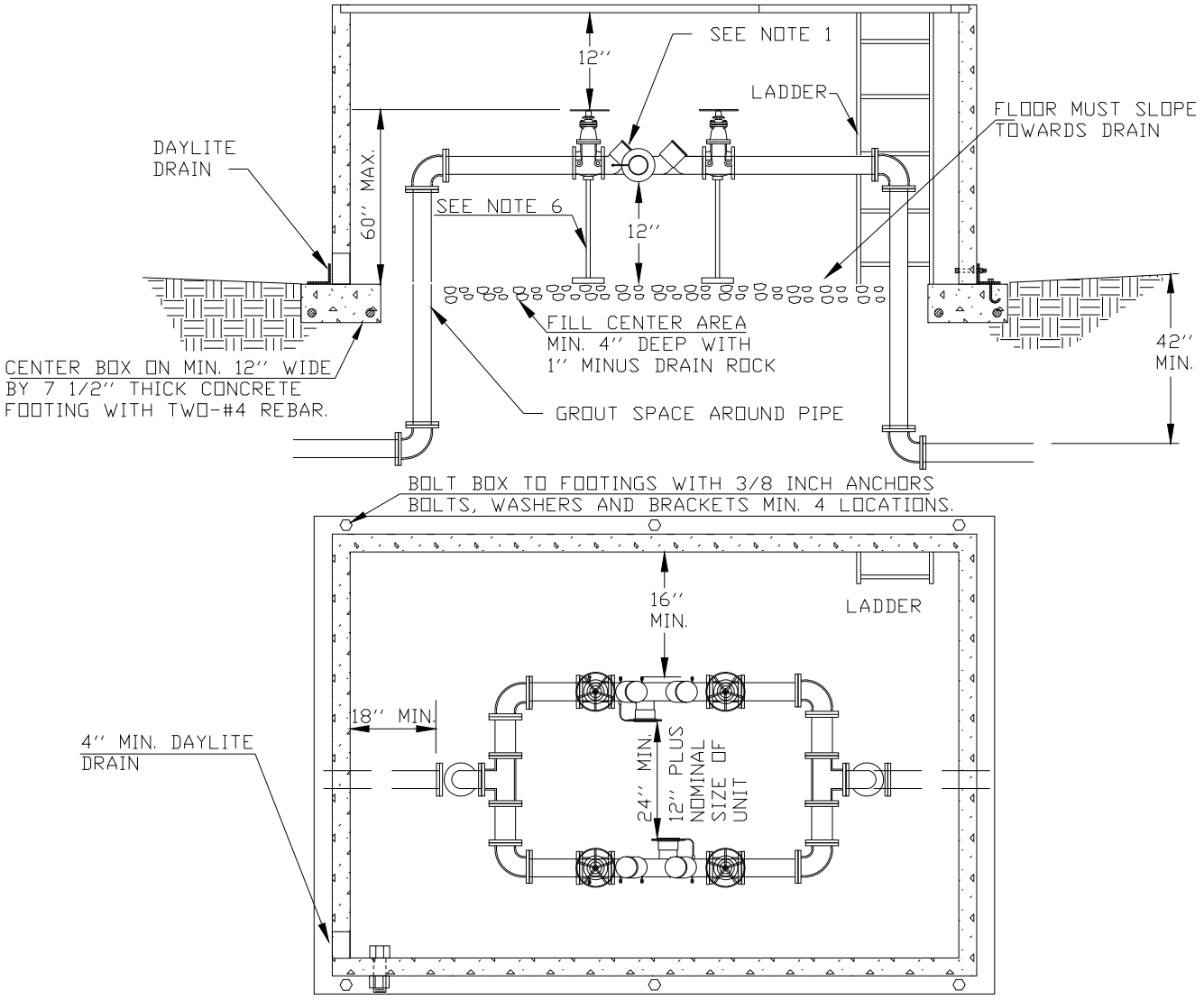
1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND. MIN. 12'' PLUS PIPE DIAMETER.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM THE RELIEF ASSEMBLY IS REQUIRED.
5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
6) SEE DWG. 4-12 FOR PIPE SUPPORTS. SET SUPPORTS ON CONCRETE BLOCKS.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	11/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-22



RPBA DUAL INSTALLATION

REDUCED PRESSURE BACKFLOW ASSEMBLY
FOR ASSEMBLIES 3'' AND LARGER

NOTES:

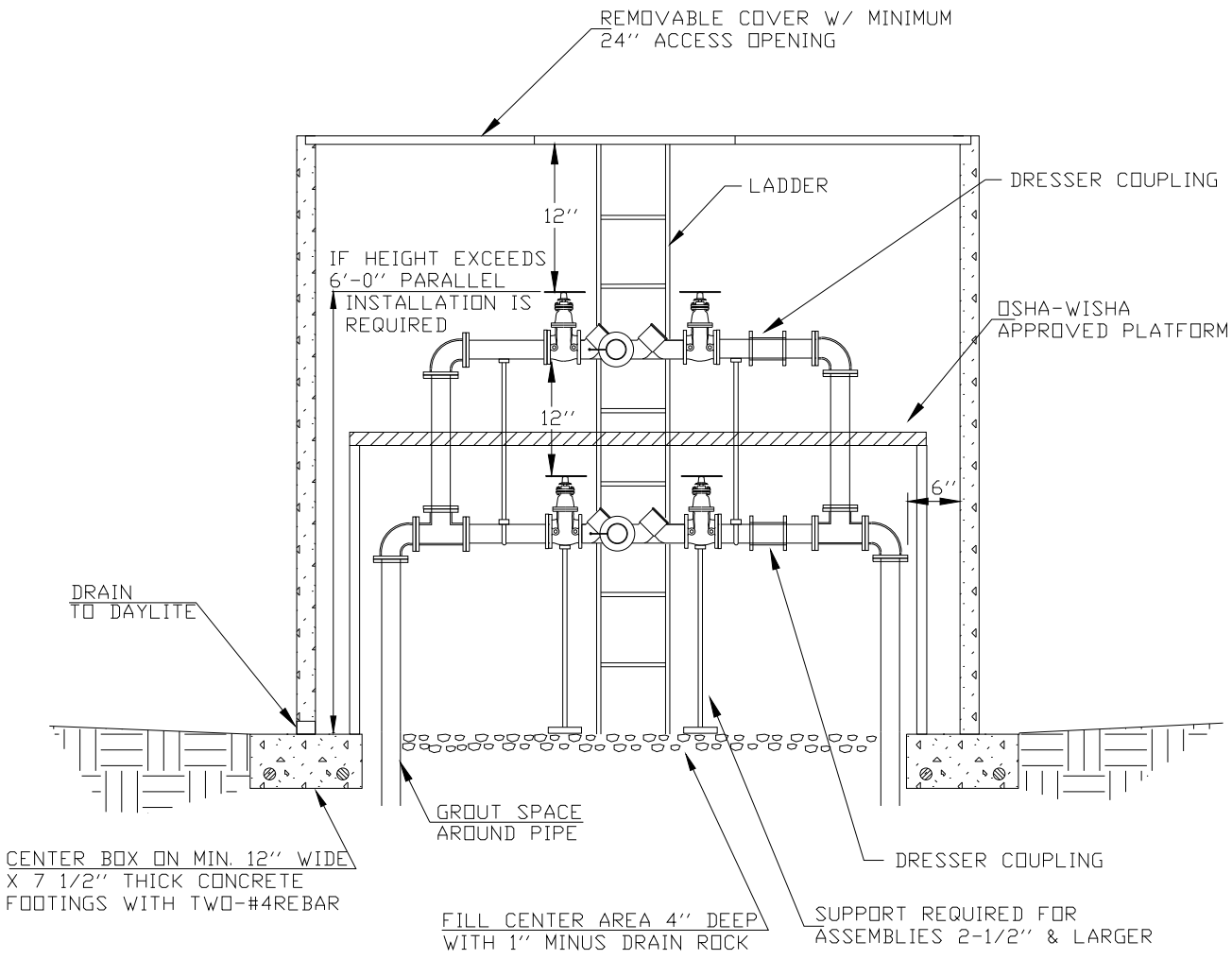
1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT MAXIMUM DISCHARGE FROM BOTH RELIEF ASSEMBLIES IS REQUIRED.
5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
6) SEE DWG. 4-12 FOR PIPE SUPPORTS. SET SUPPORTS ON CONCRETE BLOCKS.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	11/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-23



RPBA DUAL INSTALLATION

REDUCED PRESSURE BACKFLOW ASSEMBLY
REQUIRED FOR CONTINUOUS PROTECTION

NOTES:

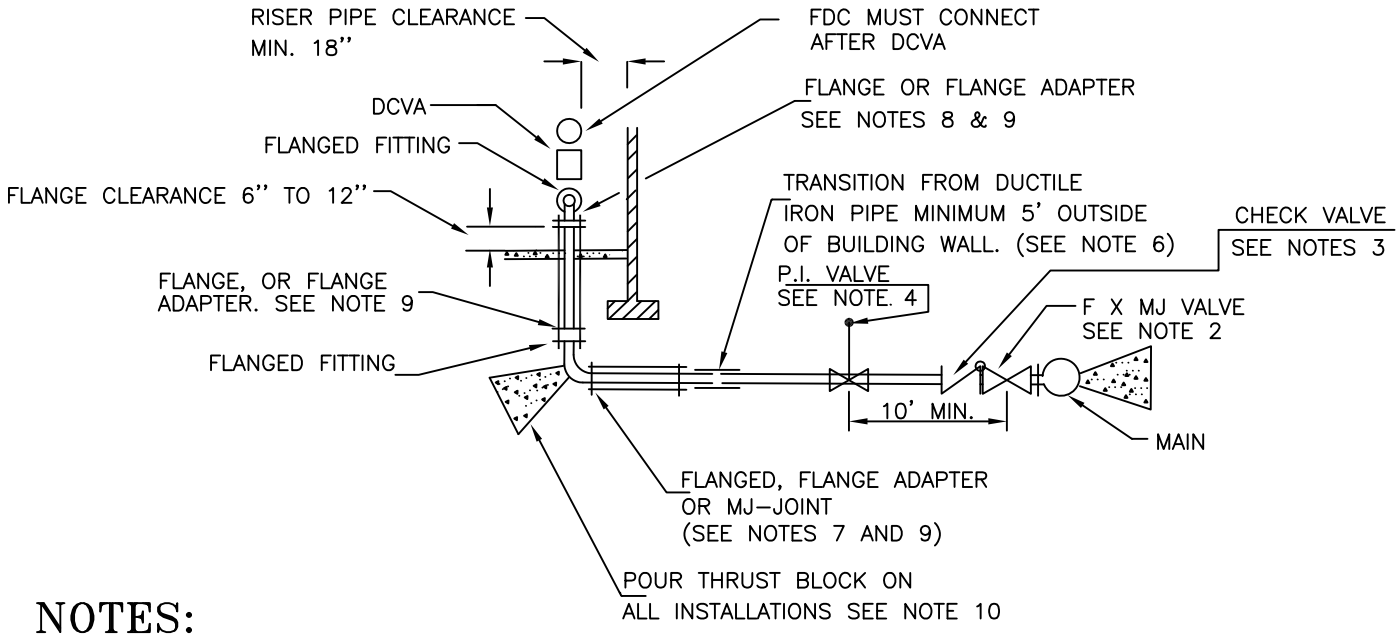
1) MUST BE ON THE LATEST DEPT. OF HEALTH APPROVED LIST OF BACKFLOW PREVENTION ASSEMBLIES.
2) MUST BE INSTALLED ABOVE GROUND.
3) A CITY OF KENNEWICK CROSS CONNECTION SPECIALIST MUST BE PRESENT DURING INSTALLATION.
4) WHEN INSTALLED INSIDE A BUILDING, A FLOOR DRAIN SIZED TO ACCEPT DISCHARGE FROM BOTH ASSEMBLIES IS REQUIRED.
5) FREEZE PROTECTION IS THE RESPONSIBILITY OF THE OWNER.
6) SUFFICIENT CLEARANCE IS REQUIRED FROM THE TOP OF THE VALVE STEM WHEN FULLY OPEN TO THE BOTTOM OF THE TOP ASSEMBLY.
7) AN OSHA-WISHA APPROVED PLATFORM MUST BE ERECTED FOR MAINTENANCE AND TESTING.
8) GUARD POSTS ARE REQUIRED IN AREAS WHERE FORK LIFTS ARE USED (CITY OF KENNEWICK STANDARD DWG. 4-4 SHEET 2).

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	11/90
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

4-24



NOTES:

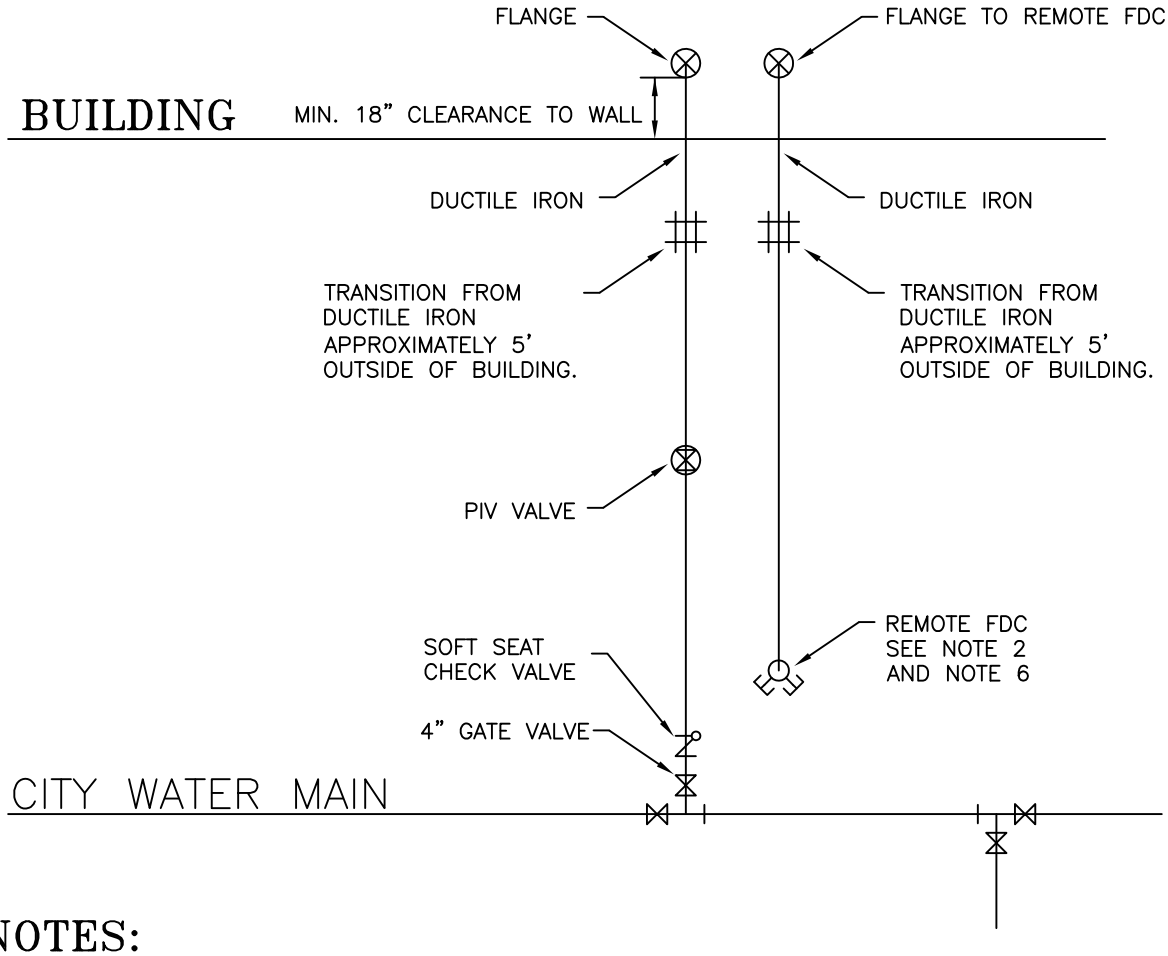
1. ENGINEERING INSPECTOR WILL INSPECT TO THE FLANGE ABOVE THE BUILDING FLOOR.
2. CITY STANDARD VALVE AND VALVE BOX REQUIRED AT CONNECTION TO CITY MAIN LINE.
3. A SINGLE SOFT SEAT CHECK VALVE IS REQUIRED.
4. FIRE DEPT. APPROVED POST INDICATOR (P.I.) VALVE REQUIRED A MINIMUM OF 10 FEET FROM THE CITY MAIN LINE ISOLATION VALVE AND REMOTE FROM THE BUILDING.
5. APPROVED BACK FLOW PREVENTION ASSEMBLY REQUIRED (SEE STD. DWG.'S 4-12 THROUGH 4-24)
6. FITTINGS AND PIPE WITHIN THE BUILDING LIMITS, AND TO A MINIMUM 5 FEET OUTSIDE OF THE BUILDING, SHALL BE AWWA CAST OR DUCTILE IRON, AS SPECIFIED IN SECTION 4 OF THE CITY SPECIFICATIONS.
7. JOINT TO BE FLANGED, OR FLANGE ADAPTER.
8. ALTERNATE MJ FITTING MAY BE USED.
9. FLANGE ADAPTER TO BE 250 PSI RATED DUCTILE OR CAST IRON "UNION FLANGE" AS MFG. BY UNION FOUNDRY CO., UNIFLANGE OR EQUAL.
10. CONSTRUCT A THRUST BLOCK ON THE 90° BEND UNDER THE FLOOR SIZED FOR THE SIZE OF PIPE AND TYPE OF FILL. SIZE TO BE 1.34 TIMES THAT CALLED FOR IN STD. DWG. 4-6.
11. PRESSURE TEST ALL FIRE LINE INSTALLATIONS, INCLUDING THE FIRE DEPARTMENT CONNECTION AT 200 PSI FOR 2 HOURS, PER THE REQUIREMENTS OF SECTION 4-1.08.02 OF THESE SPECIFICATIONS.
12. CONTRACTOR TO PROVIDE PITOT TUBE FOR MEASURING FLOW DURING FLUSHING, IF A REDUCED SIZE FLUSH PIPE IS USED. THE CONTRACTOR IS RESPONSIBLE TO CONTROL ALL FLUSH WATER.

FIRE LINE/FDC
(INTO BUILDING)

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/94
DWN	CJD
REV	6/15
CHK	BWB
SCALE	NTS

DWG. NO.
4-25
SHEET 1 OF 2



NOTES:

1. UNDERGROUND FIRE MAINS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 24.
2. THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE INSTALLED REMOTE FROM THE BUILDING AND WITHIN (90) FEET OF A FIRE HYDRANT. THE FDC SHALL BE INSTALLED TO A HEIGHT OF (3) FEET ABOVE FINAL GRADE AND BE PROVIDED WITH A (3) FOOT CLEAR SPACE AROUND THE CIRCUMFERENCE OF THE PIPE.
3. THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE CONNECTED TO THE DOWNSTREAM SIDE OF THE BACKFLOW DEVICE.
4. UNDERGROUND PIPING SHALL BE LISTED FOR FIRE PROTECTION SERVICE OR COMPLY WITH NFPA STANDARD 24, TABLE 10.1.1. A CUT SHEET SHALL BE PROVIDED TO THE FIRE DEPARTMENT, AND SUBMITTED PRIOR TO INSTALLATION FOR APPROVAL.
5. THE BACKFLOW DEVICE SHALL BE INSTALLED ON THE INTERIOR OF THE BUILDING UNLESS OTHERWISE APPROVED BY THE KENNEWICK FIRE DEPARTMENT, FIRE MARSHAL'S OFFICE OR CITY OF KENNEWICK, PUBLIC WORKS. (SEE STANDARD DWG'S 4–12 THROUGH 4–24). CITY CROSS CONNECT SPECIALIST MUST INSPECT THE BACKFLOW ASSEMBLY.
6. KNOX BRAND LOCKS SHALL BE INSTALLED ON INTAKE CONNECTIONS (FDC'S) OF ALL NEW CONSTRUCTION, TENANT IMPROVEMENTS, AND FIRE SYSTEMS WHICH HAVE HAD THEIR 5–YEAR TEST COMPLETED.
7. A DETAILED DRAWING OF THE AREA, FROM THE WATER MAIN TO THE FLANGE ABOVE THE BUILDING FLOOR, SHALL BE SUBMITTED FOR REVIEW PRIOR TO INSTALLATION.
8. ALL UNDERGROUND GALVANIZED PIPES SHALL BE WRAPPED WITH AN APPROVED MATERIAL. A WRAP SPECIFICATION SHEET, WITH THE UNDERGROUND DRAWINGS, SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.

FIRE LINE/FDC
(INTO BUILDING)

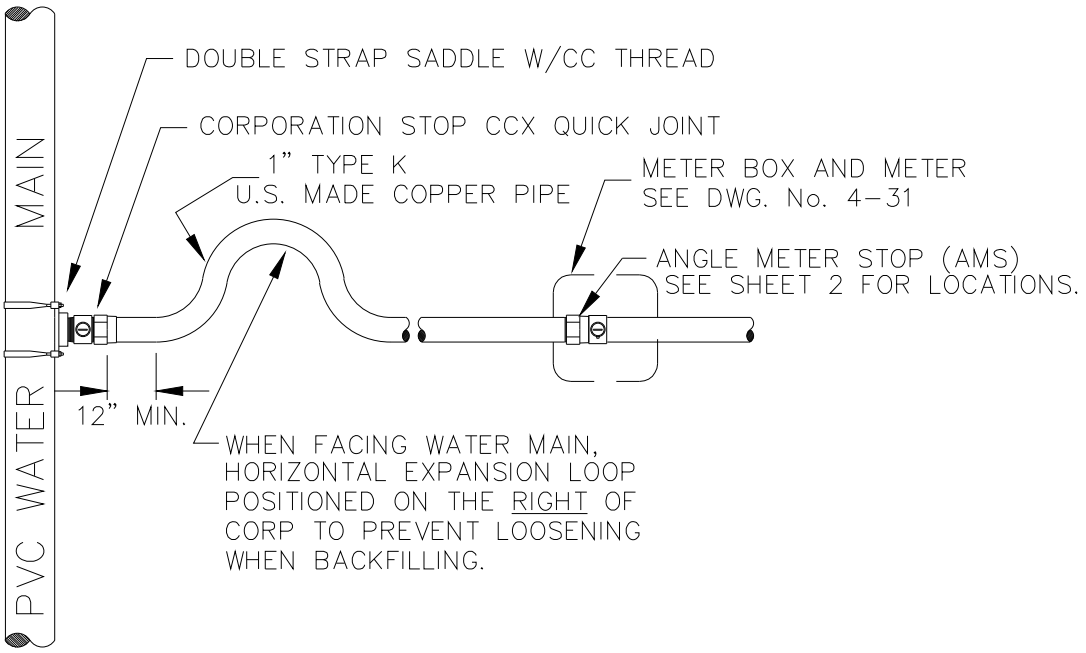
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	6/15
DWN	RAW
REV	9/15
CHK	BWB
SCALE	NTS

DWG. NO.
4-25
SHEET 2 OF 2

PLAN VIEW

SEE SHEET 2 FOR PROFILE VIEW



NOTES:

1. MINIMUM SERVICE PIPE SIZE IS 1 INCH.

2. SEE SECTION 4-3 FOR MATERIAL SPECIFICATIONS AND SHEET 2 FOR ADDITIONAL INSTALLATION REQUIREMENTS

3. ALL BENDS TO BE A MINIMUM OF ONE FOOT FROM ALL SERVICE LINE FITTINGS.

1" SINGLE WATER SERVICE
FROM PVC WATER MAIN

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	10/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

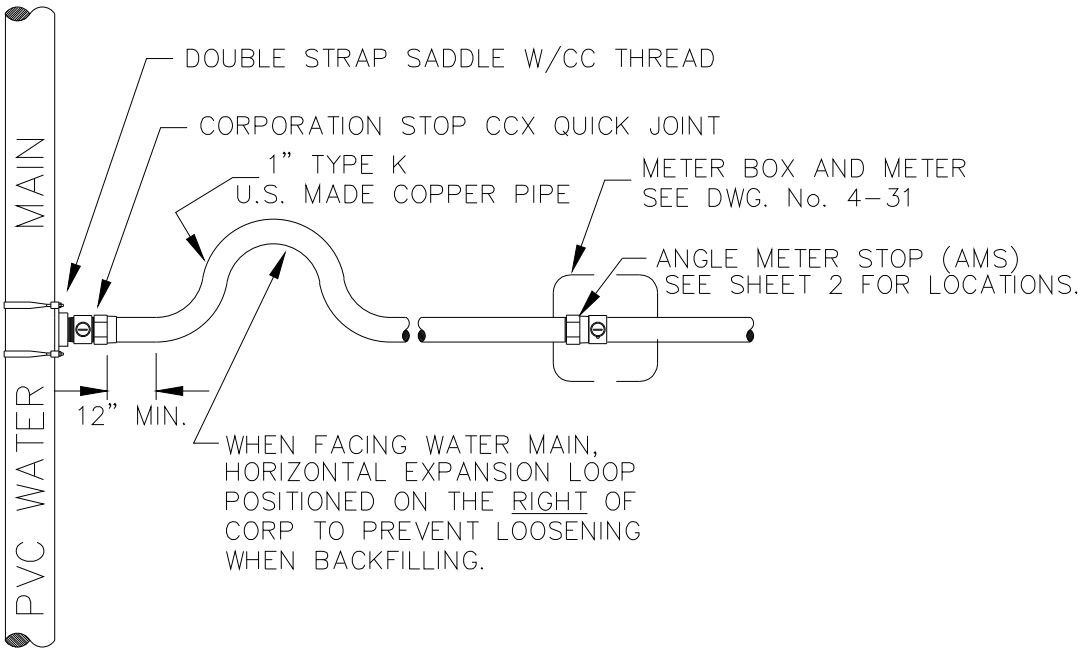
DWG. NO.

4-26

SHEET 1 OF 2

PLAN VIEW

SEE SHEET 2 FOR PROFILE VIEW



NOTES:

1. MINIMUM SERVICE PIPE SIZE IS 1 INCH.

2. SEE SECTION 4-3 FOR MATERIAL SPECIFICATIONS AND SHEET 2 FOR ADDITIONAL INSTALLATION REQUIREMENTS

3. ALL BENDS TO BE A MINIMUM OF ONE FOOT FROM ALL SERVICE LINE FITTINGS.

1" SINGLE WATER SERVICE
FROM PVC WATER MAIN

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	10/93
DWN	CJD
REV	3/14
CHK	BWB
SCALE	NTS

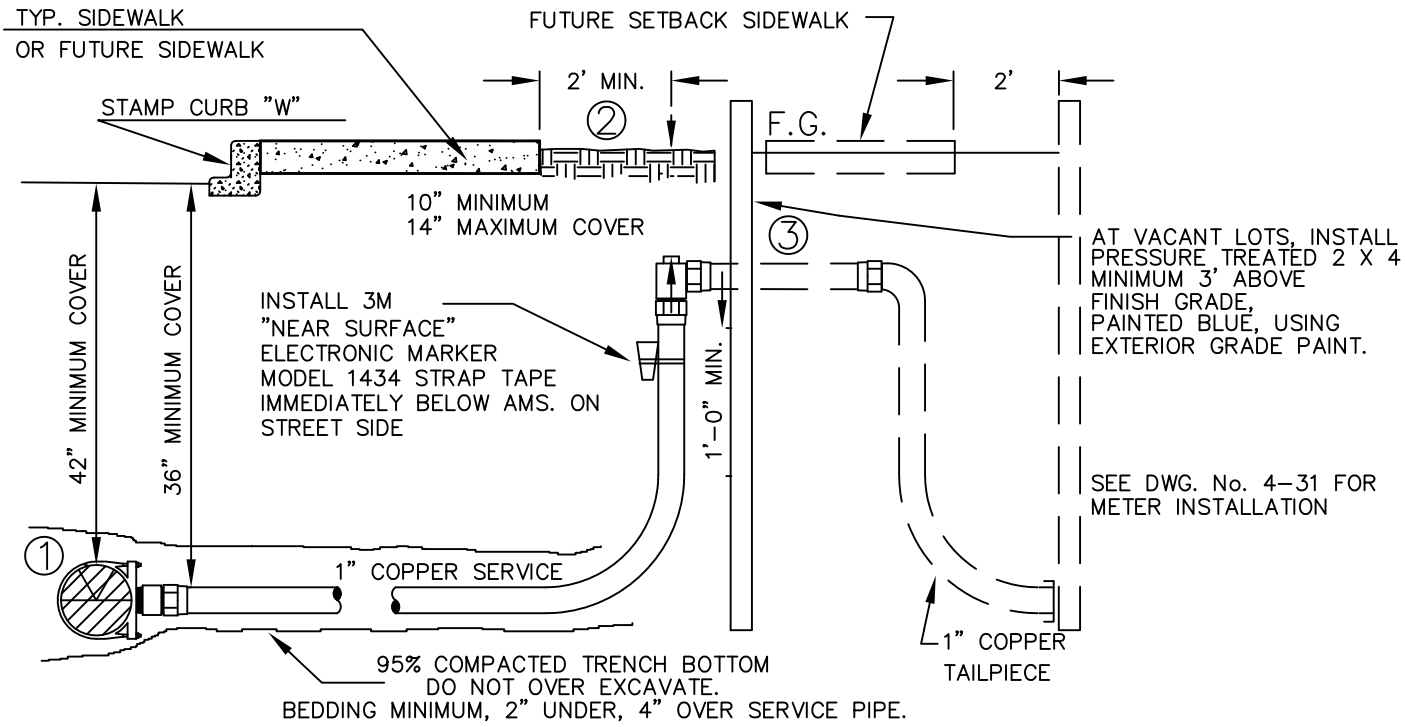
DWG. NO.

4-26

SHEET 1 OF 2

PROFILE VIEW

SEE SHEET 1 FOR PLAN VIEW



NOTES:

1. TAP AT HORIZONTAL FOR P.V.C. PIPE. SEE DWG 4-28 FOR SERVICE FROM D.I., STEEL AND A.C. MAINS

2. FOR FUTURE SETBACK SIDEWALK WITH PLANTER STRIP, AMS WILL BE 2' BEHIND BACK OF CURB. SEE NOTE 3.

3. WHEN WALK WILL BE SET BACK FROM CURB WITH PLANTER STRIP, SET AMS 2' FROM BACK OF CURB AND INSTALL 11"X1" THREADED METER SPACER (LENGTH INCLUDES THREADS), TAILPIECE PER DWG 4-31 AND EXTEND SERVICE TO 2' BEYOND FUTURE SIDEWALK, CAP AND MARK.

1" SINGLE WATER SERVICE
FROM PVC WATER MAIN

CITY OF KENNEWICK

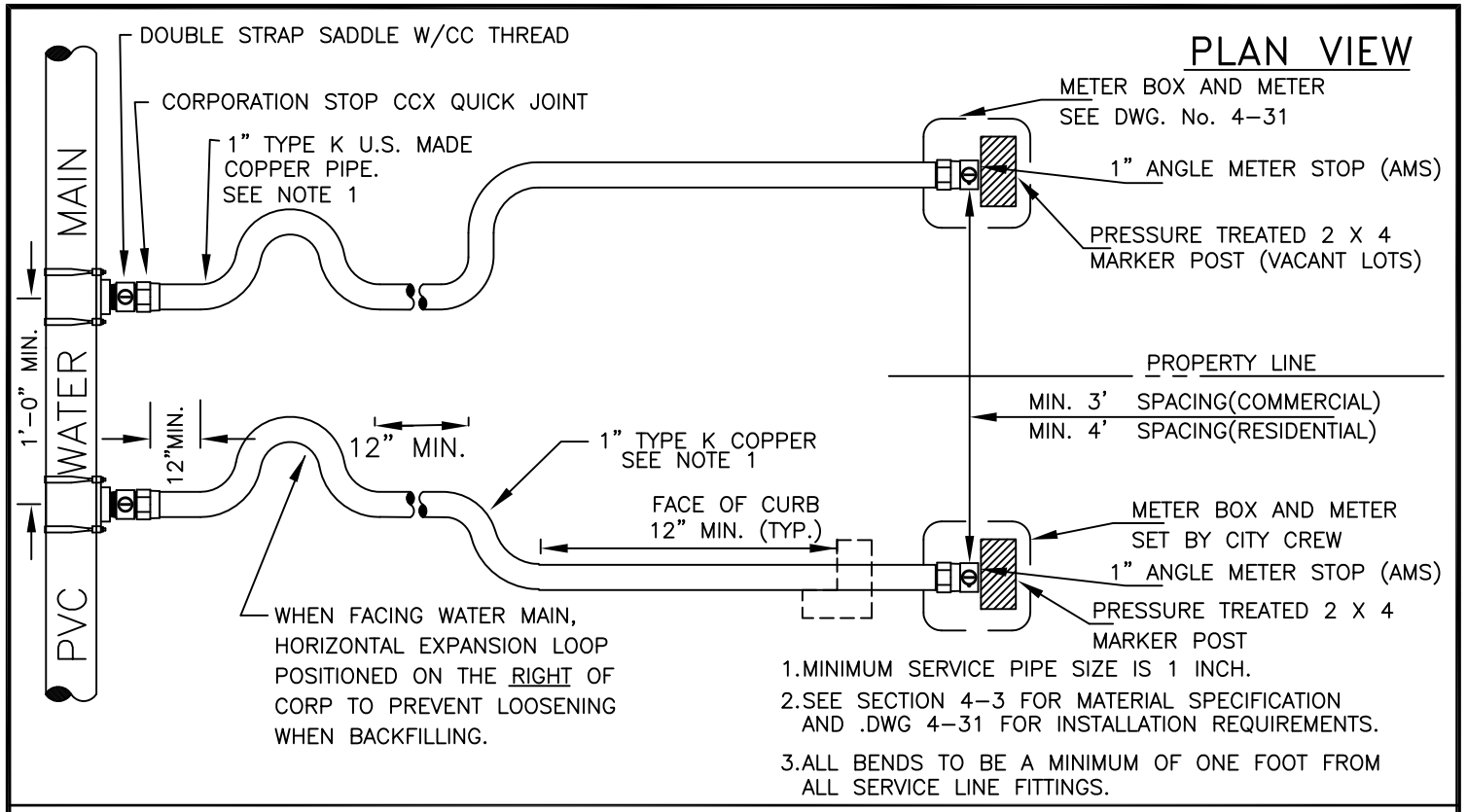
ENGINEERING DEPARTMENT

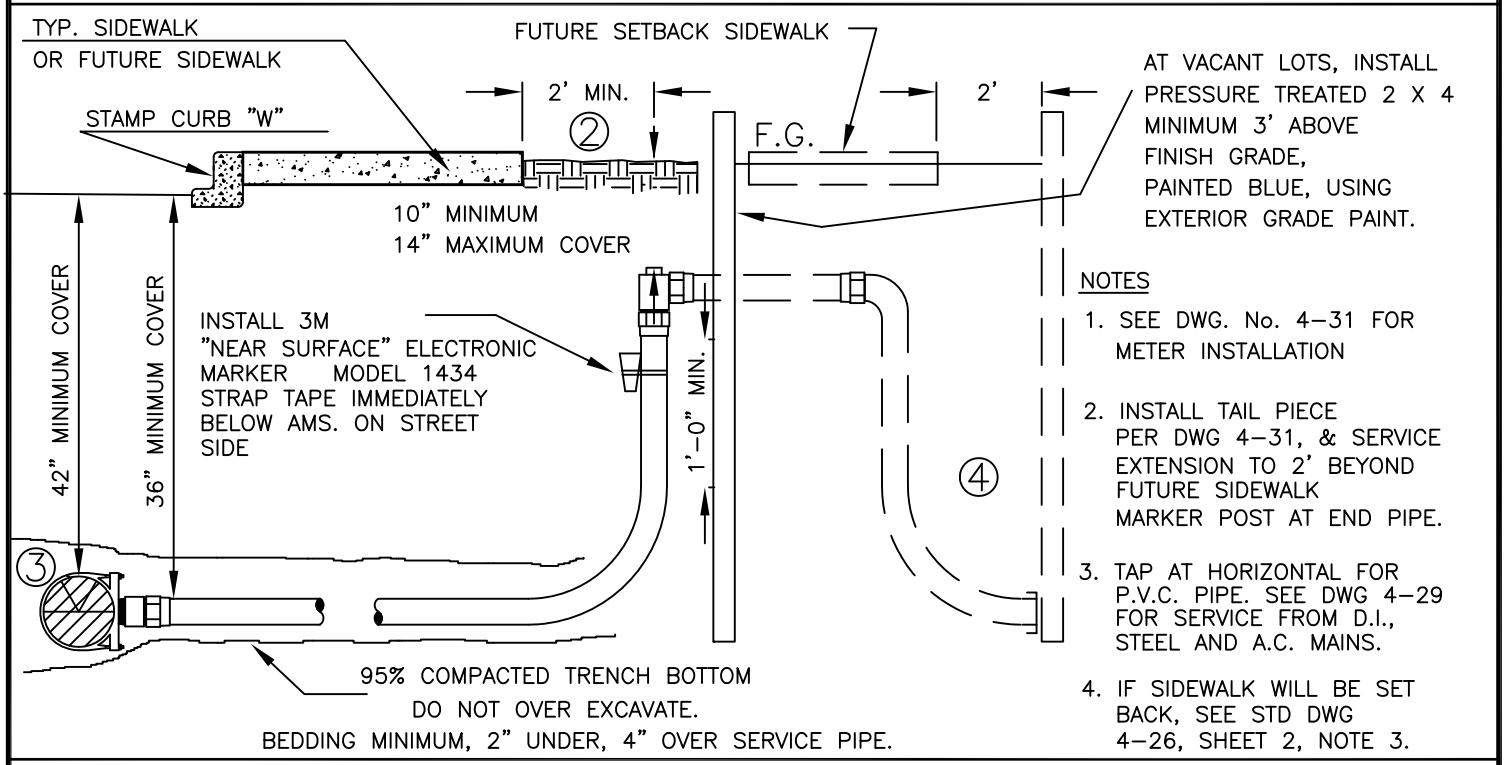
DATE	10/93
DWN	CJD
REV	2/15
CHK	BWB
SCALE	NTS

DWG. NO.

4-26

SHEET 2 OF 2





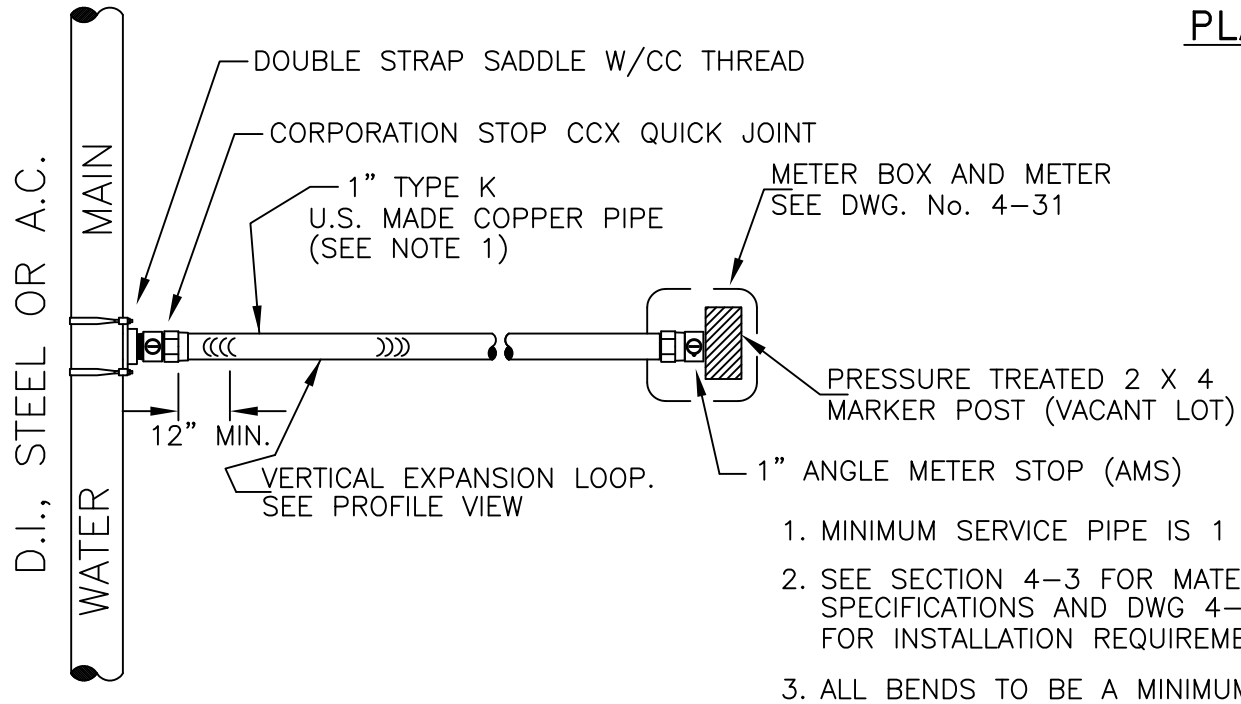
DOUBLE WATER SERVICE
FROM PVC WATER MAIN
1" TAPS, REQUIRES TWO

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	07/13
DWN	KDS
REV	2/15
CHK	BWB
SCALE	NTS

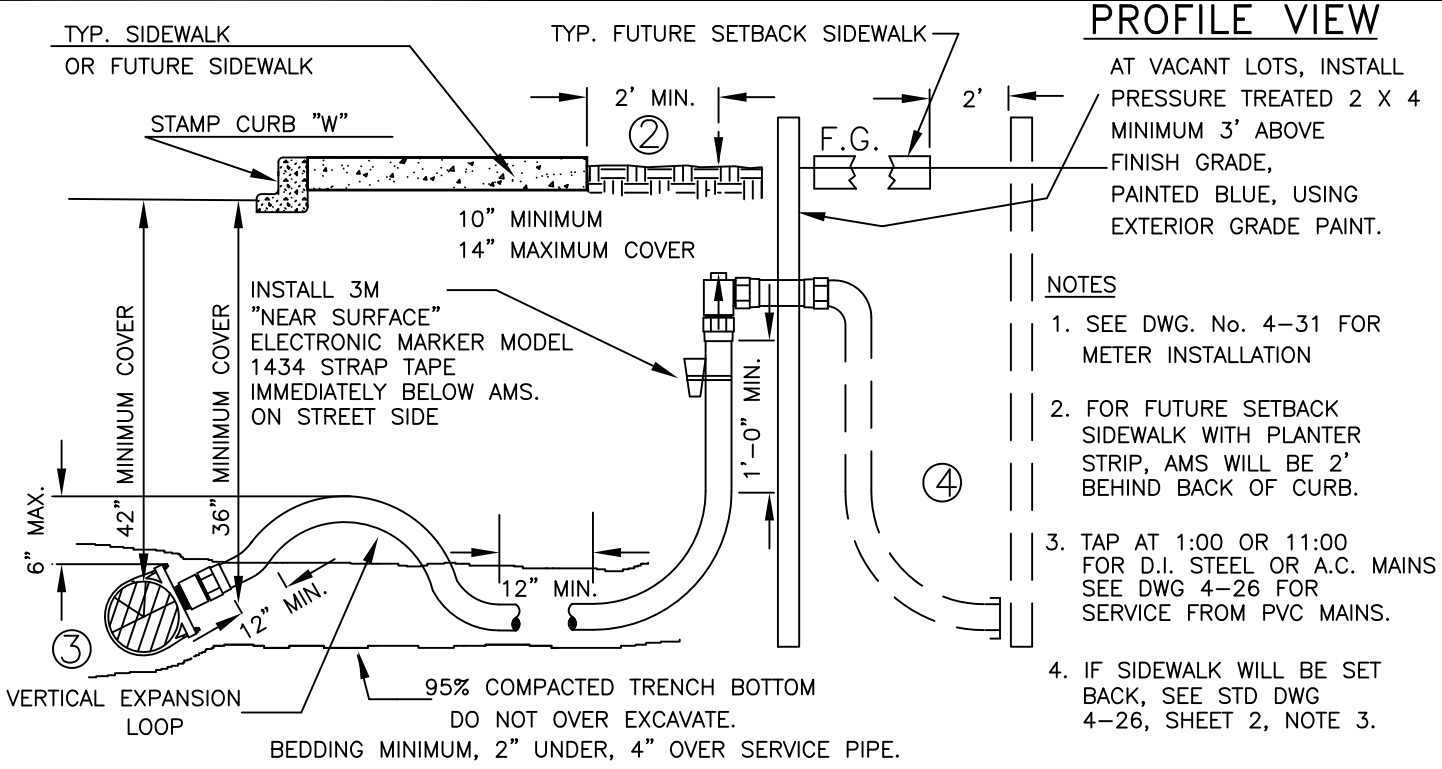
DWG. NO.
4-27

PLAN VIEW



1. MINIMUM SERVICE PIPE IS 1 INCH.
2. SEE SECTION 4-3 FOR MATERIAL SPECIFICATIONS AND DWG 4-31 FOR INSTALLATION REQUIREMENTS.
3. ALL BENDS TO BE A MINIMUM OF ONE FOOT FROM ALL SERVICE LINE FITTINGS.

PROFILE VIEW



AT VACANT LOTS, INSTALL PRESSURE TREATED 2 X 4 MINIMUM 3' ABOVE FINISH GRADE, PAINTED BLUE, USING EXTERIOR GRADE PAINT.

NOTES

1. SEE DWG. No. 4-31 FOR METER INSTALLATION
2. FOR FUTURE SETBACK SIDEWALK WITH PLANTER STRIP, AMS WILL BE 2' BEHIND BACK OF CURB.
3. TAP AT 1:00 OR 11:00 FOR D.I. STEEL OR A.C. MAINS SEE DWG 4-26 FOR SERVICE FROM PVC MAINS.
4. IF SIDEWALK WILL BE SET BACK, SEE STD DWG 4-26, SHEET 2, NOTE 3.

1" SINGLE WATER SERVICE FROM D.I., STEEL & A.C. MAINS

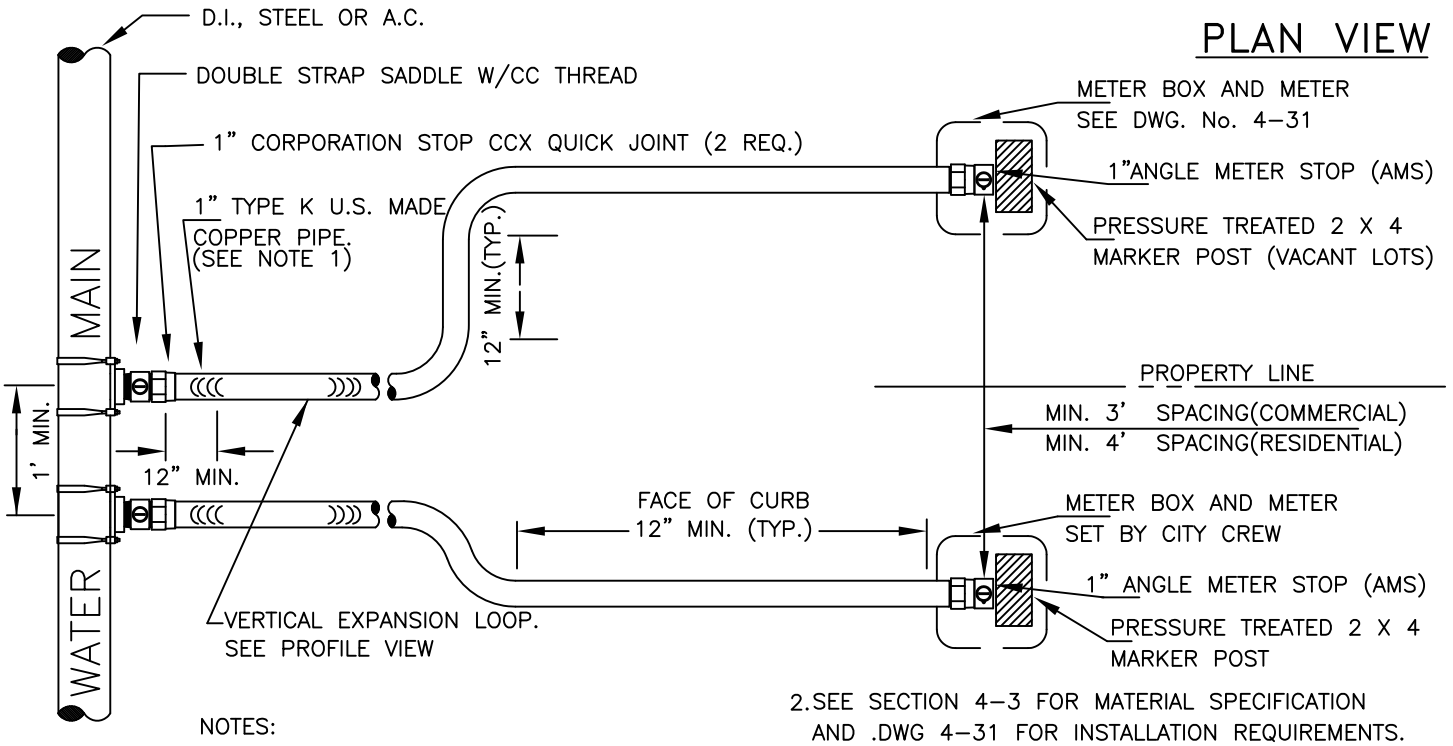
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	07/13
DWN	KDS
REV	2/15
CHK	BWB
SCALE	NTS

DWG. NO.

4-28

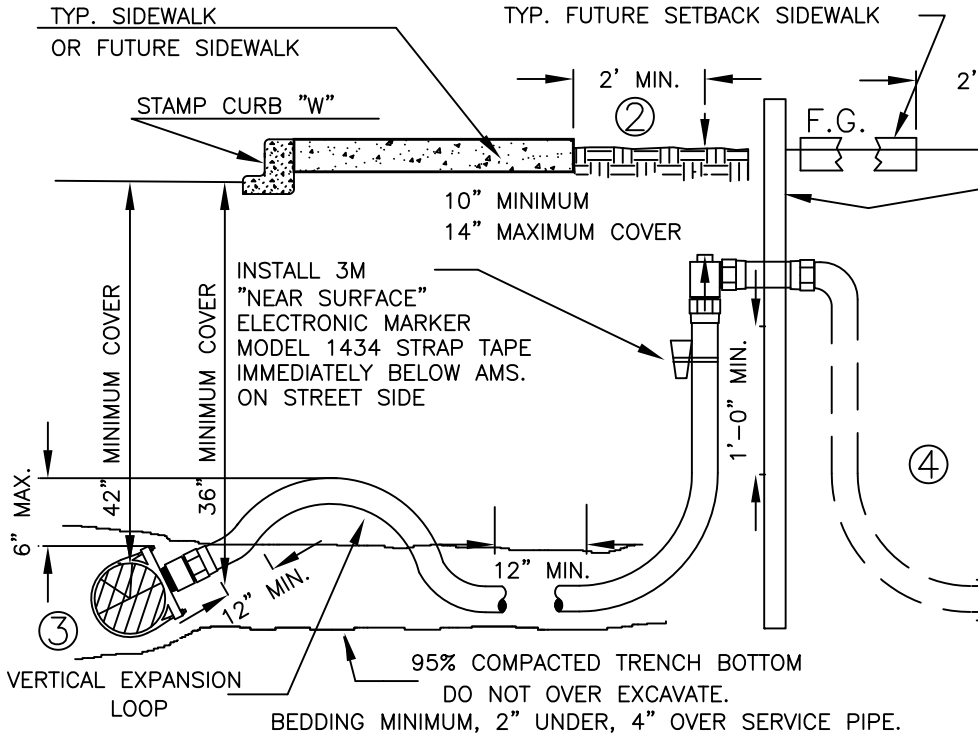
PLAN VIEW



NOTES:

1. MINIMUM SERVICE PIPE SIZE IS 1 INCH
2. SEE SECTION 4-3 FOR MATERIAL SPECIFICATION AND .DWG 4-31 FOR INSTALLATION REQUIREMENTS.
3. ALL BENDS TO BE A MINIMUM OF ONE FOOT FROM ALL SERVICE LINE FITTINGS.

PROFILE VIEW



AT VACANT LOTS, INSTALL PRESSURE TREATED 2 X 4 MINIMUM 3' ABOVE FINISH GRADE, PAINTED BLUE, USING EXTERIOR GRADE PAINT.

NOTES

1. SEE DWG. No. 4-31 FOR METER INSTALLATION
2. FOR FUTURE SETBACK SIDEWALK WITH PLANTER STRIP, AMS WILL BE 2' BEHIND BACK OF CURB.
3. TAP AT 1:00 OR 11:00 FOR D.I. STEEL OR A.C. MAINS SEE DWG 4-26 FOR SERVICE FROM PVC MAINS.
4. IF SIDEWALK WILL BE SET BACK, SEE STD DWG 4-26, SHEET 2, NOTE 3.

1" DOUBLE WATER SERVICE

FROM D.I., STEEL & A.C. MAINS

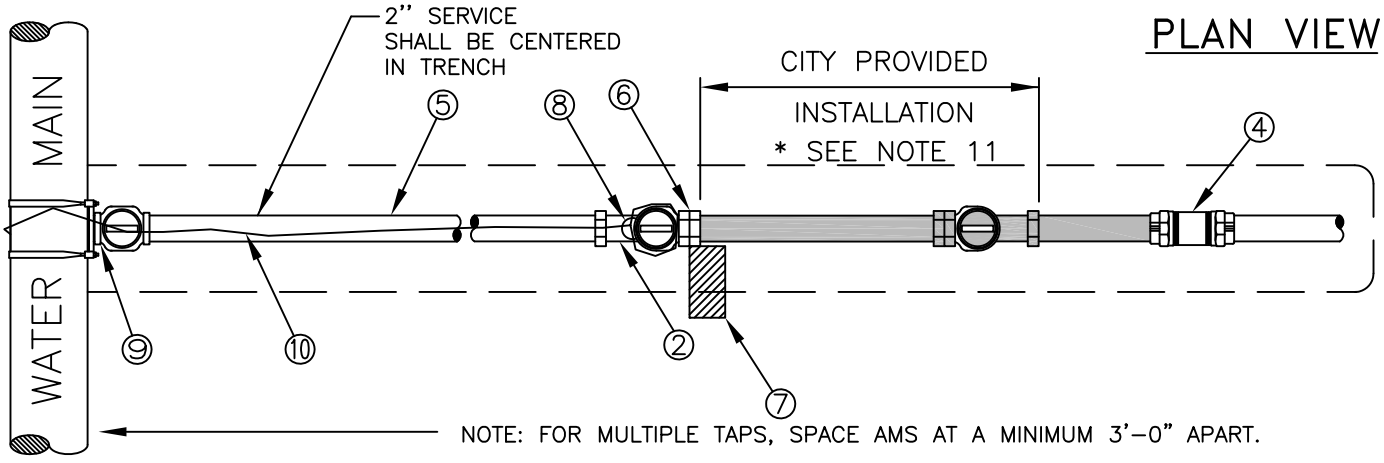
CITY OF KENNEWICK

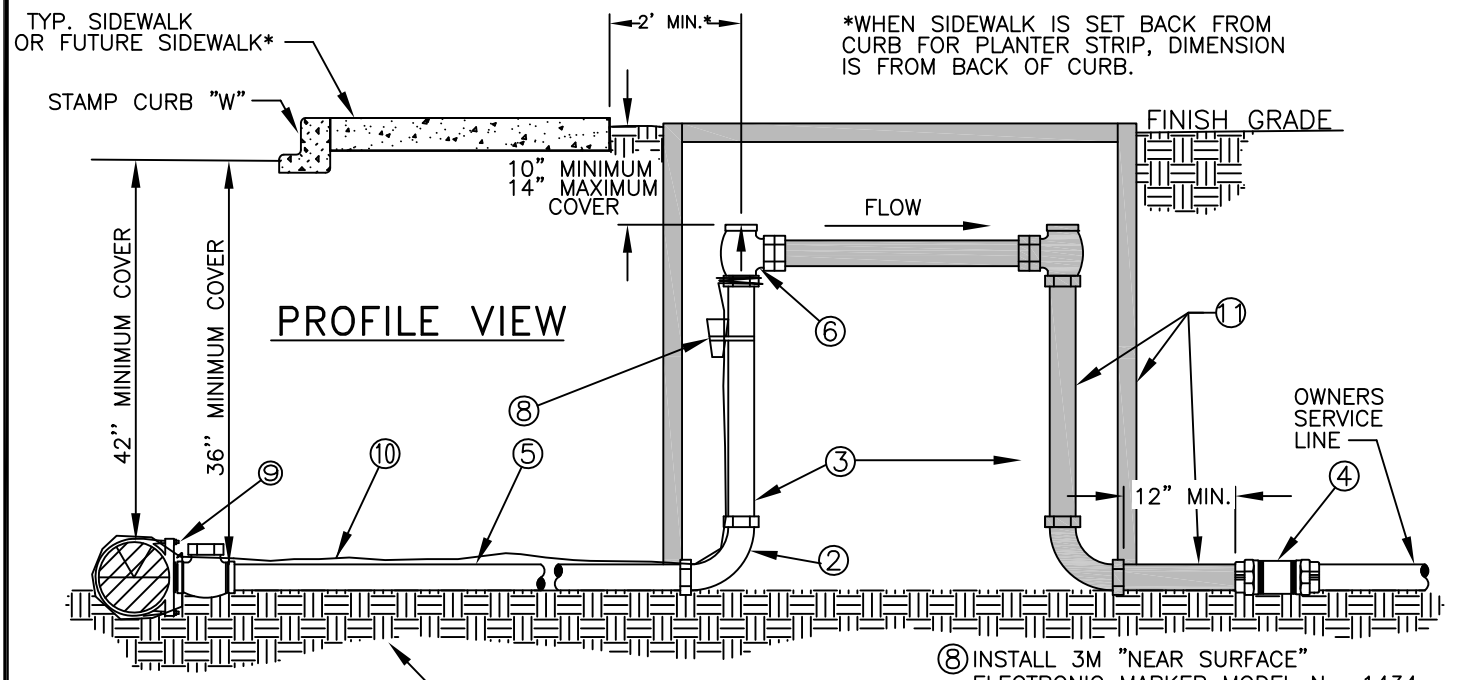
ENGINEERING DEPARTMENT

DATE	07/13
DWN	KDS
REV	2/15
CHK	BWB
SCALE	NTS

DWG. NO.

4-29





METER ASSEMBLY MATERIALS

① METER BOX– CITY SUPPLIED

② 2" X 90° COMPRESSION ELL

③ 2" TYPE "K" COPPER TUBING

④ 2" COMPRESSION COUPLING, REDUCER AS REQUIRED, DIELECTRIC UNION IF SERVICE IS GALVANIZED.

⑤ 2" POLYETHYLENE PIPE

⑥ 2" ANGLE METER STOP. IF IN PLANTER STRIP AT BACK OF CURB, INSTALL 17 1/4" SPACER(FLG TO FLG) FOR FUTURE METER BY CITY CREWS.

⑦ CONTRACTOR TO INSTALL GROUND CONTACT PRESSURE TREATED 2"x4"x6' MARKER POST. SET TOP 3' ABOVE FINISH GRADE, PAINTED BLUE, USING EXTERIOR GRADE PAINT.

⑧ INSTALL 3M "NEAR SURFACE" ELECTRONIC MARKER MODEL No. 1434. STRAP TAPE IMMEDIATELY BELOW A.M.S. ON STREET SIDE– IF STUB ONLY IS PROVIDED–SEE DWG 4–29

⑨ 2" DOUBLE STRAP, SADDLE & CORP. STOP, IRON PIPE THREAD X COMPRESSION TAP AT HORIZONTAL FOR ALL MAINLINE PIPE TYPES

⑩ LOCATE WIRE– CONNECT TO METALLIC MAIN LINE OR MAIN LINE LOCATE WIRE AND TERMINATE AT METER LOCATION

⑪ FOR COMMERCIAL PERMITS, THE CITY WATER DEPT. SUPPLIES AND INSTALLS THE METER BOXES & METERS AND TAIL PIECE AS PART OF THE PERMIT.

2 INCH WATER SERVICE

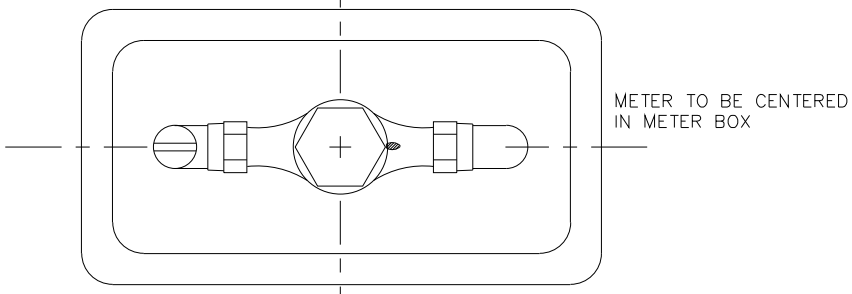
REQUIRED FOR 2" METER INSTALLATIONS
SEE SECTION 4–3 FOR MATERIAL SPECIFICATIONS AND INSTALLATION REQUIREMENTS

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

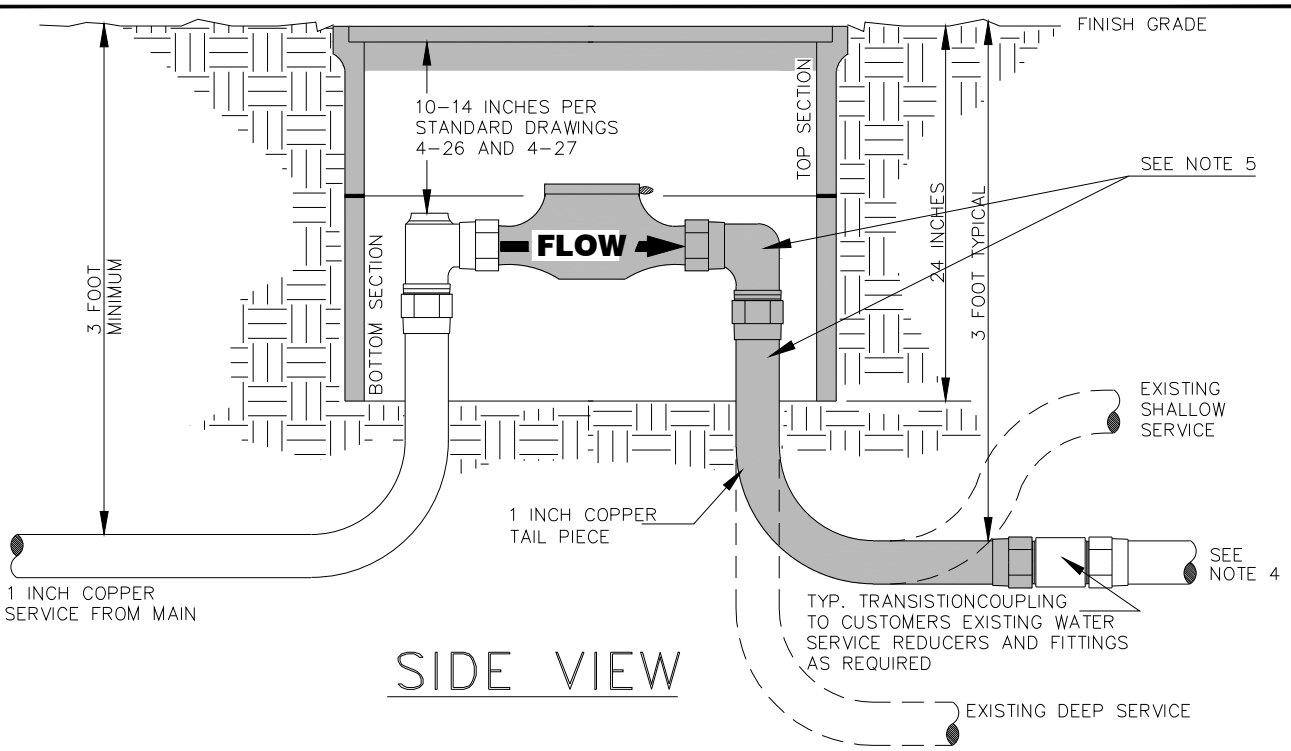
DATE	07/13
DWN	KDS
REV	2/15
CHK	BWB
SCALE	NTS

DWG. NO.

4-30



TOP VIEW



SIDE VIEW

NOTE:

1) BOTTOM SECTION TO BE ADJUSTED BY COMPACTING MATERIAL 24 INCHES BELOW THE SURFACE TO ALLOW TOP SECTION TO SET LEVEL WITH SURFACE.
2) NO ADJUSTMENT MATERIALS OR GROUT ALLOWED BETWEEN METER BOX SECTIONS.
3) SEE CITY STD SECTION 4–3 FOR MATERIAL SPECIFICATIONS AND INSTALLATION REQUIREMENTS. SPACE AMS A MINIMUM 3' APART (COMMERCIAL) AND A MINIMUM 4' APART (RESIDENTIAL).
4) WHERE THE EXISTING SERVICE IS GALVANIZED INSTALL DIELECTRIC UNION BETWEEN THE NEW COPPER AND GALVANIZED PIPES.
5) FOR NEW HOME CONNECTIONS AND ALL COMMERCIAL PERMITS, THE CITY WATER DEPT. SUPPLIES AND INSTALLS THE METER BOXES, AND METER. WHEN THE SIDEWALK IS LOCATED AT THE CURB. THE CITY WILL ALSO SUPPLY AND INSTALL THE TAIL PIECE, AS PART OF THE PERMIT.

WATER METER INSTALLATION

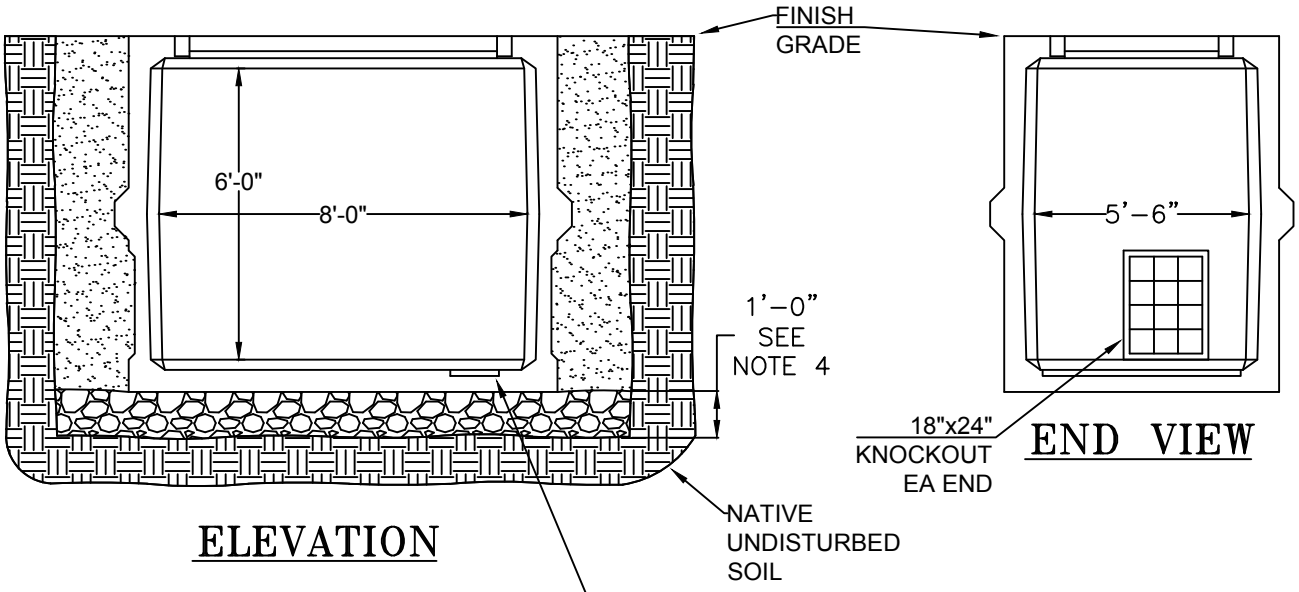
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	2/95
DWN	FSG
REV	3/14
CHK	BWB
SCALE	NTS

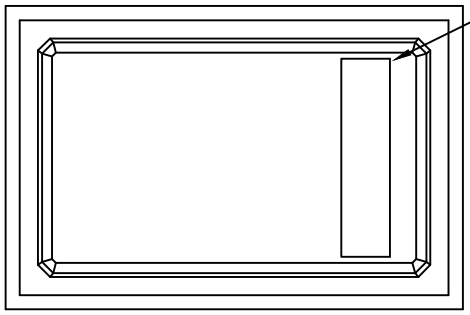
DWG. NO.

4-31

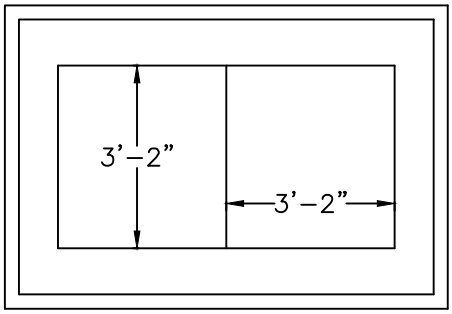


ELEVATION

END VIEW



PLAN



ACCESS HATCH

NOTES

1) THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR ASSIGNED TO THE PROJECT TO SET UP A MEETING WITH A REPRESENTATIVE OF THE CITY OF KENNEWICK WATER DEPT, CONTRACTOR AND CITY INSPECTOR PRIOR TO BEGINNING EXCAVATION OF THE VAULT HOLE AND TO SCHEDULE THE METER AND METER VAULT INSTALLATION.

2) IN ALL VEHICLE TRAFFIC ARES, THE VAULT STRUCTURE, INCLUDING BASE SECTION, TOP SECTION, LID SECTION AND ACCESS HATCH SHALL CONFORM TO AASHTO H30 WHEEL LOAD RATINGS. IN LANDSCAPED AREAS THE VAULT STRUCTURE, INCLUDING BASE SECTION, TOP SECTION, LID SECTION AND ACCESS HATCH SHALL CONFORM TO AASHTO H20 WHEEL LOAD RATINGS. INSIDE DIMENSIONS OF VAULTS FOR 3 AND 4-INCH METERS SHALL MEASURE 96-INCHES BY 66-INCHES AND 72-INCHES TALL. ALL VAULTS SHALL HAVE A MANUFACTURES LOAD RATING CERTIFICATION. THE ACCESS HATCHES SHALL HAVE DOUBLE DOORS THAT OPEN BUTTERFLY STYLE.

3) EXCAVATION AREA FOR VAULTS SHALL BE 10 FT. WIDE X 11 FT. LONG. WHERE LARGER VAULTS ARE REQUIRED, THE EXCAVATION SHALL BE PROPORTIONATELY EXTENDED. EXCAVATION DEPTHS SHALL BE SUCH THAT THE ACCESS HATCHES WILL BE FLUSH WITH THE FINAL GRADE. VAULTS SHALL BE SET LEVEL AND PLUMB.

4) PLACE 12 INCHES OF WELL GRADED 1/2 IN. TO 1-1/2 IN. RIVER ROCK BELOW VAULT FOR BASE AND DRAINAGE.
ADDITIONAL EXCAVATION DEPTH MAY BE REQUIRED, IF THE BOTTOM OF THE EXCAVATED AREA IS LESS THAN 2 FT. BELOW THE BOTTOM OF THE EXISTING WATER MAIN THAT THE SERVICE LINE IS CONNECTED TO.

5) THE CONTRACTOR SHALL SUPPLY THE WATER SERVICE LINE TO 1 FOOT INSIDE THE METER VAULT. THE CITY PROVIDES AND INSTALLS THE WATER METER, BYPASS AND STUB PIPE OUT OF THE METER VAULT.

6) THE CONTRACTOR IS RESPONSIBLE FOR TRENCH / VAULT EXCAVATION AND BACKFILL. ALL CLEANUP AND LANDSCAPE RESTORATION SHALL BE COMPLETED BY THE CONTRACTOR.

3" AND 4" METER VAULT INSTALLATION
TYPICAL VAULT
N.T.S.

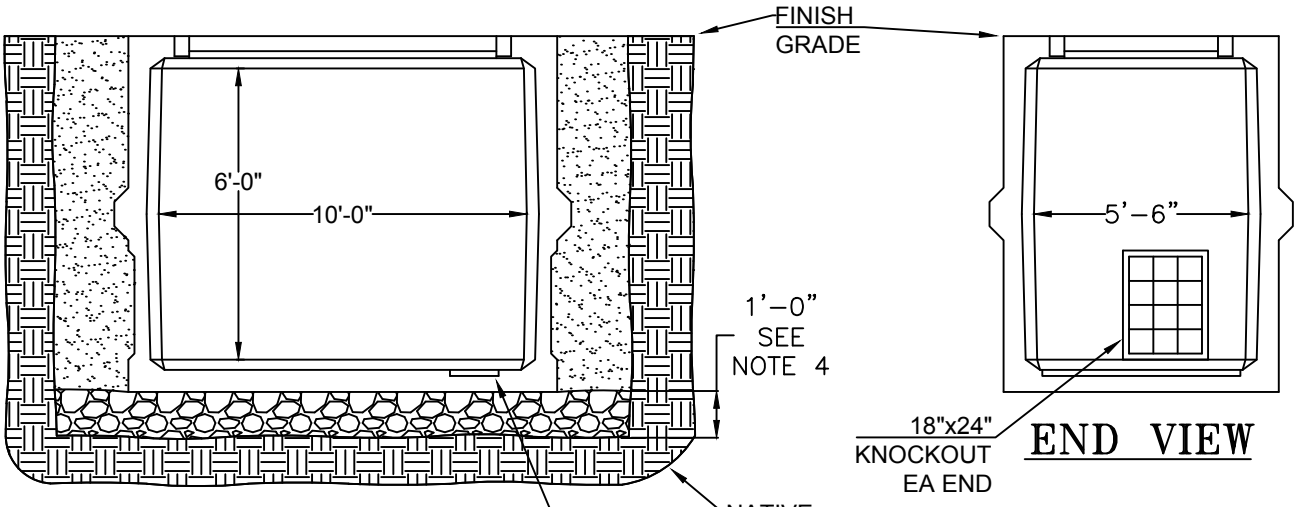
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/04
DWN	RAW
REV	5/16
CHK	BWB
SCALE	NTS

DWG. NO.

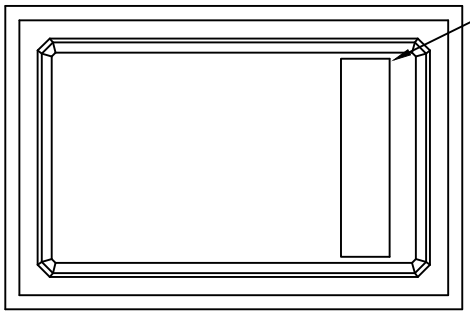
4-32

SHEET 1 OF 2

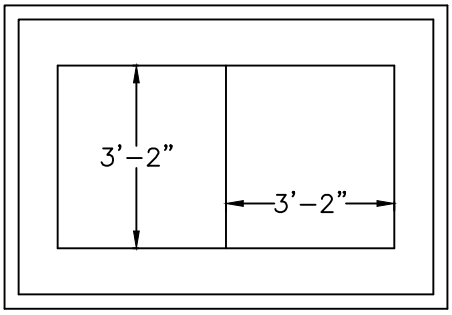


ELEVATION

END VIEW



PLAN



ACCESS HATCH

NOTES

1) THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR ASSIGNED TO THE PROJECT TO SET UP A MEETING WITH A REPRESENTATIVE OF THE CITY OF KENNEWICK WATER DEPT, CONTRACTOR AND CITY INSPECTOR PRIOR TO BEGINNING EXCAVATION OF THE VAULT HOLE AND TO SCHEDULE THE METER AND METER VAULT INSTALLATION.

2) IN ALL VEHICLE TRAFFIC ARES, THE VAULT STRUCTURE, INCLUDING BASE SECTION, TOP SECTION, LID SECTION AND ACCESS HATCH SHALL CONFORM TO AASHTO H30 WHEEL LOAD RATINGS. IN LANDSCAPED AREAS THE VAULT STRUCTURE, INCLUDING BASE SECTION, TOP SECTION, LID SECTION AND ACCESS HATCH SHALL CONFORM TO AASHTO H20 WHEEL LOAD RATINGS. INSIDE DIMENSIONS OF VAULTS FOR 6-INCH AND LARGER METERS SHALL MEASURE 120-INCHES BY 66-INCHES AND 72-INCHES TALL. ALL VAULTS SHALL HAVE A MANUFACTURES LOAD RATING CERTIFICATION. THE ACCESS HATCHES SHALL HAVE DOUBLE DOORS THAT OPEN BUTTERFLY STYLE.

3) EXCAVATION AREA FOR VAULTS SHALL BE 10 FT. WIDE X 14 FT. LONG. WHERE LARGER VAULTS ARE REQUIRED, THE EXCAVATION SHALL BE PROPORTIONATELY EXTENDED. EXCAVATION DEPTHS SHALL BE SUCH THAT THE ACCESS HATCHES WILL BE FLUSH WITH THE FINAL GRADE. VAULTS SHALL BE SET LEVEL AND PLUMB.

4) PLACE 12 INCHES OF WELL GRADED 1/2 IN. TO 1-1/2 IN. RIVER ROCK BELOW VAULT FOR BASE AND DRAINAGE.
ADDITIONAL EXCAVATION DEPTH MAY BE REQUIRED, IF THE BOTTOM OF THE EXCAVATED AREA IS LESS THAN 2 FT. BELOW THE BOTTOM OF THE EXISTING WATER MAIN THAT THE SERVICE LINE IS CONNECTED TO.

5) THE CONTRACTOR SHALL SUPPLY THE WATER SERVICE LINE TO 1 FOOT INSIDE THE METER VAULT. THE CITY PROVIDES AND INSTALLS THE WATER METER, BYPASS AND STUB PIPE OUT OF THE METER VAULT.

6) THE CONTRACTOR IS RESPONSIBLE FOR TRENCH / VAULT EXCAVATION AND BACKFILL. ALL CLEANUP AND LANDSCAPE RESTORATION SHALL BE COMPLETED BY THE CONTRACTOR.

6" AND LARGER METER VAULT INSTALLATION
TYPICAL VAULT
N.T.S.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/04
DWN	RAW
REV	5/16
CHK	BWB
SCALE	NTS

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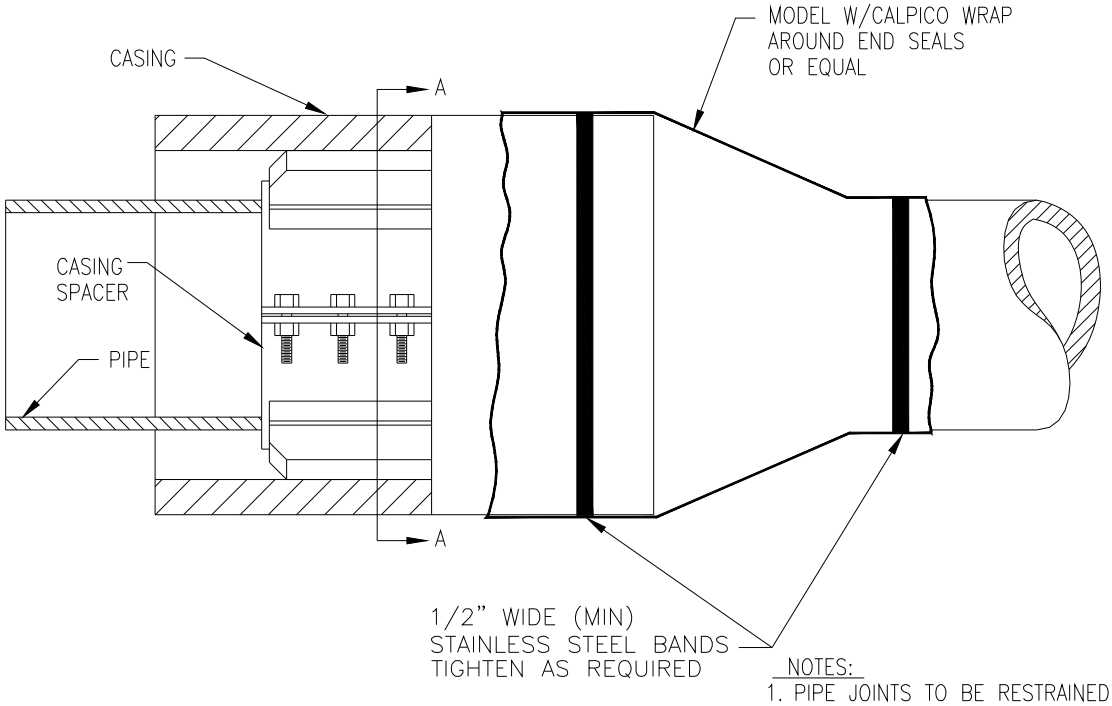
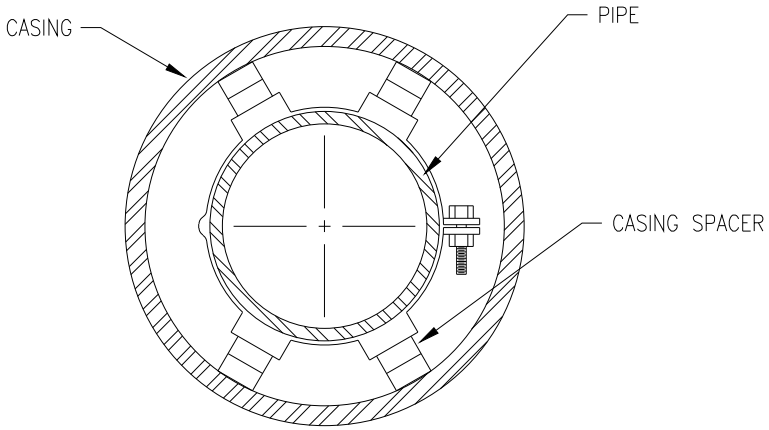
4-32
SHEET 2 OF 2

CASING SPACER



NOTES:

1. PIPE JOINTS TO BE RESTRAINED PER APPROVAL OF CITY ENGINEER.
2. FOR PIPES 12" & SMALLER, 2 SPACERS PER JOINT OF 13' SEWER, 4 SPACERS PER JOINT OF 18' OR 20' WATER
3. MINIMUM 3/8" STEEL. THICKER CASINGS MAY BE REQUIRED BY THE RAILROAD OR IRRIGATION UTILITY.



SECTION A–A

NOTES:

1. CASING SPACERS SHALL BE MANUFACTURED GALVANIZED, OR STAINLESS STEEL OR POLYETHYLENE, SIZED FOR THE TYPE OF PIPE & CASING SIZE.
2. CASING TO BE SIZED TO PROVIDE MINIMUM 2 INCH CLEAR FOR THE TYPE OF JOINT APPROVED BY THE CITY ENGINEER.
3. PIPE JOINTS WITHIN CASING TO BE RESTRAINED JOINT AS APPROVED BY THE ENGINEER.

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

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DWN	DDS
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CHK	BWB
SCALE	NTS

DWG. NO.

4-33

Section 5 Index

Storm Drain [click on number or heading below]

SECTION 5

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

STORM DRAIN

5-1 STORM DRAIN PIPE

5-1.01 GENERAL

The work covered in this section shall include storm drainage design criteria and the furnishing, installation and testing of storm drain pipe of the types and sizes specified and shown on the plans together with other appurtenances and incidental work required to construct the storm drainage facilities in accordance with SWSS Section 7-04 except as herein modified. The minimum pipe size for catch basin runs is 10 inches. The minimum pipe size for main line runs is 12 inches.

Developer and builder storm drainage systems will be required to meet, or exceed the requirement of Section 5-9 of these standard specifications.

All storm sewer mainline under crossings of 6-inch and 8-inch AC water mains will require removal and replacement of a section of the AC water main as herein specified.

5-1.02 APPROVED PIPE MATERIALS

The storm drain pipe shall be one of the types indicated unless a different type and class of pipe is called for in the special provisions. The only pipes approved for open-ended culverts will be concrete, or CMP.

A. NON-REINFORCED CONCRETE PIPE shall conform to the requirements of AASHTO M86 Class 2 and be designed for H20 loading at the design depth. All concrete pipe over 30” shall be reinforced.

B. REINFORCED CONCRETE PIPE shall conform to the requirements of SWSS Section 9-05.7(2) and be designed for H20 loading at the design depth.

C. DUCTILE IRON PIPE shall conform to the requirements of AWWA designation C151 with Class 2 up through 12-inch diameter and Class 1 for 14-inch diameter and larger.

D. HIGH DENSITY POLYETHYLENE PIPE – HDPE pipe, as specified herein, is approved for 10-inch and 12-inch catch basin runs, with a minimum 1.5 feet bury and for main line pipes, with a minimum height of cover below finish grade of 3.0

feet. The high-density polyethylene pipe shall be WSDOT approved for culvert use under H-20 rated roadways. The high-density polyethylene pipe shall be manufactured in accordance with the most recent AASHTO M252 and M294, ASTM F405 and ASTM F667, for smooth interior walled, corrugated polyethylene pipe.

Bell and spigot joints shall be a testable, water tight, rubber gasket and spigot pipe joint. The components shall be manufactured by the supplier of the pipe and shall be designed to meet or exceed the requirements of Section 5-1.04 and 5-1.05 of this specification section.

E. POLYVINYL CHLORIDE (PVC) PIPE, 10-INCH THROUGH 24-INCH

PVC pipe. As specified herein, is approved for 10-inch and 12-inch catch basin runs, with a minimum height of cover below finish grade of 1.5 feet and for main line pipes, with a minimum height of cover below finish grade of 3.0 feet. PVC pipe shall meet or exceed one of the below specifications.

a. Solid wall PVC pipe manufactured in accordance with the requirements of ASTM D3034, SDR41 or SDR35.

b. Smooth interior, corrugated PVC pipe with bell and spigot joints, manufactured in accordance with ASTM F949. Minimum pipe stiffness shall be 50 psi in accordance with the requirements of ASTM D 2412.

F. GALVANIZED CORRUGATED STEEL PIPE, SHALLOW BURY AND 27 INCHES AND LARGER

Galvanized corrugated steel pipe conforming to the requirements of AASHTO M36, with ½-inch deep corrugations, or ¾ x ¾ x 7-1/2-inch" pitch spiral rib pipe may be utilized for main line storm sewers where a minimum 3.0 foot bury cannot be obtained, for installations that require 27 inch and larger pipes and when utility conflicts prevent the required minimum 18-inch pipe bury for catch basin runs. All CMP pipe shall be coated per the requirements of Section 5-1.03, unless otherwise required by the contract special provisions. Gauge shall be a minimum 16 gauge, or as called for by the contract special provisions.

5-1.03 COATING FOR GALVANIZED STEEL PIPE

Unless otherwise called for by the contract special provisions, galvanized steel pipe shall be coated on the outside with an asphalt, or protective coating. The protective polymer coating shall conform to AASHTO M-246 and shall be a minimum 10 mils thick, and composed of polyethylene and acrylic acid copolymer.

5-1.04 COUPLING AND JOINT MATERIALS

Rubber gasket jointing materials for concrete (reinforced and non-reinforced) pipe, ductile iron pipe, high density polyethylene pipe, and PVC pipe shall be in accordance with SWSS Sections 9-05.7(3), 9-05.12 and 9-05.13.

Corrugated and spiral rib coupling bands shall meet the requirements of SWSS Section 9-05.4(7), or Section 9-05.10(1) All bands shall use a full width 3/8-inch thick neoprene rubber gasket in conformance with SWSS Section 9-04.4(3).

5-1.05 TESTING

The Contractor shall provide all required test equipment and gauges and test all mainline storm sewers 24 inches and smaller by the exfiltration pressure test per SWSS Section 7-04.3(1) B as herein modified, or the below described air test. Prior to testing, the pipe shall be thoroughly cleaned and flushed by the Contractor and visually inspected by the City, by lamping or televising as the Engineer chooses. Any protruding gaskets, pipe breaks or obvious imperfections, shall be repaired as directed by the Engineer. Infiltration leaks at a seam or joint that exceed the flow of adjoining sections, or leaks that appear to be the result of improper installation or faulty material shall be repaired by the Contractor as directed by the Engineer. The contractor shall inspect completed storm sewer main lines by lamping, prior to acceptance. Storm sewer lines may be subject to television inspection by the City.

Exfiltration Test: Leakage shall be no more than one (1.0) gallon per hour per inch of diameter per 100 feet of storm sewer pipe, with a minimum test pressure of six (6) feet of water column above the crown at the upper end of the pipe.

The length of pipe shall be limited so that the pressure on the low end of the test section shall not exceed 16 feet. For each two (2)-foot interval that the high-end test water level is above six (6) feet over the crown of the pipe at the lower end of the pipe test section, the allowable leakage shall be increased 10 percent.

Low Pressure Air Test: For pipe 24-inches in diameter and smaller, the Contractor may, at his option, test by a low-pressure air test. The pipe shall be plugged and pumped to 4.0 PSI. The pressure shall be allowed to drop to 3.5 PSI and a watch used to measure the time in seconds that it takes for the pressure to drop from 3.5 to 2.5 PSI. The time required in seconds for the pressure to drop from 4 PSI to 3.5 PSI or from 3.5 PSI to 2.5 PSI must exceed that calculated by the following equation:

Time in seconds = 14.15 x diameter in inches.

This test allows double the allowable loss over what is allowed for a sanitary sewer test.

5-1.06 MEASUREMENT AND PAYMENT

The unit contract price for each size of pipe shown on the plans and in the proposal shall be paid per linear foot, and shall be measured along its length through manholes, dry wells, and catch basins. The unit contract price, per linear foot, shall be full compensation for furnishing all labor, equipment, materials, pipe fittings, tees, elbows, flared end sections, and all other incidentals necessary to place the pipe in the trench to the line and grade as shown on the plans and in accordance with these specifications or as directed by the Engineer.

5-2 TRENCH EXCAVATION AND BACKFILL

5-2.01 GENERAL

All trench excavation and backfill for storm drain pipe shall be to the depth as shown on the plans and/or as indicated in the proposal for the various depths. Trench excavation and backfill shall be completed in accordance with the requirements of SWSS Section 7-04.3 as herein modified. Pavement restoration shall meet the requirements of City Standard Drawing 2-6 and Section 2-29 of these standards.

Trench excavation shall be unclassified unless rock excavation is listed as a pay item, and shall include all excavation, disposal of surplus and unsuitable material, and all other work incidental to the construction of trenches for drains, gravity sewers, force mains or culverts, including manholes, catch basins, inlets or other appurtenances which are part of the pipeline.

Rock excavation shall include solid rock formation requiring systematic drilling and blasting with explosives and any boulders or broken rock larger than one-half cubic yard in volume. Hardpan or cemented gravel, even though it may be advantageous to use explosives in its removal, shall not be classified as solid rock excavation. The bottom of the trench shall be brought up to grade by backfilling with selected backfill material and be compacted to the satisfaction of the Engineer.

The Contractor shall notify the Engineer at least 24 hours prior to any blasting. All blasting shall be done in accordance with local, county, and state regulations governing this class of work. Any damage to persons or property resulting from blasting operations shall be the sole responsibility of the Contractor and his surety.

Trench backfill material shall be compacted per the requirement of City Standard 1-13, by means approved by the Engineer, as required to preclude future settlement and to achieve a minimum of 95 percent maximum density when tested, in accordance with SWSS 7-08.3(3) as herein modified.

As a minimum, all trenches, which parallel the street centerline, shall be water-flooded and compacted with a hoe-mounted or double drum, vibratory mechanical compactor. Water content during compactions shall exceed optimum at all times. Hand-operated jumping jacks or shoe-type mechanical tampers will not be approved.

All trench excavation shall have adequate safety systems for the trench excavation that meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor shall be fully responsible for providing the necessary back sloping, cribbing, trench boxes, etc., as required to meet the specified safety requirements for the trench, manhole, drywell, etc.

The Contractor is advised that all water main lines have thrust blocks typically located as shown on Standard Drawing 4-6. These thrust blocks have been found to be constructed

of rocks, blocks, concrete or other materials. The Contractor shall take such precautions, shoring, etc. as required to protect and not disturb the existing thrust blocks.

When a sanitary sewer main line, or storm sewer main line will cross under a 6-inch or 8-inch AC water main, then prior to excavation under the water main, the section of AC water main which is estimated to span the trench and to a minimum of three feet each side of the trench, shall be removed and replaced with a section of city standard C900 PVC water main. After completion of the excavation and backfill, the repair couplings shall remain firmly on undisturbed ground, or the contractor will be required to replace the water repair.

Sewer service locates and repairs shall be made in accordance with Section 4-19 of these specifications.

5-2.02 MEASUREMENT

A. Trench Excavation and Backfill

Measurement for payment of "Trench Excavation and Backfill" shall be by the linear foot for the appropriate depth increment of trench excavation and backfill, including measurement through manholes.

Measurement shall be the depth from the pipe invert to original grade, except that where the storm sewer is constructed in conjunction with new street construction, and unless excavation to subgrade is not allowed by the contract special provisions. Measurement shall be from the pipe invert to the street design subgrade regardless of when the Contractor chooses to excavate the street to subgrade.

B. Rock Excavation

Measurement for payment of "Rock Excavation" shall include boulders exceeding one-half cubic yard in volume and solid rock, which requires systematic drilling and blasting. Rock Excavation will be measured on a cubic yard basis computed as follows:

a. LENGTH

Length will be the entire horizontal distance where rock is encountered measured on a linear foot basis along centerline of the trench.

All excavation for dry wells and other structures will be excluded and will be measured separately. Measurement will commence at the first location where rock is encountered and continue to the point where rock terminates.

b. WIDTH

The trench width for payment of "Rock Excavation" shall be as follows:

Size of Pipe	Pay Width of Trench
10" - 15"	2.5 feet
18" - 36"	Outside pipe diameter plus 12"
42" and larger,	Outside pipe diameter plus 24"

c. DEPTH

Measurement for depth will be the vertical distance from six inches (6") below the pipe invert to the top of the solid rock strata. Depth will be measured at intervals of 25 feet along centerline of trench, beginning at the first location that solid rock is encountered, and the average depth between measuring points will be the depth used for computing depth of rock.

C. Rock Excavation for Structures

Rock excavation quantities for manholes, dry wells, and other storm drain structures shall be computed on a cubic yard basis from the actual profile depth as described above, multiplied by the area within a line parallel to and one foot (1') outside of the actual dimensions of the manhole, dry well, or structure base.

D. Trench Safety Systems

The unit contract price for "Trench Safety Systems", per linear foot, shall be measured along the trench length through manholes, drywells, and catch basins.

5-2.03 PAYMENT

A. Trench Excavation and Backfill

The unit contract price for "Trench Excavation and Backfill", per linear foot, for the various depths indicated in the proposal, shall be full compensation for the cost of excavation, backfill, furnishing all labor, equipment, and all other incidentals necessary to perform the work in accordance with the plans and specifications or as directed by the Engineer.

Unless provided for in the contract special provisions, all costs for labor, equipment and materials as required to replace sections of 6-inch and 8-inch AC water mains at main line trench crossings, shall be considered incidental to the “Trench Excavation and Backfill” bid items as provided in the bid proposal.

B. Rock Excavation

When included in the bid proposal, the unit contract price for "Rock Excavation", per cubic yard, will be paid in addition to the payment for trench excavation and backfill at the various depths indicated in the proposal in which the rock is encountered. If not included in the bid proposal, Trench Excavation is unclassified, and a separate measurement and payment will not be made for rock excavation. Payment for rock excavation shall be full compensation for all work required to excavate and dispose of the rock material. No payment will be made for rock excavated below required grade or outside the widths stated in Section 5-2.02B of these specifications, unless approved by the Engineer.

C. Trench Safety Systems

The unit contract price, per linear foot, shall be full compensation for furnishing all labor, equipment materials and all other incidentals necessary to meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW, including all requirements for drywells, manholes and catch basins.

5-3 PIPE BEDDING

5-3.01 GENERAL

It is the intent of this contract to use select native material from the construction site for backfill around the storm drain piping. Select native material used for pipe bedding shall meet the approval of the Engineer and shall be free of any organic materials, frozen lumps, rocks or pavement chunks. When unsuitable native material exists or is encountered during trench excavation, imported bedding material may be required by the Engineer, depending on the type of pipe being installed, and the type of native material encountered. When directed by the Engineer, the Contractor shall furnish and place imported pipe bedding.

5-3.02 NATIVE AND IMPORTED BEDDING MATERIAL

Pipe bedding shall be placed in accordance with the City of Kennewick Standard Drawing No. 4-7. The bedding material shall be placed in lifts of not more than six inches (6") in depth and compacted.

Bedding materials shall meet the requirements of Sections 4-4.02 and 4-4.03 of these specifications.

5-3.03 MEASUREMENT AND PAYMENT

The unit contract price for "Imported Pipe Bedding", per linear foot, shall be full compensation for furnishing all labor, materials, tools, all other equipment and incidentals required to provide and install bedding material in accordance with the plans and specifications or as directed by the Engineer.

Select native materials, which do not require truck hauling and are determined to be acceptable as bedding and utilized as bedding, shall be considered, as incidental to

"Trench Excavation and Backfill", and no additional payment will be made for its use as "Imported Pipe Bedding".

5-4 CATCH BASIN

5-4.01 DESIGN AND CONSTRUCTION

Catch basins are to be furnished and installed in accordance with City of Kennewick Standard Drawings 5-1 and 5-2 and SWSS Section 7-05, as herein modified.

Filter fabric shall be placed per the requirements of Section 2-27 of these specifications.

Catch basins shall be designed for the grade of the street, in order to maintain a maximum three foot wide flow during the design 25 year storm; however, the maximum catch basin spacing allowed shall be 400 feet, and in addition, catch basin(s) shall also be installed prior to each intersecting street.

5-4.02 CATCH BASIN PROTECTION

Prior to construction, the Contractor shall supply and install a section of filter fabric under the grate of all existing catch basins on the project and downstream as directed by the Engineer and required by Sections 5-4.01 and 2-27 of these specifications. Catch basins installed in conjunction with the project shall also be similarly protected.

5-4.03 MEASUREMENT AND PAYMENT

The unit contract price for "Catch Basin", per each, shall be full compensation for furnishing all labor, materials, equipment, rings, grates, fabric protection, and all other incidental work required to complete the catch basin in accordance with the plans and specifications or as directed by the Engineer. All costs for fabric protection of off-site and existing catch basins shall be incorporated into the project maintenance, or storm pipe bid items as provided for in the bid proposal.

5-5 STANDARD MANHOLE

5-5.01 GENERAL

Manholes shall be furnished and installed in accordance with the City of Kennewick Standard Drawings 3-2, 3-3, and 3-5 and as herein modified. Storm drain manholes may have either a poured-in-place base or a precast base. Channelization is not required.

5-5.02 CONSTRUCTION

Construction of manholes shall conform to the SWSS Section 7-05 as herein modified. The following provisions shall apply to the construction of all manholes:

A. Manhole steps shall be fabricated from three-quarter inch (3/4") galvanized or aluminum deformed bars and have a three-inch (3") drop for personnel safety, or co-polymer polypropylene steel reinforced steps as manufactured by M.A. Industries or approved equal.

B. Precast concrete cones shall be eccentric. If used in conjunction with flat top, sections in shallow bury areas; the access openings shall be aligned.

C. All manhole joints shall be made with flexible gaskets or a positive self-sealing mastic.

D. Where directed by the Engineer, the channelization of manhole bases will be covered by a rigid material such as three-quarter inch (3/4") plywood or better. This cover shall remain in place until street construction is completed and the manhole castings are grouted and then shall be removed, along with any the debris, prior to acceptance of construction.

E. Manhole connections shall be reconstructed in accordance with the requirements of SWSS Section 7-05.

F. Manhole sections installed below the high static ground water level shall be infiltration tested. A water infiltration allowance of 0.20 gallons per hour, per foot of static head above the lowest manhole invert, shall be considered as a satisfactory manhole test.

5-5.03 MEASUREMENT AND PAYMENT FOR STANDARD MANHOLE

The unit contract price for "Standard 48-Inch Manhole," per each, shall be full compensation for furnishing all materials, labor, frames, covers, ladder rungs, and all other incidental work required to construct a ten-foot (10') deep standard manhole in accordance with the plans and specifications.

5-5.04 MEASUREMENT AND PAYMENT FOR ADDITIONAL MANHOLE DEPTH

Payment for additional depth manholes, which are over ten feet (10') in depth, shall be in accordance with the unit contract price for "Additional Manhole Depth," per vertical foot, as measured from the invert thereof, to the top of the cover, less ten feet (10'), and shall be full compensation for furnishing all labor, materials, and equipment required to construct the manhole in accordance with the plans and specifications or as directed by the Engineer.

5-5.05 MEASUREMENT AND PAYMENT FOR DROP CONNECTIONS

Payment for drop connections shall be in accordance with the unit contract price for "Drop Connection", per vertical foot, as measured from the invert thereof to the invert of the pipe from which the drop was made, and shall be full compensation for furnishing all labor,

materials, and equipment required to construct the drop connection in accordance with the plans and specifications or as directed by the Engineer.

5-6 STANDARD DRY WELL

5-6.01 GENERAL

Dry wells are to be furnished and installed in accordance with the City of Kennewick Standard Drawings, 5-4, or 5-5 for the type of dry well as indicated on the plans or as directed by the Engineer. Drywells may have a poured-in-place, or a precast base.

When unsuitable soil conditions are encountered at the standard depth, and when authorized or directed by the Engineer, the Contractor shall construct an extra depth standard, or modified dry well.

A filter fabric shall be required as per the standard drawings. The filter fabric shall be designed for use as a soil filtration media. The fabric shall be a non-woven fabric consisting of polypropylene fibers treated to resist degradation caused by exposure to sunlight. The fabric shall be resistant to commonly encountered soil chemicals, mildew, and insects and be non-biodegradable with a minimum fabric weight of 6.0 ounces per square yard, minimum roll thickness of 80 mils. Fabric shall be Trevira, AMOCO 4551, Ling GTF 150 Ex, Geotex 601, or equal.

The Contractor's attention is hereby called to Section 5-7 of these specifications for additional requirements concerning dry well presoak and testing.

5-6.02 MEASUREMENT AND PAYMENT

The unit contract price for "Standard Dry Well, (Drawing 5-5), or "Modified Dry Well, (Drawing 5-4)", per each, shall be full compensation for furnishing all labor, materials, equipment, and all other incidentals necessary to construct the dry well complete in accordance with the plans and specifications. A separate measurement and payment will be made for testing, per Section 5-7 of these specifications.

5-6.03 PAYMENT FOR ADDITIONAL DRYWELL DEPTH

When an extra depth standard dry well, or an extra depth modified dry well, is required, an additional payment will be made in accordance with the unit contract price for "Additional Dry Well Depth," per vertical foot as measured from the top of the footing to the cover finish grade, less the standard depth, and shall be full compensation for additional dry well depth.

5-7 DRY WELL PERCOLATION TESTS

5-7.01 GENERAL

The work covered in this section pertains to the hauling, piping, and measuring of water into a newly constructed dry well for the purpose of presoaking and determining dry well percolation rates, as per City of Kennewick Standard Drawing 5-3.

5-7.02 CONSTRUCTION

The Contractor shall place a minimum amount of 3,000 gallon of water into the dry well a minimum of 12 hours prior to actual percolation rate measurements, to presoak the underlying strata. At the end of the 12-hour period, and in the presence of the Engineer, the Contractor shall then place a minimum amount of 3,000 gallons of water into the dry well and the Engineer will make the dry well percolation rate measurements.

It shall be the responsibility of the Contractor to provide the means to accurately measure the total amount of water placed in the dry well regardless of whether it is by tank truck, piping, or by fire hose.

Water used to presoak and test will be provided by the City, at no cost to the Contractor, at the closest point of delivery to the dry well being tested.

5-7.03 MEASUREMENT AND PAYMENT

The unit contract price for “Drywell Percolation Test” per each shall be full compensation for all labor, materials and equipment, as required to haul, pipe, and measure the water in the dry well, presoak the underlying strata, and testing.

5-8 ABANDONED CONDUITS

All pipes, conduits and other openings determined to be abandoned, which are cut or opened during the storm sewer installation, shall be capped or concrete plugged, prior to backfilling of the trench. Measurement and payment for required pipe cuts, labor, equipment, work and materials required to complete the specified plug shall be incidental to the pipe installation pay items.

5-9 STORM DRAINAGE DESIGN

5-9.01 COMMERCIAL DEVELOPMENT/PRIVATE STREETS

Commercial sites and private streets shall be designed to retain and dispose of a 10-year 24-hour storm on-site. Drywells, perforated pipe systems and other means of infiltration may be used, where there is no potential for groundwater contamination.

Oil/water separators shall be installed with all sub-surface infiltration facilities within the city’s wellhead protection area.

The developer is advised that the Department of Ecology has determined that infiltration facilities are Class V injection wells. Prior to acceptance of the project by the city, the owner of the facility must register the drywell/infiltration system with the Washington State Department of Ecology. A copy of the registration form and well

assessment shall be submitted to the city prior to project acceptance. Registration forms may be obtained from the Department of Ecology web page at: http://www.ecy.wa.gov/programs/wq/grndwtr/uic/registration/reginfo.html

Parking lots may not be used for storm water storage in conjunction with an infiltration system. Where the "*Rational" method* is used for design, the minimum storage volume for an infiltration system shall be based on the peak hour.

Grassy swales and retention ponds may also be used. Due to winter ground freeze conditions, where surface retention is used without sub-surface infiltration mechanism, the facility shall be designed to store the entire 10-year 24-hour event, without regard to surface infiltration. Detention facilities using controlled outfall to the city's storm drain system (ponds, vaults, etc.) are not allowed.

Design calculations, bearing a registered professional engineer's stamp, are required for all storm drainage designs.

The City will not assume ownership or maintenance of the on-site commercial storm drainage facilities. Connection to city-owned drainage facilities is not allowed.

5-9.02 RESIDENTIAL DEVELOPMENT

Storm drainage systems for all collector and arterial streets shall be designed to retain and dispose of a 25-year 24-hour event.

Storm drainage systems for all other streets, to be dedicated to the public, shall be designed to retain and dispose of the calculated difference between a 25-year 24-hour event for the developed state and the 10-year 24-hour event for the natural pre-developed state. The developed state shall include streets, sidewalks, an estimated average driveway and one-half of an estimated average building roof for impervious surfaces and 50-foot from back of sidewalk for pervious surfaces.

All street low points, including localized curb return low points, shall have a positive overflow. An analysis of downstream impacts is required for off-site overflows.

Catch basins shall be designed, spaced and installed as required by Section 5-4.01. The main line storm sewer shall be designed with a minimum 5.0 foot bury, to provide for water and other utilities to be installed in the corridor above the storm sewer. The storm sewer shall be designed as required to not conflict with sewer laterals.

Sub-surface infiltration is preferred where there is no potential for groundwater contamination. The City Engineer may restrict or deny the use of sub-surface infiltration where percolation rates are marginal and a retention pond will be required. Infiltration facilities shall be constructed in accordance with city standards.

Retention ponds (no outfall) are required within the city's wellhead protection area and may be required where percolation rates are marginal In other areas, retention ponds

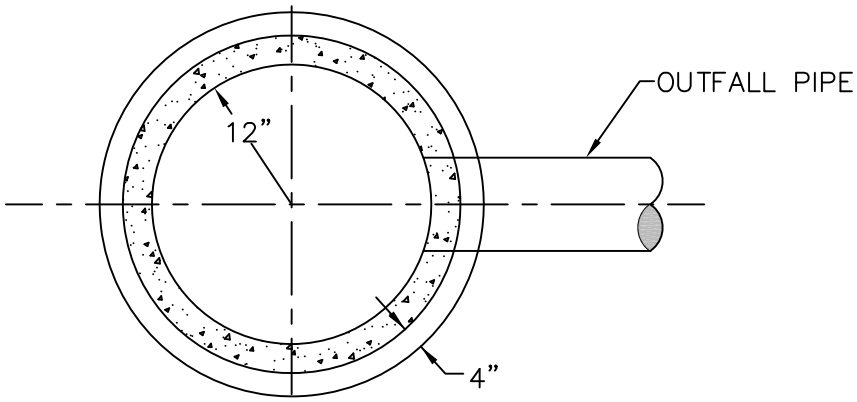
may be used in lieu of sub-surface infiltration, with prior approval from the City Engineer. Where retention ponds are required and/or approved for use, the facility shall be designed to store the entire 25-year 24-hour event, without regard to surface infiltration. A drywell shall be utilized in conjunction with the retention pond to provide pond drainage when the ground is frozen. The owner, or homeowners association of the facility must register the drywell/infiltration system within the retention pond with the Washington State Department of Ecology. A copy of the registration form and the well assessment shall be submitted to the City, prior to acceptance of the project. Registration forms may be obtained from the Department of Ecology web page at: http://www.ecy.wa.gov/programs/wq/grndwtr/uic/registration/reginfor.html.

Detention ponds (controlled outlet) may be used only where it can be clearly demonstrated that infiltration, or retention, are not feasible. Detention ponds may only be used with prior approval of the City Engineer. Where detention ponds are approved for use, the release rate shall not exceed the 5-year natural state peak hour flow. An emergency spillway shall be constructed and shall include an analysis of downstream impacts. Detention vaults may be used in lieu of a detention pond only where it can be clearly demonstrated that a detention pond is not feasible and only with prior approval from the City Engineer.

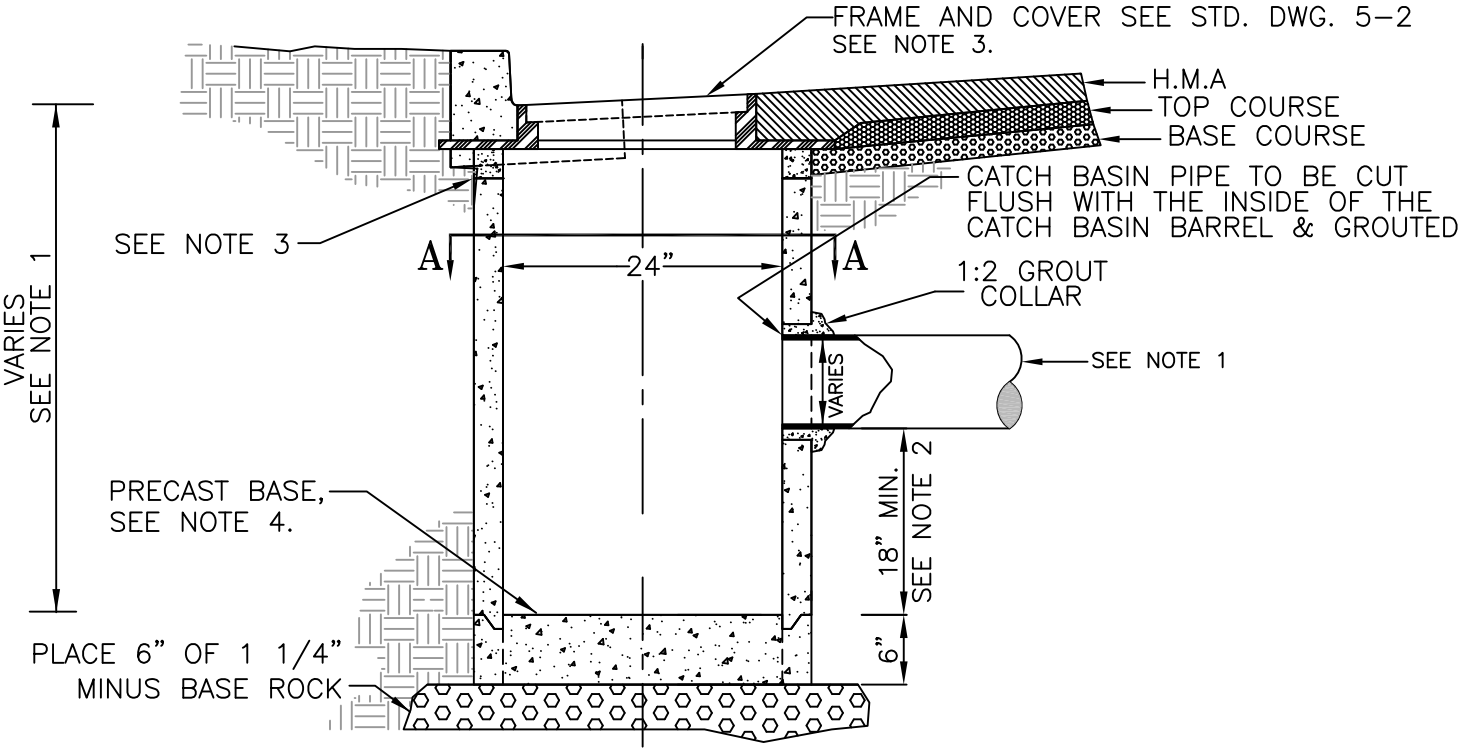
Retention and detention ponds shall be designed with a minimum two foot of free board. Side slopes shall be 3:1 or flatter. All ponds with a slope steeper than 4:1 shall have at least one stairway constructed of stone block steps, or similar, suitable for a child to exit on the steeper slope.

The city will not assume ownership or maintenance of retention and/or detention ponds. Ownership and maintenance of ponds and internal drywells shall be the responsibility of a homeowners association approved by the Director of Community Planning. Swales and detention vaults are not allowed for residential development.

Design calculations, bearing a registered professional engineer's stamp, are required for all storm drainage designs.



SECTION A–A



NOTES:

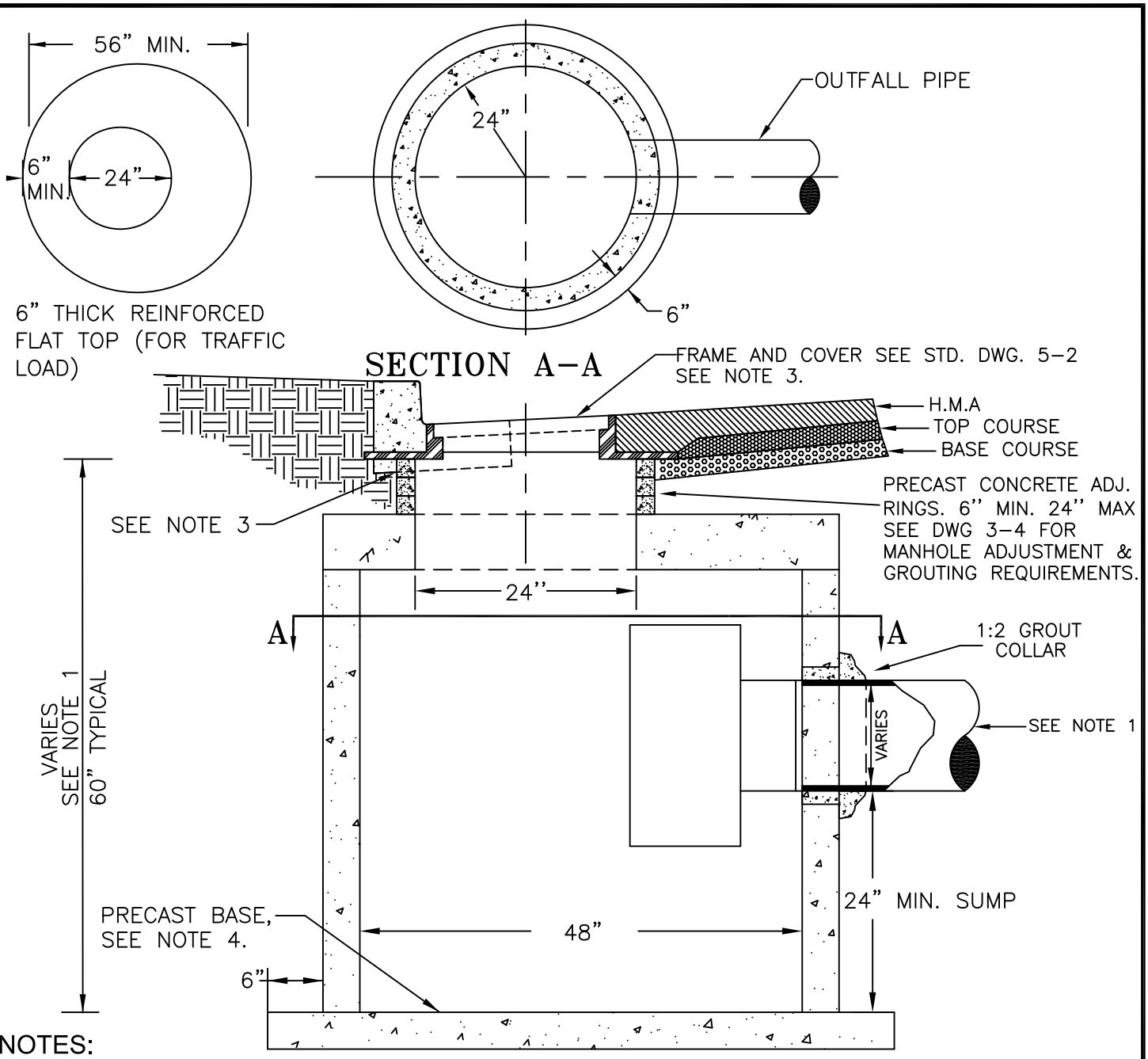
1. SEE PIPE SPECIFICATIONS SECTION 5–1.02 AND CATCH BASIN SPECIFICATIONS SECTION 5–4, FOR ADDED REQUIREMENTS. MAXIMUM NUMBER AND SIZE OF PIPES CONNECTING INTO CATCH BASIN SHALL NOT EXCEED 3 – 12" PIPES. WIRE REINFORCED PRECAST CATCH BASIN SHALL BE REQUIRED WHEN 3 PIPES ARE TO BE CONNECTED TO A CATCH BASIN. PENETRATION OF EXISTING CATCH BASINS, OR FIELD CUT PENETRATIONS OF CATCH BASINS, TO BE MADE BY SAW / CORE DRILLING ONLY.
2. MINIMUM SUMP IS 18" UNLESS APPROVED BY THE ENGINEER DUE TO UTILITY CONFLICTS.
3. 1:2 GROUT BETWEEN CATCH BASIN RING AND CONCRETE TILE, BOTH INSIDE AND OUTSIDE. ADJUSTMENTS OF 2" AND GREATER TO BE MADE WITH PRECAST CONCRETE RINGS. FILTER SOCK TO BE INSTALLED UNDER GRATE PER SECTION 2–27 OF THESE SPECIFICATIONS. REMOVE ONLY WHEN DIRECTED BY ENGINEER.
4. PRECAST CATCH BASIN TO BE MANUFACTURED WITH MINIMUM 3200 PSI CONCRETE, TO THE REQUIREMENTS OF SWSS SECTION 7–05. CAST IN PLACE BASE MAY BE USED WHEN APPROVED BY THE ENGINEER.

CATCH BASIN

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	02/07
DWN	DDS
REV	5/15
CHK	DLK
SCALE	NTS

DWG. NO.
5-1
SHEET 1 OF 2



NOTES:

1. SEE PIPE SPECIFICATIONS SECTION 5–1.02 AND CATCH BASIN SPECIFICATIONS SECTION 5–4, FOR ADDED REQUIREMENTS. MAXIMUM NUMBER AND SIZE OF PIPES CONNECTING INTO CATCH BASIN SHALL NOT EXCEED 3 – 12" PIPES. WIRE REINFORCED PRECAST CATCH BASIN SHALL BE REQUIRED WHEN 3 PIPES ARE TO BE CONNECTED TO A CATCH BASIN. PENETRATION OF EXISTING CATCH BASINS, OR FIELD CUT PENETRATIONS OF CATCH BASINS, TO BE MADE BY SAW / CORE DRILLING ONLY.
2. MINIMUM SUMP IS 24" UNLESS APPROVED BY THE ENGINEER DUE TO UTILITY CONFLICTS.
3. 1:2 GROUT BETWEEN CATCH BASIN RING AND CONCRETE TILE, BOTH INSIDE AND OUTSIDE. ADJUSTMENTS OF 2" AND GREATER TO BE MADE WITH PRECAST CONCRETE RINGS. FILTER SOCK TO BE INSTALLED UNDER GRATE PER SECTION 2–27 OF THESE SPECIFICATIONS. REMOVE ONLY WHEN DIRECTED BY ENGINEER.
4. PRECAST CATCH BASIN TO BE MANUFACTURED WITH MINIMUM 3200 PSI CONCRETE, TO THE REQUIREMENTS OF SWSS SECTION 7–05. CAST IN PLACE BASE MAY BE USED WHEN APPROVED BY THE ENGINEER.

48" CATCH BASIN

CITY OF KENNEWICK

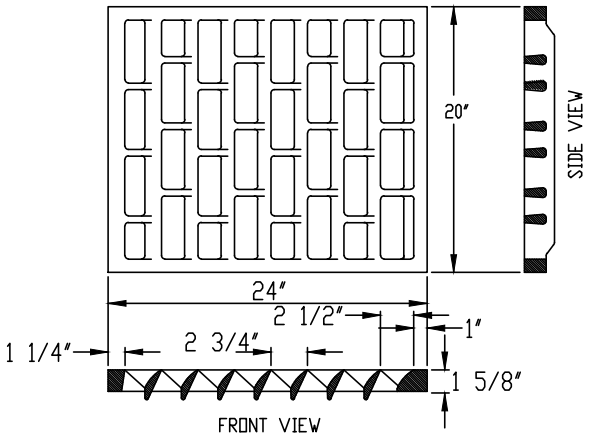
ENGINEERING DEPARTMENT

DATE	11/13
DWN	SLG
REV	5/15
CHK	BWB
SCALE	NTS

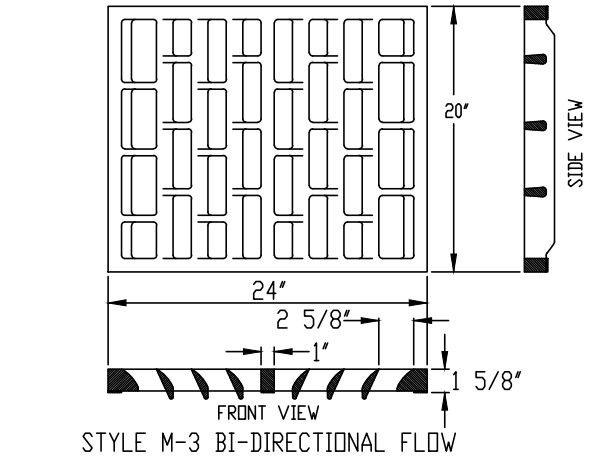
DWG. NO.

5-1

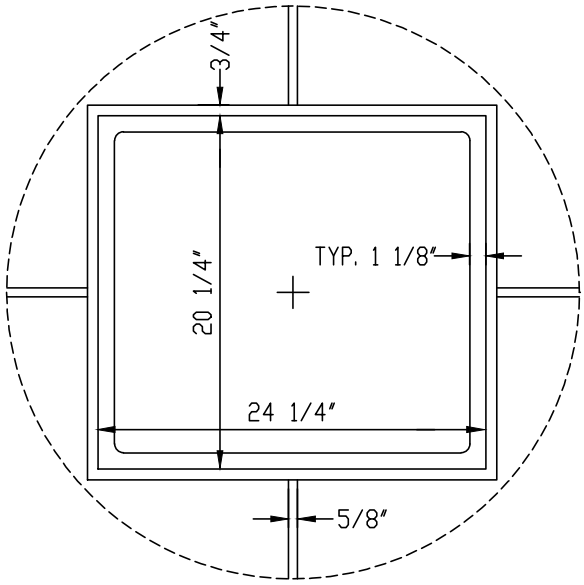
SHEET 2 OF 2



STYLE M-2 ONE DIRECTIONAL FLOW



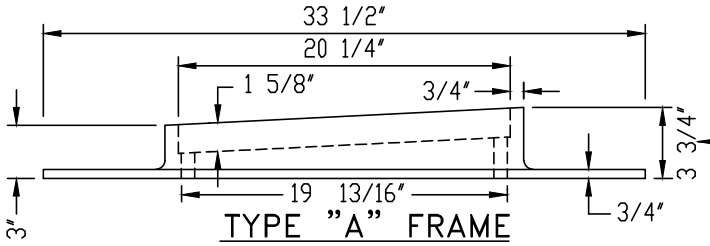
STYLE M-3 BI-DIRECTIONAL FLOW



TYPE "A" FRAME

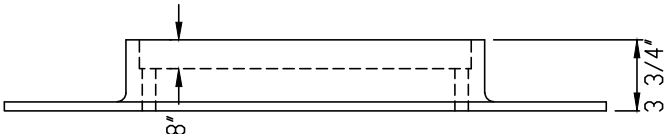
NOTES:

* STYLE M-2 OR EQUAL
  USE AT CONTINUOUS GRADE LOCATIONS
* STYLE M-3 OR EQUAL
  USE AT CURB LOW POINTS



TYPE "A" FRAME

EAST JORDAN 7753 ROUND BASE CATCH BASIN FRAME AND GRATE OR APPROVED EQUAL.
USE GRATE
M-2 – 1 DIRECTION
M-3 – BI-DIRECTIONAL



TYPE "B" FLAT FRAME
(SPECIAL USE ONLY)

CATCH BASIN FRAME AND COVER

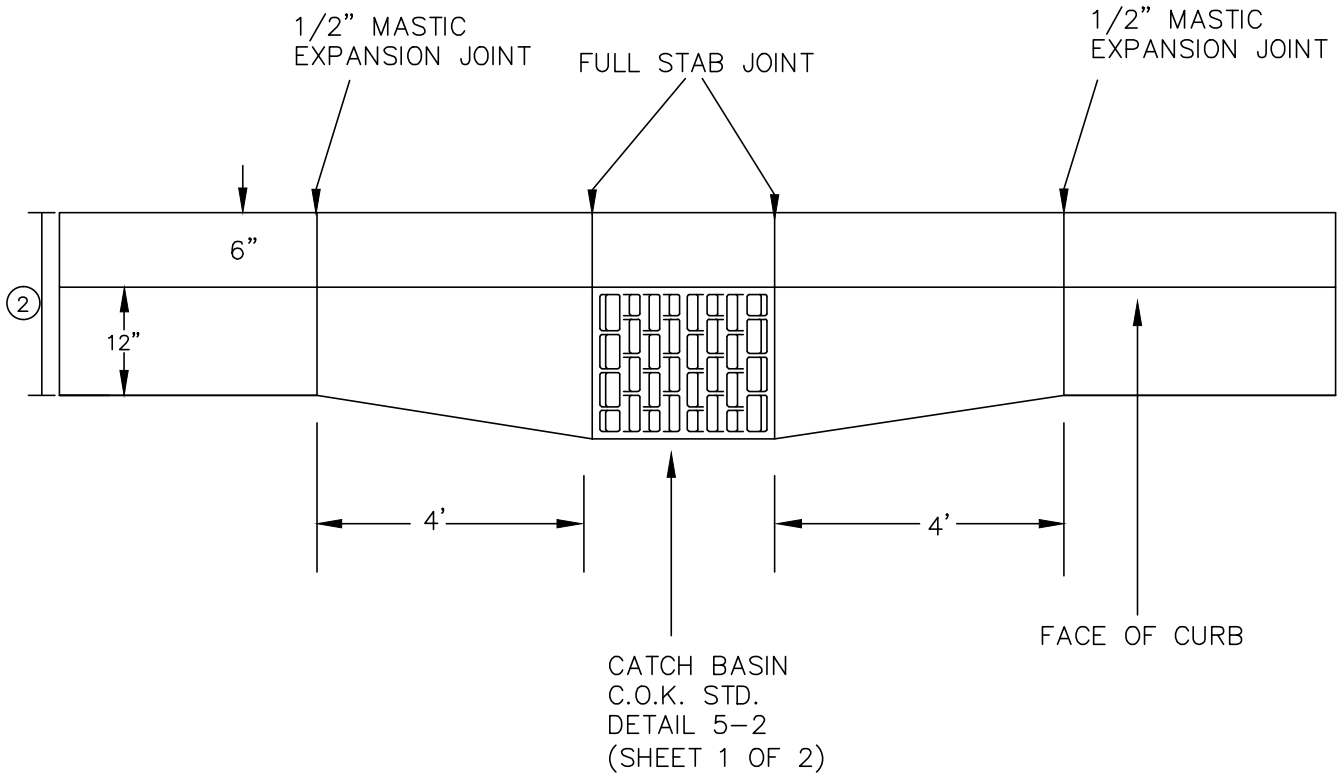
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/07
DWN	LCB
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

5-2

SHEET 1 OF 2



NOTE;
1. FIVE SACK (3000 PSI) CONCRETE REQUIRED AS PER C.O.K. STD. DWG 2-13
2. SEE C.O.K. STD DWG 2-10 (SHEET 1 OF 2) FOR CURB SPECIFICATIONS

CATCH BASIN GUTTER WIDENING

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

5-2

SHEET 2 OF 2

DATE: _____

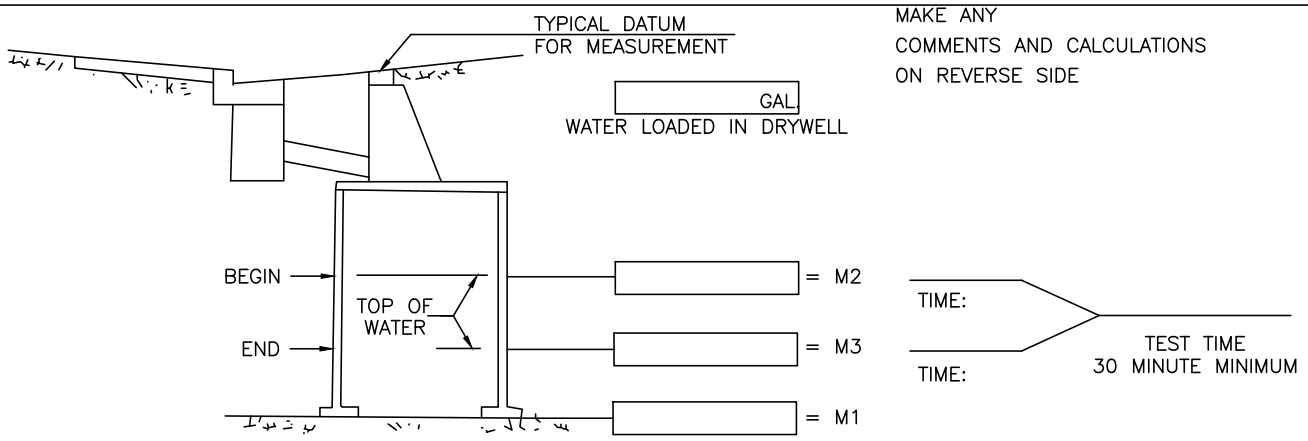
CONTRACTOR _____

NEAREST
STREET INTERSECTION _____

LOCATION FROM
NEAREST INTERSECTION _____

DRYWELL PRE–LOADED–DATE: _____ TIME: _____

DRYWELL TESTED DATE: _____ TIME: _____



MAKE ANY
COMMENTS AND CALCULATIONS
ON REVERSE SIDE

PRE–TEST PROCEDURE:

1. MEASURE DEPTH (IN INCHES) FROM KNOWN REFERENCE POINT TO BOTTOM OF DRYWELL AND RECORD IN M1 BOX
2. PLACE A MINIMUM AMOUNT OF 3000 GAL. OF WATER IN DRYWELL AT LEAST 12 HOURS BEFORE MAKING THE TEST.

TEST PROCEDURE:

1. PLACE A MINIMUM AMOUNT OF 3000 GALLONS OF WATER IN DRYWELL AND IMMEDIATELY MEASURE FROM KNOWN REFERENCE POINT TO TOP OF WATER (IN INCHES) AND RECORD IN M2 BOX TOGETHER WITH THE TIME OF DAY.
2. AFTER 30 MINUTES (PREFERABLY 60 MINUTES) REMEASURE FROM KNOWN REFERENCE POINT TO TOP OF WATER (IN INCHES) AND RECORD IN M3 BOX TOGETHER WITH THE TIME OF DAY.

CALCULATIONS:

1. DRYWELL GALLONS PER INCH
   GAL./INCH $= \frac{3000}{M1-M2} =$ _____ GAL/INCH.
2. DRYWELL PERCOLATION RATE
   GAL/MIN $= \frac{M3-M2}{\text{TIME IN MIN.}} \times$ GAL/INCH $=$ _____ GAL/MIN
3. DESIGNATED DRYWELL PERCOLATION RATE
   REQUIRES 2:1 SAFETY FACTOR FOR CALCULATION 2 ABOVE
   0.5 X GAL/MIN(2)= _____ DESIGN GAL/MIN

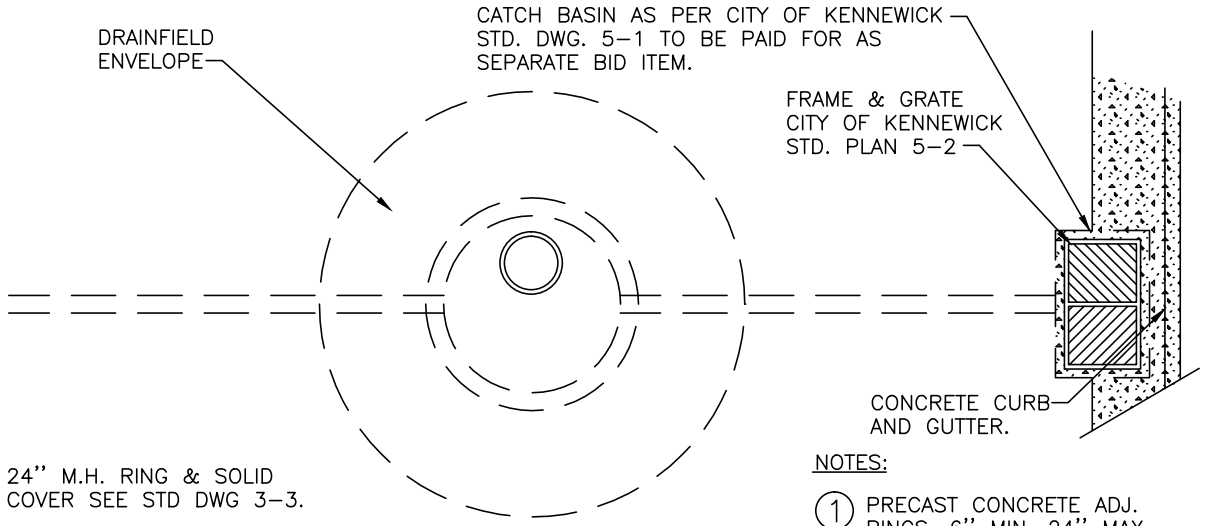
CITY OF KENNEWICK DRYWELL PERCOLATION REPORT

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/99
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

5-3



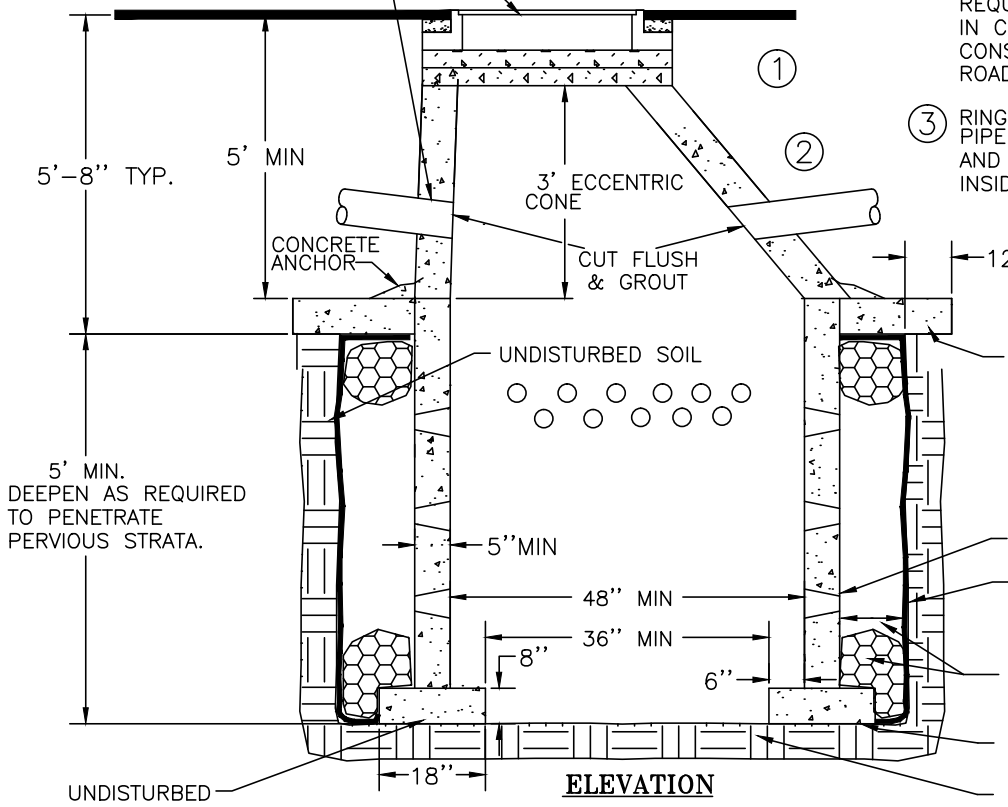
PLAN

24'' M.H. RING & SOLID COVER SEE STD DWG 3–3.

TO BE MARKED "STORM" ON COVER

ACCESS TO LINE UP WITH FLAT TOP ACCESS

10'' MIN. STORM DRAIN PIPE FROM CATCH BASIN



NOTES:

1. PRECAST CONCRETE ADJ. RINGS. 6'' MIN. 24'' MAX SEE DWG 3–4 FOR MANHOLE ADJUSTMENT & GROUTING REQUIREMENTS.
2. WHEN UNDER A.C.P., ALL BACKFILL ABOVE THE CONCRETE CAP TO BE 5/8'' MINUS CRUSHED ROCK. 95% MIN. DENSITY. ROCK BACKFILL NOT REQUIRED IF DRYWELL IS INSTALLED IN CONJUNCTION WITH NEW STREET CONSTRUCTION AND IS IN THE ROADWAY.
3. RINGS, CASTING, LIFTHOLES AND PIPE INLETS INTO CATCH BASIN AND DRYWELL SHALL BE GROUTED INSIDE & OUT.

NOTE:
4" CONCRETE CAP.
CAP TO BE BELOW OUTLET PIPE IF DRYWELL USED IN STORM SEWER AS A MANHOLE.
NO PERFORATIONS TO BE ABOVE CONCRETE CAP.

PERFORATED M.H. SECTION

SOIL FILTRATION FABRIC

2''–3'' WASHED RIVER ROCK
24" MIN WIDTH
36" MAX WIDTH UNDER PAVEMENT.

POURED "IN PLACE" OR REINFORCED PRECAST BASE

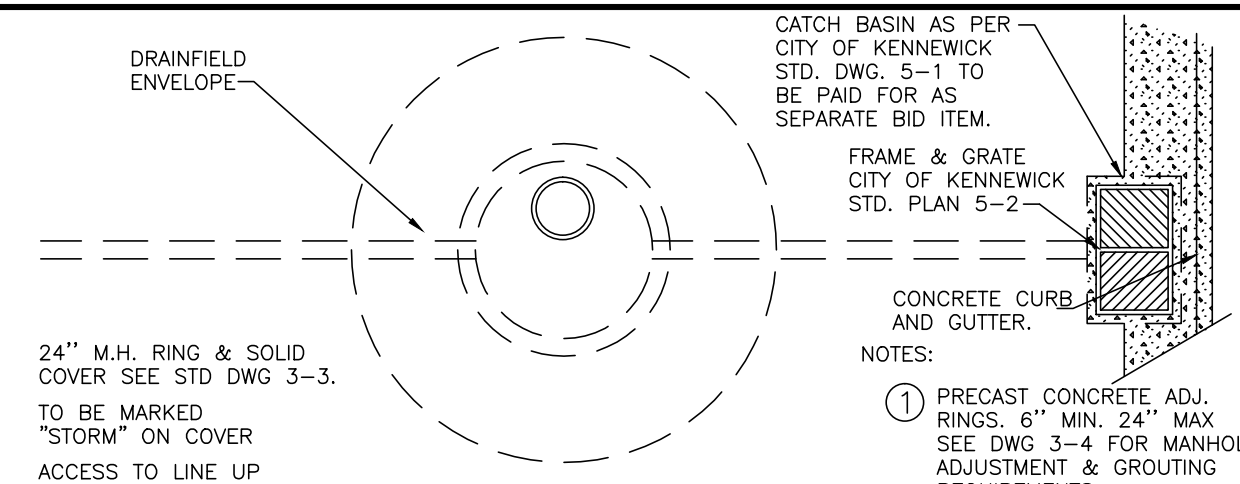
PERVIOUS STRATA

MODIFIED DRYWELL

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 2/93 DWN RAW REV 3/14 CHK BWB SCALE NTS

DWG. NO.

5-4



PLAN

NOTES:

1. PRECAST CONCRETE ADJ. RINGS. 6" MIN. 24" MAX SEE DWG 3-4 FOR MANHOLE ADJUSTMENT & GROUTING REQUIREMENTS.
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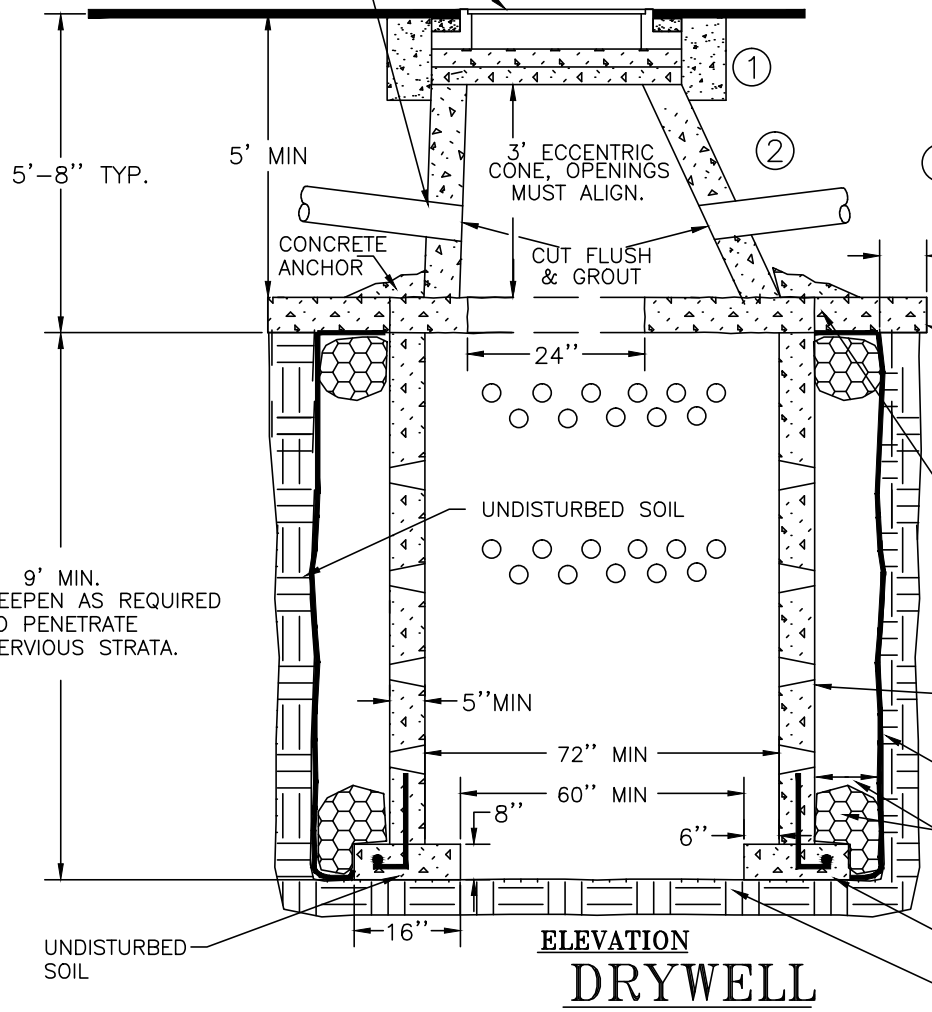
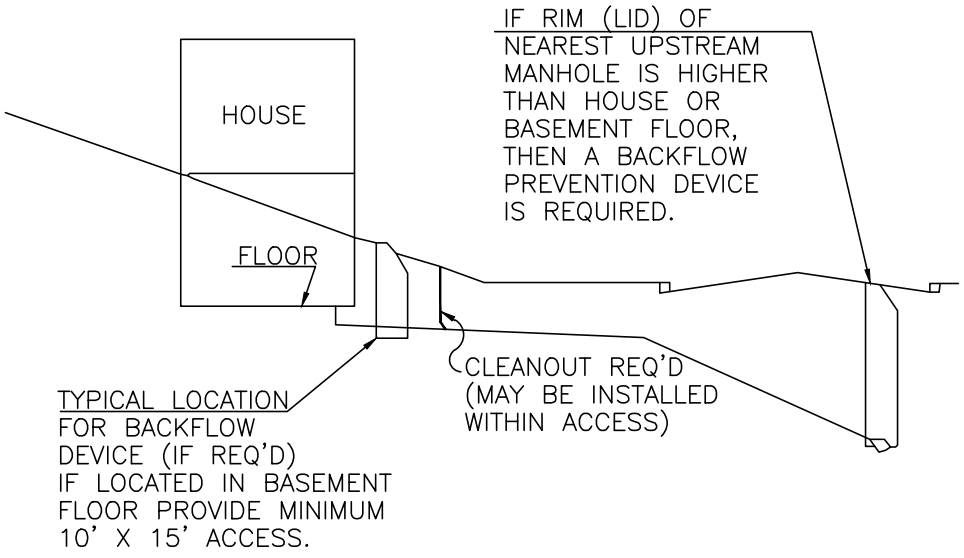
3. RINGS, CASTING, LIFTHOLES AND PIPE INLETS INTO CATCH BASIN AND DRYWELL SHALL BE GROUTED INSIDE & OUT.

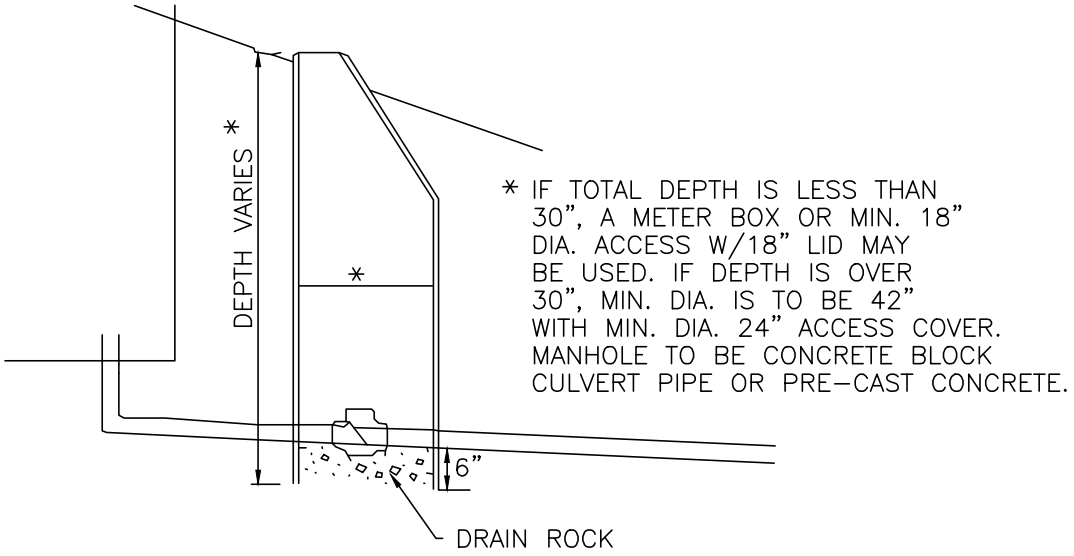


ELEVATION

DRYWELL

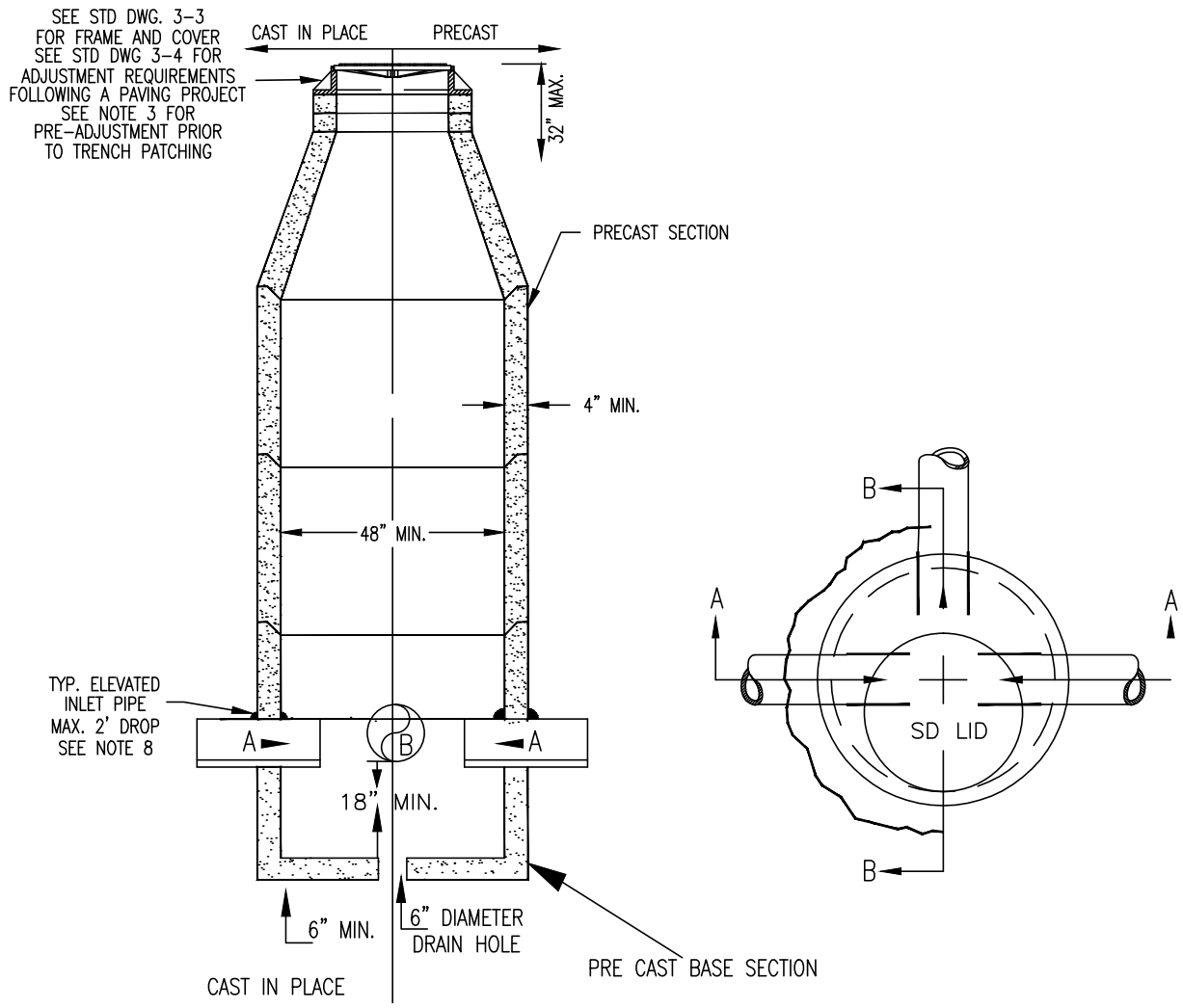
CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 2/93 DWN RAW REV 3/14 CHK BWB SCALE NTS	DWG. NO. **5-5**





TYPICAL SANITARY SEWER SERVICE BACKFLOW REQUIREMENT

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 1/89 DWN AGH REV 3/14 CHK BWB SCALE NTS	DWG. NO. **5-6**



NOTE:

1. A RUBBER RING ENTRY COUPLING SHALL BE USED WITH P.V.C. PIPE.
2. ALL MANHOLE JOINTS SHALL BE MADE USING A CONTINUOUS FLEXIBLE RUBBER MANHOLE GASKET, OR FULL BED GROUT JOINT.
3. ADJUSTMENTS OVER 2" UTILIZE PRECAST CONCRETE RINGS. GROUT OR PLACE SEALANT (SONNEBORN – SONOLASTIC NPI, OR EQUAL) BETWEEN EACH RING AND AT FRAME. REMOVE ALL WOOD SHIMS AND FINISH GROUT (WIPE) INSIDE OF ADJUSTMENT RING.
4. PROVIDE A MINIMUM 0.1 FOOT IN-OUT DROP FOR STRAIGHT RUNS AND 0.2 FOOT IN-OUT DROP FOR ANGLE RUNS.
5. WHEN CONNECTING TO AN EXISTING MANHOLE, PIPE HOLE TO BE SAW CUT.

STANDARD STORM DRAIN MANHOLE

MINIMUM 5' INVERT TO COVER. SEE SHEET 2 FOR SHALLOW MANHOLES

CITY OF KENNEWICK

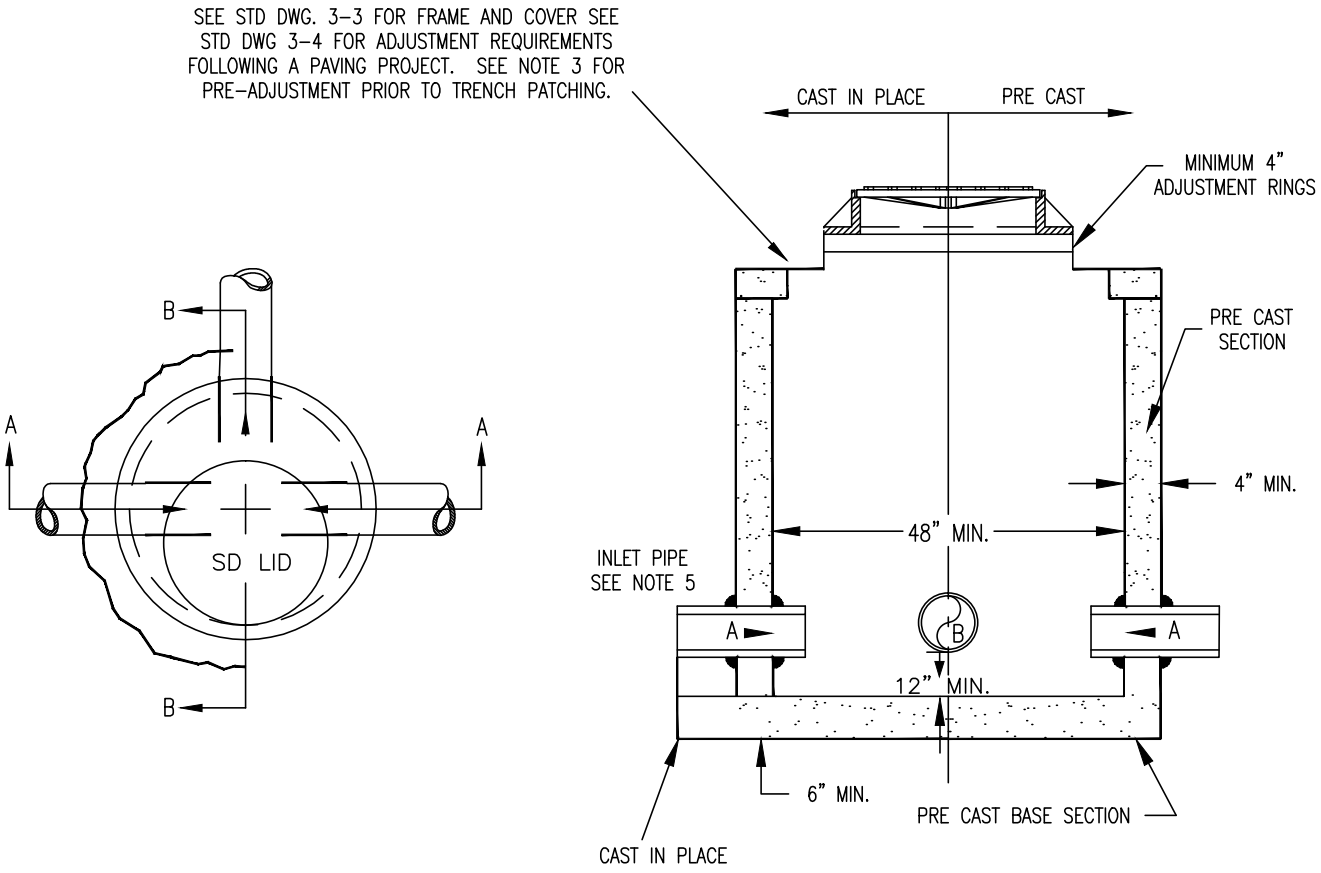
ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

5-7

SHEET 1 OF 2



NOTE:

1. A RUBBER RING ENTRY COUPLING SHALL BE USED WITH P.V.C. PIPE.
2. PRE CAST MANHOLE SECTION AND FLAT SLAB COVER SHALL CONFORM TO WSDOT STD DWG B-23C.
3. ADJUSTMENTS OVER 2" UTILIZE PRECAST CONCRETE RINGS. GROUT OR PLACE SEALANT (SONNEBORN - SONOLASTIC NPI, OR EQUAL) BETWEEN EACH RING AND AT FRAME. REMOVE ALL WOOD SHIMS AND FINISH GROUT (WIPE) INSIDE OF ADJUSTMENT RING.
4. ALL MANHOLE JOINTS SHALL BE GROUTED INSIDE AND THE JOINTS TROWELED.
5. WHEN CONNECTING TO AN EXISTING MANHOLE, PIPE HOLE TO BE SAW CUT.

SHALLOW STORM DRAIN MANHOLE

UNDER 5' INVERT TO COVER

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	7/13
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SHEET 2 OF 2

Section 6 Index

Street Light Construction [click on number or heading below]

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

STREET LIGHT CONSTRUCTION

6-1 STREET LIGHTING SYSTEM

6-1.01 GENERAL

The work covered in this section shall apply to the furnishing and installation of all materials and equipment necessary to construct the street lighting system in accordance with the requirements of the plans, specifications, and the City of Kennewick standard drawings 6-1 through 6-6 inclusive. No materials shall be ordered until the city has approved the power source as specified.

6-1.02 RESIDENTIAL DEVELOPMENT

As part of all residential development instruction plans, there shall be a separate schematic drawing which at a minimum, shows the power source(s), wiring diagram and street light pole spacing.

6-1.03 ELECTRICAL REGULATIONS AND CODES

All electrical work required under this specification shall be complete and in accordance with the required standards of all state laws, rules and regulations and the National Electrical Code (NEC), hereinafter referred to as the "Code." The Contractor's attention is called to Section 8-20.1(2) of the SWSS for a listing of Electrical Industry Codes and their abbreviations which shall be used within the body of these specifications and to call out standard procedures, materials, and testing requirements.

6-1.04 REQUEST FOR POWER SOURCE

The city will make approval of the power source when proposing to connect to an existing street light circuit. The PUD will make approval of the power source in all other situations. It is the contractor's full responsibility to verify that the luminaires ordered are compatible with the power voltage that is available, or will be installed. If the required power source(s) for street lights is not existing for the site or subdivision, the owner/developer will be required to schedule to have the power feed and transformer installed during construction of the project.

The power source for the city street lights must be an independent and approved source. Combining the power source for city street lights with private lights or other non-city service use is not allowed.

6-1.05 ELECTRICAL PERMITS

The Contractor will be required to secure, at his own expense, from the State of Washington Department of Labor and Industries Electrical Division, all state inspection permits required to construct the lighting system.

In addition to the State Electrical permit, on all projects not directly administered by a city contract, a separate construction permit is required from the City Department of Public Works,

The Contractor shall ensure that all required state and city electrical inspections are coordinated with the appropriate agency and made, prior to covering or energizing the lighting system.

6-1.06 ACCEPTANCE OF THE LIGHTING SYSTEM

All lighting installations are required to have an energized power source prior to acceptance of the installation(s) by the City.

The City Inspector will provide a City of Kennewick Electrical Submittal form to the Contractor. After the Contractor has obtained written approval from the State Electrical Inspector that the lighting system components and construction have been installed, in accordance with the requirements of the Electrical Code, the Contractor shall complete the City of Kennewick Electrical Submittal form and submit it along with an as-built map showing the detailed location of the street lights and meter to the City Inspector.

The City Inspector will then request the PUD energize the lighting system.

6-1.07 MATERIALS

Unless otherwise indicated on the plans or special provisions, all materials utilized in the project shall be new.

6-2 STREET LIGHT STANDARDS: (POLE, MAST ARM, AND ACCESSORIES)

6-2.01 GENERAL

Street light standards (poles) shall be in accordance with City of Kennewick Standard Drawing 6-1. The pole shaft shall be of a one-section design, fabricated from U.S. Standard 11 gauge (0.1196") steel having a minimum yield strength of 55,000 psi after fabrication. The single shaft section design shall be of a one-piece construction utilizing a

single full length longitudinal high-frequency weld in accordance with applicable American Welding Society (AWS) procedures, standards and specifications. The pole shaft shall be of a uniform and cylindrical cross section having a uniform taper of 0.14 inches of diameter change per foot of length. The completed assembly, including pole, mast arm, and luminaire, shall be capable of sustaining a wind velocity of ninety (90) miles per hour.

6-2.02 UNDERGROUND WIRING ACCESS HOLE

A one and five-eighth inch by nine and five-eighth inch (1-5/8" X 9-5/8") minimum, oval-shaped underground access hole with its edges deburred inside and out shall be provided in the pole shaft and located a minimum of four feet six inches (4'6") above the base end of the pole shaft at 180 degrees from the luminaire mast arm attaching point.

6-2.03 HANDHOLE

A seven and nine-sixteenth inch by five and one-eighth inch (7-9/16" X 5-1/8") minimum, oval shaped above-ground handhole with removable access cover shall be provided in the pole shaft and located 24-inches above the ground or sidewalk. The hand hole will be located on the same side of the pole as the luminaire mast arm, per Standard Drawing 6-1.

6-2.04 GROUND SLEEVE

A seven (7) gauge, twelve-inch (12") long galvanized ground sleeve shall be welded to the pole shaft around the total circumference of the pole, both top and bottom of the sleeve. The location of the ground sleeve is to be attached to the pole and shall be in accordance with the City of Kennewick Standard Drawing 6-1 for individual luminaire mounting heights.

6-2.05 POLE TOP CAP

Each standard shall be provided with a cast-iron removable pole top cap which is secured in place with three (3) stainless steel or galvanized plated set screws equally spaced about its perimeter. The pole cap shall meet ASTM A-48 Class 30.

6-2.06 LUMINAIRE MAST ARM

The luminaire mast arm shall be constructed of two and three-eighths inch (2-3/8") O.D. by 0.121" wall steel tubing with a guaranteed minimum yield strength of 36,000 psi. The mast arm shall be constructed in such a fashion as to provide a uniform rise of 2.25 feet above its point of attachment to the light standard. The standard and mast arm attaching components shall be welded to their respective members as shown on City of Kennewick Standard Drawing 6-1. The mast arm shall be capable of being held in place, on the standard, by gravity while being secured with a single one-half inch (1/2") - 13 UNC

galvanized high-strength carbon steel hex-head hub bolt. The installed attachment of the mast arm to the light standard shall provide an internal weather resistant wiring raceway.

6-2.07 STANDARD FINISH, FASTENERS, AND ACCESSORIES

The luminaire standard, mast arm, and accessories shall receive a hot-dipped galvanized finish after fabrication in accordance with ASTM designation A123. All fasteners and attaching devices shall be galvanized in accordance with ASTM designation A153.

6-2.08 GROUNDING LUG

Each light standard shall be provided with an internal threaded one-half inch (1/2") diameter nut holder and fastener for grounding the pole and mast arm assembly.

6-2.09 MEASUREMENT AND PAYMENT

The unit contract price for "Light Standard Type I", (or for "Light Standard Type II")," per each, shall be full compensation for furnishing all labor, materials tools and equipment necessary or incidental to furnish and install the light pole, mast arm, pole top cap and other appurtenances to the pole at the locations shown on the plans or where directed by the Engineer.

6-3 LUMINAIRES

6-3.01 GENERAL

Luminaires shall be of the Illumination Engineering Society (IES) Type III distribution pattern, unless otherwise specified in the special provisions, and shall be of the wattage, average initial lumens, and spaced to meet the requirements for street widths as required on City of Kennewick Standard Drawing 6-2 or as on the contract drawing.

Luminaires shall be as manufactured by TANKO Lighting (415)-254-7579 Model Series EW-3870FX, or City approved equal. Luminaires shall be Series 250 im (small housing, internal mounted driver), battleship gray, and be driver in-head type with cobra head configuration, flat, full cut off, glass lens and shall provide a cut-off distribution using a refractorless housing and an induction light source. The lamp compartment shall be sealed with an elastomer gasket and shall provide a charcoal filter for the vent. Luminaries shall have a cast aluminum housing with a slip-fitter end mounting capable of being attached to a one and one-quarter inch (1-1/4") I.D. through two inch (2") I.D. pipe tenon on mast arms.

The reflector of all luminaires shall be manufactured of a polished aluminum. The flat lens shall be formed from heat-resistant, high-impact borosilicate or tempered glass and shall be mounted in a door frame assembly which shall be hinged to the luminaire at a point

near the slip-fitter end and secured in the closed position to the luminaire by means of an automatic type latch. The lens and door assembly, when closed, shall exert pressure against a gasket seat. Gaskets shall be composed of materials capable of withstanding year round ambient air and lamp operating temperatures and shall be securely held in place.

All luminaires shall have their internal components secured to the luminaire frame with corrosion-resistant type hardware (nuts, bolts, washers, hinges, etc.). The slip-fitter bolts shall be either stainless steel or hot-dipped galvanized.

The luminaire housing complete with integral driver shall be weathertight and shall receive a painted aluminum finish.

All luminaires shall be mounted level, both traverse and longitudinally, as measured across points specified by the manufacturer. Leveling shall be accomplished after luminaire standard is plumbed.

All luminaires shall be provided with markers for positive identification of light source, wattage and voltage.

Contractor's attention is called to City of Kennewick Standard Drawings 6-2 for luminaire minimum requirements for street widths and area uses.

6-3.02 DRIVERS

Drivers for induction lamps shall be of the IES Type III Small Housing Internal mounted type. Drivers shall be Tanko MT 120-277 V for 50W induction luminaires or approved equal and Tanko MT 208-207 V for the 135W and 200W luminaires or approved equal.

6-3.03 PHOTOELECTRIC CONTROLS

Unless otherwise specified in the special provisions, the photoelectric controls shall be the primary control mechanism for each luminaire. Photoelectric controls shall be a plug-in type meeting EEI-NEMA standards for locking devices hermetically sealed, rated to operate at the proper voltage of the lamp furnished.

Photo controls shall conform to current I.E.S. Standards, ANSI C136.10 latest revision and UL773, Par. 25.2.

Photo control shall be Ripley Model 6390L-BK Longlife LED version The light sensitive element shall be installed and oriented on the luminaire head so that it faces the north sky.

6-3.04 MEASUREMENT AND PAYMENT

The unit contract price for "(Designated Wattage) Watt Luminaire," per each, shall be full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to furnish and install the required luminaire, photoelectric control, and driver on the light standard mast arm, installing electrical conductors, making splices, installing fusing and light standard grounding connections from the luminaire to the base of the pole together with any other work required to complete the luminaire and pole installation ready for connection to the power supply.

6-4 UNDERGROUND WIRING AND CONDUIT

6-4.01 UNDERGROUND CONDUIT

All underground electrical conductors, between the junction box or disconnect switch at the source of power and the junction boxes adjacent to the individual street lights, shall be installed within a one and one-half inch (1-1/2") (minimum diameter), Schedule 40, polyvinyl chloride (PVC) pipe conforming to the requirements of ASTM D1785.

The electrical conduit installation shall be installed in conformance with the appropriate articles of the Code, except that the minimum depth of bury on the conduit shall be twenty-four inches (24"). Conduits smaller than one and one-half inch (1-1/2") diameter shall not be used unless otherwise listed in the Special Provisions.

All conduits shall be installed per the City Standard Specification Drawing No. 6-4, 6-5, 6-6 and 6-7, and the trenches compacted as specified in Section 5-2 of these specifications.

Field cuts on conduits shall be made square and true and shall be well reamed inside and out to remove all burrs and rough edges with bushings.

Bends for rigid non-metallic conduit (PVC) shall conform to the requirements of Article 347-13 of the Code.

The twenty-four inch (24") minimum cover depth on the conduit shall be measured from the top of curb, where it exists. Where no curbing exists, the depth of cover shall be measured from the existing road centerline elevation plus six inches (6") or as directed by the Engineer.

Those conduits shown on the plans to receive future conductors shall be installed as described above and then blown clean with compressed air and end caps shall be used to seal the conduit ends. No pull wires shall be installed within the conduit. The Contractor shall install at each end of conduit a 4" x 4" x 4' cedar marker post as an end of conduit reference point.

Conduits shall enter all junction boxes through the bottom utilizing standard radius bends. The ends of the conduits inside the junction box shall terminate near the side walls of the box so as to leave a major area of the box open and clear.

Conduits shall enter or leave the junction box in the direction of the conduit run.

The conduit and wiring runs shown on the plans are for bidding purposes only and they may be changed by the Engineer to avoid existing underground obstructions which may show up during construction.

6-4.02 JUNCTION BOXES

Underground enclosures for the splicing and termination of wiring conductors and conduits shall be installed at the locations as shown on the plans or as directed by the Engineer. The size of the box shall meet the requirements of Article 370.18 and 370.19 of the State Electrical Code. At a minimum, a junction box shall be installed on both sides of each electrical conduit crossing of City right of way, at each street light and at maximum 180 foot max intervals. All exposed metallic rings or covers must be bonded and grounded.

When an existing street light and junction box are relocated on the same circuit due to construction, and the junction box would be in the street and/or where a new commercial driveway or street widening would otherwise leave a J-Box in the driveway or widening area, the wires coming into the existing box shall be removed back to the first junction box on both sides. Remove the junction box to be abandoned and install conduit sweeps and conduit from the existing junction box site to the relocated or new junction box location and pull new wires as required to eliminate splices. A junction box will not be left at the abandoned location in the street and no wire splices will be allowed between junction boxes.

A. NON-TRAFFIC BEARING JUNCTION BOX – TIER 15

Junction boxes to be used in non-vehicular traffic bearing areas shall be composed of reinforced plastic materials and shall be equipped with a removable locking cover with the word "Electric" formed into its top. The junction box shall be a Quazite 13-inch x 24-inch PG Style with CA Series cover manufactured by Quazite Company, San Jose, California, or an approved equal.

B. TRAFFIC BEARING JUNCTION BOX – TIER 15

B.1 Driveways and Sidewalks

Junction boxes to be used in occasional vehicular traffic bearing areas such as driveways or sidewalks shall be composed of reinforced plastic materials and shall be equipped with a removal locking cover with the word “Electric” formed into its

top. The junction box shall be a Quazite 13-inch x 24-inch PG Style with HA series cover, or HH cover as conditions require, or an approved equal.

B.2 Street

Typically, junction boxes shall not be located in the street traveled way. When conditions are such that a junction box must be located in the street, the box shall be WSDOT approved for highway use, or as called for on the plans.

C. JUNCTION BOX INSTALLATION

Junction boxes shall be located as shown on the plans or as directed by the Engineer. The Contractor may install, with the approval of the Engineer, and at his own expense, such additional junction boxes as may be desired to facilitate his work.

The Contractor shall place four inches (4") of five-eighths inch (5/8") crushed rock in the bottom of all junction boxes after installing the conduit and wiring. When placing the crushed rock in the junction box, the Contractor shall take special care to prevent any dust, dirt, rock chips, or objectionable materials from entering into the exposed ends of the conduit.

The Contractor's attention is called to the City of Kennewick Standard Drawing 6-4 for typical junction box location and installation.

6-4.03 WIRING

The minimum size of the lighting conductor shall be No. 6 aluminum, unless a larger conductor is required by load conditions as specified in Section 6-4.05 B. The conductor shall be cross-link poly USE insulation. The minimum ground wire shall be No. 8 THHN, green coded, insulated copper wire. A larger ground wire shall be used where load conditions require.

All wiring shall conform to appropriate articles of the Code. Wiring within pole bases, junction boxes, etc., shall be neatly arranged. The ground wire shall be color coded green the entire length.

Powdered soapstone, talc, or other approved lubricant shall be used in placing conductors in conduit.

Splicing of lighting conductors will only be permitted in junction boxes, in transformer boxes for transformer leads, and in control equipment boxes. Splices are not allowed in the street light pole or at pole hand holes.

Conductors in junction boxes shall be spliced by Burndy Series BIBS350DB.

The handmade Western Union splice will be permitted for aerial installation only, per SWSS Section 9-29.12(1). All tape splice insulation shall consist of thermoplastic electrical insulating tape applied to a thickness equal to the original wire insulation. It shall be well lapped over the original insulation, and there shall be a coating of moisture resistant varnish applied and allowed to dry. Two layers of friction tape will then be applied and the splice shall be finished with a second complete coating of moisture resistant varnish.

Where heat shrink splice insulation is used, the insulation of the individual conductors will be wiped clean and dry. The splice material shall be well lapped over the conductor insulation. Care shall be taken to ensure that the conductor insulation is not damaged by the application of too much heat to the splice. If the conductor insulation shows indications of heat deformation, the entire splice shall be replaced. Heat shrink splices shall conform to SWSS Section 9-29.12(1)A.

Drip loops shall be provided on all conductors where they enter poles or transformer leads.

The Contractor shall provide additional conductor length inside all junction boxes equal to a loop of conductor having a diameter of one foot (1').

When conductors are being installed, care shall be exercised to not exceed tension limitations recommended by the manufacturer. Conductors may be pulled directly by hand; however, if conductors are pulled by any mechanical means, a dynamometer with drop-needle hand shall be used on every mechanical pull.

To limit the sidewall pressure at bends in duct and conduit runs, the pulling force in pounds shall not exceed 100 times the radius of the bend in feet. Adequate lubrication of the proper type to reduce friction in conduit and duct pulls shall be utilized as necessary.

6-4.04 BONDING, GROUNDING

All metallic appurtenances containing electrical conductors (luminaires, light standards, cabinets, etc.) shall be mechanically bonded to form a continuous grounding system which shall effectively be grounded to the PUD neutral conductor at the source of power.

The equipment grounding conductor shall in all cases be sized consistent with Table 250-95 of the Code except that the minimum ground conductor shall be of equal grounding capacity to a No. 6 copper conductor. Where paralleled electrical circuits exist in an electrical conduit, the equipment grounding conductor shall be sized as determined by the rating of the largest overcurrent device serving any circuit contained in the conduit.

The equipment grounding conductor shall be insulated stranded copper, rated for direct burial.

Equipment grounding conductors shall employ insulation rated at 60 degrees centigrade or higher and shall be chemically compatible to other insulations contained with the system.

Identification of the equipment grounding conductor shall conform to all Code requirements.

Grounding of the neutral shall be accomplished only at the PUD's point of service. Grounding of the neutral at the service point shall be accomplished by the Contractor on a multiple fixture circuit, and by the PUD on a single fixture circuit.

6-4.05 LUMINAIRE FUSING AND ELECTRICAL CONNECTIONS AT LIGHT STANDARD BASES AND POWER SUPPLY

A. INDIVIDUAL LUMINAIRE FUSING

An in-line fused, watertight, electrical quick disconnect kit shall be installed inside the junction box, at every light standard base for every conductor above-ground potential. The fused watertight electrical quick disconnect kit shall be properly sized to accommodate the various conductors and fused as required by Section 6-4.05C of these specifications. All connections shall be made with compression or mechanical fittings. The kit shall be designed so that upon disconnection of the fuse holder the fuse shall remain in the load side of the kit.

B. METERED LOAD CENTER PEDESTAL

A metered load center pedestal shall be required and located adjacent to the PUD's source of power, on single and multiple fixture installations. The number of metered load center pedestals within a subdivision shall be kept to a minimum, with typically ten to thirteen lights on a single leg of the circuit. Where fewer than ten lights are scheduled for installation, all lights shall be energized from a single metered load center pedestal, unless extenuating circumstances are encountered and the Engineer’s approval is received.

For a typical 100 amp metered load center controlled circuit, which tee’s into two directions, the feeder wire from the power source to the junction box at the ‘T” shall be #4 gauge. Each leg of the circuit can then typically be serviced with #6 wire. The typical maximum number of lumnaires on a circuit shall be no more than eighteen (18). Wire requirements and number of lights allowed, shall be evaluated by the Engineer, when higher wattage lights are required.

In subdivisions, the street light metered load center pedestal location shall be coordinated with the power company to ensure that the transformer will be installed in a timely manner, as required to allow energizing of the street light circuit as soon as practical. The BENTON PUD APPROVED metered load center pedestal shall be one of the following: Cooper B-Line M1M100PD, Midwest M101CP6 or Milbank MPRV-100-78. The Contractor will leave the service door unlocked at all times and the city crew will secure the box when it is energized. The Contractor shall install

the metered load center pedestal in accordance with the requirements of the City of Kennewick Standard Drawing 6-5.

C. SYSTEM PROTECTION REQUIREMENTS (Fuses and Breakers)

Protection furnished for street lights shall be capable of handling the operating voltage of the circuit involved and shall have the following characteristics:

1) Maximum Breaker – size shall be 20 amp.

2) Protection shall be capable of indefinitely supporting 100 percent of the rated load.

3) Protection shall be capable of supporting 135 percent of the rated load for approximately one (1) hour.

4) A load of 200 percent of the rated load will effectively cause instantaneous failure of the circuit breaker.

5) Fuses shall be of the slow burn type and rated as listed below and shall be sized to fit the fuse containers furnished on this project, according to the manufacturer's recommendations therefore:

		Service Voltage	
		240V	
Luminaire Size	200 W	5A.	5A.
	135 W	5A.	5A.
	50 W	5A.	5A.

6) Protection shall be UL Listed.

6-4.06 FIELD TEST

Prior to completion of the work, the Contractor shall cause the following tests to be made on all electrical circuits whose nominal operating voltage is between 240 volts and 600 volts:

A. Test for continuity of each conductor.

B. Verify grounds in each circuit, this shall consist of the physical examination of the installation to ensure that all required ground jumpers, devices and appurtenances do exist and are mechanically firm.

C. A functional test in which it is demonstrated that each and every part of the system functions as specified or intended herein. A one hour burn is required on new installations.

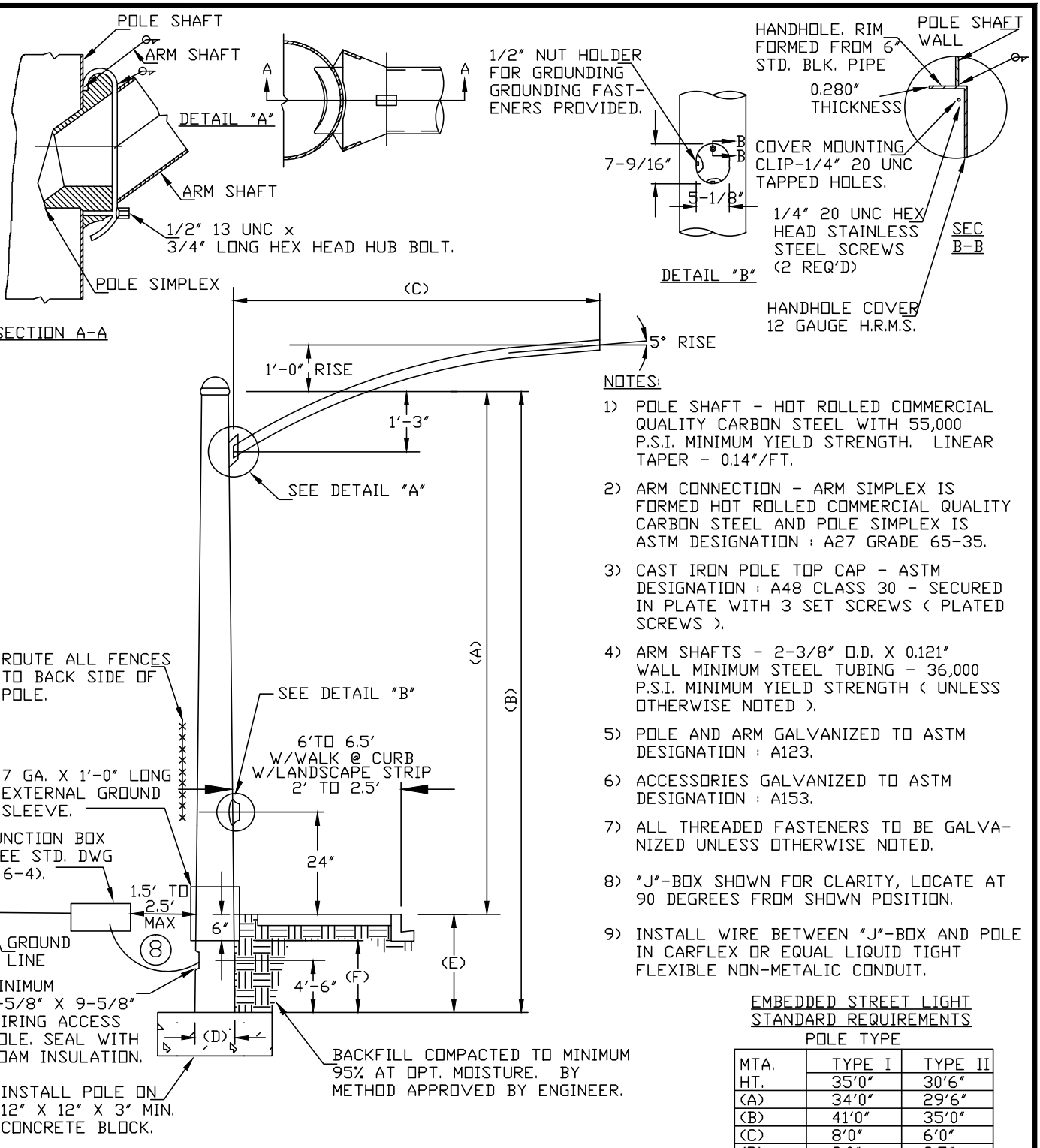
6-4.07 RETESTING

Any fault in any material or in any part of the installation revealed by these tests shall be replaced or repaired by the Contractor at no expense to the City in a manner approved by the Engineer, and the tests shall be repeated.

6-4.08 MEASUREMENT AND PAYMENT

Except when separate bid items are provided for in the bid proposal, the unit contract price for "Wiring and Conduit," per linear foot, junction box to junction box, shall be full compensation for furnishing all labor, materials, tools and equipment, trench excavation and backfill, install conduit, conduit fittings, conductors, junction boxes, installing metered load center pedestal, and electrical disconnect kits, making splices, grounding equipment, connecting power conductors to luminaire conductors, making all required field tests of the lighting system, adjusting junction boxes to finished grade, and all other incidental work necessary to install the lighting system complete or as directed by the Engineer.

The unit contract price for “4-inch spare electrical conduit” per linear foot, shall be full compensation as specified above and shall also include a terminal junction box at each end of the specified spare conduit, where the conduit would not otherwise terminate in a junction box installed in conjunction with the street light wiring and conduit installations.



NOTES:

1) POLE SHAFT - HOT ROLLED COMMERCIAL QUALITY CARBON STEEL WITH 55,000 P.S.I. MINIMUM YIELD STRENGTH. LINEAR TAPER - 0.14"/FT.
2) ARM CONNECTION - ARM SIMPLEX IS FORMED HOT ROLLED COMMERCIAL QUALITY CARBON STEEL AND POLE SIMPLEX IS ASTM DESIGNATION : A27 GRADE 65-35.
3) CAST IRON POLE TOP CAP - ASTM DESIGNATION : A48 CLASS 30 - SECURED IN PLATE WITH 3 SET SCREWS (PLATED SCREWS).
4) ARM SHAFTS - 2-3/8" O.D. X 0.121" WALL MINIMUM STEEL TUBING - 36,000 P.S.I. MINIMUM YIELD STRENGTH (UNLESS OTHERWISE NOTED).
5) POLE AND ARM GALVANIZED TO ASTM DESIGNATION : A123.
6) ACCESSORIES GALVANIZED TO ASTM DESIGNATION : A153.
7) ALL THREADED FASTENERS TO BE GALVANIZED UNLESS OTHERWISE NOTED.
8) "J"-BOX SHOWN FOR CLARITY, LOCATE AT 90 DEGREES FROM SHOWN POSITION.
9) INSTALL WIRE BETWEEN "J"-BOX AND POLE IN CARFLEX OR EQUAL LIQUID TIGHT FLEXIBLE NON-METALIC CONDUIT.

EMBEDDED STREET LIGHT STANDARD REQUIREMENTS

POLE TYPE

MTA. HT.	TYPE I	TYPE II
(A)	34'0"	29'6"
(B)	41'0"	35'0"
(C)	8'0"	6'0"
(D)	9.0"	8.5"
(E)	7'0"	6'0"
(F)	6'6"	5'6"

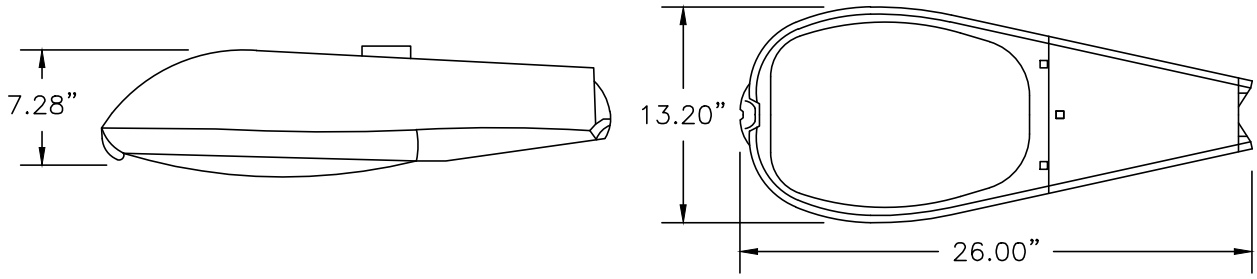
STREET LIGHT STANDARD

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/93
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

6-1



NOTES:

1) LUMINAIRE SHALL BE EW–3870 SERIES 250im (400im FOR 200 WATT LAMPS), AS MANUFACTURED BY TANKO LIGHTING, OR CITY APPROVED EQUAL. LUMINAIRE SHALL BE COBRA–HEAD CONFIGURATION WITH INTERNAL MOUNTED DRIVER MEETING I.E.S. TYPE III LIGHT DISTRIBUTION PATTERN WITH FULL CUTOFF, FLAT GLASS LENS. THE COLOR TEMPERATURE OF THE LAMP SHALL BE BETWEEN 5000 AND 5500K AND THE FIXTURE COLOR SHALL BE BATTLESHIP GRAY..

2) POWER VOLTAGE TO LUMINAIRE SHALL BE VERIFIED WITH BENTON P.U.D. NO. 1 PRIOR TO ORDERING LUMINAIRE. ALL LUMINAIRES SHALL BE 240V.

4) PHOTOELECTRIC CONTROL PER EACH LUMINAIRE SHALL BE A PLUG–IN TYPE, THE PHOTOELECTRIC CONTROL SHALL BE A MULTI–VOLTAGE UNIT SIMILAR AND EQUAL TO MODEL LED LONGLIFE 6390L–BK AS MANUFACTURED BY RIPLEY LIGHTING CONTROLS. THE LIGHT SENSING ELEMENT SHALL BE ORIENTED TO THE NORTH SKY.

5) SEE CITY STANDARD DRAWING 6–1 FOR POLE AND MAST ARM REQUIREMENTS.

6) LUMINAIRE REQUIREMENTS :

STREET WIDTH (SEE NOTE 1)	LUMINAIRE MOUNTING HEIGHT	GENERAL STREET CLASSIFICATION	LAMP WATTAGE	MAXIMUM POLE SPACING (SEE NOTE 2)
60'	35.0'	PRINCIPAL ARTERIAL, 5–LANE, HIGH DENSITY COMMERCIAL	200	125'
60'	35.0'	PRINCIPAL ARTERIAL 5–LANE	135	150'
40'–48'	35.0'	MINOR ARTERIALS/COLLECTORS 3 AND 4–LANE	135	150'
34'–36'	30.0'	LOCAL RESIDENTIAL/NIEGHBORHOOD	50	300'

NOTES:

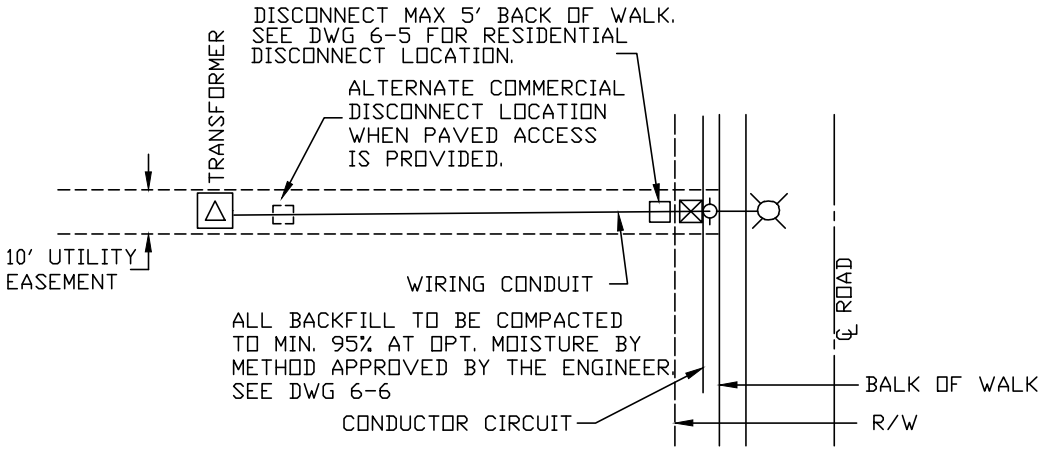
1. MEASURED FROM FACE OF CURB TO FACE OF CURB.
2. SPACING TO BE STAGGERED OPPOSITE SIDE OF STREET INTERVALS, EXCEPT ON CURVES WHERE SPACING SHALL BE DETERMINED BY THE ENGINEER.
3. WIDER STREETS, NON–STANDARD STREETS AND STREETS WITH MEDIANS REQUIRE AN ENGINEERED DESIGN.

TYPICAL INDUCTION LUMINAIRE

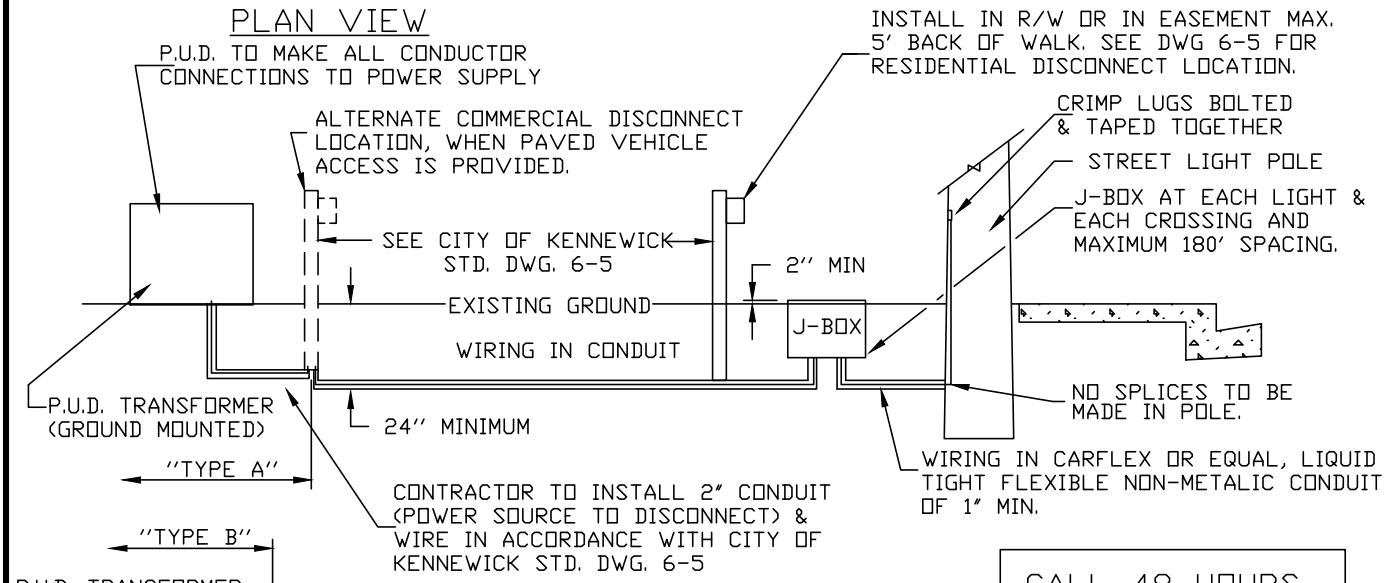
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

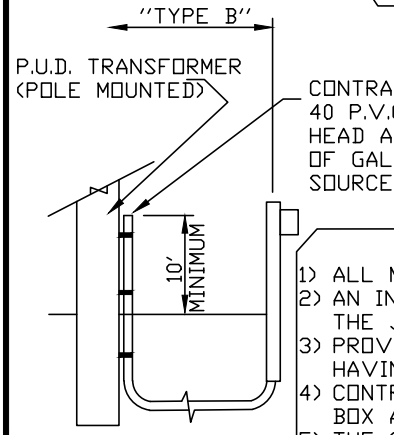
DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
6-2



PLAN VIEW





CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

NOTES

1) ALL MATERIALS AND CONSTRUCTION TO CONFORM TO SECTION 6 OF THESE SPECIFICATIONS
2) AN IN-LINE, FUSED, WATERTIGHT ELECTRICAL DISCONNECT KIT SHALL BE INSTALLED IN THE JUNCTION BOX FOR EVERY CONDUCTOR ABOVE GROUND POTENTIAL.
3) PROVIDE ADDITIONAL CONDUCTOR LENGTH IN ALL JUNCTION BOXES EQUAL TO A LOOP HAVING A DIAMETER OF ONE (1) FOOT.
4) CONTRACTOR SHALL PLACE 4'' OF 5/8'' MINUS CRUSHED ROCK IN BOTTOM OF JUNCTION BOX AFTER INSTALLING CONDUIT AND WIRING.
5) THE CONTRACTOR SHALL BE REQUIRED TO SECURE, AT HIS OWN EXPENSE, FROM THE CITY AND FROM THE STATE OF WASHINGTON ELECTRICAL INSPECTION DEPT., ALL INSPECTION PERMITS REQUIRED TO CONSTRUCT THE LIGHTING SYSTEM.

TYPICAL LIGHT CIRCUIT

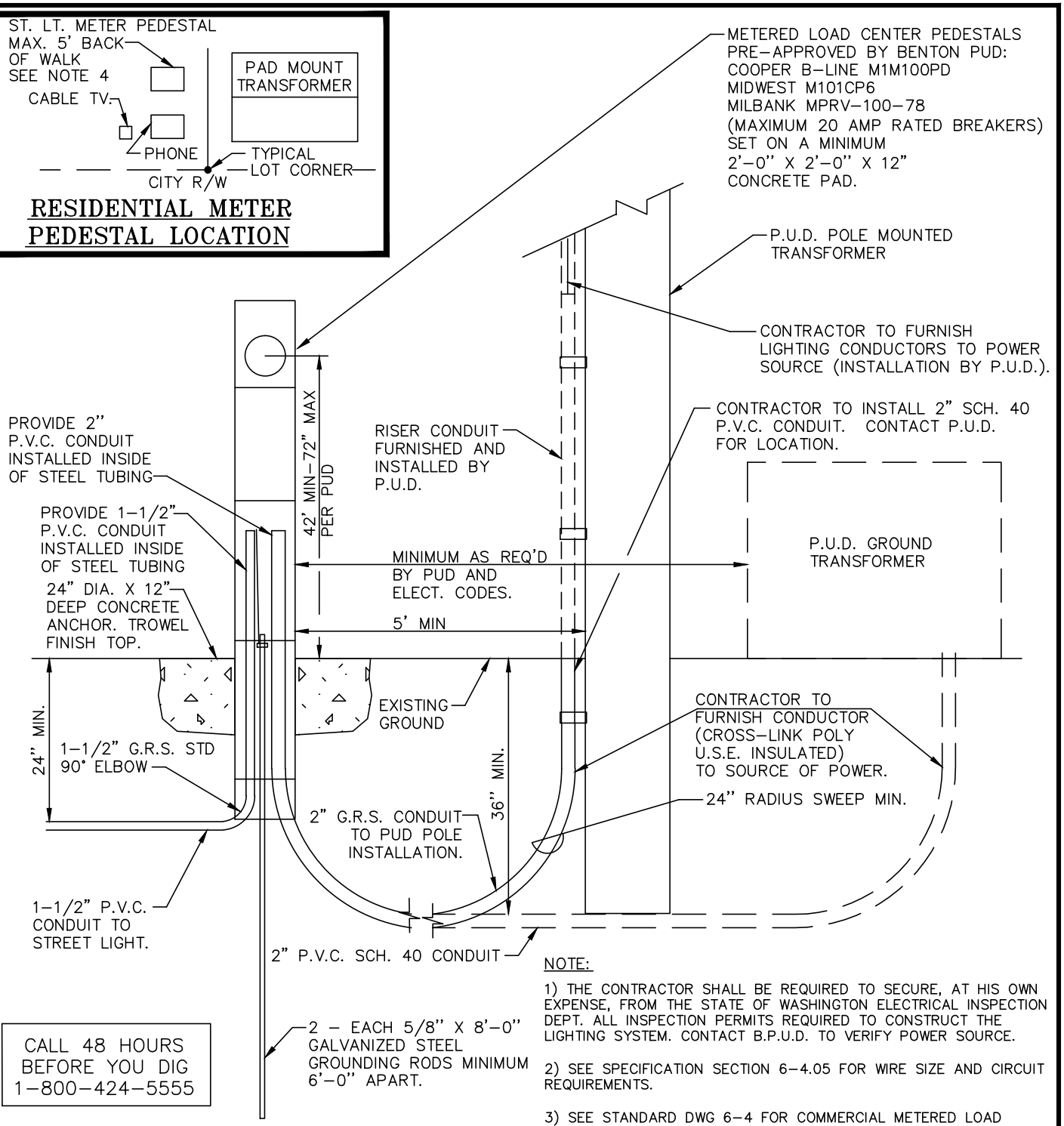
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	02/91
DWN	SRP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

6-4

RESIDENTIAL METER PEDESTAL LOCATION



CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555

NOTE:

1) THE CONTRACTOR SHALL BE REQUIRED TO SECURE, AT HIS OWN EXPENSE, FROM THE STATE OF WASHINGTON ELECTRICAL INSPECTION DEPT. ALL INSPECTION PERMITS REQUIRED TO CONSTRUCT THE LIGHTING SYSTEM. CONTACT B.P.U.D. TO VERIFY POWER SOURCE.

2) SEE SPECIFICATION SECTION 6-4.05 FOR WIRE SIZE AND CIRCUIT REQUIREMENTS.

3) SEE STANDARD DWG 6-4 FOR COMMERCIAL METERED LOAD CENTER PEDESTAL LOCATION.

4) METERED LOAD CENTER PEDESTAL IN RESIDENTIAL SUBDIVISIONS SHALL BE LOCATED WITHIN 3 FT. OF PHONE AND CABLE TV PEDISTALS BUT NOT CONFLICT WITH ACCESS TO THE PUD TRANSFORMER.

METERED LOAD CENTER PEDESTAL

SINGLE & MULTI-LIGHT CIRCUIT

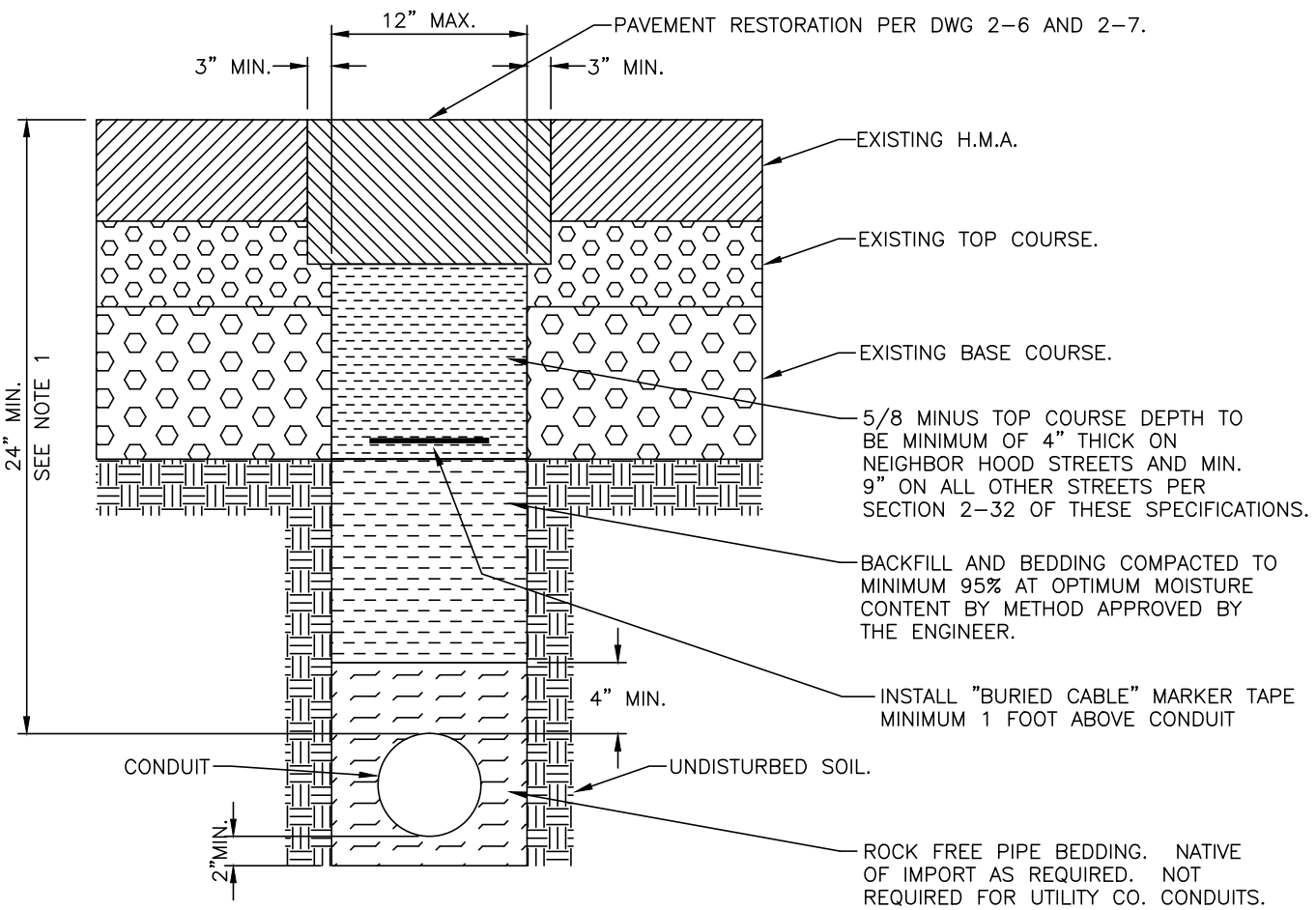
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	11/13
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

6-5



NOTES:

1) TRENCH DEPTH SHALL PROVIDE A MINIMUM COVER OF 24" OVER TOP OF CONDUIT. G.T.E. AND P.U.D. TO BE MIN. 30" AT NON CURBED STREET CROSSINGS OR AS REQUIRED BY THE PERMIT.
2) MINIMUM ONE-WAY TRAFFIC TO BE MAINTAINED.
3) ALL ROADWAY APPURTENANCES TO BE PROTECTED AND ROAD SIGNS LEFT AS FOUND.
4) PAVEMENT REPAIR TO BE MADE WITHIN 24 HOURS OF TRENCH BACKFILL.
5) PATCH TO BE 2" OF HMA CLASS "G" PG 64-28 ON RESIDENTIAL STREETS AND 3" OF HMA CLASS "A" ON ARTERIAL STREETS. HMA SHALL BE PLACED IN LIFTS NOT TO EXCEED 2" IN DEPTH
6) PERMIT REQUIRED ON ALL PROJECTS NOT CONTRACT ADMINISTERED BY THE CITY ENGINEERING DEPT.

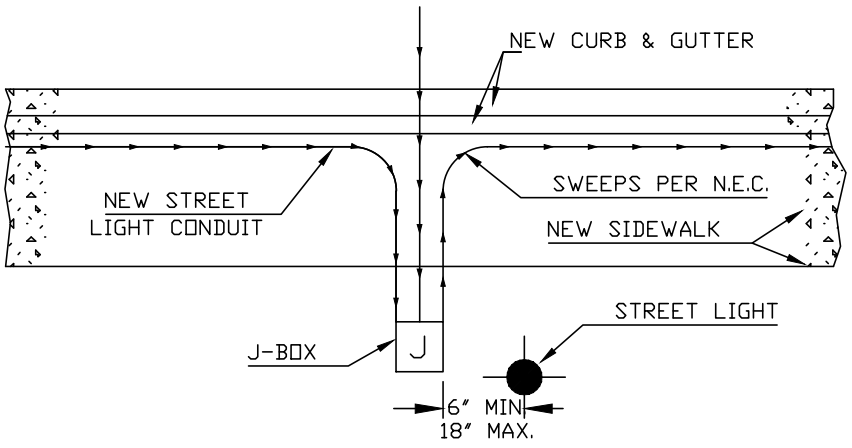
STREET CUT AND PATCH DETAIL FOR TYPICAL TRAFFIC SIGNAL, STREET LIGHTING AND UTILITY CO. CONDUITS

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/94
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

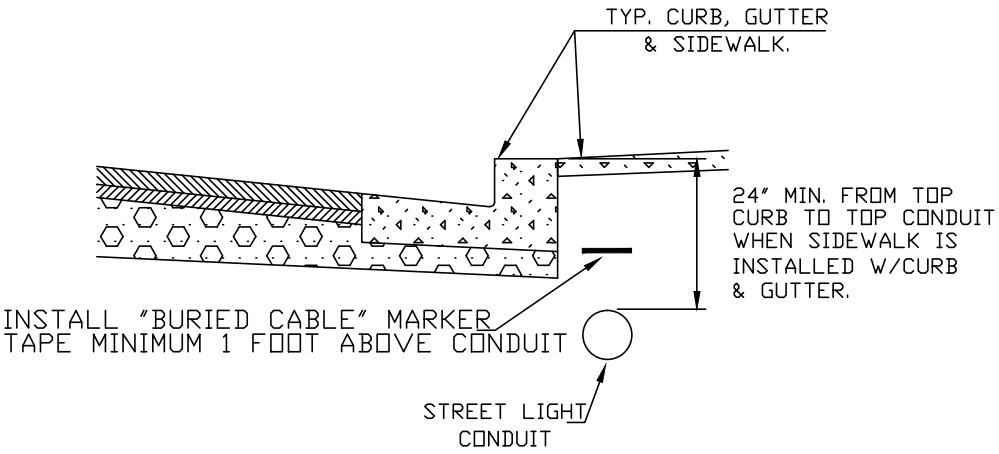
DWG. NO.
6-6

ALTERNATE STREET LIGHT CONDUIT LOCATION



NOTE:

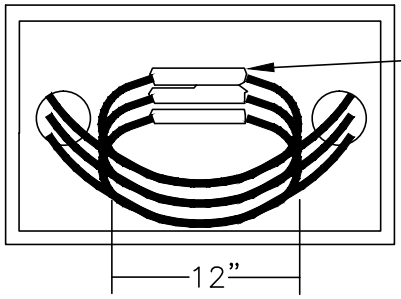
A TOTAL OF FOUR 90° BENDS, OR AN EQUIVALENT OF 360° MAXIMUM IS PERMITTED IN A CONDUIT RUN PER NEC SECTION 347-14. SINCE EACH "J" BOX REQUIRES ONE 90° BEND TO ENTER THE BOTTON OF THE BOX, A MAXIMUM OF TWO ADDITIONAL 90° BENDS CAN BOXES OR NO MORE THAN 180°



STREET LIGHT CONDUIT

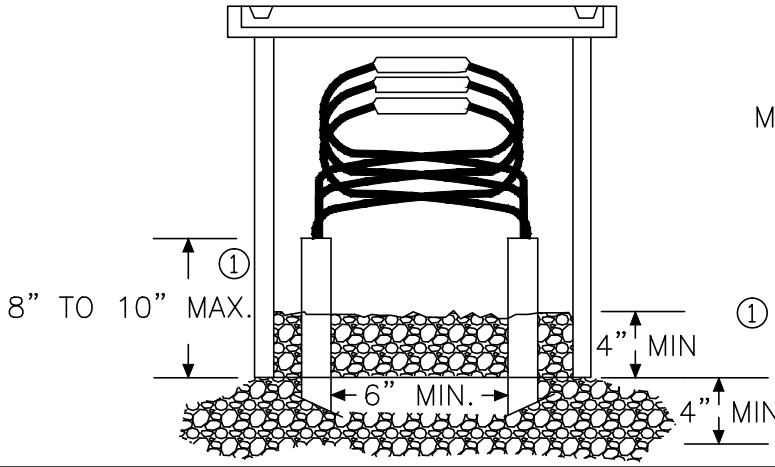
SINGLE & MULTI-LIGHT CIRCUIT

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 2/94 DWN CJD REV 3/14 CHK BWB SCALE NTS	DWG. NO. **6-7**



PLAN VIEW

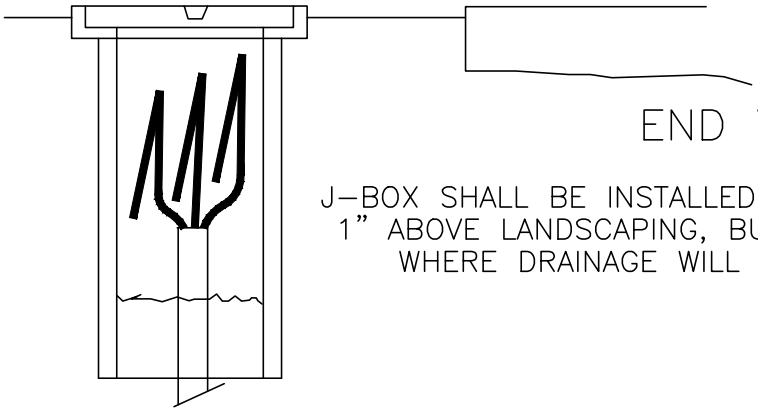
FUSED, WATERTIGHT, QUICK DISCONNECT
GROUND WIRE TO BE COLOR-CODED GREEN
CONDUCTOR LOOP MIN. 12 INCHES
BOX AND LID PER
CITY STANDARD SPECIFICATIONS
SECTION 6-4.02



PROFILE VIEW

MINIMUM OF 4 INCHES OF 5/8" GRAVEL
TO BE PLACED IN BOTTOM OF J-BOX
AFTER INSTALLING THE CONDUIT
AND WIRING.

① CUT CONDUITS 4" TO 6" MAXIMUM
ABOVE 5/8" MINUS ROCK



END VIEW

J-BOX SHALL BE INSTALLED FLUSH WITH SIDEWALK OR
1" ABOVE LANDSCAPING, BUT SHALL NOT BE PLACED
WHERE DRAINAGE WILL COLLECT IN OR NEAR.

NOTE:

1) ALL MATERIALS AND CONSTRUCTION TO CONFORM TO SECTION 6-4.02 OF THESE SPECIFICATIONS.
2) ALL BACKFILL TO BE COMPACTED TO MINIMUM OF 95% OF MAXIMUM DENSITY. OR AS REQUIRED TO PRECLUDE FUTURE SETTLEMENT.

STREET LIGHT JUNCTION BOX INSTALLATION

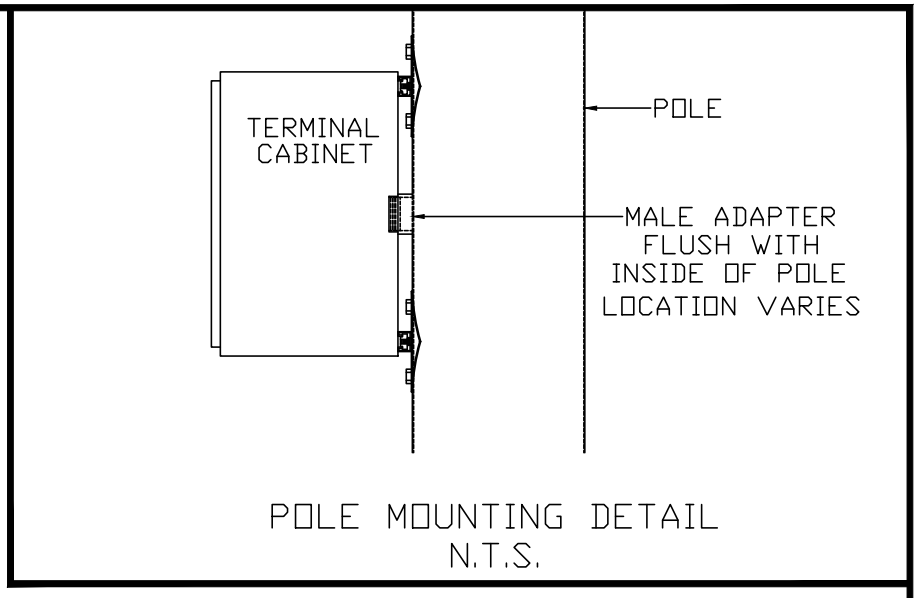
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

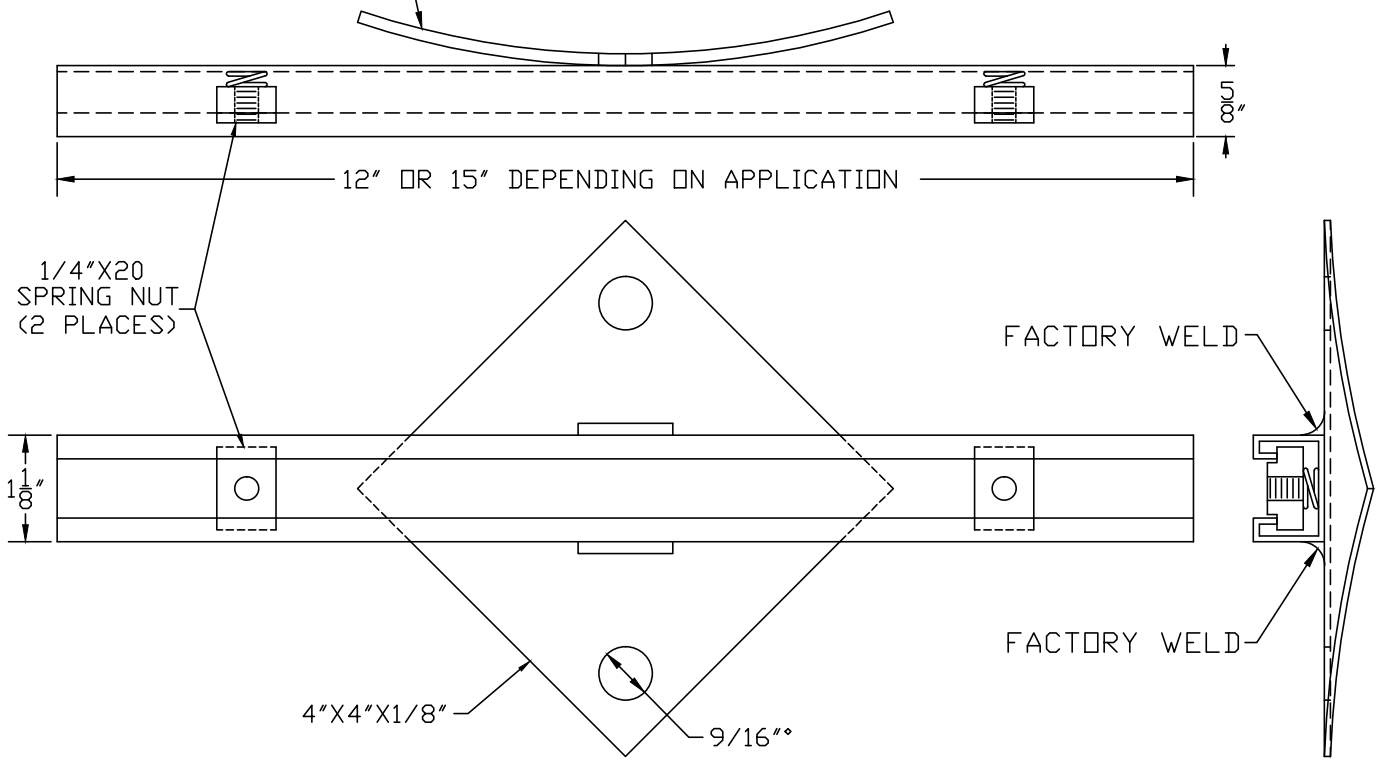
DATE	1/94
DWN	TRR
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

6-8



POLE MOUNTING DETAIL
N.T.S.



"MORFAB" PART # 12SOSM-12, 15SOSM-15

TERMINAL CABINET POLE STAND OFF BRACKET

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 9/00 DWN DDS REV 3/14 CHK BWB SCALE NTS

DWG. NO.

6-9

Section 7 Index

Traffic Control [click on number or heading below]

SECTION 7

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

TRAFFIC CONTROL

7-1 TRAFFIC CONTROL

7-1.01 GENERAL

The work covered in this section shall apply to all projects which require measures to protect pedestrian, bicycle and vehicular traffic. All traffic control requirements shall be completed in conformance to sections 1-07.23 "Public Convenience and Safety" and 1-10 "Temporary Traffic Control" of the latest (English Units) edition of the SWSS, except as herein modified.

7-2 TRAFFIC CONTROL PLANS

For city-administered contracts, which do not utilize federal funding, the following revisions shall apply.

The first sentence in Section 1-10.2 (2) of the SWSS is amended to read:

> The traffic control plan(s) appearing in the contract documents, or in Part VI of the MUTCD (Typical Application Diagrams), or the Kennewick Standard Drawings (7-14 through 7-31), or in the State of Washington Standard Plans (Section K), or WSDOT M54-44 show methods of handling traffic.

The following shall be added after the first paragraph in Section 1-10.2 (2) of the SWSS:

> Any modifications to the approved traffic control plan(s) shall be done by the Contractor at no additional expense to the City.
>
> Approval of the traffic control plan(s) by the Engineer is tactic and does not relieve the Contractor of their responsibilities. The Contractor shall assume all responsibility in providing a safe work zone and adequate traffic control and protection.

7-3 CONSTRUCTION SIGNS AND OTHER DEVICES

For city-administered contracts, which do not utilize federal funding, the following revisions shall apply.

The first sentence in Section 1-10.3 (3) A of the SWSS is amended to read:

> All signs and other traffic control devices required by the approved traffic control plan(s) as well as other appropriate signs and traffic control devices prescribed by the Engineer shall be furnished by the Contractor, unless otherwise provided for in the contract documents or special provisions.

7-4 LANE RESTRICTIONS AND CLOSURES

City designated arterial, secondary arterial and collector streets shall have one (1) through lane of traffic maintained in each direction at all times, except upon written approval of the Engineer. In those cases, one lane of traffic with Flaggers may be provided. Arrowboard(s) shall be used where traffic is diverted across the centerline on arterials, secondary arterials or major collector streets, unless otherwise approved by the Engineer. Local streets shall maintain traffic in at least one direction at all times, except with written approval of the Engineer. Traffic control for a lane closure on arterial and minor arterial streets shall not be in effect between the hours of 6:30 a.m. to 8:30 a.m. and 3:30 p.m. to 6:00 p.m., unless prior approval is obtained from the Engineer.

Any lane restrictions shall be held to a minimum time and length needed for each operation. If the Engineer determines that the lane restrictions are causing congestion, the Contractor will be required to open all lanes to traffic until the congestion is eliminated. All lane closures and lane restrictions will be subject to prior approval by the Engineer.

Street or lane closures on streets serving primarily commercial areas shall not be permitted from the fourth Thursday in November to the first week in January, unless prior written approval is obtained from the Engineer.

7-5 NO PASSING ZONES

For city-administered contracts, which do not utilize federal funding, the following revisions shall apply.

The second through sixth sentences in the second paragraph of Section 1.10.3(3)A) "No Passing Zones" of the SWSS are modified as follows:

> "The number of necessary signs will be as shown in the approved traffic control plan(s) or as specified by the Engineer. The Contractor shall provide, install and maintain the necessary signs until the no passing zones are reestablished by striping or as otherwise determined by the Engineer".

7-6 REMOVAL OF EXISTING TRAFFIC CONTROL SIGNS

Where construction requires the removal of existing City-owned signs, or where the signs are in such close proximity to the construction that they are susceptible to damage, the contractor shall remove the existing signs in conformance with the requirements of section 1-35 and 2-25 of these standards. Signs must be returned to the city sign shop at 1010 E. Chemical Drive due to inventory tracking., unless scheduled to be reinstalled for the project.

7-7 CONTRACTOR'S EMERGENCY TELEPHONE NUMBERS

The Contractor shall provide the Engineer with names and telephone numbers of the Traffic Control Manager (TCM) and Traffic Control Supervisor (TCS) who are responsible for and have authority to correct, erect, and maintain traffic control devices within the project limits during working and non-working hours (refer to sections 1-10.2 (1), 1-10.2 (1) A and 1-10.2 (1) B of the SWSS).

7-8 TEMPORARY VEHICULAR LANE STRIPING

On new road construction, overlay projects, or work which involves the patching or paved surfaces in which vehicular lane striping is covered, eradicated, destroyed, or otherwise rendered ineffective, the Contractor shall install, maintain, and remove temporary centerline and lane striping as directed by the Engineer. All costs for temporary vehicular lane striping as described herein, shall be considered as incidental to the lump sum traffic control bid item.

7-9 TRAFFIC CONTROL

7-9.01 TRAFFIC CONTROL LABOR

Traffic control labor shall be provided per the provisions of SWSS Section 1-10.3(1) as herein supplemented for contracts, which do not utilize federal funding. When the bid proposal includes an item for "Flaggers and Spotters" the work covered by this item shall be limited to flagging labor and the traffic control labor required for setting, moving, maintaining, positioning, and removing the temporary traffic control signs and devices required for the days detours, or lane closures and flagged construction operations, provided that the installed, relocated, or new locations are in accordance with the contract plans, approved traffic control plans, or the orders of the Engineer.

On street reconstruction projects and other long term site specific projects, where long term detours and traffic control is initially set up for the project phase and then left in place for longer than one day, the labor, equipment and materials as required to supply, set up, install, maintain and remove the project long term signing and detours, shall be included in the lump sum bid item for Project Temporary Traffic Control.

All maintenance of signs and detours during non-working hours shall be included in the lump sum bid item for Project Temporary Traffic Control, regardless of whether the bid proposal contains a bid item for traffic control labor, or not.

7-9.02 MEASUREMENT AND PAYMENT FOR TRAFFIC CONTROL

Section 1-10.4 of the SWSS is amended to incorporate the following revisions:
The unit contract price for "Project Temporary Traffic Control," per lump sum shall be full compensation for all labor, equipment and materials as required to remove existing signs and posts in the work area and deliver to the city yard, as required by City Standard 1-35 and 2-25 and to supply, install, maintain and remove all traffic signs, posts, barricades, channelization devices, flashers, arrow and/or message boards, detours, no passing zones, temporary striping, traffic control plan(s), other traffic control devices, r TCS labor (unless provided for otherwise in the bid proposal), or equipment, materials, maintenance of signs and detours, and all other incidentals and miscellaneous work required to provide traffic control as specified herein or as directed by the Engineer, except, when a separate bid item is provided in the bid proposal for "Flaggers and Spotters", or "Traffic Control Supervisor".

When a separate bid item is not provided in the bid proposal for "Flaggers and Spotters" per hour, then all cost for traffic control labor, flagging labor, materials and supplies specified and as required to maintain safe traffic conditions, protect the work area and new pavement surfaces, shall be included in the lump sum bid item for "Project Temporary Traffic Control."

When the bid proposal contains an item for "Flaggers and Spotters" per hour, the Contractor will be reimbursed for hours of traffic control labor, including flagging laborand temporary traffic control maintenance as above described in the amount per hour provided in the bid proposal. Measurement and payment will only be made for the "Flaggers and Spotters", per hour, to set up and remove traffic signing and cones for the days operation and for time flagging at the flagging station. A separate measurement and payment will not be made for time required to set up and remove any long term or phased project signing and traffic devices and the required labor for such work, when the traffic control will remain in place longer than one day, shall be included in the lump sum bid item for "Project Temporary Traffic Control".

Prior to beginning construction, the Contractor shall declare whether his crew will work an 8-hour day, 40-hour week, or a 10-hour day, 40-hour week. Traffic control labor overtime will be paid per employee, when payrolls are submitted showing that overtime was required and paid. If an employee is moved from another project and will then qualify for overtime, prior approval of the engineer for the use of the "overtime" employee will be required. Overtime will be paid at 1.5 hours per hour worked.

Unless a separate bid item is provided in the bid proposal, all work described under this section, performed by a TCM or TCS , will not be paid as "Labor for Flagging" and all costs

for labor, equipment and materials for the TCM or TCS, shall be included in the lump sum bid for "Project Temporary Traffic Control" or included in other bid items as applicable.

The quantity, and/or hourly rate, when stated in the proposal, is the City's estimate, without knowledge of the Contractor's specific method of operation or costs. When a unit bid amount is included in the bid proposal, the Contractor shall make an estimate of actual costs, including designated wage rates, work procedures, etc. and include all costs in excess of the per hour unit cost included in the bid proposal, in the traffic control lump sum bid item.

Time cards for the traffic control labor as required to complete the previously described work shall be signed by the Contractor and Engineer's representative no later than the following work day. If the Contractor fails to present the time cards to the Engineer as specified, no work will be acknowledged and no payment will be made for the previous days traffic control labor.

7-10 PERMANENT SIGNING

7-10.01 GENERAL

When provided for in the contract, the contractor shall provide city standard signs, posts, brackets and miscellaneous construction as required to provide the designated street direction and safety signing, complete and installed. Signs, posts, brackets and mounting shall be as required by City Standard Drawings Section 7 and the construction plans, bid proposal and City Traffic Engineer. Removal of existing signs shall be completed by the contractor, per the provisions of Section 1-35 and 2-25 of these standard specifications.

7-10.02 MEASUREMENT AND PAYMENT

The unit contract price per each, for each type and size of sign, as provided for in the bid proposal, shall be full compensation for all labor, equipment and materials as required to provide and install the sign at the designated location, complete with brackets and mounting hardware.

The unit contract price per each for "Sign Post" shall be full compensation for all labor, equipment and materials as required to provide and install a sign post at designated locations, in conformance with the requirements of City Standard Drawing 7-1.

7-10.03 INSPECTION AND TAG

All signs will be inspected by the City of Kennewick prior to installation on any project; including but not limited to, subdivisions, commercial, residential or city contracts. The contractor will deliver the signs to the City Street Department at which time the City will have 5 business days to inspect, tag and approve the signs.

Approved signs will be tagged with a City of Kennewick barcode, having a unique identifying number for that sign. Once signs are inspected, the contractor will be notified to pick up the signs and either make the necessary corrections or proceed with installation according to the project and City of Kennewick standards. Signs without a City of Kennewick barcode are not approved for installation.

7-10.04 MANUFACTURERS' IDENTIFICATION AND DATE

All signs shall be labeled with the manufacturers' name and date of manufacture on the back. Hand written labels are not permitted, street name signs or other double sided signs are exempt. However, a detailed list of all exempted street name or double sided signs shall be provided to the City on manufacturers' letterhead with the date of manufacture.

7.11 PAVEMENT MARKINGS

7.11.01 GENERAL

Except as herein modified, the work under this section shall apply to all projects that require channelization and other pavement markings for pedestrian, bicycle and vehicular traffic.

All pavement marking work shall be in conformance with Section 8-09 "Raised Pavement Markers", Section 8-22 "Pavement Marking" and Section 8-23 "Temporary Pavement Markings" of the Washington State Department of Transportation's (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (SWSS) and as currently amended, the WSDOT Standard Plans, the contract documents, Special Provisions and this section.

7.11.02 PAVEMENT MARKINGS AND MARKER REMOVAL

Traffic pavement markings and raised pavement markers shall be removed to the fullest extent possible from the pavement by any method that does not materially damage the surface or texture of the pavement or surfacing. Accumulations of sand or other material which might interfere with drainage or might constitute a hazard to traffic will not be permitted. Sand or other material deposited on the pavement as a result of removing pavement markings or raised pavement markers shall be removed as the work progresses to avoid hazardous conditions.

The Contractor shall remove pavement markings and raised pavement markers where shown or indicated on the plans, or where designated by the Engineer. The pavement markings shall be obliterated until blemishes caused by pavement marking removal conform to the coloration of the adjacent pavement. If, in the opinion of the Engineer, the pavement is materially damaged by pavement marking removal, such damage shall

be repaired by the Contractor at the Contractor's sole expense and to the satisfaction of the Engineer.

Raised pavement markers shall be removed flush with the pavement surface. No portions of the raised pavement markers are to remain. Epoxy build-up, if existing, shall be removed by grinding, brush hammering or other methods as approved by the Engineer. Damage caused to the pavement due to Contractor's removal operation shall be repaired by the Contractor, at the Contractor's sole expense and to the satisfaction of the Engineer. All removed raised pavement markers and other debris resulting from the removal operations shall become the property of the Contractor and shall be properly disposed of outside the project limits.

Pavement markings, as shown on the Plans or as directed by the Engineer, shall be properly removed before any change is made in the traffic pattern, and before installing permanent new pavement markings or raised pavement markers or temporary pavement markings. Removal of pavement markings and raised pavement markers on any working day shall be limited to that area which is to be remarked for traffic control, either permanent or temporary, that same working day, unless otherwise directed by the Engineer. The Contractor shall remove temporary pavement markings upon installation of the permanent pavement markings.

To remove the existing striping on chip sealed streets the contractor shall include the following process:

1. Sweep the area to be removed and/or revised.
2. Spray one, uniform coat of undiluted CSS-1 or CSS-1H (fog seal) over the striping to be removed/revised and allow it to day, protected from traffic, until fully cured. (approx. 30 to 60 minutes)
3. Spray one, uniform coat of asphalt emulsion (tack) over cured fog seal.
4. Spread sand immediately over the wet tack and wheel sand in with truck tires to ensure adhesion.
5. Broom or blow off excess sand when cured and provide temporary striping tape if needed.
6. Restripe areas as required by project/plans.
7. Restriping must be done within 3 days of removal.

When refreshing existing plastic markings, the marking must be heated slightly and the top scraped lightly with a flathead shovel before installing new marking.

The Contractor shall submit, to the Engineer for approval, the proposed methods of removal. Removal of stripes, pavement markings and raised pavement markers shall not begin until the Contractor has received written approval from the Engineer.

Payment. Payment for "Pavement Marking and/or Raised Pavement Marker Removal" shall be at the Lump Sum price shown in the Bid Proposal. Such payment shall be considered full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary to remove pavement markings, temporary pavement markings, and raised pavement markers, in accordance with the plans, Standard Specifications, SWSS, and the Special Provisions. If a separate pay item is not provided in the Bid Proposal, payment for all work herein specified shall be incidental to the lump sum bid item for "Project Temporary Traffic Control".

7-11.03 PLASTIC PAVEMENT MARKINGS

This work shall consist of applying plastic pavement markings at locations and in accordance with the details shown on the plans or designated by the Engineer, and as specified in the Standard Specifications, SWSS, and the Special Provisions. Plastic markings must be thermoplastic -, or plastic tape, unless otherwise specified on the plans, in the bid schedule, in the Special Provisions or in this section. The method(s) chosen must be consistent throughout the project.

Longitudinal traffic stripes including: center lines, lane line, edge lines, gore stripes, two-way left-turn lanes, no-passing lines, lane drops, etc., shall be 3-M Stamark High Performance Pavement Series 380 (white) and 381 (yellow) tape.

Plastic tape shall be installed by an inlaid method as specified by the manufacturer for all new or newly overlayed asphalt pavement surfaces. Failure to properly inlay the tape shall result in a thirty percent (30%) reduction in the contract amount due to the Contractor for this item(s). Tape used in inlaid method shall have a minimum thickness of 0.060 inch (1.52 mm), without adhesive.

Traffic stripes on existing surfaces (those not newly surfaced) shall be either thermoplastic (extruded, sprayed, or preformed), unless otherwise indicated in the plans or approved by the Traffic Engineer in writing. Thermoplastic (spray or extruded) shall be applied at a minimum thickness of 120 mil (0.120-inch).

The Contractor shall apply glass beads to the surface of the pavement markings (unless they are integral as in preformed) immediately after thermoplastic material is applied to the pavement surface and while the thermoplastic material is still molten so that the

beads will be held by and embedded in the surface material. The beads shall be applied at a uniform rate of not less than eight (8) pounds per 100 square feet of markings and striping.

The glass beads to be applied to the surface of the molten thermoplastic material shall conform to the requirements of AASHTO Designation: M247 (Type I).

When plastic tape is approved by the Traffic Engineer for use on existing surfaces, a primer, of the type recommended by the manufacturer of the plastic tape material, shall be applied immediately in advance of, but not concurrent with, the application of plastic tape. The primer shall be applied at the application rate recommended by the manufacturer and shall not be thinned.

Traffic symbols or legends, and transverse traffic stripes (arrows, letter legends, symbols, numbers, crosswalks, stop bars, yield lines, - and railroad crossings) shall be preformed thermoplastic only (extruded or sprayed thermoplastic, epoxy material, and tape is not permitted). Thickness for these markings shall be 0.125 inch and installed in accordance with the manufacturers specifications. All pavement arrows shall be the elongated arrows per WSDOT Standard Plan M-24.40-02.

Existing surfacing which is to receive the plastic marking material shall be mechanically wire brushed to remove all dirt and contaminants, unless otherwise recommended by the pavement marking material manufacturer.

Thermoplastic material for pavement markings shall be applied in accordance with the manufacturers specifications. Thermoplastic material for pavement markings shall be applied in a single uniform layer with no seams. The pavement surface to which the thermoplastic material is applied shall be completely coated by the material and the voids of the pavement surface shall be filled.

The pavement marking material used on the project shall be guaranteed to retain an average one-hundred (100) millicandellas per lux per square meter, two (2) years after installation of the markings or will be replaced at no cost to the City.

Section 8-22.1 “Crosswalk Stripe” of the SWSS is amended to read:

> A SOLID WHITE line, 24 inches wide, 6 feet long, installed parallel to a series of other crosswalk stripes so as to form a ladder type crosswalk. The crosswalk will normally be 6 feet wide, unless otherwise shown on the plans or in the contract.

Section 8-22.3(1) of the SWSS is amended to read:

> The Contractor will provide necessary control points to assist in preliminary spotting of the lines before marking begins. All work necessary to establish satisfactory alignment for stripes and all layout work required for pavement

markings shall be performed by the Contractor with any device or method that does not damage the pavement nor conflict with other traffic control devices. The Contractor is responsible for the completeness and accuracy of all layout, alignment and spotting. Approval by the Traffic Engineer of the layout is required before permanent striping or marking begins.

Section 8-22.3(2) of the SWSS is supplemented with he following:

The liquid plastic material shall be applied in accordance with the manufacturer's recommendations and shall be installed by a manufacturer certified installer. Pavement surfaces shall be clean, dry and free from contaminants such as curing agents, surface oils or existing road marking materials prior to application of the pavement marking material. Installation on coal tar based asphalt is not allowed. The surface temperature shall be between 0° C and 40° C (32° F and 105° F).

Coverage per gallon of material (plus or minus 5%) for various mileage's are as follows:

MILS	SQ. FT.	4" EDGE LINE (FT.)
120	13	40

Drop on beads are not included in this measurement

Section 8-22.4, "Measurement" of the SWSS is amended to read:

Pavement traffic stripes (all centerline stripe types, all no-passing stripes, lane lines, edge lines, bike lane lines, drop lane lines, gore lines, stop bars, crosswalk lines, dotted extension stripes, barrier stripes, etc.) shall be measured in actual linear feet of material used per the specified width, complete-in-place.

Pavement marking legends and symbols (single and combination arrows, whole word legends, RR crossing markings, bike symbols, etc.) shall be measured by the unit, complete-in-place.

Section 8-22.5, "Payment" of the SWSS is amended to read:

The contract prices paid per completed linear foot for plastic pavement marking stripes of the widths designated in the Bid Proposal and for each type of plastic legend and symbol specified in the Bid Proposal, shall be considered full compensation for furnishing all labor, materials, tools, equipment, guarantees, and incidentals necessary for performing all work involved in applying plastic pavement markings, including layout work, and all miscellaneous work as required to provided the specified plastic pavement marking, complete in place, as shown in the Plans, SWSS, Standard Specifications, as specified in the Special Provisions, and as directed by the Engineer. If a separate pay item is not

provided in the Bid Proposal, payment for all work herein specified shall be incidental to the lump sum bid item for “Project Temporary Traffic Control”.

7.11.04 PAINT PAVEMENT MARKINGS

This work shall consist of applying painted markings (stripes, legends and symbols) at locations and in accordance with the details shown on the Plans or designated by the Engineer, and as specified in the Standard Specifications, SWSS, and the Special Provisions.

Section 8-22.1 “Crosswalk Stripe” of the SWSS is amended to read:
A SOLID WHITE line, 24 inches wide, 6 feet long, installed parallel to a series of other crosswalk stripes so as to form a ladder type crosswalk. The crosswalk will normally be 6 feet wide, unless otherwise shown on the plans or in the contract.

Section 8-22.3(1) of the SWSS is amended to read:
The Contractor will provide necessary control points to assist in preliminary spotting of the lines before marking begins. All work necessary to establish satisfactory alignment for stripes and all layout work required for pavement markings shall be performed by the Contractor with any device or method that does not damage the pavement nor conflict with other traffic control devices. The Contractor is responsible for the completeness and accuracy of all layout, alignment and spotting. Approval of the layout by the Traffic Engineer is required before permanent striping or marking begins.

Section 8-22.4 “Measurement" of the SWSS is amended to read:

The contract prices paid per linear foot for paint pavement marking stripes of the widths designated in the Bid Schedule and for each type of paint legend and symbol specified in the Bid Schedule, shall be considered full compensation for furnishing all labor, materials, tools, equipment, guarantees, and incidentals necessary for performing all work involved in applying painted pavement markings, including layout work, and all miscellaneous work as required to provided the specified paint pavement marking, complete in place, as shown in the Plans, SWSS, Standard Specifications, as specified in the Special Provisions, and as directed by the Engineer. If a separate pay item is not provided in the bid proposal, payment for all work herein specified shall be incidental to the lump sum bid item for “Project Temporary Traffic Control”.

7-11.05 PAVEMENT MARKING - Materials

All pavement marking materials must have been tested and prequalified for meeting the requirements noted in Section 8-22, 8-23 and 9-21 of the SWSS and be listed on the current WSDOT QPL to include:

Paint Pavement Marking - Sprayed Applications (Longitudinal Applications)

Plastic Pavement Marking - Extruded Applications (Longitudinal Applications) 120 mil (0.120 inch)

Plastic Pavement Marking - Extruded Applications (Transverse Applications) 125 mil

Plastic Pavement Marking - Sprayed Applications (Existing pavement only)
All materials shall be applied with profiles at 20 inches centers. Base line thickness shall be 120 mils min. Profiles shall be within a tolerance of 50 mils. Profile width shall be a minimum of 80% of the line width. Profile longitudinal length shall be a minimum of 1.5 inches. All thicknesses are measured from the pavement surface.

Plastic Pavement Marking - Preformed Tapes (Longitudinal Applications)
Preformed tapes are not allowed on bituminous surface treatment (BST) pavement.

Plastic Pavement Marking - Preformed (Transverse Applications)

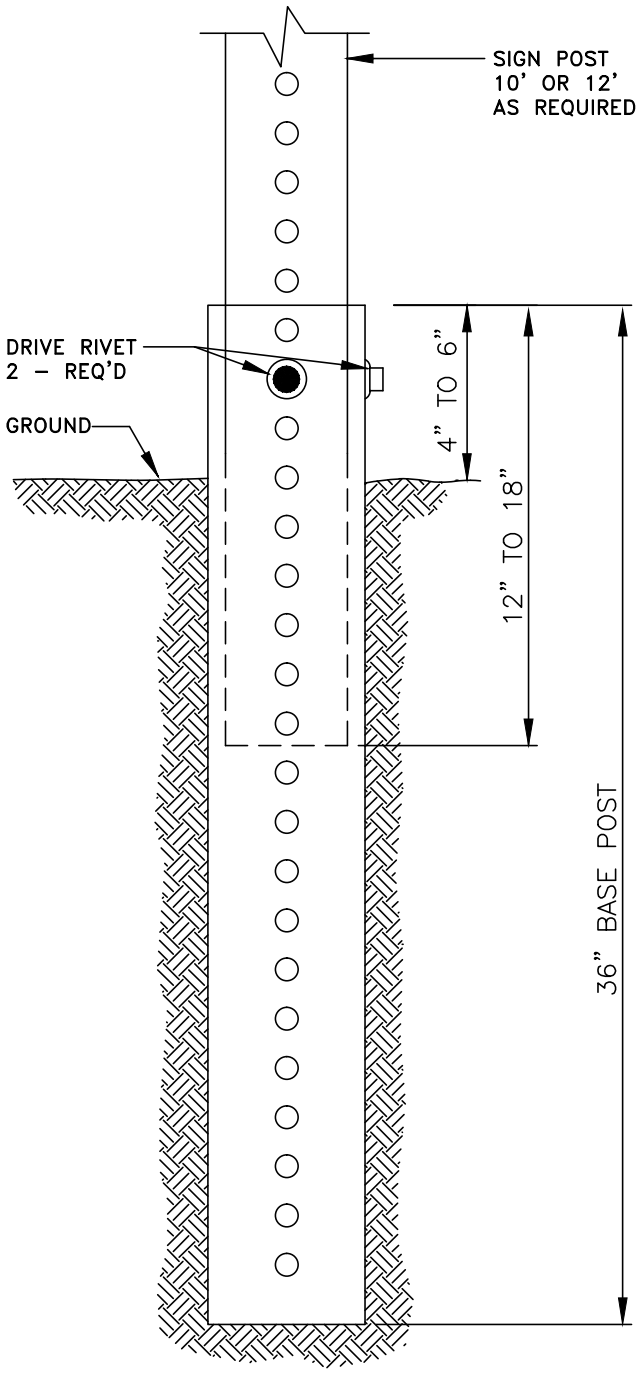
Temporary Pavement Marking - Removable Preformed Tapes

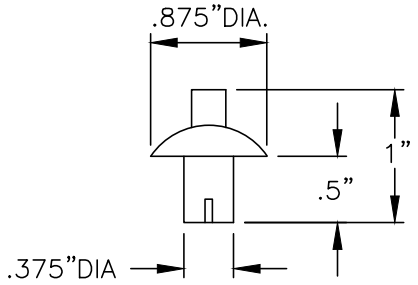
Temporary Pavement Marking - Non-Removable Preformed Tapes

Temporary Raised Pavement Markers Type 2 (Long Term)
Temporary pavement markers for long term (6 months or less). Raised pavement markers approved for permanent installations can also be used.

Temporary Raised Pavement Markers Type 2 (Short Term)
Temporary pavement markers for short term (14 days or less). Raised pavement markers approved for permanent and long term installations can also be used.

Temporary Raised Pavement Markers Type 2 (Short Term-Seal Coat)
Temporary pavement markers for short term (14 days or less) at seal coat locations.





WT. .018/C

DRIVE RIVET

NOTES:

1. POSTS SHALL BE TELESPAR BRAND SQUARE TUBING OR APPROVED EQUAL. SIGN POST MUST BE BREAK AWAY AND ACCEPTABLE PER NCHRP 350.
2. POSTS SHALL BE COLD ROLLED STEEL WITH PERFORATIONS OF .4375 INCH DIAMETER ON ONE INCH CENTERS ON ALL FOUR SIDES.
3. POSTS SHALL EMPLOY A YIELDING BREAKAWAY SYSTEM CONSISTING OF A BASE POST AND SIGN POST.
4. ALL FASTENINGS OF TUBING JOINTS AND CONNECTIONS SHALL UTILIZE A MINIMUM OF TWO DRIVE RIVETS UNLESS OTHERWISE SPECIFIED. RIVETS SHALL BE ON ADJOINING FACES OF POST NOT OPPOSITE SIDES AND SHALL NOT USE WASHERS.
5. GALVANIZED COATING SHALL CONFORM TO A.S.T.M. SPECIFICATION A–525,DES. G–90.
6. BASE POST MUST BE DRIVEN WITH A MECHANICAL DRIVER UNLESS OTHERWISE APPROVED BY THE TRAFFIC ENGINEER.
7. WHENEVER A SIGN WILL HAVE CONCRETE POURED AROUND THE BASE (i.e. SIDEWALK, ISLANDS OR WITH EXCEPTIONS ALLOWED BY THE TRAFFIC ENGINEER), A ZUMAR HDA20 HEAVY DUTY 30" SIGN ANCHOR MUST BE USED. THE TOP OF THE BASE MUST BE TAPED OFF TO PREVENT CONCRETE FROM FILLING BASE WHILE POURING CONCRETE.

PART	TUBE SIZE	MIN. WALL THICKNESS	LENGTH
BASE POST	2.25" x 2.25"	12 GAGE	36 INCH
SIGN POST	2" x 2"	12 GAGE	10' or 12' AS REQ'D.

TYPICAL SIGN POST

CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	7/94
DWN	LCB
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-1

NOTES:

1. LETTERS ARE TO BE HIGHWAY GOTHIC, SERIES "C". CHARACTER SPACING REDUCTIONS FOR THE LEGEND SHALL BE NO LESS THAN 30% AND NO GREATER THAN 60% TO ALLOW FOR FIT. VERTICAL BORDERS WILL BE 1.5 INCHES TOP AND BOTTOM FROM THE EDGE OF THE PLATE EXCEPT WHEN LOWER CASE LETTERS HAVE DESCENDERS, IN WHICH CASE THE ENTIRE SIGN TEXT MAY NEED TO BE SHIFTED UP.

2. HIGHWAY GOTHIC, SERIES "B" SHALL BE PERMITTED WHEN SIGN LENGTH EXCEEDS 36". IF HIGHWAY GOTHIC, SERIES "B" DOES NOT ALLOW FIT ON 36" PLATE, INCREASE PLATE SIZE TO 42" (MAXIMUM) TRYING SERIES "C" FIRST AND THEN SERIES "B" IF "C" DOES NOT FIT.

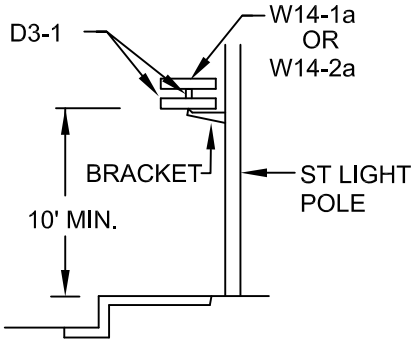
3. LETTERS, NUMBERS, ARROWS AND BORDERS SHALL BE 3M ELECTROCUT SERIES 1170. BACKGROUNDS SHALL BE 3M DIAMOND GRADE DG3 REFLECTIVE SHEETING SERIES 4000.

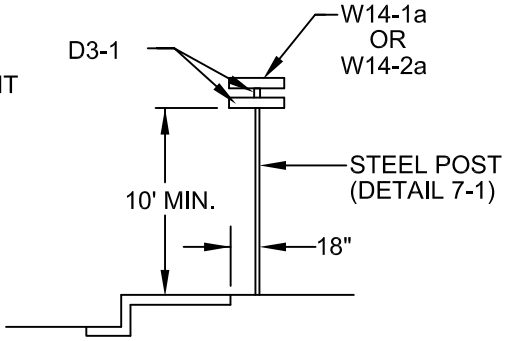
4. D3-1'S AND W14'S SHALL BE AN EXTRUDED ALUMINUM PLATE 6061-P61 WITH ALODINE FINISH. FLAT PLATE WITH 1 INCH RADII CORNERS FOR ROUNDABOUTS.

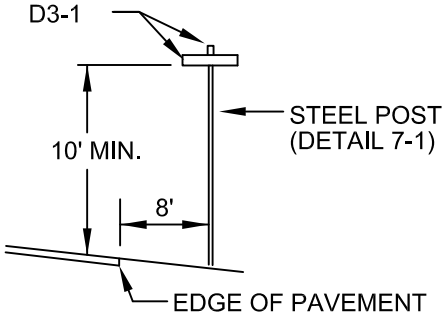
5. SIGNS SHALL BE INSTALLED ON THE SIGN POST OR STREET LIGHT STANDARD BY MEANS OF AN ALUMINUM SIGN BRACKET APPROVED BY THE TRAFFIC ENGINEER.

6. SIGN BRACKETS MUST BE ZUMAR PRODUCTS (12 INCH), TRAFFIC SAFETY SUPPLY PRODUCTS OR TRAFFIC ENGINEER APPROVED EQUAL. ZUMAR PRODUCTS CAN BE PURCHASED THROUGH ZUMAR INDUSTRIES, INC AT (800) 426-7967 AND TRAFFIC SAFETY SUPPLY PRODUCTS CAN BE PURCHASED AT TRAFFIC SAFETY SUPPLY CO. AT (800) 547-8518.

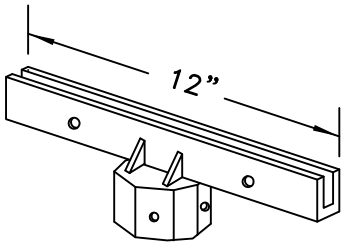
7. BLACK LETTERS, ARROWS AND BORDER ON REFLECTIVE, STANDARD YELLOW (491) BACKGROUND. LETTERS ARE TO BE HIGHWAY GOTHIC, SERIES "C". LETTERS AND SPACING TO BE PER THE STATE OF WASHINGTON SIGN FABRICATION MANUAL.



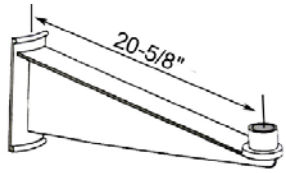




TYPICAL PLACEMENT

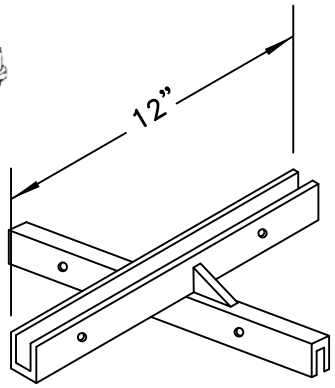


Z12RDSQ00EX



STYLE #KC 500
16504202

STREET SIGN BRACKETS



812EX90X

NOTE: SMALLER SET SCREWS ON BRACKET.

STREET NAME SIGN (D3-1)

CITY OF KENNEWICK

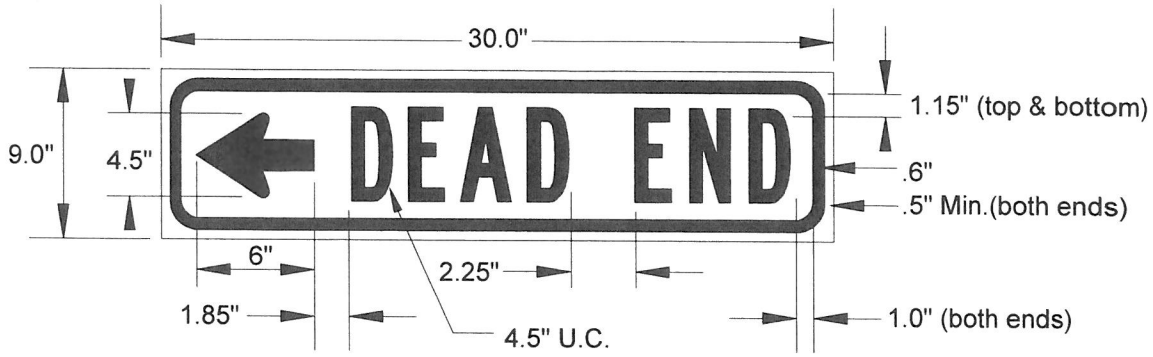
ENGINEERING DEPARTMENT

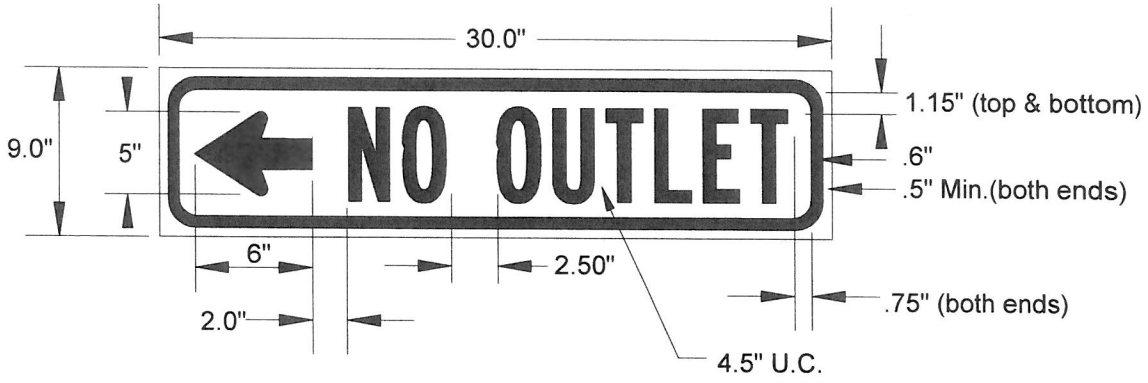
DATE	7/13
DWN	DJW
REV	9/15
CHK	BWB
SCALE	NTS

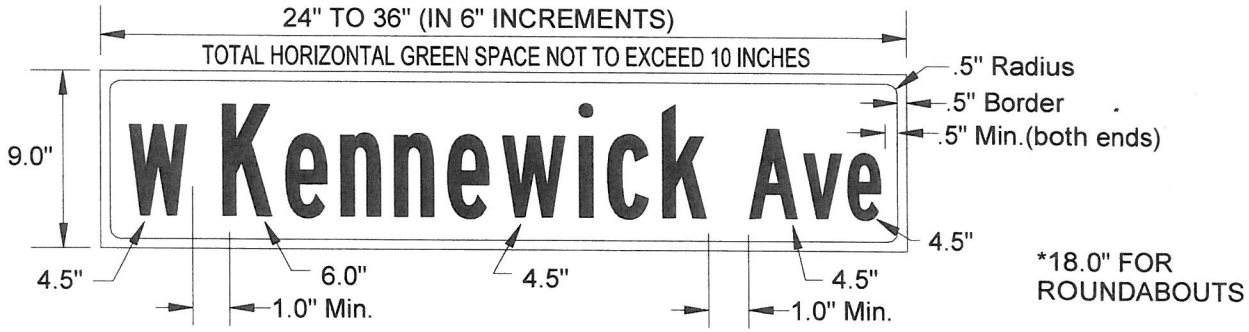
DWG. NO.

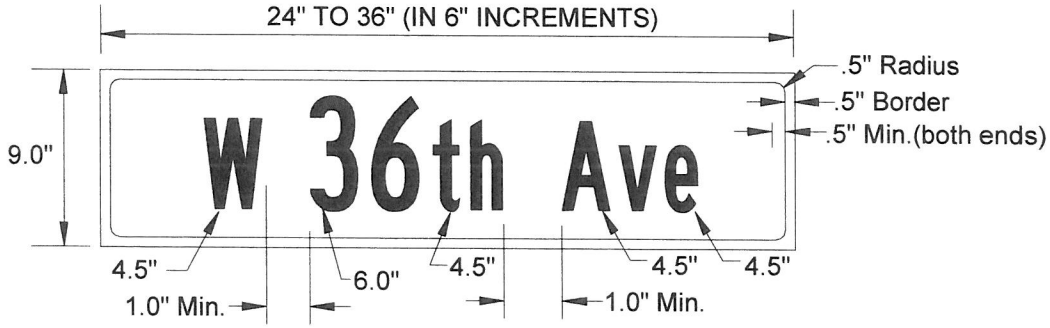
7-2

SHEET 1 OF 3







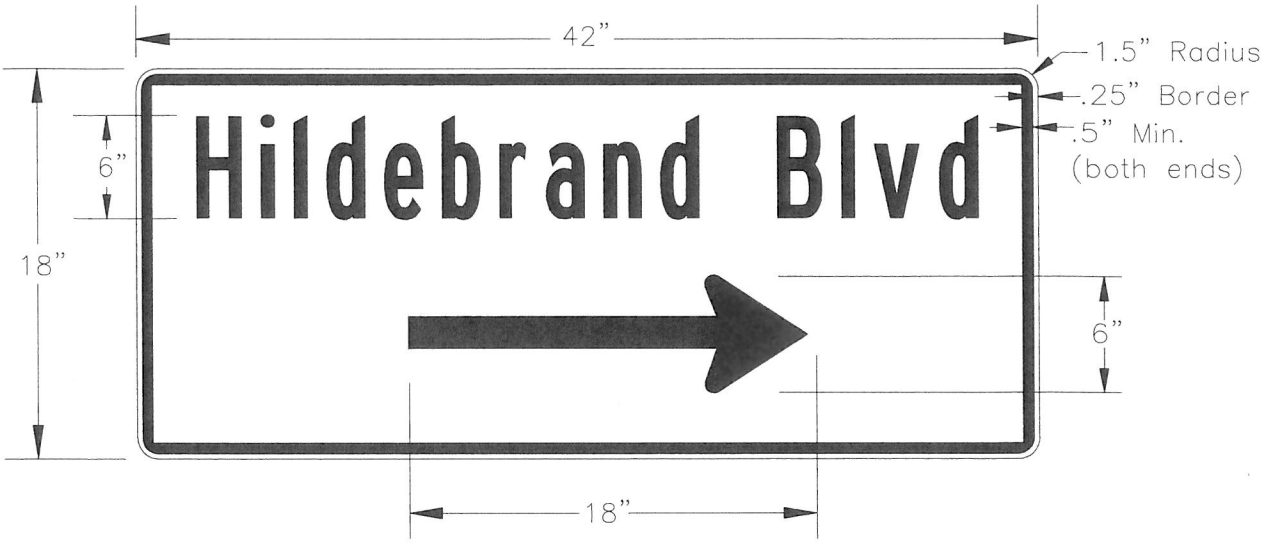


STREET NAME (D3-1), DEAD END (W14-1a) NO OUTLET (W14-2a) SIGNS

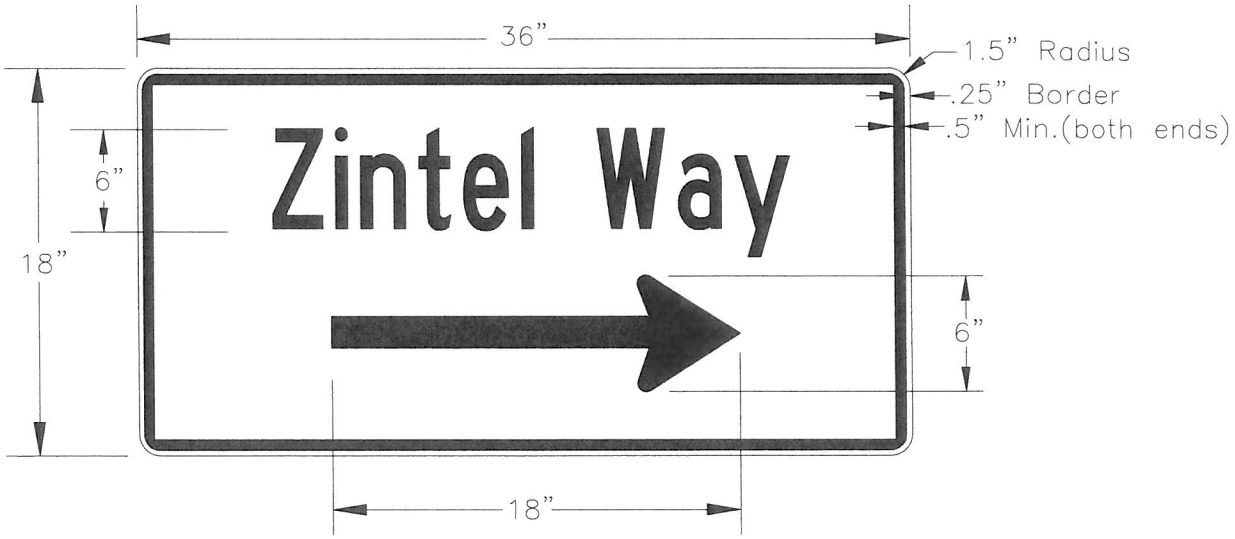
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	9/15
CHK	BWB
REV. BY	DJW

DWG. NO.
7-2



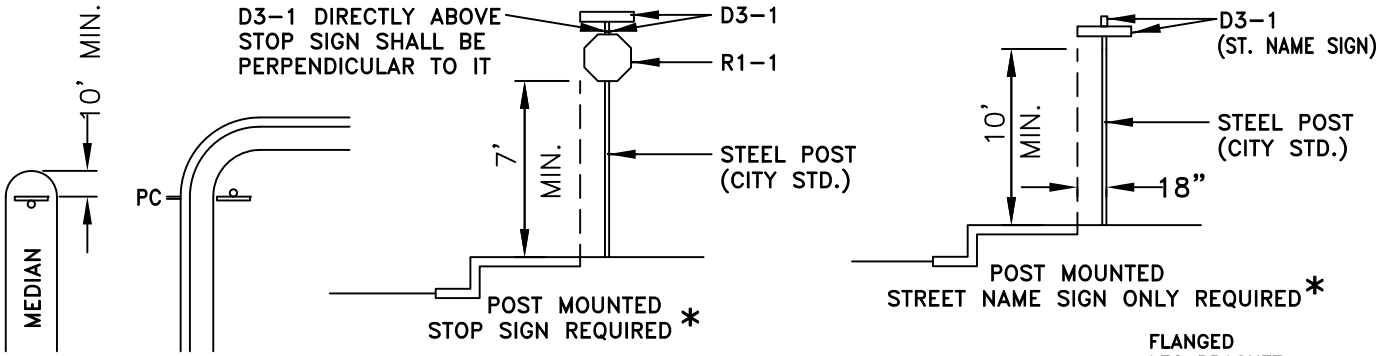
HIGHWAY GOTHIC, SERIES B, 6" HIGH CHARACTERS
42"x18", SIGN SHALL BE 0.125" THICK



HIGHWAY GOTHIC, SERIES C, 6" HIGH CHARACTERS 36"x18"

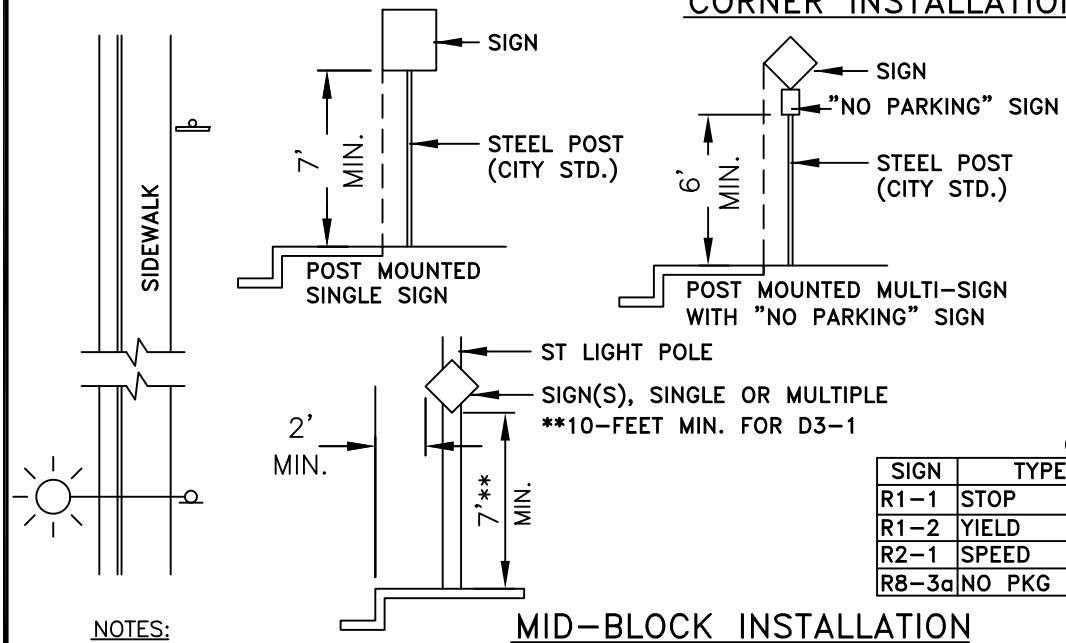
ROUNDABOUT STREET NAME SIGNS (D3-1)

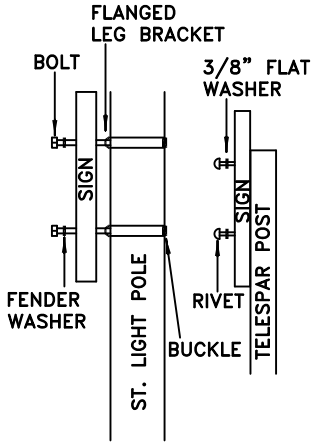
CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 7/13 DWN KDS REV 9/15 CHK BWB SCALE NTS	DWG. NO.	**7-2** SHEET 3 OF 3



(* AS DETERMINED BY TRAFFIC ENGINEER)

CORNER INSTALLATION





SIGN ASSEMBLY

CITY STANDARDS

SIGN	TYPE	MATERIAL	SIZE
R1-1	STOP		30"X30"
R1-2	YIELD		36"X36"X36"
R2-1	SPEED		24"X30"
R8-3a	NO PKG SYMBOL		12"X12"

MID-BLOCK INSTALLATION

NOTES:

1. EDGE OF SIGN TO BE EVEN WITH BACK OF SIDEWALK.
2. SIGNS TO BE INSTALLED AT BACK OF SIDEWALK UNLESS OTHERWISE NOTED ON PLANS.
3. SIGNS SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND "STANDARD HIGHWAY SIGNS" MANUAL. THEY SHALL BE THE STANDARD SIZE AND LETTERING APPROPRIATE FOR CONVENTIONAL URBAN AREAS UNLESS OTHERWISE NOTED.
4. ALL SIGN PLAQUES SHALL BE MADE OF ALUMINUM AND HAVE A MINIMUM THICKNESS OF .080 INCHES. ANY SIGN WITH A HORIZONTAL DIMENSION OVER 36" SHALL HAVE A MINIMUM THICKNESS OF 0.125 INCHES AND SIGN BRACING IN ACCORDANCE WITH WSDOT STD. PLAN G-50.10-00. THE SIDE DIMENSION FOR A DIAMOND SHAPED SIGN IS CONSIDERED THE HORIZONTAL DIMENSION.
5. BOLTS, NUTS, RIVETS, AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATE STEEL. INSTALL A OUTSIDE DIAMETER 7/16" AND INSIDE DIAMETER OF 5/16" FLAT WASHER, BEHIND RIVET ON THE SIGN FACE FOR STABILITY. NO PLASTIC OR NYLON.
6. POSTS SHALL CONFORM TO CITY OF KENNEWICK STD. DWG. NO. 7-1.
7. REFLECTIVE SHEETING SHALL BE 3M DIAMOND GRADE DG3 SERIES 4000. ALL SIGNS MUST BE COVERED WITH 3M 1160 SERIES FILM WITH PREMASK FOR PROTECTION FROM GRAFFITI (EXCEPT D3-1'S).
8. ALL MOUNTING HARDWARE FOR STREET LIGHT POLES MUST BE BAND-IT OR APPROVED EQUAL. THE HARDWARE REQUIRED IS 3/4" X .030 STAIINLESS STEEL BANDS, 3/4" STAINLESS STEEL EAR LOCK, BUCKLES, STAINLESS STEEL FLARED LEG BRACKETS WITH ONE BOLT AND METAL FENDER WASHER.
9. ALL SIGNS TO BE INSTALLED PER APPROVED PLANS. MODIFICATIONS TO BE APPROVED BY TRAFFIC ENGINEER OR ASSIGNED DESIGNEE.
10. ALL OLD AND/OR UNUSED BANDS AND FASTENERS MUST BE REMOVED.
11. ALL SIGNS MUST BE DELIVERED TO THE CITY SIGN SHOP A MINIMUM OF 5 DAYS PRIOR TO INSTALLATION FOR TAGGING AND INSPECTION. CONTACT SIGNING DIVISION AT 585-4510 FOR COORDINATION.

TYPICAL SIGN INSTALLATION

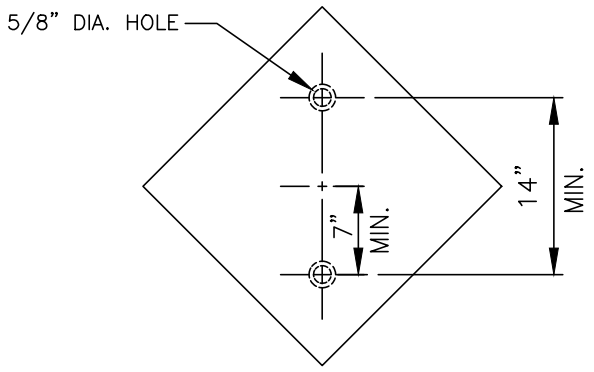
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

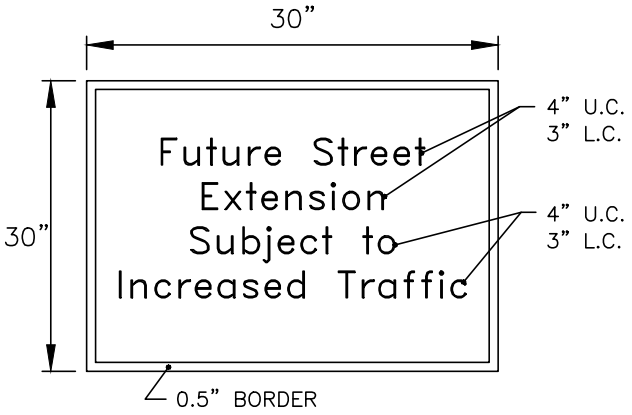
DATE	9/07
DWN	LCB
REV	9/15
CHK	BWB
SCALE	NTS

DWG. NO.

7-3



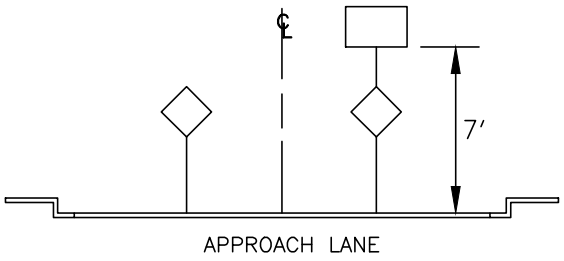
OM4–3
COLOR: RED
18" X 18"

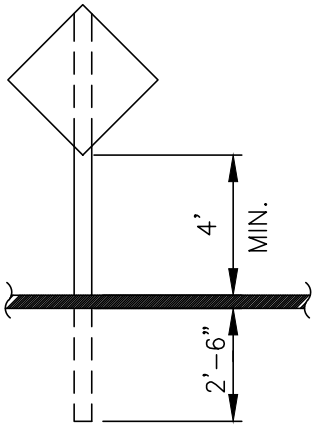


COLOR: WHITE LETTERS AND BORDER WITH BROWN ELECTROCUT AND WHITE SHEETING

NOTES:

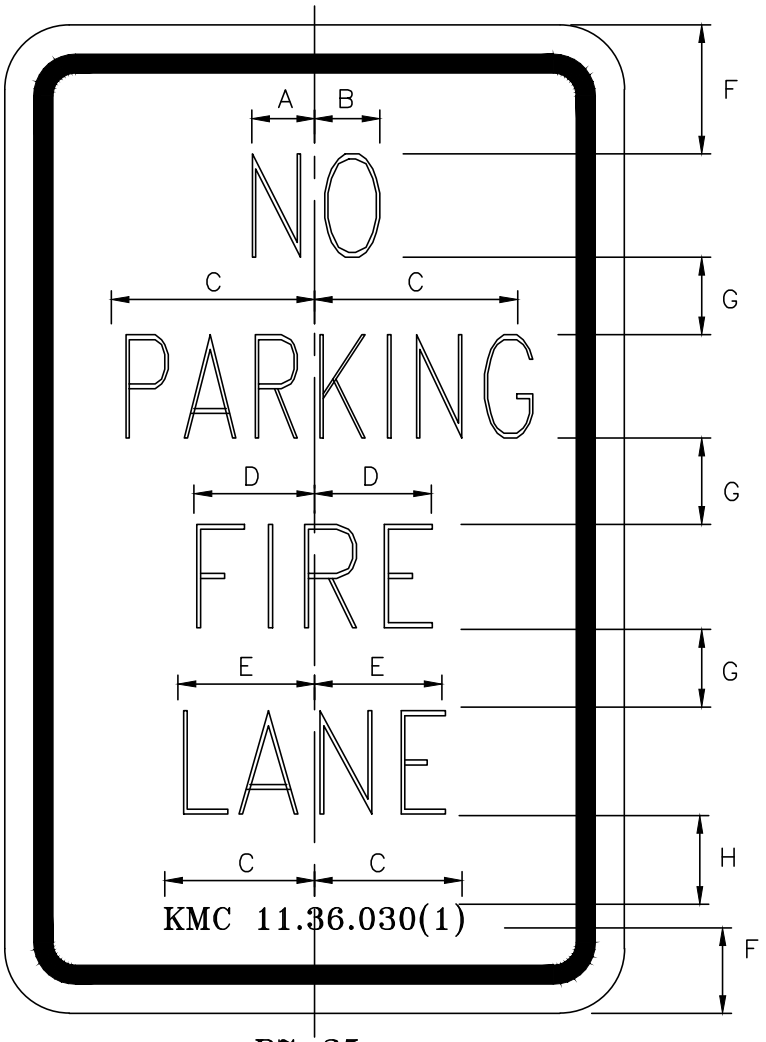
1. REFLECTIVE SHEETING SHALL BE 3M DIAMOND GRADE DG3 SERIES 4000 OR TRAFFIC ENGINEER APPROVED EQUAL.
2. ONE–TENTH GAUGE ALUMINUM PLATE.
3. POST SHALL BE AS PER CITY OF KENNEWICK STD. DWG. NO. 7–1 EXCEPT 8 FT. SIGN POSTS MAY BE USED WHEN OM4–3 ARE USED ALONE.
4. THE NUMBER OF OM4–3 SIGNS REQUIRED FOR ANY STREET SHALL BE DETERMINED BY THE TRAFFIC ENGINEER.
5. OM4–3 SIGNS ARE TO BE INSTALLED IN THE CENTER OF TRAVEL AND/OR PARKING LANE.
6. ONE "FUTURE STREET EXTENSION" SIGN SHALL BE INSTALLED ABOVE ONE OF THE OM4–3 AT THE END, UNLESS OTHERWISE APPROVED BY THE ENGINEER.





END OF ROADWAY SIGNAGE

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 7/13 DWN KDS REV 3/14 CHK JD SCALE NTS	DWG. NO. **7-4**



R7-35

ALL DIMENSIONS ARE IN INCHES

SIZE	BORDER WIDTH	MARGIN WIDTH	LETTER SIZE, SERIES & STROKE WIDTH					CORNER RADIUS	
			LINE 1	LINE 2	LINE 3	LINE 4	LINE 5		
12 x 18	1/4	1/4	2 C	2 C	2 C	2 C	1 C	1-1/4	

	DIMENSIONS													
	A	B	C	D	E	F	G	H						
12 x 18	1-1/8	1-1/2	4-1/2	2-5/8	2-7/8	1-7/8	1-3/8	1						

WHITE BACKGROUND WITH RED BORDER & LEGEND.
REFLECTORIZED BACKGROUND/OPAQUE LEGEND.

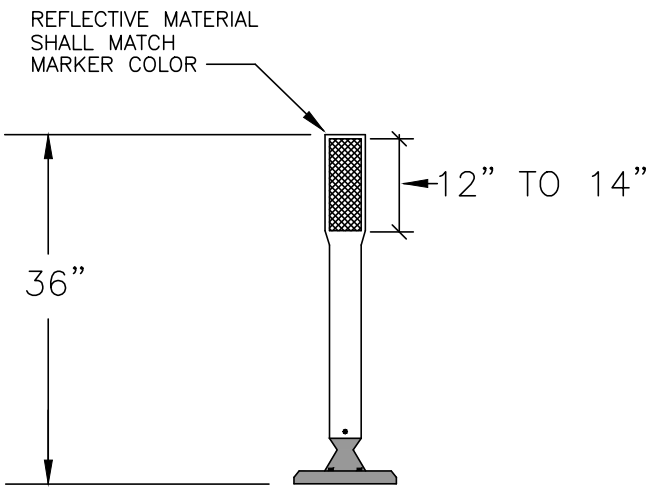
NO PARKING FIRE LANE SIGN

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

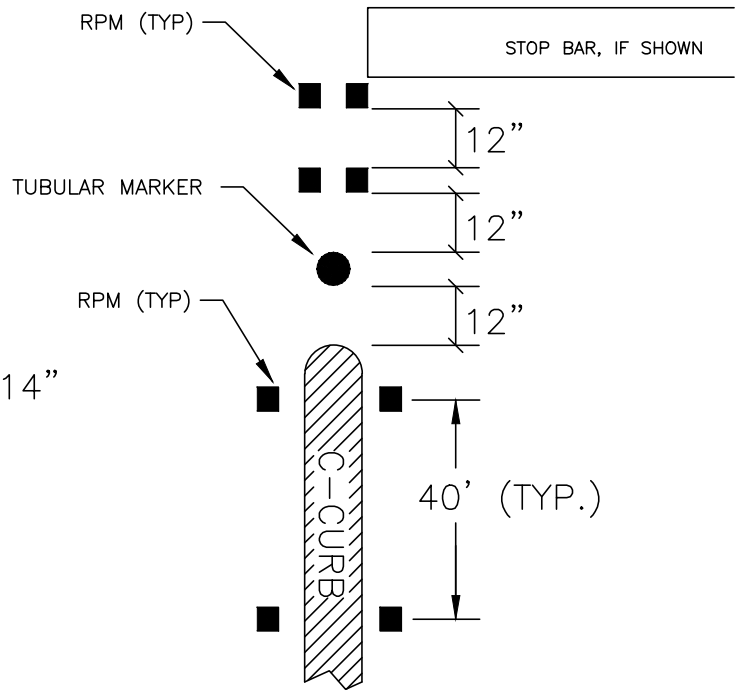
DATE	11/03
DWN	LCB
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-5



TUBULAR MARKER



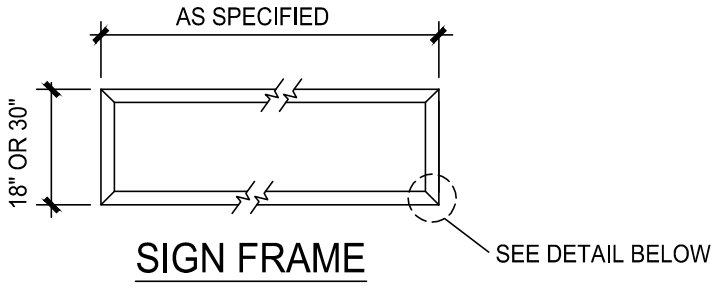
DIMENSIONS SHOWN ARE APPROXIMATE AND MAY VARY ± 10 PERCENT.

NOTES:

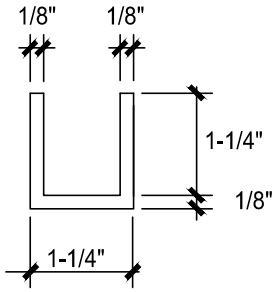
1. RAISED PAVEMENT MARKERS (RPM) ARE TO BE PER THE STATE OF WASHINGTON STANDARD SPECIFICATION (SWSS) SECTION 8-09 AND 9-21. TYPE 2 SHALL NORMALLY BE REQUIRED.
2. C-CURB SHALL BE PER SWSS SECTION 8-07.
3. RPM'S SHALL BE 2YY WHEN USED FOR CENTERLINE, AND 2W WHEN USED FOR GORE LINES UNLESS OTHERWISE INDICATED ON THE PLANS OR DIRECTED BY THE ENGINEER.
4. TUBULAR MARKERS SHALL BE 36" FLEXIBLE YELLOW (ON CENTERLINE) OR WHITE (ON GORE LINES) MARKERS. THE TUBULAR MARKERS SHALL BE FLAT-TOPPED DELINEATOR POSTS FROM IMPACT RECOVERY SYSTEMS OR ENGINEER APPROVED EQUAL. MARKERS SHALL HAVE 2-1/2" X 12" REFLECTIVE MATERIALS ON BOTH SIDES IN A COLOR MATCHING THE MARKER COLOR. REFLECTIVE MATERIALS SHALL BE 3M DIAMOND GRADE DG3.
5. MARKERS ARE TO BE INSTALLED USING SUPER BUNDY OR ENGINEER APPROVED EQUAL PER THE MANUFACTURERS RECOMMENDATIONS. ADHESIVE TO COVER THE ENTIRE BASE. A MINIMUM OF 3 MUST BE USED FOR THE TUBULAR MARKERS, APPLIED ONE AT A TIME TO FILL THE VOIDS THROUGH THE TOP. IF NEEDED, ADHESIVE MUST BE CUT TO FIT RPM'S.

PAVEMENT AND TUBULAR MARKER INSTALLATION

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 2/07 DWN ADP REV 3/14 CHK DLK SCALE NTS	DWG. NO.	**7-6**

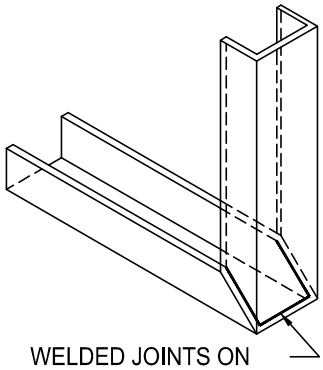


SIGN FRAME

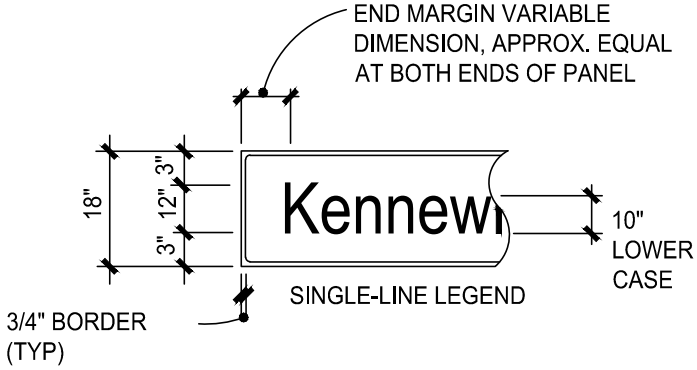


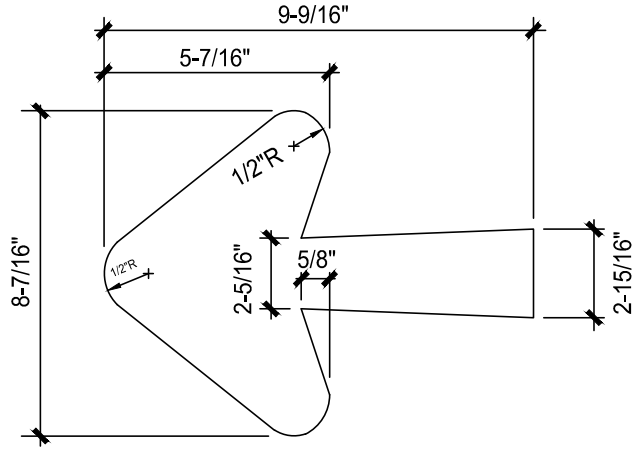
FRAME SECTION

ALUMINUM 6063T5

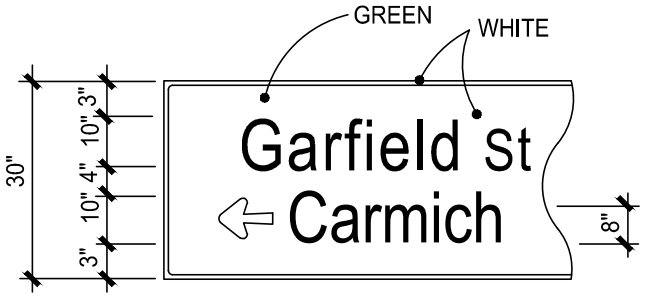


FRAME CORNER





ARROW DETAIL



DOUBLE-LINE LEGEND

SIGN PANEL

MAST ARM ST. NAME SIGN

T□□E B SIGN

CITY OF KENNEWICK

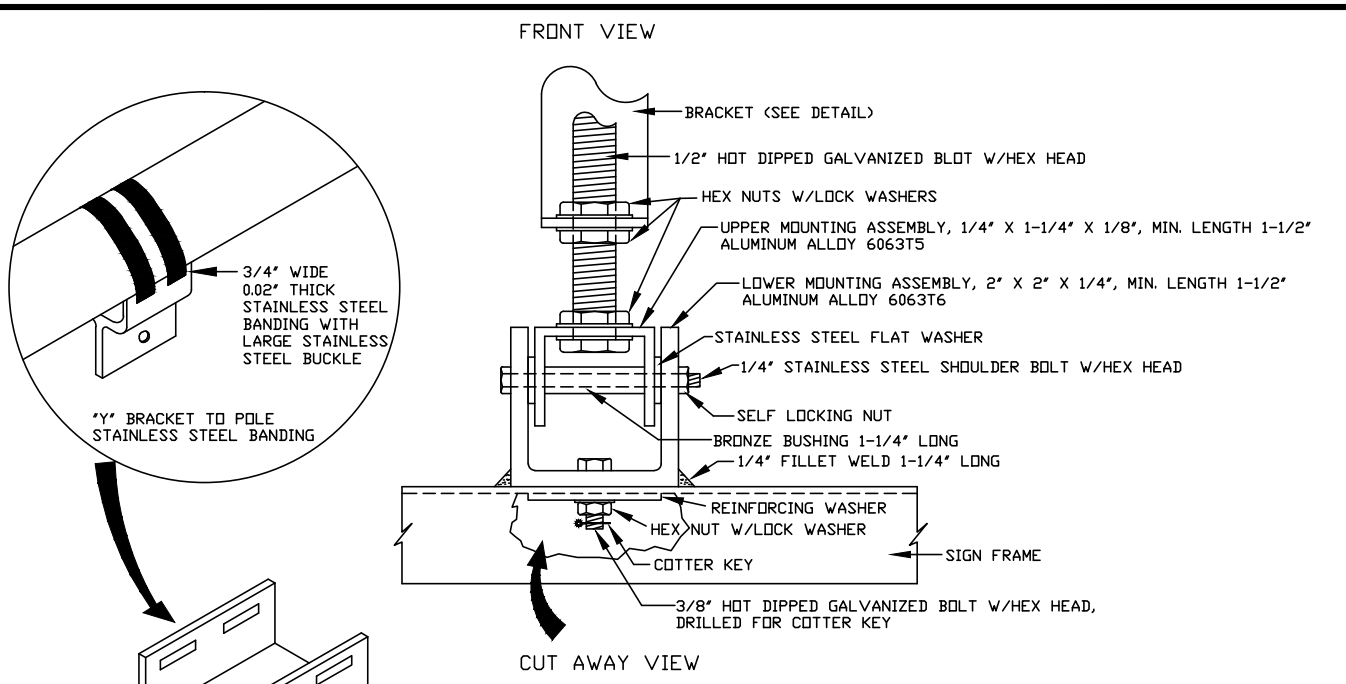
ENGINEERING DEPARTMENT

DATE	12□□4
DWN	ADT
REV	3/14
CHK	B□ B
SCALE	NTS

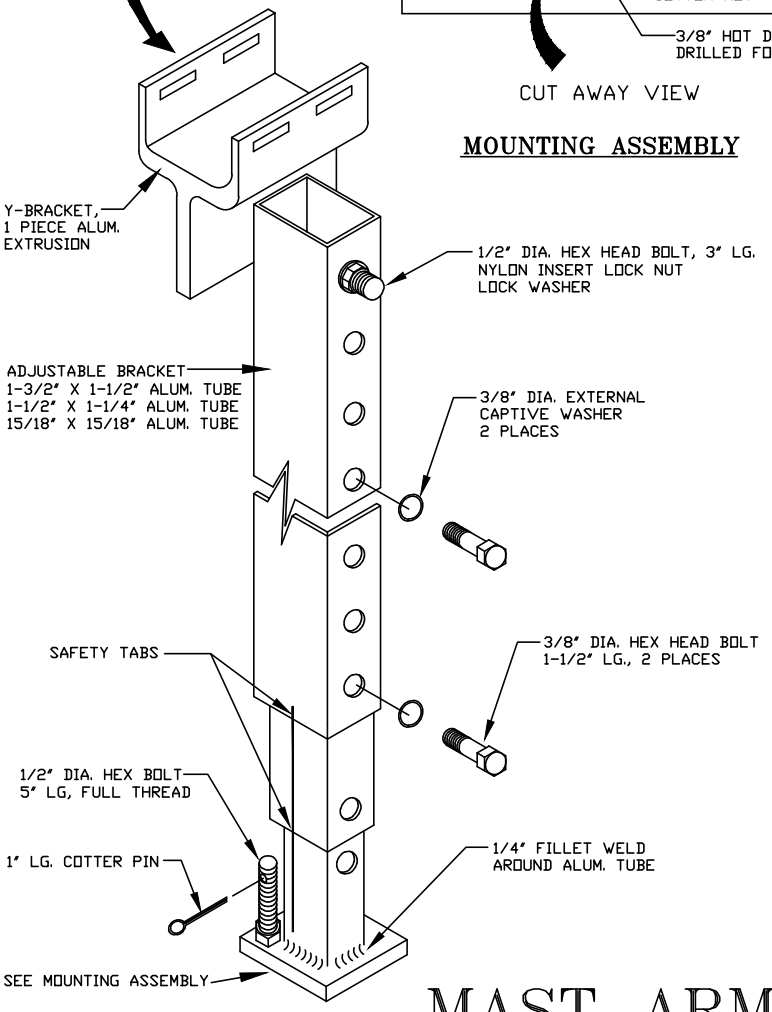
DWG. NO.

7-7

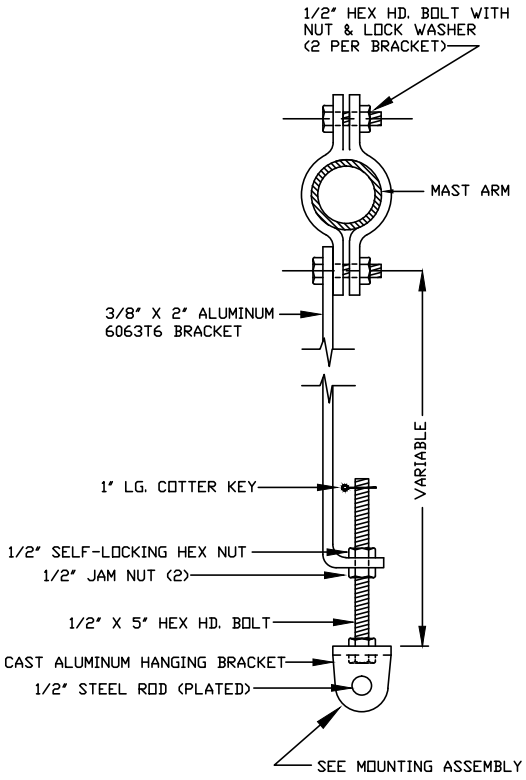
SHEET 1 OF 2



MOUNTING ASSEMBLY



BRACKET



BRACKET
(ALTERNATIVE)

MAST ARM SIGN

CITY OF KENNEWICK	DATE 12/94
ENGINEERING DEPARTMENT	DWN ADT
	REV 3/14
	CHK BWB
	SCALE NTS

DWG. NO.

7-7

SHT 2 OF 2

NOTE□
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TO BE HOT DI□□ED
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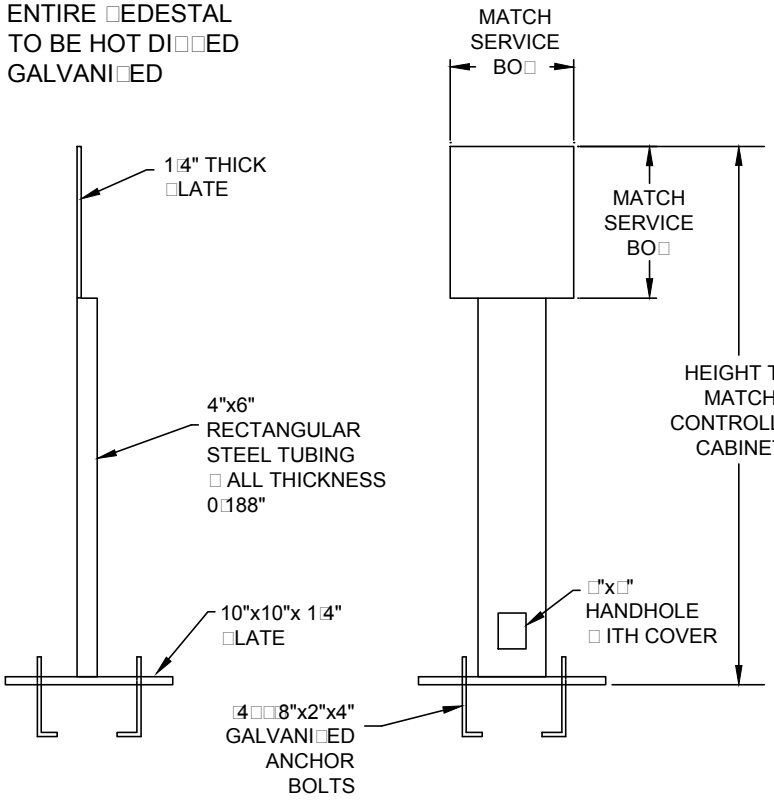
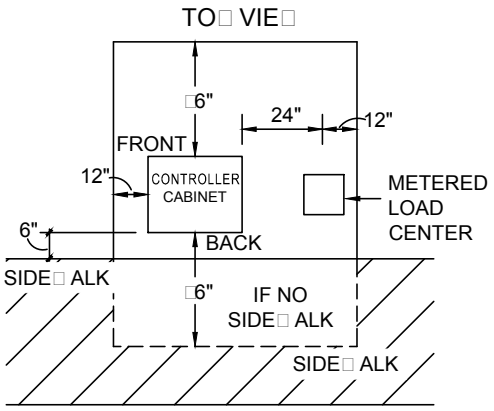
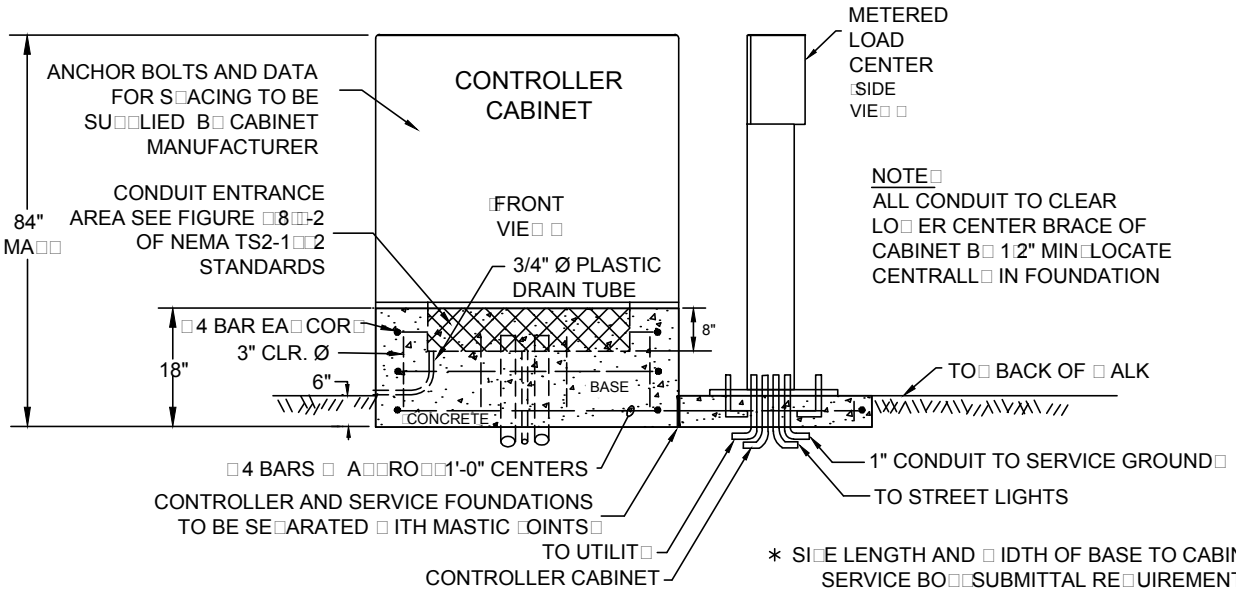


METERED LOAD CENTER



T□□ICAL □AD



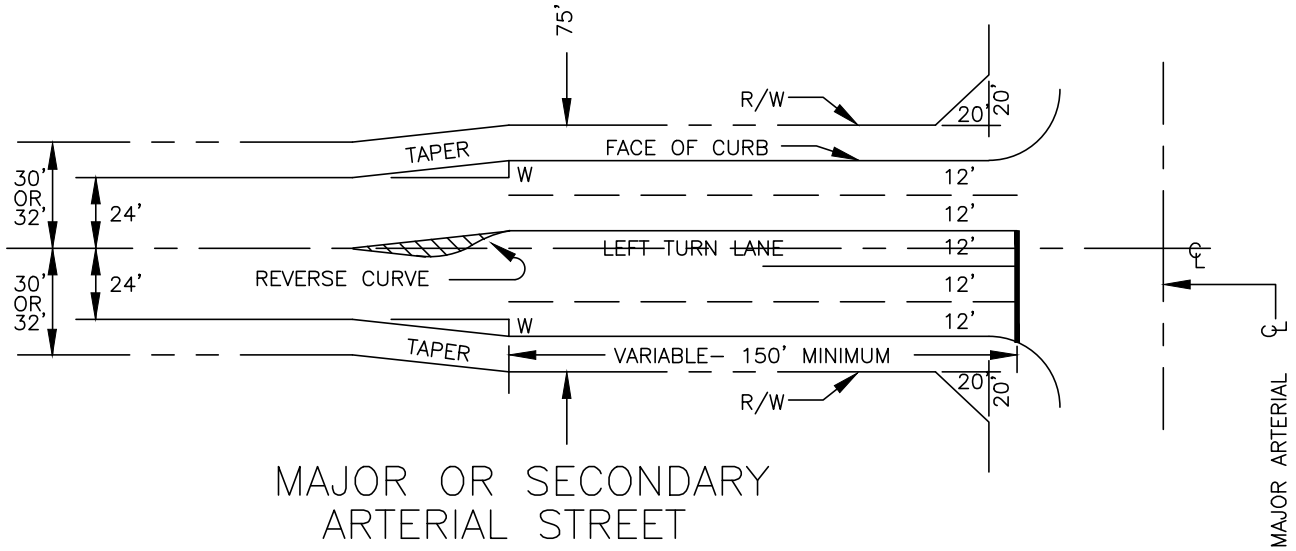
ALTERNATE CONTROLLER CABINET □ METERED LOAD CENTER □LACEMENT

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	8□□4
DWN	CL□
REV	□□14
CHK	B□ B
SCALE	NTS

DWG. NO.

7-8



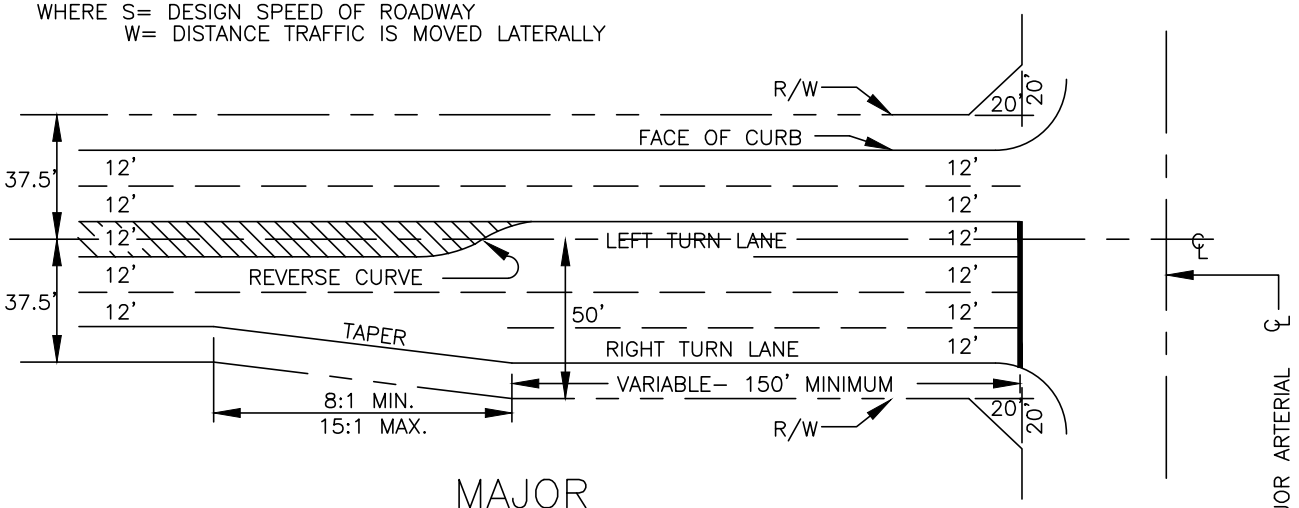
MAJOR OR SECONDARY
ARTERIAL STREET

TAPER LENGTH FORMULAS:

DESIGN SPEED >40 M.P.H. : S x W= TAPER LENGTH

DESIGN SPEED ≤40 M.P.H. : $\frac{W \times S^2}{60}$ = TAPER LENGTH

WHERE S= DESIGN SPEED OF ROADWAY
W= DISTANCE TRAFFIC IS MOVED LATERALLY



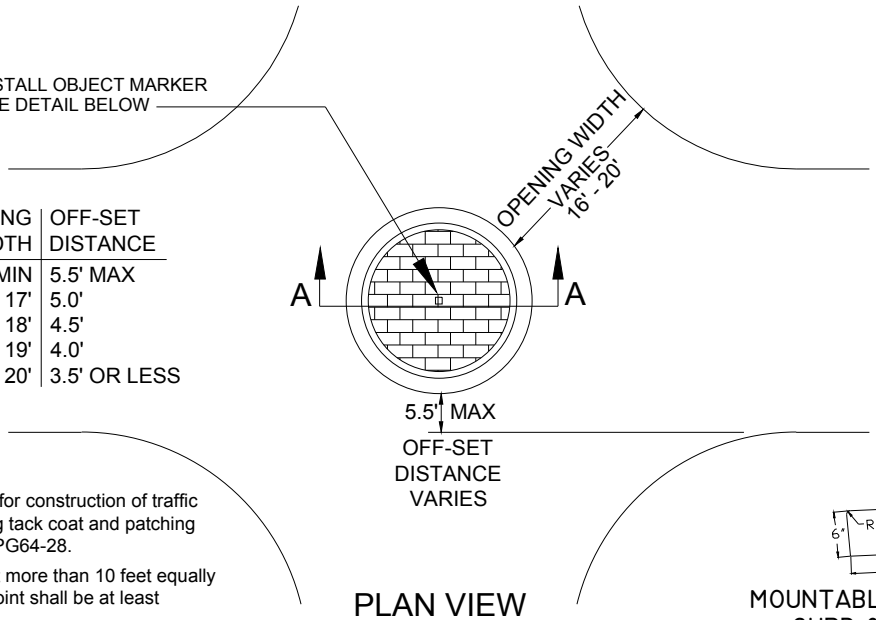
MAJOR
ARTERIAL STREET

NOTE:

STORAGE LANES GREATER THAN THE MINIMUM SHALL BE DETERMINED BY THE TRAFFIC ENGINEER.

STREET INTERSECTION WIDENING

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 12/94 DWN ADT REV 3/14 CHK BWB SCALE NTS	DWG. NO. **7-10**

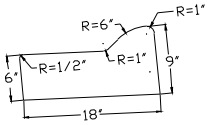


OPENING WIDTH	OFF-SET DISTANCE
16' MIN	5.5' MAX
17'	5.0'
18'	4.5'
19'	4.0'
20'	3.5' OR LESS

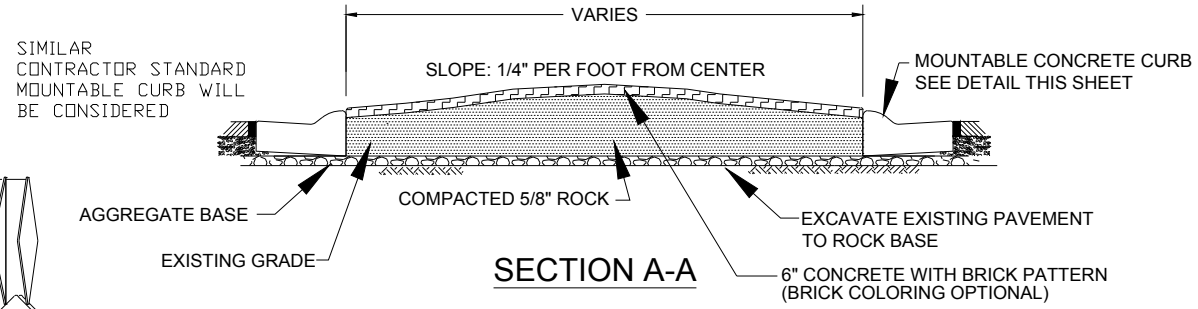
CONSTRUCTION NOTES:

1. Sawcut and remove existing asphalt for construction of traffic circle. Finish by sawcutting, applying tack coat and patching around circle with 2" HMA Class 'A' PG64-28.
2. Contraction joint spacing shall be not more than 10 feet equally spaced around circle. Depth of the joint shall be at least $1\frac{1}{2}$- inches.

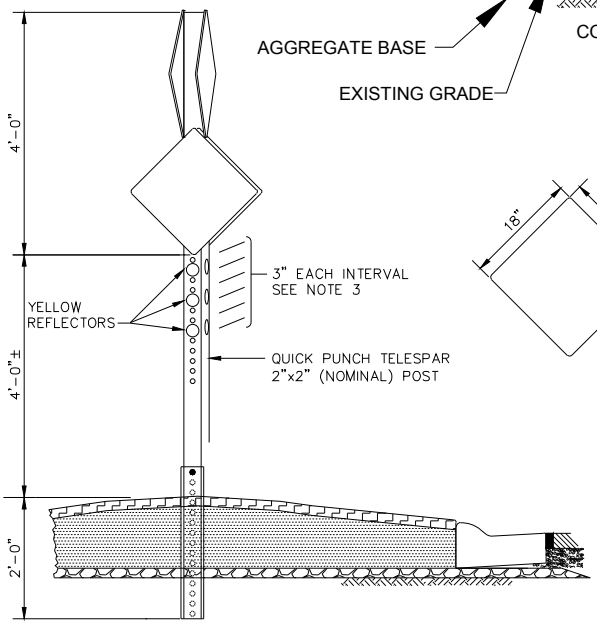
PLAN VIEW



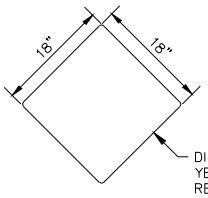
MOUNTABLE CONCRETE CURB & GUTTER
N.T.S.



SECTION A-A



SIGN DETAIL



ADDITIONAL SIGNING AND STRIPING MAY BE REQUIRED ON EACH APPROACH AS DETERMINED BY THE TRAFFIC ENGINEER.

NOTES:

1. IN THE CASE WHERE ALL APPROACHES OF THE INTERSECTION ARE PRIMARILY AT THE SAME LEVEL WITH RESPECT TO GRADES (LESS THAN 3%) THE LOWER SET OF SIGNS SHALL FACE THE HIGHER TRAFFIC VOLUME STREET.
2. IN THE CASE WHERE AN APPROACH HAS A GRADE LARGER THAN 3% THE HIGHER SIGNS WILL FACE THE STEEPEST APPROACH TO ALLOW BETTER SIGHT DISTANCE.
3. PLACE A MINIMUM OF THREE (3) REFLECTORS ON EACH AND EVERY SIDE OF POST OR PLACE THREE (3) DIAMOND GRADE REFLECTORIZED YELLOW STRIPS COMPLETELY AROUND POST.

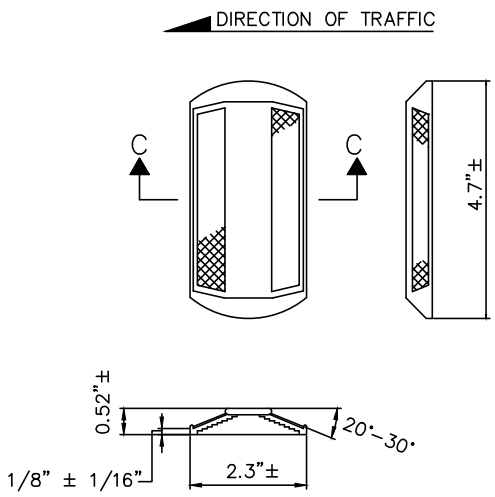
TRAFFIC CIRCLE

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

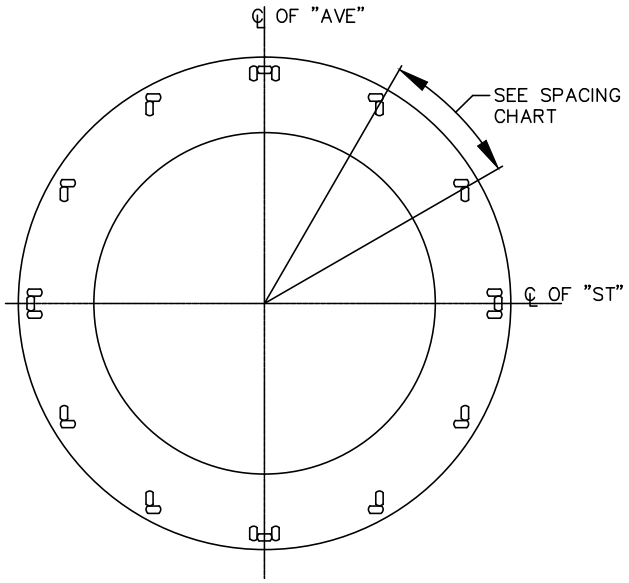
DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-11
SHEET 1 OF 2



SECTION C–C

LANE MARKER–TYPE 2B

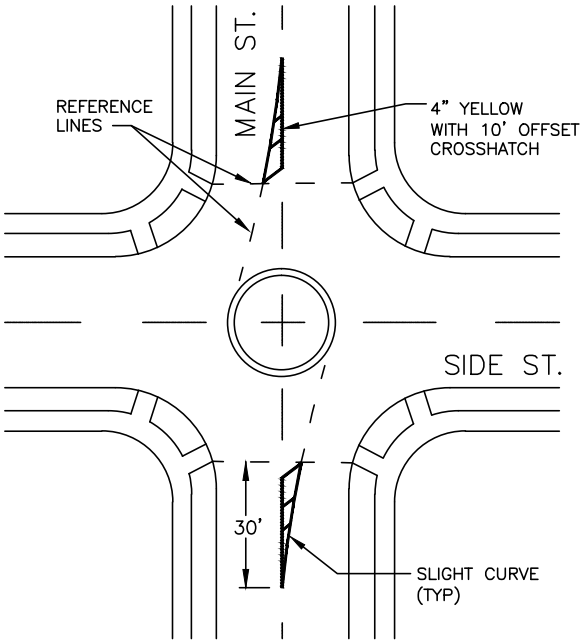


TRAFFIC CIRCLE REFLECTOR LAYOUT

SPACING CHART

DIAMETER OF CIRCLE	DEGREE OF SPACING
≤12'–0"	EVERY 45°
≤20'–0"	EVERY 30°
>20'–0"	EVERY 22–1/2°

(FACING VEHICLE APPROACHES)



STRIPING LAYOUT

WHEN REQUIRED

TRAFFIC CIRCLE

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

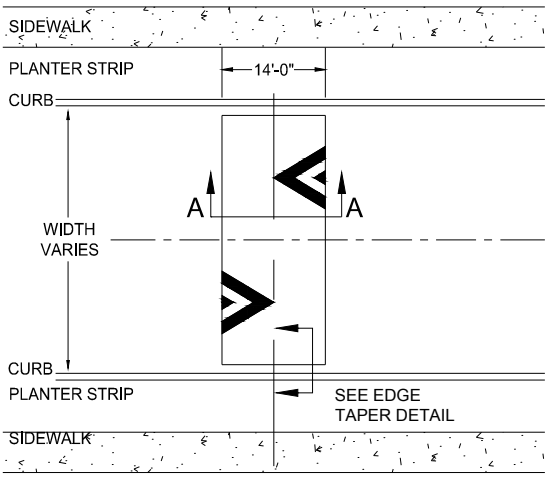
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/10
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

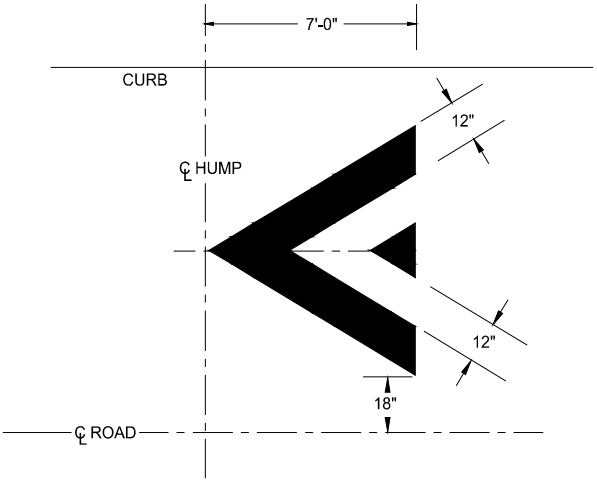
DWG. NO.

7-11

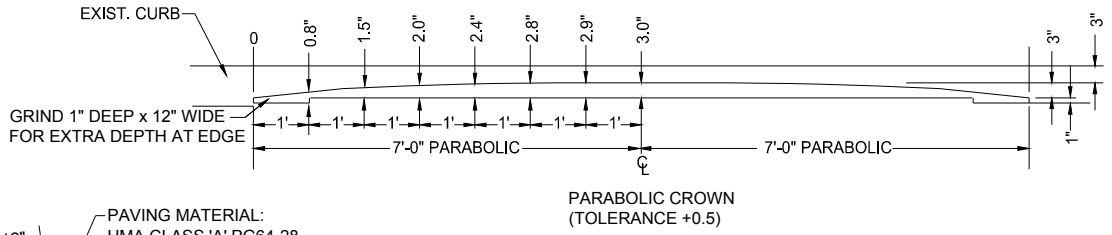
SHT 2 OF 2



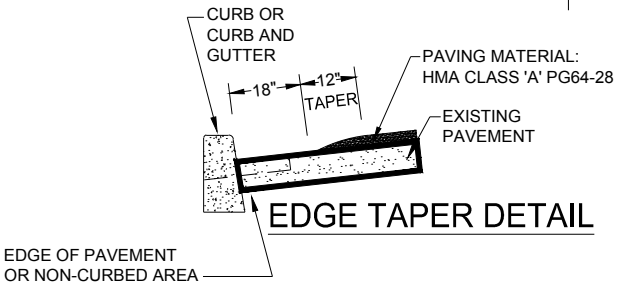
PLAN VIEW



PAVEMENT MARKING DETAIL



SECTION A-A

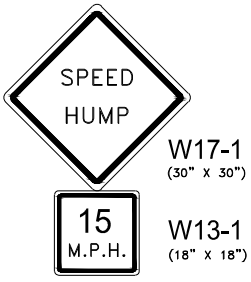


EDGE TAPER DETAIL

ADDITIONAL SIGNING AND STRIPING MAY BE REQUIRED ON EACH APPROACH AS DETERMINED BY THE TRAFFIC ENGINEER.

CONSTRUCTION NOTES:

1. Grind for extra depth at edges as shown.
2. Apply bitumal tack coat over air-blown cleaned and swept asphalt concrete.
3. Asphalt shall be rolled for compaction per specifications.
4. Install W17-1 & W13-1 signs 100' to 150' in advance of the hump, on each approach as directed by the Engineer. Use existing street light standards for mounting if possible.
5. Pavement markings shall be min. 0.120 inch thick plastic. Markings shall be in accordance with WSDOT Standard Specifications sections 8-22.3(3)(4)and (5) and section 9-34.3.



SIGN DETAIL

Sign materials and installation must be in accordance with City of Kennewick Standard Drawings 7-1 and 7-3.

SPEED HUMP

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	1/05
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-12

W21–1701

(36" X 36")

REFER TO WSDOT SIGN FABRICATION MANUAL FOR SIGN DETAILS

RCW 47.36.200

(2) IF THE CONSTRUCTION, REPAIR, OR MAINTENANCE WORK INCLUDES OR USES GROOVED PAVEMENT, ABRUPT LANE EDGES, STEEL PLATES, OR GRAVEL OR EARTH SURFACES, THE CONSTRUCTION, REPAIR, OR MAINTENANCE ZONE MUST BE POSTED WITH SIGNS STATING THE CONDITION, AS REQUIRED BY CURRENT LAW, AND IN ADDITION, MUST WARN MOTORCYCLISTS OF THE POTENTIAL HAZARD. FOR THE PURPOSES OF THIS SUBSECTION, THE DEPARTMENT SHALL ADOPT BY RULE A UNIFORM SIGN OR SIGNS FOR THIS PURPOSE, INCLUDING AT LEAST THE FOLLOWING LANGUAGE, "MOTORCYCLES USE EXTREME CAUTION."

REQUIRED SIGN

(WHEN ABOVE CONDITIONS APPLY)

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	1/05
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-13

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

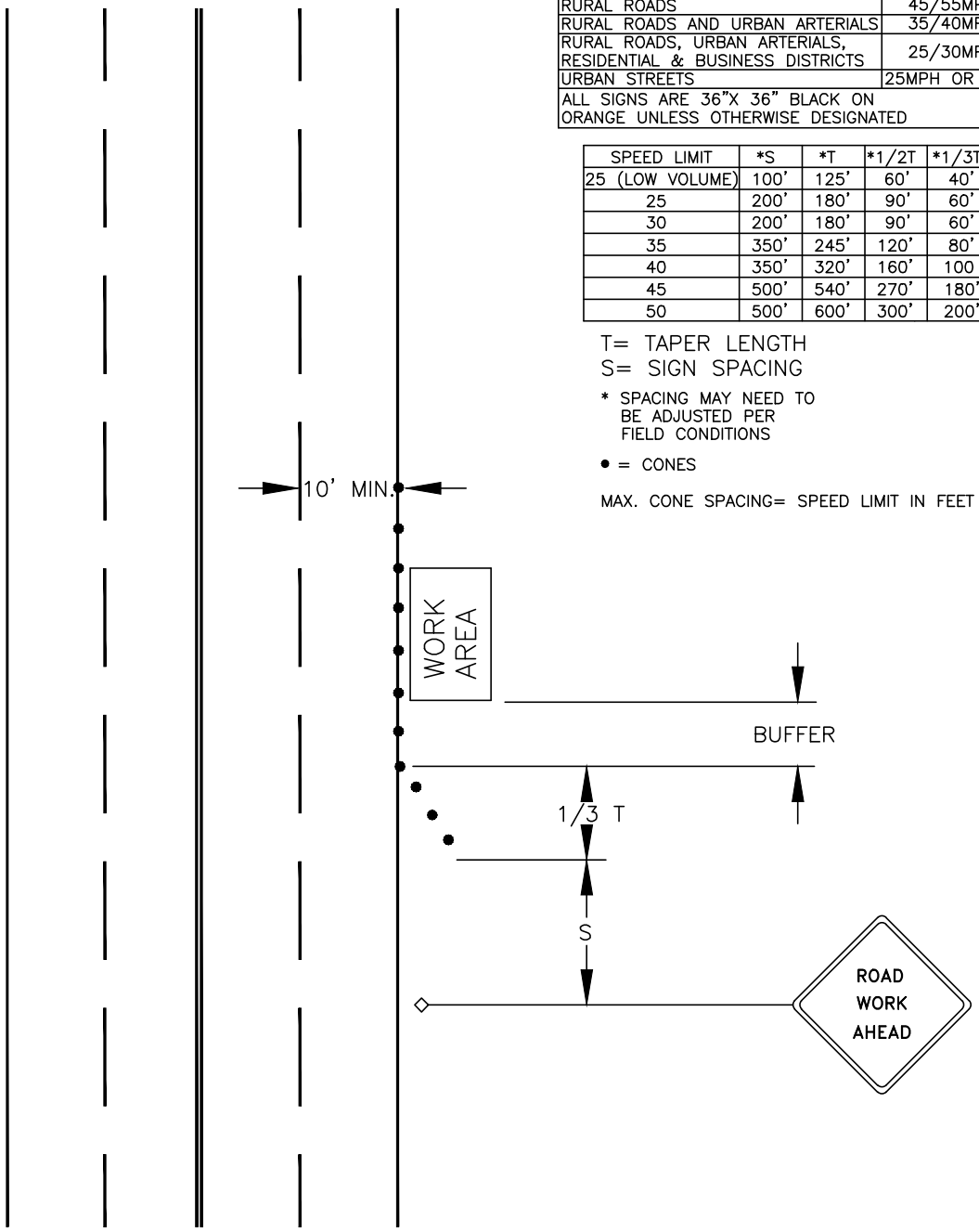
SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



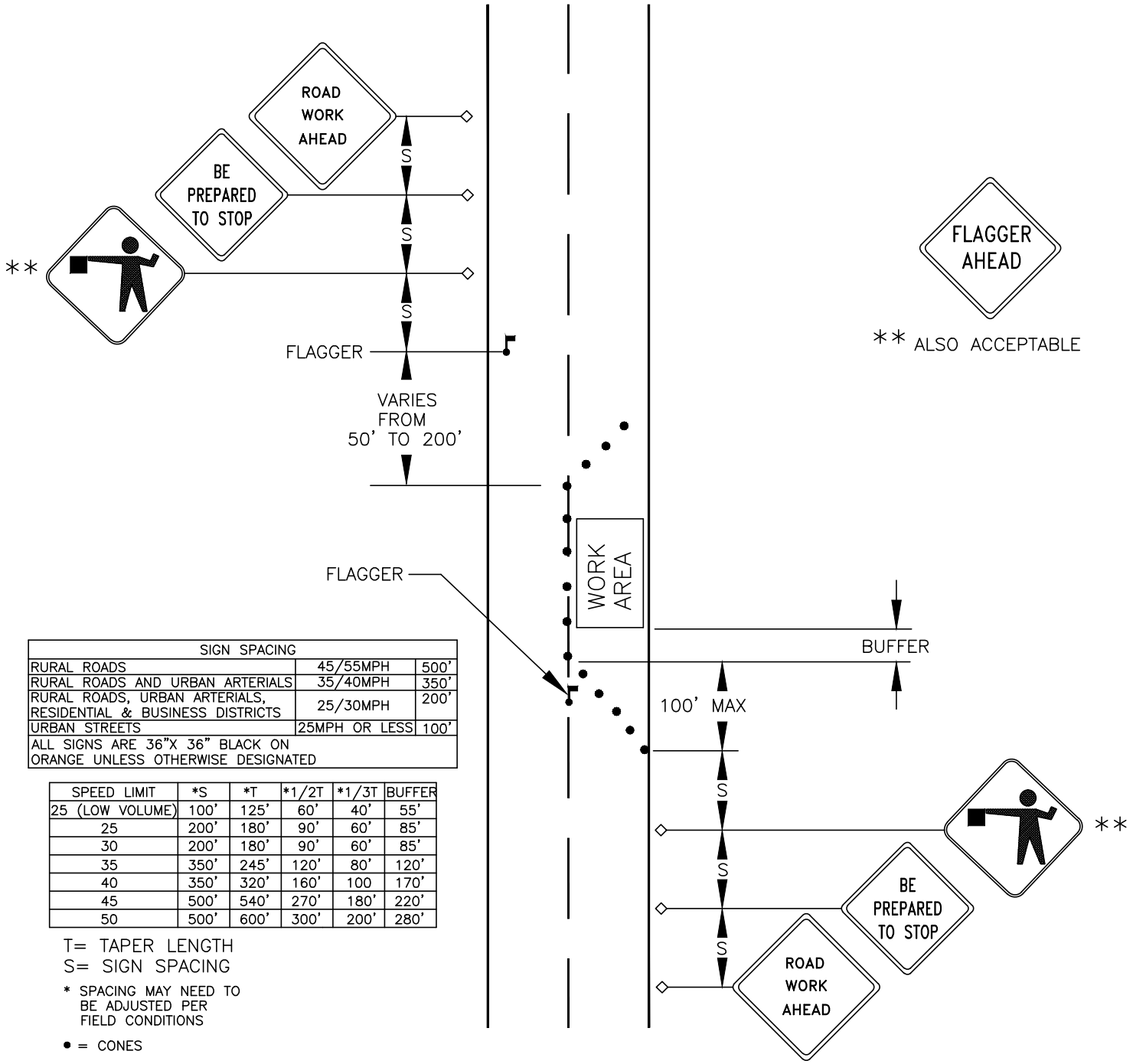
SHOULDER WORK
ANY ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-14



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET

TYPICAL LANE CLOSURE 2 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-15

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

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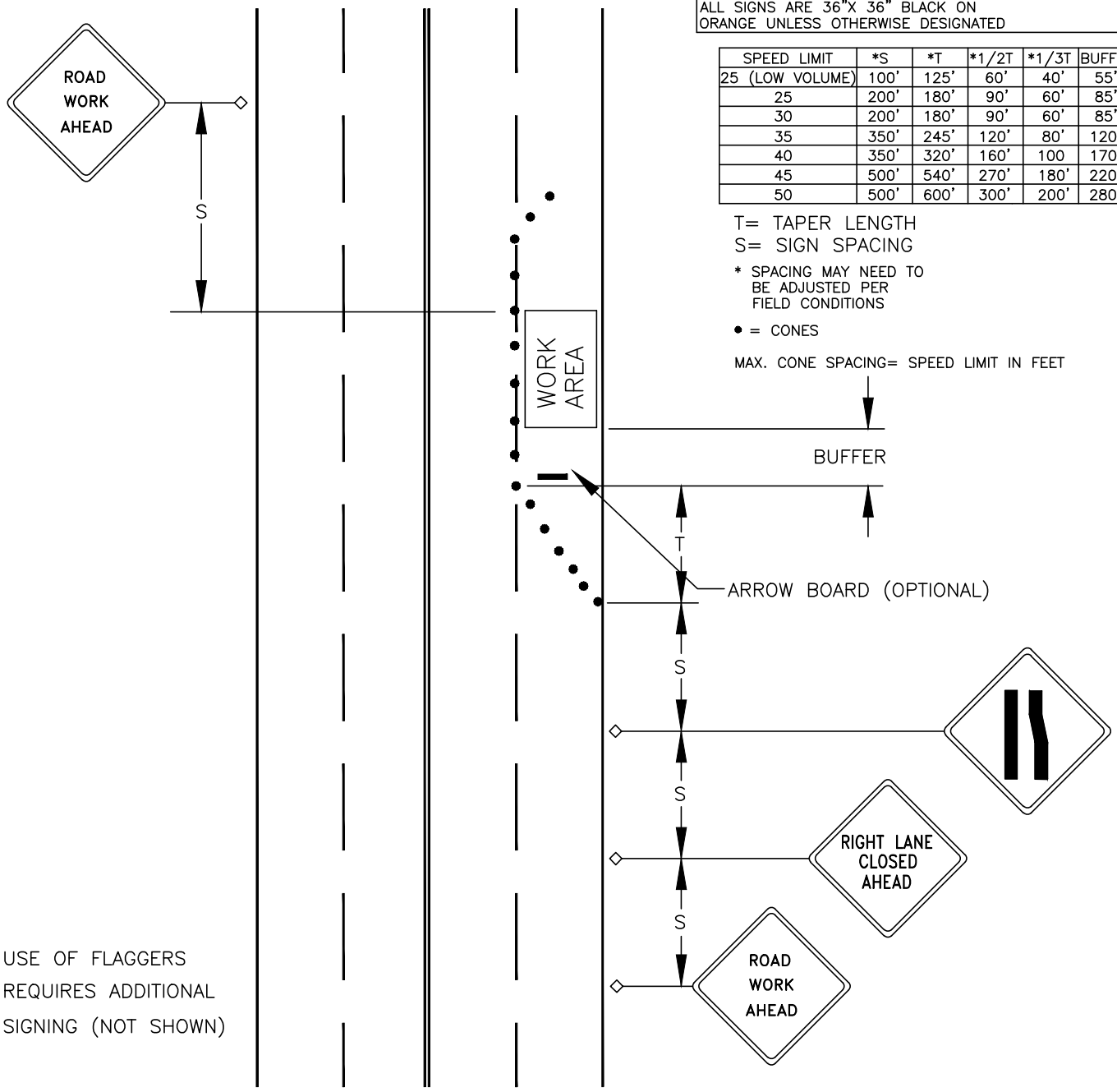
● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



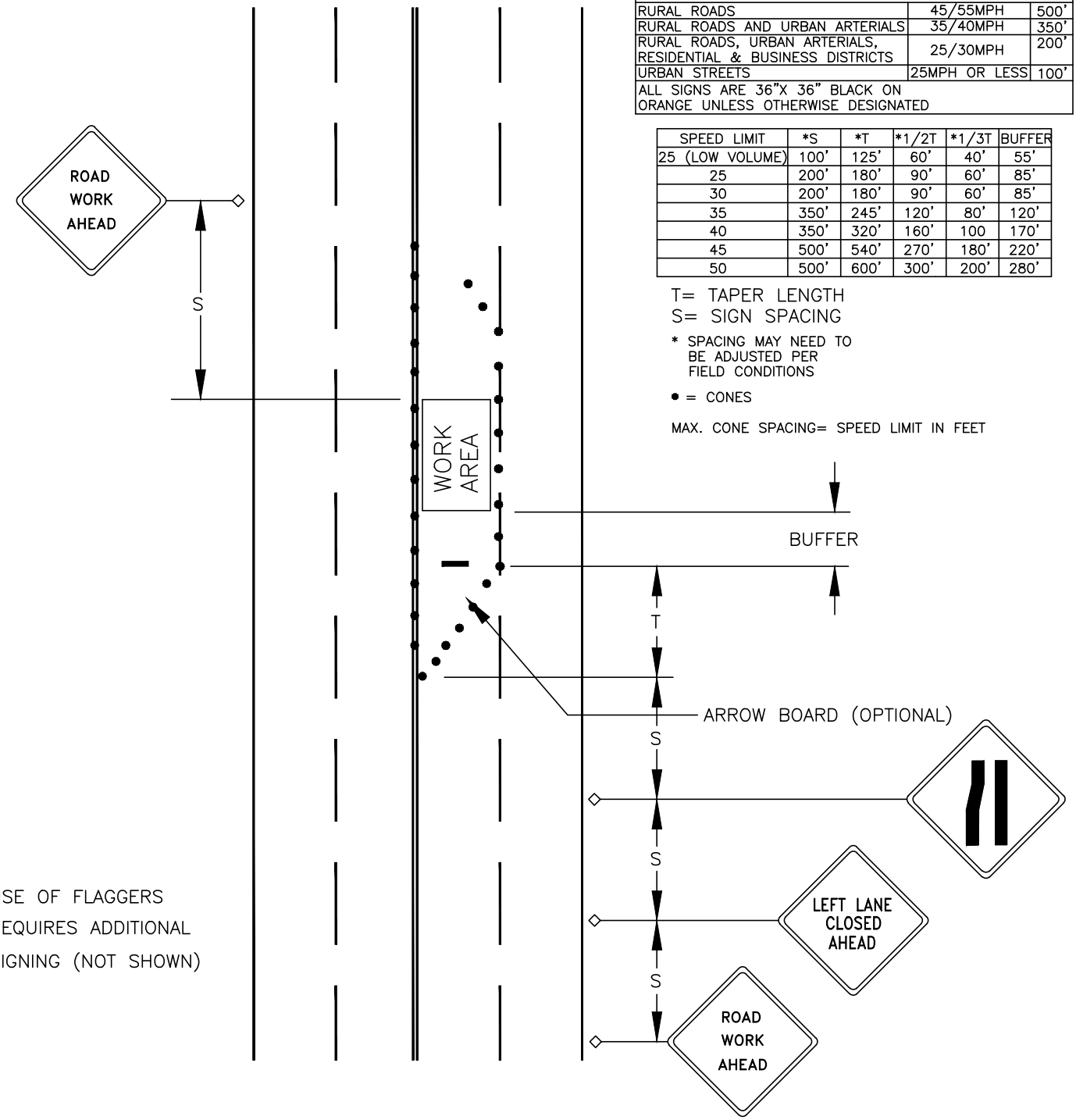
TYPICAL RIGHT LANE CLOSURE
4 LANE ROAD
(WITH OR WITHOUT 2-WAY TURN LANE)

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-16



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET

USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

TYPICAL LEFT LANE CLOSURE
4 LANE ROAD

(WITH OR WITHOUT 2–WAY TURN LANE)

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-17

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
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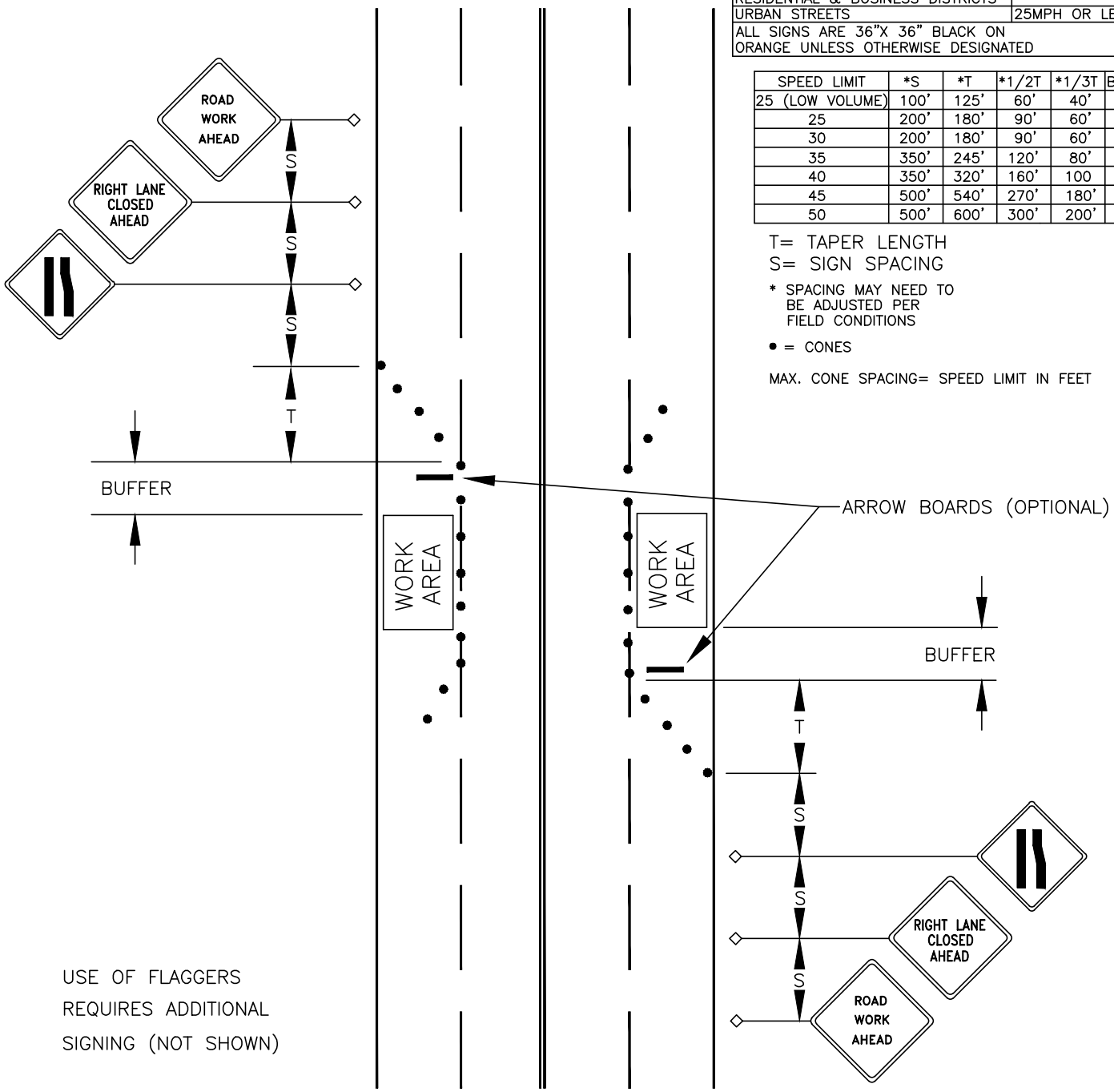
T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

TYPICAL DOUBLE LANE CLOSURE OUTSIDE–4 LANE ROAD

(WITH OR WITHOUT 2–WAY TURN LANE)

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-18

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

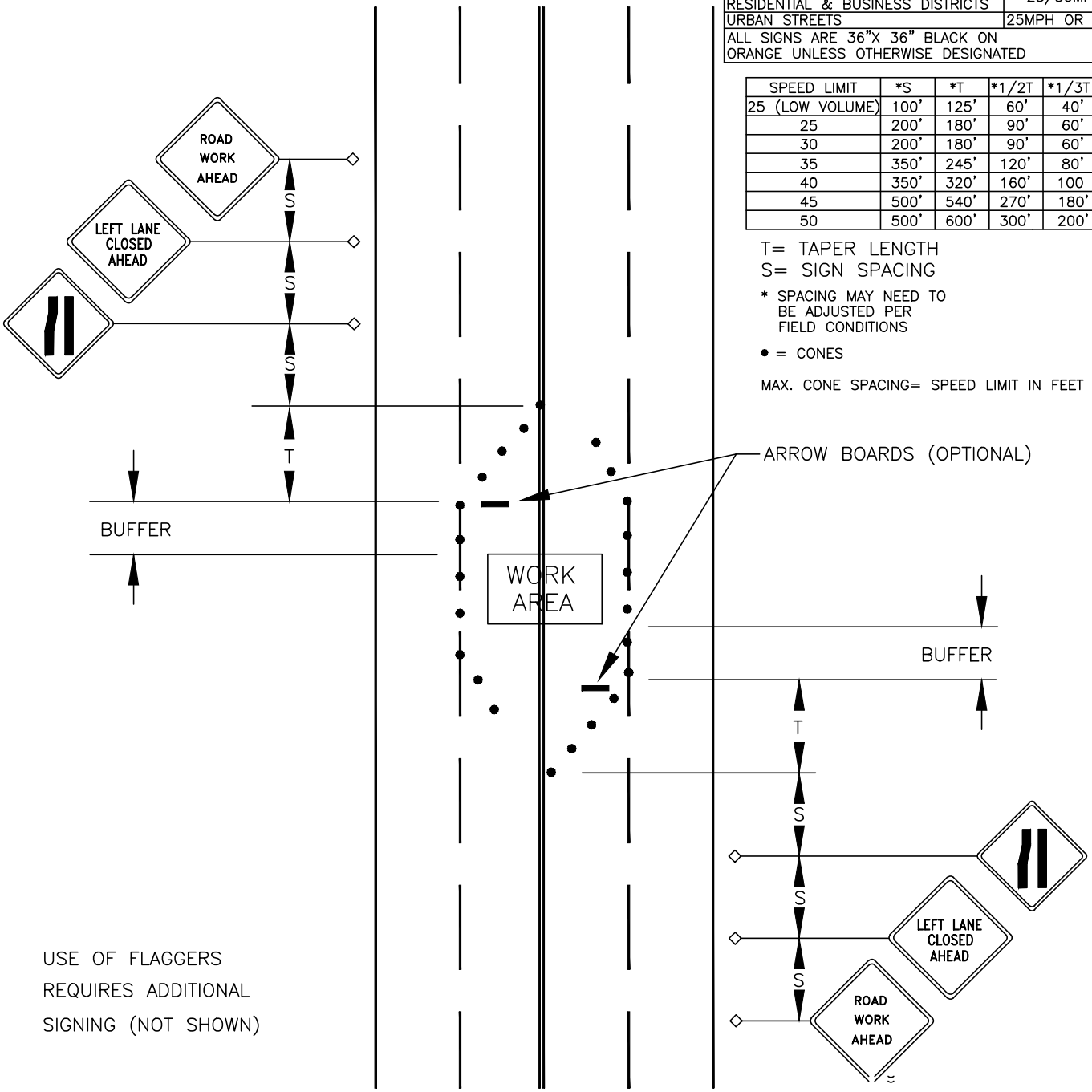
SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

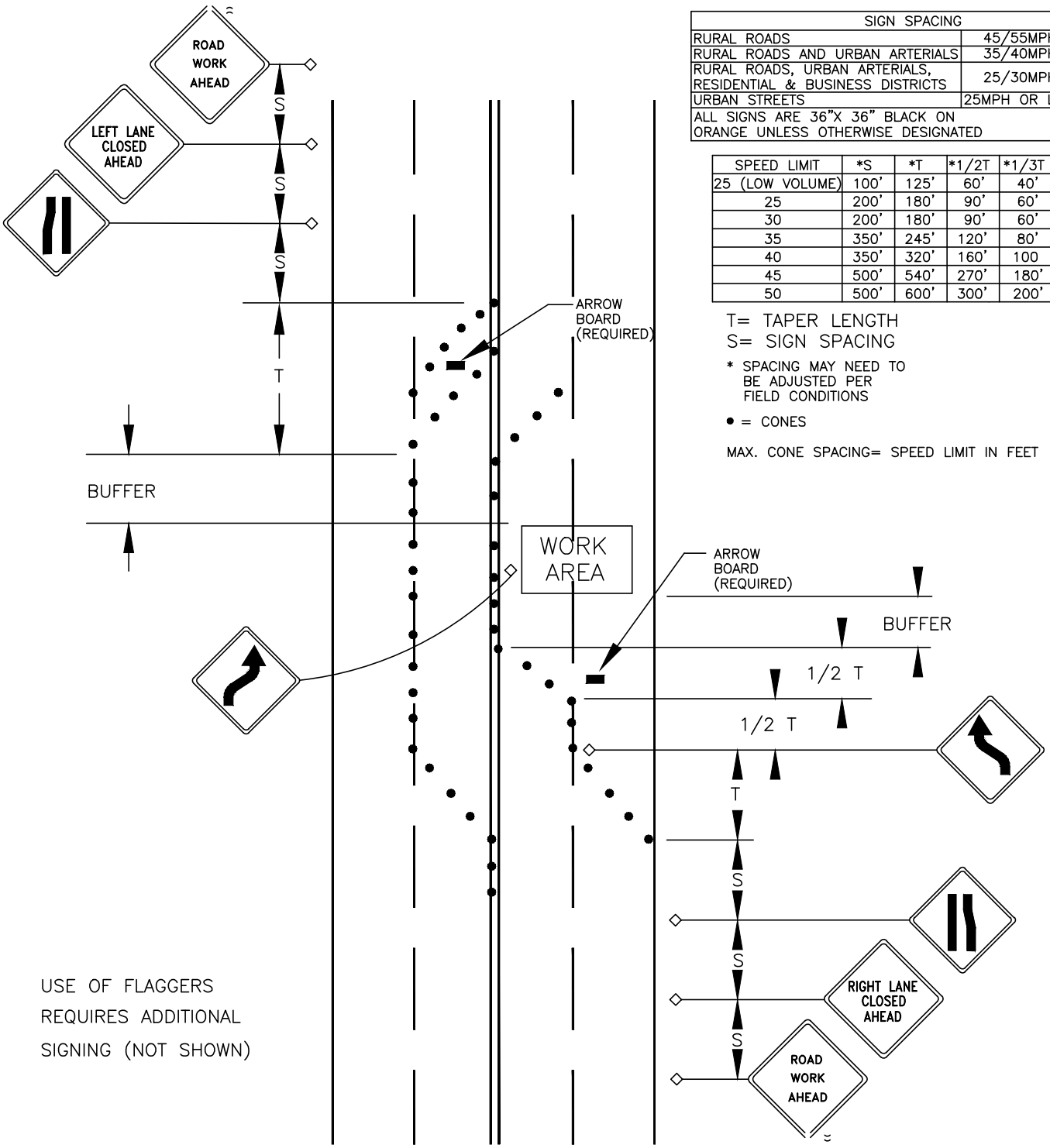
TYPICAL DOUBLE LANE CLOSURE INSIDE–4 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-19



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET

USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

TYPICAL 2-LANE CLOSURE
4 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-20

USE OF FLAGGERS
REQUIRES ADDITIONAL
SIGNING (NOT SHOWN)

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

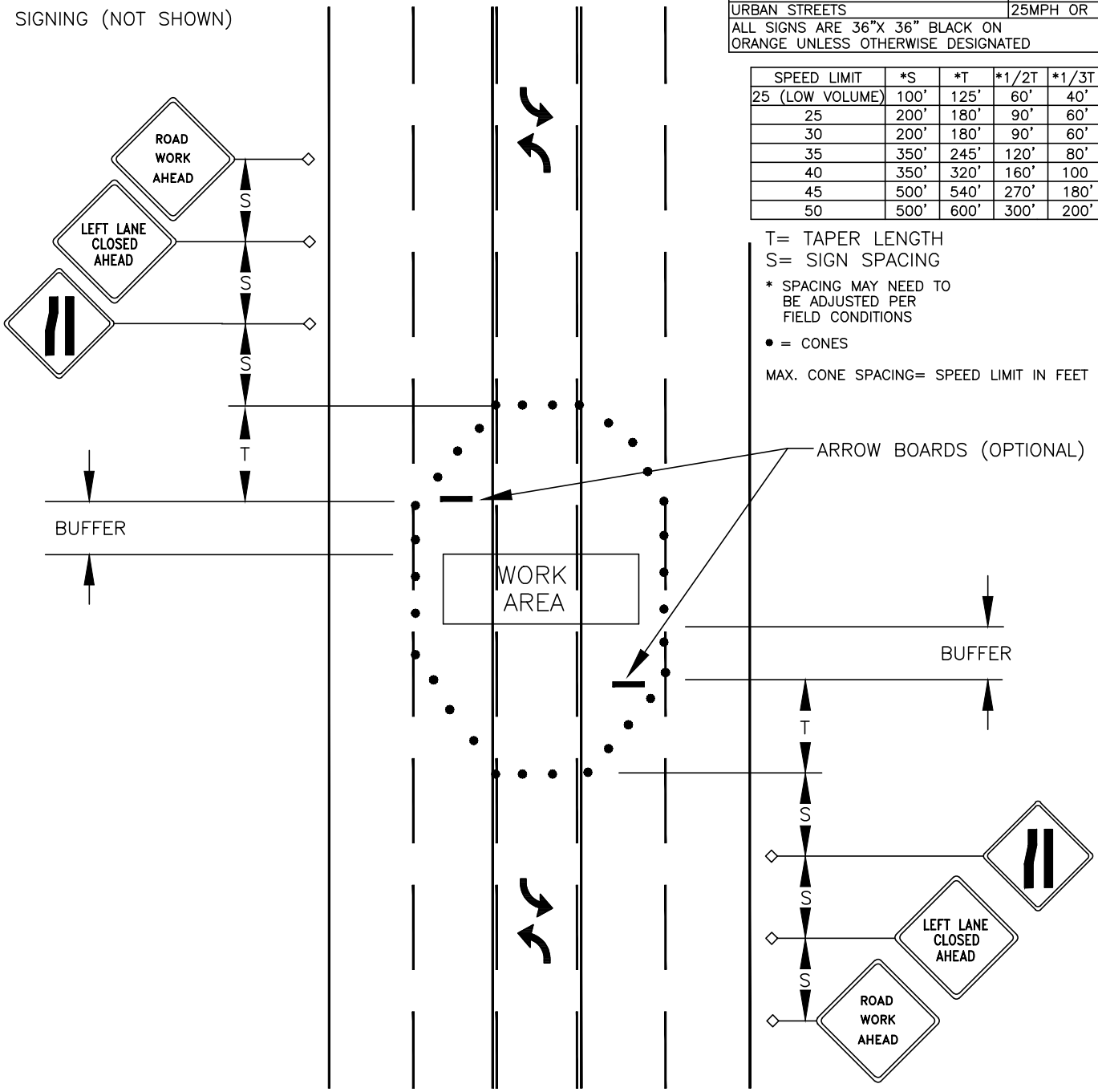
SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



TYPICAL 2-LANE CLOSURE
INSIDE-5 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-21

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

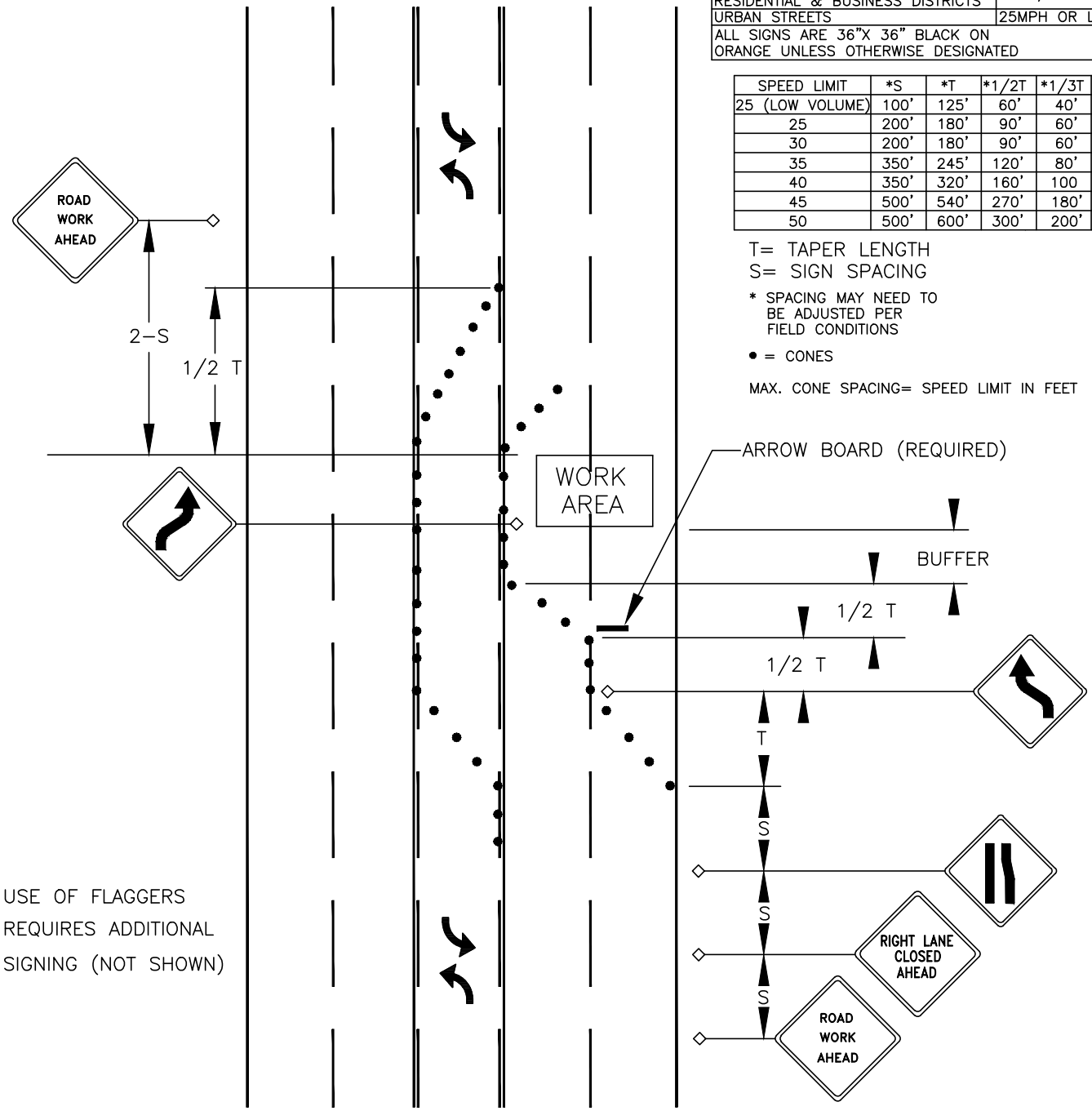
SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

• = CONES

MAX. CONE SPACING= SPEED LIMIT IN FEET



USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

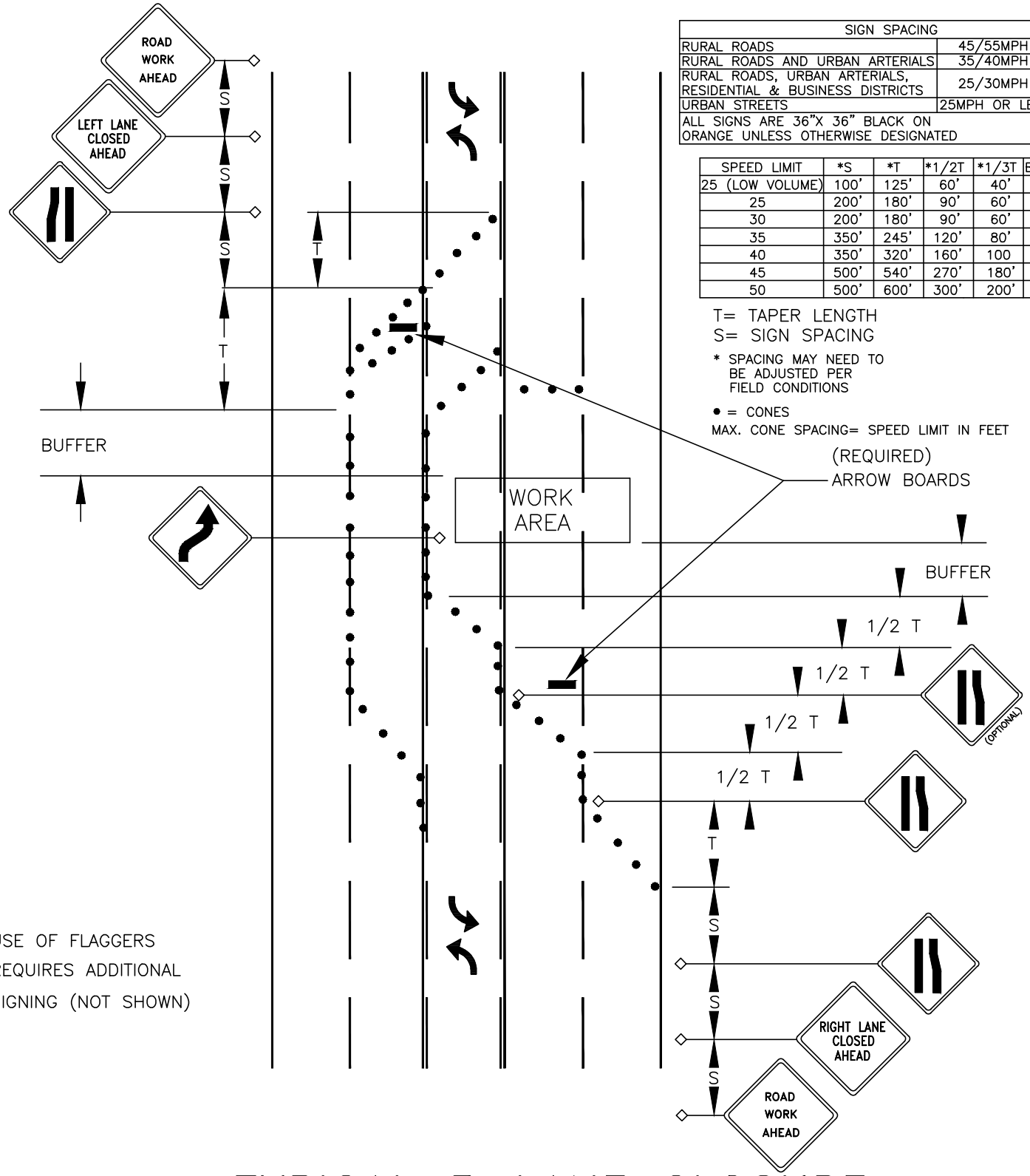
TYPICAL 2–LANE CLOSURE OUTSIDE–5 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-22



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET

TYPICAL 3-LANE CLOSURE OUTSIDE-5 LANE ROAD

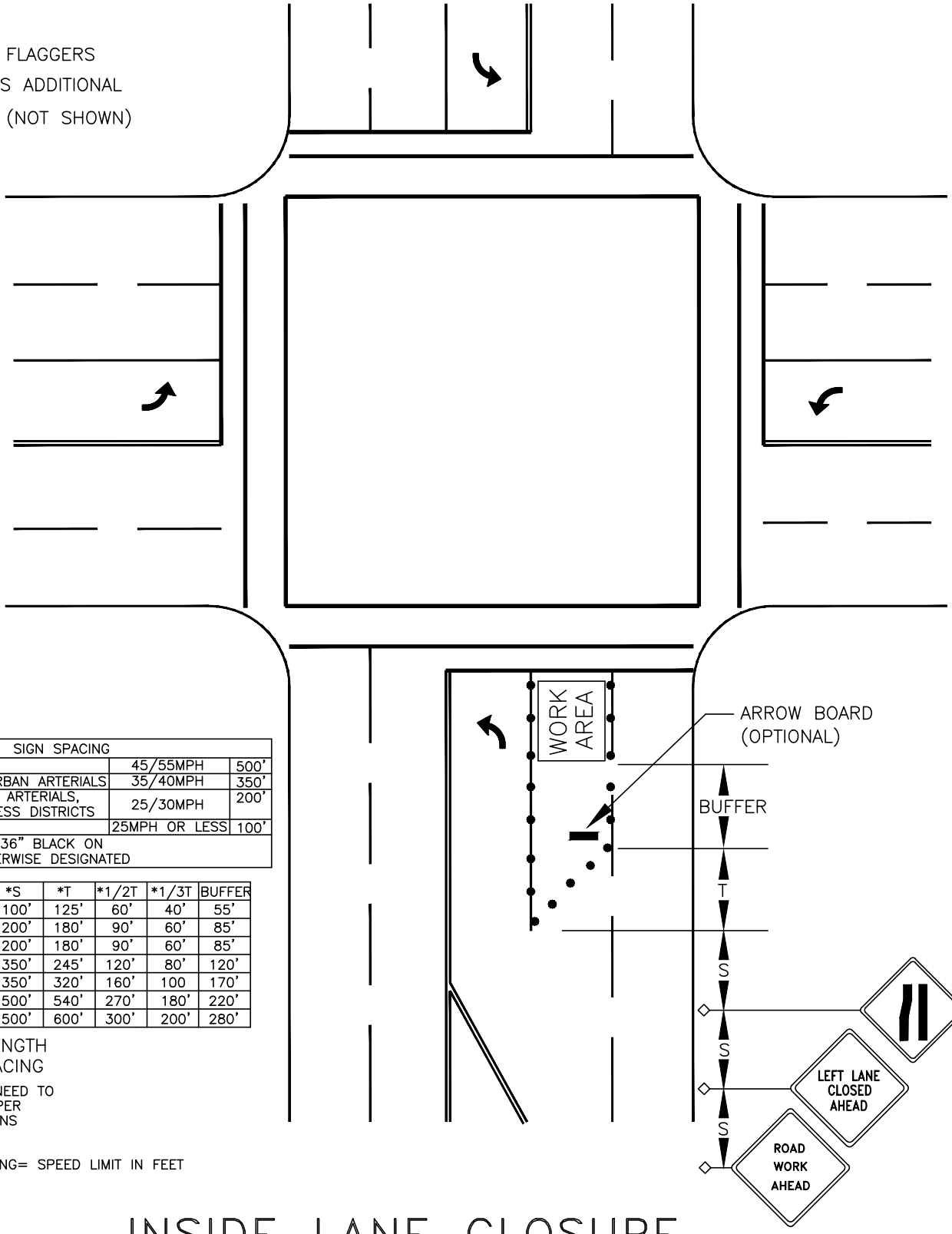
ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-23

USE OF FLAGGERS
REQUIRES ADDITIONAL
SIGNING (NOT SHOWN)



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET

INSIDE LANE CLOSURE NEAR SIDE OF INTERSECTION

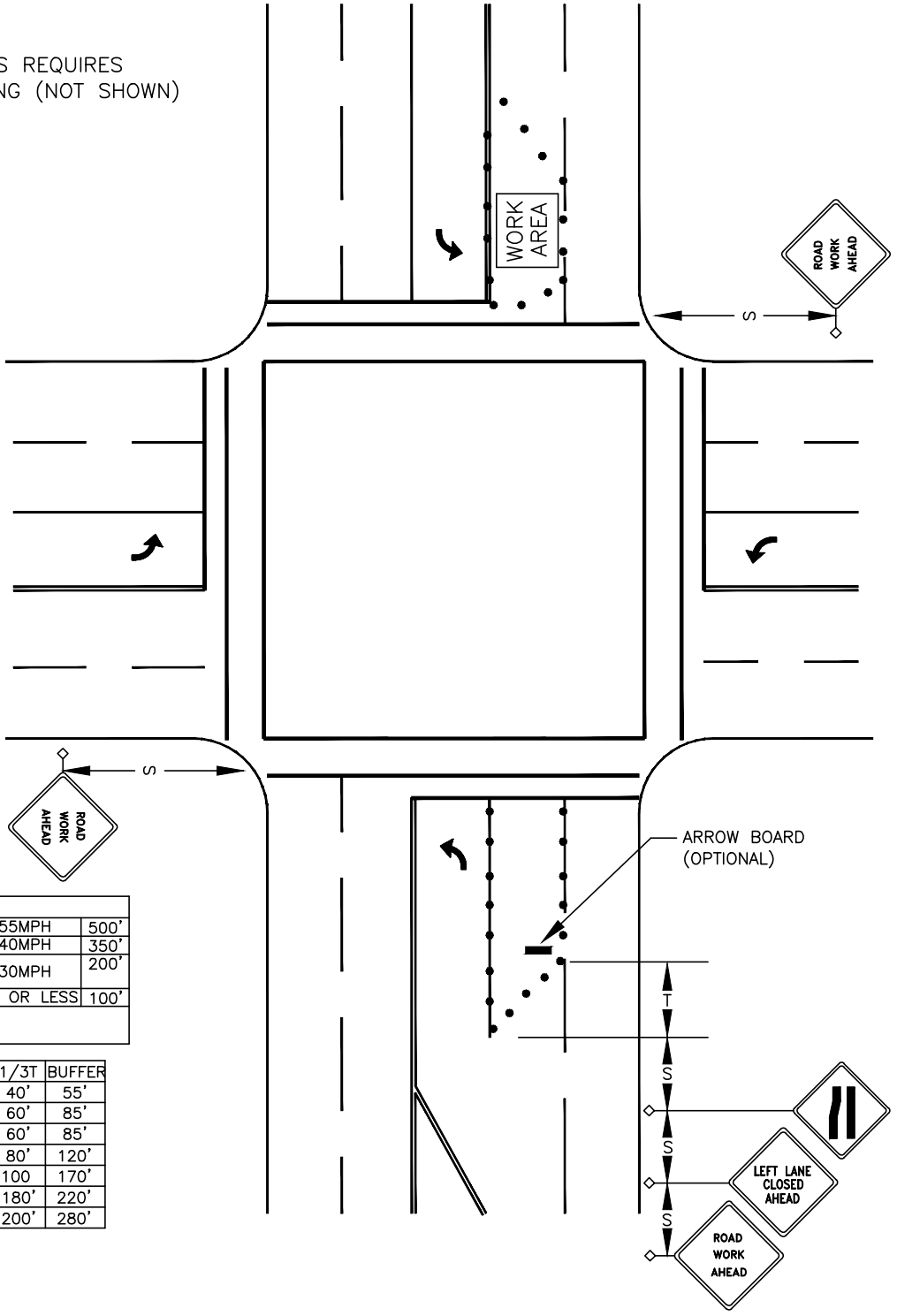
ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-24

USE OF FLAGGERS REQUIRES
ADDITIONAL SIGNING (NOT SHOWN)



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING
* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS
● = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET

INSIDE LANE CLOSURE
FAR SIDE OF INTERSECTION

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

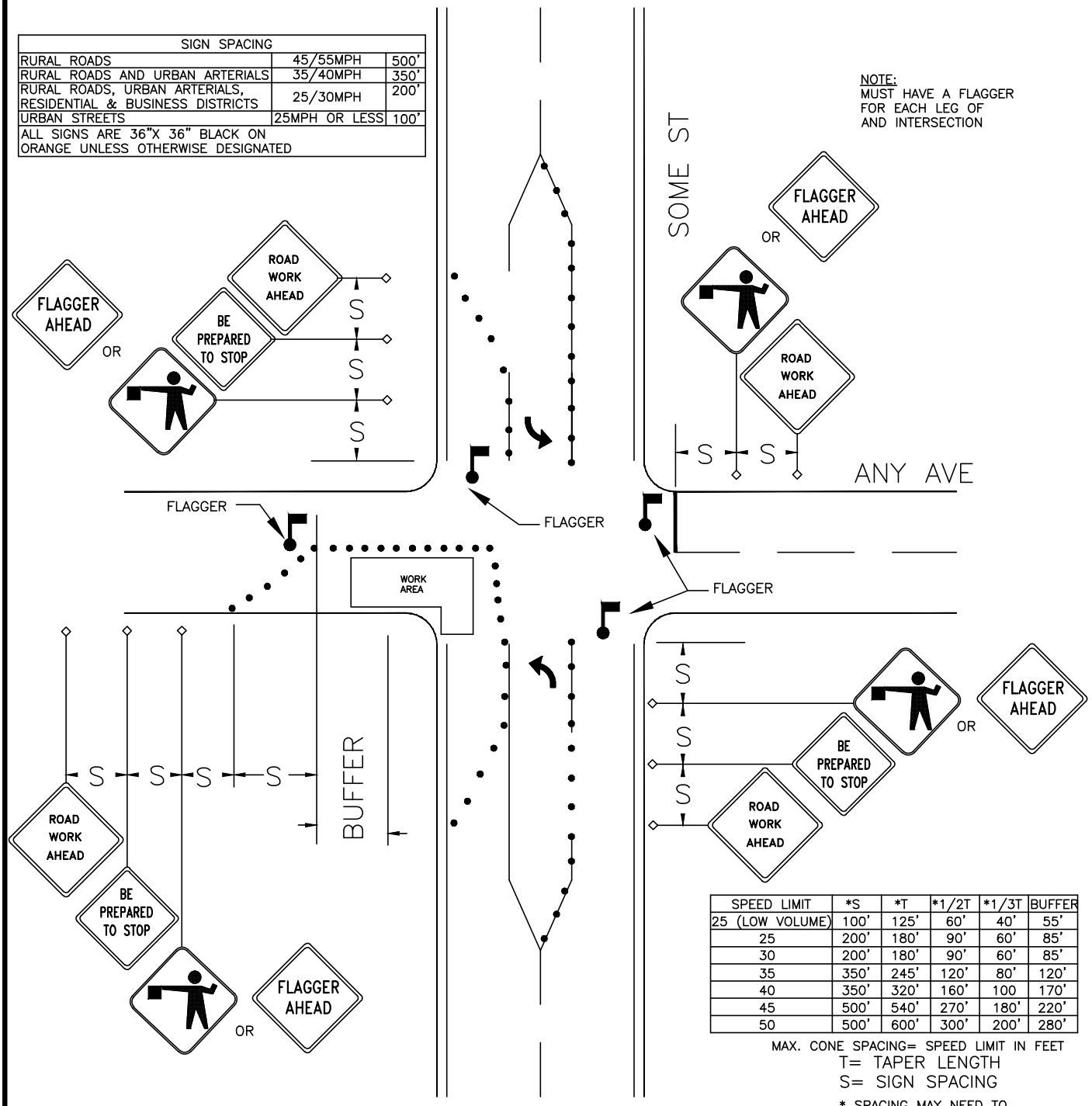
CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-25

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

NOTE:
MUST HAVE A FLAGGER FOR EACH LEG OF AND INTERSECTION



SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

MAX. CONE SPACING= SPEED LIMIT IN FEET
T= TAPER LENGTH
S= SIGN SPACING
* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS
● = CONES

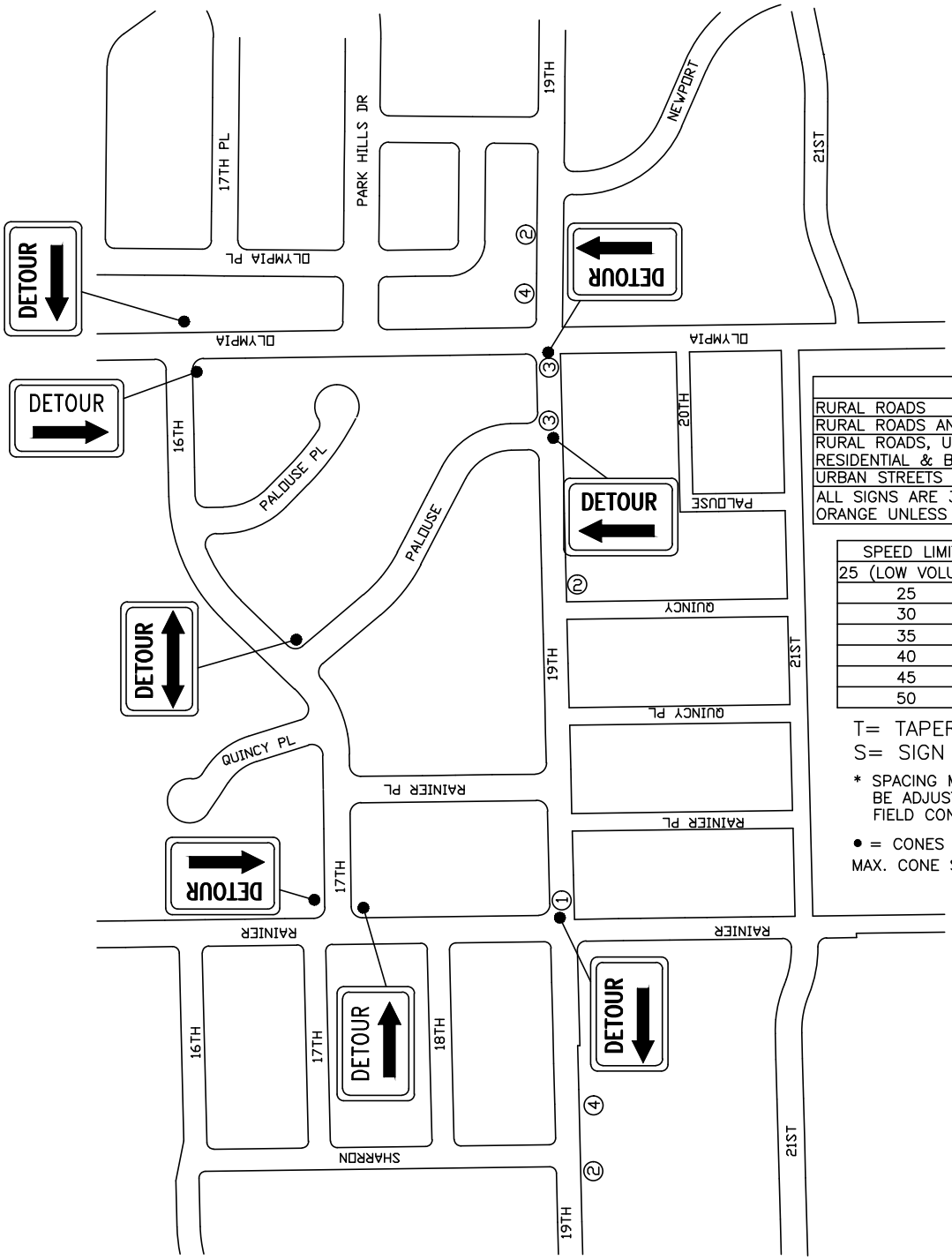
EXAMPLE OF WORK NEAR INTERSECTION

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/99
DWN	SLG
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-26



SIGN LEGEND

① ROAD CLOSED TO THRU TRAFFIC
R11-4
60"X30"
ON TYPE III BARRICADE

② STREET CLOSED AHEAD
W20-3
(36"x 36")

③ ROAD CLOSED
R11-2
(48"x 30")
ON TYPE III BARRICADE

④ DETOUR AHEAD
W20-2
(36"x 36")

SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

• = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET

EXAMPLE OF ROAD CLOSURE AND DETOUR

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	1/98
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-27

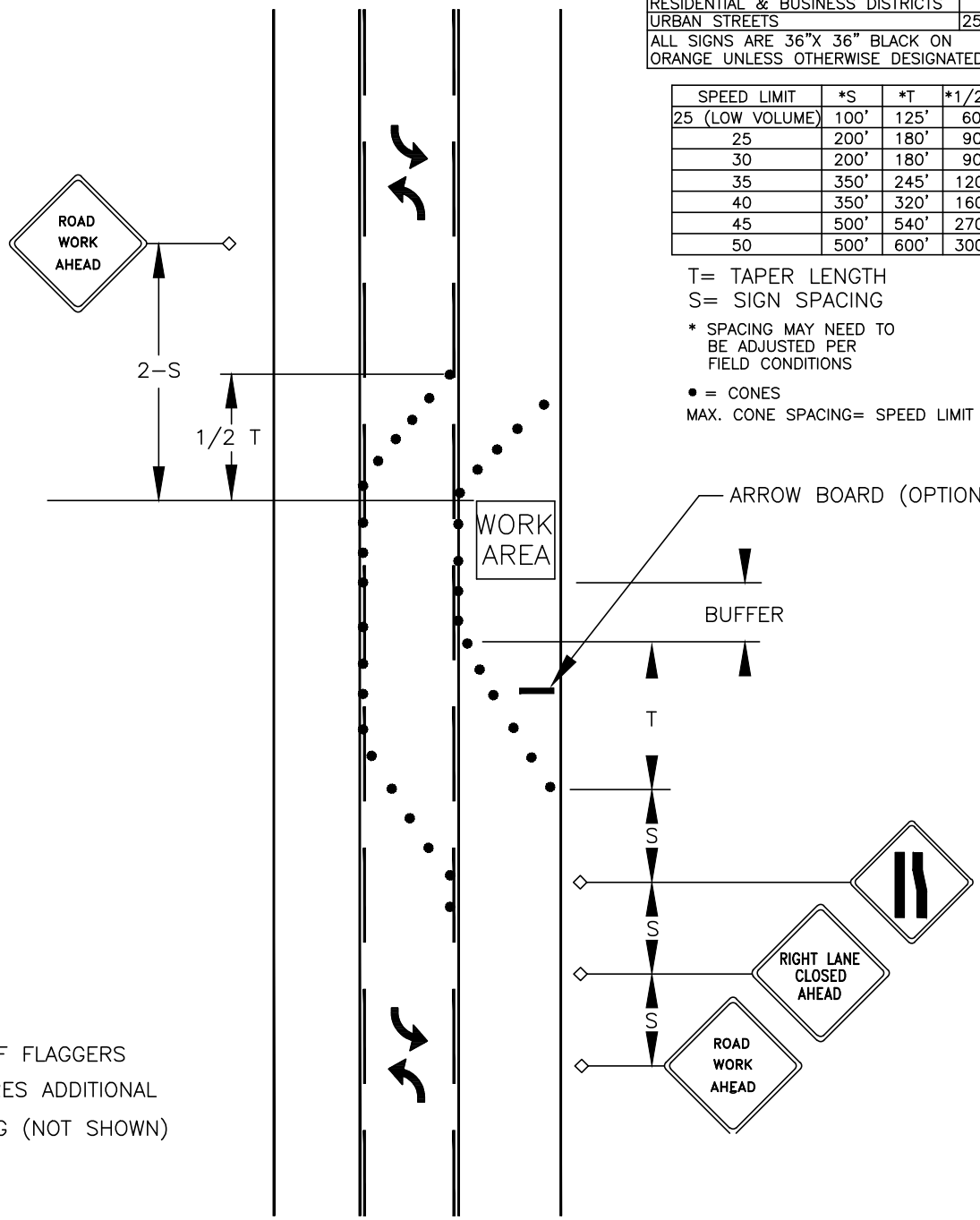
SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET



USE OF FLAGGERS REQUIRES ADDITIONAL SIGNING (NOT SHOWN)

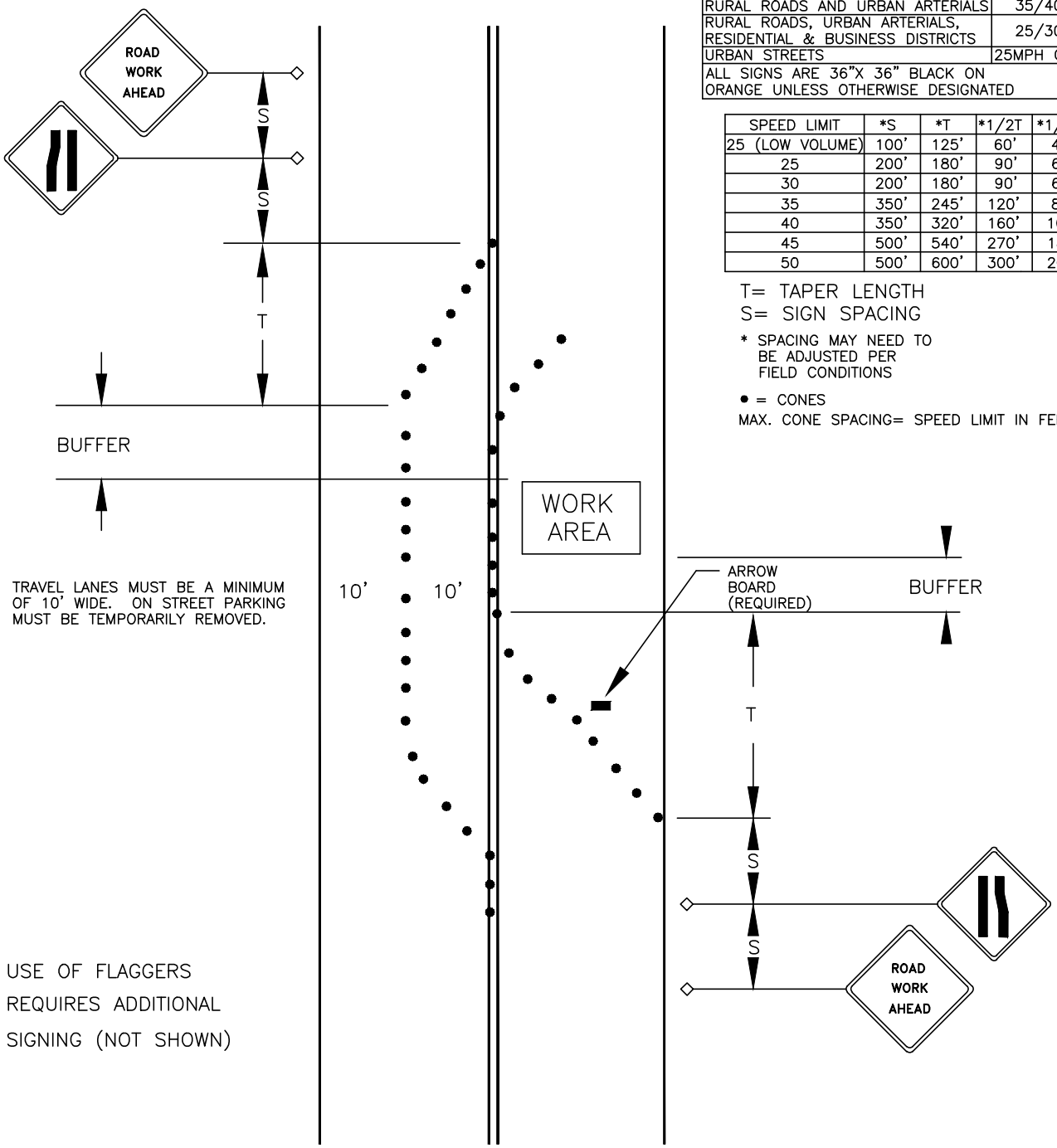
TYPICAL 1–LANE CLOSURE ONE SIDE–3 LANE ROAD

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	12/01
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-28



SIGN SPACING		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 36"X 36" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES
MAX. CONE SPACING= SPEED LIMIT IN FEET

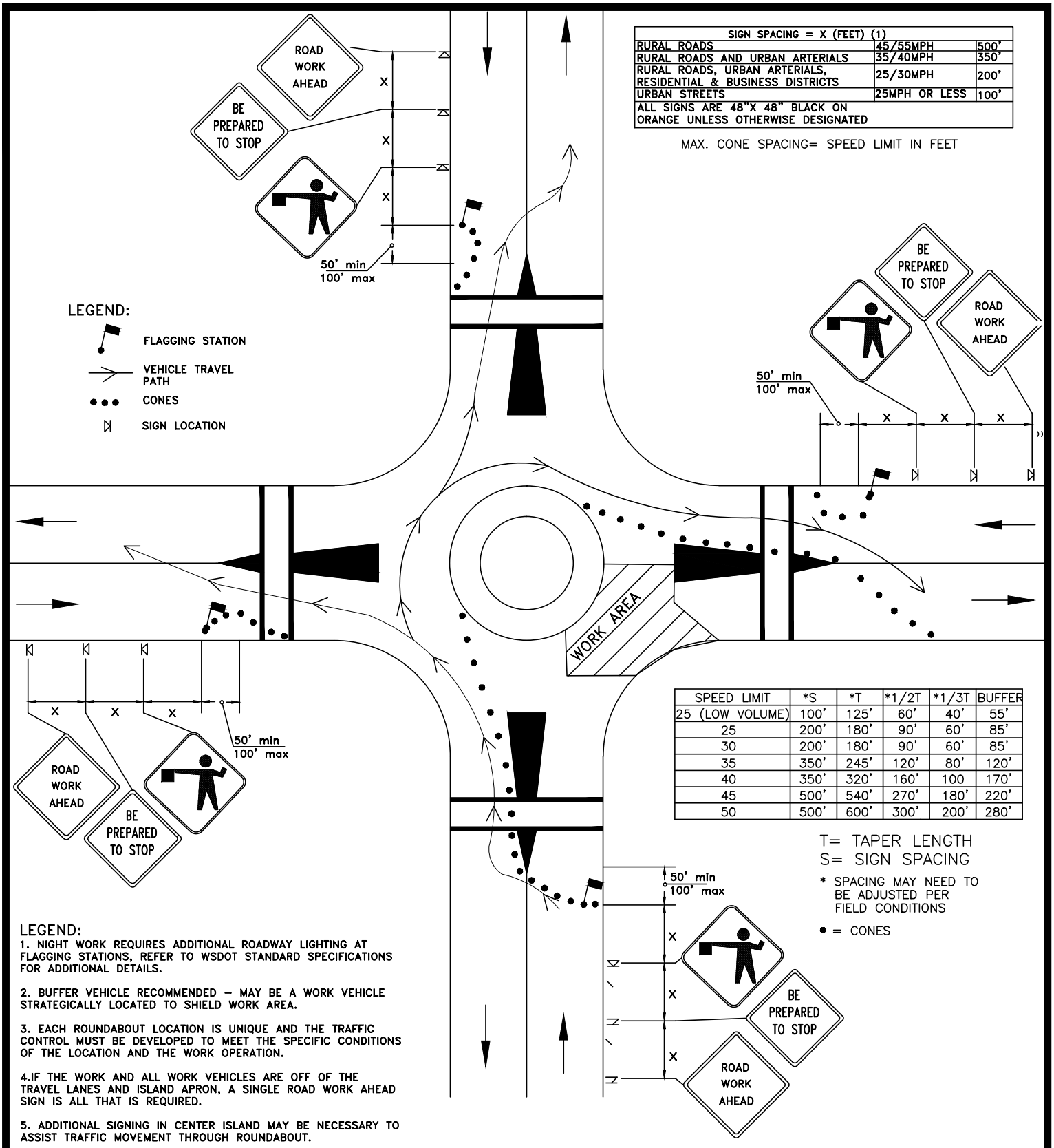
TYPICAL LANE CLOSURE
2 LANE ROAD 2-WAY TRAFFIC

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK
TRAFFIC ENGINEERING DEPARTMENT

DATE	7/02
DWN	ADP
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
7-29



SIGN SPACING = X (FEET) (1)		
RURAL ROADS	45/55MPH	500'
RURAL ROADS AND URBAN ARTERIALS	35/40MPH	350'
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25/30MPH	200'
URBAN STREETS	25MPH OR LESS	100'
ALL SIGNS ARE 48"X 48" BLACK ON ORANGE UNLESS OTHERWISE DESIGNATED		

MAX. CONE SPACING= SPEED LIMIT IN FEET

SPEED LIMIT	*S	*T	*1/2T	*1/3T	BUFFER
25 (LOW VOLUME)	100'	125'	60'	40'	55'
25	200'	180'	90'	60'	85'
30	200'	180'	90'	60'	85'
35	350'	245'	120'	80'	120'
40	350'	320'	160'	100	170'
45	500'	540'	270'	180'	220'
50	500'	600'	300'	200'	280'

T= TAPER LENGTH
S= SIGN SPACING

* SPACING MAY NEED TO BE ADJUSTED PER FIELD CONDITIONS

● = CONES

LEGEND:

1. NIGHT WORK REQUIRES ADDITIONAL ROADWAY LIGHTING AT FLAGGING STATIONS, REFER TO WSDOT STANDARD SPECIFICATIONS FOR ADDITIONAL DETAILS.

2. BUFFER VEHICLE RECOMMENDED – MAY BE A WORK VEHICLE STRATEGICALLY LOCATED TO SHIELD WORK AREA.

3. EACH ROUNDABOUT LOCATION IS UNIQUE AND THE TRAFFIC CONTROL MUST BE DEVELOPED TO MEET THE SPECIFIC CONDITIONS OF THE LOCATION AND THE WORK OPERATION.

4.IF THE WORK AND ALL WORK VEHICLES ARE OFF OF THE TRAVEL LANES AND ISLAND APRON, A SINGLE ROAD WORK AHEAD SIGN IS ALL THAT IS REQUIRED.

5. ADDITIONAL SIGNING IN CENTER ISLAND MAY BE NECESSARY TO ASSIST TRAFFIC MOVEMENT THROUGH ROUNDABOUT.

TYPICAL ROUNDABOUT FLAGGING OPERATION

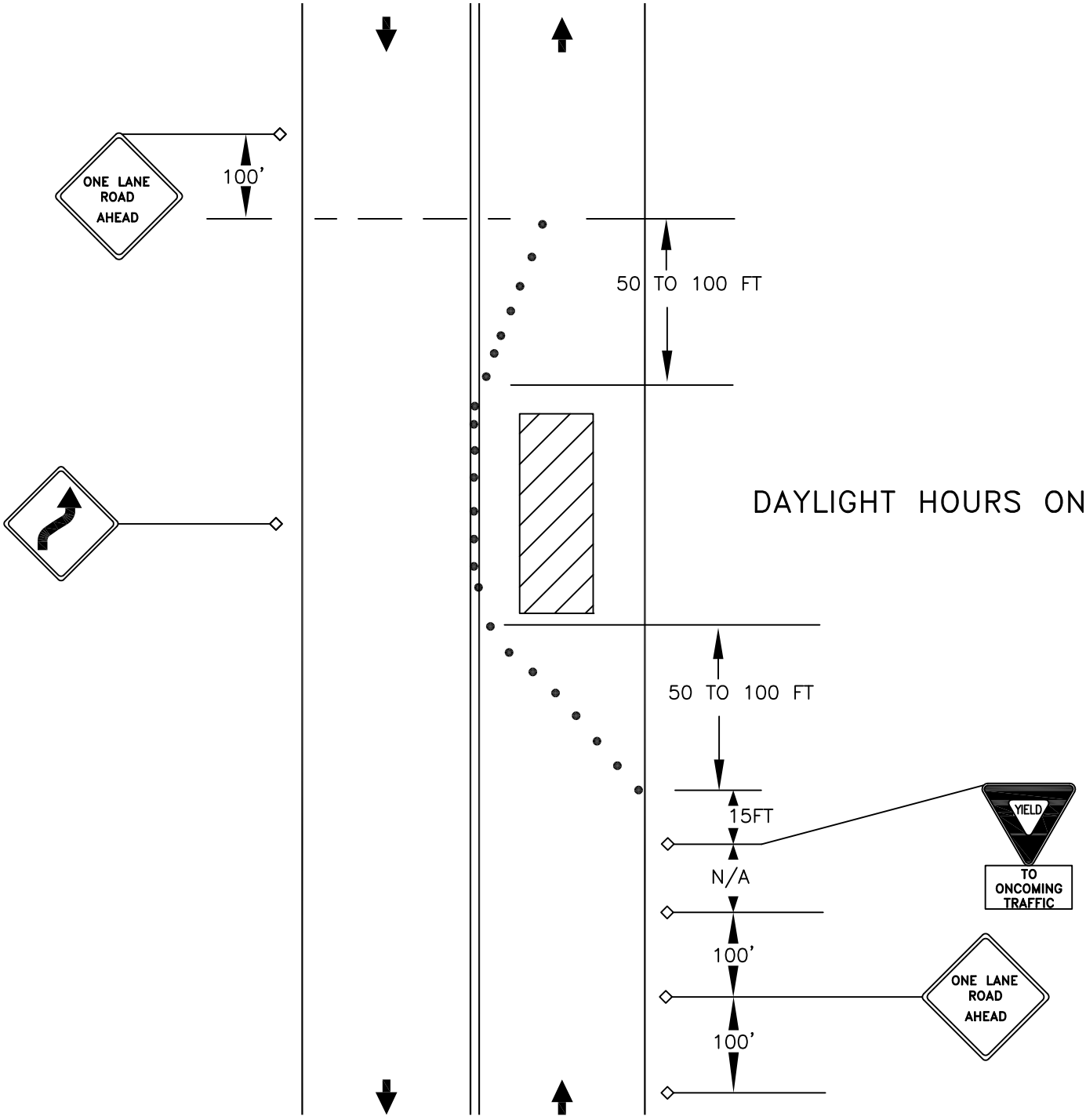
CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

7-30



RESIDENTIAL LANE CLOSURE ON A TWO-LANE ROAD WITH LOW TRAFFIC VOLUME

(MUST HAVE PRIOR APPROVAL TO USE)

ALL CHANGES MUST BE APPROVED BY THE TRAFFIC ENGINEER

CITY OF KENNEWICK

TRAFFIC ENGINEERING DEPARTMENT

DATE	7/13
DWN	KDS
REV	9/15
CHK	BWB
SCALE	NTS

DWG. NO.

7-31

Section 8 Index

Irrigation Systems [click on number or heading below]

SECTION 8

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR

IRRIGATION SYSTEMS

8-1 GENERAL

The work covered in this section shall consist of furnishing all materials, labor, tools, equipment and all other incidentals required to execute the work as indicated on the plans and as herein specified and necessary to complete the intent of the project, including, but not limited to the following major items of work:

A. Irrigation system and related appurtenances
B. Connections to water and electrical utilities
C. Excavation and backfill
D. Record drawing and quantities
E. Testing requirements
F. Cleanup

All work shall be done in accordance with the requirements of SWSS Section 8-03 except as herein modified by these specifications.

For projects requiring modifications to an existing irrigation system, the contractor shall salvage any replaced irrigation sprinklers, valves, valve boxes, time clocks or other usable items as determined by the city and deliver to the city. The contractor will be billed for the cost of designated items not salvaged, or salvaged items, damaged by the contractor due to improper handling and not returned to the city in usable condition.

All materials or equipment not specifically identified in this section, that are required for a complete and properly functioning irrigation system, shall be new, first quality of their respective kinds, and shall be subject to the approval of the Engineer.

8-2 FIELD VERIFICATION

The Engineer shall field stake only the irrigation system main supply lines. The Contractor shall be responsible for staking all lateral lines and sprinkler head locations.

When provided, the sprinkler irrigation plan is diagrammatic for bidding purposes and therefore is subject to minor changes. The Contractor shall follow the plans as closely as possible.

Before commencing any trench excavation required for main or lateral line installation, the Contractor shall check and verify existing ground measurements to those which are

shown on the plans. Any discrepancies found shall be brought to the attention of the Engineer as quickly as possible.

The City reserves the right to make any necessary field changes to the project, which result from conflicts with underground utilities or differences between field and plan dimensions. Any changes in line locations, sprinkler heads, valves, and other such related equipment shall be made for the sole purpose of providing a complete and functioning irrigation system which provides proper irrigation coverage of lawn and landscaped planting areas.

8-3 MATERIALS

8-3.01 PIPES, JOINTS AND FITTINGS

A. Polyvinyl Chloride (PVC) plastic pipe shall be PVC Class 200, Type 1120 or SDR 21 and shall meet the requirements of ASTM D2241.

Pipe sizes from three-quarter (3/4) inch to three (3) inches inside diameter inclusive shall be PVC Class 200 SDR 21 Glue Joint Fittings shall be Schedule 40 Glue Joint.
Irrigation pipe for any installation other than repair of an existing pipe, shall be not less than one (1”) in diameter and shall only be sized in one half (1/2”) increments thereafter. Exceptions to this are swing joints.

Pipe sizes four (4) inches and larger shall be integral gasket joint PVC Class 200, SDR 21, The integral bell and spigot joints will have flexible elastomeric compound seal gaskets, meeting the requirements of ASTM D3139. Fittings shall be Schedule 40 ASTM D-2466 Glue Joint.

PVC pipes and pipe fittings shall be approved and certified by the National Sanitation Foundation (NSF) Standard No. 14.

Each length of PVC pipe shall be marked with an identifying extrusion "run" number and the manufacturer's name or trade name plus pipe size, classification SDR number, and ASTM designation number. All installed irrigation pipes shall be laid with the pipe markings facing upward.

PVC solvent cement and primer shall be NSF approved and meet the requirements of ASTM D2564 and ASTM D2855. Primer shall be P-70 as manufactured by Industrial Polychemical Service of Gardena, California, or an approved equal.

When a connection is made between PVC pipe and metal pipe, male PVC adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench. Pipe thread joint compound shall be nonlead base (teflon paste, tape, or equal).

Locate Wire – For 6-inch and larger PVC Irrigation pipe, a locate wire and marker tape will be installed as specified in section 4-1.05 and 4-1.06 of these specifications.

B. GALVANIZED PIPE

Galvanized pipe, when shown on the plans or stated in the special provisions shall be ASA Schedule 40, mild steel threaded pipe. Galvanized pipe couplings may be merchant coupling. Fittings shall be medium galvanized screwed beaded malleable iron.

C. COPPER PIPE

Copper pipe, when shown on the plans or stated in the special provisions, shall be Type "K" sweat soldered pipe.

D. BRASS PIPE

Brass pipe, when shown on the plans or stated in the Special Provisions, shall be red brass screwed pipe conforming to the requirements of Federal Specification No. WW-P-351. Fittings shall be red brass conforming to the requirements of Federal Specifications No. WW-P-460.

E. PVC SLEEVES

The Contractor shall install all irrigation lateral and main lines within a PVC sleeve where such lines are to be installed under asphaltic concrete pavement or concrete structures. The PVC sleeves shall be Class 200 in accordance with the requirements of ASTM D-1784. The PVC pipe sleeve shall have a minimum diameter of two-inches (2”) greater than the irrigation line it carries. The sleeves shall extend a minimum of eighteen inches (18") outside the limits of the asphalt or concrete structures and shall be capped and/or water tight sealed with silicone sealant.

Irrigation sleeves shall be twice the diameter up to an 8” sleeve for a 4” irrigation pipe. For any irrigation piping larger than 4”, the sleeve shall be a minimum of 2” greater diameter than the irrigation line it carries. Irrigation control wires shall be sleeved in all the same locations as required for irrigation pipe. Control wires may be run in the same sleeve with the irrigation pipe, provided there is adequate room, otherwise the contractor shall be required to place a separate PVC sleeve, sized adequately to carry the number of irrigation control wires to be installed.

8-3.02 TRENCH EXCAVATION AND BACKFILL

Trench excavation and backfill for irrigation distribution lines shall be done before placing and spreading any topsoil material and it shall be done in accordance with SWSS Section 8-03 and as herein modified.

A. All main lines shall be a minimum of twenty-four (24) inches below finished grade measured from the bottom of the pipe.

B. Lateral or section lines shall be a minimum of eighteen (18) inches below finished grade, measured from the bottom of the pipe.

C. In the event that rock or utility conflicts are encountered, the minimum depth may be reduced with the approval of the Engineer.

D. Backfill material shall be free from rocks, stones, and any other objectionable materials, which could damage the pipe.

E. All pipes two inches (2") and larger shall be bedded two inches (2") over and under with rock free sands or soils. All pipes under two-inches (2") shall be bedded a minimum one-inch (1") over and under with rock free sands or soils.

F. Compaction of all trenches shall be done in such a manner as to preclude future settlement.

G. The Contractor shall remove and dispose of any excess rocks, sod, soil, and trench materials at a disposal site secured by the Contractor.

H. Trenches shall be wide enough to allow a minimum of six inches between parallel pipe lines.

I. Contractor shall furnish, erect, and maintain all warning signs, shoring, barricades, and required public warning devices during the course of the project until such a time as directed by the Engineer.

8-3.03 INSTALLATION

PVC plastic pipe couplings and fittings shall be handled and installed in accordance with the manufacturer's recommendations. PVC pipe field cuts shall be made square and true and shall be well reamed inside and out to remove all burrs and rough edges before being inserted into any pipe fitting or coupling.

Pipes less than four (4) inches and all fittings shall be jointed by solvent welding per the manufacturer's recommendations. Slip fitting socket tapers shall be sized so that a dry unsoftened pipe end can be inserted no more than halfway into the socket. Plastic saddle and flange fittings will not be permitted. Only Schedule 80 pipe may be threaded. Pipe four inches (4") and larger shall be gasket joint and installed per the manufacturer's recommendations. All fittings for pipe 4 inches and larger shall have concrete thrust blocks poured, sized as specified in Section 4-8.02 F of these specifications.

8-3.04 MEASUREMENT AND PAYMENT

The unit contract price for "Pipe and Fittings," per linear foot, for each size and type of pipe as shown on the proposal, shall be full compensation for furnishing all labor, equipment, tools, and materials necessary to excavate trenches, install sleeves, place and join all pipe and fittings, thrust blocks, pipe bedding, connect to supply lines and irrigation control valves, together with flushing, testing, balancing and adjusting the completed system, providing mylar reproducible "as-built" drawings, site security, safety signs, backfilling and compaction of trenches, site cleanup, and all other incidentals required to install and connect all main and lateral irrigation lines to the supply source and related control valves and equipment in accordance with the plans and specifications or as directed by the Engineer.

8-4 IRRIGATION SYSTEM CONTROL APPURTENANCES

8-4.01 GENERAL

Where shown on the plans or required by the Special Provisions, the Contractor shall install such system control equipment such as drain valves, vacuum breakers, pressure reducing valves, flow control valves, air relief valves in accordance with the requirements of the appropriate subsections of SWSS Section 9-15.

8-4.02 VALVE BOXES

Valve boxes shall be MSBCF1324-12 with a ductile iron lid without flip readers. Manufacturer is Mid States Plastics, Inc., Molded Access Division, or approved equal. Gate Valves and all other manually operated valves shall be provided with a valve box. All valve boxes shall be installed flush with the finished ground surface. Blocks or bricks shall be placed on the corners of the valve box to prevent settlement and contact between the valve box and the irrigation pipe. Lids with lettering other than “irrigation” stamped on top; shall have the lettering ground off prior to placement. Knockouts shall be cut accordingly to provide a clear gap of one inch (1”) all around the irrigation pipe. The cost for valve boxes shall be included in the unit costs for the valves being installed see Section 8-4.06.

8-4.03 BALL / GATE VALVES

Manual operated valves shall be installed where shown on the plans and shall meet the requirements as follows.

Ball valves shall be used and sized the same as the pipes on which they are placed for all pipe sizes up to four (4”) inches in diameter. Unions are required to be installed on each side of the ball valve and shall be provided with a valve box in accordance with the requirements of Section 8 of these specifications, unless otherwise stated in the special provisions or directed by the Engineer. Ball valves may be either p.v.c. or brass.

Gate valves where shown on the plans shall meet the requirements of City Standard Specification Section 4-8.02B unless otherwise specified in the contract special provisions, except that gate valves shall only be placed on pipe sizes larger than four (4") inches in diameter. Gate valves shall be provided with a valve box in accordance with the requirements of Section 8-4.02 of these specifications unless otherwise stated in the special provisions or directed by the Engineer.

8-4.04 CORPORATION STOP VALVES

Where shown on the plans, the Contractor shall install ball valve curb stops. The curb stops shall be the size shown on the plans and shall be similar and equal to the type as manufactured by Ford Meter Box Company of Wabash, Indiana, and shall be provided with a valve box in accordance with the requirements of Section 8-4.02 of these specifications.

Valve access boxes shall be installed on a free draining gravel base of at least six inches (6"). All valve boxes shall be provided with the proper length and size of valve box extensions to properly bring the top of the valve box flush with walks, turf, curbs, header boards and finished pavement elevations unless otherwise specified.

8-4.05 QUICK COUPLING VALVES

Quick coupling valves, when shown on the plans or stated in the special provisions, shall be of the type and manufacture specified or an approved equal. Each quick coupler shall have a molded vinyl locking cover.

Upon completion of the project and prior to final acceptance, the Contractor shall supply to the City quick coupler keys and hose ells of the quantity called for on the plans. The quick coupler keys and hose ells shall be of the same manufacture as the coupling valve.

8-4.06 MEASUREMENT AND PAYMENT

The unit contract price for:

"Gate Valves", per each
"Corporation Stop", per each
"Quick-Coupling Valve", per each
"Double Check Valve", per each
"Pressure Vacuum Breaker", per each
"Atmospheric Vacuum Breaker", per each
"Flow Control Valve", per each
"Air Relief Valve", per each
"Hose Bib", per each
"Pressure Regulator Valve", per each

shall be full compensation for furnishing all labor, equipment, tools, and materials required to install complete each particular type and size of valve, together with valve box in accordance with the plans and specifications, or as directed by the Engineer. The Contractor's attention is hereby called to the special provisions for other additional requirements, which may apply to each particular valve.

8-5 SPRINKLER HEADS

8-5.01 MATERIALS

Sprinkler heads shall meet the requirements of the type, style and pattern with a radius of throw, pressure, discharge and any other descriptive designations as shown in "The Sprinkler Head Key" on the plans, and shall be manufactured by either Rainbird, or Toro. Substitutions by other manufacturers may be considered for special applications.

All sprinkler heads of a particular type of function in the system shall be of the same manufacture, and shall be marked with the manufacturer's name and model number in such a manner that they can be identified in the field after installation without being removed from the system.

All sprinkler heads which are to be installed within the playing areas of athletic fields or where indicated on the plans, shall be provided with a heavy resilient rubber top cover for protection against injury of a player should contact be made with the sprinkler head.

All sprinkler heads shall be vandal resistant and shall have special vandal resistant screws in the top cover to prevent removal of the top cover by ordinary tools. The Contractor shall purchase and turn over to the Engineer two sets of any special tools needed to work on and maintain each type of sprinkler head required on the project.

All sprinkler heads and quick coupling valves shall be provided with a double swing joint adjustable height riser between the supply lateral and the sprinkler head, unless the sprinkler uses 6 gpm or less, in which case, ½" polyethylene (funny pipe) is an acceptable substitute. The swing joint shall be assembled by the use of a minimum of three 90' street elbows and two Schedule 80 PVC nipples of the required diameter and length to properly supply water to the sprinkler head and to adjust it to the finished ground elevation. The tee on the supply lateral shall be Schedule 40 or 80 in accordance with the requirements of Section 8-3.01 of these specifications and shall be sized to the lateral and provided with FIP threads on the outlet side of the tee. All threaded joints shall be sealed with Teflon tape.

8-5.02 INSTALLATION

All sprinkler heads shall be set perpendicular and one-half inch (1/2") to three-quarter inch (3/4") above the finished ground grade unless otherwise specified.

All sprinklers having adjustable pin nozzles shall have the pins adjusted to provide the proper distribution of water over the coverage pattern.

After ground cover has been established and when directed by the Engineer, the Contractor shall readjust the sprinkler head height to be flush with adjacent ground elevation.

All sprinkler heads regardless of type or size shall be connected to the irrigation supply lateral line by the means of a double swing joint riser or polyethylene pipe (funny pipe), which shall be sized to meet the sprinkler head inlet diameter, unless otherwise stated in the special provisions.

The swing joint shall be constructed and installed in accordance with the City of Kennewick Standard Drawing 8-2.

The contractor may be required to add sprinkler stakes to some or all sprinklers installed or relocated to prevent flop over, dependent upon sprinkler stability under pressure. In such cases, as directed by the Engineer, the installation shall be considered incidental to the project and shall be installed at no cost to the city.

8-5.03 MEASUREMENT AND PAYMENT

The unit contract price for:

"Full Circle Rotary Sprinkler", per each
"Adjustable Rotary Sprinkler," per each
"Stream Rotor Sprinkler", per each
"Pop-up Sprinkler"', per each
"Shrub Spray Sprinkler", per each
"Bubbler Head Sprinkler", per each

shall be full compensation for furnishing all labor, equipment, tools and materials required to install the particular type of sprinkler head in the system, together with the installation of double swing joints, making adjustments of sprinkler height to finished grade, staking, setting, testing sprinkler pattern to conform to the radius of throw, and arc of coverage to provide for a uniform area of coverage. The cost to install resilient rubber top covers on those sprinkler heads lying in athletic playing areas, shall be considered as incidental. All sprinkler heads shall be installed to provide a complete functional and efficient operating system in accordance with the plans and specifications or as directed by the Engineer.

8-6 LOW VOLTAGE CONTROL WIRING

8-6.01 GENERAL

Wiring used for connecting the automatic irrigation controller to the remote valve(s) shall be either direct burial Type U.S.E./UF, or if placed in conduit, Type THHW. The wire shall be either stranded or solid copper, single conductor; UL Listed and shall meet the National Electric Code requirements for the application in which the wiring is being used and in the sizing of conduit based upon the number of conductors to be installed.

Separate pilot or "hot" conductors shall be run between the automatic controller and each electric control valve. Automatic valves shall be allowed to share a common neutral.

Wire shall be a minimum of AWG No. 14 and meet the requirements of the code for Class II circuits. Each pilot or "hot" wire shall be red in color with the common or neutral wire being white.

The control wire between the controller and the remote control valves shall be installed in accordance with the requirements of Local and State codes by people licensed in the trade. Unless the governing code specifies otherwise, the sprinkler contractor may install the low voltage control wire. Splicing of all low voltage conductors will be permitted only at junction boxes or valve boxes. The contractor shall leave a minimum coiled loop of eighteen (18") inches in each valve box for the wires connected at each valve location. The conductors shall be spliced with a wire nut and watertight connector at any exterior or in-ground location. All exterior or in-ground connections shall require the watertight connector, which shall be a "Connector Kings" part No. SA102 for connector burial and approved for wire sizes 10 ga. – 20 ga. In protected areas, such as buildings, wire nut splices wrapped with electrical tape is acceptable, provided they are enclosed in an approved junction box.

All low voltage control wire shall be run in the same trench with the irrigation main, but shall be placed below the main line as indicated in the City of Kennewick Standard Specifications and Detail.

The contractor shall be responsible for determining the quantity of wiring required to provide power to all electric control valves as indicated on the plans and bidding accordingly.

8-6.02 MEASUREMENT AND PAYMENT

The unit contract price for "DIRECT BURY LOW VOLTAGE CONTROL WIRE", or "LOW VOLTAGE CONTROL WIRE IN CONDUIT" per lump sum, or per linear feet as provided for in the bid proposal, shall be full compensation for furnishing all labor, equipment, tools, and materials required to provide and install the control wires, or control wires in conduit, from the irrigation controller to each electric irrigation valve,

including splicing, all as indicated on the plans, in accordance with the specifications, or as directed by the Engineer. The contractor's attention is hereby called to the special provisions for other additional requirements, which may be, project specific.

8-7 ELECTRIC IRRIGATION VALVES

8-7.01 GENERAL

All irrigation valves shall be operated by electric solenoid, shall be equipped with flow control, bleed screw and manual on/off internal bleed operation of the valve. Valve sizes shall be as indicated on the plans. See Standard Drawing 8-1 for installation requirements of the electric valves. Valve boxes shall be installed at each electric valve and shall be in accordance with Section 8-4.02. All wire splices at the valves shall be in accordance with Section 8.

8-7.02 BATTERY OPERATED ELECTRIC IRRIGATION VALVES

If an AC power source is unavailable and a battery operated electric irrigation valve system is specified, the Rainbird TBOS system shall be used. The valves and system shall come complete with TBOS Control Module(s) and TBOS Potted Latching Solenoid(s) as required for a complete and operational system installation. It shall be the responsibility of the contractor to verify that electric valves from other manufacturers, that are submitted for use, are compatible with the Rainbird TBOS application and shall include any TBOS Solenoid Adapters as may be required for the valves to operate the TBOS system.

8-7.03 MEASUREMENT AND PAYMENT

The unit contract price for "size as indicated", " _____ INCH ELECTRIC IRRIGATION VALVE" and " _____ INCH BATTERY OPERATED ELECTRIC IRRIGATION VALVE", per each, shall be full compensation for all labor, materials, tools, equipment and other incidentals as may be required to provide and install the new electric valves, and to supply and install the valve boxes and extensions as described herein, as shown on the plans or as directed by the Engineer.

8-8 IRRIGATION CONTROLLERS

8-8.01 GENERAL

Irrigation controllers, when required, shall be either the Toro Sentinel or the Rainbird ESP-LX Plus as noted on the plans. The irrigation controllers, when required, shall be mounted on a galvanized steel pedestal enclosed in the below specified water tight enclosure and as specified in Kennewick Standard Detail Drawing 6-5, including a concrete collar at grade as indicated on the drawing.

When the Toro Sentinel is specified, the contractor shall also provide and install the controller in a contractor provided water tight enclosure. The enclosure shall be NEMA rated,

watertight, lockable and sized as needed to contain the irrigation controller, power supply and terminal strip(s). The contractor shall be responsible for providing 120-volt power to the enclosure, installation of a transformer for the irrigation controller power supply and terminal strip capacity capable of handling all the circuits of the irrigation controller. The contractor shall also be required to provide a disc antenna or a Yagi antenna and coaxial cable for the Sentinel, meeting or exceeding the manufacturer requirements. The disc antenna may be mounted to the top of the irrigation controller enclosure, the Yagi shall be mounted at a location and elevation as noted on the plans and shall be grounded. The contractor shall be responsible for providing as much coaxial cable as needed to make a connection between the Yagi antenna and the Sentinel Controller. The coaxial cable shall be concealed and underground in conduit between the controller and the antenna location.

When the Rainbird ESP-LX Plus is specified, the contractor shall be responsible for providing 120-volt power to the irrigation controller.

The contractor shall be required to terminate all circuits for the irrigation system within the irrigation controller enclosure and shall then test and demonstrate that all circuits function properly before acceptance shall be granted.

8-8.02 MEASUREMENT AND PAYMENT

The unit contract price for "Toro Sentinel Irrigation Controller, Antenna and Power Supply" or "Rainbird ESP-LX Plus Irrigation Controller and Power Supply", per lump sum shall be considered full compensation for all labor, materials, tools, equipment and other incidentals as may be required to provide and install the pedestal mounted irrigation controller as described herein, in accordance with the plans and specifications or as directed by the Engineer.

8-9 CLEANING, TESTING, AND ADJUSTING SYSTEM

8-9.01 GENERAL

The irrigation piping system shall be cleaned, tested, and adjusted in accordance with SWSS Section 8-03.3(7) except that only the main system supply lines shall be required to be pressure tested to a minimum of 100 PSI.

After the system has been successfully cleaned, tested, backfilled, and adjusted, the Contractor shall demonstrate the entire system to the Engineer to show that all sprinkler heads, remote control valves and other various system controls are properly balanced to provide for the proper radius of throw and coverage, and that the installed system is workable, clean and efficient.

8-9.02 WINTERIZATION

When construction, repair, or modification of any city owned irrigation system is being made by the contractor and when full use and operation of the irrigation system has not been assumed by the city prior to cold weather, the contractor shall be fully responsible for winterization of the irrigation system under his control. The contractor shall notify the city in writing, when the irrigation system is deemed, substantially complete and request the city to assume operation of the irrigation system. If agreed to by the city, only then will the city assume liability for winterization. All costs for labor, equipment and materials as required to winterize the irrigation system under the contractor's control, shall be incorporated into the pay items as provided for in the bid proposal.

8-10 AS-BUILT DRAWINGS

8-10.01 GENERAL

The Contractor shall be required to mark and keep record of any changes to the contract plans, which are done during the course of the project. After completion of the work and before final acceptance, the Contractor shall turn over to the Engineer one complete set of the contract drawings showing any and all "as-built" changes.

8.11 OPERATION AND MAINTENANCE MANUALS

8-11.01 GENERAL

The Contractor shall submit four (4) copies of the complete operation and maintenance manuals for all major irrigation equipment installed under this contract. Such equipment includes but is not limited to, automatic controller, all system control valves, and any other equipment, which may be specifically requested by the Engineer.

Each manual shall be complete and individually bound and shall include the following minimum information:

Index sheet
Contractor's name, address and telephone number
List of equipment
Manufacturer's local representative name, address and telephone number
Complete operation and maintenance instructions on all major equipment

In addition to the above manuals, the Contractor or equipment supplier shall provide at the conclusion of the project, if requested by the Engineer, the City maintenance personnel with instructions on the proper operation and maintenance of the major components of the irrigation system.

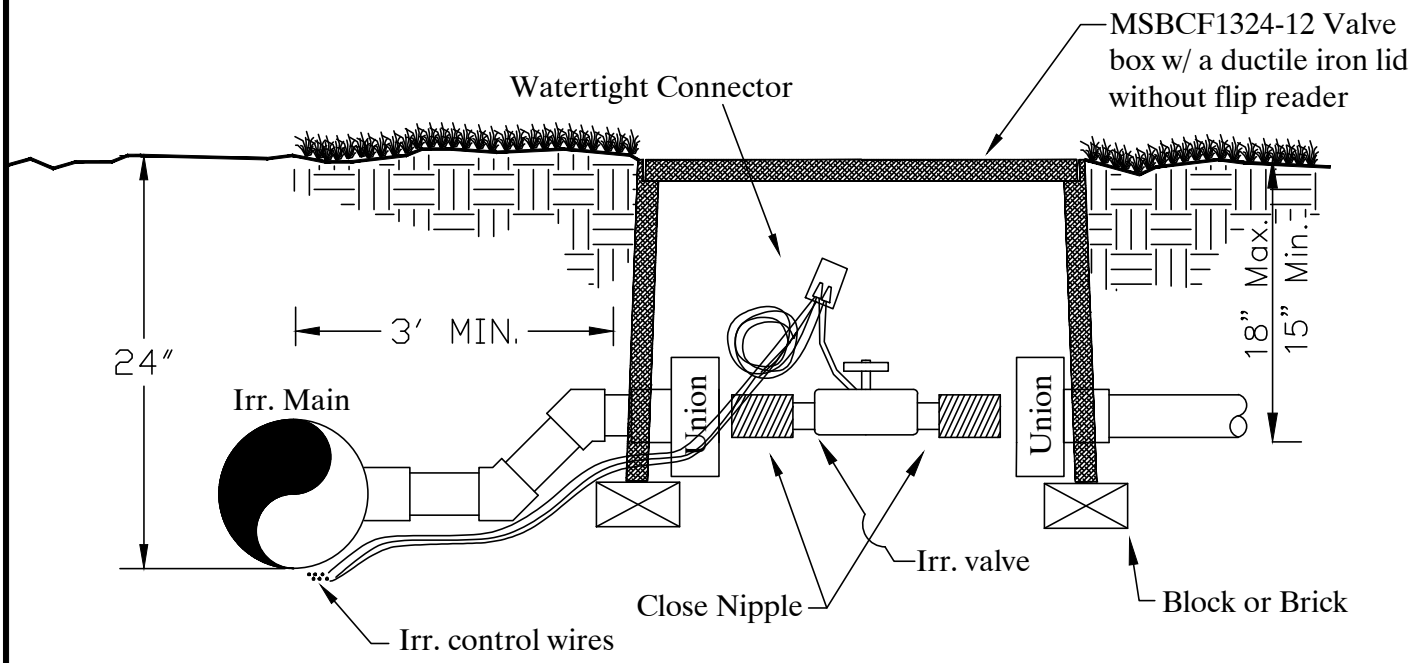
8-12 IRRIGATION GUARANTEE

8-12.01 GENERAL

The entire sprinkler system shall be unconditionally guaranteed by the Contractor as to material and workmanship, including settling of backfilled areas below grade for a period of one year following the date of final acceptance of the work by the Kennewick City Council.

If within one year from the date of final acceptance, settlement occurs and adjustments in pipes, valves and sprinkler heads, sod or paving is necessary to bring the system, sod or paving to the proper level of the permanent grades, the Contractor, as part of the work under this Contract, shall make all adjustments without extra cost to the City, including complete restoration of all damaged planting, paving, or other improvements of any kind.

Should any operational difficulties in connection with the sprinkler system develop within the specified guarantee period, which in the opinion of the Engineer may be due to inferior material or workmanship, said difficulties shall be immediately repaired by the Contractor at no additional cost to the City, including any and all other damage caused by such defects.



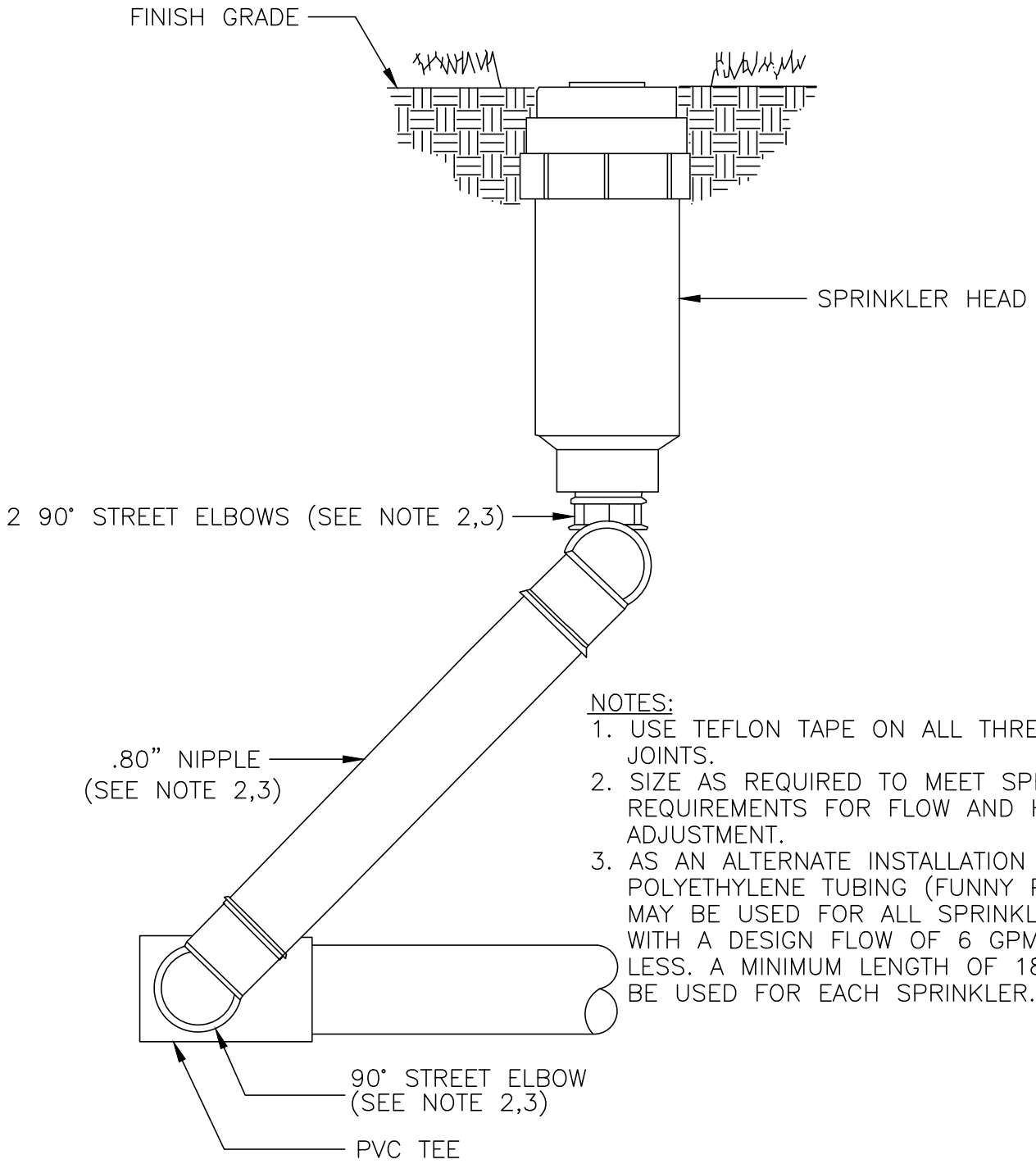
NOTES:

1) TOP OF VALVE BOX TO BE SET FLUSH WITH FINISH GRADE.

2) ELECTRIC VALVE TO BE CENTERED IN VALVE BOX FOR EASY MAINTENANCE ACCESS. UNIONS SHALL ALLOW REMOVAL OF THE VALVE WITHOUT REMOVAL OF THE VALVE BOX OR OTHER ASSEMBLYS.

ELECTRIC IRRIGATION VALVE INSTALLATION

CITY OF KENNEWICK ENGINEERING DEPARTMENT	DATE 01/02 DWN DDS REV 3/14 CHK BWB SCALE NTS	DWG. NO. **8-1**



NOTES:

1. USE TEFLON TAPE ON ALL THREADED JOINTS.
2. SIZE AS REQUIRED TO MEET SPRINKLER REQUIREMENTS FOR FLOW AND HEIGHTH ADJUSTMENT.
3. AS AN ALTERNATE INSTALLATION POLYETHYLENE TUBING (FUNNY PIPE) MAY BE USED FOR ALL SPRINKLER HEADS WITH A DESIGN FLOW OF 6 GPM OR LESS. A MINIMUM LENGTH OF 18" SHALL BE USED FOR EACH SPRINKLER.

SWING JOINT RISER ASSEMBLY

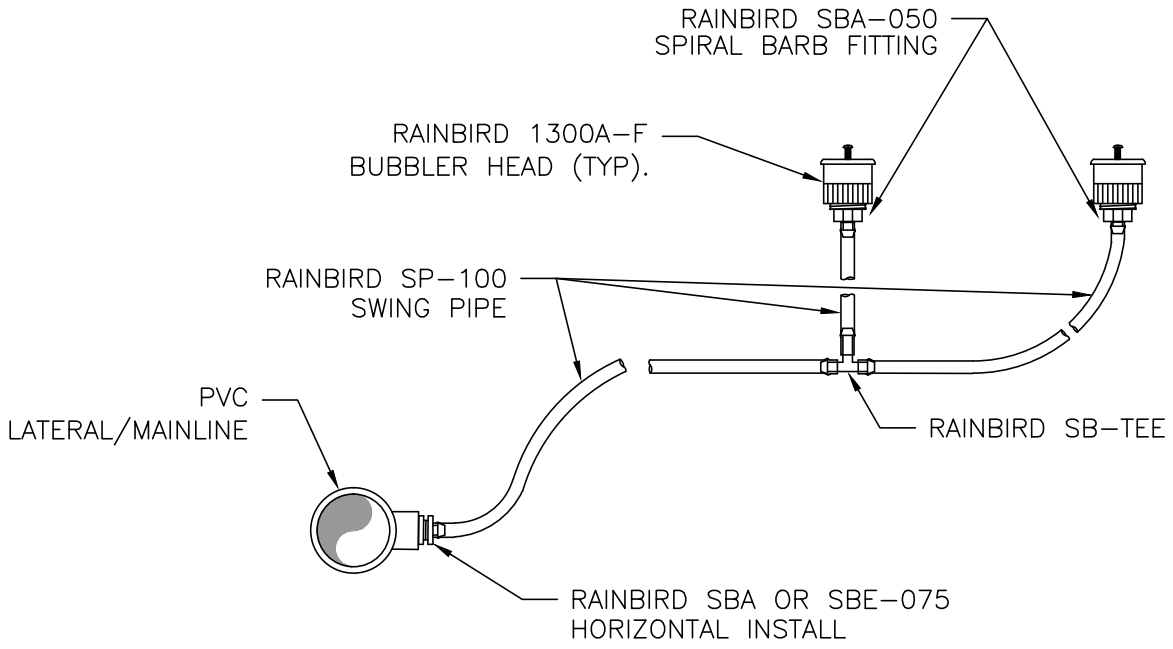
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	1/00
DWN	DDS
REV	3/14
CHK	BWB
SCALE	N.T.S.

DWG. NO.

8-2



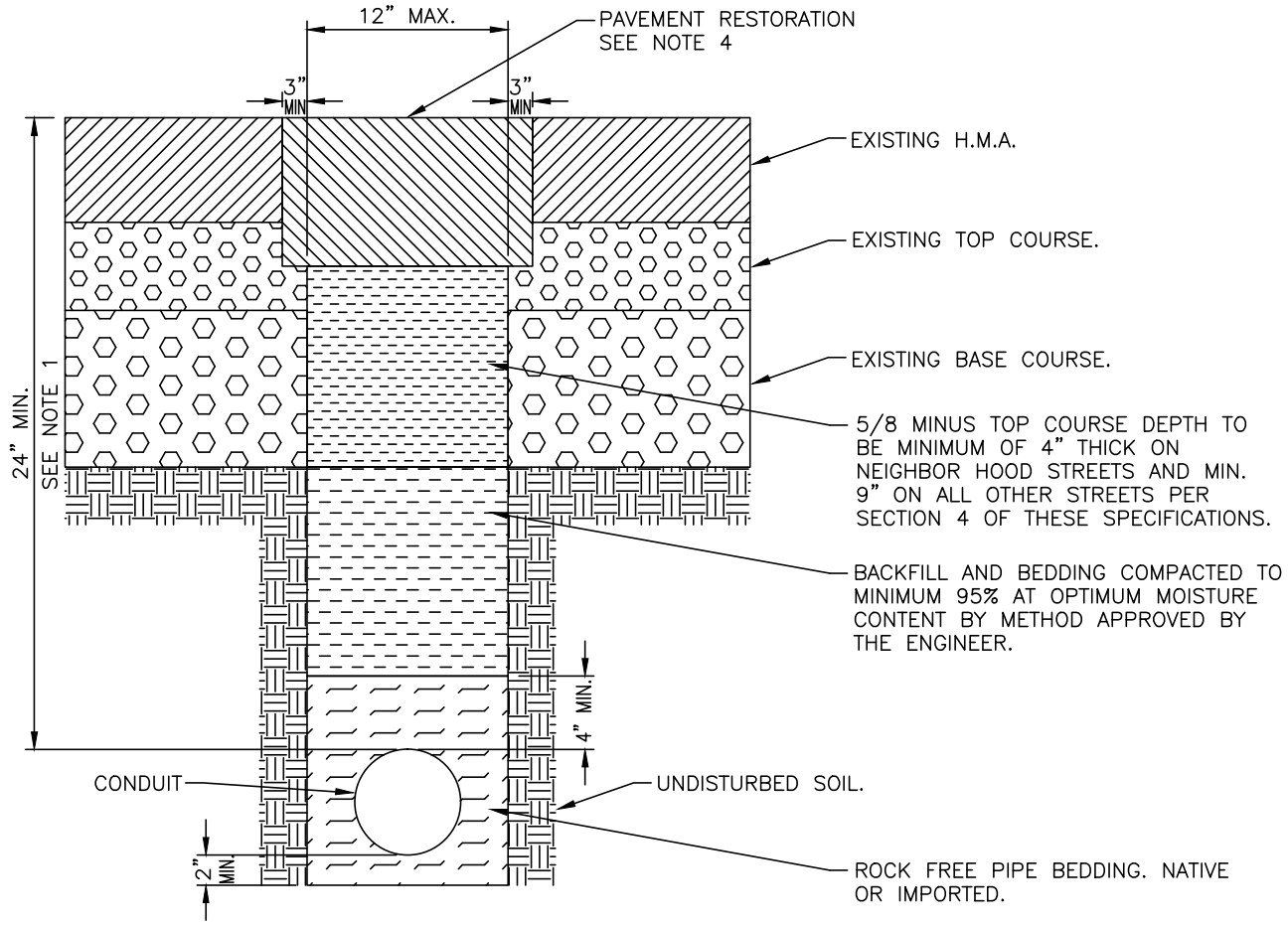
NOTE:
INSTALL 2 BUBBLERS HEADS PER SHRUB OR TREE IN LAWN AREAS AND 3 BUBBLER HEADS PER TREE IN ALL OTHER LOCATIONS.

LATERAL LINE AND BUBBLER HEADS

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	6/11
DWN	RJD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.
8-3



NOTES:

1) TRENCH DEPTH SHALL PROVIDE A MINIMUM COVER OF 24" OVER TOP OF IRRIGATION PIPE.
2) MINIMUM ONE-WAY TRAFFIC TO BE MAINTAINED.
3) PAVEMENT REPAIR TO BE MADE WITHIN 24 HOURS OF TRENCH BACKFILL.
4) PATCH TO BE 2" OF HMA CLASS "G" PG 64-28 ON RESIDENTIAL STREETS AND 3" OF HMA CLASS "A" PG 64-28 ON ARTERIAL STREETS. HMA SHALL BE PLACED IN LIFTS NOT TO EXCEED 2" IN DEPTH.
5) IRRIGATION PIPE WITHIN CITY RIGHT OF WAY TO BE MINIMUM CLASS 200 P.V.C. PIPES WITHIN CITY RIGHT OF WAY TO BE PRESSURE TESTED AT MINIMUM 100 P.S.I.
6) PERMIT REQUIRED ON ALL PROJECTS NOT CONTRACT ADMINISTERED BY THE CITY ENGINEERING DEPT.

IRRIGATION PIPES WITHIN CITY RIGHT OF WAY OR EASEMENTS.

CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	2/93
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

8-4

Section 9 Index

Landscaping [click on number or heading below]

SECTION 9

CITY OF KENNEWICK

STANDARD SPECIFICATIONS

FOR LANDSCAPING

9-1 LANDSCAPING

9-1.01 GENERAL

The work covered in this section shall apply to the furnishing of all materials, labor, equipment, and other incidentals necessary for the installation of the landscaping as shown on the planting plan. The work includes clearing and grubbing, site excavation, embankment compaction, rough-site grading, finished site grading, provide topsoil ground preparation, fine grading, application of fertilizers, insecticides, soil sterilants, soil amendments, mulch, seeded or sodded lawn, protection, maintenance, guarantee of seeded or sodded lawn areas and all related items required by the plans and as indicated by the proposal bid items to complete the work in accordance with the plans and specifications.

The Contractor shall be experienced and have adequate facilities and personnel required for the work involved. The Contractor shall thoroughly acquaint himself with all work related to site improvements which might affect the work. Workmanship shall be equal to the best-accepted trade practices and shall comply with all applicable codes and trade regulations.

9-2 EARTHWORK

9-2.01 GENERAL

The work covered in this section shall consist of clearing and grubbing, excavation, embankment compaction and borrow excavation required to clear, shape, grade, and otherwise construct the site to the elevations as shown on the plans or as directed by the Engineer.

9-2.02 MATERIALS

It is the intent of these specifications to use on-site materials to form a smooth and uniform site, which conforms to the finished elevations as shown on the plans or as directed by the Engineer. Borrow material, which is required to fill project low areas when insufficient on-site excavation materials do not exist or are unacceptable for use, shall be

provided by the Contractor. Embankment materials obtained at an off-site source shall be secured by the Contractor at his own expense. The Contractor shall receive written approval from the Engineer for any imported embankment materials prior to placing any such materials on the project site. The Contractor's attention is hereby called to the special provisions for additional information which may pertain to this project regarding borrow material.

9-2.03 CONSTRUCTION

A. Clearing and Grubbing

Removal and disposal of all objectionable brush, stumps, roots, logs, vegetation, fences, trash piles, and any other items which may be called out in the special provisions shall be done in accordance with the requirements of SWSS Section 2-01.

B. Excavation

Rough site grading shall be done in accordance with the requirements of SWSS Section 2-06 as herein modified. All unsuitable or excess materials shall be removed from the site and disposed of at a site provided by the Contractor unless otherwise specified in the special provisions or as directed by the Engineer.

C. Embankment Compaction

Onsite native materials determined by the Engineer to be suitable for embankment fill shall be spread and compacted to the line and grade as shown on the plans in accordance with the requirements of SWSS Section 2-06 and shall be compacted in accordance with the requirements of SWSS Section 2-03.3(14) C Method C.

D. Borrow Excavation

Embankment materials which are required to be brought in from off-site sources shall be secured, hauled, and placed in accordance with the requirements of SWSS Section 2-03.3 (14) C Method C.

9-2.04 MEASUREMENT AND PAYMENT

A. The unit contract price for "Clearing and Grubbing," per lump sum, shall be full compensation for all labor, equipment, material, and all of the incidentals required to remove and dispose of all objectionable on-site materials in accordance with the plans and specifications or as directed by the Engineer.

B. The unit contract price for "Earthwork," per lump sum, shall be full compensation for furnishing all labor, equipment, materials, and all other incidentals required to haul, place, grade, and compact existing on-site materials or those materials secured from off-site sources in accordance with the plans and specifications or as directed by the Engineer.

9-3 CLEAN-UP

9-3.01 GENERAL

The Contractor shall be required to clean up daily during the progress of the work and upon completion, he shall clear and clean the site by removing all cans, surplus materials, and any debris resulting from his work operations. All planting areas shall be neatly dressed and finished. All walks, paved areas, adjacent walls, windows, and all such areas flushed clean by approved methods.

9-3.02 MEASUREMENT AND PAYMENT

All costs to clean up the project site as required shall be considered as incidental to the unit contract prices for the various other proposal bid items and no additional compensation will be allowed.

9-4 SEEDING/LAWN ESTABLISHMENT

9-4.01 GENERAL

The work covered in this section shall apply to the establishment of newly seeded/sodded ground cover, soil preparation, topsoil, fertilizer, and all other incidentals required to establish a vigorous and healthy growing lawn which will hereinafter be referred to as either planting material or ground cover.

9-4.02 SOIL PREPARATION

The Contractor shall remove and dispose of all undesirable surface plant growth, noxious weed seeds, rhizomes, roots and all other objectionable surface materials and debris at a waste site provided by the Contractor.

The Engineer shall then determine acceptability of on-site topsoil, which is suitable for reuse.

After the site has been rough-graded and all underground utilities have been completed, the Contractor shall smooth and finish the lawn and planting areas to the required cross section. The lawn and planting areas shall then be thoroughly scarified to a depth of six

inches (6"). The Contractor shall remove all undesirable weeds, plant growth, and all clods, rocks, debris, and foreign materials two inches (2") or larger in any dimension from the top four inches (4") of scarified soil.

9-4.03 MATERIALS

A. Residual Soil Sterilant

Residual soil sterilants shall be applied in strict conformance to SWSS Section 5-04.3(5) D as herein modified. All ground surface areas on which asphaltic concrete pavement, crushed rock, or concrete is to be placed shall be treated as specified.

All herbicide containers delivered to the project site shall carry the manufacturer's product identification label. All empty herbicide containers shall be, as soon as is practical, removed from the project site and disposed of by the Contractor in accordance with the requirements of the Federal Pesticide Control Act.

Prior to applying any herbicide, the Contractor shall be required to post clearly visible public notices warning of the presence of the herbicides.

B. Topsoil

It is the intent of these specifications to salvage for reuse the on-site topsoil from the general excavation for landscape topsoil and finish around park amenities. If sufficient, suitable materials are not available on-site, the contractor shall import topsoil at the direction of the engineer. When required by the special provisions, or when indicated on the plans, proposal bid items or when directed by the Engineer, the Contractor shall be required to remove, stockpile and replace suitable on-site topsoil with the purpose of later replacing it in the same area. Any topsoil imported to the site shall be fertile and friable, possessing characteristics of representative productive soils in the vicinity. It shall not be excessively acid or alkaline, having a pH factor between six (6) and eight (8), and shall not contain any rock larger than one-inch (1") diameter, noxious weeds or weed seeds, oil or chemicals which may be injurious to plant growth. A sample of the topsoil shall be approved by the Engineer prior to delivery.

C. Fertilizer

Fertilizer shall be applied at a rate of four hundred (400) pounds per acre. Application shall be by an agitator type hydro-seeder or approved blower equipment.

Fertilizer for seeded lawn and lawn sod areas shall have the following formulation of total available ingredients:

Nitrogen - N 16%
Phosphoric Acid P2O5 16%
Potash - K2O 16%

The fertilizers shall be delivered to the site in manufacturer's packages with labels attached showing complete chemical composition and analysis.

D. Wood Cellulose Fiber Mulch

Wood cellulose fiber mulch shall be furnished, hauled, and evenly applied at a rate of 1500 pounds per acre within forty-eight (48) hours after seeding or the mulch material may be applied with the seed and fertilizer materials in one operation by approved hydraulic equipment. The equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed and water. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with a set of hydraulic discharge spray nozzles, which will provide a uniform distribution of the slurry.

The wood cellulose fiber mulch shall conform to the requirements of SWSS 9-14.4(2).

E. Lawn Seeding

Seeding of all lawn planting area shall be by one of the following methods:

1. Approved type hydro seeder, which utilized water as the carrying agent and maintains continuous agitation through paddle blades.
2. Blower or power-drive devices capable of maintaining a contact, measured rate of distribution of seed or fertilizer.
3. Approved power drawn drills or seeders.

Seed shall be applied at a rate of 200 pounds per acre.

The Contractor shall be responsible for protecting all planting areas against vehicle and pedestrian traffic by use of approved warning signs and barricades. Planting areas which have been damaged through any cause prior to final inspection and areas failing to receive a uniform application at the specified rate, shall be reseeded, refertilized, and remulched at the Contractor's expense.

The seed mixture shall meet the requirements of applicable state laws, and shall contain no noxious weed seeds. The grass seed mixture for seeded lawn shall

contain no more than 2 percent inert material and shall meet the following requirements:

Common Name	Weight Proportion	Minimum Germination
Perennial Rye Grass	40%	90%
Fescue	29%	85%
Bluegrass	29%	85%

There shall be no less than three different types of rye grass and bluegrass contained within the percentage shown. Each different variety shall be resistant to diseases and climate conditions common to the Tri-City area. Within each classification, each grass type shall be resistant to harmful diseases or climatic conditions known to occur in, or cause damage to the other grass types provided. All grass seed to be used shall be submitted and approved prior to seeding. Submittal shall describe each grasses composition and resistant tendencies.

F. Water

Water for irrigation of ground cover and plant materials shall not contain dissolved or suspended matter, which will be harmful to plant material on which it is to be used. Upon completion of the irrigation system and after it has been approved for use by the Engineer, the Contractor may use the system to irrigate new planting areas.

G. Lawn Sod

Where shown on the plans or stated in the special provisions or as a Contractor's option to seeding lawn-planting areas, he shall furnish and place established healthy lawn sod material in accordance with the requirements SWSS Section 9-14.6(8) as herein modified.

The sod shall contain grasses in close proportions with that of the grass specified in Section E above, or approved equal. The sod shall have a proven field record of at least three years in this area or be certified to be adaptable and resistant to harmful climatic and disease tendencies for this region.

The sod shall be one (1)-year old minimum, healthy, thick, even strand of grasses, grown under intensive care and cultivation with rigid quality control, cut from fields not more than forty-eight (48) hours before delivery to project site.

The root system shall be sufficient to ensure survival and healthy growth.

9-4.04 MAINTENANCE

A. Planting Material Maintenance for Seed/Lawn Establishment

The Contractor shall ensure adequate and proper care of all planting material and work done on this project during construction until acceptance by the Engineer, all in accordance with SWSS Section 8-02.3(16) as herein modified. The Contractor shall keep all plant material in a healthy growing condition by watering, cultivating, spraying, fertilizing, mowing, and other incidental items of work, which may be required to maintain the lawn materials. The work shall also include keeping the planted area free from insect infestation, weeds and grass, litter and other debris.
After the seeding/sod work on this project is completed and accepted by the Engineer, the Contractor shall be required to provide all maintenance on lawn areas until three (3) mowings have been completed. The contractor shall notify the project inspector prior to each of the three (3) required mowings. Any mowing done without proper notification shall not be considered as one of the three (3) required mowing cycles.

Should the seed/sod be done late in the year when no mowing is required due to little or no growth, the Contractor shall be responsible for the initial three (3) mowings in the spring.

The weeding, spraying (broadleaf) and control of diseases of the lawn area shall remain the responsibility of the Contractor until the three (3) mowings have been completed and one application of fertilizer and broadleaf has been applied by the Contractor. The fertilizer and broadleaf shall not be applied sooner than 30 days nor more than 60 days after the third mowing has been completed. The contractor shall notify the project inspector prior to applying broadleaf and fertilizer. Any application of broadleaf and fertilizer without proper notification shall not be considered as meeting the requirements of this section. At the city's discretion, additional applications of both broadleaf and fertilizer may be required.

The Contractor shall fertilize and spray for weed infestation at rates determined by the Contractor and approved by the Engineer. The fertilizer used between June and August shall consist of a slow release form of nitrogen fertilizer. Fertlizers and broadleaf shall be applied at a rate recommended by the manufacturer.

The Contractor shall furnish mowing machines, fertilizer spreaders, spreaders, tools, all labor, hose, and other water equipment, and other equipment required for the performance of lawn maintenance work until the end of the guarantee period.

At completion of the project maintenance period, the contractor shall be required to provide a recommended watering schedule to the city for any newly seeded or sodded areas. This is required to insure proper watering, lawn establishment and warranty of planted materials.

For projects where modifications have been done to the existing irrigation and landscaping, the contractor shall be required to work with the city to establish written watering schedules that meet the needs for newly planted materials and adjacent established landscaping. The contractor shall be responsible for providing a written watering schedule for newly planted areas and verifying times and rates are set properly throughout the maintenance period of the contract. The contractor shall also be responsible for working directly with city staff to adjust adjacent irrigation systems to prevent over/under watering of new and existing landscaping.B. Irrigation System

The use of a new or existing underground irrigation system will be permitted to be used by the Contractor with the approval of the Engineer. The Contractor shall be responsible for any damage to the irrigation system, which may result from its use in irrigating the planted materials.

9-4.05 MEASUREMENT AND PAYMENT

Measurement and payment will be made for one or both of the following bid items as may be listed in the proposal:

"Imported Topsoil" per cubic yard
"Furnish and Install Seeded Lawn," per acre
"Furnish and Install Sodded Lawn," per square yard

The unit contract price, per cubic yard, for "Imported Top Soil:, shall be full compensation for all materials, equipment, labor and incidentals to provide and place imported Top Soil.

The unit contract price, per acre, for "Furnish and Install Seeded Lawn," and per square yard for "Furnish and Install Sodded Lawn," shall be full compensation for furnishing all labor, tools, equipment, materials, and all other incidentals required to prepare the seed bed, plant the lawn, apply fertilizer, mulch, water, weed control, lawn maintenance, installing and removing lawn area protective barriers required to establish the lawn area as specified, and shall be paid in the following sequence for healthy vigorous lawn.

1. Completion of lawn planting ...60% of individual areas

2. Completion of three mowings ...100% of individual areas

9-5 TREE AND SHRUB PLANTING

9-5.01 GENERAL

The work covered in this section shall apply to the furnishing, installation, care and maintenance of trees, shrubs, seeding and ground other than seeded/sodded lawn areas. Trees, shrubs, seedling, and ground cover shall hereinafter be collectively referred to as plants and shall be installed in accordance with the requirements of SWSS Section 8-02 as herein modified. All new trees shall be staked in accordance with City of Kennewick Standard Drawings 9-1 and 9-2.

9-5.02 MATERIALS

A. All plants shall be tagged as per SWSS Section 9-14.6(4) as herein modified.

Plants designated as "B&B" on the plant list are required to be supplied with their root system to be balled and burlapped.

B. Planting mix shall be in accordance with the following requirements:

1. Provide a planting mix for backfilling of trees and shrubs, consisting of two parts approved topsoil and one part organic matter.

2. Organic matter shall be derived from spaghnum peat and/or pulverized, well-rotted, unleached cattle manure free from viable weed seeds, oil, or chemicals injurious to plant growth.

C. Fertilizer for planting soil shall have the following formulation of total available ingredients:

Nitrogen -N- 20%
Phosphoric Acid P2O5- 10%
Potash K2O- 5%

The fertilizer shall be in 21-gram tablets and shall be "Agriform Planting Tablets," or approved equal.

Fertilizer shall be delivered to the site in the manufacturer's packages with labels attached showing complete chemical composition and analysis.

9-5.03 CONSTRUCTION

Planting shall meet the requirements of SWSS Section 8-02.3 as herein modified.

1. Tree locations shall be adjusted so that the tree is not directly in front of rotating or fixed spray, sprinkler heads. Trees requiring a bubbler sprinkler head for irrigation shall be planted not more than three (3) feet from the bubbler head.

2. All burlap shall be removed from root balls and/or all containers shall be completely removed at the time of planting.

3. The root ball shall be loosened and gently crumbled. The top of the root ball shall be gently loosened and remove to expose the "true" tree collar or root crown when planting (root balls are generally mounded when dug and wrapped). The collar shall be set so that after any settlement that it is level with the adjoining finished grades. Girdling or encircling roots shall be gently loosened from the root ball and straightened. Any that cannot be straightened shall be cut with a sharp, neat cut, prior to planting. Planting mix, root ball material and native soil shall be mixed and used to backfill the prepared hole. After planting, the tree shall be watered so that the complete hole is filled and saturated with water and all air pockets have been removed.

4. When planting trees and or shrubs that are not contained within a curbed bed, the contractor shall place a minimum 4-foot diameter border ring filled with 3-inch depth shredded wood mulch around individual plantings. Group plantings shall be as depicted on the construction drawings or as staked by the engineer. The border shall be heavy-duty plastic 6-inch height landscape border. Individual rings shall be one piece and the joint shall be doweled with manufactured dowels made for joining and shall be staked in accordance with the manufacturer's recommendation. The border shall be placed such that the finished top of the border is a maximum 1.5-inches above the adjacent topsoil grade on the exterior of the border.

9-5.04 MAINTENANCE OF TREE AND SHRUB PLANTS

The Contractor shall provide all necessary maintenance of plant materials. The maintenance period shall run a minimum of ninety (90) days after the planting of the last plant. Maintenance shall be in accordance with the requirements SWSS Section 8-02.3(12) as herein modified. Maintenance shall include proper watering, plant saucer berming, pruning, mulching, resetting plants that become settled or out of plumb to the proper grades or upright position, staking, weeding, pesticide and fungicide spraying, fertilizing, plant replacement, and other necessary functions to bring all plant material to a vigorous, healthy growing condition throughout the maintenance period. The Contractor shall also guarantee plants in accordance with Section 9-6 of these specifications.

At conclusion of the ninety (90) day maintenance period, the contractor shall provide the city with a written watering schedule for newly planted materials. The contractor shall be responsible for monitoring the watering of the plant materials through the guarantee period established in Section 9-6 of these specifications. If, upon inspection, the

the project inspector and provide a written change to the watering schedule(s). The city shall work directly with the contractor to make all requested changes to the irrigation time clock in accordance with the contractor's instructions.

9-5.05 INSPECTION FOR ACCEPTANCE

At the conclusion of the maintenance period and upon written notice by the Contractor to the Engineer, an inspection of the planting shall be made to determine completion of contract work. After inspection, the Contractor will be notified in writing by the Engineer of acceptance of all work of this section, exclusive of the possible replacement of plants subject to guarantee, any deficiencies, or unfulfilled requirements for completion of the work. Work remaining to be done shall be subject to reinspection before acceptance.

At the end of the guarantee period, an inspection by the City will be made. Any plant which was installed under this contract and is dead, or not in satisfactory growth, or missing, shall be removed from the site and replaced with the same kind and size as specified in the plant list.

9-5.06 MEASUREMENT AND PAYMENT

The unit contract price for each type of tree or shrub, per each, as listed in the proposal bid items, shall be full compensation for furnishing all labor, materials, equipment, and all other incidentals necessary to furnish and install topsoil, planting mixture, planting materials, wood mulch in tree rings, plastic landscape border, fertilize, stake, locate, prune, replace defective plants, apply insecticides, and all maintenance work and guarantee periods required together with all other incidentals necessary to establish the plantings in accordance with the plans and specifications or as directed by the Engineer. Wood mulch provided for group plantings or beds larger than 4-foot diameter shall be measured and paid as specified under Section 9.7, Shredded Wood Mulch.

9-6 GUARANTEE

At the conclusion of the maintenance periods as specified in Sections 9-04 and 9-05 of these specifications or upon final inspection and acceptance by the Kennewick City Council, the Contractor shall begin a plant guarantee period, which shall be in effect for one full growing season from April 1 to October 1.

9-7 SHREDDED WOOD MULCH

9-7.01 GENERAL

All references to mulch, with the exception of the wood cellulose fiber mulch used for hydroseeding (Section 9-4.03 D) shall be as follows:

- 75 % (by volume) 2-inch to 5-inch shredded wood
- 25% (by volume) ¾-inch minus fine bark & wood dust

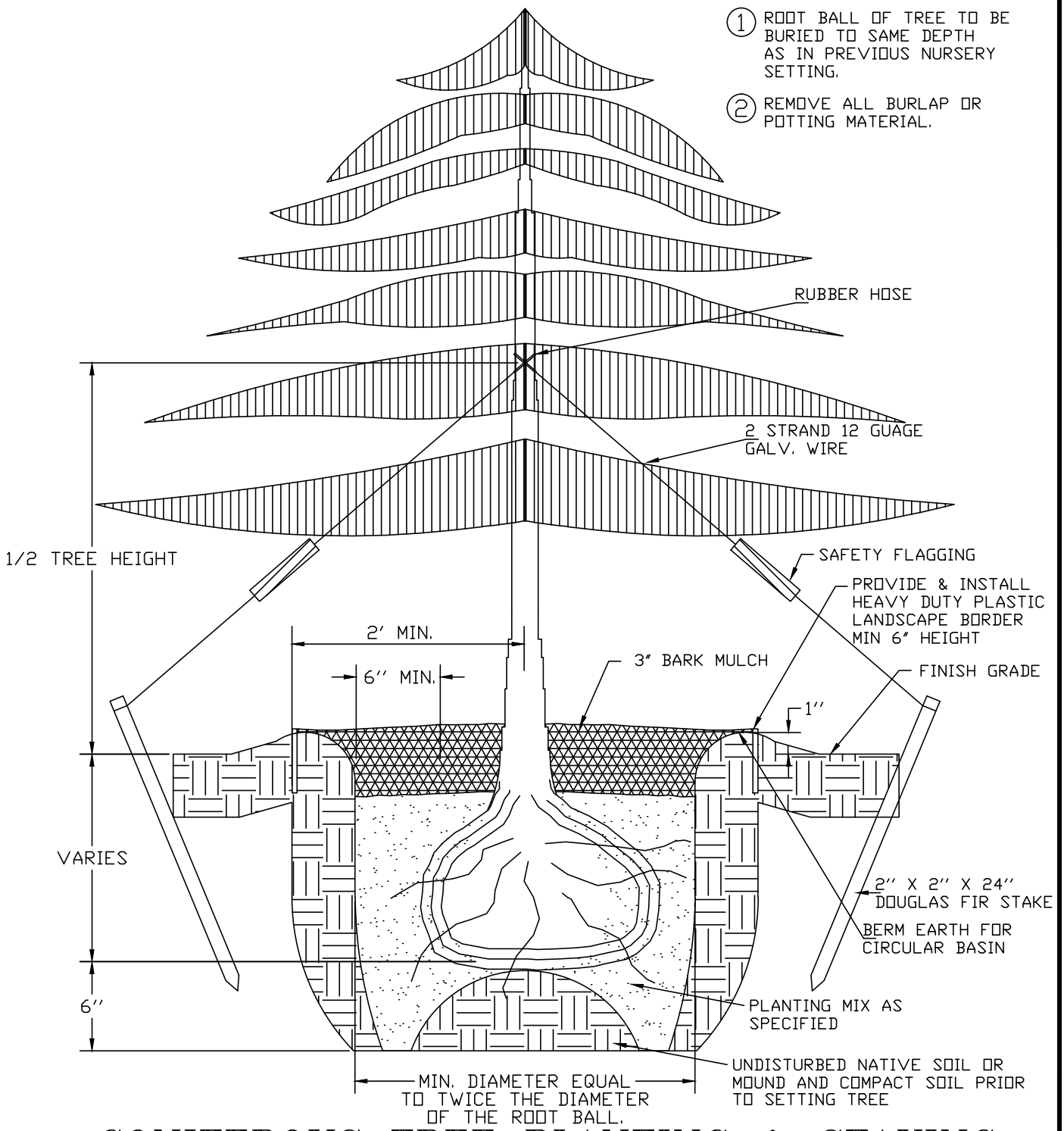
The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. The wood mulch shall be seed free. A sample of the shredded wood mulch shall be provided to the engineer and approved prior to delivery. The mulch shall be placed to a minimum depth of 3-inches or as specified in contract drawings or Special Provisions. The ground shall be prepared as specified in Section 9-4.02 and shall be even, vegetation free and lightly compacted prior to placement of the wood mulch. After placement, the shredded wood mulch shall be leveled, thoroughly wetted and lightly compacted.

9-7.02 MEASUREMENT AND PAYMENT

Shredded wood mulch for individual tree rings is incidental to the unit contract price for the tree planting as specified in Section 9-5.06. The unit contract price for ”Shredded Wood Mulch”, per square yard, shall be full compensation for furnishing all labor, materials, equipment and all incidentals required to provide, place, spread, wet and compact the wood mulch in planter beds and landscape areas in accordance with these specifications.

NOTES:

1. ROOT BALL OF TREE TO BE BURIED TO SAME DEPTH AS IN PREVIOUS NURSERY SETTING.
2. REMOVE ALL BURLAP OR POTTING MATERIAL.



CONIFEROUS TREE PLANTING & STAKING

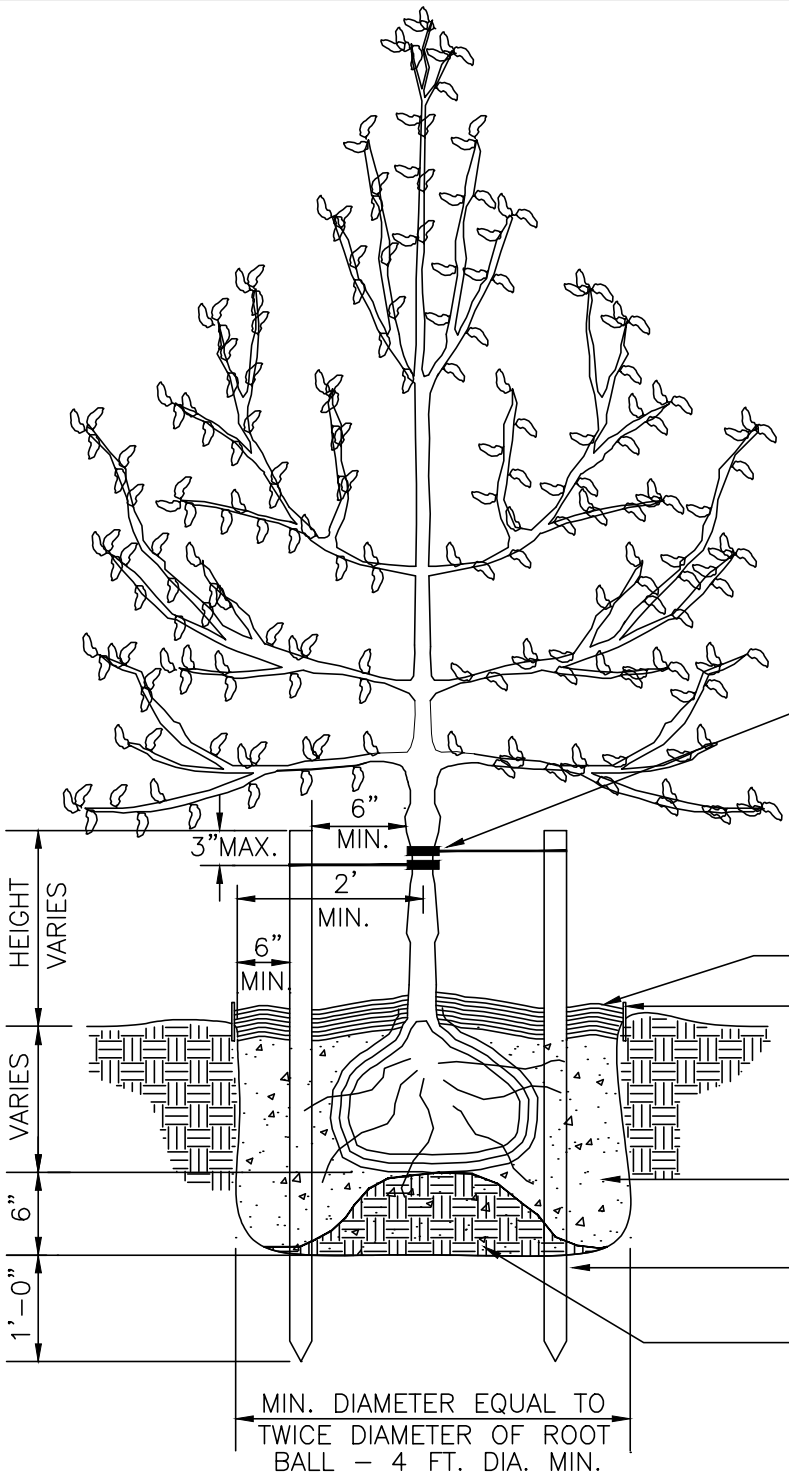
CITY OF KENNEWICK

ENGINEERING DEPARTMENT

DATE	3/96
DWN	RAW
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

9-1



NOTES:

1) REMOVE ALL BURLAP AND WRAPPINGS. LOOSEN ROOT BALL TO EXPOSE OUTSIDE ROOTS.

2) ROOT BALL OF TREE TO BE BURIED TO THE SAME DEPTH OR SLIGHTLY HIGHER AS IN PREVIOUS NURSERY SETTING TO ALLOW FOR SETTLEMENT.

3) STAKING TO BE REMOVED WITHIN 12 MONTHS OF PLANTING.

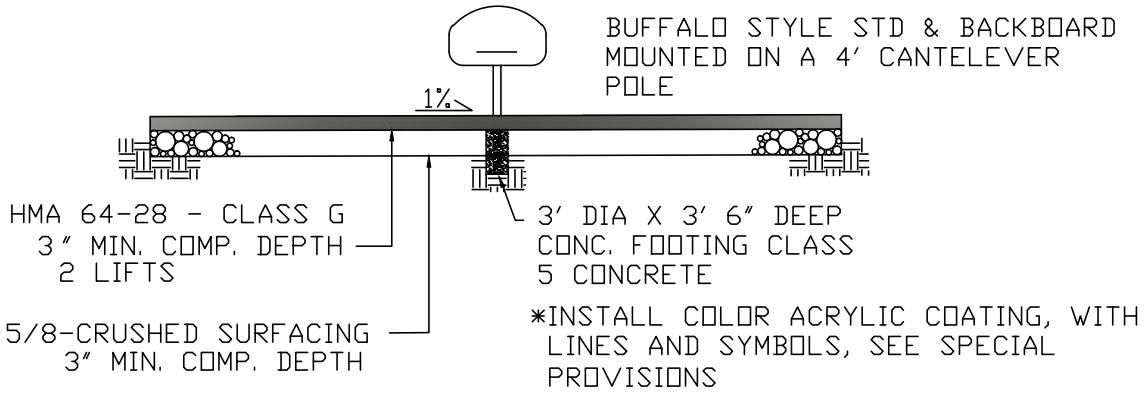
DECIDUOUS TREE PLANTING & STAKING

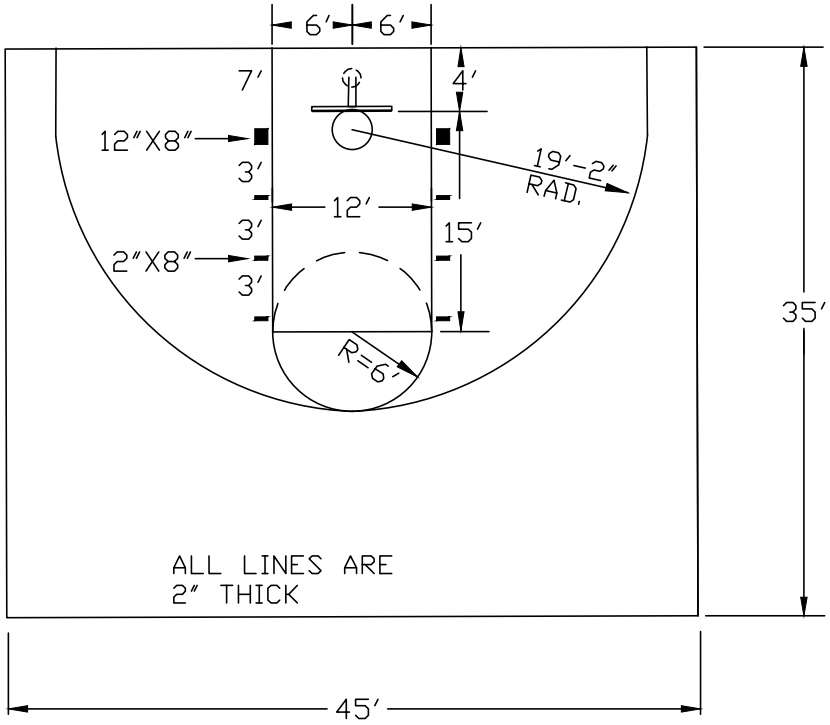
CITY OF KENNEWICK
ENGINEERING DEPARTMENT

DATE	1/95
DWN	GD
REV	3/14
CHK	BWB
SCALE	NTS

DWG. NO.

9-2





HALF COURT BASKETBALL

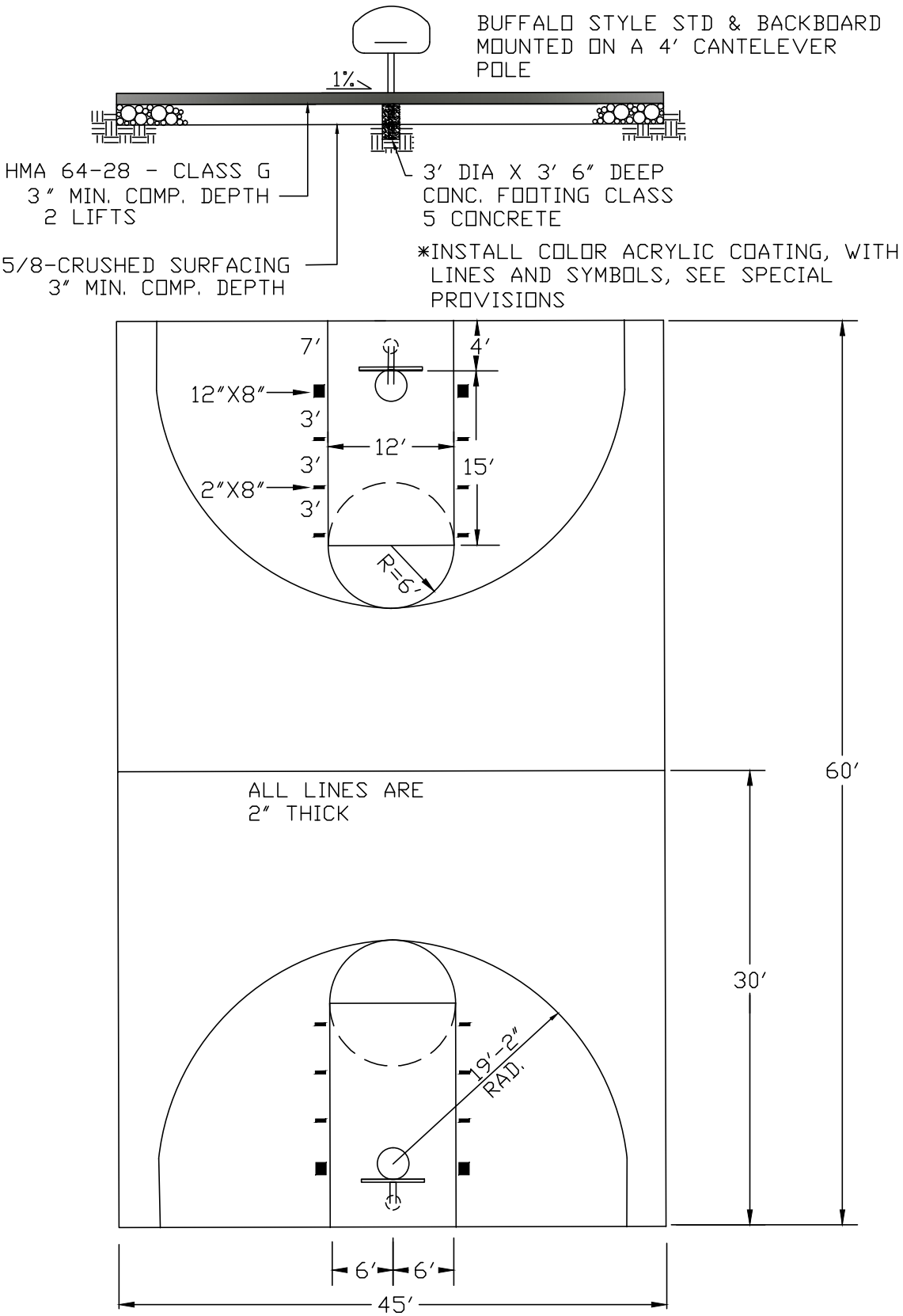
CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	TOH
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO.

10-1



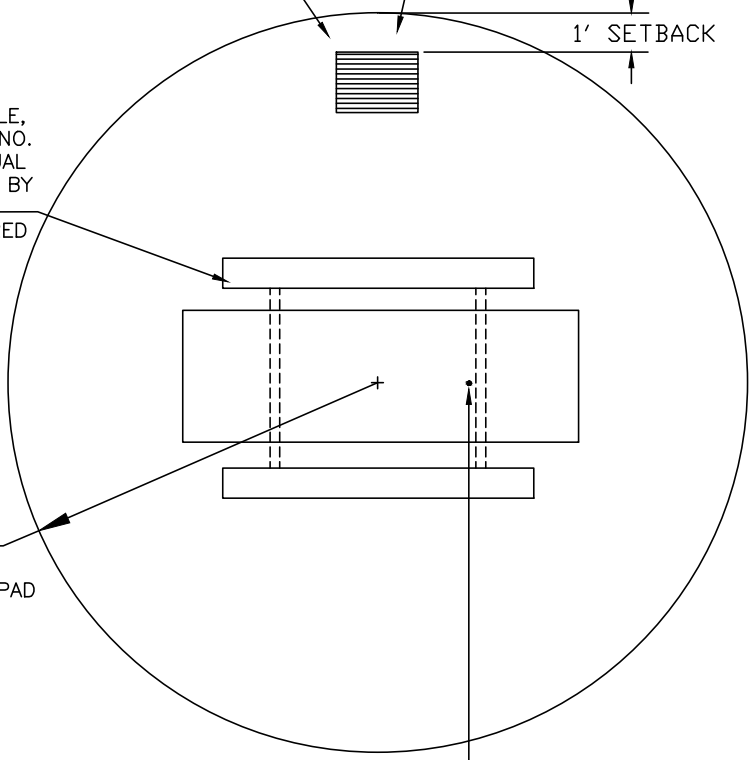
FULL COURT BASKETBALL

CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	TOH
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO. **10-2**



THE CONCRETE PAD SHALL BE 4" THICK – CLASS 5 OVER 2" COMPACTED DEPTH OF SAND OR 5/8" CRUSHED SURFACING. FINISHED CONC. SHALL BE 1" ABOVE BARE GROUND WHERE THERE IS SOD. OR 2" ABOVE BARE GROUND BEING SEEDED. THE PAD SHALL HAVE A CROSS SLOPE OF 1/8" PER FOOT TO PREVENT PONDING. WHEN THE PAD IS PLACED ON THE SLOPING GROUND THE CONTRACTOR SHALL FORM THE HIGH SIDE SUCH THAT IT IS THE 1" TO 2" ABOVE GRADE AS DESCRIBED ABOVE AND SHALL FILL THE LOW SIDE AT 4:1 OR FLATTER SLOPE TO CATCH POINT WITH AN APPROVED TOP SOIL. IF THE PAD IS BEING PLACED IN AN EXISTING SODDED AREA. THE CONTRACTOR SHALL RESTORE SOD BACK TO THE EDGE OF CONCRETE.

THE CONTRACTOR SHALL SET AN EYE BOLT IN THE CONC. INSIDE EITHER OF THE SUPPORT LEGS FOR SECURING THE TABLE TO THE SLAB WITH A CHAIN. THE EYE BOLT SHALL BE CLOSED WITH A MIN. OPENING OF 1 1/2" AND A MIN. BOLT DIA. OF 1/2".
THE CONTRACTOR SHALL PROVIDE A 5' LENGTH OF 5/16" GALVANIZED STEEL CHAIN TO THE CITY FOR EACH "PICNIN TABLE W/CONCRETE PAD".

PICNIC TABLE W/CONCRETE PAD

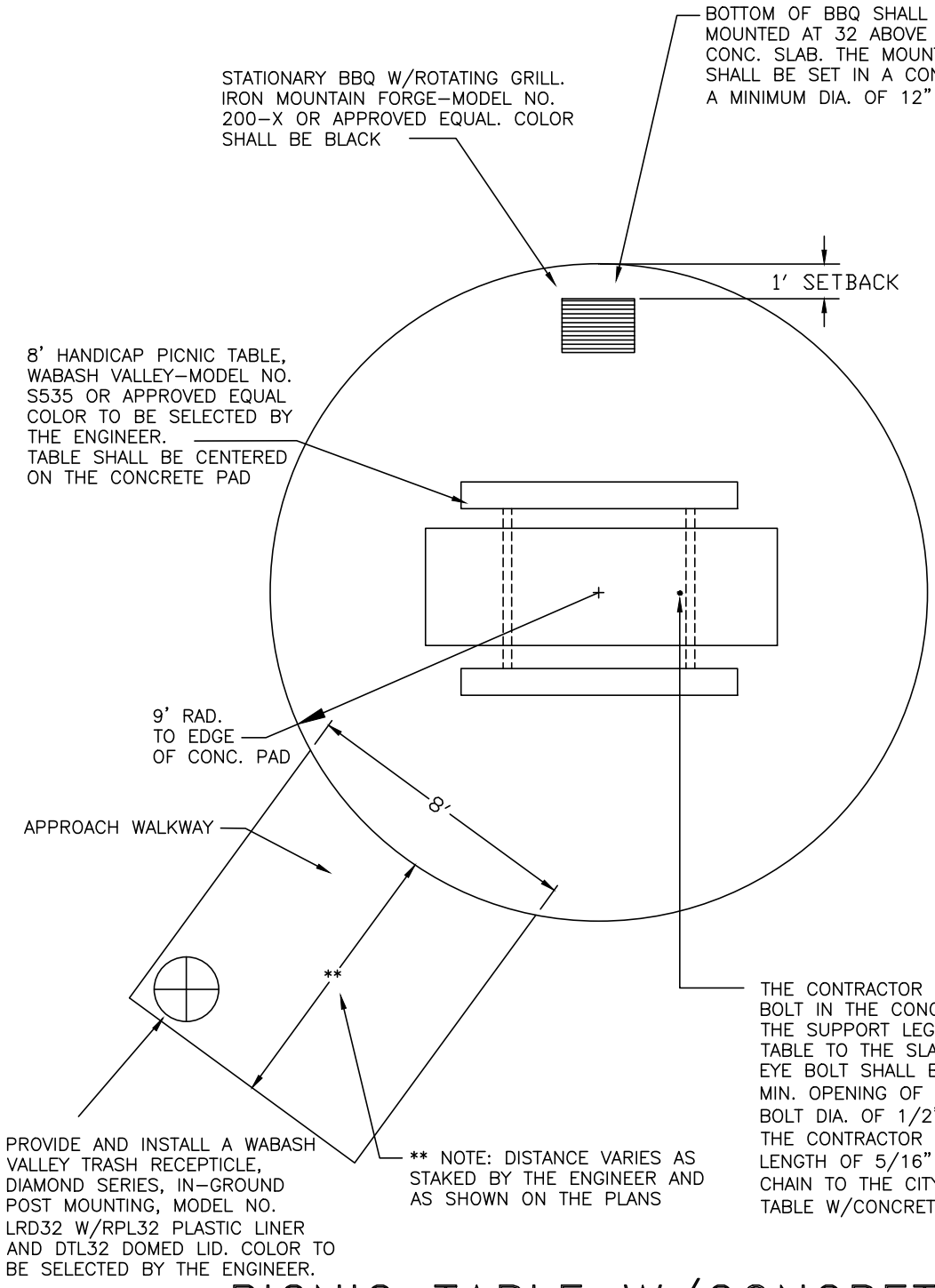
CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	TOH
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO.

10-3



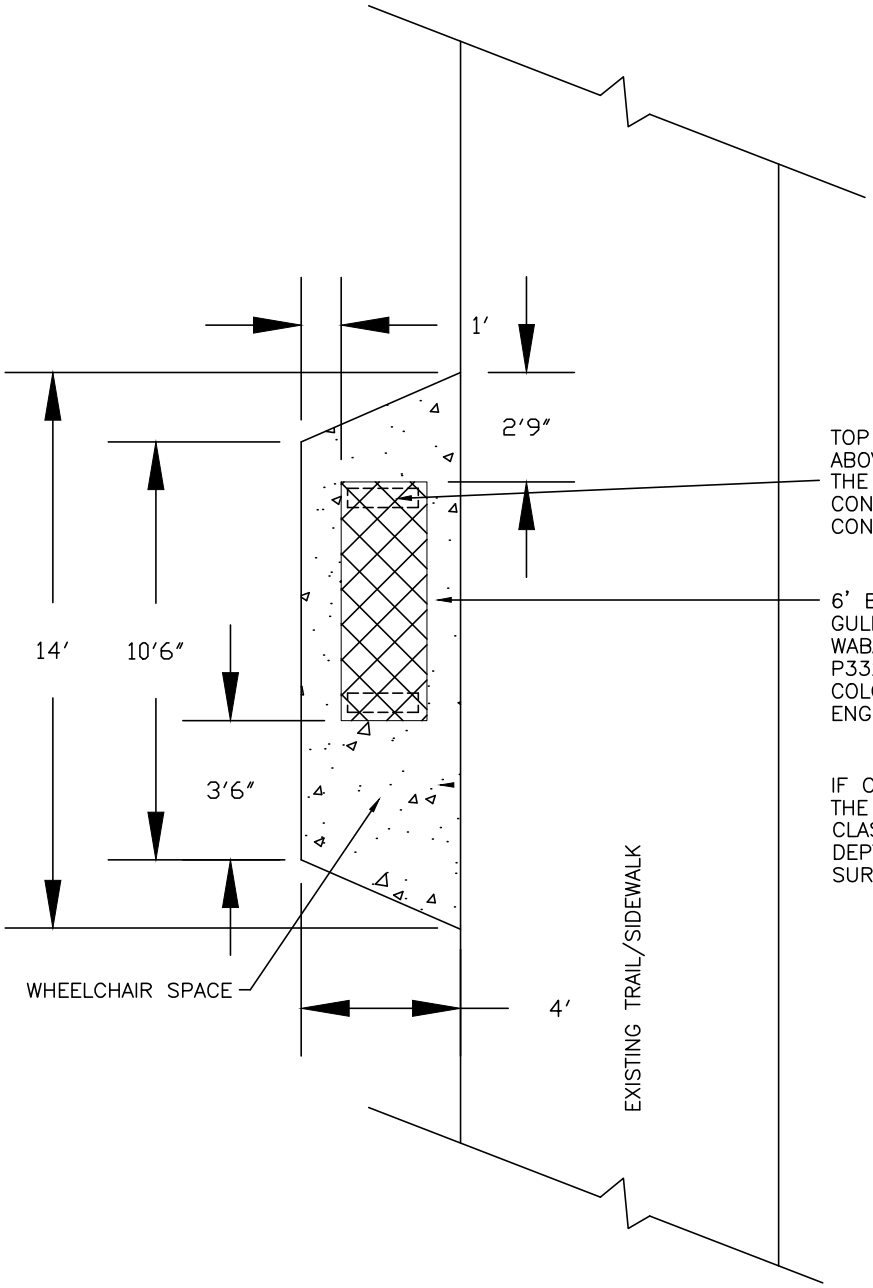
PICNIC TABLE W/CONCRETE PAD AND APPROACH

CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	TOH
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO. **10-4**



TOP FRONT OF BENCH SHALL BE 17" ABOVE THE FINISHED CONCRETE PAD. THE BENCH SHALL BE SECURED TO THE CONCRETE SURFACE WITH APPROVED CONCRETE ANCHORS.

6' BENCH w/ ARM REST AND GULLWING LEG SUPPORT MOUNTING WABASH VALLEY – MODEL NO. P3325 OR AN APPROVED EQUAL. COLOR TO BE SELECTED BY THE ENGINEER.

IF CONCRETE SURFACING IS USED, THE SECTION SHALL BE 4" OF CLASS 5 CONCRETE OVER 2" COMPACTED DEPTH OF SAND OR 5/8" CRUSHED SURFACING.

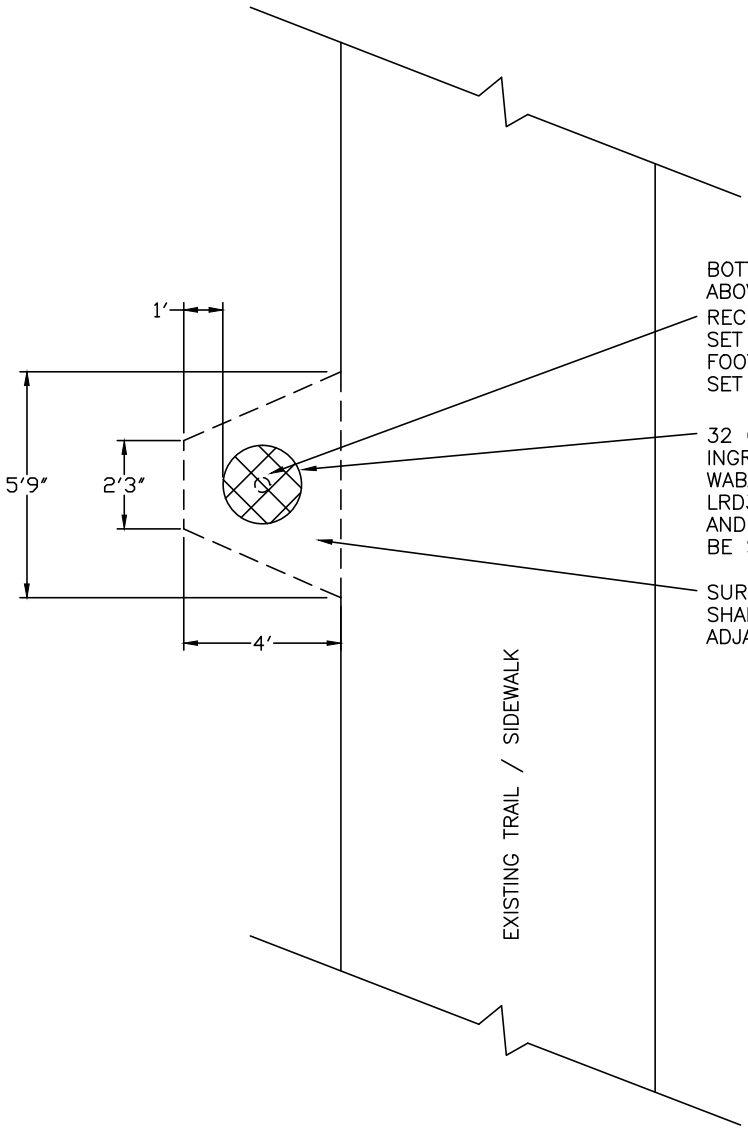
TRAIL / SIDEWALK WIDENING FOR BENCH INSTALLATION

CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	GCD
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO. **10-5**



BOTTOM OF RECEPTACLE SHALL BE 4" ABOVE THE FINISHED SURFACING

RECEPTACLE MOUNTING POST SHALL BE SET IN A 12" MINIMUM DIA. CONCRETE FOOTING AND THE TOP OF FTG. SHALL SET FLUSH WITH FIN. SURFACING

32 GALLON TRASH RECEPTACLE INGROUND POST MOUNTED, WABASH VALLEY – MODEL NO. LRD32 w/ RPL32 PLASTIC LINER AND DTL32 DOMED LID. COLOR TO BE SELECTED BY THE ENGINEER.

SURFACING UNDER THE RECEPTACLE SHALL MATCH THAT OF THE ADJACENT TRAIL / SIDEWALK.

*** IF CONCRETE SURFACING IS USED, THE SECTION SHALL BE 4" OF CLASS 5 CONC. OVER 2" COMPACTED DEPTH OF SAND OR 5/8" CRUSHED SURFACING.

*** IF ACP SURFACING IS USED, THE SECTION SHALL BE 1 1/2" COMPACTED DEPTH OF ACP CLASS G OVER 2" COMPACTED DEPTH OF 5/8" CRUSHED SURFACING.

TRAIL / SIDEWALK WIDENING FOR TRASH RECEPTACLE INSTALLATION

CITY OF KENNEWICK

MUNICIPAL SERVICES DEPARTMENT

DATE	1/10
DWN	GCD
REV	3/14
CHK	BWB
SCALE:	NTS

DWG. NO. **10-6**