



CITY OF SAN JUAN

SUBDIVISION STANDARD

DESIGN MANUAL

FOR PUBLIC INFRASTRUCTURE

IMPROVEMENT

PREFACE

The City of San Juan is devoted to providing a high quality of life throughout the city by ensuring properly designed and constructed infrastructure to serve those who work and live in the City of San Juan. The condition of public infrastructure is significant to the everyday life of the general public. The City of San Juan mitigates the financial implications, as well as liability, imposed by failed infrastructure by designing, constructing, and maintaining quality infrastructure.

This manual was prepared to assist engineers, designers, planners, and architects during the development of infrastructure improvements by specifying subdivision design standards and regulations and does not relieve the engineer, developer, or contractor of any legal responsibilities.

DISCLAIMER: This document is to be reviewed and revised, as necessary, in order to adapt any infrastructure improvements, advances and innovations in standard design practices. The user of this manual is responsible for requesting the most recent version.

Copies of this standard design manual are available at:

City of San Juan
Planning & Zoning Department
San Juan, Texas, 78589
(956) 223-2200

This development manual is adopted under the authority of the Constitution and laws of the State of Texas, and the City Charter of the City of San Juan, Texas.

ORDINANCE NO. _____

ORDINANCE ADOPTING THE CITY OF SAN JUAN'S STANDARD DESIGN MANUAL FOR PUBLIC INFRASTRUCTURE IMPROVEMENTS.

WHEREAS, The Standard Design Manual outlines minimum standards, and delegates authority to the City of San Juan to promulgate the Standards Manual _____

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SAN JUAN, TEXAS, THAT:

SECTION 1: The Engineering Standard's Manual is hereby adopted by the City of San Juan setting the minimum standards referenced in the Unified Development Code for new developments within the City and the City's extraterritorial jurisdiction.

SECTION 2. REPEALER CLAUSE: The Ordinance shall be cumulative of all other ordinances dealing with the same subject, and any provision of any ordinance in direct conflict with any provision of the Ordinance, including the Chapters and Sections of the City Code of Ordinances specifically listed in the caption of this Ordinance, is hereby repealed to the extent of such conflict and the provisions of this Ordinance shall supersede any provisions in conflict herewith; all provisions of any other ordinance not in conflict herewith shall remain in full force and effect.

SECTION 3. SAVINGS CLAUSE: If any section, part, or provision of this Ordinance is declared unconstitutional or invalid, by a court of competent jurisdiction, then, in that event, it is expressly provided, and it is the intention of the City Council in passing this Ordinance that its part shall be severable and all other Ordinances shall not be affected thereby and they shall remain in full force and effect.

SECTION 4. PUBLICATION AND EFFECTIVE DATE: This ordinance shall be published according to law and take effect on _____, 2024.

READ, CONSIDERED, PASSED AND APPROVED ON FIRST READING at a regular meeting of the City Council of the City of San Juan, Texas, at which a quorum was present and which was held in accordance with Vernon's Texas Codes Ann, Government Code, Section 551.041, on the ___ day of _____, 20__.

READ, CONSIDERED, PASSED AND APPROVED ON SECOND READING at a regular meeting of the City Council of the City of San Juan, Texas, at which a quorum was present and which was held in accordance with Vernon's Texas Codes Ann, Government Code, Section 551.041, on the ___ day of _____, 20__.

CITY OF SAN JUAN

By: _____
Mayor

ATTEST:

By: _____
City Secretary

APPROVED AS TO FORM:

By: _____
City Attorney

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SECTION I – DEFINITIONS

I-1 Definitions

Access Point:

Driveways, median openings and street connection to a roadway.

Alleys:

Minor public right-of-way which is used primarily for vehicular service access to the back or sides of properties otherwise abutting on a street, and not intended to provide the primary means of access to abutting lots.

Amended Plat:

A plat of a subdivision correcting the scrivener errors of a previously approved plat. Amended Plats must be prepared in accordance with the requirements of this development manual, shall require City approval, and upon approval shall be filed for record with the County Clerk of Hidalgo County, Texas.

Arterial Streets:

A free-flowing street, normally the main thoroughfare through a community, receiving traffic from a collector and minor streets. The assigned corresponding Right-of-Way Dimensions can be found on [Table VII-3](#).

Building:

A structure (anything constructed or erected), designed to be used as a place of occupancy, storage, or shelter. Any structure designed to be built for the support, enclosure, shelter, or protection of persons, animals, chattel, or property of any kind.

Building Plans:

Plans for the construction of a building. Building Plans may include: architectural plans, architectural elevations, structural plans, foundation plans, mechanical (HVAC) plans, electrical and lighting plans, plumbing plans, etc. Building Plans will often be accompanied by Construction Plans for site development projects. Building Plans may not, in some cases, include Construction Plans for remodel projects.

Building Area:

A portion of a lot on which single-family buildings are allowed to be placed.

Building Lot:

A single tract of land located within a single block which, (at time of filing for a building permit) is designed by its owner or developer as a tract to be used, developed, or built upon as a unit, under single ownership or control. It shall front upon a street unless otherwise approved by the City. Therefore, in some cases, a "building lot" may not be the same as a lot of record. A building lot may be subsequently subdivided into two or more building lots, and a number of building lots may be cumulated into one building lot, subject to the provisions of the City's development requirements.

Building Pad:

A portion of a lot covered by a building footprint.

Building Setback Line:

Line within a property defining the minimum permissible horizontal distance between a building and the adjacent street right-of-way line.

City:

The City of San Juan, Hidalgo County, Texas. Any reference to an act of the city shall be deemed to include acts of the city commission, board of aldermen, or other such elected governing body of the city.

City of San Juan:

The Texas Licensed Professional Engineer or Texas Registered Engineering Firm, employed by the City or engaged by the City as a consultant, and designated by the City as the “City of San Juan.”

City Staff:

City employees and City consultants, including the City of San Juan, designated by the City and by properly constituted authority to recommend and enforce the regulations contained in the City’s development requirements.

Clear Vision Area:

A part of a lot (generally corner lot) which may not be utilized for plantings, walls, fences, parking, vending machines, or other obstructions which would cause danger, as determined by the City, to traffic by obstructing the view.

Collector Streets:

Carries traffic from minor streets to the major system of arterial streets and highways, including streets of circulation around residential development. The assigned corresponding Right-of-Way Dimensions can be found on [Table VII-3](#).

Commercial Property:

Any building, or land, developed with the intent to generate capital gain will be referred to as Commercial Property in this development manual.

Commercial Development:

Any development subdivision which is not strictly Residential in nature as defined by this development manual. Retail uses, restaurants, office buildings, mixed-use developments, industrial uses, and all other non-residential uses will be considered Commercial Development as used throughout this development manual.

Comprehensive General Plan:

A statement of public policy containing the goals and objectives of the community, the capital improvement program, the land use plan, the subdivision and zoning regulations,

and other development codes, ordinances, policies and plans or amendments promulgated by the city council for the quality and orderly growth of the community.

Construction Plans:

Plans for construction activities other than building construction. Construction plans may include: paving plans, grading plans, drainage plans, water line plans, sanitary sewer plans, erosion control plans, construction details, etc. Construction Plans will often accompany Building Plans for site development projects.

Control of Access Line:

Lines along sections of the street and alley rights-of-way that delineate areas where no driveway access will be permitted. These lines shall be shown within the limits that the city determines to be potentially unsafe for driveway access.

Controlled Access Streets:

Streets which are parallel to and adjacent to arterial streets and highways and which provide access to abutting properties and protection from through traffic.

Conveyance Plat:

A complete and exact plan, map, or drawing, indicating the boundary information of a parcel of previously un-platted land, solely for the purpose of conveying property in a real estate transaction. Conveyance Plats must be prepared in accordance with the requirements of this development manual, shall require City approval, and upon approval shall be filed for record with the County Clerk of Hidalgo County, Texas.

Corner Clip:

A triangular area of additional right-of-way at street and alley intersections.

Council:

The City Council of the City of San Juan, Texas.

Crosswalk:

Public right-of-way, six feet or more in width between property lines, which provides pedestrian circulation.

Cul-De-Sacs:

Street having but one outlet to another street and terminated on the opposite end by a vehicular turnaround.

Dead-End Streets:

Streets, other than a cul-de-sac, with only one outlet.

Developer:

Means and shall be used synonymously with the term “subdivider”

Development Plan:

The site plan document for one or more lots upon which is shown all information required by the City’s development requirements. Also called “Development Plan” or “Site Plan” throughout this development manual.

Easement:

The right granted for the purpose of limited public use across, over, or under private land.

Engineer:

A person licensed and authorized to practice engineering in the state under the Texas Engineering Practice Act.

Excavation Permit:

A permit which must be obtained from the City of San Juan prior to commencing any grading, filling, excavating or trenching activities within the City of San Juan.

Extraterritorial Jurisdiction (ETJ):

Area surrounding the City Limits and extending five miles therefrom, except where modified by interlocal cooperation agreements with neighboring cities, the County or where modified by court order.

Final Plat:

A map or drawing and any accompanying material of a proposed subdivision prepared in a manner suitable for recording in the county records and prepared as described in these regulations.

Fire Lane:

A fire apparatus access road (or drive) meeting the minimum width specified by City standards and the International Fire Code and constructed of a City approved all-weather surface, typically asphalt or reinforced concrete, sufficiently designed to support the imposed loads of fire apparatus and providing a surface capable of being striped in accordance with current City requirements. Fire Lanes will be required and maintained in accordance with this development manual and the International Fire Code.

High Density Residential:

A residential zone that consists of more than one dwelling units per acre. Multi-family residential and mobile home parks shall be considered under this design manual as High Density Residential in terms of process and design requirements.

Lot:

An undivided tract or parcel of land having frontage on a public street, and which is, or in the future may be, offered for sale, conveyance, transfer or improvement; which is designated as a distinct and separate tract, and which is identified by a tract, lot number and/or symbol in a duly approved subdivision plat which has been properly filed of record.

Master Plan:

The various plans for the City and its adjoining areas, as adopted by the Council, and as it may subsequently be amended, and which indicates the existing and recommended general locations of various land uses, streets, parks, and other public and private developments and improvements.

Measuring Standard:

Where indicated or called for, 1,300 feet shall be measured by using the most direct route utilizing public rights-of-way and/or easements. The city shall make the final determination in all cases.

Medial Island:

Normally landscaped barrier constructed between lanes of traffic.

Mining:

The use of a facility or area for the extraction, removal, or stockpiling of sub-earth materials, including sand, gravel, oil, gas or other materials found under the earth.

The following are not considered mining:

1. The excavation, extraction, removal, or stockpiling of earth materials for ponds or lakes, or incidental to an approved plat, or incidental to construction with a building permit, or for governmental or utility construction projects such as streets, alleys, gas, electrical, water, telephone facilities and similar projects.
2. The extraction, removal, or stockpiling of earth materials incidental to construction of landscaping, retaining walls, screening devices and similar activities consistent with the land use allowed at the site of removal.
3. Grading, filling, or excavating when done in conjunction with an approved Excavation Permit properly issued by the City of San Juan.

Minor Street:

Street primarily used for access to abutting residential property.

Multi-Family Residential:

Development or subdivision, consisting of one or more lots, developed, or intended for development, for the purpose of providing any building or portion thereof, which is designed, built, rented, leased, or let to be occupied as two (duplex) or more dwelling units or apartments or which is occupied as a home or residence of three or more households.

Multi-Lot Single-Family Residential:

Development or subdivision, consisting of two or more lots, which is Single-Family Residential in nature, as defined by this development manual.

Net Area:

The area of a lot, excluding all easements greater than 15 feet in width or length, dedications and/or rights-of-way.

Non-Residential:

All uses in all zoning districts that are not Single-Family Residential in nature as defined by this development manual. Multi-family residential and mobile home parks shall be considered under this design manual as Non-Residential in terms of process and design requirements. As used throughout this development manual, the term “Commercial” shall mean Non-Residential as defined herein.

Off-Site Public Improvements:

All improvements outside the limits of the development.

On-Site Public Improvements:

All improvements constructed within the development.

On-Site Sewage Facilities:

On-site sewage facilities as that term is defined in rules and/or regulations adopted by TCEQ, including, but not limited to, 30 TAC chapter 285.

Opaque:

As specified in the Screening Requirements shall mean a fence or hedge that cannot be seen through. A chain link fence with slats or a fabric fence are not considered opaque under the requirements of this development manual.

Ordinances, Standards, Codes, Criteria, Requirements, Construction Details, and Specifications:

These terms may be used interchangeably throughout this development manual. As used in this development manual, these terms may be used interchangeably, and any of these terms shall mean the various or combined ordinances, standards, codes, criteria, requirements, construction details, and/or specifications of the City of San Juan.

Pavement Width:

The portion of a street available for vehicular traffic, and where curbs are laid, the portion between the face of curbs.

Planned Unit Development:

A combination of different dwelling types and/or a variety of land uses which creatively complement each other and harmonize with existing proposed land uses in the vicinity.

Planner:

A person having an occupation classified as city or land planning.

Planning and Zoning Commission:

A planning commission, planning and zoning commission, planning and zoning board, or delegated representative of the city responsible for the proper implementation of the city

codes and ordinances. The planning commission is also responsible for proper city growth and development.

Plat:

A map or drawing of a tract of land which presents the developer's plan of his subdivision. As a general rule, the plat will show the tract's location, boundaries and area, as well as individual lot boundaries, proposed streets, utilities, public areas, and other information the city must have to determine whether the proposed subdivision complies with the requirements of local regulations, and a copy of which the developer intends to file for record. See "Amended Plat," "Conveyance Plat," "Final Plat," "Preliminary Plat," "Replat."

Preliminary Plat:

A preliminary plan, map, or drawing that represents a proposed subdivision, showing all boundaries, easements, location of individual properties and streets, as well as other information in accordance with the requirements of this development manual. Preliminary plats must be approved by the City in accordance with the requirements of this development manual.

Protected Tree:

Trees that are defined as protected by City standards, often determined by species and caliper size.

Private Improvements:

Any privately maintained infrastructure attached to the improved property itself whose complete liability falls upon the private entity and/or person.

Public Improvements:

All publicly maintained infrastructure including public surface improvements (curbs, gutters, driveway approaches, sidewalks, paved streets, alleys, bridges, culverts, streetlights, and etc.) and public utilities (water lines, sanitary sewer lines, storm drains, fire hydrants, and etc.).

Public Utilities:

All lines and auxiliary equipment and services necessary to furnish water, sewer and publicly provided services to a subdivision including, but not limited to, the installation cost of all streetlights as determined and established by the utility company servicing such subdivision.

Queue:

A line or sequence of people or vehicles awaiting their turn to be attended or to proceed. A successive stacking of vehicles.

Replat:

A plat of any portion or all of a subdivision which has been previously platted (other than by Conveyance Plat). Replats must be prepared in accordance with the requirements of this

development manual, shall require City approval, and upon approval shall be filed for record with the County Clerk of Hidalgo County, Texas.

Residential:

Development which is Single-Family Residential in nature as defined by this development manual. Multi-family residential and mobile home parks shall be considered under this design manual as High Density Residential in terms of process and design requirements.

Residential Streets:

Streets which are intended primarily to serve traffic within a neighborhood or limited residential district, and which are used for access to abutting properties.

Rural Development:

That portion of the city's extraterritorial jurisdiction outside of the suburban development area.

Screening Hedge:

An allowable Screening Device of shrubs as required in the development manual.

Screening Fence:

A solid opaque screening fence used to screen outside storage in accordance with the screening section of this development manual.

Screening Wall:

A solid, opaque wall made of wood, brick, stone, decorative concrete block, or concrete panels to be erected at designated areas in accordance with the screening section of this development manual.

Semi-Public Improvements:

Privately maintained improvements installed on private property, other than easements, which are required for the public benefit, public use or public welfare. Semi-Public Improvements might include: fire lanes, fire lines, onsite fire hydrants, screening devices, onsite drainage, etc.

Single-Lot Variance:

An exception to the mandates of this chapter which, due to extreme extenuating circumstances or to a proposed use of a temporary nature to the subject property, may be approved exclusively by the planning and zoning commission and which meets the criteria found in section 98-8(b) Subdivision Code.

Single-Family Residential:

Development or subdivision with the intended purpose of providing for single-family detached housing. Duplexes will also be considered as Single-Family Residential for the purposes of this development manual. Development involving commercial, industrial, or multi-family uses is not considered as Single-Family Residential as defined by this development manual.

Site Improvements:

All necessary site related improvements required by this development manual.

Site Plan:

The site plan document for one or more lots upon which is shown all information required by this development manual. Also called “Development Plan” or “Site Plan” throughout this development manual.

Soil/Earth Disturbance:

Any grading, filling, excavating or trenching activities within the City of San Juan.

Storage:

Storage refers to the stacking of vehicles usually in a queue. On-site Storage, in this Design Standards Manual, refers to the minimum required measured distance from the roadway Right-of-Way line to the first crossing or conflict point (throat length).

Street:

A way for vehicular traffic, whether designated as a street, highway, thoroughfare, parking, thoroughway, road, avenue, boulevard, lane, place or however otherwise designated. (Ex.: Arterial Street, Collector Street and Minor Street)

Subdivider:

Any person or any agent thereof dividing or proposing to divide land so as to constitute a subdivision as that term is defined in this section. In any event, the term "subdivider" shall be restricted to include only the owner, equitable owner or authorized agent of such owner or equitable owner, of land sought to be subdivided.

Subdivision:

A subdivision of a lot, tract or parcel of land situated within the corporate limits, or within the extraterritorial jurisdiction, into two or more parts, lots or sites for the purpose, whether immediate or future, of sale, division of ownership or building development. Subdivision includes resubdivision of land or lots which are a part of a previously recorded subdivision, but it does not include the division of land for agricultural purposes of parcels of five acres or more and not involving any new street, alley, or easement of access; and where water service by a public water supplier is available immediately to the parcel upon application by the owner of a parcel beyond the boundaries of the suburban development area. On all parcels which are divided within the boundaries of the extraterritorial jurisdiction, a subdivision plat shall be filed.

Surveyor:

A licensed state land surveyor or a registered public surveyor, as authorized by the state statutes to practice the profession of surveying.

Thoroughfare Plan:

A master plan, as adopted by the City Council, and as it may subsequently be amended, which indicates the existing and recommended streets of the City of San Juan and its extra territorial jurisdiction.

Throat Length:

Throat length refers to the length of the driveway up to the first conflict point.

Total Cost:

Costs of completed system including engineering and contingencies.

Tract:

An un-platted parcel of land whose boundaries have been established by a recorded deed and which is recognized as a separate parcel for purpose of transfer of title.

Tree Survey:

A drawing showing all trees on a property greater than the minimum diameter described in this development manual.

Truck-Lay:

The route Fire Department apparatus travels from a fire hydrant to all points of a structure or combustible storage area. Actual distance is measured along a paved street and/or fire lane as the apparatus would travel.

Urban Development Area:

That area that lies within the corporate limits of the city as modified from time to time.

Urban Subdivision:

A subdivision within the corporate limits of the city.

Utility Easements:

Land granted to the City, to the public generally, and/or to a private utility corporation for the installation and maintenance of utilities across, over or under land as required within the right to enter thereon with machinery and vehicles necessary for the maintenance of such utilities.

Utility Company:

Companies, corporations and other entities that undertake transmission and distribution of natural gas, electricity, telecommunications, radio or television communications.

Utility Lines / Utilities:

Pipes, poles, structures, wire, aerial cables and related facilities used in transmission and distribution of, but not limited to, natural gas, electricity, water or sanitary sewer.

Variance:

A grant of permission by the City Council that authorizes a specific suspension or waiver of one or more of the development rules and regulations of the City.

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SECTION II – DEVELOPMENT REQUIREMENTS

II-I Platting Requirements

A. Preliminary Plat

1. The preliminary plat shall include a separate page dedicated to the design and specifications of the access lane. No preliminary plat for a commercial or industrial zone shall be approved unless a notation is included on the plat indicating if an access lane is required.
2. The Planning and Zoning Commission shall require that all preliminary plats submitted for approval under the City's subdivision regulation shall include thereon a legend detailing the compliance with the additional requirements of the applicable Overlay Zone. In particular, it shall require:
 - i. That the building lines and the access lanes be clearly designated in the preliminary and final plats; and
 - ii. No plat shall ever be approved for recording unless it shall so comply with these requirements.
3. Preliminary Plat approval will be granted only on the condition that all lots can stand alone in terms of public and semi-public improvements.
4. Development Plan approval is typically required prior to approval of a Preliminary Plat. However, Preliminary Plat and Development Plan applications may be submitted and considered concurrently.
5. A Preliminary Plat approval is typically required prior to approval of a Final Plat, or Replat. However, at the discretion of the Director of Planning and Zoning, the City shall have the option to accept applications for Final Plats, or Replats concurrently with applications for the associated Preliminary Plats and Development Plans.
6. The approval of the Preliminary Plat by the City shall be effective for a period of eighteen (18) months after the date of formal approval. Following an eighteen (18) month period after the approval of a Preliminary Plat, the Preliminary Plat or any portion of the Preliminary Plat which has not had final plat approval by the Planning and Zoning Commission, will be considered invalid.
7. At the discretion of the City of San Juan Planning and Zoning Director, the expiration date of an approved Preliminary Plat may be extended an additional twelve (12) months without the need to resubmit through the typical approval process for new Preliminary Plats.

8. Request for extension shall be made by the property owner in writing at least fourteen (14) calendar days prior to the end of the first eighteen (18) month period. Preliminary Plats are not filed with the County.

B. Final Plat

1. The Final plat shall include a separate page dedicated to the design and specifications of the access lane. No preliminary plat for a commercial or industrial zone shall be approved unless a notation is included on the plat indicating if an access lane is required.
2. A Final Plat shall be required by the City of San Juan, whereby the owner of a tract of land, located within the limits or in the extra-territorial jurisdiction of a municipality, who divides the tract in two or more parts for the purpose of sale, or to lay out a subdivision or building lots or any lots, or streets, alleys, parks or other portions intended for public use or the use of purchasers or owners of lots, shall cause a final plat to be made in accordance with this development manual and with the Local Government Code.
3. A Final Plat shall substantially conform to an approved Preliminary Plat, or a revised Preliminary Plat must be submitted for formal approval.
4. Final Plat approval will be granted only on the condition that all lots can stand alone in terms of public and semi-public improvements. Every structure hereafter erected or enlarged shall be located on a lot of record as identified on a Final Plat for the property.

C. Replat

1. A Replat will be required to further subdivide a lot which has already been final platted.
2. When replatting, a lot of record must be replatted in its entirety. In addition, all replats of commercially zoned land and all replats of single-family and two-family residential zoned land of more than six lots must be considered in a public hearing in accordance with the Local Government Code.
3. Upon approval and County filing, a Replat will be treated as a Final Plat with regard to the development process of the City of San Juan.
4. Replat approval will be granted only on the condition that all lots can stand alone in terms of public and semi-public improvements.
5. Development Plan and Preliminary Plat approval is typically required prior to approval of a Replat. However, at the discretion of the Director of Planning, the

City shall have the option to accept applications for Replats concurrently with applications for the associated Preliminary Plats and Development Plans.

D. Conveyance Plat

1. A Conveyance Plat may be obtained solely for the purpose of conveying property in a real estate transaction in order to plat an unplatted tract of land.
2. A Conveyance Plat may only be obtained if the tract is plated as a single lot that fronts on an existing street, does not require the creation of any new street or the extension of municipal facilities, and is not a Replat.
3. A Conveyance Plat, can be “administratively approved” by the Mayor or other person as designated by the City Council.
4. The Mayor or designee shall not unreasonably disapprove a Conveyance Plat which meets the City’s standards and requirements.
5. Upon request by the landowner, the Mayor or designee shall be required to refer any disapproved Conveyance Plat to the Planning and Zoning Commission for consideration and public hearing.
6. Upon approval and County filing, a Conveyance Plat will be treated as a Final Plat with regard to the development process of the City of San Juan.

II-2 Development Plan Requirements

- A. Development Plan approval is required for all construction other than projects which involve only interior building remodel.
 1. Projects performed and funded by the City of San Juan are exempt from this requirement to the extent that such projects are for the construction or maintenance of public streets, drainage, water and/or sanitary sewer facilities.
 2. Development Plans may proceed through staff review and approval so long as no variances are required.
- B. Development plan approval will be required when any of the following apply:
 1. Any platting or subdivision of real property.
 2. Any proposed new development, including building construction or site improvements (paving, grading, drainage, sanitary sewer, etc.).

3. Any change in the location, configuration, or square footage of any existing building, driveway, fire lane, parking area, on-site public drainage system, open drainage channel, or storm water detention facility.
- C. Existing legal non-conforming structures may maintain a legal nonconforming status until the requirement for a Development Plan is triggered per the section above or until the use or operation of the structure or property ceases or becomes vacant for a period of twelve (12) months or more, in which case, the startup of any use of the structure or property will require compliance with all applicable provisions of this development manual, including platting and Development Plan application.
 - D. The approval of a Development Plan shall be effective for a period of eighteen (18) months after the date of formal approval. Following an eighteen (18) month period after the approval of a Development Plan, the Development Plan will be considered invalid. At the discretion of the Director of Planning, the expiration date of an approved Development Plan may be extended an additional twelve (12) months without the need to resubmit through the typical approval process for new Development Plans. Request for extension shall be made by the property owner in writing at least fourteen (14) calendar days prior to the end of the first eighteen (18) month period.

II-3 Platting and Development Plan Procedures

- A. All plats, Development Plans, construction plans and building plans shall be submitted to the Building Inspection Division of the Planning & Zoning Department.
- B. Persons wishing to discuss specific questions in the development process should contact the appropriate department/division, but all formal submittals should be made to the Building Official in order to provide a coordinated review.
- C. In the event that the Building Official is not available, submittals can be made to the City of San Juan Planning and Zoning Director.
- D. Prior to submitting a plat or Development Plan, the developer/owner should consult with the appropriate City staff concerning the proposal. Staff will assist in determining whether the proposed development is generally consistent with City of San Juan standards, plans and policies. City review staff will be available on a regular basis for a meeting with any person wishing to discuss projects in review or proposed for submittal.
- E. The project engineer or architect is encouraged to attend the review meeting in order to directly receive pertinent information regarding the proposed project. This meeting will not provide a full review of any particular project, but will provide the opportunity for a developer, architect or engineer to ask questions regarding City policies, process, plans, and requirements.

- F. Persons wishing to schedule a review meeting should contact the Building Official or the Director of Planning.
- G. Upon submittal, plats, Development Plans, permit applications, building plans, construction plans, and other related items will be reviewed by applicable Director of Planning staff. The Building Inspection Division will coordinate all submittals and returns of marked-up copies. The Building Inspection Division will also coordinate payment of City fees, acceptance of tax certificates, and acceptance of final file copies. The developer shall be responsible for providing copies of plats and Development Plans to the electric, telephone, gas, cable, and solid waste disposal utility companies for review and comment. The developer shall coordinate with each utility company prior to plat or development plan approval to ensure that adequate utility easements are provided to serve the proposed development. In order to prevent delays in obtaining building or construction permits, the developer shall obtain letters from each utility (electric and gas at a minimum) indicating that the utility has reviewed the plat or Development Plan, and that the developer has satisfied the utility's easement requirements. The developer shall provide copies of the utility acceptance letters to the City at the time of permit application. The City shall have the right to refuse issuance of building permits and construction permits if proof of utility company acceptance is not provided to the City.
- H. All plats and Development Plans submitted for review will be on the City's active list for a period of three months from the date of each submittal. After the three-month period, a project may be considered abandoned and may be removed from the City's files. Substantial developer-initiated changes in the project from one submittal to the next that need additional review will require an additional payment equal to one-half of the original review fee.
- I. Following completion of the review process, plats must be submitted to the Planning and Zoning Commission. If a variance is requested, Preliminary Plats will be forwarded to the City Council after going before the Planning and Zoning Commission. Although the City Council will consider the recommendations of the Planning and Zoning Commission, City Council is not required to adhere to those recommendations.
- J. Following completion of the review process, Development Plans can be granted approval by City staff if the Development Plans conform with all applicable requirements of the City. If a variance is requested, upon completion of staff review, Development Plans will be forwarded to the Planning and Zoning Commission and then to City Council for a public hearing. Although City Council will consider the recommendations of the Planning and Zoning Commission, City Council is not required to adhere to those recommendations.

II-4 Building Permits

- A. All building activities within the City of San Juan and adjacent areas subject to its Extraterritorial Jurisdiction (ETJ) shall comply with the City of San Juan Code of Ordinances.
- B. No building or structure shall be erected, added to, or structurally altered until a permit has been issued by a Building Inspector. All applications for such permits shall be in accordance with the requirements of this Chapter, and further, no building permit or certificate of occupancy shall be issued for any building where said construction, addition, or alteration or use thereof would be in violation of any of the provisions of this Chapter unless upon written order of the Zoning Board of Adjustment.
- C. Prior to commencement of any building activities, the owner, developer or contractor shall secure a Building Permit, a site Construction Permit (if applicable) and an Excavation Permit (if applicable), all properly issued by the City of San Juan. Simultaneous construction of public and private improvements may be approved by the Director of Planning in some instances where a written request of sufficient merit, as determined by the Director of Planning, has been made by the applicant. However, without written approval of the Director of Planning, no building or construction permit for private improvements, including but not limited to permits for electrical, mechanical, plumbing, signs, paving, etc. (with the exception of temporary power permits associated with construction), will be issued for any residential or commercial building until all public improvements associated with the development are completed and accepted by the City and until gas and electrical service has been made available to each lot. These public improvements and franchise utilities constitute the basic infrastructure required to serve the development and include construction of streets, sidewalks, drainage, water and sanitary sewer facilities.
- D. Commercial Building Permit applications will not be granted until a Development Plan has been approved and the construction and acceptance of all required public and semi-public improvements (fire lanes, fire lines, fire hydrants and other appurtenances, sidewalks, driveway approaches, drainage facilities, water and sanitary sewer service connections, etc.) as shown on the approved Development Plan. Simultaneous construction of public and private improvements will require written approval of the Director of Planning.
- E. A foundation permit may be issued, on a case-by-case basis, based on the approved Development Plan that adequately addresses the location and elevations of water and sanitary sewer services in relation to the proposed finish floor elevation of the building.
- F. No building construction above the slab may be commenced prior to the construction and approval of all fire lanes, fire lines, fire hydrants and other waterline appurtenances.

- G. Some items of public and semi-public improvements (i.e., sidewalks, driveway approaches, grading and drainage improvements, water and sanitary sewer service connections) may be constructed simultaneously with the building provided a cash escrow is deposited with the City to cover 100 percent of the cost of the improvements. A non-refundable fee will be charged by the City for escrow handling. On cash escrow's where the developer satisfactorily completes all public and semipublic improvements, the City will return the entire amount escrowed (without interest). If the developer fails to complete the project, then the escrowed funds will be retained by the City. The City will either use the funds to complete the public improvements associated with the project, or the City will hold the funds and apply them for public improvements on a future project at the same location. The City shall be entitled to retain all interest earned on the escrowed funds.
- H. Three-party contracts may be considered on a case-by-case basis and are subject to approval by the City Council.
- I. The developer shall coordinate with each utility company prior to plat or development plan approval to ensure that adequate utility easements are provided to serve the proposed development. In order to prevent delays in obtaining building or construction permits, the developer shall obtain letters from each utility (electric and gas at a minimum) indicating that the utility has reviewed the plat or Development Plan, and that the developer has satisfied the utility's easement requirements. The developer shall provide copies of the utility acceptance letters to the City at the time of permit application. The City shall have the right to refuse issuance of building permits and construction permits if proof of utility company acceptance is not provided to the City.
- J. Building Permits shall be valid for a period of six (6) months from the date of permit issuance. That portion of the building activities which is not substantially complete within six (6) months will require a new permit and the remaining building activities must comply with the most current City standards and regulations, unless a variance is granted by the City Council. In cases of large-scale building projects which require longer than six (6) months to complete, the Building Official, upon approval by the Director of Planning, shall be authorized to provide permit extensions which do not require compliance with new building codes.

II-5 Construction Permits

- A. Prior to commencement of any construction activities (paving, drainage, utilities, etc.) the owner, developer or contractor shall secure a Construction Permit properly issued by the City of San Juan. A Construction Permit will be issued only after City requirements have been met.
- B. Three-party contracts may be considered on a case-by-case basis and are subject to approval by the City Council.

- C. Construction must be underway within six (6) months from the date of permit issuance and the improvements must be substantially completed within eighteen (18) months from the date of permit issuance. That portion of the construction which is not substantially complete within eighteen (18) months will require a new permit and the remaining construction must comply with the most current City standards and regulations, unless a variance is granted by the City Council.
- D. Any construction activities involving grading, filling, excavation, or trenching activities, shall also require an Excavation Permit.

II-6 Fire Protection and Regulations

- A. Apartment complexes with 3 or more dwellings will require a sprinkler system.
- B. Staircases in buildings of two story's or greater, to be made of non-combustible materials only.
- C. Knox boxes for any commercial building to be located at every entrance
- D. Multiple-family residential projects having more than 100 dwelling units shall be equipped throughout the two separate and approved fire apparatus access roads.
Exceptions:
 - a. Projects having up to 200 dwelling units shall have not fewer than one approved fire apparatus access road where all buildings, including nonresidential occupancies, are equipped throughout the approved automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.3.1.2.
- E. Multiple-family residential projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus access roads regardless of whether they are equipped with an approved automatic sprinkler system.
- F. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.
- G. Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads.
Exceptions:
 - a. Where there are more than 30 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.

- b. The number of dwelling units on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the fire code official.
- H. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

These regulations set in place are per the 2018 International Fire Code (IFC) Section D106-D107. Any additional information can be located in Appendix D Fire Apparatus Access Roads.

II-7 Excavation Permit

- A. No permittee shall make any excavation for any purpose or construct any lines for conveyance of fuel, water, or minerals on, under, or through the streets and alleys of the city without express permission of the city in writing, and then only in strict compliance with regulations of the city; provided, however, that emergency repairs may be made without such permission when in the good faith opinion of the permittee the delay required to obtain written permission would involve a hazard to person or property.
- B. No grading, filling, excavation, or trenching activities shall be performed within the limits of the City of San Juan except by an unexpired Excavation Permit properly issued by the City. An Excavation Permit will be issued only after the requirements outlined in this development manual and other City requirements have been met. The City of San Juan shall be exempt from this requirement.
- C. In order to apply for an Excavation Permit, the applicant must submit various plans and items as outlined in this document. An Excavation Permit will not be issued until all of the required submittal items have been approved.
- D. The applicant must pay an Excavation Permit fee.
- E. An Excavation Permit will not be issued if the work is deemed to adversely affect drainage on adjacent or other properties, create a traffic safety problem, or be considered a mining operation. Specific use district zoning is required for mining, including such mining as sand and gravel removal.
- F. Excavation within the floodway or floodplain will trigger additional requirements.

- G. Excavation impacting trees is prohibited prior to the approval of a Development Plan for commercial developments. The Development Plan requirement may be waived by the Director of Planning for Excavation activities necessary to improve drainage or for utility work if such activities are not associated with demolition, construction, expansion, or reconfiguration of a commercial building, fire lane, commercial parking lot, outdoor storage area, or outdoor area used for business operations.
- H. An Excavation Permit is not required for the addition of topsoil or similar material used to spread over grassed areas in average depths of less than two inches.
- I. The contractor shall establish erosion control devices in accordance with the current Texas Pollution Discharge Elimination System (TPDES) requirements. Texas Commission on Environmental Quality (TCEQ) requirements must be followed by the developer and contractor.
- J. Grading, filling, excavating, and/or trenching activities must be underway within six (6) months from the date of permit issuance and must be substantially completed within twelve (12) months from the date of permit issuance. The portion of the work which is not substantially complete within twelve (18) months will require a new permit and the remaining work must comply with the most current City standards and regulations, unless a variance is granted by the City Council.
- K. All excavations will be followed by inspection done by the City of San Juan.

II-8 Driveway Permits

- A. To secure a permit to construct a private driveway or revise an existing driveway, the applicant shall contact the Planning Department, at which time details of the permit will be initiated. Design layout and construction details shall be submitted to the Planning Department for review. The following information shall be provided by the applicant prior to the processing of the permit:
 - a. Vicinity map showing location of property respect to arterial streets, railroads, etc.;
 - b. Map showing streets, alleys, right-of-way, and all utilities, together with the width and location of existing driveways, on both sides of the street, for a distance of 150 feet beyond property lines;
 - c. Description of the proposed use of the property;
 - d. Location and geometric of proposed access points and the use of each point (i.e. entrance only, exit only or entrance and exit);
 - e. Location and size of all existing and proposed buildings;
 - f. Proposed parking arrangements and number of spaces; and
 - g. Location and size of all permanent signs.

When:

- 1. The permit has been prepared; and

2. A statement agreeing to comply with its terms, design and construction requirements has been signed by the applicant and Code Enforcement Officer –

The permit shall become valid

Exception: if access or exit driveway is to be constructed on a State or Federal Highway, the Texas Department of Transportation shall also approve and sign the permit before it becomes valid. Once the applicant's permit has been approved by the City and the Texas Department of Transportation, and received by the applicant, he or she may begin construction as per permit.

All permits for the use of access drives shall be considered limited use permits and must be reapplied for upon every change in [use and] a certificate of occupancy for commercial and industrial property will not be made until the access drive permits for that property have been issued.

- B. No driveway shall be constructed within the limits of the City of San Juan and ETJ, except by an unexpired Driveway Permit properly issued by the City. A Driveway Permit will be issued only after the requirements outlined in this development manual and other City requirements have been met. The City of San Juan shall be exempt from this requirement.
- C. In order to apply for a Driveway Permit, the applicant must submit various plans and items as outlined in this document. A Driveway Permit will not be issued until all of the required submittal items have been approved. The applicant must pay a Driveway Permit fee. A Driveway Permit will not be issued if the driveway is deemed to create a traffic problem or a potential safety problem. If granted, a Driveway Permit shall be effective for a period of thirty (30) days from the date the permit is issued. The driveway must be constructed within the thirty (30) day period, or a new permit will be required. The contractor shall construct all City permitted driveways within five (5) days of the saw cut and removal of the existing pavement. In addition to the requirements described above, access to state-controlled highways shall require State permits through the Texas Department of Transportation (TxDOT).
- D. Permit fees shall be based on the total cost of construction of curb, gutter and parking area. Permit fees are \$10.00 minimum, plus \$3.00 for every \$1,000.00 of construction or a fractional part of each \$1,000.00 cost of construction.

II-9 Sign Permits

- A. No sign or advertising structure shall be erected, relocated, posted, painted or maintained within the City by any person, firm or corporation without first obtaining a permit therefor, properly issued by the City Building official, except as may otherwise be provided in the City's sign ordinance.

- B. Any person applying for a sign permit must show proof of property damage and public liability insurance in an amount not less than ten (10) times the construction cost of the sign and containing standard provisions that the sign contractor or property owner are insured against claims by third persons for negligence of the contractor or owner or their agents, officers, or employees in the construction, erection, or maintenance of the proposed sign. Electrical signs shall also require electrical permits. Permits for advertising signs (billboards) shall also require approval of the city council.
- C. No sign permit shall be issued except after receipt of an application prescribed by the building official and showing the sign location, size, type, height, materials of constructions, surface area and such other information as the building official shall require. When required by the building official, plans shall be prepared by a registered professional engineer or architect.
- D. The fee for all permitted signs shall be as provided for in the fee schedule which can be obtained from the City of San Juan Planning Department. When a sign is erected, placed or maintained or work started thereon before obtaining a sign permit, there shall be a late fee equal to twice the amount of the sign permit fee. The late fee does not excuse full compliance with the sign code provisions.
- E. A permit for a sign shall expire if the work is not started within sixty (60) days or is not completed within one hundred and twenty (120) days after work has commenced. A new permit shall be required to replace any permit which has expired. Any permit issued in conflict with the provisions of this section is void.

II-10 Development of Land Served by Substandard Public Improvements (Not Served by Public Improvements)

- A. General Provisions: This section deals with lots or tracts that are not served by public improvements or that are served by one or more existing substandard public improvements including water, sanitary sewer, streets, sidewalks or storm drainage. Such developments must meet these required minimum standards in order to obtain a building permit for a new building or if an addition is being made to an existing building. In reviewing the required Development Plan, the City staff will note areas that fail to meet minimum standards. If in the opinion of the City staff, on a case-by-case basis, these minimums are not adequate, more extensive improvements may be required, as necessary. Additionally, each of the lots or tracts found within the City Limits must follow all City master plans for streets, utilities, parks and other public improvements. If the lots or tracts are found to be outside the City Limits, but within the City's ETJ, then the development must conform to the standards set by the County.
- B. Paving: Development must be served by minimum street right-of-way as determined by the adopted Thoroughfare Plan shall be required.
- C. Water Lines: If development is to occur on land which is not currently served or which is currently served by sub-standard water utilities, the owner, developer or applicant

may be required to extend the existing system or improve the existing system to current requirements.

- D. Fire protection: Inadequate or substandard water line size may require line upgrades and additional fire hydrants, or other measures may be needed in order to provide adequate fire protection.
- E. Sanitary Sewers: If improvement is to occur on land that is not currently served or that is served by substandard sanitary sewer utilities, the owner, developer, or applicant may be required to extend the existing system or improve the existing system to current requirements.
- F. Septic Systems: Application for construction and operation of a septic system must be submitted to City of San Juan Health Department if located within the City Limits, and to both the City of San Juan Health Department and Hidalgo County Health Department if located within the County, but inside the City of San Juan ETJ. Application, fees, tests, design and on-site inspections must be submitted and coordinated with the City of San Juan Health Department, and both the City and Hidalgo County Health Department if located within the City of San Juan ETJ. The tract of land must consist of one (1) acre or more to qualify for a septic system. If the project includes a septic system, prior to issuance of a Certificate of Occupancy by the City of San Juan, the City must be in receipt of the following:
 - 1. Approved septic system permit by Hidalgo County
 - 2. Approved design by Hidalgo County
 - 3. Approved final inspection by Hidalgo County

Septic systems will not be permitted within the City limits of the City of San Juan for Single-Lot Single-Family Residential where any part of the platted lot or tract is within 100 feet of an existing City sanitary sewer line, unless otherwise approved by the City of San Juan. Septic systems will not be permitted within the City limits of the City of San Juan for Multi-Lot Residential or Non- Residential uses (including Multi-Family) where any part of the platted lot or tract is within 1,000 feet of an existing City sanitary sewer line, unless otherwise approved by the City of San Juan. The requirements to connect to the City's sewer system may be enforced even if the improvements must include a lift station, force main or both. The requirement will not be enforced in instances where the City of San Juan determines that the connection is impractical.

- G. Drainage: Storm water detention may be required for any development at the discretion of the City of San Juan or Director of Planning. All site drainage resulting in concentrated flow must discharge to an adequate outfall condition capable of conveying the proposed runoff for a 10-year rainfall event and detaining for a 50-year rainfall event. Concentrated flow shall discharge from the site to public right-of-way or a drainage easement. In the event that a drainage easement cannot be obtained from

adjacent property owners, the developer shall take measures to, as closely as practical, simulate pre-existing drainage flow rates and patterns.

II-11 Abandonment of Real Property

A. General Provisions: An Abandonment Ordinance is required for abandonment of any public right-of-way. Any easement may be abandoned with a Certificate of Abandonment in accordance with paragraph (c) below. Requests for abandonment shall be made in writing to the Director of Planning. The City will file with the County all documents that are required to record the transaction. An application fee must accompany all requests and the Hidalgo County filing fees shall be submitted with a separate check. If applicable, fair market value will be established by the City based on information acceptable to the City. Should appraisals be required, the cost shall be paid in advance by the applicant? Any relocation, adjustment or other construction shall be the financial responsibility of the applicant. The following information must be provided with any request for abandonment of real property by the City of San Juan:

1. Metes and bounds description of the property to be abandoned
2. Exhibit showing the property to be abandoned
3. Letters of Release from utility companies, if applicable
4. Application fee made payable to City of San Juan
5. Filing fee made payable to Hidalgo County Clerk

B. Additional Requirements for Certain Abandonments:

1. Abandonment of an improved street or alley:
 - a. Fair market value of the real property and the improvements that are to be removed or converted to private use
 - b. Dedication of easements for any facilities that are to remain
2. Abandonment of street or alley right-of-way (unimproved):
 - a. Fair market value of the real property
 - b. Dedication of easements for any facilities that are to remain
3. Abandonment of a part of an occupied easement where the reduction in easement will adversely affect the operation and maintenance of the facility:
 - a. Fair market value of the released area

- b. Compensation for detriment to the remainder
- 4. Abandonment of an occupied easement in exchange for another easement at the request of the property owner:
 - a. Fair market value of the difference in value if the abandoned easement is greater than the replacing easement
 - b. Escrowed funds for the cost to relocate and/or reconstruct any streets, drainage improvements, utilities, or other facilities (unless otherwise waived by the City)

To abandon an easement in exchange for an equivalent easement, or when it is determined that an easement is no longer necessary, a Certificate of Abandonment, or such other documents as may be legally required, shall be filed of record with Hidalgo County. This certificate shall be filed only after all information for abandonment of an easement on real property has been submitted and a final approval for abandonment has been made by the Director of Planning.

II-12 Parkland Dedication

- A. Purpose: The City of San Juan has adopted this ordinance to provide recreational areas in the form of neighborhood parks as a function of subdivision development within the City. The City Council has declared that recreational areas in the form of neighborhood parks are necessary and in the public welfare, and that the only adequate procedure to provide for same is by integrating such a requirement into the procedure for planning and developing property or subdivisions in the City, whether such development consists of new construction on vacant land or rebuilding and remodeling of structures on existing residential property. Neighborhood parks are those parks providing a variety of outdoor recreational opportunities and within convenient distances from a majority of the residences to be served thereby. The primary cost of neighborhood parks should be borne by the ultimate residential property owners who, by reason of the proximity of their property to such parks, shall be the primary beneficiaries of such facilities.
- B. General Requirements: Whenever a final plat is filed of record with the County Clerk of Hidalgo County for development of a residential area in accordance with the planning and zoning ordinances of the city, such plat shall contain a clear fee simple dedication of an area of land to the city for park purposes, which area shall equal one (1) acre for each one hundred thirty-three (133) proposed dwelling units. Any proposed plat submitted to the city for approval shall show the area proposed to be dedicated under this division. The required dedication of this section may be met by a payment of money in lieu of land when permitted or required by the other provisions of this section. The City Council declares that development of an area smaller than one-half

(1/2) of one (1) acre for public park purpose is impractical. Therefore, if fewer than sixty-six (66) units are proposed by a plat filed for approval, the developer shall be required to pay the applicable cash in lieu of land amount provided by Sec. 3.11 D “Money in Lieu of Land”, rather than to dedicate any land area. No plat showing a dedication of less than one-half (1/2) of one (1) acre shall be approved. In instances where an area of less than five (5) acres is required to be dedicated, the City shall have the right to accept the dedication for approval on the final plat, or to refuse same, after consideration of the recommendation of the planning and zoning commission and to require payment of cash in lieu of land in the amount provided by Sec. 3.11 D “Money in Lieu of Land”, if the City determines that sufficient park area is already in the public domain in the area of the proposed development, or if the recreation potential for that zone would be better served by expanding or improving existing parks. The dedication required by this division shall be made by filing of the final plat or contemporaneously by separate instrument unless additional dedication is required subsequent to the filing of the final plat. If the actual number of completed dwelling units exceed the figure upon which the original dedication was based, such additional dedication shall be required, and shall be made by payment of the cash in lieu of land amount provided by Sec. 3.11 D “Money in Lieu of Land,” or by the conveyance of an entire numbered lot to the city.

- C. Prior Dedication: At the discretion of the city, any former gift of land to the city may be credited on a per-acre basis toward eventual land dedication requirements imposed on the donor of such lands. The city council shall consider the recommendation of the planning and zoning commission in exercising its discretion under this division.
- D. Money in Lieu of Land: Subject to the veto of the City Council, a landowner responsible for dedication under this division may elect to meet the requirements of Sec. 3.11 B “General Requirements” in whole or in part by a cash payment in lieu of land, in the amount set forth in Sec. 3.11 D “Money in Lieu of Land.” Such payment in lieu of land shall be made at or prior to the time of final plat approval. The City may from time to time decide to purchase land for parks in or near the area of actual or potential development. If the City does purchase parkland in a park zone, subsequent parkland dedications for that zone shall be in cash only and calculated to reimburse the City’s actual cost of acquisition and development of such land for parks. The cash amount shall be equal to the sum of (1) the average price per acre of such land, and (2) the actual cost of adjacent streets and on-site utilities, or an estimate of such actual cost provided by the City of San Juan. Once the City has been reimbursed entirely for all such parklands within a park zone, this subsection shall cease to apply, and the other sections of this subsection shall again be applicable. To the extent that Sec. 3.11 D “Money in Lieu of Land” is not applicable, the dedication requirement shall be met by a payment in lieu of land at a per-acre price set from time to time by resolution by the city council, sufficient to acquire land and provide for adjacent streets and utilities for a neighborhood park to serve the park zone in which such development is located. Unless changed by the City Council, such per-acre price shall be computed as provided in the City’s fee schedule which can be obtained from the City of San Juan Planning

Department. Cash payments may be used only for acquisition or improvement of a neighborhood park located within the same zone as the development.

- E. Comprehensive Plan Considerations: Land shown on a comprehensive plan as being suitable for development of the City for a major recreational center, school site, park, or other public use, shall be reserved, for a period of one (1) year after the preliminary plat is approved by the City if within two (2) months after such approval the City Council advises the subdivider of its desire to acquire the land or of the interest of another government unit to acquire the land, for purchase by the interested governmental authority at land appraisal value at the time of purchase. A failure by the City Council to notify the subdivider shall constitute a waiver of the right to reserve the land. Any waiver of the right to reserve the land shall no longer be effective if the preliminary plat shall expire without adoption of a final plat.
- F. Special Fund, Right to Refund: There is hereby established a special fund for the deposit of all sums paid in lieu of land dedication under this section or any preceding section, which fund shall be known as the parkland dedication fund. The City shall account for all sums paid in lieu of land dedication under this section with reference to the individual plats involved. Any funds paid for such purposes must be expended by the city within three (3) years from the date received by the City for acquisition of development of a neighborhood park as defined herein. Such funds shall be considered to be spent on a first in, first out basis. If not so expended, the owners of the property on the last day of such period shall be entitled to a pro rata refund of such sum, computed on a square footage of area basis. The owners of such property must request such refund within one (1) year of entitlement, in writing, or such right shall be barred.
- G. Additional Requirements, Definitions: Any land dedicated to the City under this division must be suitable for park and recreation uses. The following characteristics of a proposed area are generally unsuitable:
 - 1. Any area primarily located in the one hundred (100) year floodplain.
 - 2. Any areas of unusual topography or slope which renders same unusable for organized recreational activities.

Drainage areas may be accepted as part of a park if the channel is constructed in accordance with City of San Juan standards, and if no significant area of the park is cut off from access by such channel.

II-13 Variances and Exceptions

- A. The Planning and Zoning Commission may recommend variances from this Chapter to the City Commission solely in those cases when in its opinion undue hardships will result from requiring strict compliance. In considering a variance, the Planning and Zoning Commission shall prescribe only conditions that it deems necessary or desirable in the public interest. In making the finding required below, the Planning and Zoning

Commission shall take into account the nature of the proposed subdivision and the probable effect of such variance upon traffic conditions and upon the public health, safety, convenience, and welfare in the vicinity. No variance can be considered unless the Planning and Zoning Commission finds:

- a. That there are special circumstances or conditions affecting the configuration or other factor of the land involved such that the strict application of the provisions of this Chapter would deprive the applicant of the reasonable use of his/her land;
 - b. That the variance is necessary for the preservation and enjoyment of the legal property rights of its owner;
 - c. That the granting of the variance will not be detrimental to the public health, safety, or welfare or injurious to the legal rights other property owners enjoy in the area; and
 - d. That the granting of the variance will not prevent the orderly subdivision of other land in the area in accordance with the provisions of this Code. Such findings of the Planning and Zoning Commission together with the specific facts upon which such findings [are] based shall be incorporated into the official minutes of the Planning and Zoning Commission meeting at which such variance is considered. Variances may be granted only when in harmony with the general purpose and intent of this Code so that the public health, safety, and welfare may be secured and substantial justice done. Financial hardship to the subdivider, standing alone, shall not constitute undue hardship.
 - e. The City Commission shall have the ultimate power to grant or reject variances upon receipt of a recommendation from the Planning and Zoning Commission.
- B. Variances requested on a plat or Development Plan will be scheduled for the Planning and Zoning Commission after staff's review. After the Planning and Zoning Commission hearing, variance requests will be scheduled for a City Council hearing.
- C. The city commission may authorize a variance to any restriction set forth in this article. Before granting a variance, the city commission must determine that a literal enforcement of this article would create an unnecessary hardship or a practical difficulty on the applicant, that the situation causing the unnecessary hardship or practical difficulty is unique to the affected property and is not self-imposed, that the variance will not injure and will be wholly compatible with the use and permitted development of adjacent properties, and that the granting of the variance will be in harmony with the spirit and purpose of this article. A person may request a variance from this article by filing the request with the city secretary.
- D. An administrative fee will be charged by the City for processing variance requests.

- E. Where the City Council, in its judgment, finds that hardship or practical difficulties may result from strict compliance with the regulations outlined in this development manual, and/or that the purpose of the regulations may be served to a greater extent by an alternative proposal, the City Council may approve exceptions to these subdivision regulations so that substantial justice may be done and the public interest secured, provided that such exception shall not have the effect of nullifying the intent and purpose of the regulations. In approving exceptions, the City Council may require such conditions and stipulations that will, in its judgment, secure substantially the objectives of the standards of the regulations.
- F. A petition for any such exception shall be submitted in writing by the owner/agent, four weeks prior to any council meeting, to the Director of Planning. The request shall state fully the grounds for the application and all facts relied upon by the applicant. All supporting exhibits, fees and documents must be included with the application. Incomplete applications will not be processed until all documents are received by staff.

II-14 Tax Certificate Requirement

- A. A current Tax Certificate must be included with all plat submittals, Development Plan submittals, Construction Permit applications, and Building Permit applications. All taxes due to the City of San Juan must be current at the time of approval of plats and Development Plans and at the time of issuance of construction and building permits. A current, original (official) Tax Certificate must be provided to the City prior to filing of any Final Plat, Replat, or Conveyance Plat.

II-15 Title Opinion Requirement

- A. To provide evidence that the owner has adequate title and authority to convey dedication, a Title Opinion must be submitted for all plats or actions that include dedication of land or easements to the City. Said Title Opinion must be deemed to be satisfactory by the City Attorney and will be at the sole expense of the owner. In the event there is one or more lien holder(s), written approval by the lien holder(s) must be provided to show agreement with the plat or dedication. Dedication along state routes shall be by warranty deed.

II-16 Phasing Development

- A. Development may be performed in phases by establishing phase lines and/or lot lines on a Development Plan. Each phase shall be capable of standing alone, as development occurs, and shall not be dependent on future construction associated with separate phases to meet City standards or requirements. All required public, semipublic and private improvements, as defined by this development manual, (roads, turn lanes, deceleration lanes, traffic control devices, sidewalks, screening walls, etc.), shall be designed and constructed with each phase in conformance with all applicable City standards.

II-17 Traffic Impact Analysis Requirement

When a proposed development is estimated to generate more than 1,000 vehicle trips per day, a traffic impact analysis shall be required with the submittal of a preliminary plat application or a Development Plan. The traffic impact analysis shall be prepared in accordance with accepted engineering practices. The purpose of the traffic impact analysis is to determine the need for traffic mitigation measures which may include, but are not limited to, dedication of additional right-of-way, construction of turning lanes, or per construction of traffic control facilities. Any mitigating measures required shall be the responsibility of the developer, unless a cost-sharing agreement is approved by the City.

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SECTION III – SUBMITTAL AND PLAN REQUIREMENTS

III-1 Submittal Requirements

- A. All submittals must adhere to the specified requirements and be submitted to all relevant entities, including external ones. The City of San Juan will not assume responsibility for delivering or sending submittals to external entities. Submittal documents that lack necessary items or fail to meet the submittal standards outlined in this development manual may be subject to rejection.
- B. The following items shall be submitted to the City Planning Department and to the City of San Juan:
1. P&Z Submittals for Plats and Development Plans:
 - Submit directly to the Planning Department
 - i. Preliminary Plat Plans
 - a. Six (6) Size “D” (24”x36”)
 - ii. Plats - (24”x36”)
 - iii. Drainage Report for Review
 - iv. PDF copy of all drawings & Drainage Report
 - v. Geotechnical Report for Record
 - vi. 4% Testing and Inspection Fee must be paid prior to final submittals.
 2. Final Submittals for Construction Plans, Building Plans, Tree Surveys, Etc.:
 - Submit directly to the Planning Department
 - i. Civil Construction Plans
 - a. Six (6) Size “D” (24”x36”)
 - ii. Approved Drainage Report by HCDD#1
 - iii. City Fees and Current Tax Certificates
 - iv. AutoCAD dwg files, version 2020 or later, showing all line work and text on USB.
 - v. PDF copy of all drawings & Drainage Report, signed, sealed and dated.
 - vi. Tax certificates to be submitted at time of final submittal.
 - vii. Park fees are due at time of final submittal. Reference city ordinance Appendix A Unified Development Code Chapter 3 Subdivision Regulations Article 3 Procedures and Requirements Section 3 Design Standards Subsection i Parks and Playgrounds.
 - viii. Escrow for expansion of streets or a letter of credit to be submitted.

*Note: Hard copies and electronic media can be delivered by hand delivery, courier, FedEx, UPS, US Postal Service, etc. Electronic files can also be sent by email, or USB. Please call or check the City of San Juan’s web site for current mailing address and email.

NOTE: ALL DEVELOPMENT PLANS, PLATS, CONSTRUCTION PLANS, AND CITY FEES, ARE DUE AT THE TIME OF INITIAL SUBMITTAL. ALL FEES AND TAX CERTIFICATES SHALL BE SUBMITTED DIRECTLY TO THE CITY (NOT THROUGH THE CITY OF SAN JUAN).

III-2 City of San Juan Signature Block

CITY OF SAN JUAN
APPROVAL BY PLANNING AND ZONING COMMISSION:

I, _____, CHAIRMAN OF THE PLANNING AND ZONING COMMISSION, HEREBY CERTIFY THAT THE SUBDIVISION PLAT CONFORMS TO REQUIREMENTS OF THE SUBDIVISION REGULATION OF THE CITY.

CHAIRMAN, PLANNING & ZONING COMMISSION

APPROVED DATE:

APPROVAL BY CITY COMMISSION:

APPROVED AND ACCEPTED BY THE CITY COMMISSION OF THE CITY OF SAN JUAN, TEXAS, ON THIS DAY OF _____, 20____.

MAYOR

ATTEST: CITY SECRETARY

APPROVAL BY HIDALGO COUNTY IRRIGATION DISTRICT #2

THIS PLAT IS HEREBY APPROVED BY THE HIDALGO COUNTY IRRIGATION DISTRICT #2 ON THIS, THE _____ DAY OF _____, 20____.

NO IMPROVEMENT OF ANY KIND (INCLUDING WITHOUT LIMITATION, TREES, FENCES AND BUILDINGS) SHALL BE PLACED UPON HIDALGO COUNTY IRRIGATION DISTRICT #2 RIGHTS-OF-WAY OR EASEMENTS.

PRESIDENT – HCID #2

SECRETARY – HCID #2

DATE

APPROVAL BY HIDALGO COUNTY DRAINAGE DISTRICT #1

HIDALGO COUNTY DRAINAGE DISTRICT #1 HEREBY CERTIFIES THAT THE DRAINAGE PLANS FOR THIS SUBDIVISOIN COMPLY WITH THE MINIMUM STANDARDS OF THE DISTRICT ADOPTED UNDER TEXAS WATER CODE SEC. 49.211 ©. THE DISTRICT HAS NOT REVIEWED AND DOES NOT CERTIFY THAT THE DRAINAGE STRUCTURES DESCRIBED ARE APPROPRIATE FOR THE SPECIFIC SUBDIVISION, BASED ON GENERALLY ACCEPTED ENGINEERING. IT IS THE RESPONSIBILITY OF THE DEVELOPER OF THE SUBDIVISOIN AND ITS ENGINEER TO MAKE THSE DETERMINATIONS.

BY: HIDALGO COUNTY DRAINAGE DISTRICT NO. 1

III-3 Single-Family & Multi-Family Plan Requirements

- A. This section applies to individual single-family construction projects involving infill development. Single-family construction projects which involve multiple lots shall comply with the Multi-Lot Single-Family Residential Development Plan criteria. The following is a checklist for items, which shall be included, as applicable, on each Single-Lot Single-Family Residential and Multi-Family Residential Development Plan submitted for review:
1. A title block located at the bottom right-hand side of the page to include project's name, addition's name, lot, block and phase designations, total acreage, zoning classification and address if available
 2. A summary table to include total land area (square feet / acres) and the building area (square feet)
 3. City of San Juan signature block as per Section III-2
 4. North arrow
 5. Date (all revision dates should also be indicated)
 6. Location map (at legible scale)

7. Sheet size of 22”X34”
8. Scale (must be legible)
9. Name, address and phone number of contact persons of developer/owner and Engineer of Record (or Architect of Record)
10. Distances and bearings of the lot including total land area and subdivision lot & block designation. The entire platted lot or tract shall be shown on the Development Plan
11. Iron rods set or found and shown on the plan
12. Contours with intervals of five feet (5') or less or spot elevations indexed to the NAD 1983 State Plane Coordinate System using the appropriate horizontal projection for the applicable zone, and indexed to the NAVD 1988 vertical datum
13. Building setback lines
14. Zoning of subject lot and adjoining property
15. Easements, deed restrictions or encumbrances which impact development of the lot
16. Control of access lines, corner clips and clear vision areas
17. Streets, alleys and easements adjacent to the site showing right-of-way and limits of paving
18. Existing and proposed streets, driveways and sidewalks
19. Existing and proposed water and sanitary sewer utilities and services
20. Fire protection including fire hydrants, fire lanes, fire lines and related devices, if applicable
21. Franchise utilities serving the property
22. Finished floor elevation. The builder is responsible to furnish the City with a form survey (surveyor certification of elevation and location) prior to construction of a foundation.
23. Requested variances from City requirements shall be clearly listed on the face of the Development Plan
24. All Development Plans must include a note with the following wording:

"Notice: Approval of this Development Plan does not entitle the developer to deviate from City zoning, development policy, construction standards, or building standards, except for those variances which are listed on the Variance Table provided on this Development Plan. All other deviations shown on the Development Plan, whether deviations from City zoning, City development requirements, or City design standards, are not approved and the developer shall be required to seek official variance approval or provide a conforming, substantially similar, alternative for staff review prior to approval of any construction or building permits."

- B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Single-Lot Residential Development Plan submitted for review:
1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Development Plan.
 2. Tree Survey
 3. Tree Preservation and Mitigation Plan (if applicable)

III-4 Non-Residential or Commercial Plan Requirements

- A. The following is a checklist for items, which shall be included, as applicable, on each Non-Residential (Commercial) Development Plan submitted for review:
1. A title block located at the bottom right-hand side of the page to include project's name, addition's name, lot, block and phase designations, total acreage, zoning classification and address if available.
 2. A summary table to include total land area (square feet / acres) and the building area (square feet)
 3. City of San Juan signature block as per Section III-2
 4. North arrow
 5. Date (all revision dates should also be indicated)
 6. Location map (at legible scale)
 7. Sheet size of 22"X34"
 8. Scale (must be legible)

9. Name, address and phone number of contact persons of developer/owner and engineer.
10. Drainage Reports for projects within the City of San Juan and/or ETJ shall be reviewed by The City of San Juan Planning and Engineering Department prior to submittal to the Hidalgo County Drainage District No. 1 (HCDD#1). A copy of the Approved Drainage Report by HCDD#1 will be required for Final Approval.
11. Distances and bearings of the lot including total land area, subdivision lot & block designation and phase lines (if any). The entire platted lot or tract shall be shown on the Development Plan.
12. Iron rods set or found and shown on the plan.
13. Existing contours with intervals of two feet (2') or less or spot elevations indexed to the NAD 1983 State Plane Coordinate System using the appropriate horizontal projection for the applicable zone and indexed to the NAVD 1988 vertical datum.
14. Building setback lines.
15. Zoning of subject lot and adjoining property
16. Easements, deed restrictions or encumbrances which impact development of the lot.
17. Control of access lines, corner clips and clear vision areas.
18. Streets, alleys and easements adjacent to the site showing right-of-way and limits of paving.
19. Existing and proposed streets, driveways, fire lanes, sidewalks, and parking areas.
20. Existing and proposed water and sanitary sewer utilities and services.
21. Fire protection including fire hydrants, fire lanes, fire lines and related devices, if applicable.
22. Landscape and open space areas
23. Franchise utilities serving the property
24. Finished floor elevations. The builder is responsible to furnish the City with a form survey (surveyor certification of elevation and location) prior to construction of a foundation.
25. Requested variances from City requirements shall be clearly listed on the face of the Development Plan

26. Location of all proposed freestanding signage.

27. All Development Plans must include a note with the following wording:

"Notice: Approval of this Development Plan does not entitle the developer to deviate from City zoning, development policy, construction standards, or building standards, except for those variances which are listed on the Variance Table provided on this Development Plan. All other deviations shown on the Development Plan, whether deviations from City zoning, City development requirements, or City design standards, are not approved and the developer shall be required to seek official variance approval or provide a conforming, substantially similar, alternative for staff review prior to approval of any construction or building permits."

B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Non-Residential (Commercial) Development Plan submitted for review:

1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Development Plan.
2. Preliminary site improvement plans/exhibits prepared by a Texas Licensed Professional Engineer (including grading, drainage, water, and sanitary sewer)
3. Preliminary Landscape Plan
4. Tree Survey
5. Preliminary Tree Preservation and Mitigation Plan (if applicable)

III-5 Preliminary Plat Plan Requirements

A. The following is a checklist for items, which shall be included, as applicable, on each Preliminary Plat submitted for review:

1. A title block located at the bottom right-hand side of the page to include project's name, addition's name, lot, block and phase designations, total acreage, zoning classification and address if available.
2. A summary table to include (as applicable):
 - a. Non-Residential: total land area (square feet / acres) and the building area (square feet) for Non-Residential developments

- b. Residential: total land area (square feet / acres), land area per phase (square feet / acres), total number of lots and number of lots per phase, minimum lot size (square feet / acres), minimum dwelling size (square feet), and density per acre.
3. City of San Juan signature block as per Section III-2
4. North arrow
5. Date (all revision dates should also be indicated)
6. Location map (at legible scale)
7. Sheet size of 24"x 36"
8. Scale (must be legible)
9. Name, address and phone number of contact persons of developer/owner and engineer and/or surveyor
10. Iron rods set or found and shown on the plan
11. Contours with intervals of two feet (2') or less or spot elevations indexed to the NAD 1983 State Plane Coordinate System using the appropriate horizontal projection for the applicable zone, and indexed to the NAVD 1988 vertical datum
12. Abstract(s) and Survey(s) of subject tract
13. Abstract and Survey lines
14. Boundary line, accurate in scale, of the subject tract
15. Building setback lines
16. The layout and approximate dimensions of proposed lots, blocks, etc.
17. Lot number, block letter designations, and square footage / acreage of each lot
18. Zoning of subject property and adjoining property
19. The names of adjacent subdivisions and/or the names of record owners of adjoining parcels of unplatted land
20. Designation of boundaries of municipalities, counties, and special districts

21. Existing and proposed streets and alleys including widths of right-of-way and pavement, street names, and any proposed dedication of right-of-way in accordance with the requirements of the Thoroughfare Plan
 22. Easements, deed restrictions or encumbrances
 23. Control of access lines, corner clips and clear vision areas
 24. Median openings, turning lanes, acceleration and deceleration lanes
 25. For residential developments, park dedication provisions are to be addressed by the Park Board prior to approval of the preliminary plat. The park dedication agreement shall be noted on the face of the plat with the approval date.
 26. All land proposed for public use dedication or to be reserved for the common use of all property owners, together with conditions or limitations of such use. Such reservations and dedications must be identified with a lot and block designation except street and alley rights-of-way. Right-of-way dedication square footage and acreage must be listed on the plan.
 27. Other features which impact the subject property including, but not limited to, buildings, cemeteries, parks, landfills and monuments
 28. Phase lines must be clearly delineated, with improvements capable of standing alone as development occurs and not depending on future construction to meet City standards or requirements.
 29. Variances from this development manual that may be requested shall be listed on the face of the plat.
- B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Preliminary Plat submitted for review:
1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Preliminary Plat.
 2. A copy of an approved Development Plan or a copy of a Development Plan to be considered by the City
 3. Preliminary site improvement plans/exhibits prepared by a Texas Licensed Professional Engineer (including grading, drainage, water, and sanitary sewer).
 4. Preliminary Landscape Plan

III-6 Final Plats, and Replats Requirements

- A. The following is a checklist for items, which shall be included, as applicable, on each Final Plat and Replat submitted for review:
1. A title block located at the bottom right-hand side of the page to include project's name, addition's name, lot, block and phase designations, total acreage, zoning classification and address if available.
 2. A summary table to include (as applicable):
 - a. Non-Residential: total land area (square feet / acres), total number of lots, minimum lot size (square feet / acres)
 - b. Residential: total land area (square feet / acres), total number of lots, minimum lot size (square feet / acres), minimum dwelling size (square feet), and density per acre
 3. City of San Juan signature block as per Section III-2
 4. North arrow
 5. Date (all revision dates should also be indicated)
 6. Location map (at legible scale)
 7. Sheet size of 22”X34”
 8. Scale (must be legible)
 9. Name, address and phone number of contact persons of landowner and surveyor
 10. Location of corner pins and monuments, including description and indication of whether found or set
 11. Abstract(s) and Survey(s) of subject tract
 12. Abstract and Survey lines
 13. Zoning of subject property and adjoining property
 14. The names of adjacent subdivisions and/or the names of record owners of adjoining parcels of unplatted land
 15. Designation of boundaries of municipalities, counties, and special districts

16. Boundary line, accurate in scale and with exact distances and bearings, of the subject tract and each lot within the subdivision including exact acreage and square footage per lot
17. Designations of lots and blocks within the subdivision
18. Metes and bounds description of the subdivision, with exact acreage, in reference to the deed records of the County, including the volume and page of the deed for the land being platted
19. Drainage Reports for projects within the City of San Juan and/or ETJ shall be reviewed by The City of San Juan Planning and Engineering Department prior to submittal to the Hidalgo County Drainage District No. 1 (HCDD#1). A copy of the Approved Drainage Report by HCDD#1 will be required for Final Approval.
20. Copy of Approved Drainage Report by Hidalgo County Drainage District.
21. Building setback lines
22. Existing and proposed street and alley right-of-way and access easements, indicating street names, right-of-way or easement widths, and curve data. Any proposed dedication of right-of-way, including right-of-way dedication square footage and acreage, in accordance with the requirements of the Thoroughfare Plan.
23. Easements, deed restrictions or encumbrances. A note regarding responsibility for maintenance shall be included for all drainage easements
24. Control of access lines, corner clips and clear vision areas
25. All land proposed for public use dedication or to be reserved for the common use of all property owners, together with conditions or limitations of such use. Such reservations and dedications must be identified with a lot and block designation except street and alley rights-of-way.
26. Right-of-way and public property to be abandoned should be identified on the plat, but information being provided separately as required for the creation of an abandonment ordinance.
27. The 100-year flood plain per current FEMA Flood Insurance Rate Map (FIRM), if applicable, shall be delineated. If the floodplain is not mapped, the developer is responsible for making this determination using a FEMA approved method.
28. Other features which impact the subject property including, but not limited to, buildings, cemeteries, parks, landfills, and monuments.

29. For all residential development, the park dedication shall be finalized at the time of approval of the final plat including all dedications and/or fees to be paid at this time. The park dedication agreement, including the approval date, must be noted on the face of the plat.
 30. Variances from this development manual shall be listed on the face of the plat.
 31. Certification by a Registered Professional Land Surveyor (R.P.L.S.), registered in the State of Texas, to the effect that the plan represents a survey made by him or under his direct supervision and that all the monuments and corner pins shown exist and are correctly described
 32. An Owner's Certificate of Dedication of all streets, alleys, parks, easements and other public ways, signed and acknowledged before a notary public by the owner, trustee(s) or person(s) duly authorized to sign the plat. This will include any lien holder(s) on the property.
 33. All plats must include the following wording:

“Notice: Selling a portion of this addition by metes and bounds is a violation of the city Subdivision Ordinance and State platting statutes and is subject to fines and withholding of utilities and building permits.”
- B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Final Plat and Replat submitted for review:
1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Plat.
 2. A copy of an approved Development Plan or a copy of a Development Plan to be considered by the City
 3. Site construction plans prepared by a Texas Licensed Professional Engineer (including grading, paving, drainage, water, sanitary sewer, erosion control, and construction details)
- C. Disapproval authority. The city shall refuse to approve a plat if it does not meet the requirements prescribed by or under these rules.

III-7 Conveyance Plat Plan Requirements

- A. The following is a checklist for items, which shall be included, as applicable, on each Conveyance Plat submitted for review:

1. A title block located at the bottom right-hand side of the page to include project's name, addition's name, lot, block and phase designations, total acreage, zoning classification and address if available
2. City of San Juan signature block as per Section III-2
3. North arrow
4. Date (all revision dates should also be indicated)
5. Location map (at legible scale)
6. Sheet size of 22”X34”
7. Scale (must be legible)
8. Name, address and phone number of contact persons of landowner and surveyor
9. Location of corner pins and monuments, including description and indication of whether found or set
10. Abstract(s) and Survey(s) of subject tract
11. Abstract and Survey lines.
12. Zoning of subject property and adjoining property
13. The names of adjacent subdivisions and/or the names of record owners of adjoining parcels of unplatted land
14. Designation of boundaries of municipalities, counties, and special districts
15. Boundary line, accurate in scale and with exact distances and bearings, of the subject tract/lot including exact acreage and square footage
16. Lot and block designation
17. Metes and bounds description of the tract/lot, with exact acreage, in reference to the deed records of the County, including the volume and page of the deed for the land being platted
18. Building setback lines
19. Existing street and alley right-of-way and access easements, indicating street names, right-of-way or easement widths, and curve data

20. Easements, deed restrictions or encumbrances
21. Control of access lines, corner clips and clear vision areas
22. The 100-year flood plain per current FEMA Flood Insurance Rate Map (FIRM), if applicable, shall be delineated. If the floodplain is not mapped, the developer is responsible for making this determination using a FEMA approved method.
23. Other features which impact the subject property including, but not limited to, buildings, cemeteries, parks, landfills and monuments
24. Certification by a Registered Professional Land Surveyor (R.P.L.S.), registered in the State of Texas, to the effect that the plan represents a survey made by him or under his direct supervision and that all the monuments and corner pins shown exist and are correctly described
25. An Owner's Certificate, signed and acknowledged before a notary public by the owner, trustee(s) or person(s) duly authorized to sign the plat. This will include any lien holder(s) on the property.
26. All Conveyance Plats must be titled "Conveyance Plat" and include a note with the following wording:

“Notice: A Conveyance Plat is a record of property approved by the City for the purpose of sale or conveyance in its entirety or interests thereon defined. No building permit shall be issued nor permanent public utility service provided until a Final Plat is approved, filed of record, and public improvements accepted in accordance with the provisions of the City of San Juan requirements. Selling a portion of this property by metes and bounds, except as shown on an approved, filed, and accepted Conveyance Plat, Final Plat, or Replat is a violation of the City ordinance and State law.”

- B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Conveyance Plat submitted for review:
 1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Plat.

III-8 Construction Permit Application Plan Requirements

- A. Construction plans shall contain engineering data for the construction of all improvements consistent with current city development standards and master plans. The following is a checklist for items, which shall be included, as applicable, as part of each set of construction plans submitted for review:

1. The plans shall be signed, sealed, and dated by a Professional Engineer licensed in the State of Texas (the Engineer of Record). In addition to the license number of the Engineer of Record, the plans shall indicate the firm registration number of the engineering firm responsible for preparation of the plans, which shall be registered as an engineering firm with the Texas Board of Professional Engineers. If standardized construction detail sheets, schedules, or specifications are included in the plans they shall be noted on the sheet index. If such standardized construction detail sheets, schedules, or specifications are not sealed by the Engineer of Record, then the Engineer of Record shall include a statement under the sheet index stating that the construction detail sheets, schedules, and/or specifications have been selected by the Engineer of Record and have been deemed appropriate by the Engineer of Record for their specified use on the project.
2. The plans shall be drawn to a standard sheet size of 22"X34".
3. The plans shall have a cover sheet including, at a minimum, the project name/description, engineer and firm licensure/registration information as described above, a location map, a sheet index, and the contact information for the developer/owner and engineer. When possible, contact information for the surveyor should also be included.
4. The maximum scale for all construction plans shall be 1" = 40' (1" = 20' is preferred). Construction plans for street construction shall be drawn to a scale of 1" = 20'.
5. Typical plan and/or profile sheets shall include the following basic items:
 - a. Title block including project name/description and information about the Engineer of Record and the engineering firm
 - b. North arrow on all plan sheets
 - c. Date (all revision dates should also be indicated)
 - d. Scale (must be legible)
 - e. Engineer's seal for completed plans or a preliminary stamp (specifying that plans are preliminary, for review only, and not for construction purposes)
 - f. Benchmark description indexed to the NAD 1983 State Plane Coordinate System using the appropriate horizontal projection for the applicable zone, and indexed to the NAVD 1988 vertical datum
6. Construction plan sets should typically include the following plan sheets as well as other sheets deemed appropriate by the Engineer of Record:

- a. A grading plan including existing and proposed one-foot interval elevation contours and spot elevations. Grades shall be indexed to the NAD 1983 State Plane Coordinate System using the appropriate horizontal projection for the applicable zone and indexed to the NAVD 1988 vertical datum. The grading plan shall include a proposed finished floor elevation for all buildings and a proposed finished pad elevation for all pad sites. Note that the builder is responsible for furnishing a certification of the foundation elevation and location prior to construction of a foundation.
- b. Typical Cross-Sections of proposed public streets and alleys drawn to a maximum scale of 1" = 10' horizontal and 1" = 2' vertical and drawn from beyond right-of-way to beyond right-of-way. Proposed street and alley pavement sections shall conform to City of San Juan standards unless otherwise approved by the City of San Juan.
- c. Paving Plans for driveways, fire lanes, parking areas, and sidewalks indicating pavement types, thicknesses, and dimensions
- d. Paving Plans and Profiles for each public street and alley with top of curb grades for streets and centerlines for alleys. The plan view shall show all existing features and the profile view shall include the existing ground. The profile grade lines and cross-sections of intersecting streets should be adjusted to provide a smooth junction and proper drainage.
- e. Roadway Cross-Sections for each arterial or collector street indicating cut and fill and the limits of earth work
- f. A Drainage Area Map which shall include size and delineation of drainage areas, storm frequency, storm water runoff calculations, designation of points of concentration, and any additional data necessary for the proper design of drainage facilities
- g. Drainage Plans for storm sewers showing drainage calculations, hydraulic data, pipe grades and sizes, manholes and junction boxes, other pipe connections, inlets, and outfall structures. Storm sewers for public systems (and all other storm sewers as required by the City of San Juan or Director of Planning) must be profiled and should include hydraulic grade line.
- h. Drainage Plans for open channels showing drainage calculations, hydraulic data and depth of flow, channel grades, channel material, channel geometry, inlet structures, culverts, bridges, and outfall structures (such as concrete rip-rap, etc.). Open channels for public systems (and all other open channels as required by the City of San Juan or Director of Planning) must be profiled and shall include depth of flow. Cross-sections may be required on a case-by-case basis.

- i. Drainage Plans for storm water detention ponds showing drainage calculations, hydraulic data, pond depth and geometry, pond material, and other information necessary for proper design review and construction of the proposed improvements. If an underground storm water detention facility is proposed, then appropriate plans and details should be provided.
- j. Water Line Plans showing pipe sizes, location of valves, fire hydrants, fittings and other appurtenances, including installation and backfill details. All public water lines (of any size) and all private water lines 12” in diameter and larger must be profiled. Waterline profiles shall include the station, elevation and description of utility crossings.
- k. Sanitary Sewer Plans and Profiles indicating pipe grades and sizes, manholes, cleanouts and other appurtenances, including installation and backfill details. Profiles are not required for private sanitary sewer services under 250 feet long and 6-inches or less in diameter, if they do not cross other private properties. Sanitary sewer lines or services crossing other private properties must be in easements and must be profiled. Sanitary sewer connections which extend more than 10 feet into the paved section of public streets must be profiled for the section which is located in the right-of-way. Private sanitary sewer profiles shall include the station, elevation, existing and proposed ground lines, and the location and description of utility crossings.
- l. An Erosion Control Plan prepared in accordance with the current Texas Pollution Discharge Elimination System (TPDES) requirements and all other applicable requirements of the Texas Commission on Environmental Quality (TCEQ). For all projects requiring a SWPPP based on TPDES/TCEQ requirements, the contractor or the developer/owner shall provide the Director of Planning with a copy of the SWPPP and the Construction Site Notice (and NOI if applicable) prior to any excavation and/or earth disturbance activities.
- m. A Traffic Control Plan shall be submitted for all proposed construction within a street right-of-way. The traffic control plan shall incorporate all applicable requirements of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).
- n. Street Lighting Plan for all projects involving public street construction

III-9 Driveway Permit Application Plan Requirements

- A. Application for a driveway permit can be made as part of the Development Plan request or as a separate request. Driveway permit applications shall contain sufficient information to allow the city to fully assess the adequacy of the proposed driveway

design. A Driveway Permit application shall include a driveway plan. The following is a checklist for items, which shall be included, as applicable, on the driveway plan:

1. Title block including property address, property legal description, and information contact information for the property owner and contractor
 2. North arrow
 3. Date
 4. Scale (must be legible)
 5. The dimensions, locations and design of the driveway(s) being requested
 6. The location of any building or structure on the site, either existing or proposed
 7. List uses on commercial lots (such as office, retail store, gas station, etc.)
 8. The layout of all drive lanes, fire lanes, and parking areas including the proposed internal circulation patterns
 9. All existing or proposed driveways, gutters, storm sewers, manholes, fire hydrants, utility poles, underground utilities, service fixtures, etc., which may be impacted by the driveway construction or may affect driveway operations
 10. Any existing driveways or curb cuts located on the property, adjacent properties, or properties across the street
 11. The geometric design features of the connecting roadway, including the roadway width, roadway material (concrete or asphalt), the presence of a median, the number and width of travel lanes, the presence of a shoulder or a parking lane, etc.
 12. The distances to the nearest intersecting streets and driveways
- B. The following is a list of accompanying documents or items, which shall be included, as applicable, with each Driveway Permit application submitted for review:
1. Tax certificate showing all tax payments to the City of San Juan are current. Taxes must be current as of the date of formal City approval of the Plat.
 2. A copy of the filed Final Plat, Replat (a Conveyance Plat is not acceptable)
 3. A Traffic Control Plan shall be submitted for all proposed construction within a street right-of-way. The traffic control plan shall incorporate all applicable requirements of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

III-10 Sign Permit Application Plan Requirements

- A. No sign permit shall be issued except after receipt of an application prescribed by the building official and showing the sign location, size, type, height, materials of constructions, surface area and such other information as the building official shall require. When required by the building official, plans shall be prepared by a registered professional engineer or architect

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SECTION IV – OFF-STREET PARKING AND LOADING REQUIREMENTS

IV-1 General

The purpose of this section is to function as a guide in the design and layout of off-street parking facilities. Off-street parking spaces shall be provided at the time any building or structure is erected or structurally altered. Parking which is provided shall be shown on a Development Plan when such a plan is required. All parking and loading or unloading facilities, approaches, access driveways and stacking or storage parking spaces for vehicles shall be paved with concrete or asphalt. This provision shall also apply to any use located on the property with no building or structure, i.e., public or private parking lots. Trailers are defined as vehicles.

IV-2 Parking Requirements Based on Use

- A. Businesses are encouraged to provide as many spaces as possible utilizing parking formulas in this Section. Parking which is provided shall be shown on a Development Plan, when such a plan is required.
- B. All required off-street parking shall be in accordance with the following requirements.
- C. Business or Professional Office:
 - 1. One (1) parking space for each four hundred (400) square feet of floor area.
 - 2. Assembly or Exhibition Hall: One (1) parking spaces for each one hundred (100) square feet of floor area used thereof. With fixed seating, one (1) parking space for each four (4) seats or bench seating spaces.
- D. Day Care: One (1) parking space per faculty plus one (1) parking space per then (10) children plus two (2) stacking spaces per three (3) children.
- E. Dwellings, Single-Family Attached or Detached: A minimum of one (1) car garage plus one (1) additional parking space shall be provided.
- F. Dwellings, Multi-Family: Two (2) parking spaces for each dwelling unit.
- G. Hospital: One (1) space per bed, plus additional parking as required for other listed categories.
- H. Hotel, Motel or Inn: One (1) parking space for each one (1) guest room or suite for the first one-hundred (100) guests and three-quarters (0.75) of a parking space for each one (1) guest room or suite for additional guests plus one (1) space for each three hundred (300) square feet of commercial floor area contained therein.

- I. Manufacturing or Industrial Establishment: One (1) parking space for each three hundred (300) square feet of floor area.
- J. Retail Store or Personal Service Establishment: One (1) parking space for each 250 square feet of Gross Leasable Area.
- K. Restaurant, Night Club, Cafe or Similar Recreation or Amusement Establishment: One (1) parking spaces for seventy-five (75) square feet or floor area or 1:3 seats, whichever is greater.
- L. Warehouse or Storage: One (1) parking space for each 2,000 square feet of floor area.

IV-3 Rules for Computing Number of Required Parking Spaces

- A. "Floor area" shall mean the gross floor area of the specific use. Where fractional spaces result, the parking spaces required shall be constructed to the nearest whole number.
- B. The parking space requirement for a use not specifically mentioned herein shall be the same as required for a use of similar nature.
- C. Whenever a building or use constructed or established after the effective date of this development manual is changed or enlarged in floor area, number of employees, number of dwellings units, seating capacity or otherwise, to create a need for an increase of ten (10) percent or more in the number of existing parking spaces, such spaces shall be provided on the basis of the enlargement or change. Whenever a building or use existing prior to the effective date of this development manual is enlarged to the extent of fifty (50) percent or more in floor area or in the area used, said building or use shall then and thereafter comply with the parking requirements set forth herein.
- D. In the case of mixed uses, the parking spaces required shall equal the sum of the requirements of the various uses computed separately. In the event that the developer of a mixed-use development wishes to reduce the overall parking provided, a parking study based on recognized industry standards and indicating how the uses work together in a way that their peak use periods are phased, may be submitted for review by City staff. An approval of reduced parking would be in the form of a parking variance, to be approved by the City Council.

IV-4 Location of Parking Spaces

- A. Where an increase in the number of spaces is required by a change or enlargement of use or where such spaces are provided collectively or used jointly by two (2) or more buildings or establishments, the required spaces may not be located in excess of five hundred (500) feet from any other non-residential building served.

- B. In any case where the required parking spaces are not located on the same lot with the building or use served, or where such spaces are collectively or jointly provided and used, a written agreement thereby assuring their retention for such purposes, shall be properly drawn and executed by the parties concerned and shall be filed with the development plan application.
- C. For detached single family or duplex residential uses, it shall be unlawful for any owner of property to allow a driveway or parking surface in the required front yard setback to exceed 27 feet in width on lots 60 feet wide or greater or 45 percent of the lot width for lots less than 60 feet in width. For purposes of this requirement, the lot width shall mean the width of the lot measured at the front yard setback. Driveways shall be paved with concrete except that expansion of an existing driveway may be with concrete or a continuation of an existing non-conforming material adjacent to the side of the driveway being expanded, provided that the total parking area complies with the width requirements herein and not more than 45 percent of the required front yard shall be used for parking. A permit is required for all driveway and parking surface improvements.

IV-5 Minimum Dimensions for Off-Street Parking

- A. The minimum dimensions for off-street parking shall be as follows:
 - 1. Ninety (90) Degree Angle Parking: Each parking space shall be not less than nine (9) feet wide or less than eighteen (18) feet in length. Maneuvering space shall be in addition to parking space and shall be not less than twenty-four (24) feet perpendicular to the building or parking line.
 - 2. Sixty (60) Degree Angle Parking: Each parking space shall be not less than (9) feet wide perpendicular to the parking angle nor less than twenty (20) feet in length when measured at right angles to the building or parking line. Maneuvering space shall be in addition to parking space and shall be not less than twenty (20) feet perpendicular to the building or parking line.
 - 3. Forty-Five (45) Degree Angle Parking: Each parking space shall be not less than nine (9) feet wide perpendicular to the parking angle nor less than nineteen (19) feet in length when measured at right angles to the building or parking line. Maneuvering space shall be in addition to parking space and shall be not less than eighteen (18) feet perpendicular to the building or parking line.
 - 4. Parallel Parking: Each parking space shall be not less than ten (10) feet wide nor less than twenty-four (24) feet in length. Parallel parking will not be considered except when it can be situated in such a manner that persons entering and exiting vehicles will be out of the flow of traffic.
- B. When off-street parking facilities are located adjacent to a public alley, the width of said alley may be assumed to be a portion of the maneuvering space requirement.

Where off-street parking facilities are provided in excess of the minimum amounts herein specified, or when off-street parking facilities are provided but not required by this development manual, said off-street parking facilities shall comply with the minimum requirements for parking and maneuvering space herein specified.

IV-6 Minimum Dimensions for Off-Street Loading Areas

- A. All buildings (except single-family, duplex and multi-family dwellings) hereafter erected, reconstructed or enlarged so as to require additional parking spaces shall have adequate permanent off-street facilities providing for the loading and unloading of merchandise and goods within or adjacent to the building in such a manner as not to obstruct the freedom of traffic movement on the public rights-of-way.
- B. All loading areas are to be indicated on the development plan.
- C. Required off-street loading facilities may be adjacent to a public alley or private service drive, or may consist of a berth within a structure.
- D. No portion of a loading facility or space may extend into a public right-of-way, a fire lane, or into an off-street parking space.
 - 1. Loading spaces may, with the approval of the City, be located within off-street parking spaces that are anticipated to be unused when deliveries are to be made. Typically, this will apply to fast-food restaurants, and pad retail sites.
- E. The off-street loading spaces or truck berths shall provide maneuvering areas on site to prevent any blockage of public right-of-way.

IV-7 Accessible Parking Requirements

- A. Accessible parking spaces and/or loading zones shall be provided by the building or facility owner, agent, or occupants in accordance with the Americans with Disabilities Act (ADA), Texas Department of Licensing and Regulation (TDLR) and other applicable agency requirements, if any. All other requirements shall be established by the state or federal authority having jurisdiction.

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SECTION V – DRAINAGE POLICY

V-1 General

The purpose of this section is to outline the general parameters and typical construction details resulting in a storm drainage system in accordance to the drainage requirements in San Juan, Texas. If any deviations from these standards are anticipated, the City of San Juan's City of San Juan should be consulted. In cases where physical or design barriers hinder compliance with the outlined provisions, alternatives may be considered through the City of San Juan.

V-2 Master Drainage Plan & Policy

All drainage design must be coordinated with the City of San Juan Comprehensive Master Drainage Plan and the Floodway and Flood Boundary Map prepared by the Federal Emergency Management Agency. The development of these documents is crucial for the orderly growth of San Juan and major deviations from these plans will not be allowed.

A. General Policy

1. All storm drainage facilities within the City of San Juan and adjacent areas subject to its Extraterritorial Jurisdiction (ETJ) shall follow these policies, standards of design and Master Drainage Plan map for the planning, design, construction and operation of storm drainage facilities.
2. Drainage reports and improvements are to be performed and designed by a Professional Engineer licensed to practice in the State of Texas and are subject to approval by the City of San Juan.
3. Any property within the 100-year flood plain must provide an amount of floodwater storage capacity after development, which is not less than the preexisting floodwater storage capacity of said property during the 100-year flood, regardless of whether such pre-existing flood storage capacity is due to natural or artificial causes.
4. On-site and off-site detention methods include, but is not limited to, recreational areas, swales, ponds, channels, reservoirs or engineered sub-surface systems. Supplemental detention methods are to be reviewed and approved by the City of San Juan.
5. Drainage system components including street gutters, inlets, pipes and related structures that pertain to the outfall system shall be designed to intercept and convey runoff from a 10-year storm event and checked for a 50-year storm event.

6. Off-site discharge for post development conditions shall not exceed the pre-development peak discharge for all storm events up to, and including, the 10-year storm event.
7. Residential lots shall be graded to provide positive drainage towards the front of the lot at a minimum of 2.0%.
8. Final Grades along the perimeter of the proposed subdivision that are above or below the adjacent property elevation shall require the installation of a retaining wall. Properties shall be graded away from the Grade difference.
9. Site grading of residential lots shall in no instance affect neighboring properties.
10. Storm drainage design shall account for off-site drainage patterns affected by any proposed drainage improvements.

B. Outfall System

1. All Subdivision proposals shall convey storm water runoff to the nearest publicly maintained drainage system and provide the necessary engineering studies and/or hydraulic/hydrological modeling to demonstrate adequacy of the conveyance stream.
2. The drainage outfall system (drain ditches) shall be designed to carry and/or store the runoff from a minimum of a 100-year frequency storm (Post-Development Conditions). Maintaining the outfall system shall be the City's responsibility. The outfall system consists of those lines shown on the City's Master Drainage Plan.
3. Any proposed development bordering an identified open channel outfall system shall be required to dedicate the necessary Right-of-Way as shown in the Drainage Master Plan.
4. All proposed development within the City and its ETJ shall require a storm sewer outfall designated in accordance with the Master Drainage Plan.
5. In areas where the City or another developer has installed the Offsite Outfall Drainage System, and a reimbursement policy and contract has been installed, all proposed developments shall be required to pay their pro-rated share of those costs as per the contract prior to connecting to the existing outfall system. In general, City's participation requirements are as per the United Development Code, Section 7.606 – Responsibility for Payment of On-Site and Off-Site installation costs.

V-3 Stormwater Runoff

A. Rational Method

The primary consideration in any drainage study must begin with the determination of rainfall in terms of intensity, duration and frequency. The Rational Method presents the designer with a peak discharge flow rate for a specified storm event. This solution method is applicable to small areas and shall not be applied to areas exceeding 200-acres.

The Rational Method is expressed by:

$$Q = C * I * A$$

Where:

Q: Discharge (cfs)

C: Runoff coefficient

I: Rainfall intensity at the time of concentration (in./hr.)

A: Area in acres of drainage basin

B. Rainfall and Intensity

The rainfall intensity is the rate of rainfall in (in./hr.) for a selected time of concentration. The appropriate calculations shall utilize the Rain Intensity-Duration-Frequency Coefficients for Hidalgo County.

Table VI - 1			
Recurrence Interval (years)	IDF Coefficients		
	E	b	d
2	0.8317	66.6399	12.357
5	0.8201	81.0003	12.2367
10	0.8117	93.1792	12.3404
25	0.802	110.353	12.609
50	0.7951	123.6652	12.8624
100	0.7888	137.9853	13.3182
500	0.7792	178.7526	15.2816

*Based on 'National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 11 Version 2.0: Texas' (Perica et. al. 2018).

Intensity can be calculated by the following relationship:

$$i = \frac{b}{(t_c + d)^e}$$

Where:

i: Intensity (in./hr.)

t_c : Time of Concentration (min.)

C. Time of Concentration

The time of concentration shall be estimated by integrating the velocity with three typical flow regimes; pipe or channel flow, shallow concentrated flow, and overland/sheet flow. The time of concentration shall be calculated for each system.

The time of concentration for shallow concentrated flow shall be calculated by the following relationship:

$$t_c = \frac{L}{60V}$$

Where:

t_c = travel time (min.)

L = watercourse length (ft.)

V = average flow velocity (ft./sec.)

D. Velocity Estimates

The velocities for shallow and overland/sheet flow shall be estimated following the relationship:

$$V = K_u k S_p^{0.5}$$

Where:

K_u = 3.28

V = velocity (feet/second)

k = intercept coefficient (Table VI-2)

S_p = slope (%)

Table VI - 2: INTERCEPT COEFFICIENTS

Land Cover / Flow System	k
Forest with heavy ground litter; hay meadow (overland flow)	0.076
Trash fallow or minimum tillage cultivation; contour or strip cropped; woodland (overland flow)	0.152
Short grass pasture (overland flow)	0.213
Cultivated straight row (overland flow)	0.274
Nearly bare and untilled (overland flow); alluvial fans in western mountainous regions	0.305
Grassed waterway (shallow concentrated flow)	0.457
Unpaved (shallow concentrated flow)	0.491
Paved area (shallow concentrated flow); small upland gullies	0.619

Reference: FHWA Urban Drainage Design Manual, 3rd Edition (2013)

To estimate the average flow velocities in channels and conduits, consider Manning’s Equation:

$$V = \frac{1.49}{n} R^{\frac{2}{3}} S^{1/2}$$

Stormwater runoff calculations shall consider fully developed conditions.

E. Runoff Coefficients

Runoff Coefficients shall be determined for each drainage area depicted on Table VI-3. A weighted coefficient of runoff shall be determined where conditions that are non-homogenous exist.

$$C_W = \frac{(C_1 A_1 + C_2 A_2 + C_3 A_3 + \dots + C_n A_n)}{A_{total}}$$

Where:

C_w = Weighted Runoff Coefficient

C_n = Runoff Coefficient nth term

A_n = Area of nth term (acres)

A_{total} = Total Area (acres)

TABLE VI-3: RUNOFF COEFFICIENTS FOR RATIONAL FORMULA	
Description	Runoff Coefficient (C)
Business:	
Downtown Areas	0.7 - 0.95
Neighborhood Areas	0.50 - 0.70
Residential:	
Single-Family Areas	0.30 - 0.50
Multi-Units (detached)	0.40 - 0.60
Multi-Units (attached)	0.60 - 0.75
Suburban	0.25 - 0.40
Apartment Dwelling Areas	0.50 - 0.70
Industrial:	
Light Areas	0.50 - 0.80
Heavy Areas	0.60 - 0.90
Parks Cemeteries	
Parks	0.10 - 0.25
Cemeteries	0.20 - 0.40
Railroad Yard Areas	
Railroad Yard Areas	0.20 - 0.40
Unimproved Areas	
Unimproved Areas	0.10 - 0.30
Lawns:	
Sandy Soil (flat_2%)	0.05 - 0.10
Sandy Soil (average_2-7%)	0.10 - 0.15
Sandy Soil (steep_7%)	0.15 - 0.20
Heavy Soil (flat_2%)	0.13 - 0.17
Heavy Soil (average_2-7%)	0.18 - 0.22
Heavy Soil (steep_7%)	0.25 - 0.35
Streets:	
Asphaltic	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Drives Walks	
Drives Walks	0.75 - 0.85
Roofs	
Roofs	0.75 - 0.95

V-4 Street Flow

Street's primary function is to accommodate traffic and must be expected to retain some degree of serviceability during periods of rainfall. Water spread limits is an effective method to define the degree of protection required to achieve that serviceability. The following water spread limits are established to provide passage of vehicular traffic as specified in Table VI-4 below.

TABLE VI-4: WATER SPREAD LIMITS	
Street Classification	Permissible Water Spread
Expressway	10-year storm 1 traffic lane may be closed
Major Thoroughfare (Divided)	10-year storm 1 traffic lane must remain open in each direction
Major Thoroughfare (Undivided)	10-year storm 2 traffic lanes must remain open
Minor Streets (remain open)	10-year storm 1 traffic lanes must remain open
Residential Streets	10-year storm water flow must not exceed top of curb

The allowable water spreads are based on the initial storm frequencies, but considerations must be given to street conveyance of the major storm and possible flooding. All streets shall be designed to convey a major storm without water encroaching into adjacent buildings. The maximum spread limits in streets for a major storm shall be the building lines. This requirement of designing the street to convey the runoff of a major storm may require increasing the capacity of the enclosed drainage system.

V-5 Design Storm Frequencies

Storm drainage planning requires establishment of standards to refer to the magnitude of a storm. The storm frequency establishes the degree of safety desired. A major storm refers to a storm having the probability of reoccurrence once every 100 years. Runoff from an initial storm is intercepted and conveyed through a conveyance system composed of inlets and a pipe system. Storm frequency is a parameter in storm drainage design; major storms are controlled and conveyed in open drainage systems.

TABLE VI-5: DESIGN STORM FREQUENCIES	
Area	Frequency
Enclosed Pipe System (Internal Subdivision)	10 years
Enclosed Pipe System (Outfall Master Drainage Plan)	10 years
Channels and Ditches (1)	100 years
Culverts and Small Bridges	50 years
Large Bridges (2)	50 years
Floodways Between Building Lines	100 years

A. Hydraulics

Storm water is usually conveyed on the upper end of a drainage basin by inlets and storm sewers (closed conduit systems) to channels and through culverts and bridges. All calculations and design procedures for this hydraulic work shall follow the Hydraulic Manual prepared and compiled by the Texas Highway Department Bridge Division.

Tables VI-7, VI-8, VI-9 and VI-10 show adopted Manning's Coefficients, minimum pipe slopes, maximum channel velocities and roughness coefficients for channels to be used in San Juan, Texas.

Table VI-7: MANNING'S COEFFICIENT OF ROUGHNESS FOR PIPE		
Material	Value of 'n'	Adopted
Asbestos-Cement Pipe	0.011 - 0.015	0.013
Cast Iron Pipe (Coated)	0.010 - 0.014	0.012
Cast Iron Pipe (Uncoated)	0.011 - 0.016	0.013
Concrete Monolithic Conduit	0.012 - 0.017	0.015
Concrete Pipe	0.011 - 0.015	0.013
Corrugated Metal Pipe (1/2" x 2 -2/3")	0.022 - 0.026	0.024
25% Paved	0.021 -0.023	0.022
Fully Paved	0.012 - 0.015	0.013
Plastic Pipe (Smooth)	0.011 - 0.015	0.013
Vitrified Clay Pipe	0.011 - 0.015	0.013

TABLE VI-9: RECOMMENDED MAXIMUM CHANNEL VELOCITIES	
Channel Material	Maximum Channel Velocity (fps)
Fine Sand	2
Coarse Sand	4
Fine Gravel	6
Earth	
Sandy Silt	2
Silt Clay	3.5
Clay	6
Grass Lined Earth	
Bermuda Grass - Sandy Silt	6
Bermuda Grass - Silt Clay	8
Poor Rock (typically sedimentary)	10
Soft Sandstone	8
Soft Shake	3.5
Good Rock (igneous or hard metamorphic)	12
Reinforced Concrete Lining	15

Table VI-8: MINIMUM PIPE SLOPES		
Pipe Diameter	Slope in Foot Per Foot	
	<u>n = 0.013</u>	<u>n = 0.024</u>
12"	0.00435	0.0149
15"	0.00324	0.0111
18"	0.00254	0.00868
21"	0.00208	0.00709
24"	0.00174	0.00592
27"	0.00148	0.0051
30"	0.00129	0.00439
33"	0.00113	0.00386
36"	0.00101	0.00345
42"	0.0082	0.0028
48"	0.00069	0.00235
54"	0.00059	0.00201
60"	0.00051	0.00175
66"	0.00045	0.00154
72"	0.0004	0.00137

**Note: $V = (1.486/n) * R * S$ (V value: $V = 3fps$)*

Table VI-10: MANNING'S COEFFICIENT OF ROUGHNESS FOR CHANNELS

Description	n Values		Adopted n Values
	Minimum	Maximum	
Lined Channels			
Metal Corrugated	0.021	0.024	0.023
Concrete	0.012	0.018	0.015
Cement Rubble	0.017	0.03	0.025
Concrete Gutter	0.015	0.02	0.016
Rock Riprap	0.03	0.045	0.035
Unlined Channels			
Poor Grass Growth	0.025	0.035	0.03
Average Grass Growth	0.035	0.045	0.04
Dense Grass Growth	0.04	0.05	0.045
Stony Beds, Weeds on Banks	0.025	0.04	0.035
Rock Cuts, Smooth & Uniform	0.025	0.035	0.03
Rock Cuts, Rugged & Irregular	0.035	0.045	0.04
Natural Stream Channel			
Moderate Grass & Weeds: Little to no brush	0.03	0.035	0.035
Dense Growth of Weeds: :Depth of flow greater than weed height	0.035	0.05	0.045
Moderate Weeds - light brush on banks	0.035	0.05	0.045
Moderate Weeds - heavy brush on banks	0.05	0.07	0.06
For Trees within Channels with Branches submerged at high stage increase all values above by:	0.01	0.02	0.015
Pasture, No Brush			
Short Grass	0.03	0.035	0.03
Tall Grass	0.035	0.05	0.04
Cultivated Areas			
No Crop	0.03	0.04	0.035
Mature Row Crops	0.035	0.045	0.04
Mature Field Crops	0.04	0.05	0.045
Heavy Weeds, Scattered Brush	0.05	0.07	0.06
Wooded	0.12	0.16	0.14

V-6 Drainage System Requirements

A. General

A complete drainage system in an urban area is composed of:

1. Pipe systems shall be designed to convey runoff from a 10-year frequency storm.
2. Open channels shall have a trapezoidal shape, in which the water surface elevation of the 25-year frequency channel flow is up to the proposed benching of the channel, and an additional channel height shall be provided as required to convey the 100-year channel flow with one (1) foot freeboard up to the existing natural ground.
3. The initial storm drain system is required when the runoff exceeds the limitations established in Section I-5. Inlets and storm drains shall be designed in accordance with applicable portions of this section.
4. A closed pipe system shall normally convey quantities up to and including the flow of a 48-inch pipe. For quantities larger than that carried by a 48-inch pipe, channels or ditches will normally be utilized, depending upon the economics of the development.
5. All pipe systems maintained as a public facility shall be constructed with reinforced concrete pipe, or other materials if approved by the City of San Juan.
6. For all open channels, the 100-year flow shall be contained within the building lines; channels shall be expanded as necessary to meet this requirement.
7. Reinforced concrete lined channels shall have a maximum side slope of 1:1 (horizontal to vertical), and unlined ditches shall be no steeper than 2:1 for stability and maintenance. All channels, lined and unlined, shall have a one (1) inch per foot traverse bottom slope to the centerline.
8. Unlined ditches will be considered for quantities larger than the equivalent flow of a 72-inch pipe. These channels shall provide a minimum of one (1) foot of freeboard up to the existing natural. Additional freeboard shall be considered where wave action is anticipated.
9. All culverts crossing under streets shall extend from property line to property line, plus sufficient length on each end to permit a 3:1 slope to extend from the street property line to a point 6 inches beneath the top of the headwall.
10. All culverts shall have adequate reinforced concrete headwalls, wing walls for 3:1 fill slope, and aprons at each end.

B. Additional Storm Drain Criteria Include:

1. Minimum velocity with the pipe flowing full shall be 3 feet per second
2. Minimum storm drainpipe diameter shall be 24 inches.
3. Pipe diameters shall not decrease downstream.
4. Pipe crowns at change sizes should be set at the same elevation.
5. Vertical and horizontal curves in the conduit will be permitted only with the approval of the City of San Juan
6. Street crowns shall be reduced for approximately 100' on each side of valley gutter. A maximum of two valley crossings shall be used at an intersection.
7. Retention ponds are typically not allowed unless other alternatives are not available. The allowability of retention ponds will be determined by the Director of Planning and/or City of San Juan.
8. At streets with culverts or bridges, an emergency overflow shall be provided to contain the 100-year channel flow within the building lines
9. Streets should be graded to avoid sumps and utilize the natural existing flow patterns.
10. The maximum length of gutter flow before runoff is intercepted by an under-ground storm sewer system is 300' from the high point to an inlet measured along the gutter.
11. Manhole spacing shall be maintained as presented in the table below:

Pipe Size	Maximum Spacing
24"	300'
27" – 36"	400'
42" – 54"	500'
60" or greater	1000'

12. No storm junction boxes or manholes to be placed in the middle of a property. Such structures shall only be placed between property lot lines.
13. Detention ponds must have safety end inlet at discharge location and will require a pilot channel that runs through the entire length of the pond.

V-7 Storm Water Detention

A. General

Detention ponds are utilized to store increased runoff due to a new development, and release said runoff at the rate prior to development (existing conditions). The use of detention ponds to effectively reduce peak runoff rates is an effort by the City to reduce unregulated runoff from subsequent developments to mitigate floods and its associated risks.

Storm water runoff generated from developed improvements shall be detained on-site for a 50-year post-development frequency storm event and released into the receiving system at the rate for a 10-year frequency storm event at pre-existing conditions. The volumetric difference must be detained on-site by a properly sized detention pond or engineered sub-surface systems; acceptable methods of supplemental detention shall be based upon approval by City of San Juan.

The City's adopted methodology for designing small urban detention ponds is centered around the Rational Method due to its general simplicity and acceptance. The Rational Method estimates the peak rate of runoff at any location in a watershed as a function of the runoff coefficient, the mean rainfall intensity set at a duration equal to the specified time of concentration and the drainage area. The formula is expressed as:

Intensity can be calculated by the following relationship:

$$Q = C * i * A \text{ (see section VI - 3)}$$

Where:

- **Peak Flow “Q”:** Peak storm runoff flow in cubic feet per second (cfs)
- **Runoff Coefficient “C”:** This variable represents the ratio of runoff to rainfall, and is influenced by parameters that include, but is not limited to, infiltration, ground cover, ground slopes, percent impervious and soil types. **Table VI-3** lists runoff coefficients for different land descriptions. Where a drainage area is nonhomogeneous and incorporates various land descriptions, a composite coefficient for the total drainage area is computed (See Section VI-3,E).
- **Rainfall Intensity “I”:** This variable represents the peak rainfall intensity/severity for a specified storm event recurrence interval. Rainfall intensity at a duration equal to the specified time of concentration (Tc) is used to calculate the peak flow in the Rational Method. The Rational method assumes that the rainfall intensity is uniform throughout the duration of the storm.

- **Drainage Area “A”:** This variable specifies the area in acres of the contributing watershed. The area shall include all land enclosed by the surrounding drainage divides.

Storm water runoff generated from developed improvements shall be detained on-site for a 50-year frequency storm event and released into the receiving system at the rate of a 10-year frequency storm event at pre-existing conditions. The Rational Method may be used to estimate the storm’s associated runoff volumes by analyzing and comparing the pre-developed and post-developed peak runoff rates. The volumetric difference must be detained on-site by a properly sized detention pond or engineered sub-surface systems; acceptable methods of supplemental detention shall be based upon approval by City of San Juan. These calculations are best made in tabular form shown; an example is provided below. The Rational Method is applicable to small areas and shall not be applied to determine storm water storage requirements for areas exceeding 200.0-acres.

On-site detention basins are to be constructed in dedicated areas. Existing drainage facilities shall not take the place of dedicated facilities unless previously included in the City of San Juan’s Master Drainage Plan. On-site detention facilities shall include ponds or engineered sub-surface systems. Detention areas may be incorporated into landscape and greenbelt areas provided that vegetation is considered in the design analysis. Areas designated as dual use area (detention/landscape, detention green space, etc.) shall display appropriate signage indicating so. Maintenance of detention areas shall be the responsibility of property owner or homeowner’s association as applicable. The City shall have the authority to assume the responsibility of maintaining the detention areas and impose applicable fees in the event the property owner or homeowner’s association fails to comply.

B. Detention Storage Requirement Calculation Process

The City’s Drainage Policy ensures that increased storm water runoff from subsequent development is regulated and released at a rate that does not exceed its pre-developed peak flow rate in an effort to mitigate floods and associated risks.

1. Existing Conditions Analysis

- Calculate runoff coefficient “C” based on the corresponding terrain and general areas
- Calculate the time of concentration “Tc,” or the elapsed time for runoff to flow from the hydraulically furthest point of the area to the outlet.
- From **Table VI-1**, select the appropriate intensity corresponding to the time of concentration.

- Calculate peak flow runoff rate “Q.” NOTE: This is the peak flow rate that the proposed development will be able to discharge at and must not be exceeded

2. Proposed Conditions Analysis

- Calculate new runoff coefficient “C” based on site improvements and change in impervious area.
- Calculate revised time of concentration.
- Determination of intensity and runoff not required at this stage.

3. On Site Storage Requirements

- Storage requirements are based on the difference between the volume of runoff generated in the improved condition and the volume of runoff that can be discharged from the property, which is based on the existing condition analysis.
- The runoff volume in and the runoff volume out is calculated, analyzed and compared. Select the peak storage volume, and base detention design on this value. A specific example is referenced below.

Table VI-11 Rational Method

- | | |
|---|---|
| (A) – Duration in minutes | (E) – Pre-developed peak discharge |
| (B) – Intensity for respective duration | (F) – Pre-developed runoff volume |
| (C) – Developed conditions peak discharge | (E) – Pre-developed peak discharge |
| (D) – Developed conditions runoff volume | (G) – Storage required ($V_{in} - V_{out}$) |

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Duration (min)	Intensity (in/hr)	Q_{in} (cfs)	V_{in} (cf)	Q_{out} (cfs)	V_{out} (cf)	Storage (cf)
Time Interval (ti)	$i = \frac{b}{(tc + d)^e}$	$Q = CIA$	$V = Q * ti * 60$	Pre-Developed Q_{peak} OR Discharge Pipe Flow Rate	$V = 0.5 * (t_i + t_c) * Q * 60$	$S = V_o - V_i$

Pre-Developed Conditions	
C	0.25
t _c	60 min
i ₁₀	2.88 in/hr
Q _{peak}	7.21 CFS

Post-Developed Conditions	
C	0.6
t _c	15 min
i ₅₀	8.78 in/hr
Q _{peak}	52.66 CFS

Duration (min)	Intensity (in/hr)	Q _{in} (cfs)	V _{in} (ft ³)	Q _{out} (cfs)	V _{out} (ft ³)	Storage (ft ³)
15	8.78	52.66	47,392	7.21	6,490	40,902
30	6.23	37.39	67,299	7.21	9,735	57,564
45	4.91	29.45	79,521	7.21	12,980	66,541
60	4.09	24.52	88,272	7.21	16,225	72,047
75	3.52	21.13	95,081	7.21	19,470	75,611
90	3.11	18.64	100,658	7.21	22,715	77,943
105	2.79	16.73	105,387	7.21	25,960	79,428
120	2.53	15.21	109,500	7.21	29,205	80,295
135	2.33	13.97	113,144	7.21	32,450	80,694
150	2.16	12.94	116,419	7.21	35,695	80,724
165	2.01	12.06	119,397	7.21	38,940	80,457
180	1.88	11.31	122,130	7.21	42,185	79,945

V-8 Development Requirement

A. General

Drainage design is a crucial aspect to new development. Adequate planning and coordinating are required to accomplish an economical storm drain system that is in accordance with the City's drainage requirements. Failure to meet the specified standards will result in a poorly designed drainage system with costly consequences. Existing sites at redevelopment areas shall require appropriate detention measures to be designed and constructed.

B. Responsibility in Development

1. Developers must provide an acceptable storm water conveyance system from the development to the outfall at his/her expense. All drainage facilities shall be designed and sized to provide max capacity for the development. At the option of the developer, and the City's approval, Drainage facilities may be oversized to accommodate other land in the overall drainage basin delineated on the City's Master Drainage Plan. A 7-year developer's reimbursement contract may be

entered into with the City for the costs of oversizing for upstream future development.

2. All on-site drainage construction development is the responsibility of the developer.
3. Retention ponds will not typically be allowed unless other alternatives are not available. The use of retention ponds will be determined by the City of San Juan Planning and Zoning Director. A geotechnical evaluation will be mandatory. The design of detention/retention facilities shall follow the SWPPP guidelines. Should retention be allowed, the dissipation of the stored runoff will be accomplished as rapidly as possible, but no longer than 48 hours, primarily through the use of below grade infiltration gallery systems. Residual collected runoff in the pond bottom is not acceptable.
4. All on-site detention facilities must be designed in accordance with the City's standards specified herein.
5. All on-site detention/retention facilities shall be owned and managed by developer/owner/HOA. The City will default responsibility in the case that the aforementioned is unable to. (See Section VI-7, Section A)
6. Internal enclosed pipe drainage systems shall be designed on a 10-year return frequency. Off-site outfall and detention design shall be based on Tables VI: 1-5.

V-9 Fees

A. Offsite Outfall Drainage Costs

In areas where the City or another developer has installed the Offsite Outfall Drainage Systems, and a reimbursement policy and contract has been initiated, all proposed developments shall be required to pay their pro-rata share of those costs as per the contract prior to connecting to the existing outfall system.

In areas where the Outfall Drainage System is not installed, the proposed development may:

1. Install the required improvements identified on the Master Drainage Plan to the farthest upstream end of the development and submit for a reimbursement contract.
2. Install drainage facilities sized as per the drainage policy for the proposed development to the nearest existing outfall that has sufficient capacity. The City may, at its option, oversize the facilities for future growth in accordance with the Master Drainage Plan and initiate a reimbursement contract.

3. Detain on-site all runoff in excess of the predevelopment runoff rate and quantity. All detention areas must provide a method of drainage within a 48-hour period after the storm passes.
If the retention method is used, the design of detention/retention facilities shall follow the SWPPP guidelines. Should retention be allowed, the dissipation of the stored runoff will be accomplished as rapidly as possible, but no longer than 48 hours, primarily through the use of below grade infiltration gallery systems. Residual collected runoff in the pond bottom is not acceptable.

B. Detention Costs

The development is responsible for all onsite detention costs. Offsite detention proposals shall be subject to a case-by-case review by the City of San Juan and subject to final approval by the Planning & Zoning Commission and the City Council. Any such alternatives shall be presented in the form of a recommendation by the City of San Juan.

C. Oversizing on-site Drainage and Detention Facilities

At the City's option, the City may oversize onsite drainage & detention facilities at its own cost provided that the oversizing will not cause additional flooding and/or overload the existing drainage system.

V-10 Required Submittals

A. Preliminary: Minimum Requirements for Drainage Reports

1. Summary of Project:
 - a. Existing and Proposed conditions.
2. Location Map
3. Location of Proposed Site with Respect to FEMA Floodplain
4. Summary of Soil Conditions/Soils Classification
5. Summary of Existing Drainage Conditions
6. Summary of Proposed Drainage Conditions
7. Drainage Area Map:
 - a. All contributing areas delineated Contours
 - b. Spot elevations
 - c. Direction of flow
 - d. Right-of-way, Property lines
 - e. Existing/proposed storm sewer systems; outfalls
 - f. Design assumptions
8. Drainage Calculations:
 - a. Runoff, detention and hydraulic calculation summary

- b. Time of concentration estimates
 - c. Runoff coefficient assumptions
 - d. Storage volume calculations
 - e. Pipe and inlet capacities
 - f. Ponded widths and depths Inlet capacities and bypass
 - g. Hydraulic Grade Line (HGL)
9. Drainage Reports for projects within the City of San Juan and/or ETJ shall be reviewed by the City of San Juan Planning and Zoning Department prior to submittal to the Hidalgo County Drainage District No. 1 (HCDD#1). A copy of the approved drainage report by HCDD#1 will be required for final approval.

B. Final Approval Phase

1. Finalized versions of all the required submittals in the Preliminary Phase.

C. Construction Phase

1. Six complete plans, profiles and specifications for all drainage improvements showing:
 - a. Street Widths, Grades, Existing and Proposed Profiles
 - b. Drainage Pipes, Ditches, Channels with Grades and Existing and Proposed Profiles
 - c. Cross Sections
 - d. Complete construction details
2. Cost Estimate for All Drainage Improvements
3. A pre-construction conference will be held at the City Hall or designated location with the developer, his Engineer and Contractor, the Public Works Inspector, the City of San Juan, and all other parties designated by the City. A Notice to Proceed from the City of San Juan shall be obtained delineating proposed project, required conditions and pavement repair specifications. All 6 sets shall be signed and shall be the "Official Construction Plans" for the project.
4. Any changes from approved plans or change orders shall be submitted to the City for approval prior to construction.
5. Certified copies of the as-built plans shall be furnished to the City at completion of the improvements.

V-11 Detail Standards

The following Stormwater details adopted standards required by the City can be found in Appendix 2 – Drainage & Erosion Control Details.

V-12 Approved Material

A. Reinforced Concrete Pipe:

- a. Comply with requirements of ASTM C 76, Class III, installed with flexible plastic (Bitumen) gaskets at all joints. Gaskets shall comply with AASHTO M-198 751, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.

B. Polyvinyl Chloride (PVC):

- a. Only permitted when specifically approved by the City. Pipe and fittings shall comply with ASTM D 3034, rated SDR 35. Pipe shall be continually marked with manufacturer's name, a pipe size, cell classification, SDR rating, and ASTM D 3034 classification. Pipe joints shall be integrally molded bell ends in accordance with ASTM D 3034, Table 2. with factory supplied elastomeric gaskets and lubricant.

C. Manholes:

1. Precast Concrete Manholes:

- a. In accordance with ASTM C-478.

2. Precast Polyethylene Manholes:

- a. Manholes shall comply with ASTM D 1248 and shall be manufactured with factory-molded steps. The nominal cylinder internal diameter shall be 48" and shall be designed to accept concrete filled polyethylene manhole lids and standard cast iron frames with lid or grate. Manholes shall have compressive strength which meets ASTM D 2412 standards. Acceptable Manufacturers: Advanced Drainage Systems (ADS) or Owner-Approved equivalent manufacturer.

D. Inlets:

- a. Type A
- b. Type C
- c. Type C-C
- d. Type F
- e. Landscape

E. Cast Iron Frames, Covers, and Grates:

- a. As approved by the City of San Juan

*All other proposed products to be reviewed by City of San Juan for approval on a case-by-case basis.

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SECTION VI – STREETS & ROADWAYS

VI-1 General

The purpose of this section is to define the general requirements for the design of roadways by establishing street rights-of-way, pavement widths, pavement thickness, geometric alignments and construction details. As conditions are encountered beyond the scope of this section, coordination with the City of San Juan is required to establish new requirements and procedures.

VI-2 Master Plan

All street design must be coordinated with the City of San Juan Comprehensive Master Plan. The Master Plan was developed for orderly growth and major deviations from the Plan will not be permitted.

VI-3 Standards Public Roads

The purpose of this section is to outline the general requirements for the design of roadways within the City and provide typical details for construction. The City of San Juan should be consulted if any deviations from these standards are anticipated before and during construction. All street and roadway improvements shall conform to the City of San Juan's Code of Ordinances, or as approved by the City of San Juan.

Table VII-1 Street Classification/Flexible Pavements Standards				
Characteristic	Street Classification			
	Local	Collector	Minor Arterial	Principal Arterial
Street Width (back of curb to back of curb) (B-B)	32' B-B to 40' B-B ⁴	40' B-B ⁴ to 44' B-B	52' B-B to 65' B-B	65' B-B and Greater
Minimum Structural Section				
Subgrade ¹	6 inches	6 inches	12 inches	12 inches
Flexible Base ²	8 inches	10 inches	12 inches	12 inches
Hot Mix Asphaltic Concrete (HMAC) ³	2 inches	2 ½ inches	3 inches	3 inches
Min. Transverse Slope	2%	2%	2.50%	2.50%
Min. Longitudinal Slope	0.30%	0.30%	0.30%	0.30%
Min. Width of Curb and Gutter	24 inches	24 inches	24 inches	24 inches

- A. Subgrade should be compacted to 98% maximum dry density, as determined by the standard proctor (ASTM D698) and treated with lime at an applicable rate if the plasticity index of the soils is greater than 20. All compacted subgrade shall extend to a minimum of 2 feet behind the proposed back of curb.
- B. The flexible base shall be compacted to 98% maximum dry density, as determined by the standard proctor (ASTM D698) and treated with lime at an applicable rate if the plasticity index of the soils is greater than 102. All compacted flexible base shall extend to a minimum of 2 feet behind the proposed back of curb.
- C. All hot mix asphaltic concrete shall consist of Type "D," crushed limestone aggregate and be compacted to 98% of the maximum theoretical dry density.
- D. 40' B-B may be designated as a local or collector street depending on the street's function.
- E. Design is the responsibility of the Engineer of Record/Geotechnical Engineer.

VI-4 On-sight Storage

A. Throat Lengths

1. The Throat Length refers to the measured distance from the roadway Right-of-Way line to the first crossing or conflict point.
2. On-Sight Storage refers to the minimum throat length required to be provided.
3. All Commercial developments are required to provide a minimum throat length of 30 feet.
4. Any development designed with an internal roadway network shall be required to provide a minimum storage (throat length) of 80-feet before any crossing or conflict point is allowed as depicted on Figure 1.
5. The minimum driveway throat length requirements may increase on recommendations by the City of San Juan.

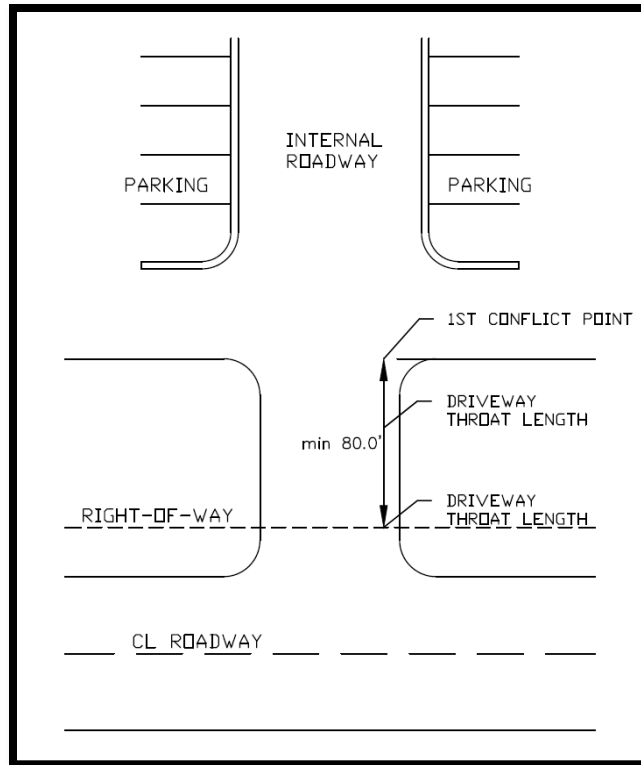


Figure 1: Driveway Throat Length

B. Residential

1. Access points along arterials shall be designed to provide adequate space on the property to allow for vehicles to turn around without the need to back onto the roadway.

C. Non-Residential and Mixed Use

1. Access points shall be designed so that backing, loading, unloading, and other maneuvers are accommodated on-site to prevent using the public right-of-way.
2. The access shall also provide adequate on-sight storage (throat length) to prevent entering or exiting vehicles from obstructing the flow of traffic on roadways. The Engineer may provide verification by means of turning movement templates or Auto-Turn.
3. A driveway median may be required to preserve the length of storage, or to prevent cross access to an outparcel within the storage area of a driveway.

D. Special Traffic Generators

1. Adequate on-sight storage shall be provided within the internal circulation system for properties that include either a drop-off loop or drive-through facility so that vehicles do not queue onto roadways, do not interfere with parking or internal circulation and do not block driveways.
2. Dimensions are measured from the right of way. Minimum lengths are described in Table VII-3.

Table VII-3: Special Traffic Generator Minimum Throat Lengths		
Development Type:		Throat Length
Gas Stations	Pumps parallel to edge of pavement	Minimum setback 35-feet from pump islands to parallel right-of-way
	Pumps not parallel to edge of pavement	Minimum setback 50-feet from pump islands to parallel right-of-way
Restaurant	Fast-Food with drive-thru window	Queue of eight vehicles measured from menu board and three vehicles length from menu board to pick up window**
Banking	Single-Lane	Queue of six (6) vehicles
	Multi-Lane	Queue of five (5) vehicles per lane
Car-Wash	Single-Lane drive-thru full service	Queue of five (5) vehicles
	Automatic or self-serve multi-bay	Queue of two (2) vehicles
Controlled Access	Gate Subdivision	Minimum of 30-feet from Right-of-way to call box; from call box to gate 40 feet
<p>*Note:</p> <ul style="list-style-type: none"> • 1 Vehicle = 20 feet • **or a combination approved by The City of San Juan equaling no less than 11 Vehicles 		

3. Schools require adequate storage for drop-off and pick-up areas, which shall be provided entirely on the school campus site to ensure safety for the students and to minimize the impact on the surrounding traffic network. The School On-sight Storage requirements are shown below on Table VII-4.

Table VII-4: School Storage Lengths		
Type	Student Population	Loop Drive Stacking Length
Elementary School	200-600	650-1,000 Linear Feet
	600-1,200	1,000-1,500 Linear Feet
Middle School	200-600	700-1,000 Linear Feet
	600-1,200	1,000-1,500 Linear Feet
High School	400-800	800-1,200 Linear Feet
	800-2,500	1,200-1,500 Linear Feet
*Note:		
<ul style="list-style-type: none"> • 1 Vehicle = 20 feet • **or a combination approved by The City of San Juan equaling no less than 11 Vehicles 		

VI-5 Shared Access

A. General

1. Shared Access points are required when the frontage of a property is insufficient for proper spacing of access point as depicted on Figure 2.
2. The property owner is required to record a common ingress/egress access easement with the plat allowing ingress/egress to properties that share access as determined by the City of San Juan.
3. In the case where a subject property is being platted through which ingress/egress is necessary for another property to have access to public right-of-way, then the subject property shall record a common access easement allowing such other property to a shared access.
4. Use of such easement by other property owners shall be made contingent on such other owners' agreement to the shared maintenance responsibilities on a pro-rata basis, proportional to respective square footage of all properties having access to easement.

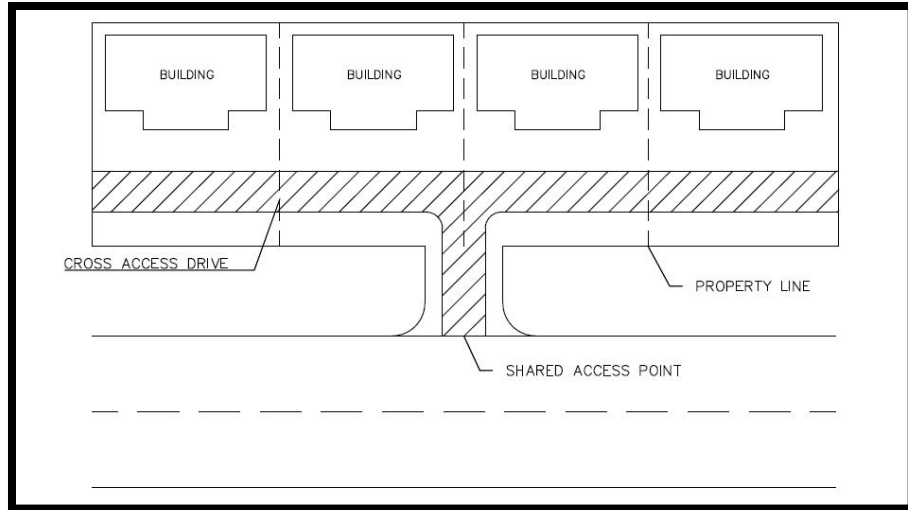


Figure 2: Shared Access

VI-6 Alley Design

- A. Developers shall construct alleys in accordance with the engineering requirements of the City.

ROW	20 feet
Paving Width	16 feet
Minimum Structural Section	
Subgrade	6 inches
Flexible Base	8 inches
HMAC	2 inches

In any case where an alternate pavement section is requested, a pavement design analysis will be required for approval by the City of San Juan.

VI-7 Geometrics

A. General

1. Provisions must be made for the extension of major streets; minor streets shall be provided for circulation of traffic through the subdivision or development; and adequate local residential streets provided to accommodate the development.
2. Off-center street intersections will not be permitted. The minimum street offset at intersections is 125 feet. All major and minor streets shall be continuous and in alignment with existing streets unless variation is deemed advisable by the City.

B. Corner Clips and Radius Dimensions

1. Values presented on the table below shall govern on all City intersections with the exception of intersections on TxDOT right-of-way

Table VII-3 :Corner Clip / Radius Dimension					
Roadway Type	Minor Residential (50' ROW)	Residential Collector (60' ROW)	Collector (80' ROW)	Minor Arterial (100' ROW)	Principal Arterial (120' ROW)
Minor Residential (50' ROW)	(15' / 20')	(20' / 20')	(30' / 25')	(40' / 30')	(50' / 35')
Residential Collector (60' ROW)	(20' / 20')	(20' / 25')	(30' / 30')	(40' / 35')	(50' / 40')
Collector (80' ROW)	(30' / 25')	(30' / 30')	(30' / 35')	(40' / 40')	(50' / 50')
Minor Arterial (100' ROW)	(40' / 30')	(40' / 35')	(40' / 40')	(40' / 50')	(50' / 50')
Principal Arterial (120' ROW)	(50' / 35')	(50' / 40')	(50' / 50')	(50' / 50')	(50' / 50')

B. Grades:

1. Major streets may have a maximum grade of 5 percent, unless the natural topography requires steeper grades in which case 7 1/2 percent may be used for a maximum length of 200 feet.
2. Minor streets may have a maximum grade of 7 1/2 percent.
3. Local residential streets may have a maximum grade of 10 percent.
4. All streets must have a minimum grade of at least 0.3 percent.
5. With the City's prior approval, 10 percent grade may be allowed, if necessary.
6. Centerline grade changes with an algebraic difference of more than 2 percent shall be connected with vertical curves of sufficient length to provide a minimum of 600 feet sight distance on major streets; 400 feet sight distance on minor streets and local residential streets.

7. No vertical curve shall be less than 200 feet in length if the algebraic grade change difference is 2 percent or more.
8. In the case that the algebraic difference is less than 2 percent, the minimum length of vertical curve must be 100 feet.
9. Wherever a cross slope is necessary or desirable from one curb to the opposite curb, such cross slope or curb split shall not exceed 6 inches in 31 feet.

C. Street Intersections:

1. The most desirable street intersection is 90 degrees. However, existing street patterns may necessitate fewer perfect conditions.
2. No major street shall intersect any other major street at an angle of less than 60 degrees.
3. No minor street shall intersect a major street at less than 45 degrees.
4. No local residential street shall intersect any other street at less than 60 degrees.
5. Curb radii at intersections shall be a minimum of 15 feet for local residential and minor streets and a minimum of 20 feet for all major streets.
6. All radii are measured to the back of curb.
7. Where sidewalks are adjacent to the street intersection, handicapped ramps shall be constructed to State and Federal Standards

D. Cul-de-Sacs:

1. Length of the entrance road to cul-de-sacs should not exceed 600 feet.
2. The cul-de-sac itself should have a minimum radius of 50 feet to the property line with a 40-foot radius to the back of curb.
3. Increased length of a cul-de-sac entrance road will require larger cul-de-sac radii and increased pavement widths.
4. Cul-de-sac must consist of 4" pavement or 8" concrete with #4 rebar.

E. Curb and Gutter:

1. All streets shall be constructed with 24-inch standard concrete curb and gutter as detailed in this section; exceptions will be the rural section, also shown herein.

VI-8 Pavement Detail

A. Materials:

1. Pavement sections shall be a combination of lime stabilization, subgrade, crushed caliche base and hot mix asphaltic concrete known as flexible pavement.
2. Pavement shall be constructed of reinforced or jointed concrete paving which is known as rigid pavement.
3. No seal coating of new construction will be allowed.
4. All crushed caliche base material used shall be Texas Highway Department Item 247, type E Grade 3 or better.
5. Material should be compacted in maximum eight-inch lifts to a minimum of 98 percent of ASTM D-1557 method D density.
6. All finished caliche base surfaces will be primed with MC-30 at a rate of 0.20 gallons per square yard.
7. All HMAC surfaces will be preceded by application of tack coat at a rate not to exceed 0.10 gallons per square yard.
8. Hot, mix asphaltic concrete surface material shall be Texas Highway Department Item 340, Type D.
9. Natural Subgrade – loose or disturbed material beneath pavements is to be re-compacted to 98 percent of ASTM D 698, method D density in maximum six-inch lifts.
10. Concrete used for concrete pavements shall have a 28-day compressive strength of 3,500 PSI and a 14-day flexural strength of 500 PSI.

B. Design and Testing:

1. Material testing should be performed by a Professional Geotechnical Engineer licensed to practice in the State of Texas in accordance with the City of San Juan pool of Professional Geotechnical Engineers.
2. Material testing shall be paid by the developer through the Material Testing Fee (3%). Additional funds may be required if additional costs are incurred and must be paid for before final acceptance of the subdivision.

3. The following table shows the testing requirements for material types in a typical roadway.

- The minimum pavement thickness shall be:

Flexible Pavement:

1. Residential (minor) Street: Proper compaction of subgrade 8-inch compacted caliche base 2-inch HMAC
2. Residential Collectors: Proper compaction of subgrade 8-inch compacted caliche base 2 ½-inch HMAC
3. Rural (County Standards) Streets: Proper compaction of subgrade 8-inch compacted caliche base 3-inch HMAC

Rigid Pavement:

1. Proper compaction of subgrade 5-inch concrete pavement or approved design. Thickness design shall be submitted for review and approved.

Table VII-4: Material Testing Requirements

Table VII-4: Material Testing Requirements		
Material Type	Testing Requirement	
Subgrade	1 test for every 1,000 square yards of street area for compaction and depth using standard proctor compaction test	
Flexible Base	1 test for every 1,000 square yards of street area for compaction and depth using standard proctor compaction test	
Hot Mix Asphaltic Concrete (HMAC)	1 test for every 1,500 square yards of street area for thickness verification using core samples	
Concrete	Curb & Gutter	Concrete Pavement
	3 cylinders for every 1,500 linear feet of curb and gutter to be broken at 7 and 28 days	3 cylinders for every 1,000 square yards, slump & air test for every 1,000 square yards

The following street classification shall be designed for the corresponding 18-Kip Axle Repetitions with a 30-year design life as a minimum.

<u>Street Type:</u>	<u>18-Kip Axle Repetitions</u>
Major Thoroughfare	> *250,000
Minor Thoroughfare	250,000
Residential Collector	100,000
Local Residential (Minor) Street	25,000
Cul-de-sac	14,000

*Based on traffic counts and projections.

The location of each street must be considered with respect to truck traffic and its percentage to other traffic. Accurately estimated truck traffic is essential to pavement design. A high degree of professional judgement must be used.

VI-9 Sidewalk Design

A. General

1. All sidewalk and ramp construction shall meet the accessibility standards provided in the Texas Accessibility Standards (Texas Civil Statutes, Article 9102).
2. Sidewalks shall be a minimum four (4) feet in width in residential and commercial zones.
3. Sidewalk alignment shall match existing alignment in the area. Any deviation shall require approval by the City of San Juan.
4. Sidewalk is to be a minimum of three (3) feet behind curb unless otherwise approved by the City of San Juan Planning and Zoning Director.
5. Sidewalks should be constructed with a minimum of four (4) inch thick concrete, reinforced with 6" x 6" No. 10-gauge wire mesh.
6. All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3,500 psi at 28 days.
7. Sidewalk shall slope toward the street with a maximum transverse slope of ¼ inch per foot (2%), 1-inch above the top of curb, and a maximum longitudinal slope of ½ inch per foot (5%).
8. Subgrade and 2" sand cushion should be compacted to 90% standard proctor.
9. Bar lift, plastic chairs or approved equal shall be installed to keep reinforcement at center of concrete thickness.
10. Contraction joints shall be placed at every 6 feet and expansion joints at every 30 feet.
11. Exposed aggregate concrete is not allowed. Concrete sidewalks shall be non-slip broom finished transverse to the walkway.
12. Ramps shall be placed at all intersection with roadways or where required by law/City. Curb and Gutter must be seen cut at the location of the proposed ramp.

VI-10 Residential Driveway Design

A. General

The following criteria shall be applicable to residential driveway apron designs:

1. Minimum driveway width allowed is 10 or 12 ft. and a maximum is 26 ft.
2. Curb cut must be a minimum of 6-feet from a side property line.
3. Flow line of new gutter shall match existing flow line.
4. Curb and Gutter must be saw cut
5. Driveway aprons shall be constructed of concrete with a minimum of 6-inches in thickness, reinforced with 6'' x 6'' No. 6 wire mesh, No. 3 Bars @ 12'' O.C.E.W or No. 4 Bars @ 18'' O.C.E.W.
6. Bar-lift Plastic Chairs, or approved material, shall be used to secure steel at center of concrete thickness.
7. Concrete shall have broom finish. Exposed aggregate, pavers, tile and stained or painted concrete are not permitted within the right of way.
8. All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3,500 psi.
9. Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.
10. Subgrade shall be compacted to 95% standard proctor.
11. Expansion joint required at property line and intersection with sidewalks. Longitudinal expansion joint required at mid-point of driveway if width is greater than 18-feet.
12. If a manhole falls within a driveway pad, the manhole lid shall be placed flush with the elevation of the driveway.
13. Any driveway placed where a drainage bar ditch exists shall maintain the flow line of the ditch with the placement of a concrete culvert.
14. Collector Streets: must be spaced a maximum of 600 feet or 5 lots apart.
 - a. Driveway wings shall not exceed a 12:1 Slope

VI-11 Commercial Driveway Design

A. General

The following criteria shall be applicable to Commercial driveway apron designs:

1. The minimum width allowed is 25 feet and maximum is 45 feet.
2. Curb cut must be a minimum of 6-feet inside the property line.
3. The flow line of the new gutter shall match existing flow line.
4. The curb and gutter must be saw cut.
5. Driveway aprons shall be constructed of concrete with a minimum of 6 inches in thickness, reinforced with No. 4 bars @ 12" O.C.E.W.
6. Driveways exceeding HS-20 loads to be reviewed and approved by City of San Juan.
7. Bar-lift Plastic Chairs, or approved equal, shall be used to secure steel at center of concrete thickness.
8. Concrete shall have a broom finish. Exposed aggregate, pavers, tile and stained or painted concrete are not permitted within the right of way.
9. All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3,500 psi.
10. Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.
11. Subgrade shall be compacted to 98% standard proctor.
12. Expansion joint required at property line and intersection with sidewalks. Longitudinal sawed contraction joint required at 15 feet minimum. See commercial concrete driveway & typical joint layout for details.
13. If a manhole falls within a driveway pad, the manhole lid shall be placed flush with the elevation of the driveway.
14. Any driveway placed where a drainage bar ditch exists, shall maintain the flow line of the ditch with the placement of a concrete culvert.
15. Driveway wings shall not exceed a 12:1 slope.

VI-12 Material Testing

1. Testing shall be performed by a Professional Geotechnical Engineer licensed to practice in the State of Texas.
2. Material testing shall be paid by the developer through the Material Testing Fee (3%). Additional funds may be required if additional costs are incurred and must be paid for before final acceptance of the subdivision.
3. Only Lab Engineers test results will be valid for any street construction.

The following table shows the testing requirements for material types in a typical roadway.

Table VII-5: Material Testing Requirements		
Material Type	Testing Requirement	
Subgrade	1 test for every 1,000 square yards of street area for compaction and depth using standard proctor compaction test	
Flexible Base	1 test for every 1,000 square yards of street area for compaction and depth using standard proctor compaction test	
Hot Mix Asphaltic Concrete (HMAC)	1 test for every 1,500 square yards of street area for thickness verification using core samples	
Concrete	Curb & Gutter	Concrete Pavement
	3 cylinders for every 1,500 linear feet of curb and gutter to be broken at 7 and 28 days	3 cylinders for every 1,000 square yards, slump & air test for every 1,000 square yards

VI-13 Pavement Cut Repair

A. General

There is a permit required for all street cuts with an associated fee with the exception of new construction and city project. Approved permits for pavements cut shall be issued by the City of San Juan Public Works Department with the following conditions:

1. Line and grade shall be staked by permittee 24 hours in advance of construction for City inspection of other affected city utilities.
2. All backfill shall be performed in 6-inch loose layers compacted to 98% Standard Proctor. 3% cement stabilized backfill shall be placed from 18 inches below finished grade.

3. The paving structure shall be replaced with a comparable material in composition and thickness to new condition.
4. All paving cuts shall be saw cut in straight lines.
5. The patch on asphalt streets shall extend a minimum of 12 feet one either side of the trench or to the nearest seam, or as specified. Concrete streets shall have an expansion joint where new concrete abuts old.
6. Any future settlement shall be repaired by the permittee for a period of 1 year. (Refer to Section II-11).
7. Any shrubbery, domestic plants or grass removed during construction shall be replanted and maintained by qualified personnel for 3 months.
8. Signs shall be removed and reinstalled by the City.
9. The issuance of the permit grants permission to work within City right-of-way for the purpose of laying the proposed facility but does not guarantee a route free of obstruction such as utility lines whether privately or commercially owned. In order to prevent damage to these utility lines it is the permittee's responsibility to contact the various utility companies or private owners for the exact location of any facilities that may be in the path of the proposed work.
10. The right-of-way must be cleared of trash and excess dirt and left in a neat, clean condition upon completion of the installation.
11. In crossing, the top of the utility line shall be a minimum of 2 feet below grade line in ditches or a minimum of 4 feet below the pavement edge, whichever is greater. In curb and gutter section, your line shall be covered a minimum of 2.5 feet below the flowline of the gutter. Where the boring method is required by the City, overcutting in excess of 1 inch in diameter shall be remedied by pressure grouting the entire installation.

VI-14 Required Submittals

The following submittals will be required for all improvements:

A. Preliminary Approval Phase

1. Site Plan showing existing and proposed:
 - a) Street Widths
 - b) ROW Widths
 - c) Paving Type
 - d) Street Geometrics

- e) Drainage Flow

B. Final Approval Phase

- 1. Finalized Versions of all the required submittals in the Preliminary Approval Phase.

C. Construction Phase

- 1. Six complete set of plans, profiles and specifications for all street improvements showing:
 - a) Street Widths; Grades; Proposed Profiles
 - b) Pavement Design; Curb and Gutter Type; Design Details
 - c) Cross Sections
 - d) Complete Construction Details
 - e) All plans signed and sealed by Professional Engineer.
- 2. Cost Estimate for all street improvements.
- 3. Material Testing:
 - a) Refer to Section I-8.

VI-15 Warranty

All materials, products, and workmanship shall be guaranteed for a period of no less than 60 months from the written Date of Acceptance by the City.

VI-16 Standards

The following paving details adopted standards required by the City can be found in Appendix 5 – Paving Details

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SECTION VII – WATER IMPROVEMENTS

VII-1 General

The purpose of this section is to define the general requirements for the design of water improvements and to provide typical details for construction. If any deviations from these standards are anticipated, the City should be consulted before and during construction. In cases where physical barriers or design limitations limits compliance with standards outlined in this section, alternatives are to be considered by the City of San Juan prior to construction and final acceptance of the improvements.

VII-2 Design Standards

A. General

All water mains that are proposed or extended from the distribution system of the City of San Juan shall be in conformance to these requirements:

1. Water improvements to the City of San Juan water distribution system are to be designed by a Professional Engineer licensed to practice in the State of Texas.
2. All water mains must be designed in accordance with Texas Administrative Code Title 30, Part 1, Chapter 290 (TAC 290), ***Subchapter D: Rules and Regulations for Public Water Systems*** of the Texas Commission on Environmental Quality (TCEQ), latest edition.
3. All development bordering planned extensions of major transmission lines shown on the Master Water Plan shall install the shown pipe size at the cost of the development subject to the City’s standard reimbursement policy.
4. There shall be no connection made to any water main owned by or under the control of the City of San Juan or any water main attached to the San Juan distribution system by any person or persons, except employees or authorized agents of the City of San Juan.
5. Water mains are to be designed and installed with a minimum cover of five (5) feet unless approved by the City of San Juan.
6. The minimum water main diameter for lines with fire hydrants shall be 8-inches. Fire Hydrant lead line shall be no less than 6 inches in diameter. All lines with fire hydrants shall be looped (two source) unless otherwise approved by The City. The City may require larger diameter lines based on several factors including demand, service areas, Fire Marshal requirements, and historical data.
7. Pipes shall be sized as required to serve the anticipated development, but not less than:
 - Single Family Residential

- Distribution and/or future extension (8-inch)
 - Internal Service (6-inch)
 - Commercial, Retail and Multi-Family (8-inch)
 - Industrial (12-inch)
8. On cul-de-sac streets less than 400 feet, fire hydrants should be located at the entrance of the cul-de-sac. Valves will be placed between the hydrant and tee. The City Fire Marshal has final authority regarding the quantity and location of proposed fire hydrants. Additional installations may also be required by the City of San Juan for future developments.
 9. Fire Hydrants shall be spaced at a maximum of 500 feet radius between each other in residential areas. Fire Hydrants shall be spaced at a maximum of 300 feet radius between each other in non-residential land use. All distances will be measured along Public R.O.W. or emergency access ways. Fire hydrants shall be located on both sides of the following thoroughfares: FM 495, Business Highway 83.....
 10. Blue reflective markers shall be installed on the centerline of access road to indicate the location of a fire hydrant.
 11. Blow offs will be required on dead-end mains at locations where a hydrant is not installed and where tie-in or extension of that main is delayed by more than 6 months. An assembly of 2-inch pipe with valve, valve box and riser are required.
 12. Valves shall be spaced at a maximum of 1000 feet or as directed by the City of San Juan. Valves should also be installed on any stub-outs for future line extensions.
 13. All lots shall be provided with service stub-out and said service locations shall be marked on the curb and the gutter with a “W” not less than 1 ½-inch in size or in a manner that is approved by the City of San Juan.
 14. Before being placed in service, the entire line, including service connections, shall be chlorinated by the following methods: Chlorine gas-water mixture or hypochlorite and water mixture. The chlorinating agent shall be applied at the beginning of the section adjacent to the feeder connection and shall be injected through a corporation cock or similar connection.
 15. Water shall be fed slowly into a new line with chlorine applied in amounts to produce a dosage as indicated:

<u>Dosage:</u>	<u>Residence Time for Sterilization</u>
50 ppm	24 hours
200 ppm	8 hours
500 ppm	30 minutes

After dosage has been tested by color indicator, or photocell, and residence time is complete, the line must be flushed before testing for bacteria by the City. Water for testing, flushing, etc... will be at the expense of the developer and shall collaborate with the City for the purchase of water. All water for testing must be metered.

16. Water line pipe shall conform to AWWA C900, C905, or C909 requirements and have a minimum Pressure Class or Pressure Rating of no less than 150 psi. Pipe diameters 12 inches or smaller shall be AWWA C900 PVC DR18. Pipe diameters 14 inches and larger shall conform to AWWA C905. The entire length of pipeline shall be tested as one length unless otherwise specified.
17. Tapping sleeves and valves shall be stainless steel and meet AWWA specifications with a minimum working pressure of 150 psi.
18. All bends and fittings shall be cast iron mechanical joint restraints (C.I.M.J.) for pipes and meeting the specifications of A.N.S.I./AWWA C110.
19. All water services shall be polyethylene tubing unless otherwise approved by the City of San Juan.
20. Galvanized pipe or fittings are not allowed, with the exception of a 2-inch riser on blow-offs.
21. The design of a water distribution system shall incorporate a means to achieve a two-source water line loop. This may require extensions or off-site utility improvements. Exceptions to the looped water line requirement will be evaluated on a case-by-case basis.
22. Concrete thrust blocks on water main fittings should be placed to withstand the test pressure of 150 psi.
23. Valves, fire hydrants, and services shall be as the standard plates attached and part of this section.
24. Project Close-out documents shall include an electronic and (or) hard copy of Final Record Drawings (As-Built). Electronic drawings are preferred.
25. Water Main – Sanitary Sewer Crossings:

Primary Condition	Proposed Water Existing Sanitary				Proposed Water Proposed Sanitary or Existing Water Proposed Sanitary			
	Water Over Sanitary		Water Under Sanitary		Water Over Sanitary		Water Under Sanitary	
If the Clearance Is:	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'
*Protection Requirement	1	2	3	4	5	6	3	6

****Protection requirements for sanitary sewer crossings are listed below (Unless variance is granted by the TCEQ) (All clearances shall be measured from outside wall to outside wall)***

A. Protection Requirements for Sanitary Sewer Crossings

1. Center one (1) 20-foot joint of C-900 PVC DR-18, Class 150, waterline pipe over sanitary sewer; 6-inch absolute minimum clearance.
2. If no evidence of sanitary sewer leakage, center one joint of water line over sanitary sewer: 24-inch absolute minimum clearance. If the sewer line is leaking, the sewer line shall be replaced with 150 psi lined ductile iron or PVC pipe with appropriate adapters on all lined ductile iron or PVC pipe with appropriate adapters on all portions of the sanitary sewer within 9-feet of the water main.
3. Not allowed
4. Auger 9-feet minimum each side of sanitary sewer, place one 20-foot joint of C-900 PVC, 150 psi, centered under sanitary sewer. Fill bored hole with bentonite/clay mixture: 2-foot absolute minimum clearance or replace the existing sanitary sewer with 150 psi line ductile iron or PVC pipe with appropriate adapters on all portions of the sanitary within 9-feet of the water main.
5. Minimum 18-foot joint of sanitary sewer, 150 psi lined ductile iron or PVC pipe centered at the water line; 6-inch absolute minimum clearance.
6. If clearance is between 2 to 9-feet:
 - a. Center a minimum 18-foot joint of 150 psi lined ductile iron or PVC pipe at water line.
 - b. Use cement-stabilized sand backfill (minimum 2 sacks cement per cubic yard of sand) starting at a point $\frac{1}{4}$ of the pipe diameter above the bottom of the sanitary sewer to 1-foot above the top of sanitary sewer, or one sanitary sewer

diameter, whichever is larger. Center one joint of sanitary sewer pipe about the water main.

VII-3 Testing Requirements

- A. Water mains and service lines shall be chlorinated before it can begin service. The chlorinating substance shall be applied at the beginning of each pipe section for testing.
- B. Water mains and service lines shall be flushed before testing by City inspector for bacteria. All costs associated with bacterial testing to be paid by the Contractor, including retests.
- C. Water mains shall be tested for leaking in accordance with AWWA Standard C-900 (150 psi) for two hours. Air from the water line shall be removed before the start of testing.
- D. The City Inspector must be present at time of testing.

VII-4 Right of Way Crossings

- A. Water distribution mains that are located within state right of way must conform to the requirements of the Texas Department of Transportation (TxDOT).
- B. Water distribution mains that cross railroads must conform to the requirements of the railroad company whose right-of-way is being crossed.
- C. Water distribution mains crossing creeks or drainage channels regulated by FEMA shall require encasement. Below grade crossings are preferred; however, aerial crossings may be considered.
- D. Thrust restraint shall be provided at points of transition from buried to exposed pipe and at changes in alignment of exposed pipe.
- E. Air release valves shall be provided at the high point of all crossings.
- F. Below grade crossings of creeks and drainage channels shall have a minimum cover of 5-feet below the creek flowline at the time of construction.
- G. All below grade crossings will require steel encasement with all ends capped and sealed. The casing shall be carried into the bank a distance that should consider changes in the creek channel. This distance shall be beyond the high bank, outside of a projected 1H:1V slope from the high bank away from the channel.

VII-5 Easements

- A. Water mains constructed outside of public rights of way shall be in easements of not less than 15 feet in width except for the following:
- a. If the water main is deeper than 6 feet, the easement width shall be not less than 20 feet.
 - b. If the water main depth is greater than 14 feet, the easement width shall be 30 feet.
 - c. If both water and wastewater mains are located within the same easement, the width shall not be less than 25 feet (larger widths will be required depending on the depth of the sewer main).
 - d. Where water lines are adjacent to building structures, easement width shall be increased.
 - e. When adjacent to ROW width no less than ten (10) feet.

VII-6 Required Submittals

The following submittals will be required for all improvements:

A. Preliminary Approval Phase

1. Site Utility Plan showing existing and proposed:
 - a) Water Main Sizes
 - b) Size and Location of Valves
 - c) Fire Hydrant Locations
 - d) Taps to City's distribution system
 - e) Service Locations
 - f) Direction and Proposed connection of projects done in phases

B. Final Approval Phase

1. Finalized Versions of all the required submittals in the Preliminary Approval Phase.

C. Construction Phase

1. Six complete sets of plans, profiles and specifications for all proposed water lines, valves, and fire hydrants showing location, size, depths, dimensions, and construction details. After the PRE-CONSTRUCTION CONFERENCE, City Staff, Project Engineer and the Contractor will sign the approved plans which shall be exclusively used during construction.
2. A Cost Estimate will be needed for all water improvements.

3. Pre-Construction conference will be held at City Hall or designated area. A notice to proceed from the City shall be obtained delineating proposed project, required conditions and pavement repair specifications.
4. Any deviations from the approved plans, or change orders, shall be submitted to the City for approval.
5. Three hard copies and an electronic copy of the certified “As-Built” plans shall be furnished to the City at the completion of the improvements prior to acceptance.
6. The Project Engineer will provide cut sheets at a minimum of 100-foot intervals.

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SECTION VIII – WASTEWATER IMPROVEMENTS

VIII-1 General

The purpose of this section is to define the general requirements for the design of wastewater improvements and to provide typical details for construction. If any deviations from these standards are anticipated, the City should be consulted before and during construction. In cases where physical barriers or design limitations limits compliance with standards outlined in this section, alternatives are to be considered by the City of San Juan prior to construction and final acceptance of the improvements.

VIII-2 Design Standards

A. General

All sanitary sewer mains that are proposed or extended from the collection system of the City of San Juan shall be in conformance to these requirements:

1. All wastewater mains must be designed in accordance with Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ) TAC 217, or the latest edition.
2. Wastewater improvements to the City of San Juan wastewater collection systems are to be designed by a Professional Engineer licensed to practice in the State of Texas.
3. Wastewater mains are to be designed and installed with minimum cover of four (4) feet unless approved by the City of San Juan.
4. Sanitary sewer lines shall be a minimum of eight (8) inches in diameter, except laterals and force mains. The City may require larger diameter lines based on several factors including demand, service areas, and historical data.
5. Pipe sizes shall be required to serve the anticipated development but not less than:
 - a. Single Family – 8”
 - b. Commercial & Multi-Family – 8”
 - c. Industrial – 8”
 - i. Services on commercial, industrial, institutional and multi-family shall consider a minimum of 6-inch service lines.
6. Gravity sewer lines shall be designed with a straight alignment and a uniform grade between manholes. Deviation of horizontal alignment between manholes is not allowed. Table IV-1 Depicts the minimum and maximum pipe slopes for wastewater lines.

TABLE IX - 1		
Pipe Size (in.)	Minimum Slope (%)	Maximum Slope (%)
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
Greater than 39	*	*

* Pipes larger than 39 inches in diameter slopes are determined by Manning's formula to maintain a velocity greater than 2.0 (ft/s) and less than 10.0 (ft/s) when flowing full.

Manning's Formula

$$V = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S}$$

V = velocity (ft/s)

n = Manning's roughness coefficient (0.013)

R_h = hydraulic radius (ft)

S = slope (ft/ft)

Reference: *TCEQ Chapter 217, Subchapter C: Conventional Collection Systems*

7. Sanitary Sewer manholes shall be placed at a maximum of 500-foot spacing or as directed by the City of San Juan.
8. The sewer main and service line pipe shall conform to SDR26 meeting requirements of ASTM D-3034. Force mains shall conform to SDR21.
9. All lots must be serviced with single service stub-outs, including a clean-out located at the right of way or within an easement. Service locations should be marked on the curb

or gutter with an “S” not less than (4) inches in size or in a manner approved by the City of San Juan.

10. Single service connections shall be extended for each lot and a cleanout shall be installed at the right of way or within an easement. For land use other than single family residential, individual services shall be provided for each unit or suite. If a shell building is proposed, the project engineer shall provide a reasonable assumption of the number of suites that the shell building may hold.
11. Single-family residential private service connections shall be a minimum of four (4) inches in diameter. Multi-family residential, commercial, and industrial private service connections shall be a minimum of six (6) inches in diameter.
12. Rubber gaskets shall conform to ASTM D-1869, D-361 or C-443. A maximum of 15 inches of manhole grade adjustment rings is allowed and a minimum of five (5) inch of grade rings is required between the manhole and the rings.
13. Manhole rings and covers shall have a minimum 30-inch opening and include the City of San Juan logo provided in the detail’s sections and rain guards. Manhole cover is to be traffic rated fiber composite, or as directed by City of San Juan Public Works Director. (See details at the end of this section)
14. Project Close-out documents shall include an electronic and a hard copy of Final Record Drawings.

VIII-3 Testing Requirements

A. Infiltration/Exfiltration:

1. The total infiltration or exfiltration, as determined by test, shall not exceed 200 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2 feet.
2. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, remedial action shall be undertaken in order to reduce the infiltration or exfiltration to an amount within limits as specified. Infiltration or exfiltration tests shall be performed on the total footage on the project.
3. Copies of all tests results shall be made available to the city.
4. The air test shall conform to the procedure described in ASTM C828 or other appropriate procedures.

B. Deflection:

1. Deflection tests shall be performed on all flexible and semi-rigid pipes.

2. The test shall be conducted after the final backfill has been placed.
3. No pipe shall exceed a deflection of 5%.
4. The deflection test should be performed using a rigid ball or mandrel and have a diameter equal to 95% of the inside diameter of the pipe being tested.
5. The test should not be performed using mechanical pulling devices.
6. The city's construction inspector must be present at the time of testing.

C. Low Pressure Test:

1. The Low-Pressure Air Test must follow the procedures described in American Society for Testing and Materials (ASTM) C 828, ASTM C 924, ASTM F 1417 or other procedure approved in writing by the City of San Juan. The testing times listed in Table IX-3 must be used, regardless of the testing procedure.
2. For sections of the collection system pipe with an average inside diameter of less than 36 inches, the following table applies.
3. For sections of the collection system pipe with an average inside diameter of 36 inches or larger, pipe must be pressurized to 3.5 pounds per square inch (psi) gauge. If groundwater is present, then a pipe must be pressurized to 3.5 psi gauge greater than the pressure exerted by groundwater above the pipe. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

$$T = \frac{(0.85 * D * K)}{Q}$$

Where:

T = Time for pressure to drop 1.0 pound per square inch in seconds (s)

K = 0.000419*D*L; but not less than 1

D = Average inside pipe diameter (in.)

L = Length of pipeline (ft.)

Q = Rate of loss, 0.0015 cubic feet per minute per square foot internal surface.

4. Since a K value of less than 1.0 may not be used, the minimum testing time for each pipe diameter is shown on Table IX-2.

TABLE IX - 2			
Pipe Diameter (inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Length (seconds/foot)
6	340	398	0.855
8	454	298	1.52
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856
Reference: <i>TCEQ Chapter 217, Subchapter C: Conventional Collection Systems</i>			

D. Video Camera Inspection:

1. The City of San Juan may perform a video inspection prior to final acceptance of work but is not necessary for approval.
2. Any defects including but not limited to sagging, leaking, infiltration, separation of joints, service connection, defects, or loss of roundness shall require repair and must be reported to the City of San Juan.

VIII-4 Manholes

- A. Manholes will be required to facilitate maintenance, cleaning, and inspection at changes in horizontal alignment (including at the center of horizontally curved sections of main where the included angle equals or exceeds 45-degrees), changes in grade, changes in pipe size and at junctions with other wastewater mains or collection lines.
- B. Manholes will be required at the junctions where service leads, 6-inch diameter or larger, join mains.
- C. When a change in the size of a wastewater main or collection line occurs without a change in grade, the inside top of pipe (soffit) elevations will be matched in the manhole. Elevation differences between pipes at a manhole will require a drop manhole if >2' above FL.

- D. At the end of a main or collection line, the line shall be terminated with a manhole or clean out as per TCEQ requirements.
- E. Clean-outs shall only be allowed when there is no physical means for an extension and the line is less than 4 feet in depth. If an extension is anticipated, a plugged stub-out of one full pipe joint with a clean-out is required.
- F. Manholes must be constructed of fiberglass.
 - 1. Fiberglass manholes may only be used in non-structural areas as a special design.
 - 2. Watertight sealed manholes with bolt-down lids shall be provided in creek beds and in floodplains
 - 3. The City may require HD Composite Manhole Covers when applicable.
- G. A 0.1-foot drop through the manhole is desired.
- H. Manholes 10 feet to 20 feet deep shall be at least 5 feet in diameter and manholes over 20 feet deep shall be at least 6 feet in diameter.
- I. Manhole sizes shall be as follows:

<u>Manhole Diameter</u>	<u>Main Size</u>
4 ft	<18 in.
5 ft	≥18 in. < 30 in.
6 ft	≥36 in.

VIII-5 Right-of-Way Crossing

- A. Wastewater collection mains located within state right of way must conform to the requirements of the Texas Department of Transportation (TxDOT).
- B. Wastewater collection mains that cross railroads must conform to the requirements of the railroad company whose right-of-way is being crossed.
- C. For wastewater collection mains crossing creeks or drainage channels, piers must support the elevated sections of such crossings. Dry bore all crossings of existing streets unless otherwise authorized by the Director of Planning.
- D. Below grade crossings of creeks and drainage channels shall have a minimum cover of 5-feet below the flowline at the time of construction.
- E. All below grade crossings will require encasement with steel encasement pipe and all ends shall be capped and sealed.

- F. The casing shall be carried into the bank a distance that should consider changes in the creek channel. This distance shall be beyond the high bank, outside of a projected 1H:1V slope from the high bank away from the channel.
 - 1. Should the City of San Juan allow less than 5-ft below grade crossings of creeks and drainage channels/ditch, steel encasement and concrete capping shall be required.

VIII-6 Encasement

- A. Steel cylinder pipe shall be used for all encasement pipe. Other encasement pipe material may be used per TCEQ requirements and City Specifications.
- B. Carrier pipes sized less than 30 inches shall use an encasement pipe with a wall thickness no less than 3/8-inch.
- C. Carrier pipes 30 inches and larger, a wall thickness of no less than 1/2-inch shall be used. Coating of encasement pipe may be required in special soil conditions.
- D. When required, encasement pipe diameter shall be as specified in the specifications and details.
- E. Encasement pipes shall extend 2-feet beyond the back of both curbs on the street.
- F. Ends of encasement pipes shall be sealed to prevent the intrusion and collection of groundwater.
- G. All carrier pipes will be supported by casing spacers in accordance with the specifications and details and shall have joints restrained by an approved method that will allow the removal of the carrier pipe from the encasement pipe in a single direction by means of tension on the carrier pipe only.

VIII-7 Easements

- A. Wastewater lines constructed outside of or not adjacent to public rights-of-way shall be in easements of not less than 15 feet in width except for the following:
 - 1. If the sewer main bury is deeper than 10 feet, the easement width shall be not less than 20 feet.
 - 2. If the sewer main bury is greater than 14 feet, the easement width shall be 30 feet.
 - 3. If both wastewater and water mains are located within the same easement, the width shall not be less than 25 feet (larger widths will be required depending on the depth of the sewer main).

- B. The easement must be located such that the centerline of the wastewater line is no closer than 5.5-feet to the closest edge of the easement. Additionally, when the easement is adjacent to the ROW width, the centerline of the wastewater line shall be no less than ten (10) feet to the closest edge of the easement.

VIII-8 Required Submittals

The following submittals will be required as part of the utility design on all improvements:

A. Preliminary Approval Phase

1. A reproduction of that portion of the City's Master Sanitary Sewer Collection Plan showing the relationship of the area to be improved and the proposed improvements.
2. Site Utility Plan showing existing and proposed:
 - a) Sewer Main Sizes
 - b) Manhole and Lift Stations
 - c) Grades and Capacities
 - d) Taps to City's collection system
 - e) Service locations
 - f) Direction and proposed connection of projects done in phases

B. Final Approval Phase

1. Finalized Versions of all the required submittals in the Preliminary Approval Phase.

C. Construction Phase

1. Six (6) complete set of plans, profiles and specifications for all proposed sanitary sewer lines, manholes, and lift stations showing location, size, depths, dimensions, construction details, bedding, fencing and access. After the Pre-Construction Conference, all present shall sign all (6) construction plans and shall be deemed the "Official" plans used during construction.
2. Cost Estimate for all improvements.
3. Pre-Construction conference will be held at City Hall or designated area. A notice to proceed from the City shall be obtained delineating proposed project, required conditions and pavement repair specifications.
4. Any deviations from the approved plans, or change orders, shall be submitted to the City for approval.

5. Three hard copies and an electronic copy of the certified “As-Built” plans shall be furnished to the City at the completion of the improvements prior to acceptance.
6. The Project Engineer will provide cut sheets at a minimum of 100-foot intervals.

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SECTION IX – TRAFFIC CONTROL OPERATIONS

IX-1 General

This section of the manual sets forth basic principles and prescribes standards for the design, application, installation and maintenance of the various types of traffic control devices required for road and street construction maintenance operations and utility work. These include signs, signals, lighting devices, markings, barricades, channelizing, and hand signaling devices.

Not one standard sequence of control devices can be prescribed as an inflexible arrangement for all situations due to the varying nature of traffic control.

IX-2 Purpose of Barricading and Channelization

The purpose of Barricading and Channelization is:

1. Provide for the orderly flow of traffic.
2. Reduce hazards for motorists, pedestrians and workers.
3. Reduce the overall job costs to the public.
4. Improve public relations.

IX-3 Obtaining Approval to Work in City Streets

A. General

1. In order to partially close a street, it is necessary to obtain approval from the City.
2. The Fire Department and Police Department must be notified prior to work being started.
3. Notification to all offices must be done 24 hours in advance for closing a residential street and 48 hours in advance for closing a major street or signalized intersection.

IX-4 Channelization Devices

A. Barrels or Drums

1. Effective traffic control service, particularly for use in construction areas.
2. Barrels shall not be weighed with sand, water or any other material to the extent that would make them hazardous to motorists.
3. Barrels should be marked with alternating orange and white circumferential stripes painted 4 to 6 inches wide.

4. The white shall be of a reflective material and shall be kept in a high state of repair and visibility.

B. Rubber Traffic Cones

1. Best method of channelizing traffic along a specified route.
2. Take proper precautions to assure that the device will not be blown over or displaced.
3. The insertion of appropriate delineators or internal lights should be used at night.

IX-5 Barricades

A. General

1. Barricades should not be used to channelize traffic. The barricade is specifically used to outline the excavation or construction area in the street. When used in this way, the barricades in a sense will help prevent traffic from driving into the construction area. Barricades will be freshly painted prior to use and kept clean at all times. The Color arrangements are specified in detail later in this manual.
2. A barricade should not be used as a sign and most certainly does not replace a sign. A larger and heavier barricade may be used to support signs that instruct the motorist. The size and type of signs will be covered later in this manual. The barricade is a warning device and not a physical obstruction. Barricades should not be designed with enough strength to stop a car.
3. Do not use a lone barricade to block an entire road. Above all do not use a barricade to do the work of a sign, a light, a cone, or a flagman. Torches, flares, or lights should be used during hours of darkness. Warning flags may be used during daylight hours.

IX-6 Barricade Design

A. General

1. Barricades shall be one of three types: TYPE I, TYPE II and TYPE III
2. Markings for barricade rails shall be orange and white stripes (sloping downward at an angle of 45° in the direction traffic is to pass)
3. The entire area of white and orange shall be reflectorized so as to be visible under normal atmospheric conditions from a minimum distance of 1000 feet, when

illuminated by the low beams of standard automobile headlights. The predominant color for the other barricade components shall be white.

TABLE X-1: BARRICADE CHARACTERISTICS			
Type	I	II	III
Width of Rail	8" - 12"	8"-12"	8" - 12"
Length of Rail	6' - 8'	3' - 4'	3' - Variable Max
Width of Stripes	6 in.	6 in.	6 in.
Height	3 ft.	3 ft.	5 ft.
Type of Frame	Demountable or Heavy "A" Frame	Light "A" Frame	Post or Skids
Flexibility	Essentially Moveable	Portable	Essentially Permanent

4. Other types of portable barricade may not be used except in emergency situations unless specifically approved by the City prior to installation or use.
5. In no case can portable barricade other than those specified as TYPE II be used for more than 24 hours. The portable emergency barricades shall conform in all respects concerning reflection and visibility for nighttime usage.

B. Cone Design

1. Cones shall be a minimum of 18 inches in height with a broadened base and may be made of various materials to withstand impact without damage to themselves or to vehicles.
2. Larger sizes shall be used where speeds are relatively high or where more conspicuous guidance is needed; orange shall be the predominant color.
3. For nighttime use they shall be reflectorized or equipped with lighting devices for maximum visibility.

C. Vertical Panel Design.

1. Vertical panels used as channelizing devices shall consist of at least one panel 6 to 8 inches in width and 24 inches in height.

2. They shall be striped and reflectorized in the same manner as barricades and mounted with the top a minimum of 36 inches above the roadway on a single lightweight post.
3. These devices may be used for traffic separation or shoulder barricading where space is at a minimum.

D. Barricade Applications

1. TYPE III barricades shall be erected at the points of closure used on construction projects, when a road section is closed to traffic. They may extend completely across the roadway and its shoulders, or from curb to curb. Gates or movable sections may be utilized for ingress and egress of authorized vehicles and equipment.
2. When a road or street is legally closed, but access must still be allowed for local traffic; a TYPE III barricade cannot be erected completely across the street. An arrangement should be devised to permit local traffic but discourage through-traffic. A sign with appropriate legend concerning permissible use by local traffic should be installed.
3. TYPE I or TYPE II barricades shall be used when traffic is being maintained through the area being constructed and/or reconstructed. The ultimate choice in a given situation is dependent upon the mobility required in the particular project.

IX-7 Hazard Identification

A. General

1. A hazard identification beacon is a flashing yellow light (minimum diameter; 8-inches) used at points of special hazard as a means of calling drivers' attention to these locations.
2. When used, a flashing beacon should operate 24 hours a day.

B. Barricade Warning Lights

1. Barricade warning lights are portable, lens directed, enclosed lights. The color of the light emitted shall be yellow.
2. Barricade warning lights shall be in accordance with the requirements of ITE standards for flashing and steady burn barricade warning lights.
3. Portable supports for barricade warning lights shall provide a minimum mounting height of 36 inches to the bottom of the lens.

4. These stands are not intended for use on standard barricades.

C. Lanterns and Torches

1. Lanterns or torches are single unit portable, constant burning, low intensity types of lights with open or enclosed flame.
2. They provide negligible illumination of other objects and are not dependable during adverse weather conditions.
3. They are not recommended for use within the corporate limits of the City.
4. Should it be necessary to utilize this method of marking in an emergency, the torches shall be replaced with the proper electric lighting device within 12 hours.

IX-8 Flagman

A. General

1. Flagmen should be trained and certified by the appropriate agency.
2. The flagman should be sufficiently in place in advance of the work force to warn workmen of approaching danger, such as out-of-control vehicles.
3. The stations should be adequately protected and preceded by proper advance warning sign. At night, flagman stations should be illuminated.

IX-9 Signs

A. General

1. Warning signs in construction areas shall have a black legend on an orange background. Color for other signs shall follow the standard for all highway signs. All signs to be used during hours of darkness are to be reflectorized.
2. Signs shall be placed in positions where they will convey their messages most effectively and placement must be such that the driver will have adequate time for response

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City of San Juan (THE CITY)
512 S. Nebraska Ave.
San Juan, Texas 78589

Date

To whom it May Concern:

At the request of _____, hereinafter referred to as "DEVELOPER" and for the development of _____ Subdivision; City of San Juan, County of Hidalgo, State of Texas; _____ (hereinafter referred to as 'INSTITUTION") hereby opens its irrevocable letter of credit in favor of THE CITY for the item(s) as follows:

A)	Water (onsite)	\$ _____
A-1)	*Water (offsite)	\$ _____
B)	Sewer (onsite)	\$ _____
B-1)	*Sewer (offsite)	\$ _____
C)	Drainage (onsite)	\$ _____
C-1)	*Drainage (offsite)	\$ _____
C-2)	*Reimbursements & Master Plan	\$ _____
D)	Paving (onsite)(streets & alleys)	\$ _____
D-1)	*Paving (offsite)(streets)	\$ _____
E)	*Sidewalk (if applicable)	\$ _____
F)	* Street Lighting	\$ _____
G)	* Signalization and/or traffic control signs	\$ _____
H)	Laboratory Testing	\$ _____
I)	Contingency	\$ _____
J)	*Administrative Fee	\$ _____
	TOTAL:	\$ _____

The construction of the above described work will be done or caused to be done by contractor and/or contractors selected solely by the DEVELOPER of said subdivision. The undersigned agrees with the drawers, endorsers, the bondafide holders of bills drawn in compliance with the terms of this credit that the same be duly honored on presentation.

Payment shall be made by the INSTITUTION issuing this letter of credit, within one (1) business day of presentment of such certificate for payment by the contractor and/or contractors, manually signed by at least two (2) of the following representatives of THE CITY: City Manager, City Consulting Engineer, Director of Public Works, Director of Purchasing and Contracting, Director of Planning or Person(s) designated by them. Such certificate for payment shall be supported by the project engineer's signature or the signature of his agent. This credit expires when every phase of construction has been completed and paid for or _____ (Date).

1. At least ninety (90) days before the date of the expiration of such letter of credit, when the work to be performed or payments to be paid under such Letter of Credit have not been completed, the Developer hereby agrees to deliver to the City on such ninetieth day before the expiration of the Letter of Credit an extension of such Letter of Credit for a period equal to the original term of the Letter of Credit.

2. The Developer expressly agrees and hereby authorizes the Bank, and the Bank hereby agrees that should the Developer fail to furnish the extension of the Letter of Credit as required under the provisions of paragraph number 1 above, the Bank shall between the period of the ninetieth day prior to the expiration of the Letter of Credit and such expiration date, give written notice to the City that any amounts not paid under such Letter of Credit will be deposited in a special escrow account on the expiration date. The Developer hereby authorizes the City to withdraw any and all funds from such escrow account according to the original terms of the Letter of Credit.

Please acknowledge receipt of and your agreement to this letter of credit by signing and returning to use a copy of same. This letter has also been signed by the DEVELOPER as evidence of this agreement and understanding with us and with you.

Failure to pay upon demand without just cause will subject the INSTITUTION to compensate the contractor and/or contractors for such time monetarily at the interest rate applicable at that time.

2% Administrative Fee shall be paid to THE CITY by mail within five (5) working days after receipt of statement for same by THE INSTITUTION.

*NOTE: Line Items C-2, F & G amounts shall be called for by the City immediately or during the course of construction in part or in whole. Payment shall be made upon demand and presentation of statement from THE CITY only.

BANK

DEVELOPER

By: _____
Signature

By: _____
Signature

Printed Name & Title

Printed Name & Title

(SEALED)

ENGINEERING COMPANY

PROJECT ENGINEER SIGNATURE

ORIGINAL RECEIVED AND AGREED TO:

CITY OF SAN JUAN

SIGNATURE

SIGNATURE

PRINTED NAME & TITLE

PRINTED NAME & TITLE

DEVELOPMENT IMPROVEMENTS AGREEMENT

Project Name: _____

THIS AGREEMENT is made this _____ day of _____, 20____, by and between the City of San Juan, a political subdivision of the State of Texas (herein referred to as "City"), and _____, a _____, whose address is _____ (the "Developer"). The City and Developer are individually referred to herein as a "Party" and jointly referred to herein as the "Parties". The Effective Date of this Agreement shall be the date upon which it is signed by the parties.

RECITALS

A. The Developer is the owner of certain property situated in the City of San Juan, more particularly described in Exhibit "A" hereto and known as _____ (the "Project").

B. The Developer desires to develop "Project", hereinafter referred to as the ("Property") according to the approved final subdivision Plat/Final Site Plan thereof (the "Plat" or "Final Site Plan") showing a proposed subdivision or site layout for said Property.

C. The City has approved the Plat/Final Site Plan submitted by the Developer subject to certain requirements and conditions, which involve the installation and construction of utilities, erosion and sediment devices, storm water management measures, site grading and drainage, landscaping (if applicable), as well as other public and private infrastructure improvements shown on the submitted construction drawings, Plat, Final Site Plan, Landscape Plan (if applicable) and documents for the Property, which is attached as Exhibit "B" ("Site Improvements Plan").

D. In lieu of completing all landscaping and infrastructure improvements prior to Plat/Final Site Plan recordation in accordance with City requirements, Developer may enter into a Development Improvements Agreement with the City.

E. In doing so, the City seeks to protect the health, safety and general welfare of the community by requiring a timely completion of the infrastructure depicted in the Site Improvements Plan and to limit the effects of uncompleted subdivisions, including premature subdivisions which leave property undeveloped and unproductive.

F. The purpose of this Agreement is to protect the City from assuming the cost to complete the utility, landscaping, and infrastructure improvements and is not executed for the benefit of material providers, laborers or others providing work, services or material to the Property or for the benefit of lot or home buyers in the Project.

G. The mutual promises, covenants, and obligations contained herein are authorized by State and local law and regulations.

NOW, THEREFORE, in consideration of the premises and the terms and conditions herein stated and for other valuable consideration, the adequacy of which is acknowledged by the Parties hereto, it is agreed as follows:

DEVELOPER'S OBLIGATION

1. Improvements: The Developer will design, construct, and install, at his own expense, those on-site and off-site utility, landscaping (if applicable), and infrastructure improvements in accordance with the approved Site Improvements Plan and the Cost of Construction Estimate, which is attached at Exhibit "C" (together the Site Improvements Plan and the Cost of Construction Estimate are referred to as the "Improvements"). At a minimum, the Site Improvements Plan shall address erosion and sediment control, water, sewer, electrical power service, natural gas service, telephone service, television service, storm water drainage and control, trails, roads, landscaping and weed control. The Developer's obligation to complete the Improvements will be in conformance with the time schedule defined by this Agreement and will be independent of any obligations of the City contained herein.

2. Improvement Completion Escrow ("Escrow") Options: To secure the construction and installation of the Improvements under this Agreement and the obligations for the warranty as set forth in Paragraph 4 herein, the Developer will deposit with the City as an Escrow, _____% of the Cost of Construction Estimate (which includes a 5% warranty), on or prior to the Effective Date, through one of the following mechanisms:

Option A. Irrevocable Letter of Credit in the amount of \$

The Letter of Credit shall be (a) irrevocable, (b) issued by a financial institution and (c) of a term sufficient to cover the Completion and Warranty Periods. The Letter of Credit will be payable upon demand to the City. The Letter of Credit will be payable to the City in full or in part at any time upon presentation of (i) a sight draft drawn on the issuing financial institution to which the City is entitled to draw pursuant to the terms of this Agreement and the Letter of Credit; (ii) a certification executed by an authorized representative of the City stating that the Developer is in default under this Agreement; and (iii) the original Letter of Credit.

Option B. Cash in the amount of \$ _____, to be escrowed by the City Treasurer or third party escrow agent pursuant to a Cash Bond Escrow Agreement.

Cash in the form of a cashier's check or bank account in the sole ownership of the City will be escrowed with the City Treasurer or third party escrow agent pursuant to a Cash Bond. The City is entitled to draw upon these funds, pursuant to the terms of the Cash Bond. The funds will be disbursed to the City in full or in part, upon presentation of: (i) request for disbursement; and (ii) a certification executed by an authorized representative of the City stating that the Developer is in default under this Agreement; or (iii) as otherwise provided by the Cash Bond.

3. City Standards: The Developer will construct the Improvements according to the approved Site Improvements Plan, general industry standards, this Agreement, and applicable City regulations (the "City Standards"). The Developer shall instruct the contractor or construction manager to provide timely notice to the Developer, contractor, issuer of the Assurance and the Building Commissioner whenever an observation or related construction activity reveals that an Improvement does not conform to the City Standards or is otherwise defective.

4. Warranty Period: The Developer warrants that the Improvements, each and every one of them, will be free from defects in materials or workmanship under normal operation for a period of twelve (12) months from the date of the issuance of the last building permit for the Project. Developer agrees to promptly correct any deficiencies in order to meet the City Standards, including any

component of the site improvements that was previously approved, but that has failed to comply with the warranty herein prior to the expiration of the Warranty Period, solely at the Developer's expense.

5. Commencement and Completion Periods: All Improvements, as outlined in the Cost of Construction Estimate and Site Improvements Plan, will be installed and completed within _____ months/years from Plat or Final Site Plan approval (the "Completion Period"),

6. Damage to Public Improvements: Developer agrees that it shall repair or pay for any damage to any existing public improvements damaged during the construction of new improvements or during the development/construction of the newly created lots and structures. The City shall notify Developer within a reasonable time after discovery of any damage hereunder, and Developer shall have a reasonable period of time within which to repair said damage. If the Developer shall fail to make the required repairs in a timely manner the Building Commissioner shall issue a stop work order for the entire Project.

7. Road Cuts: Developer acknowledges that the City has regulations governing road cuts, the provisions of which shall apply to the alteration of any road necessitated by the installation of any utilities or Improvements described in this Agreement.

8. Weed Control: The Developer agrees to comply with City Codes relative to control and elimination of all weeds and high grass within the Property boundaries at all times during construction. The Developer further agrees to coordinate with the City relative to inspections and importations of weed free project materials.

9. Roads: Developer agrees to construct, at Developer's cost, all public and private roads and public and private road improvements, within the Property, in accordance with the plans and specifications within the Site Improvements Plan. Developer agrees to install any traffic control signs and standard street name signs as required by the City and to revegetate all cuts and fills resulting from construction in a manner which will prevent erosion.

10. Compliance with Law: The Developer shall comply with all relevant federal, state and local laws and regulations in effect at the time of Plat and/or Final Site Plan approval when fulfilling its obligations under this Agreement.

CITY'S OBLIGATION

11. Inspections and Notice of Defect: The City shall comply with its respective UDC, and in accordance therewith shall conduct inspections of the Improvements from time to time. In the event that there is a deficiency in performance by Developer hereunder (during the Completion or Warranty Periods), the City may issue a Notice of Defect to the Developer and the issuer of the Assurance. The Developer shall have thirty (30) calendar days thereafter to cure the defect (the "Cure Period"). If a defect is not corrected within the Cure Period, a condition of default may be declared and an Affidavit of Lapse of Improvements Agreement may be issued stating that building permits, grading permits and certificates of occupancy will not be issued in connection with any lots within the Plat or Final Site Plan, and the City may request that a court of competent jurisdiction enjoin the sale, transfer or conveyance of lots within the Plat or Final Site Plan until a new Development Improvements Agreement and Assurance are accepted by the City. If the defect cannot be corrected within the Cure Period, the Developer may request an extension of the Cure Period from the Building Commissioner.

12. Notice of Non-compliance with Completion Date: The City shall issue the Developer a Notice of Noncompliance in the event that the Improvements are not completed by the Developer and accepted by the City within the Completion or Warranty Period. A written request by the Developer indicating cause and reason for an extension shall be submitted to the Building Commissioner not earlier than fourteen (14) calendar days prior to the expiration of the Completion or Warranty Period. The request for extension will be reviewed by the Building Commissioner and may only be granted in such cases where the Escrow is also extended for the life of the modified Completion Period. An approved extension will be executed as a written Addendum to this Agreement. If an extension of time is not approved by the Building Commissioner, an Affidavit of Lapse of Improvements Agreement may be issued stating that building permits, grading permits and certificates of occupancy will not be issued in connection with any lots within the Plat or Final Site Plan, and the Developer may not sell, transfer or convey any lots within the Plat or Final Site Plan until a new Development Improvements Agreement, with modified time lines, and Escrow are approved by the City.

13. Acceptance of Improvements: The City's acceptance of Improvements is conditioned upon (a) the presentation by Developer of the required signatures of acceptance by all entities serving the constructed Improvements, (b) clear documentation and testing that the Improvements have been completed per City Standards, and (c) the presentation by Developer of a document or documents, where appropriate, for the benefit of the City, demonstrating that the Developer owns the Improvements in fee simple title with no liens or encumbrances thereon. Acceptance of any Improvement does not constitute a waiver by the City of any rights it may have on account of any defect in or failure of the Improvement that is detected or which occurs after the acceptance within the Warranty Period. Public Improvements shall be dedicated to the appropriate public entity. Private Improvements serving more than one lot shall be assigned by separate agreement or deed to a Homeowners Association.

14. Reduction of Escrow: As portions of the site Improvements are completed in accordance with this Agreement, City regulations, and the approved Site Improvements Plan, the Developer may make application to the Building Commissioner to reduce the amount of the original Escrow. If the Building Commissioner is satisfied that such portion of the Improvements have been installed and completed in accordance with City Standards, he may cause the amount of the Letter of Credit or Cash Bond to be reduced by such amount that he deems appropriate, so that the remaining amount of the Letter of Credit or Cash Bond adequately insures the completion of the remaining site Improvements in accordance with Texas law. Following the expiration of the Warranty Period, the full remaining balance which may be drawn under the Letter of Credit or Cash Bond, will be released only Developer is not in default (as defined below) at the end of the Warranty Period.

15. Use of Proceeds: The City will use funds drawn under the Assurance per Paragraph 2 herein only for the purpose of completing the Improvements or correcting defects in or failure of the Improvements.

OTHER PROVISIONS

16. Events of Default: The following conditions, occurrences or actions will constitute a default by the Developer during the Completion Period or Warranty Period:

a. Developer's failure to complete any portion of the Improvements in conformance with the City Standards within the Completion Period, or the failure to cure such default within the Cure Period (or

extended Cure Period) after receipt of written Notice of Defect from the City specifying the nature of such defect. The City shall be entitled to undertake such work as may be necessary and appropriate to cure such defect and the City shall be reimbursed for the reasonable costs thereof either by payment of such costs within 30 days of delivery of an invoice to Developer or by obtaining funds from the Escrow sums set forth in Paragraph 2 herein.

b. Developer's failure to satisfactorily complete each portion of the Improvements within the Completion Period, as documented by the issuance of a Notice of Noncompliance, or to remedy defects within the Warranty Period, Cure Period or extended Cure Period as the case may be.

c. Notification to City of Developer's insolvency, the appointment of a receiver for the Developer, the filing of a voluntary or involuntary petition in bankruptcy, and the foreclosure of any lien against the Property or a portion of the Property then owned by the Developer.

17. Measure of Damages: The measure of damages for breach of this Agreement by the Developer will be the reasonable cost of satisfactorily completing the Improvements, including all professional fees such as engineering and attorney's fees. For Improvements upon which construction has not begun, the estimated costs of Improvements as shown on Cost of Construction Estimate will be prima facie evidence of the minimum cost of completion; however, neither that amount nor the Escrow amount shall establish the maximum amount of Developer's liability.

18. City's Rights Upon Default: When any event of default occurs and is not cured within any applicable Cure Period, the City may exercise its rights and/or contract with a third party for completion of the Improvements, and/or use City crews for the completion of the Improvements. The Developer grants to the City, its successors, assigns, agents, contractors, and employee, a nonexclusive right and easement to enter the Property then owned by the Developer for the purposes of inspecting, constructing, installing, maintaining, and repairing such Improvements. Alternatively, the City may assign the proceeds of the Letter of Credit or Cash Bond to a subsequent party who has acquired the Property by purchase, foreclosure or otherwise for the purpose of completing the Project (not including home buyers), who will then have the same rights of completion as the City, if and only if, the subsequent party agrees in writing to complete the unfinished Improvements and provides reasonable Assurances for the obligation. In addition, the City may also revoke certificates of occupancy with respect to any portion of the Property owned by Developer at the time of such revocation, issue an Affidavit of Lapse of Improvements Agreement, and/or enjoin the sale, transfer, or conveyance of lots within the Plat or Final Site Plan, until the Improvements are completed and accepted. These remedies are cumulative in nature and are in addition to any other remedies the City has at law or in equity.

19. Indemnification: The Developer expressly agrees to indemnify and hold the City, its employees, agents, and assigns harmless from and against all claims, costs and liability of every kind and nature except those arising out of negligence on the part of the City, its employees, agents, and assigns, for injury or damage received or sustained by any person or entity in connection with, or on account of the performance of work at the Property pursuant to this Agreement. The Developer further agrees to aid and defend the City with respect to any claim resulting from default hereunder by the Developer.

20. No Waiver: No waiver of any provision of this Agreement will be deemed or constitute a waiver of any other provision, nor will it be deemed or constitute a continuing waiver unless expressly provided for in a written amendment to this Agreement signed by both the City and

Developer; nor will the waiver of any default under this Agreement be deemed a waiver of any subsequent default or defaults of the same type. The City's failure to exercise any right under this Agreement will not constitute the approval of any wrongful act by the Developer or the acceptance of any Improvement.

21. Amendment or Modification: The Parties to this Agreement may amend or modify this Agreement only by written instrument executed on behalf of the City by the Building Commissioner and by the Developer or its authorized officer. Such amendment or modification will be properly notarized and recorded as an amendment to this Agreement, before it may be effective.

22. Vested Rights: The City does not warrant by this Agreement that the Developer is entitled to any other approval(s) required by the City, if any, before the Developer is entitled to commence development of the Property or to transfer ownership of the Property or any portion thereof.

23. Third Party Rights: No person or entity, who or which is not a party to this Agreement, will have any right of action under this Agreement.

24. Scope: This Agreement constitutes the entire agreement between the Parties and no statements, promises or inducements that are not contained in this Agreement will be binding on the Parties.

25. Severability: If any part, term, or provision of this Agreement is held by the courts to be illegal or otherwise unenforceable, such illegality or unenforceability will not affect the validity of any other part, term, or provision hereof, and the rights of the Parties will be construed as if the illegal or unenforceable part, term, or provision was never contained within this Agreement.

26. Benefits: The benefits, rights and obligations of this Agreement pertaining to the Developer are personal in nature and may not be assigned without the express written consent of the City. Such consent may not be unreasonably withheld, but any unapproved assignment is voidable at the option of the City.

27. Binding Effect: This Agreement and the covenants contained herein shall run with the land and shall be binding upon and shall inure to the benefit of the Parties hereto and their successors, heirs and assigns; provided that, purchasers of residential lots within the Property or any homeowner's association that receives title to any portion of the Property shall not incur any liability hereunder and no person or entity, including any homeowner's association that receives title to any portion of the Property, may claim to be a third party beneficiary of the terms, conditions, or covenants of this Agreement. This Agreement shall be filed with the City Clerk and be on file with the Building Commissioner.

28. Sale, Transfer or Conveyance: The sale, transfer or conveyance of any lots located within the development by Developer to another builder or homeowner shall not relieve Developer of any of its obligations hereunder, and Developer shall remain subject to the terms of this agreement until released by the City.

29. Notice: Any notice required or permitted by this Agreement will be deemed effective either (a) when personally delivered in writing, or (b) seven (7) calendar days after notice is deposited with the U.S. Postal Service, certified, and return receipt requested, and addressed as follows:
If to Developer:

Developer's Mailing Address

If to City:

City Administrator
City of San Juan
512 S. Nebraska
San Juan, Texas 78589

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed per the Effective Date as indicated.

DEVELOPER

Company Name: _____

Signature _____

By: _____

STATE OF TEXAS)
) ss.
COUNTY OF HIDALGO)

The foregoing instrument was acknowledged before me this _____ day of _____, 20____, by _____.

Witness my hand and official seal.

My commission expires:

Notary Public

CITY OF SAN JUAN

Signature _____

By: _____

STATE OF TEXAS)
) ss
COUNTY OF HIDALGO)

The foregoing instrument was acknowledged before me this _____ day of _____, 20____, by _____.

Witness my hand and official seal.

My commission expires:

Notary Public

EXHIBIT A
PROPERTY LEGAL DESCRIPTION
(Insert Legal Description of the Property after this Page)

EXHIBIT B
SITE IMPROVEMENTS PLAN
(Insert Site Improvements Plan after this Page)

EXHIBIT C
COST OF CONSTRUCTION PE ESTIMATE
(Insert Cost of Construction Estimate after this Page)

PLANNING & ZONING DEPARTMENT

Inter-Gov _____
 PLANNING & ZONING DEPARTMENT (956) 223-2200

**SUBDIVISION WITHIN CITY LIMITS CHECK LIST
 SUBDIVISION PROCESS**

PRELIMINARY PROCESS

Date : _____

Date Filed: _____ P&Z Preliminary: _____ P&Z Final: _____ City Council: _____

Reviewed : _____ Staff Review : _____ Time Line : _____ Days Expires : _____
 By: _____ Staff / Engineer : _____ 1st Extension : _____ Days Expires 1: _____
 2nd Extension : _____ Days Expires 2: _____

Director of Planning & Zoning : Monica Gomez, Interm Planning Director Email : mgomez@sitx.us City Office #: (956) 223-2200
 Director of Utilities : Juan Martinez Email : jmartinez@sjtx.us City Office #: (956) 223-2200
 Director of Public Works : Israel Garza Email : igarza@sjtx.us City Office #: (956) 223-2200
 City Engineer : _____ Email : _____ City Office #: _____

PROPERTY - OWNER		Subdivision Name				Consultant :	
Address							
DESCRIPTION		Provided	Need to Provide	Not Applicable	Need to Revise	COMMENTS	

Subdivision Process:

Subdivision Plat Submittal							
Warranty Deed							
Topography Survey							
Drainage Report Submittal (As Per City Drainage Policy)					Approved by H.C.D.D.#1	Date:	
Zoning : City Limits- ETJ Residential / Townhouses Zone							
Flood Zone: "AH" (BFE-98) & "X"-(Un-Shaded)					FEMA Panel #480338 0030 E, Dated May 14, 2001		

Preliminary Submittals:

Existing & Proposed Water Distribution Layout					Water Supply Distribution System (CCN)		
Water Distribution System Provider:					Water Supply Distribution System (CCN)		
Existing & Proposed Sewer Collection Layout					Sanitary Sewer Collection System (CCN)		
Sanitary Sewer Collection System Provider:					Sanitary Sewer Collection System (CCN)		
Minor Arterial Right-of-way Dedication: (0-ft) ROW					Proposed Street Section (Road) (XX-ft. B-B)		
Minor Arterial Right-of-way Dedication: (0-ft) ROW					Proposed Street Section (Road) (XX-ft. B-B)		
Minor Arterial Street Pavement Section (Widening)(N/A)					In Accordance to Standard Street Policy ()		
Variances Appeals Request: 2024					Planning & Zoning Meeting	Results	City Council Meeting
Street Widening Improvements: (STATE HWY.)							
Street 4-ft Sidewalk Imprvmnts: N. ROAD (E. Side)							

Construction Plans Review Submittals: (See Construction Plans Submittals Policy, 2024 STANDARD POLICY MANUAL)

Cover Sheet							
Topography Sheet (Utilities, Bench Marks)							
Sanitary Sewer Improvements: On-Site & Off-Site					City of San Juan Sanitary Sewer Collection System (CCN)		
Sanitary Sewer Detail Sheets					See Section 8 & Appendix 2 Utility Policy, Standard Policy Manual		
Water Distribution Improvements: On-Site & Off-Site					Water Distribution Service System (CCN)		
Water Distribution Detail Sheet					See Section 7 & Appendix 3 Utility Policy, Standard Policy Manual		
Drainage Improvements:							
Drainage Detail Sheets					See Section 5 & Appendix 4 Drainage Policy, Standard Policy Manual		
Principal/Major Arterial Streets Improvements:					See Section 6 & Appendix 6 Streets Policy, Standard Policy Manual		
Street Sign Sheet:							
Street Detail Sheets					See Section 2 & Appendix 6 Streets Policy, Standard Policy Manual		
Street Lighting Sheet:							
Traffic Control Plan:							
Erosion Control Plan							
Erosion Control Plan Detail Sheet					See Storm Water Management, Standard Policy Manual		

SUBDIVISION

DESCRIPTION	Provided	Need to Provide	Not Applicable	Need to Revise	COMMENTS
-------------	----------	-----------------	----------------	----------------	----------

Pre-Construction Meeting:

Notice To Proceed					Dated:
Roadway Open-Cut or Bore Permit Application					Dated:
TX-Dot Water UIR Permit					UIR:
TX-Dot Sewer UIR Permit					UIR:
N.O.I. Submittal					Dated:
SWPPP Booklet Submittal					Dated:
RFI #1 Request					Dated:
Change Orders					Dated:
Final Walk Through					Dated:
Punch List - 1st Draft					Dated:
Punch List - Final					Dated:
Letter of Acceptance					Dated:
1-year Warranty (Water/Sewer/Paving/Drainage)					Dated:
Backfill Testing Results					Dated:
As-Built (Revised Original Submittal)					Dated:

Recording Process:

Public Improvements with (Letter of Credit)					Dated:	Expires:
Recording Fees	\$	-			As required by County Clerks office	
Copy of H.C.D.D. #1 of invoice	\$	-			Required to be paid prior to Final Stages	
Street Light Escrow	\$	-			Required: 1	EA. @ \$ -
Street Escrow: ()	\$	-			Required: 2	LF @ \$ -
Sidewalk Escrow: (5-ft.)()	\$	-			Required: 3	LF @ \$ -
TOTAL OF ESCROWS:	\$	-				
Total Developer's Construction Cost: (Letter of Credit)					Date :	Lender :
Laboratory Testing Fee: 2%	\$	-			\$ -	ESTIMATED Construction Cost
Inspection Fee: 2%	\$	-			\$ -	ESTIMATED Construction Cost
Park Land Fees: Jan-24	\$	-			0 UNITS@	Full rate within the ETJ
SINGLE-FAMILY \$ -	\$ -				50% Development	50% Building Stage
Multi-PLEX UNIT \$ -	\$ -				50% Development	50% Building Stage
COMMERCIAL \$ -	\$ -				50% Development	50% Building Stage
Water Rights:	\$	-			0.00 Acres	\$ 3,000.00
Water 30-year Letter (Transfer Fee)	\$	-			1 Lots @ \$ -	RESIDENTIAL
Water 30-year Letter (Single-Family)	\$	-			2 Lots @ \$ -	RESIDENTIAL
Sewer 30-Year Letter Service (4")	\$	-			3 Lots @ \$ -	
TOTAL OF FEES:	\$	-				

Reimbursements:

Developer Sewer Improvements	\$	-			Off-Site System: 0.00	AC	\$ -
Developer Water Improvements	\$	-			Off-Site System 0.00	AC	\$ -
TOTAL OF REIMBURSEMENTS:	\$	-					

Buyouts:

North Alamo Water Supply Corporation	\$	-			Required Buyout 0.00	AC.	\$ -
Military Highway Water Supply Corporation	\$	-			Required Buyout 0.00	AC.	\$ -

Tax Certificates

County of Hidalgo / School District						
Water District					Hidalgo County Irrigation District # 2	

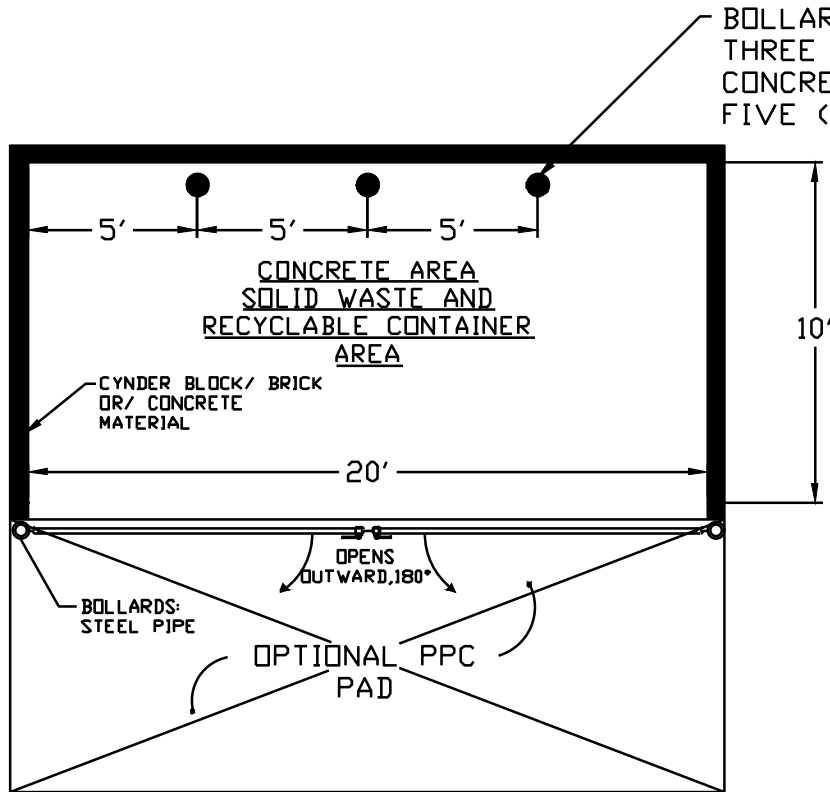
Total of Escrows, Fees, Reimbursements and Buyouts:

Escrows	\$	-	Street & Sidewalk Improvements for (MILE ROAD)			
Material Testing Fee Inspection Fees, Other F	\$	-	Parkland Fees, Water Rights/Water & Sewer 30-year Agreements			
Reimbursements - 2021	\$	-	Reimbursement to the Developer of Subdivision			
2024 City of San Juan	\$	-	15%	Payable to the City of San Juan for Administrative Fee		
2024 To the Developer of Record	\$	-	85%	Payable to the Developer of Record Owner / Developer		
Buyouts	\$	-	Based on Subdivision (Need Request and Approval rate from MHWSC/NAWSC Boards)			
TOTAL :	\$	-	Developer Total Cost of Fees, Escrows, Reimbursements & Buyouts			

APPENDIX 1

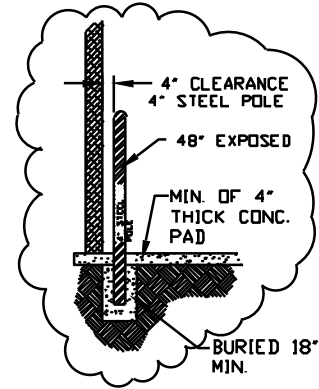
SOLID WASTE/RECYCLE CONTAINER

ENCLOSURE DETAILS



PLAN VIEW
3/16" = 1'

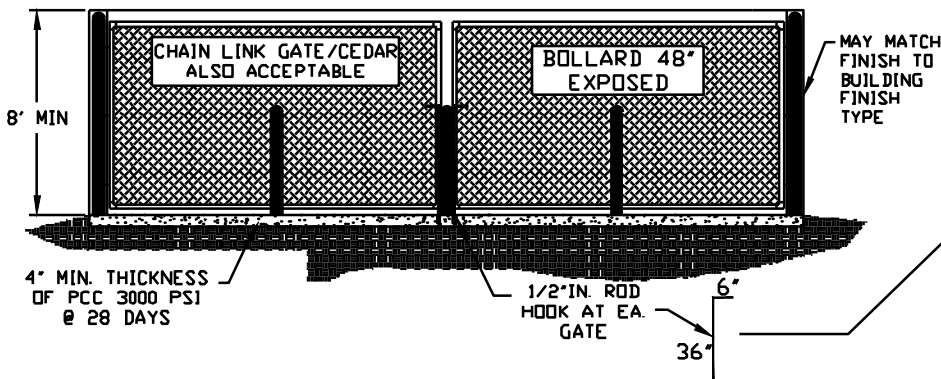
BOLLARDS:
THREE (3) STEEL PIPE FILLED W/
CONCRETE (TYPICAL). PLACED AT
FIVE (5) FOOT ON CENTER.



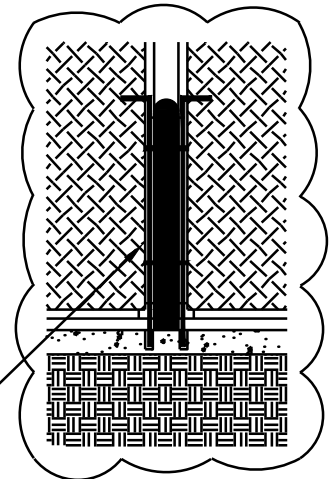
BOLLARD DETAIL

NOTES:

- ENCLOSURE WALLS SHALL BE REINFORCED; COLUMN SPACE EVERY 5 FEET.
- FOR CLARIFICATION OF ORIENTATION OF ENCLOSURE, AND WIDTH CONTACT SOLID WASTE MANAGER.



FRONT ELEVATION
3/16" = 1'

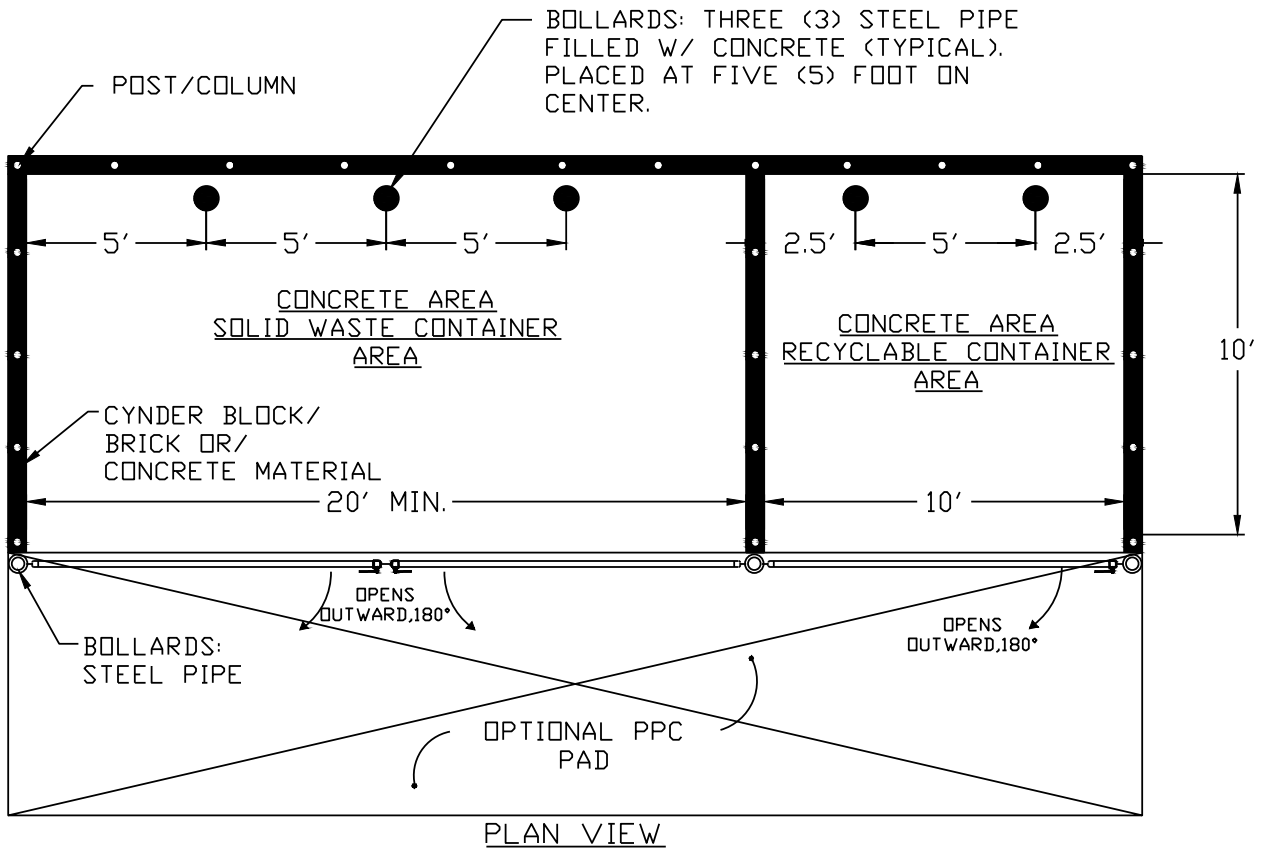


GATE HOOK DETAIL



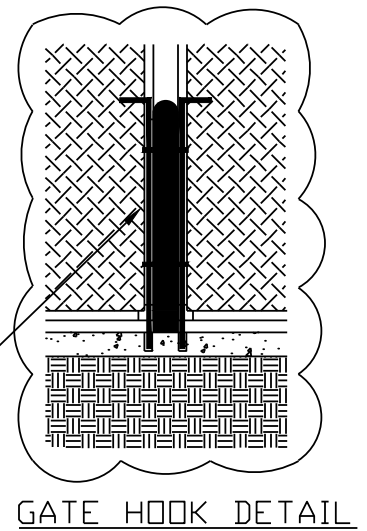
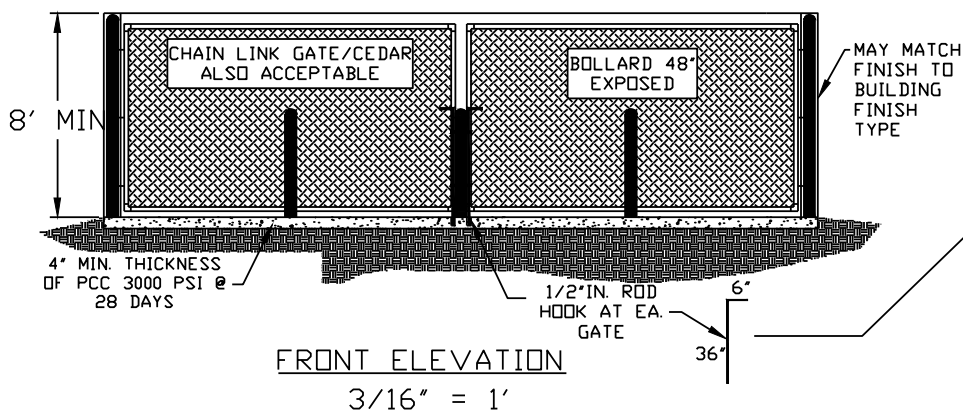
**CITY OF SAN JUAN
STANDARDS MANUAL
SMALL SOLID WASTE/RECYCLE
CONTAINER ENCLOSURE**





NOTES:

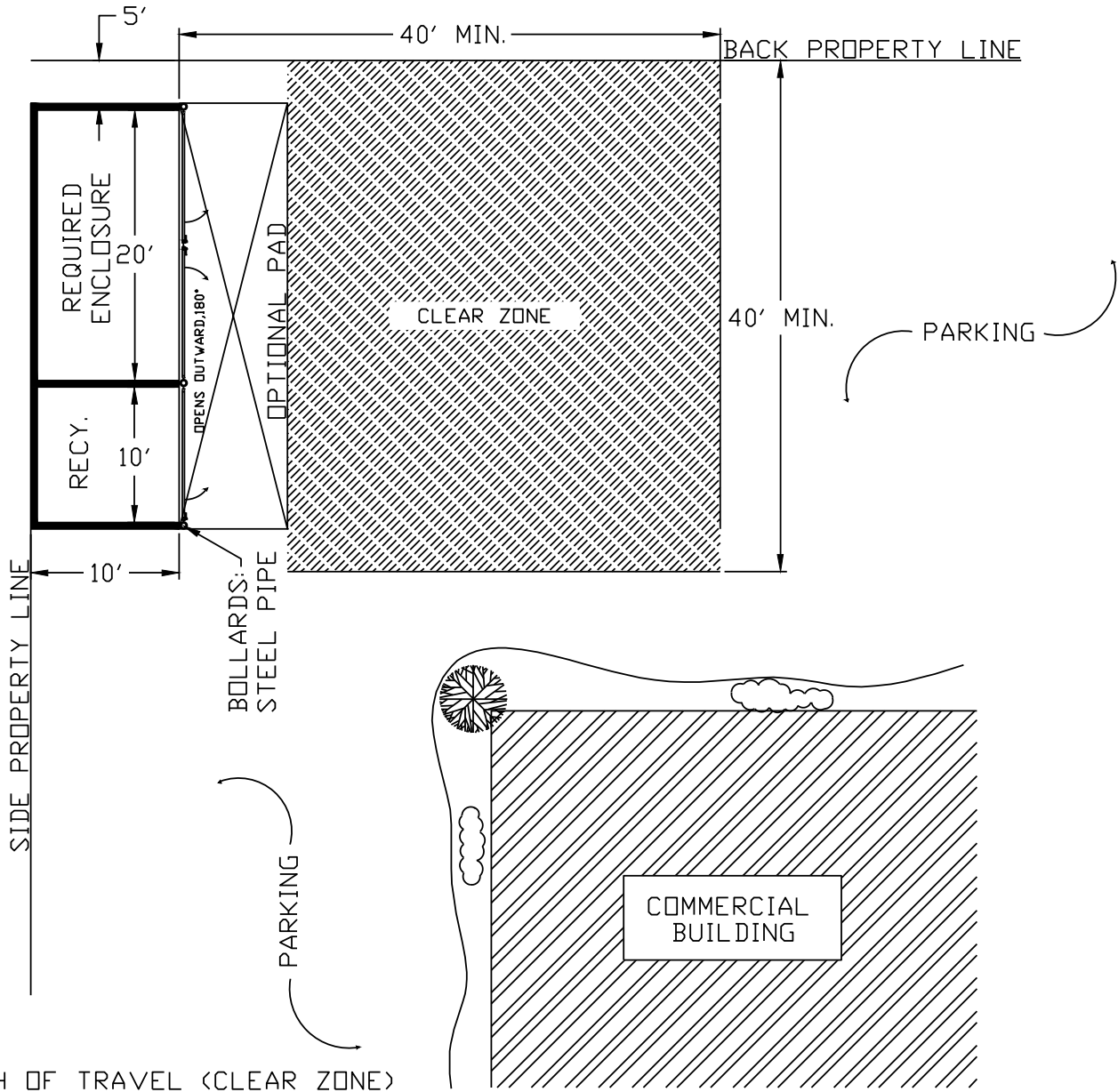
1. WIDTH OF SOLID WASTE ENCLOSURE TO BE DETERMINED BASED ON THE NUMBER OF DUMPSTERS NEED TO SERVICE THE BUILDING.
2. SPACE SHALL BE ALLOCATED FOR RECYCLABLE DUMPSTER.
3. ENCLOSURE WALLS SHALL BE REINFORCED; COLUMN SPACE EVERY 5 FEET.
4. FOR CLARIFICATION OF ORIENTATION OF ENCLOSURE, AND WIDTH CONTACT SOLID WASTE MANAGER.
5. ENCLOSURE TO HAVE SOLID ROLLING STEEL DOORS WITH LOCKING MECHANISM WHEN OPENING AND CLOSING



<p>CITY OF SAN JUAN STANDARDS MANUAL LARGE SOLID WASTE/RECYCLE CONTAINER ENCLOSURE</p>	
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FRONT-LOADER REFUSE TRUCK
SERVICE CONFIGURATION FOR
COMMERCIAL LOTS



NOTES:

1. PATH OF TRAVEL (CLEAR ZONE) LEADING TO SOLID WASTE/RECYCLE CONTAINER TO BE MADE OF REINFORCED CONCRETE

ON SITE LOCATION OF DUMPSTER
AREA AND ENCLOSURE

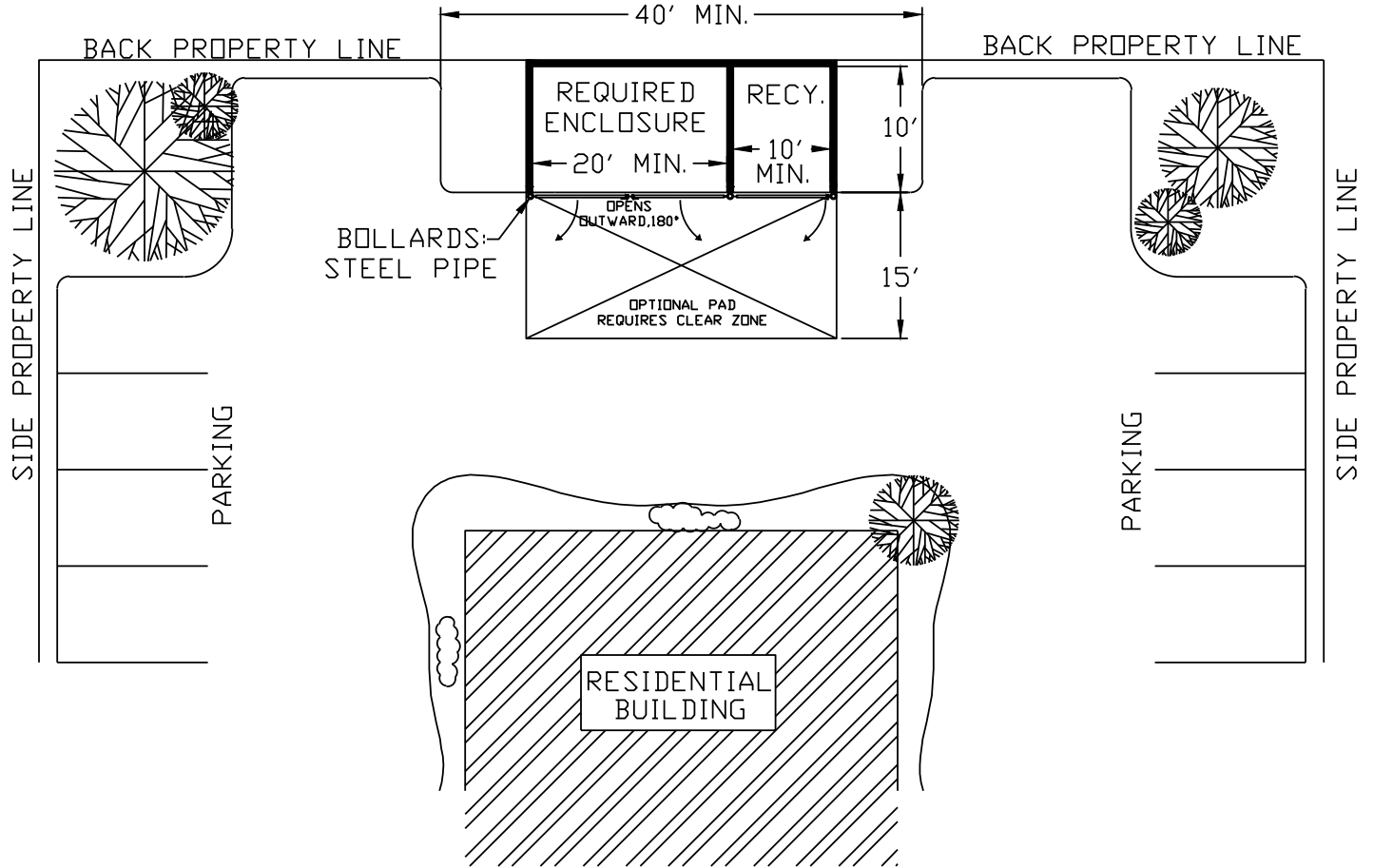


CITY OF SAN JUAN
STANDARDS MANUAL
SOLID WASTE/RECYCLE CONTAINER ENCLOSURE
FRONT LOADER CONFIGURATION



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SIDE-LOADER REFUSE TRUCK
SERVICE CONFIGURATION FOR
RESIDENTIAL LOTS



ON SITE LOCATION OF DUMPSTER
AREA AND ENCLOSURE



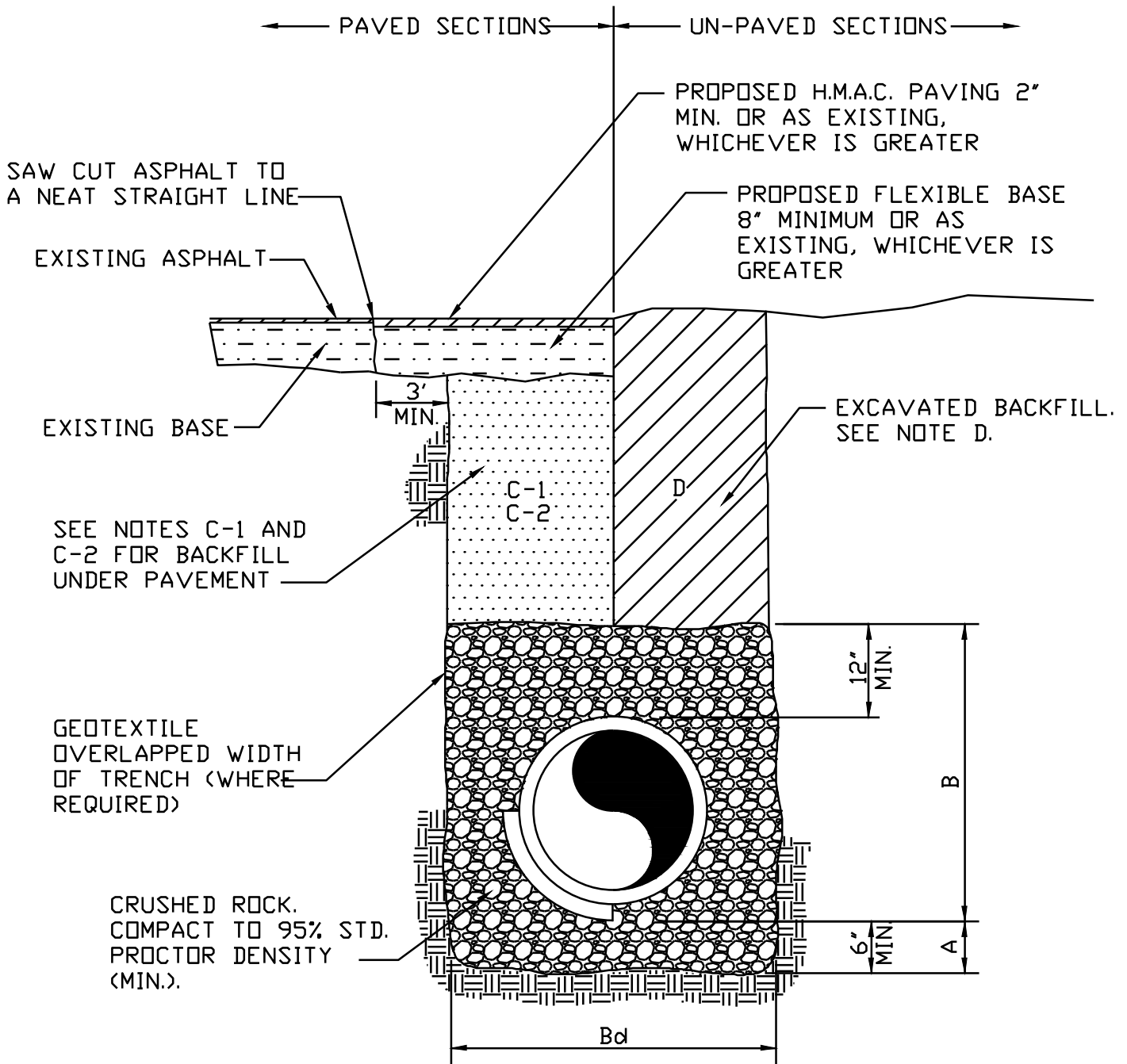
CITY OF SAN JUAN
STANDARDS MANUAL
SOLID WASTE/RECYCLE CONTAINER ENCLOSURE
SIDE LOADER CONFIGURATION



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APPENDIX 2

WASTEWATER DETAILS



**CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER (NON-FORCEMAIN)
PIPE BEDDING DETAIL**



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GENERAL NOTES:

- A. CRUSHED ROCK BEDDING PLACED, HAND LEVELED, AND COMPACTED BEFORE PIPE IS LAID, UP TO BOTTOM OF PIPE (MIN. THICKNESS = 6").
- B. CRUSHED ROCK BACKFILL PLACED AND COMPACTED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO 12" ABOVE THE TOP OF PIPE. WORK IN UNDER PIPE HAUNCHES AND COMPACT BY HAND TO SPRING LINE. USE VIBRATORY-TYPE COMPACTORS FOR LIFTS ABOVE THE SPRING LINE. MAXIMUM 6" LIFTS.
- Bd. MINIMUM TRENCH WIDTH: PIPE O.D. + 16" (FOR 16" PIPE AND SMALLER); PIPE O.D. X 1.25 + 12" (FOR 18" PIPE AND LARGER)
- C-1. (CITY STREETS, PARKING AREA, AND DRIVEWAYS) SELECT EXCAVATED BACKFILL MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 8" MAX. LIFTS.
- C-2 (STATE MAINTAINED ROADWAY) SAND/CEMENT STABILIZED BACKFILL WITH 7% PORTLAND CEMENT COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- D. EXCAVATED EARTH BACKFILL MECHANICALLY COMPACTED IN 12" MAX. LIFTS.
MINIMUM STANDARD PROCTOR DENSITY:
90% OUTSIDE RIGHT OF WAY
95% INSIDE RIGHT OF WAY
- E. EMBEDMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D 2321. EMBEDMENT MATERIAL SHALL BE CLASS 1A (CRUSHED ROCK) OR 1B (CRUSHED ROCK-SAND MIXTURE) WITH LESS THAN 50% PASSING A No. 4 SIEVE. MAXIMUM 3/4" SIZE FOR PIPE SIZE ≤ 15". GREATER THAN 90% OF CRUSHED ROCK SHALL HAVE AT LEAST THREE BROKEN FACES. NO MORE THAN 2% UNBROKEN FRACTION ALLOWED.

IN SATURATED OR UNSTABLE SOILS, EMBEDMENT SHALL BE CLASS 1B ONLY (SEE SPECIFICATIONS FOR GRADATION REQUIREMENTS).

WHERE THIS STANDARD CONFLICTS WITH THE RECOMMENDATION OF ANY GEOTECHNICAL REPORT, OBTAIN WRITTEN CLARIFICATION FROM THE UTILITY ENGINEER PRIOR TO CONSTRUCTION.

FOUNDATION PREPARATION USING COBBLES, GRAVEL, CEMENT STABILIZATION, OR OTHER METHODS AS APPROVED BY THE ENGINEER SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

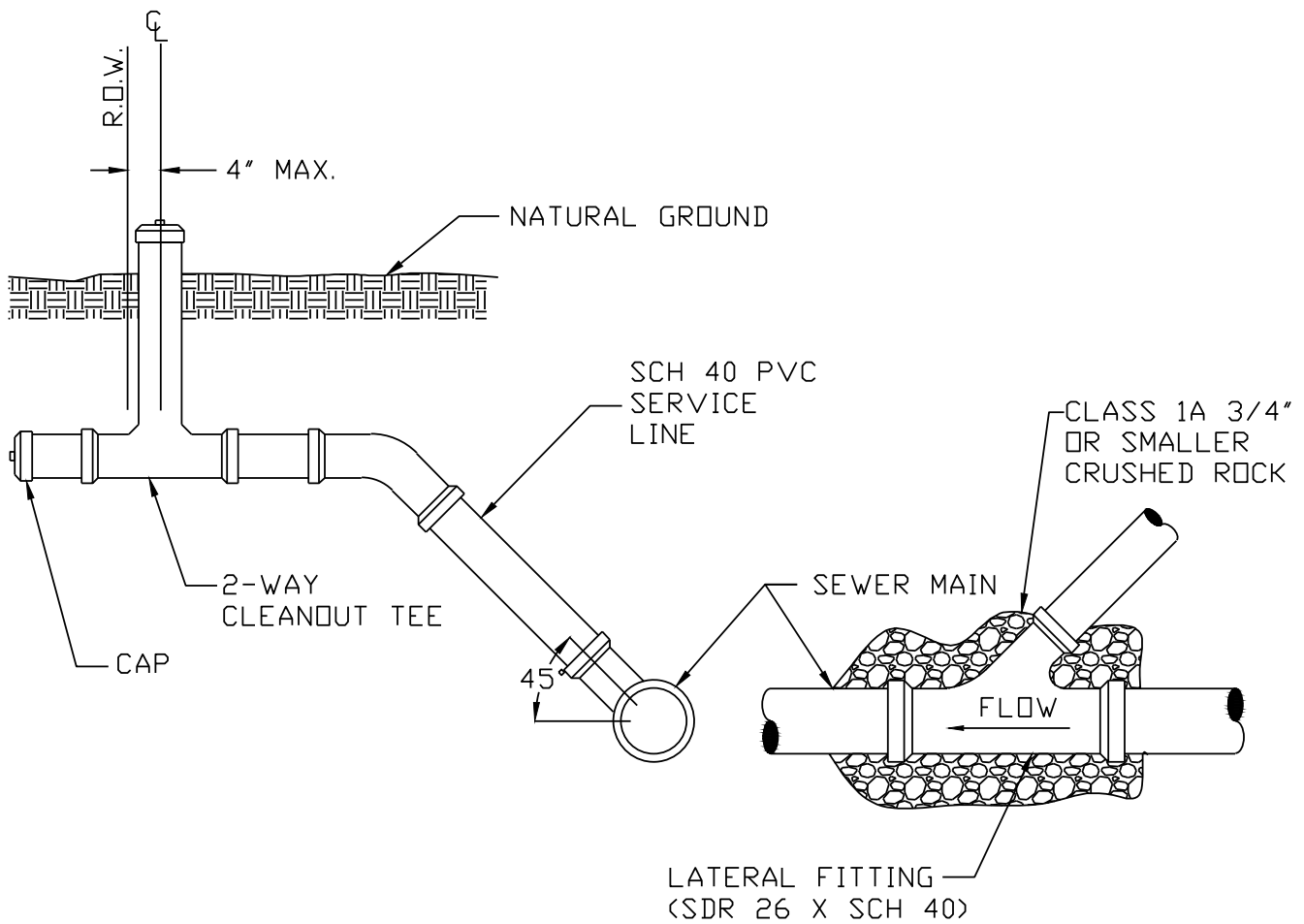
BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, AND COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 6" MAXIMUM LIFTS. STRUCTURE BACKFILL MATERIAL SHALL BE SAND.



CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER (NON-FORCEMAIN)
PIPE BEDDING DETAIL



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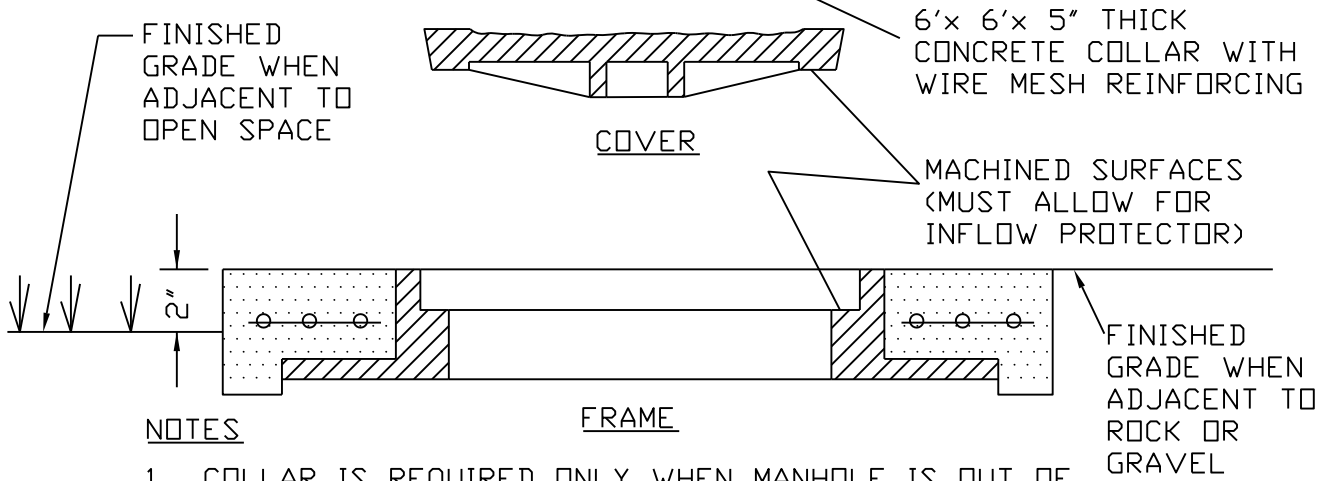
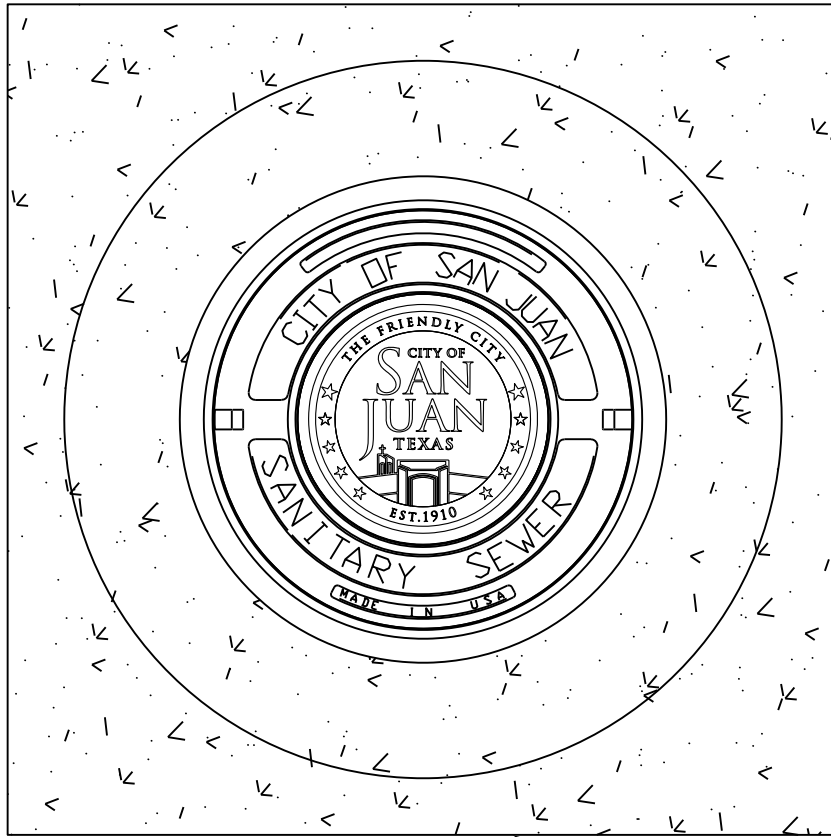
1. INDIVIDUAL SERVICE LATERALS TO BE PROVIDED TO EACH LOT.
2. SINGLE FAMILY SERVICE SHALL BE 4" MIN. MULTI-FAMILY, COMMERCIAL SHALL BE 6", AND INDUSTRIAL SERVICE SHALL BE 8" OR GREATER AS REQUIRED.



CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER
STANDARD SERVICE CONNECTION



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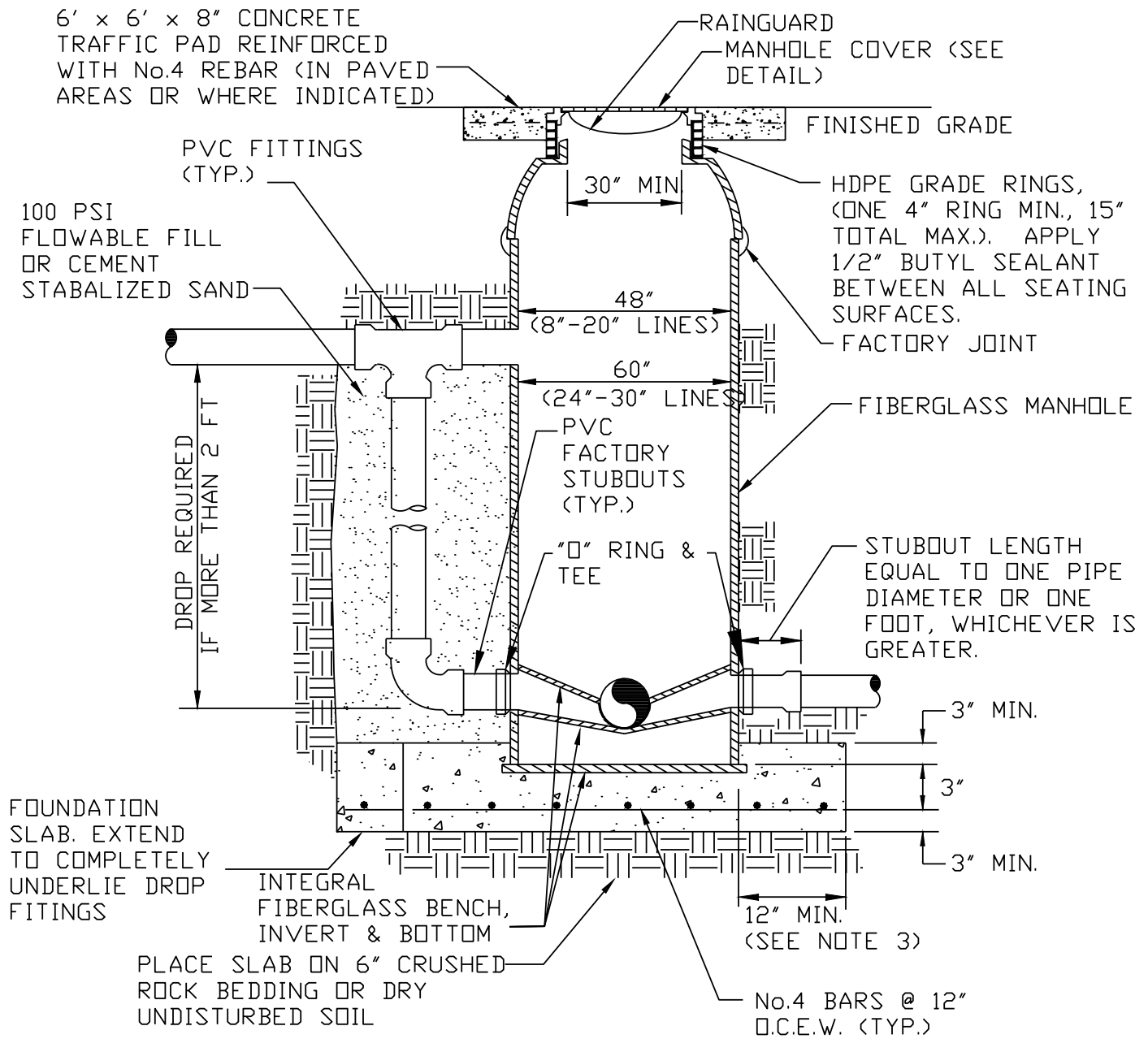
1. COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
2. STANDARD FRAME AND COVER SIZE SHALL BE USED.
3. A STEEL MANHOLE RISER, APPROVED HDPE ADJUSTING RINGS OR ADDITIONAL BRICKS MAY BE USED TO ELEVATE EXISTING MANHOLE COVERS TO RESURFACED GRADE (MAX. 4" HEIGHT).
4. COVER SHALL FIT FLUSH WITH THE FRAME WITH THE INFLOW PROTECTOR INSTALLED.
5. NO MORE THAN 2 SPACERS TO BE INSTALLED.
6. CONCRETE TO BE POURED TO SYMBOLIZE DIAMOND SHAPE



**CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE COLLAR
SANITARY SEWER MANHOLES**



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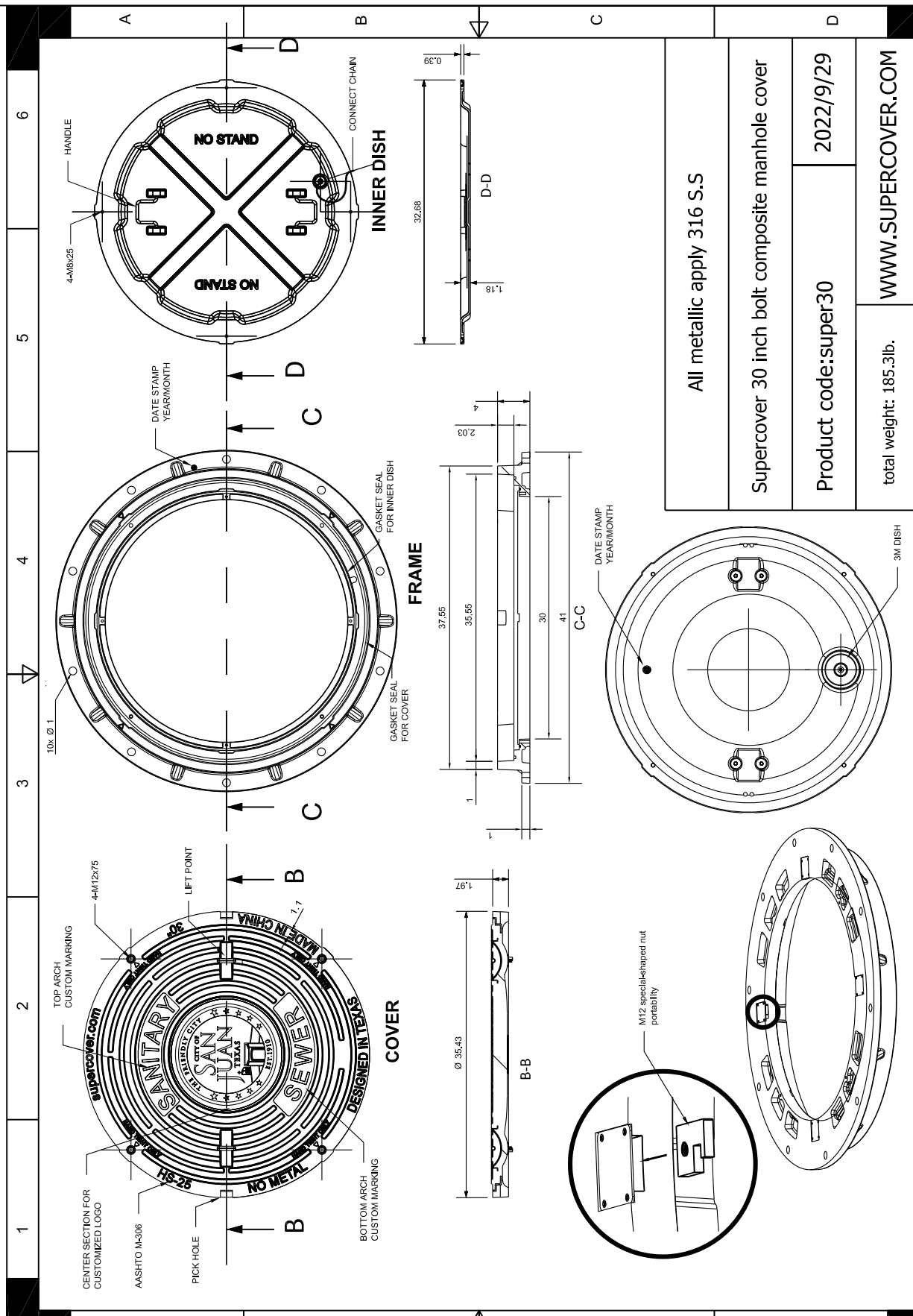
1. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. BACKFILL SHALL BE SAND COMPACTED TO 95% STANDARD PROCTOR.
3. BASE SLAB SHALL BE 4 FT. LARGER THAN MANHOLE DIAMETER WHERE SOIL BEARING CAPACITY < 2000 PSF, WATER TABLE < 5 FT., OR DEPTH > 20 FT. SLAB SHALL BE DESIGNED TO PREVENT FLOTATION OF MANHOLE.
4. COAT ALL INTERNAL CEMENTITIOUS AND METALLIC SURFACES WITH COAL TAR EPOXY.
5. OUTLET STUBOUT SHALL BE SPIGOT END. INLET STUBOUTS SHALL BE BELL END EXCEPT FOR DROP CONNECTIONS.
6. INSTALL 1' CONCRETE RINGS AROUND MANHOLES NOT FOUND ON STREETS.
7. MANHOLES WITH A CONCRETE BOTTOM TO USE 326 WWR EPOXY COATING (JEFFCOAT)



**CITY OF SAN JUAN
STANDARDS MANUAL
FIBERGLASS MANHOLE
WITH DROP STRUCTURE**



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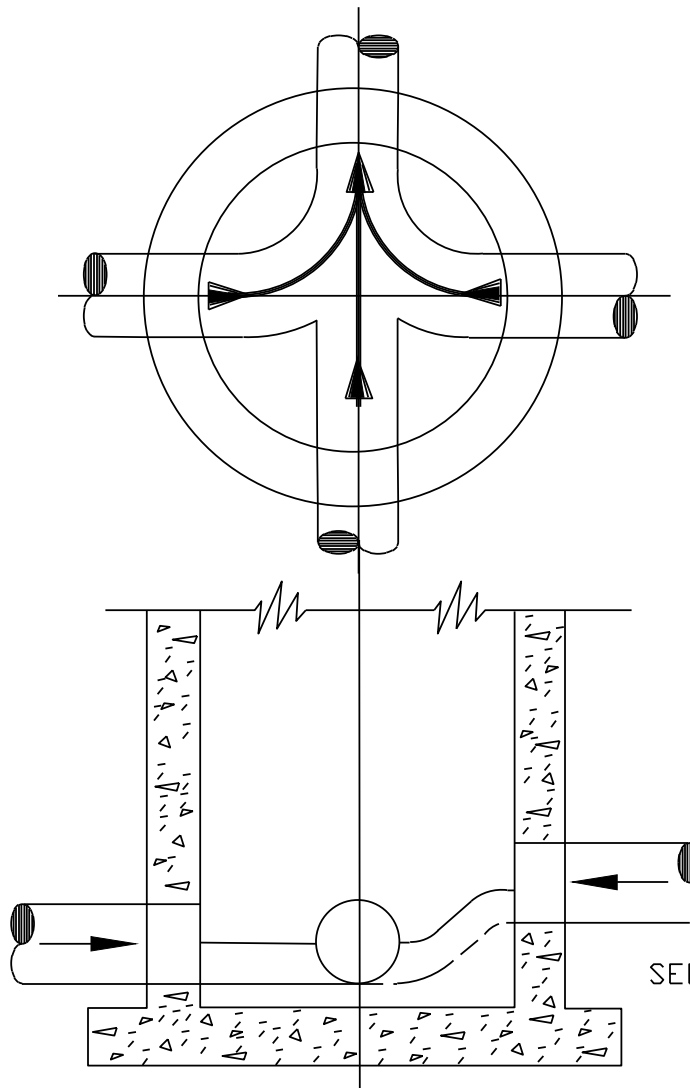


1 2 3 4 5 6

1 2 3 4 5 A3

CITY OF SAN JUAN
 STANDARDS MANUAL
 SANITARY SEWER LID COVER





SEE NOTE 6

NOTES

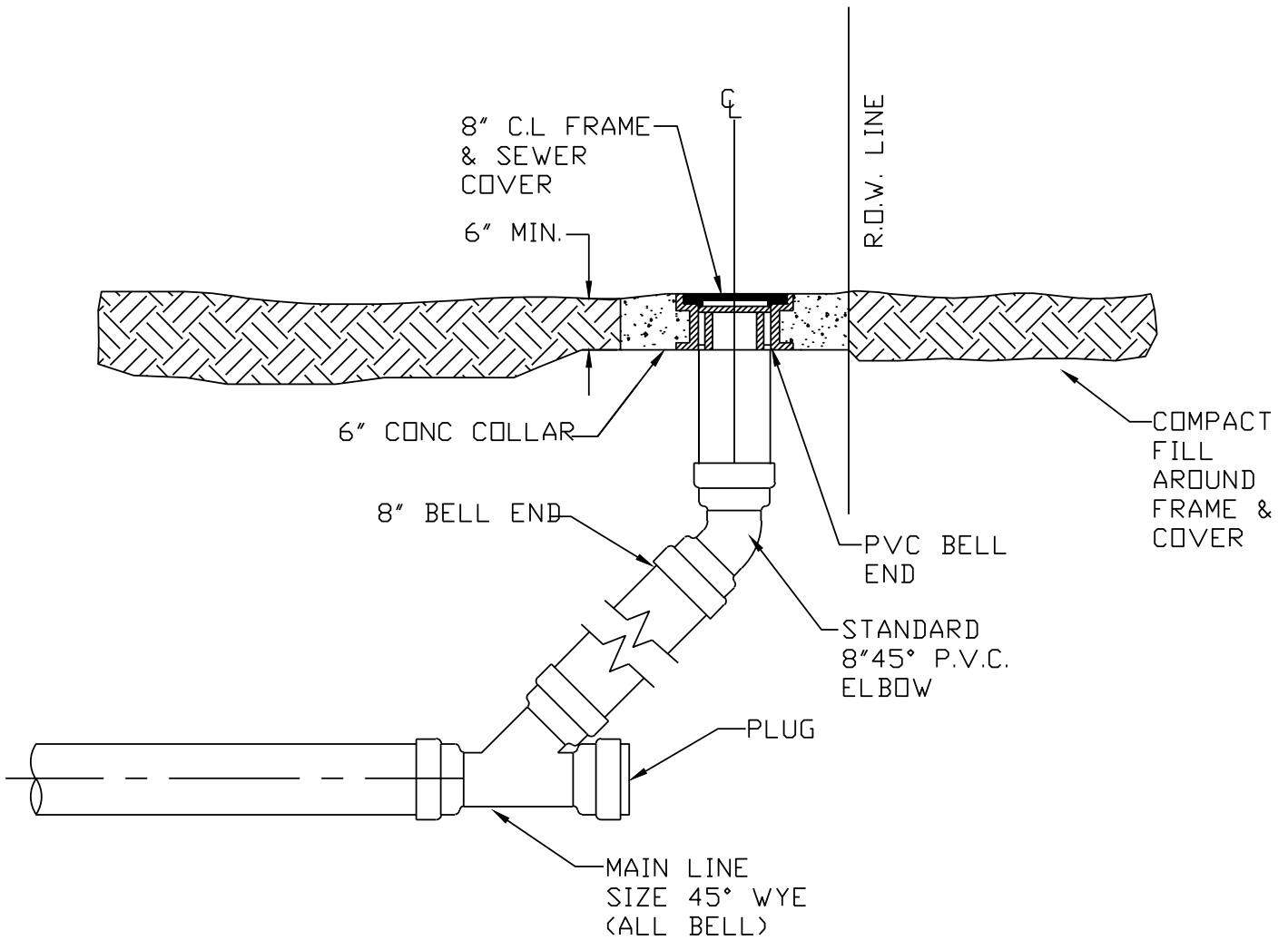
1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE TREATED AS MAINS (ELEVATIONS SHOWN, PRECAST HOLE, FLOW CHANNEL)
4. APPROVED PRECAST CONCRETE OR FIELD INSTALLED CONCRETE FLOW CHANNEL IS REQUIRED.
5. SIDEWALLS OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. NO INSIDE DROP LARGER THAN 6" SHALL BE ALLOWED WHEN THERE ARE MORE THAN 2 INVERTS OR WHEN THERE IS A CHANGE OF DIRECTION OF FLOW GREATER THAN 45 DEGREES.
7. THE FIELD APPLIED CORROSION BARRIER SYSTEM SHALL BE INSTALLED AFTER INVERT CHANNEL CONSTRUCTION, THE CORROSION BARRIER SHALL NOT BE APPLIED TO THE FLOW CHANNEL



CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER MANHOLE
INVERT COVER



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NOTES

1. SANITARY SERVICES INTO MANHOLES ARE NOT PERMITTED.
2. INSTALL STAINLESS STEEL VALVE BOX OVER CLEAN-OUTS LOCATED IN SIDEWALKS AND DRIVEWAYS WITH VALVE COVER MARKED "SEWER"
3. TOP OF STAINLESS STEEL BOX SHALL BE FLUSH WITH TOP OF CONCRETE.
4. MAXIMUM CLEAN-OUT HEIGHT SHALL BE 6" FROM NATURAL GROUND
5. ALL SANITARY SEWER LINES SHALL HAVE IDENTIFYING METALLIC TAPE 24" ABOVE TOP OF PIPE

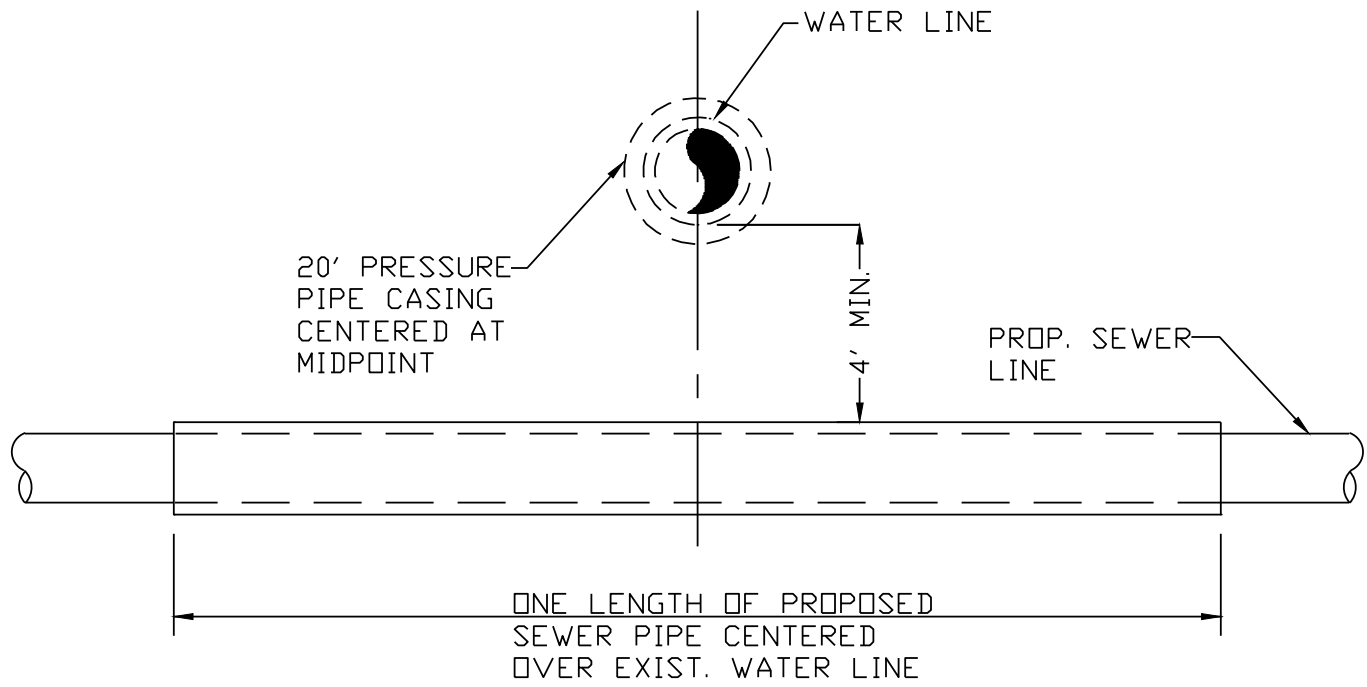
SERVICE LINE	
ZONE	DIAMETER
SINGLE FAMILY	4"
MULTI-FAMILY	6"
COMMERCIAL	6"
INDUSTRIAL	8"



**CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER
CLEANOUT DETAIL**



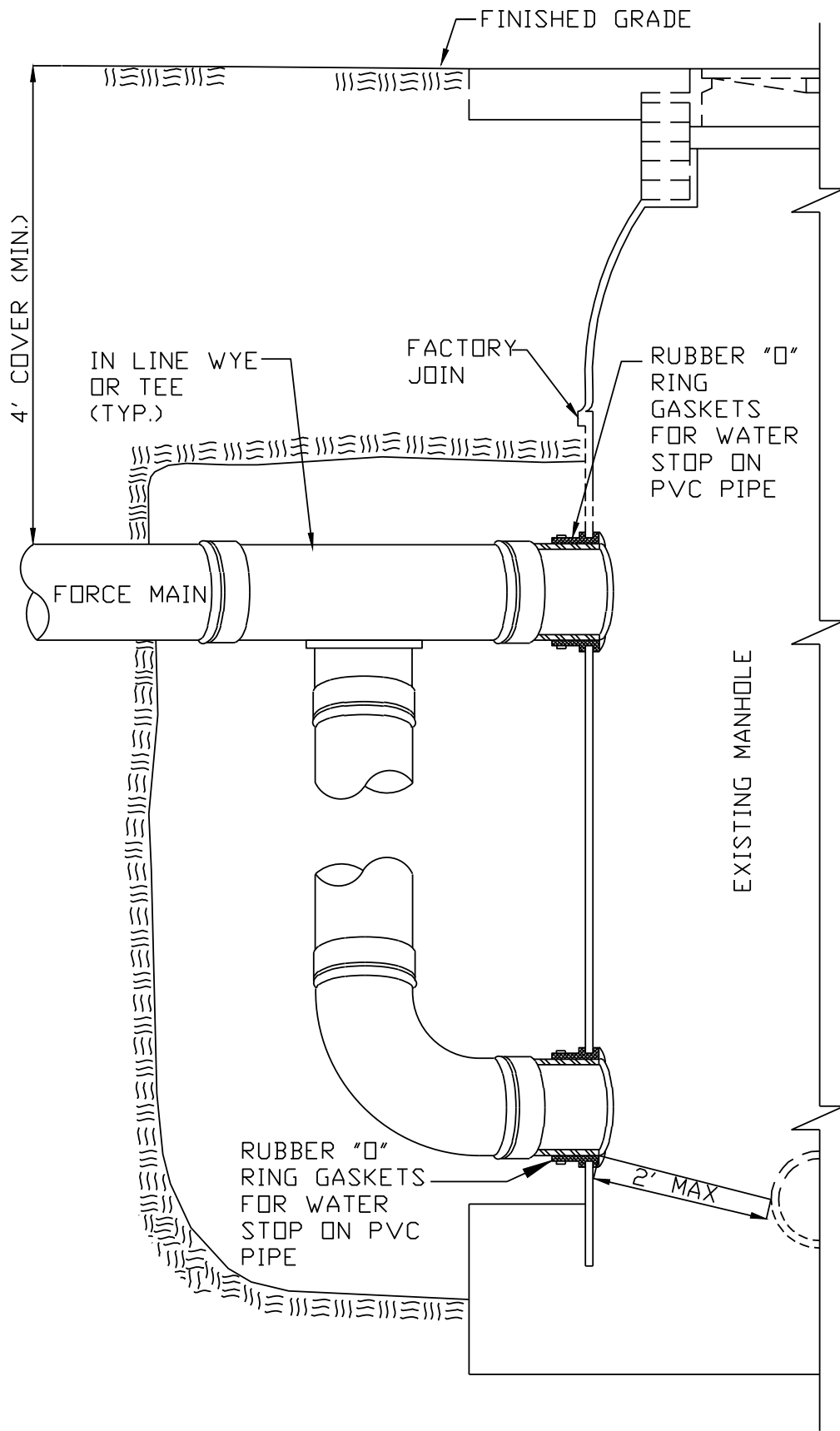
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CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER
LINE CROSSING

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CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL FORCE MAIN
TIE IN DRAIN

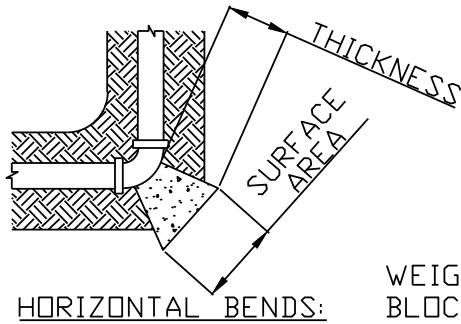


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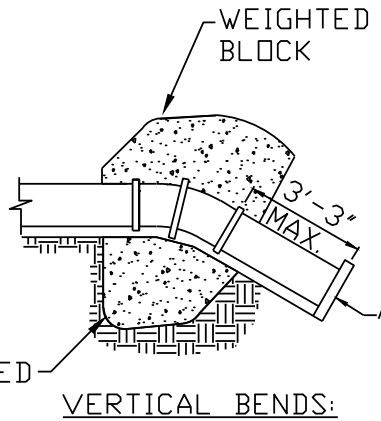


CONSTRUCTION NOTES

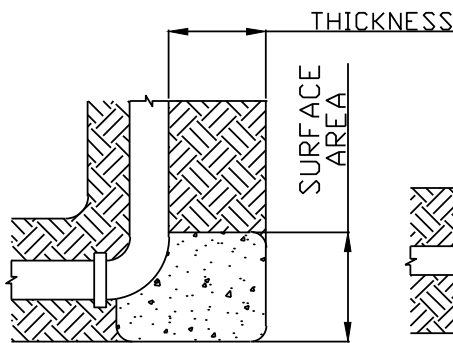
- A. SIMPLEX COUPLING
- B. ANCHOR ROD



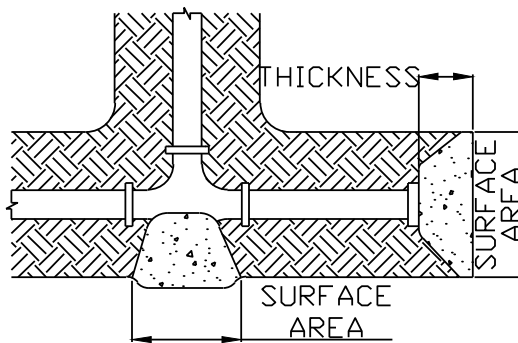
HORIZONTAL BENDS:



WEIGHTED BLOCK
VERTICAL BENDS:



HYDRANT BURYS



TEES AND DEAD ENDS

THRUST BLOCK SIZE			
DIAMETER OF PIPE INCHES	HORIZONTAL BEND		WEIGHT AT VERTICAL BENDS-LBS.
	SURFACE AREA SQ. FEET	THICKNESS INCHES	
22-1/2° BENDS			
6 OR LESS	2	8	1700
8	3	8	3,000
10	3.5	12	4,500
12	4	14	6,600
14	5	18	9,000
16	6	18	11,800
45° BENDS			
6 OR LESS	4	12	3,200
8	5	14	5,800
10	6	18	9,000
12	7	18	13,000
14	8	24	17,000
16	11.5	24	23,200
90° BENDS			
6 OR LESS	6	12	6,000
8	8	15	10,700
10	10	18	16,700
12	12	18	24,000
14	18	24	32,600
16	21	24	42,700
TEES & DEAD ENDS			
6 OR LESS	3	12	
8	4	15	
10	6	18	
12	8.5	18	
14	11.5	24	
16	15	24	

GENERAL NOTES:

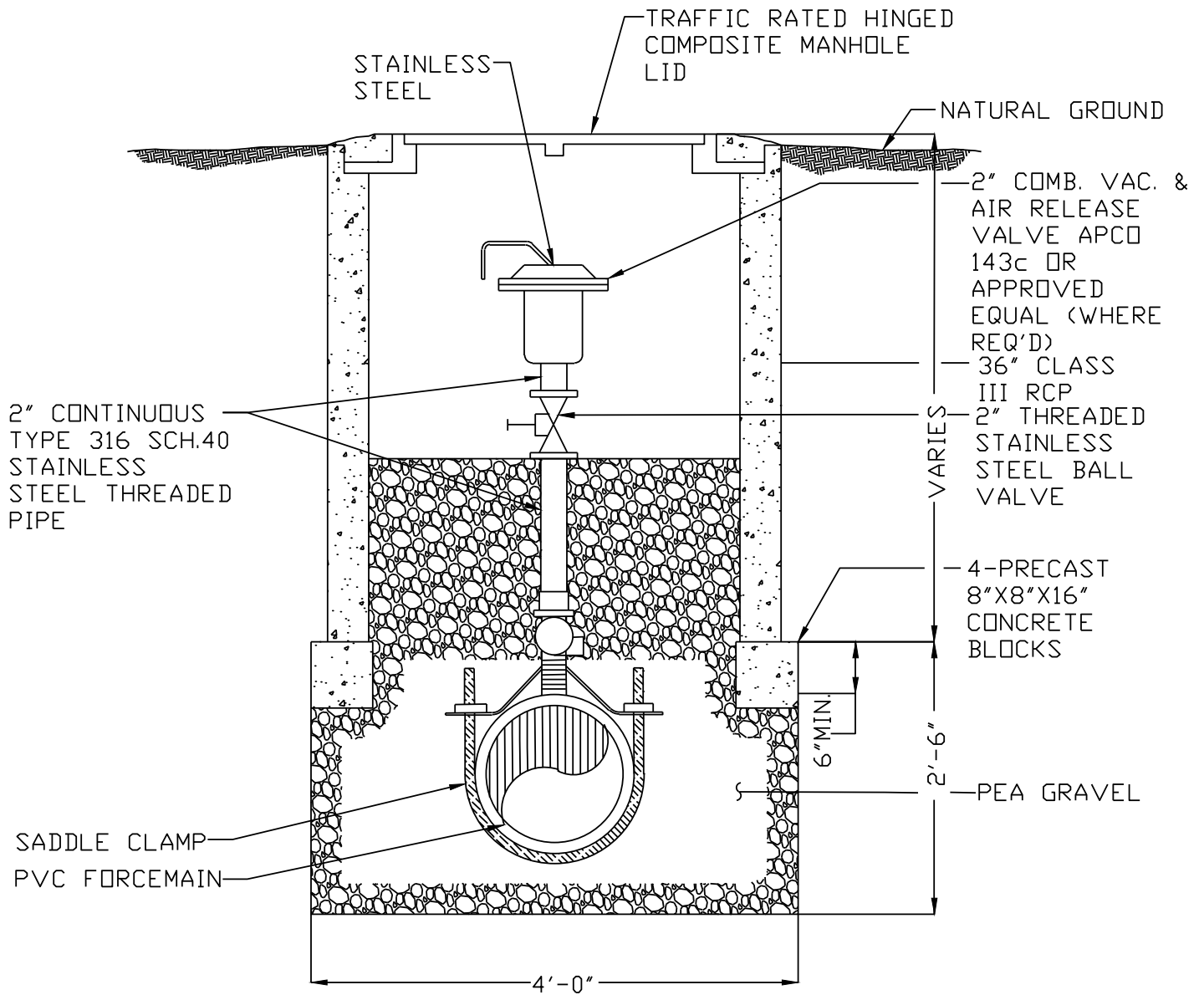
1. SEE THRUST BLOCK SIZE CHART FOR PROPER THICKNESS AND SURFACE AREAS.
2. THE LOCATION OF THRUST BLOCKS DEPENDS UPON THE DIRECTION OF THRUST AND TYPE FITTINGS



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE THRUST BLOCK
(FORCE MAIN)



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GENERAL NOTES:

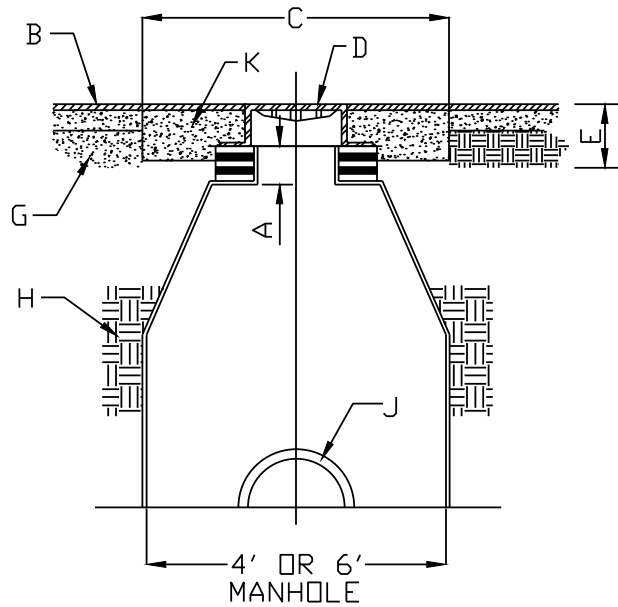
1. AIR RELEASE VALVE MUST BE ON PROPERTY LINE/ RIGHT OF WAY ROAD



**CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER AIR RELEASE
VALVE WITH MANHOLE**



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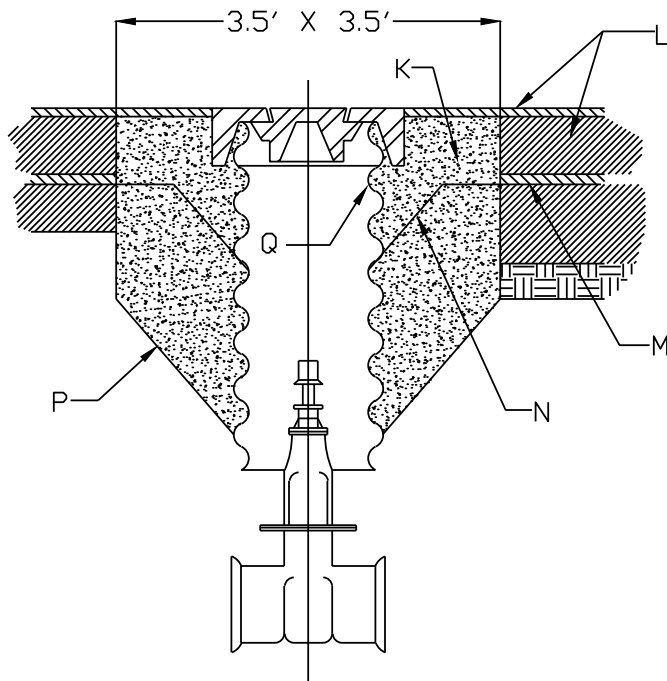
MANHOLE REGRADING DETAIL

GENERAL NOTES:

1. ADJUSTMENT TO GRADE OF FRAME AND COVER SHALL BE MADE BY VARYING NUMBER OF HDPE GRADE RINGS DIRECTLY UNDER FRAME USING A MINIMUM OF ONE RING UP TO A MAXIMUM OF 12 INCHES TOTAL. IF ADJUSTMENT REQUIRES MORE THAN 12 INCHES, THE CONE SHALL BE REMOVED, BARREL HEIGHT ADJUSTED AND CONE REPLACED.
2. FOR SHALLOW ADJUSTMENTS, WATER VALVE EXTENSION COLLAR & INSERT MAY BE USED.
3. ALL SEATING SURFACES BETWEEN INDIVIDUAL GRADE RINGS, FRAME, AND MANHOLE BRICK LEDGE SHALL BE SEALED USING 1/2" BUTYL SEALANT.

CONSTRUCTION NOTES:

- A. HDPE GRADE RINGS, ONE RING MINIMUM, 12" MAX. TOTAL
- B. OVERLAY
- C. USE A REINFORCED CONCRETE PAD 6'X6'X8" IN ALL PAVED AREAS
- D. MANHOLE FRAME & COVER
- E. STANDARD PAVING SECTION
- G. FLEX BASE
- H. SUBGRADE
- J. SEWER LINE
- K. 2'X2' NEW PORTLAND CEMENT CONCRETE.
- L. NEW PAVING MATERIAL
- M. EXISTING PAVEMENT
- N. CUT LINE
- P. EXISTING CONCRETE
- Q. VALVE BOX EXTENSION



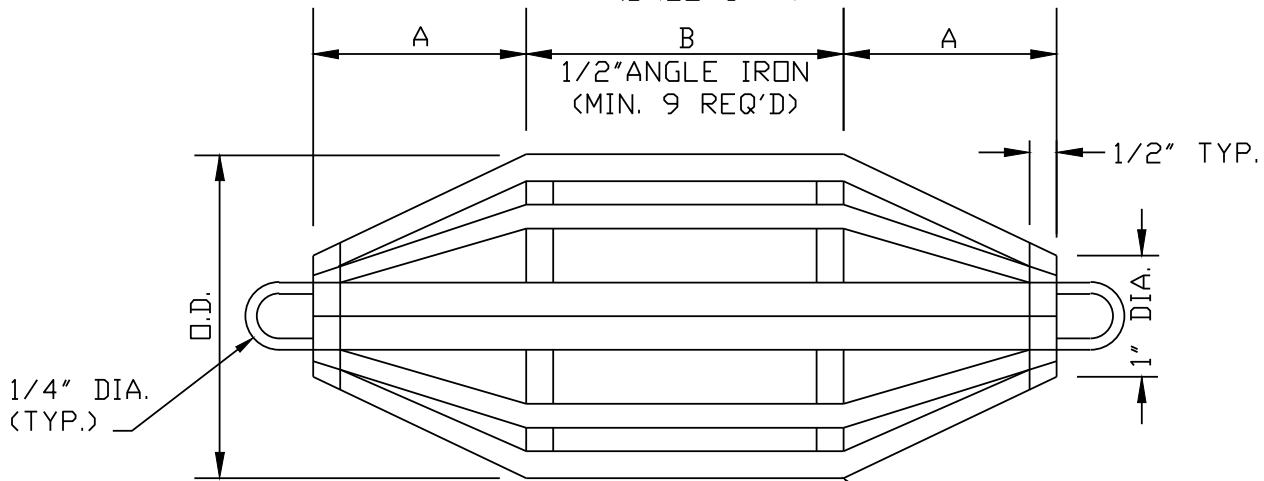
VALVE BOX REGRADING DETAIL



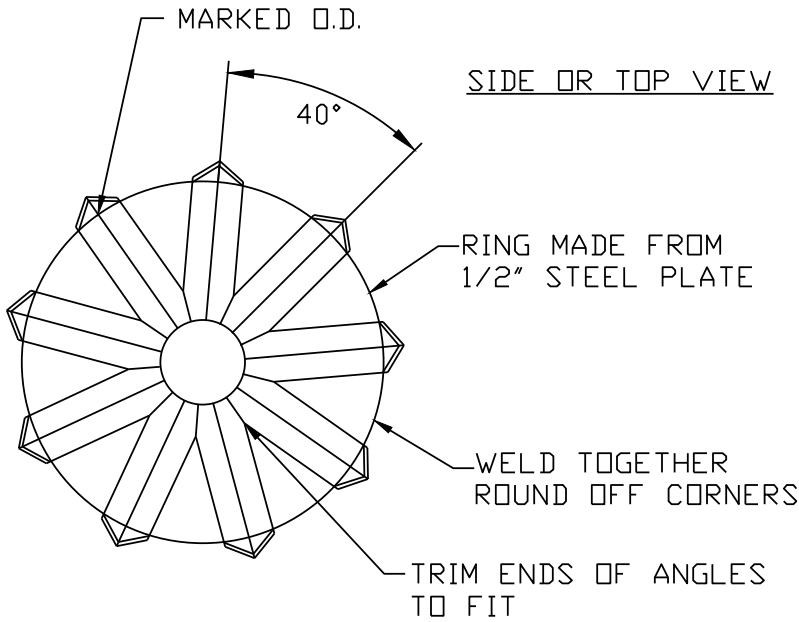
CITY OF SAN JUAN
STANDARDS MANUAL
SANITARY SEWER MANHOLE AND
VALVE BOX REGRADING



SEE TESTING
MANDREL CHART



SIDE OR TOP VIEW



END VIEW

TESTING MANDREL CHART

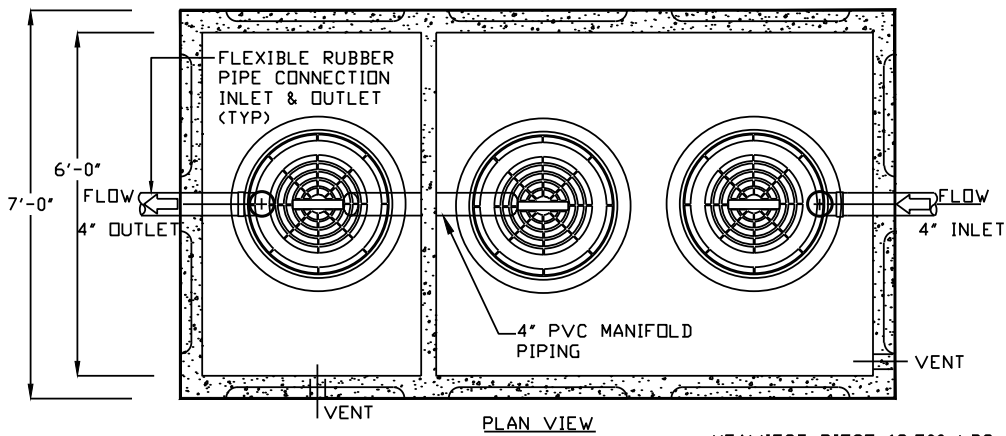
SIZE	A	B	MANDREL O.D.		RING O.D.	
			PSM SDR-26		PSM SDR-26	
6	4.0"	4.5"	5.50		4.79	
8	5.5"	6.0"	7.37		6.66	
10	7.0"	7.5"	9.21		8.50	
12	8.0"	9.0"	10.96		10.25	
15	10.0"	11.0"	13.42		12.71	
18	12.0"	13.5"				
21	14.0"	16.0"				
24	16.0"	18.0"				
27	18.0"	20.0"				



CITY OF SAN JUAN
STANDARDS MANUAL
GO NO GO DEFLECTION
TESTING MANDREL

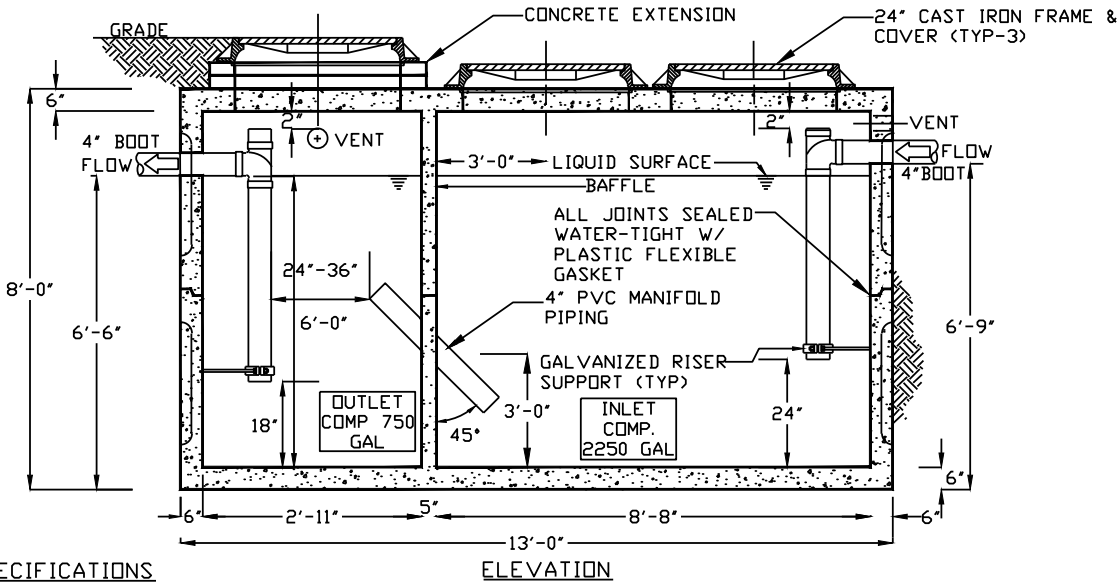


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HEAVIEST PIECE 18,500 LBS

SEE SPECIFICATIONS AND ENGINEERING DATA, SHEET 2



SPECIFICATIONS

1. CONCRETE : CLASS 1 CONCRETE WITH DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR, FIRST STAGE OF WALL AND BAFFLE WITH SECTIONAL RISER TO REQUIRED DEPTH. GROSS EMPTY WEIGHT OF APPROXIMATELY 46,000 LBS.
2. REINFORCEMENT: GRADE 60 REINFORCED WITH STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL. STRUCTURAL DESIGN IS BASED ON AASHTO HS-20 LOADING.
3. C.I. CASTINGS: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED C.I. CASTINGS: OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30. MANHOLE SHALL HAVE 24 INCH INSIDE DIAMETER AND BE TRAFFIC DUTY.

ENGINEERING DATA:

1. INTERCEPTOR IS STRUCTURALLY AND HYDRAULICALLY ENGINEERED CONFORMING TO IPC & ASTM C-1613. NOMINAL LIQUID CAPACITY IS 3,000 GALLONS WITH TOTAL GREASE & SOLIDS RETENTION CAPACITY OF APPROXIMATELY 7,000 LBS.
2. MANUFACTURER TO PROVIDE STRUCTURAL DRAWINGS & BUOYANCY CALCULATIONS CERTIFIED BY A LICENSED ENGINEER.
3. FIELD EXCAVATION AND PREPARATION SHALL BE COMPLETED PRIOR TO DELIVERY OF INTERCEPTOR.
4. USE DIMENSIONAL DATA AS SHOWN.



**CITY OF SAN JUAN
STANDARDS MANUAL
GREASE TRAP DETAIL**



APPENDIX 3

WATER DETAILS

NOTES:

1. CONTRACTOR TO CONTACT ALL UTILITIES COMPANIES IN THE AREA FOR FIELD VERIFICATION OF EXISTING FACILITIES. AND TEXAS 811 DIG-TESS PRIOR TO ANY EXCAVATION.
2. CONTRACTOR TO EXPOSE ANY EXISTING FACILITY THAT MAY BE IN CONFLICT PRIOR TO START OF CONSTRUCTION.
3. ALL EXISTING CITY UTILITIES (WATER/SEWER) SHOWN ARE FROM BEST INFORMATION AVAILABLE. NEITHER THE ENGINEER NOR THE CITY IS RESPONSIBLE FOR THE ACCURACY OF LOCATION.
4. CONTRACTOR SHALL AT ALL TIMES ALLOW ACCESS TO EXISTING DRIVEWAYS OR PROVIDE/MAINTAIN ALTERNATIVE ALL WEATHER ROUTES.
5. ALL TRAFFIC CONTROL DEVICES SHALL BE IN CONFORMANCE WITH TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
6. TRENCHES OR EXCAVATIONS MAY NOT BE LEFT OPEN OVERNIGHT UNLESS AUTHORIZED IN WRITING BY THE ENGINEERING DEPARTMENT. IN SUCH CASES, THE CONTRACTOR MUST PROVIDE 1/2" STEEL PLATES OVER PLATES WITH ANCHORING AS PER SPECIFICATIONS TO BE PROVIDED BY THE CITY OF SAN JUAN.
7. ANY DAMAGE TO FENCES, WALKS, OR PRIVATE PROPERTY SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL EXCAVATED MATERIAL AND DEBRIS FROM THE SITE AT NO ADDITIONAL EXPENSE TO THE OWNER.
9. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING CONSTRUCTION MATERIALS TESTING THROUGH THE CITY'S DESIGNATED FIELD REPRESENTATIVE 24 HOURS PRIOR TO TESTING. CONTRACTOR IS RESPONSIBLE FOR ADHERING CLOSELY TO TESTING SCHEDULE AND AVOID ANY DELAYS IN THE FIELD.
10. INSPECTION AFTER HOURS TO BE REIMBURSED BY CONTRACTOR.



CITY OF SAN JUAN
STANDARDS MANUAL
WATER UTILITIES
GENERAL NOTES



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NOTES:

- A. SAND BEDDING PLACED, HAND LEVELED, AND COMPACTED BEFORE PIPE IS LAID, UP TO BOTTOM OF PIPE (MIN. THICKNESS = 6").
- B. SAND BACKFILL PLACED AND COMPACTED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO 6" ABOVE THE TOP OF PIPE. WORK IN UNDER PIPE HAUNCHES AND COMPACT BY HAND TO SPRING LINE. USE VIBRATORY-TYPE COMPACTORS FOR LIFTS ABOVE THE SPRING LINE. MAXIMUM 6" LIFTS.
- Bd. MINIMUM TRENCH WIDTH: PIPE O.D. + 16" (FOR 16" PIPE AND SMALLER) OR PIPE O.D. X 1.25 + 12" (FOR 18" PIPE AND LARGER)
- C-1. (CITY STREETS, PARKING AREA, AND DRIVEWAYS) SELECT EXCAVATED BACKFILL MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 8" MAX. LIFTS.
- C-2 (STATE MAINTAINED ROADWAY) SAND/CEMENT STABILIZED BACKFILL WITH 7% PORTLAND CEMENT COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- D. EXCAVATED EARTH BACKFILL MECHANICALLY COMPACTED IN 12" MAX. LIFTS. MINIMUM STANDARD PROCTOR DENSITY: 90% OUTSIDE RIGHT OF WAY; 95% INSIDE RIGHT OF WAY

EMBEDMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D 2321. EMBEDMENT MATERIAL SHALL BE CLASS II OR III WITH < 50% PASSING A No. 200 SIEVE AND PLASTICITY INDEX < 7.

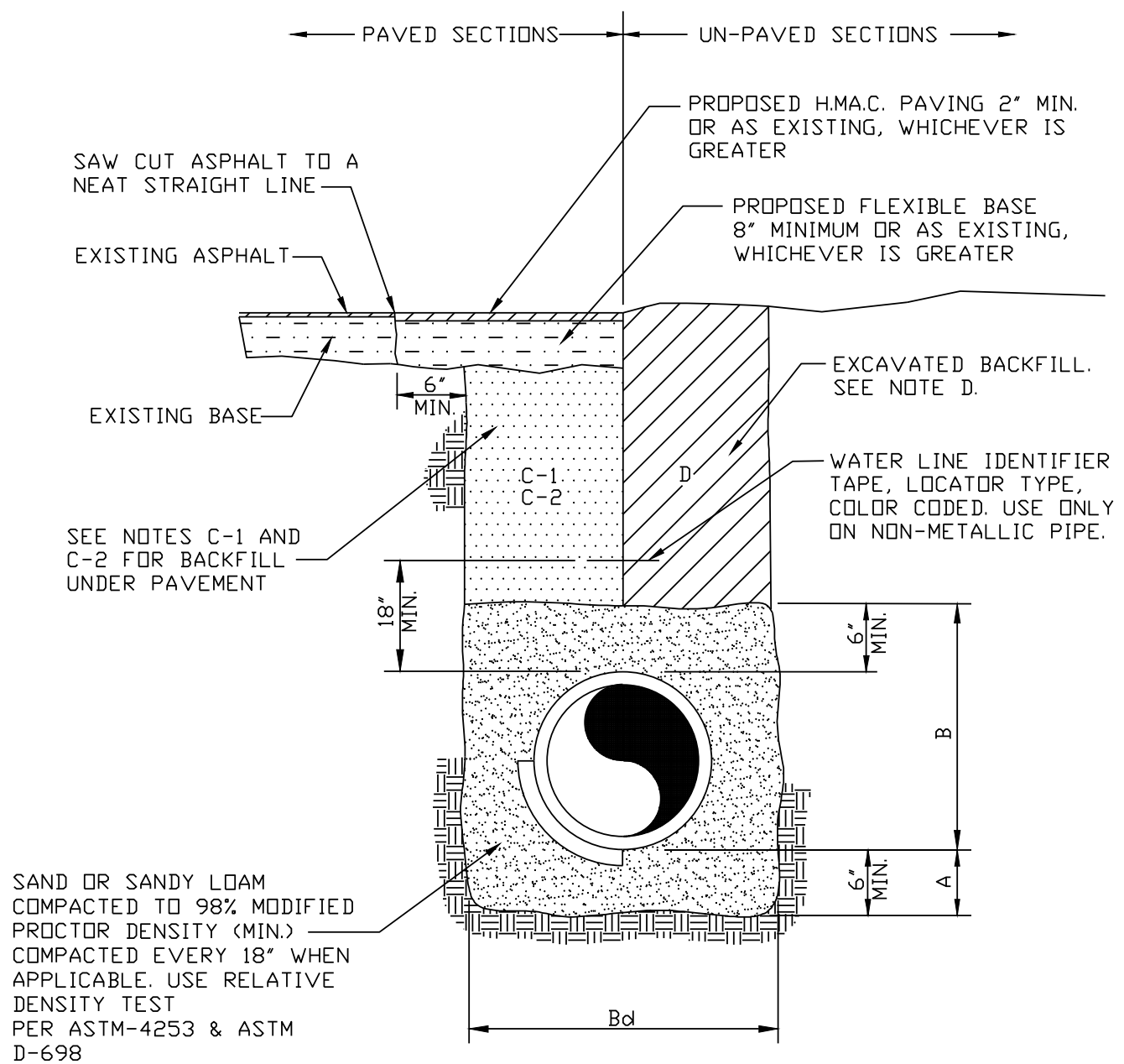
WHERE THIS STANDARD CONFLICTS WITH THE RECOMMENDATION OF ANY GEOTECHNICAL REPORT, OBTAIN WRITTEN CLARIFICATION FROM THE UTILITY ENGINEER PRIOR TO CONSTRUCTION.

FOUNDATION PREPARATION USING COBBLES, GRAVEL, CEMENT STABILIZATION, OR OTHER METHODS AS DIRECTED BY THE ENGINEER SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, AND COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 6" MAXIMUM LIFTS. STRUCTURE BACKFILL MATERIAL SHALL BE SAND.

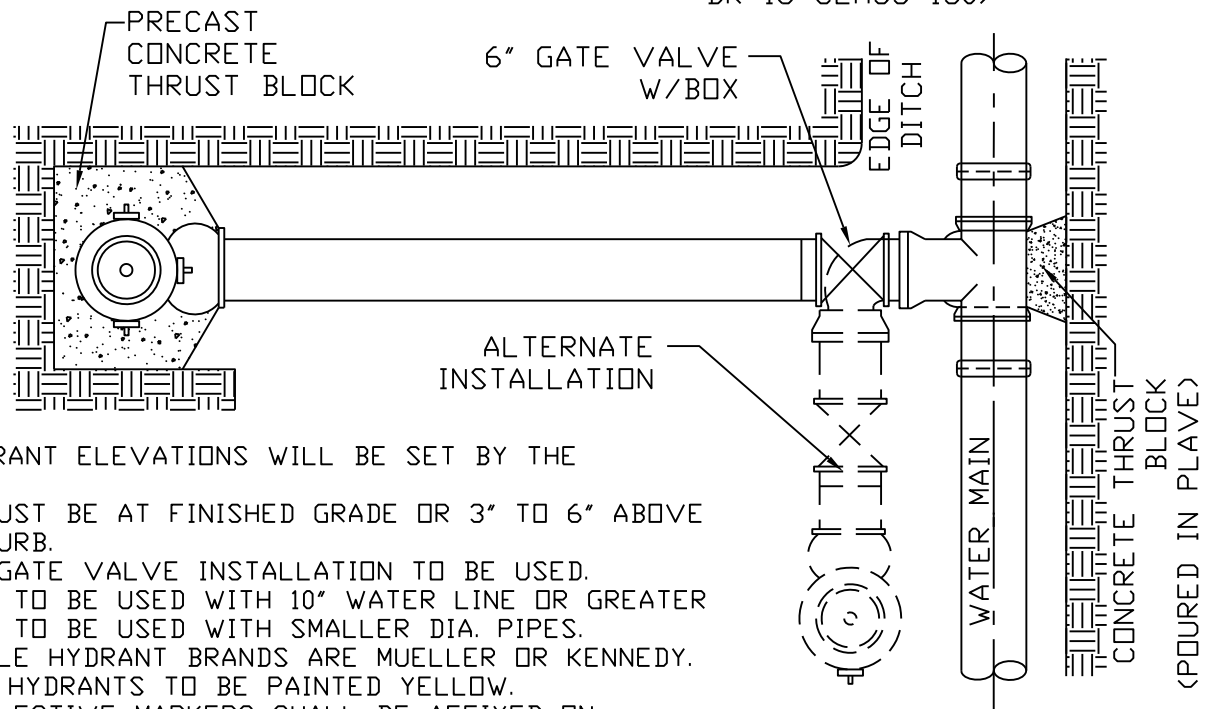
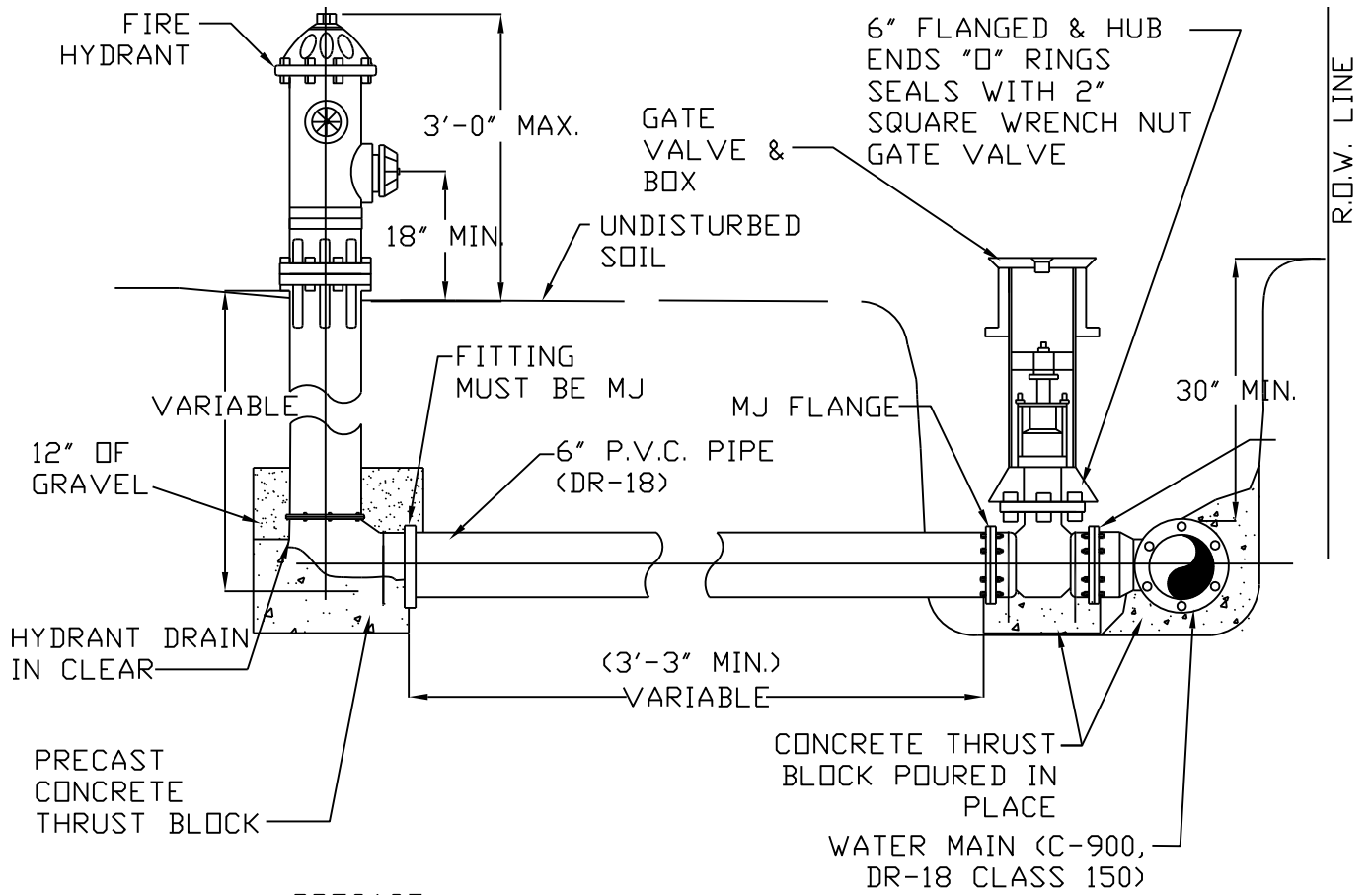


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CITY OF SAN JUAN
STANDARDS MANUAL
WATERLINE TRENCH
BEDDING





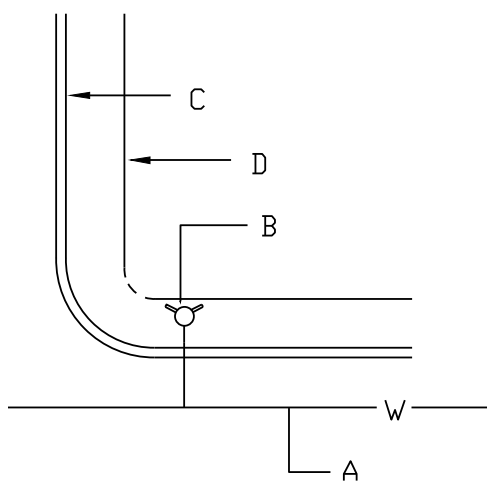
NOTES:

1. FIRE HYDRANT ELEVATIONS WILL BE SET BY THE ENGINEER.
2. FLANGE MUST BE AT FINISHED GRADE OR 3" TO 6" ABOVE TOP OF CURB.
3. FLANGED GATE VALVE INSTALLATION TO BE USED.
4. BBF TEES TO BE USED WITH 10" WATER LINE OR GREATER
BBF TEES TO BE USED WITH SMALLER DIA. PIPES.
5. ACCEPTABLE HYDRANT BRANDS ARE MUELLER OR KENNEDY.
6. ALL FIRE HYDRANTS TO BE PAINTED YELLOW.
7. BLUE REFLECTIVE MARKERS SHALL BE AFFIXED ON PAVEMENT TO INDICATE THE LOCATION OF A FIRE HYDRANT.

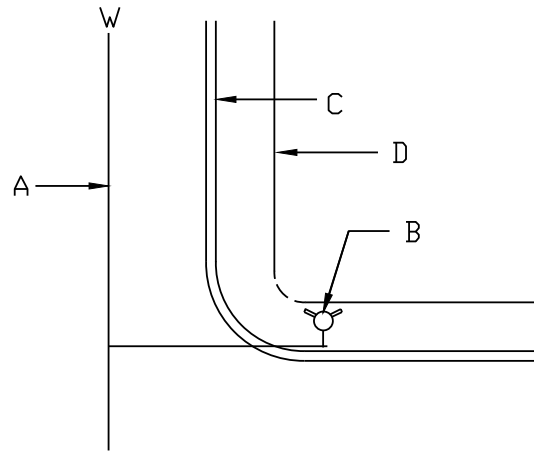


**CITY OF SAN JUAN
STANDARDS MANUAL
FIRE HYDRANT
INSTALLATION**

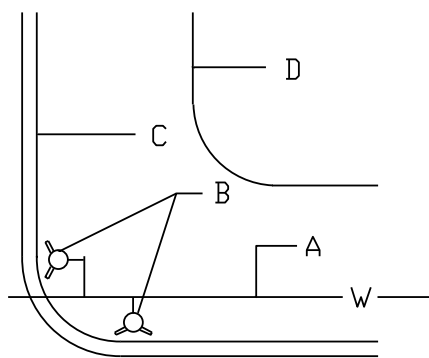




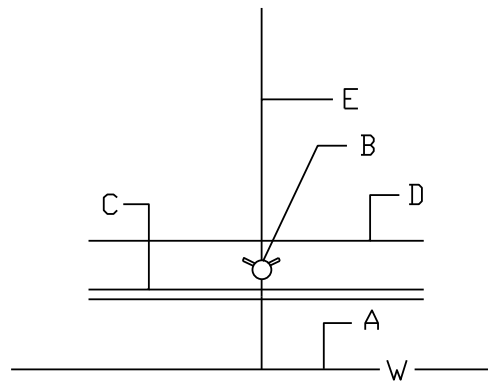
CASE 1



CASE 2



CASE 3



CASE 4

NOTES:

1. NORMALLY, FIRE HYDRANTS ARE TO BE LOCATED AT THE END OF CURB RETURN, OR AT PROPERTY LINE.
2. PERMANENT OBSTRUCTIONS SUCH AS POLES, TRAFFIC SIGNALS ETC. MAY REQUIRED RELOCATION OF FIRE HYDRANT 5' DISTANCE FROM OBSTRUCTION, FIRE HYDRANT NOT TO BE LOCATED WITHIN AREA OF CURB RETURN.

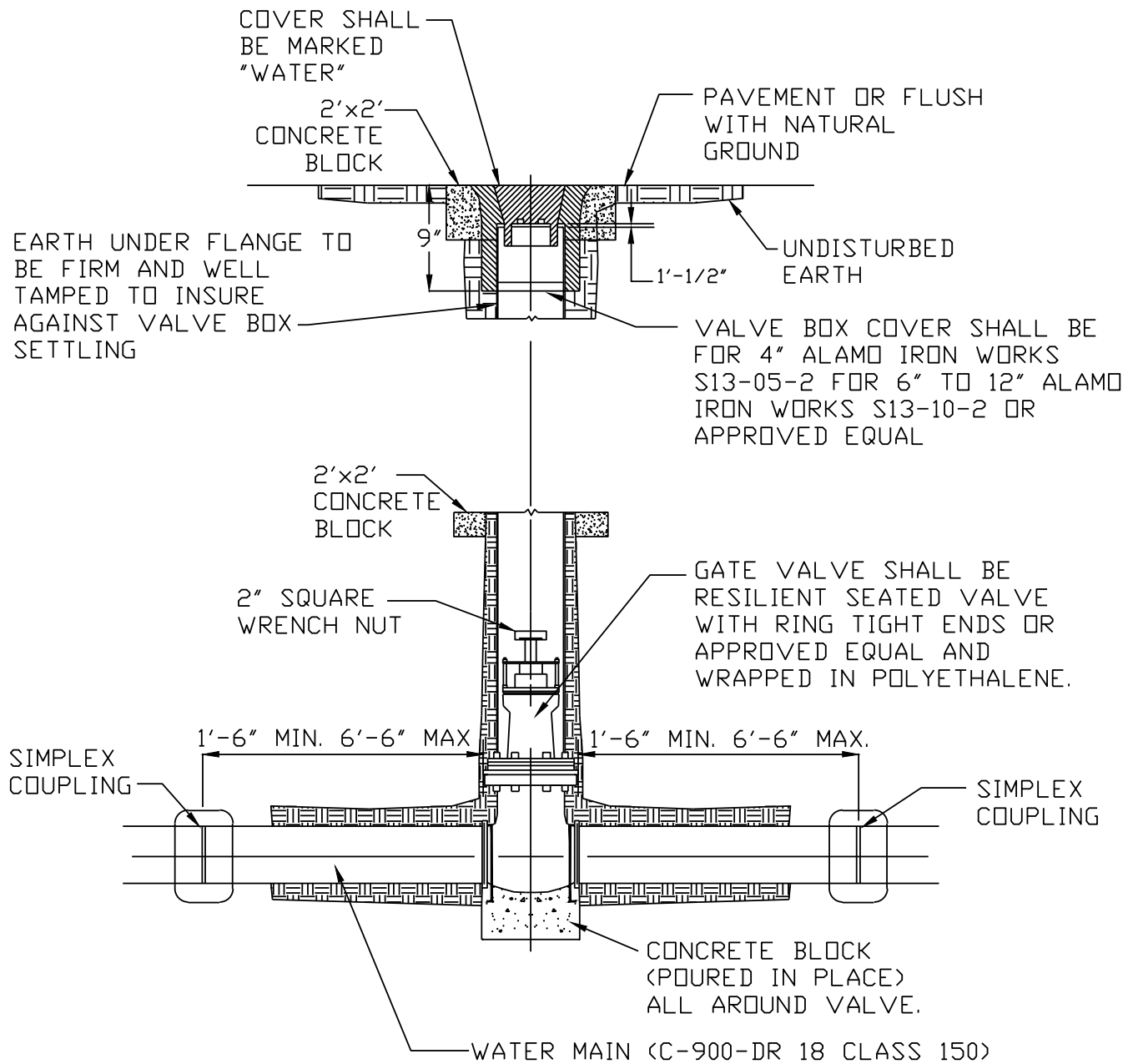
CONSTRUCTION NOTES:

- A. WATER MAIN.
- B. FIRE HYDRANT.
- C. CURB AND GUTTER.
- D. RIGHT OF WAY.
- E. PROPERTY LINE.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL FIRE HYDRANT
LOCATIONS





NOTES:

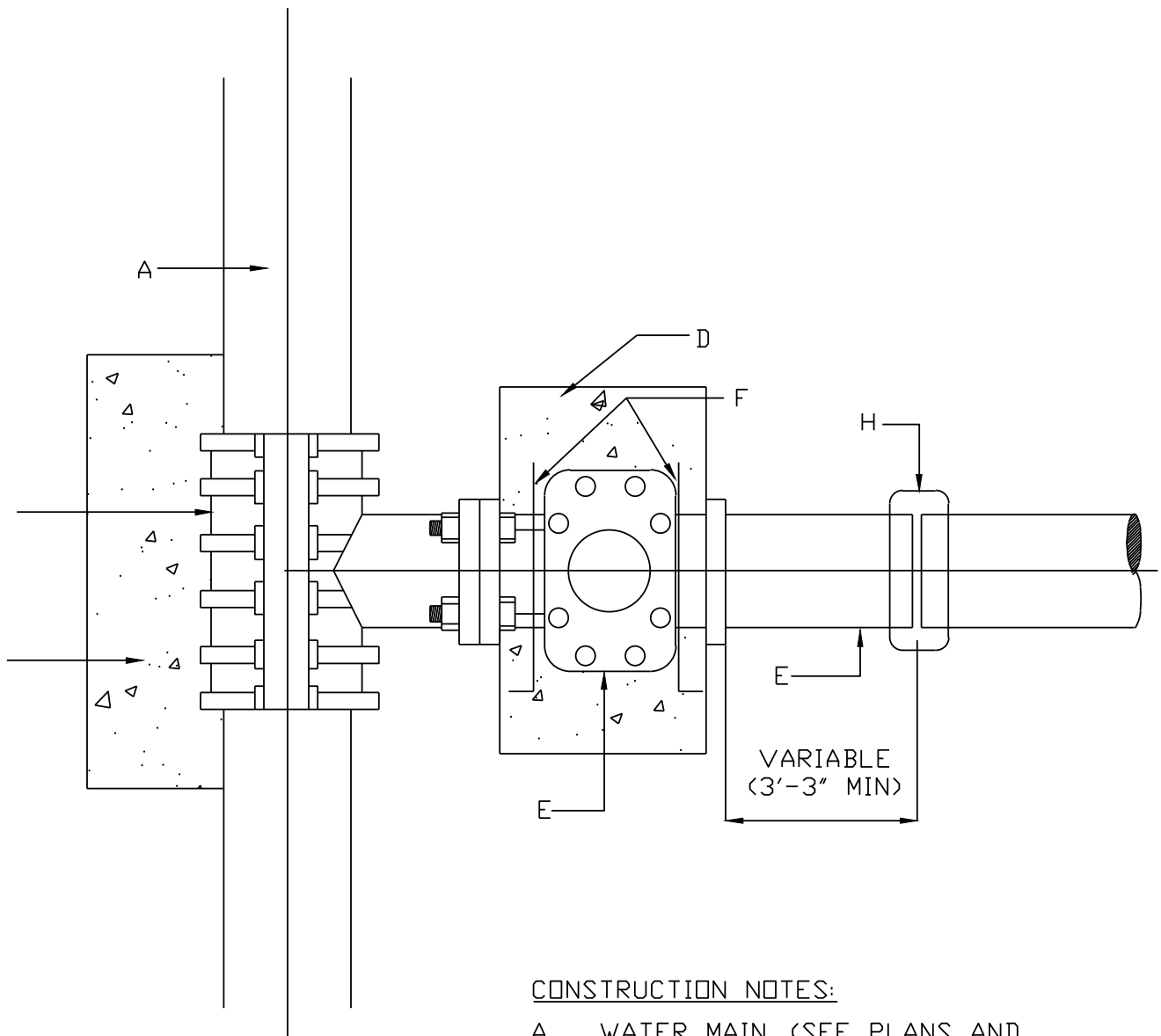
1. CAST IRON BOOT TO BE USED IN HEAVY TRAFFIC AREAS
CONCRETE BLOCK (POURED IN PLACE)



CITY OF SAN JUAN
STANDARDS MANUAL
GATE VALVE AND BOX



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GENERAL NOTES:

1. ALL CONCRETE TO HAVE A MINIMUM OF 28 DAYS COMPRESSIVE STRENGTH OF 3,000 P.S.I.

CONSTRUCTION NOTES:

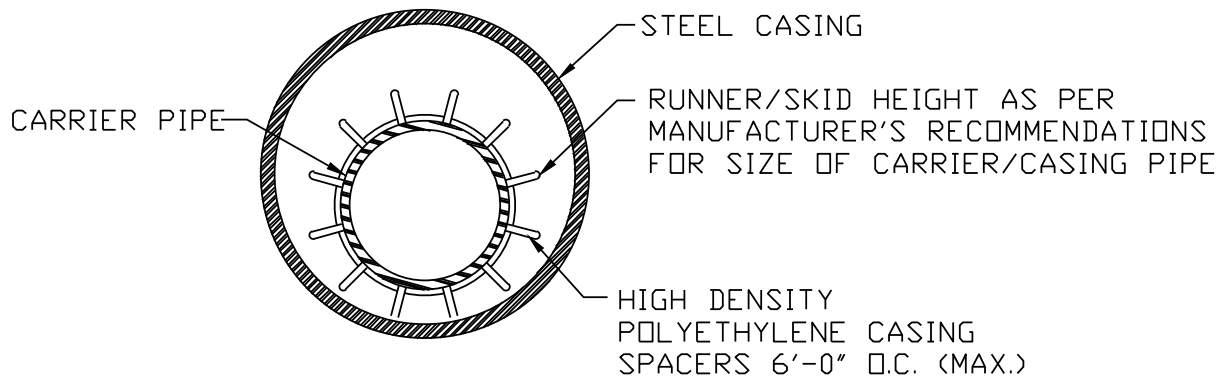
- A. WATER MAIN. (SEE PLANS AND SPECIFICATION)
- B. TAPPING SLEEVE (SIZE AS REQUIRED).
- C. CONCRETE SUPPORT UNDER TAPPING SLEEVE AND BEHIND.
- D. THRUST BLOCK AS PER SPECIFICATIONS.
- E. FLANGED AND HUB ENDS "O" RING SEALS WITH 2" SQUARE WRENCH NUT GATE VALVE.
- F. ANCHOR RODS.
- G. PVC PIPE.
- H. SIMPLEX COUPLING.
- I. STAINLESS STEEL WATER TAPPING SLEEVE WITH BOLTED NUT.



CITY OF SAN JUAN
STANDARDS MANUAL
WATER TAPPING SLEEVE
AND VALVE INSTALLATION



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BORING INSTALLATION		
CARRIER PIPE SIZE	PIPE CASING SIZE	MIN. WALL THICKNESS
6"	14"	0.3125"
8"	16"	0.3125"
10"	18"	0.3125"
12"	21"	0.3750"
14", 15"	24"	0.4375"
16"	26"	0.4375"
18"	30"	0.5000"
24"	36"	0.5625"
36"	48"	0.6250"

GENERAL NOTES:

1. ALL STEEL CASING SHALL BE WELDED.
2. STEEL CASING SHALL BE CLOSED AT EACH END USING USING SYNTHETIC RUBBER END SEALS.
3. CASING SPACERS SHALL BE USED TO INSTALL THE CARRIER PIPE INSIDE THE ENCASEMENT PIPE. CASING SPACERS SHALL FASTEN TIGHTLY ON THE CARRIER PIPE TO PREVENT RELATIVE MOVEMENT ON PIPE DURING INSTALLATION. CASING SPACERS SHALL BE DOUBLED ON EACH END OF THE ENCASEMENT.
4. PROJECTION TYPE CASING SPACERS SHALL BE CONSTRUCTED SECTIONS OF HIGH DENSITY POLYETHYLENE.
5. INSTALLATION AND SIZE OF SPACERS SHALL BE PER CITY OF SAN JUAN SPECIFICATIONS.



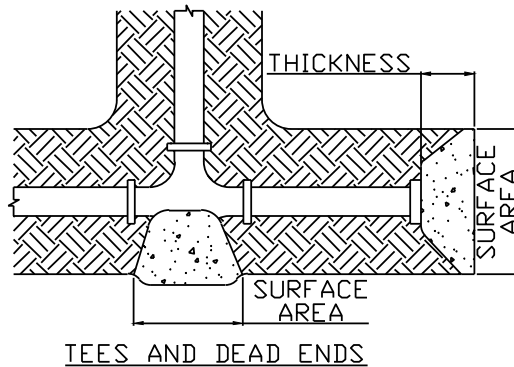
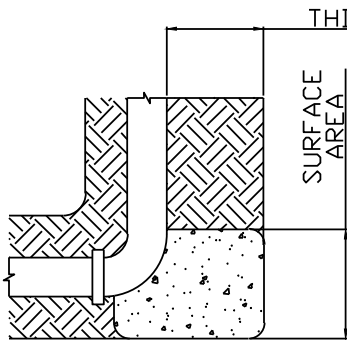
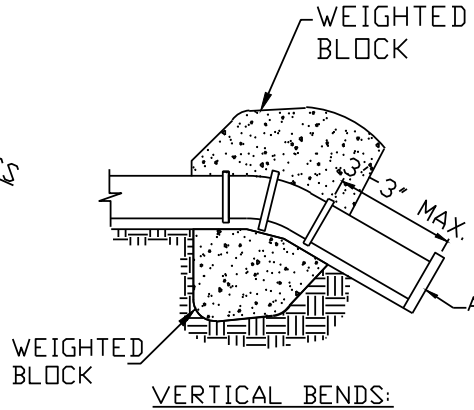
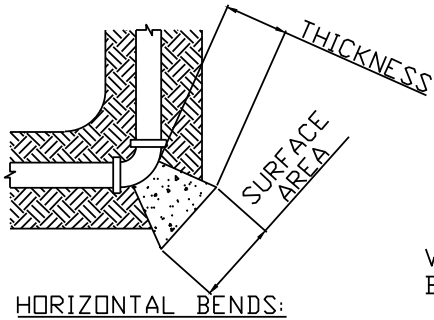
CITY OF SAN JUAN
STANDARDS MANUAL
UTILITY PIPE ENCASEMENT



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CONSTRUCTION NOTES

- A. SIMPLEX COUPLING
- B. ANCHOR ROD



GENERAL NOTES:

1. SEE THRUST BLOCK SIZE CHART FOR PROPER THICKNESS AND SURFACE AREAS.
2. THE LOCATION OF THRUST BLOCKS DEPENDS UPON THE DIRECTION OF THRUST AND TYPE FITTINGS

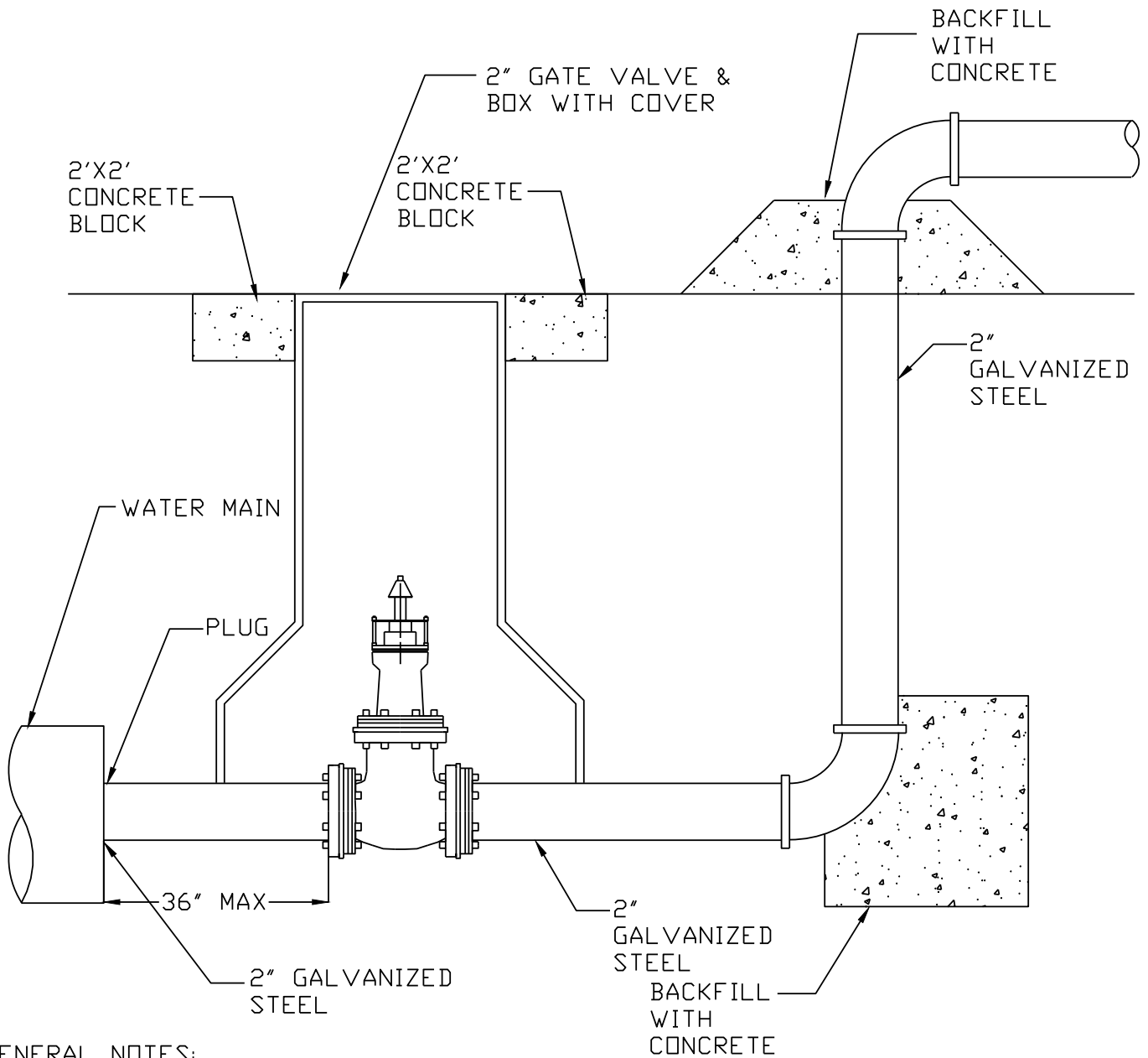
THRUST BLOCK SIZE			
DIAMETER OF PIPE INCHES	HORIZONTAL BEND		WEIGHT AT VERTICAL BENDS-LBS.
	SURFACE AREA SQ. FEET	THICKNESS INCHES	
22-1/2' BENDS			
6 OR LESS	2	8	1700
8	3	8	3,000
10	3.5	12	4,500
12	4	14	6,600
14	5	18	9,000
16	6	18	11,800
45' BENDS			
6 OR LESS	4	12	3,200
8	5	14	5,800
10	6	18	9,000
12	7	18	13,000
14	8	24	17,000
16	11.5	24	23,200
90° BENDS			
6 OR LESS	6	12	6,000
8	8	15	10,700
10	10	18	16,700
12	12	18	24,000
14	18	24	32,600
16	21	24	42,700
TEES & DEAD ENDS			
6 OR LESS	3	12	
8	4	15	
10	6	18	
12	8.5	18	
14	11.5	24	
16	15	24	

* ALL VALUES SHOWN ARE MIN. FOR A HYDROSTATIC PRESSURE OF 150 PSI AND A SOIL RESISTANCE OF 2,000 LBS PER SQ. FT. WITH PIPELINE HAVING A MIN. OF 3 FT. OF COVER WITH CURB AND GUTTER AND A 5 FT. MIN. WITHOUT CURB AND GUTTER



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE THRUST BLOCKS





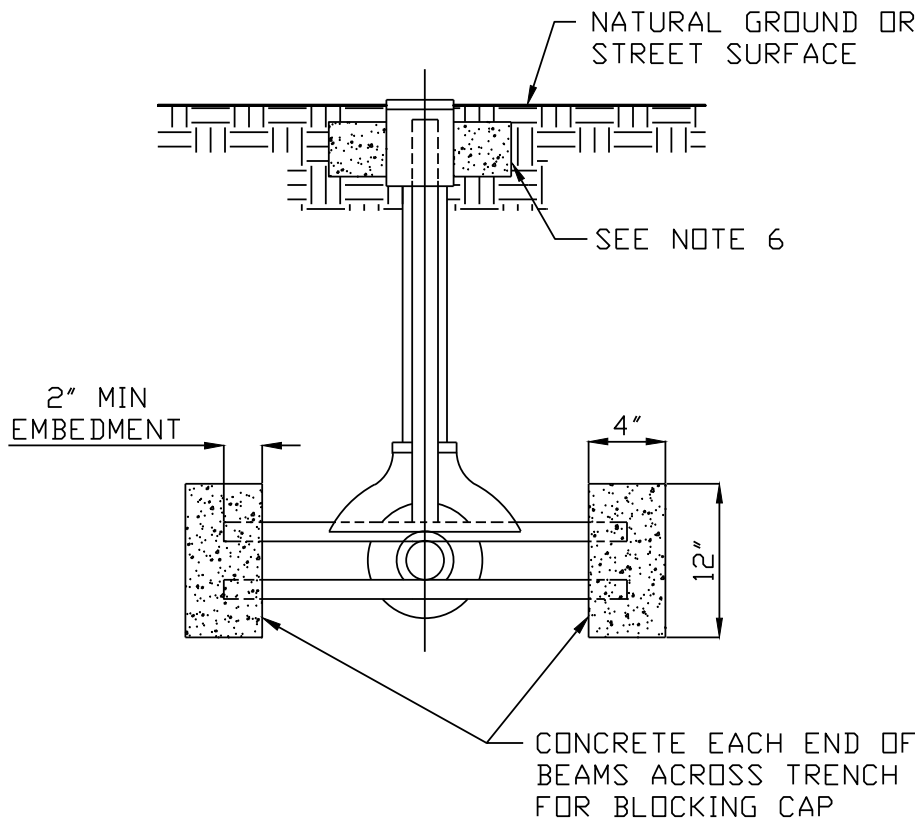
GENERAL NOTES:

1. RESTRAINT CALCULATIONS MUST BE SUBMITTED TO THE CITY OF SAN JUAN



**CITY OF SAN JUAN
STANDARDS MANUAL
2-IN BLOW OFF VALVE**





NOTES:

1. ALL DEAD-ENDS ON NEW WATER LINES SHALL BE EQUIPPED WITH A SUITABLE BLOW-OFF FACILITY, OR AS DIRECTED BY THE CITY OF SAN JUAN.
2. EMBED ALL C.I. FITTINGS IN SAND.
3. BEAM SCHEDULE SHALL BE USED FOR END CAPS AND PLUGS, OMITTING BLOW-OFF FITTINGS.
4. BEAMS SHALL EXTEND BEYOND TRENCH WALLS.
5. ALL CONCRETE TO HAVE A MIN. 28 DAYS COMPRESSIVE STRENGTH 3,000 P.S.I.
6. MIN. OF 9 SY. COMPACTION AROUND INSTALLATION.

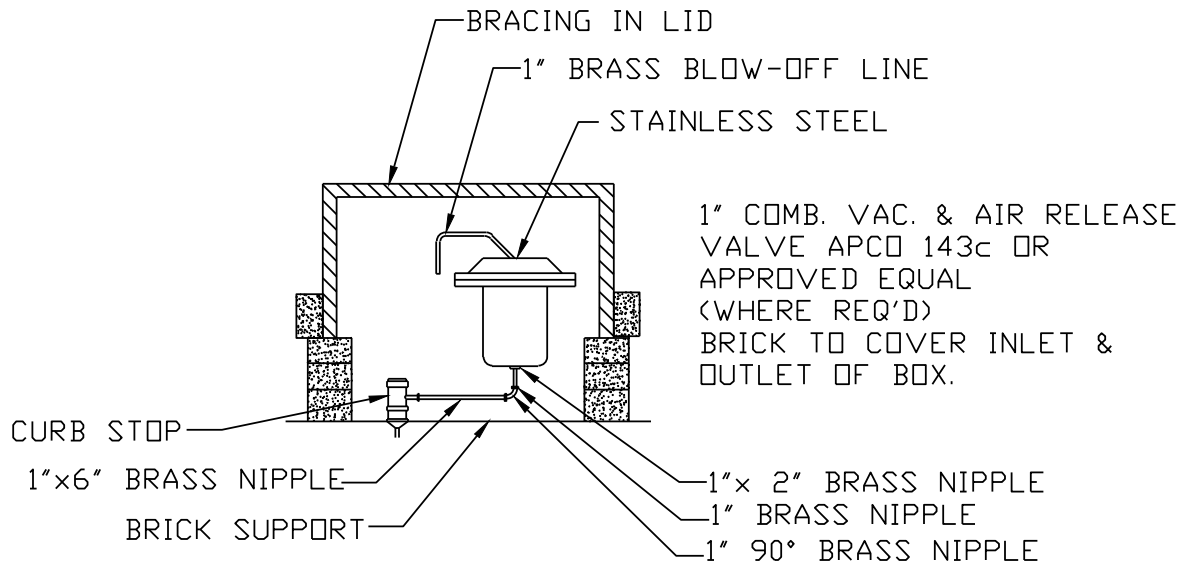
BEAM SCHEDULE			
SIZE MAIN	SIZE AND TYPE BEAM		No. OF BEAMS
2"	2"	STEEL PIPE	2
8"	3"	STEEL PIPE	2
12"	5"	I 10.0#	2
16"	6"	I 17.25#	2
20"	8"	I 18.4#	2
24"	10"	I 25.4#	2
30"	12"	I 35.0#	2
36"	15"	I 50.0#	2



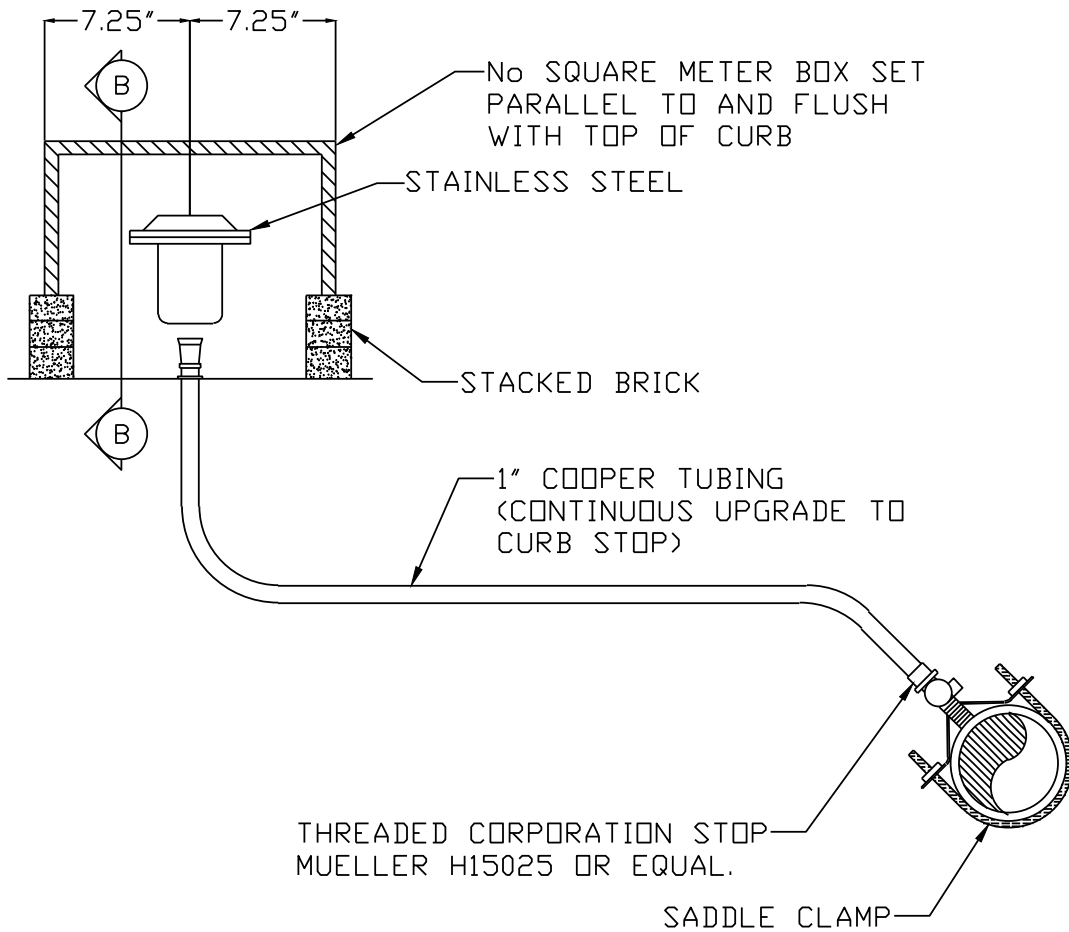
**CITY OF SAN JUAN
STANDARDS MANUAL
BLOW OFF VALVE INSTALLATION**



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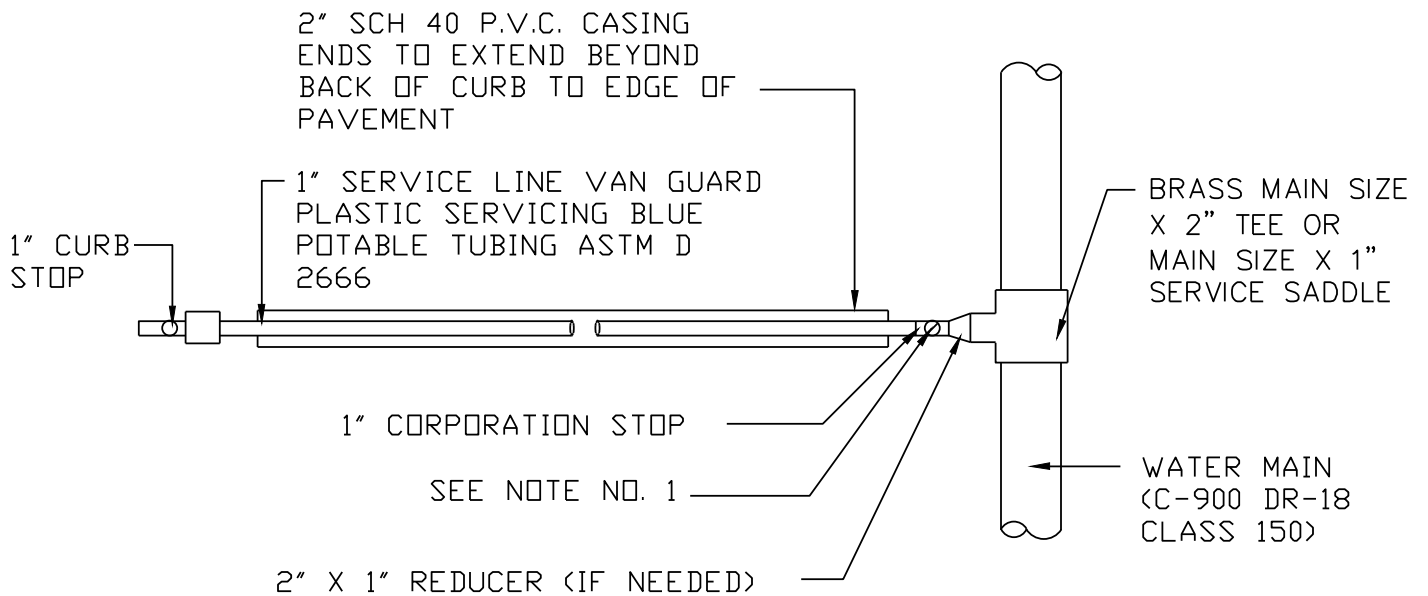
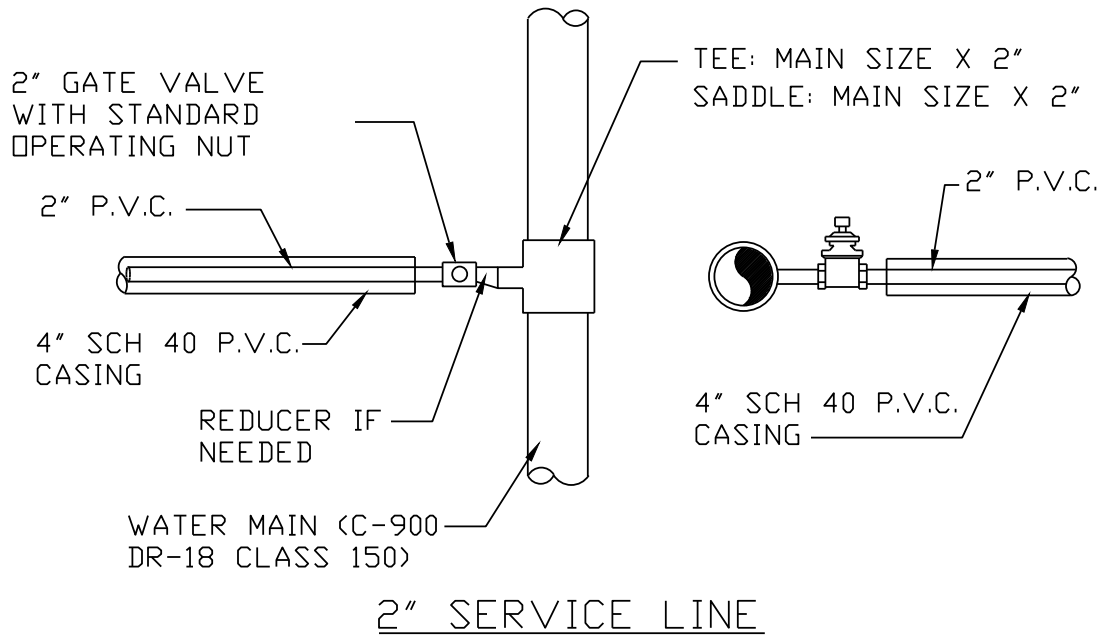


SECTION B-B



NOTES:

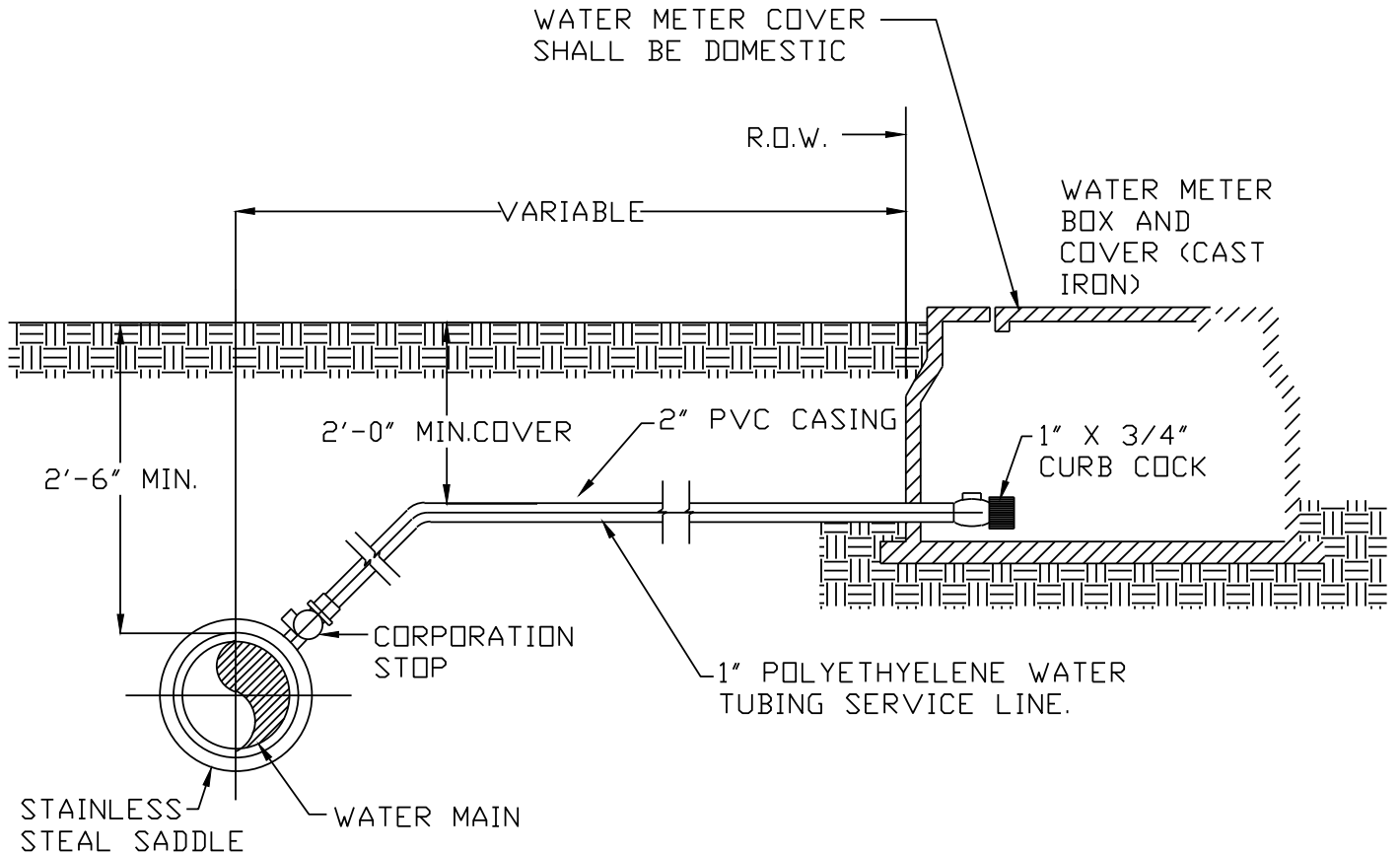
1. ON ALL SERVICE LINES GREATER THAN 1" (2" P.V.C. SCHEDULE 40), A 2" VALVE WILL BE REQUIRED.
2. ONE SERVICE PER EACH LOT.
3. 1" X 3/4" REQUIRED FOR A SINGLE STRAP
4. 2" X 1" REQUIRED FOR DOUBLE STRAP



CITY OF SAN JUAN
STANDARDS MANUAL
WATER SERVICE TYPICAL
SERVICE CONNECTION



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NOTES:

1. ALL SERVICE CONNECTIONS NEED TO HAVE A MIN. 2'-0" COVER FROM FINISHED GRADE.
2. WATER METER COVER SHALL BE ALAMO IRON WORKS 813-05-2.
3. ALL WATER MAINS HAVE 4 FT OF COVER FROM FINISHED GRADE.
4. METER BOX SHALL BE CAST IRON.
5. ALL CONCRETE TO HAVE A MIN. 28 DAYS COMPRESSIVE STRENGTH OF 3,000 P.S.I.
6. 2" GATE VALVE ONLY REQUIRED FOR 2" SERVICE.
7. POLYETHYLENE TUBING ACCEPTABLE FOR LINE SIZES 2" OR LESS.

CONSTRUCTION NOTES:

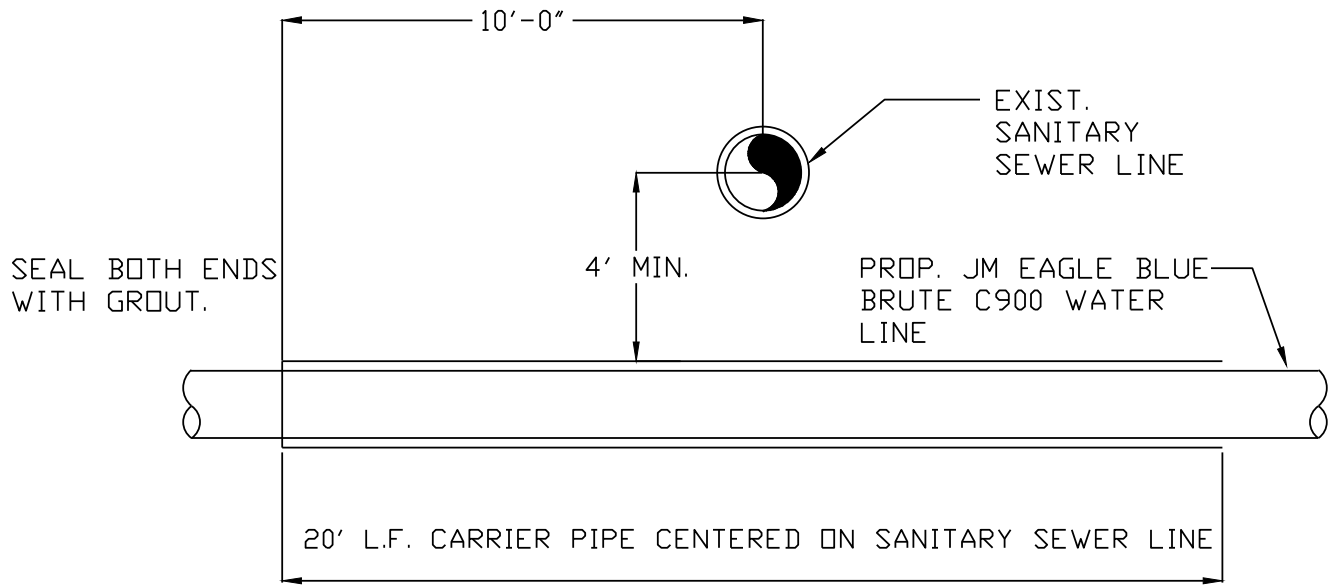
- A. WATER VALVE COVER
- B. CURB COCK
- C. METER BOX & METER PROVIDED
- D. WATER TUBING SERVICE LINE
- E. CORPORATION STOP
- F. WATER MAIN



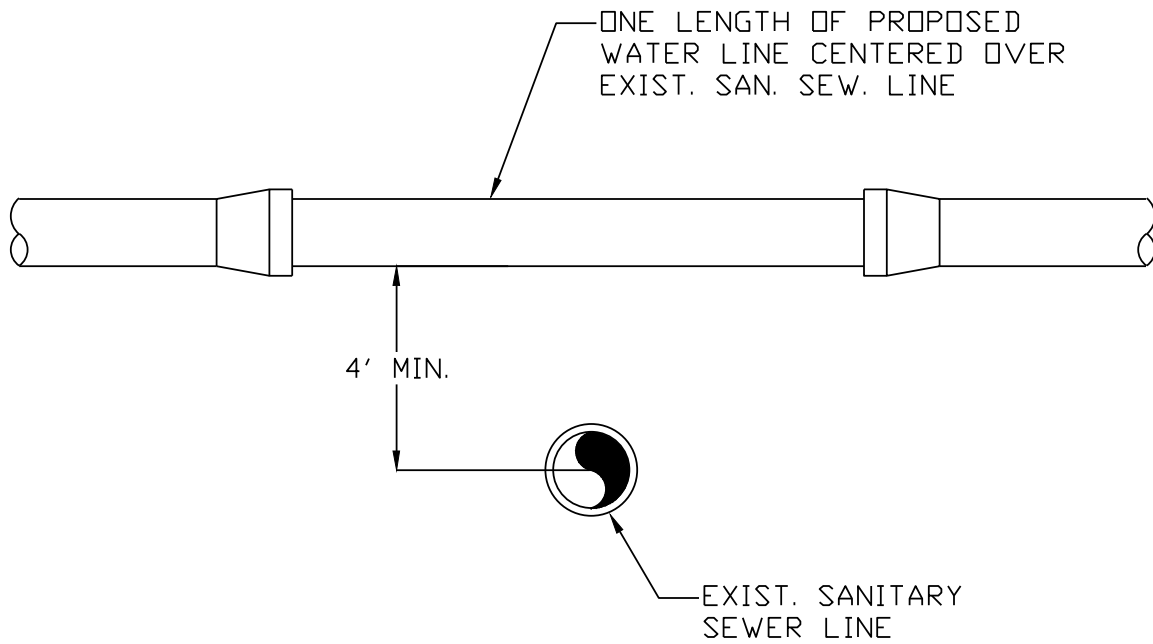
**CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL SERVICE CONNECTION
WITH METER BOX**



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WATER LINE CROSSING
UNDER EXIST. S.S. LINE

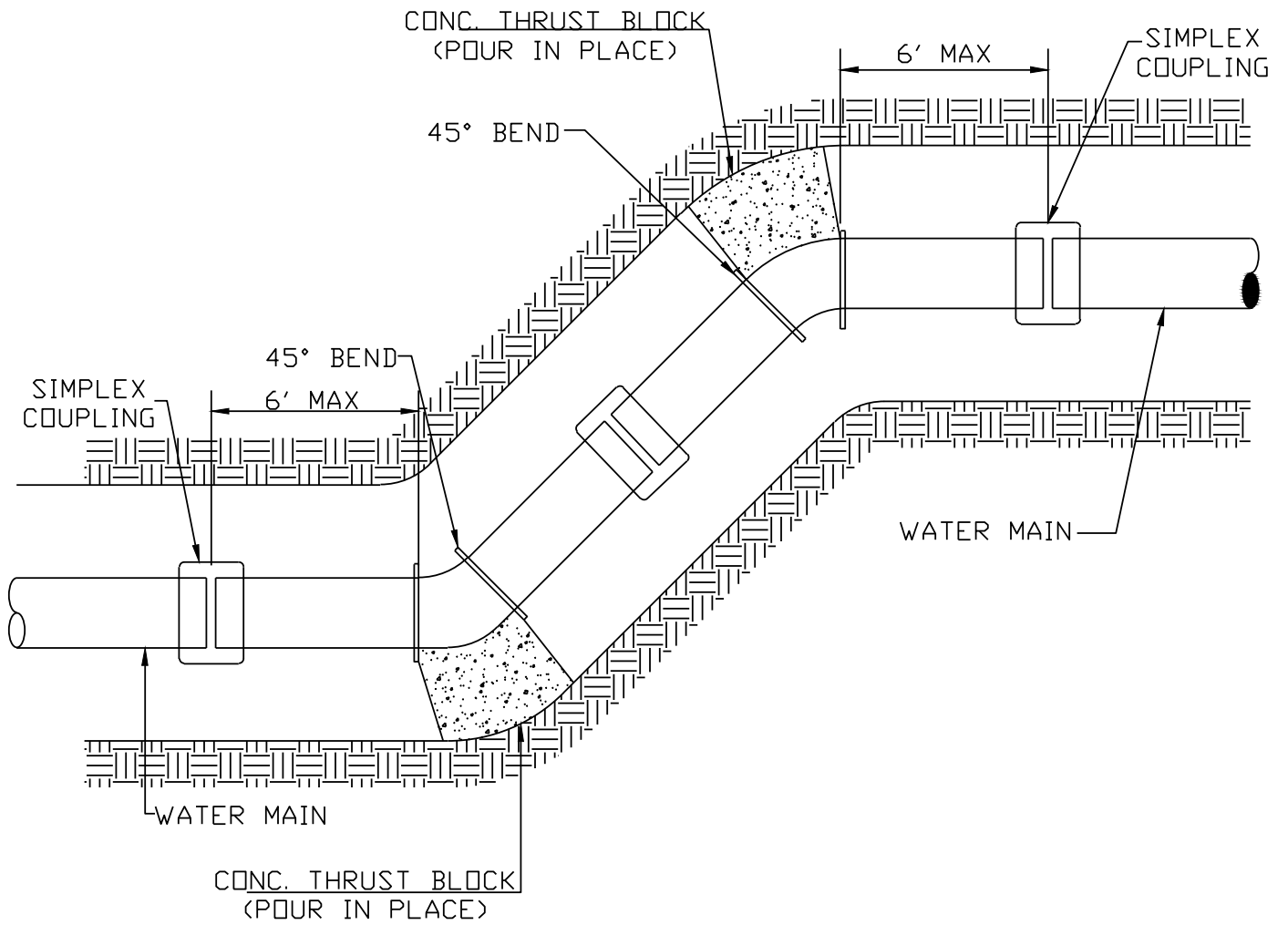


WATER LINE CROSSING
OVER EXIST. S.S. LINE



CITY OF SAN JUAN
STANDARDS MANUAL
WATERLINE CROSSING

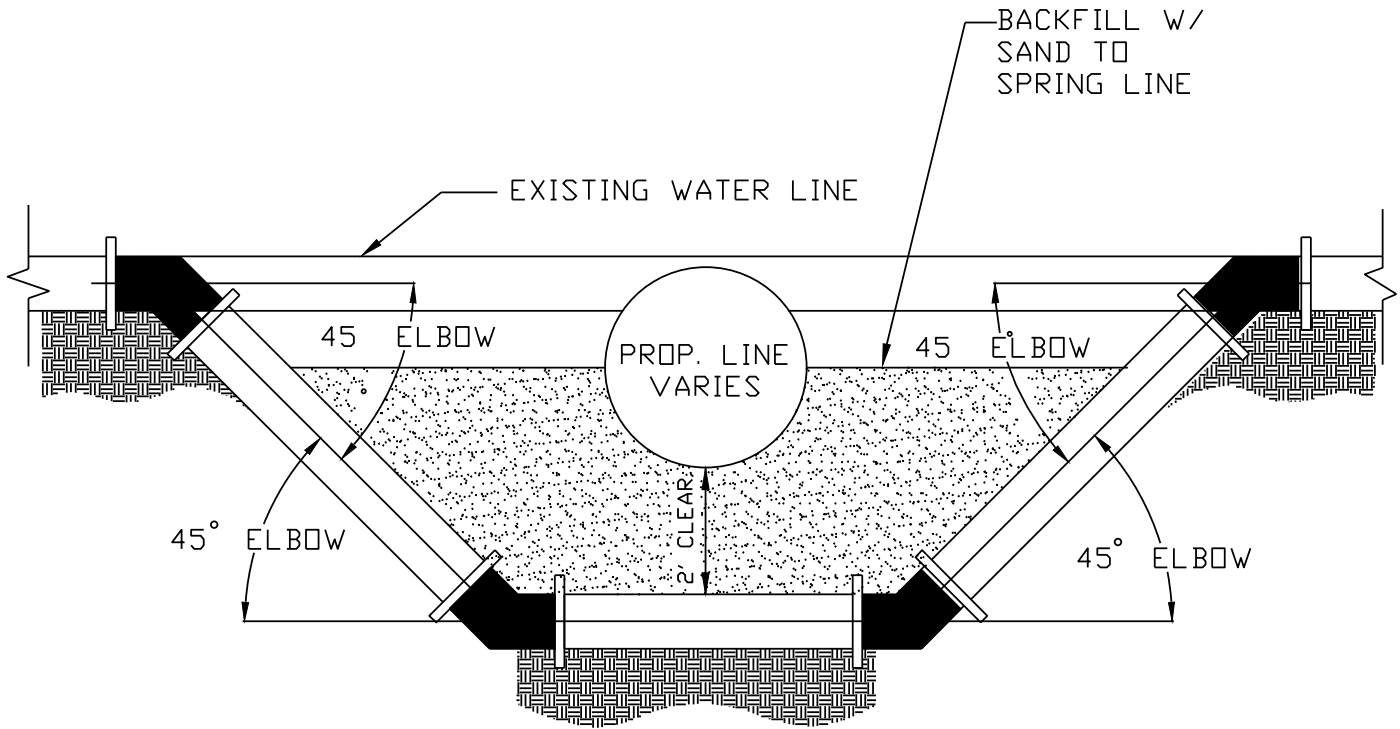




CITY OF SAN JUAN
 STANDARDS MANUAL
 WATERLINE OFFSET DETAIL

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WATER LINE ADJUSTMENT PVC

NOTE:

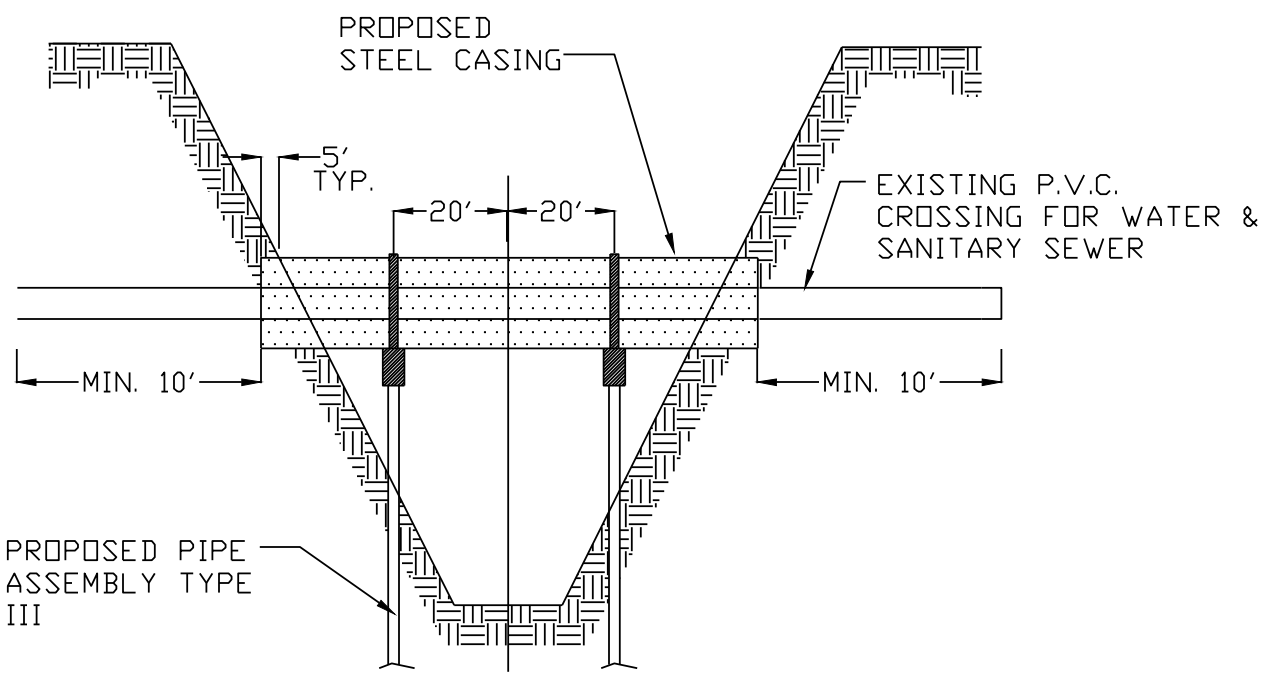
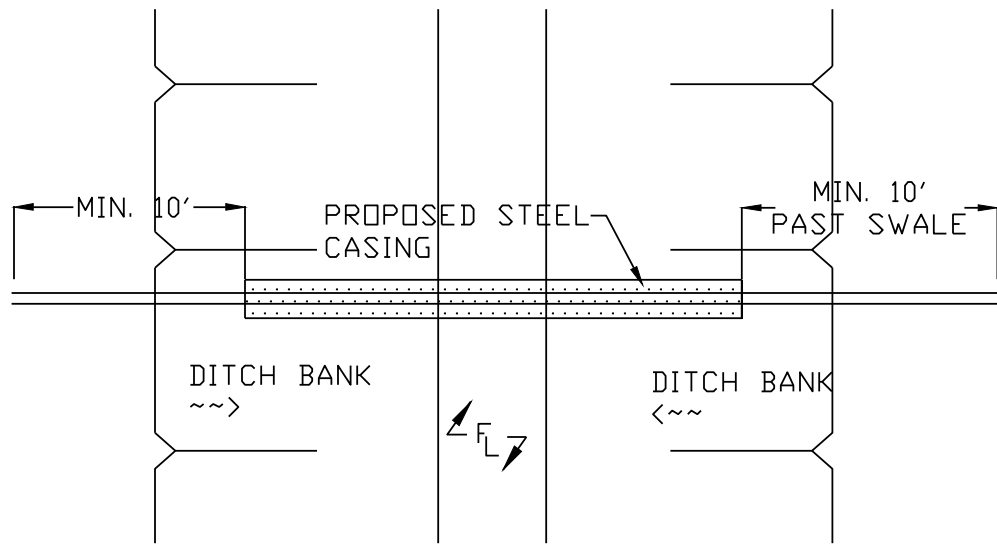
1. ALL BENDS AND JOINTS MUST BE SUPPORTED BY A MEGALUG RESTRAINT A CONC. THRUST BLOCK, APPROVED EQUAL, OR AS DIRECTED BY THE CITY OF SAN JUAN.
2. ALL BENDS AND JOINTS MUST BE M.J. W/STAINLESS STEEL BOLTS
3. WATER AND SANITARY SEWER CROSSINGS MUST MEET TCEQ STANDARDS.



CITY OF SAN JUAN
STANDARDS MANUAL
WATERLINE ADJUSTMENT



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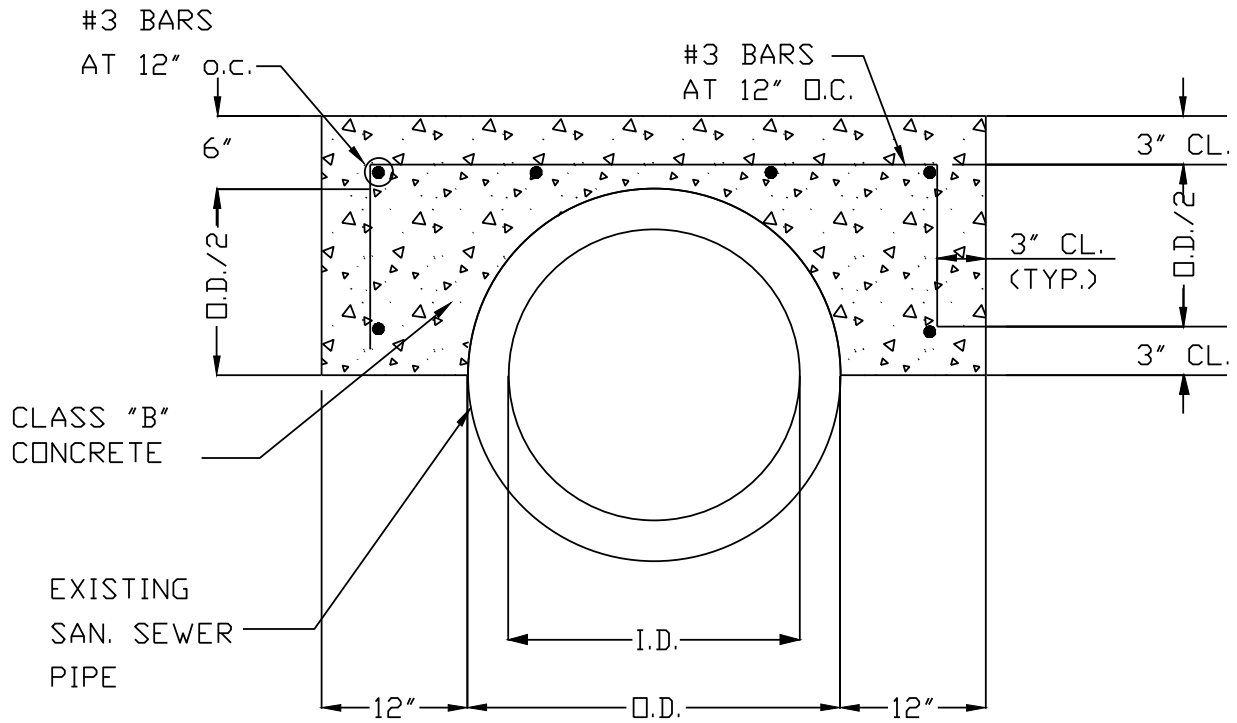
NOTE:
 FOUNDATION DESIGN TO BE SUBMITTED BY ENGINEER AND APPROVED BY THE CITY OF SAN JUAN.



**CITY OF SAN JUAN
 STANDARDS MANUAL
 WATERLINE DRAINAGE DITCH CROSSING**



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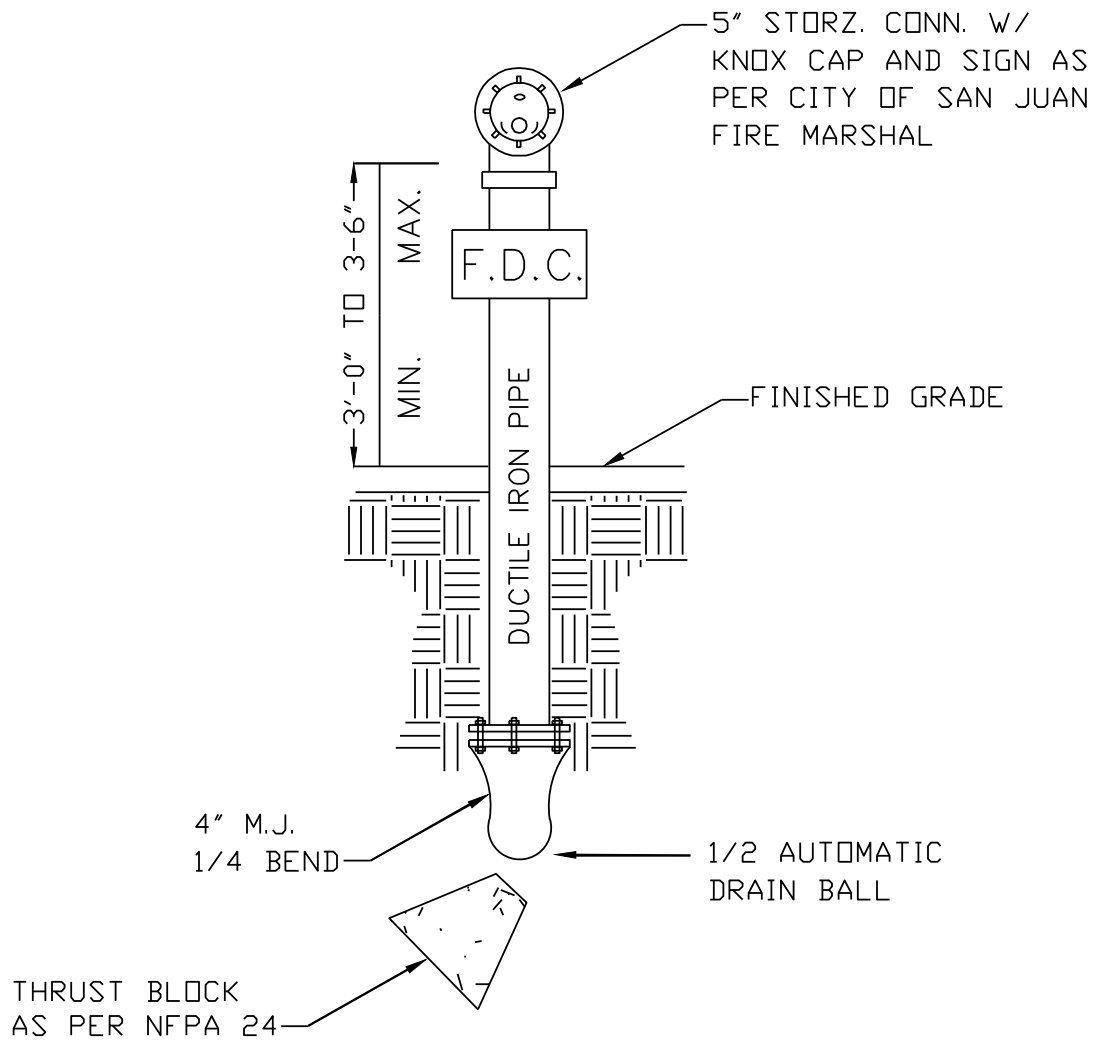


NOTE: CRADLE SHALL EXTEND A MINIMUM OF 24" ALONG PROPOSED PIPE.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL CONCRETE CRADLE





NOTE:

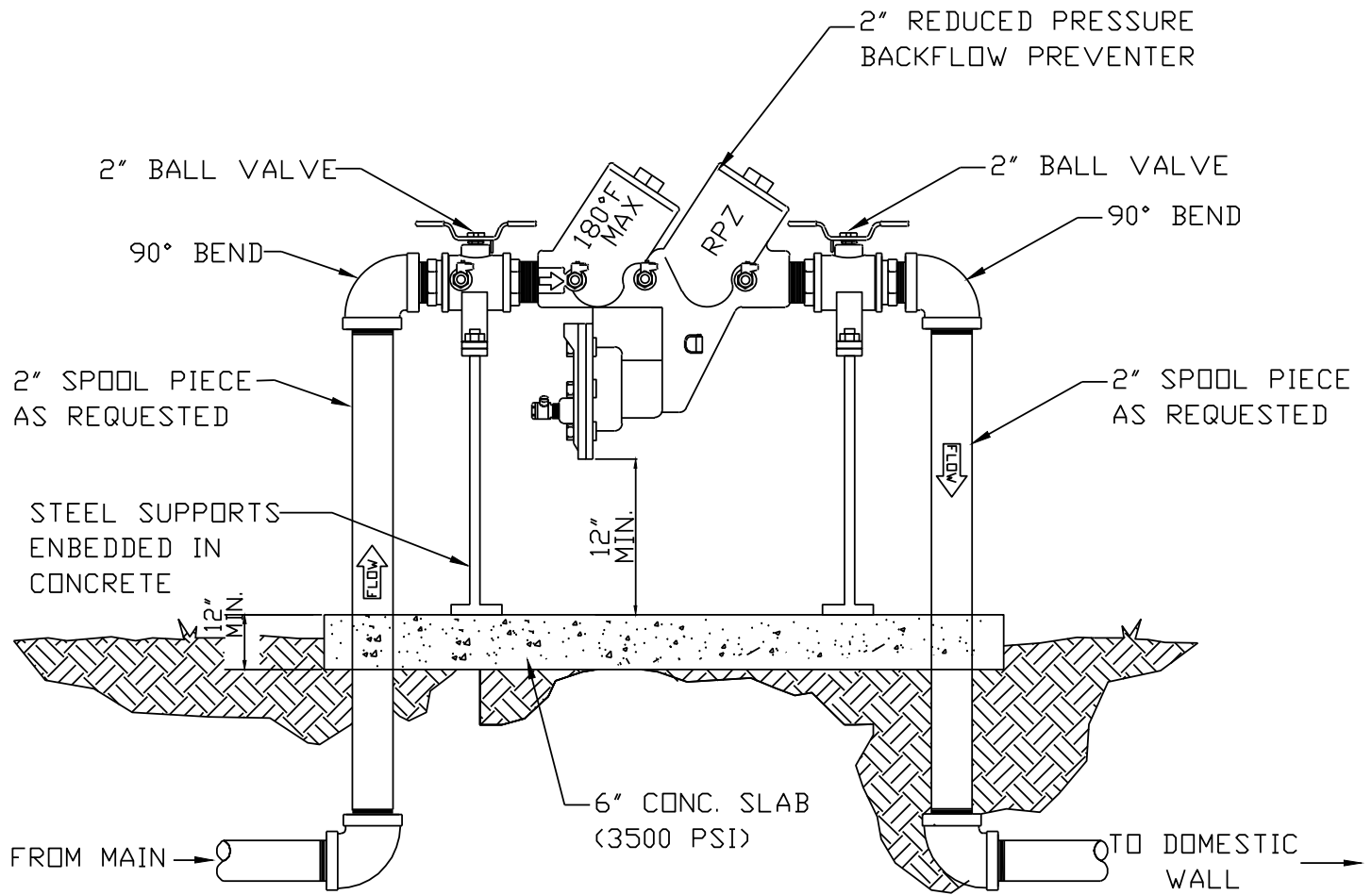
1. FIRE DEPARTMENT CONNECTION AND SIGN AS PER CITY OF SAN JUAN FIRE MARSHAL.
2. COMMERCIAL LOTS WILL REQUIRE A 4" DUCTILE IRON PIPE. RESIDENTIAL LOTS WILL REQUIRE A 2 1/2" DUCTILE IRON PIPE.



CITY OF SAN JUAN
STANDARDS MANUAL
FREE STANDING F.D.C



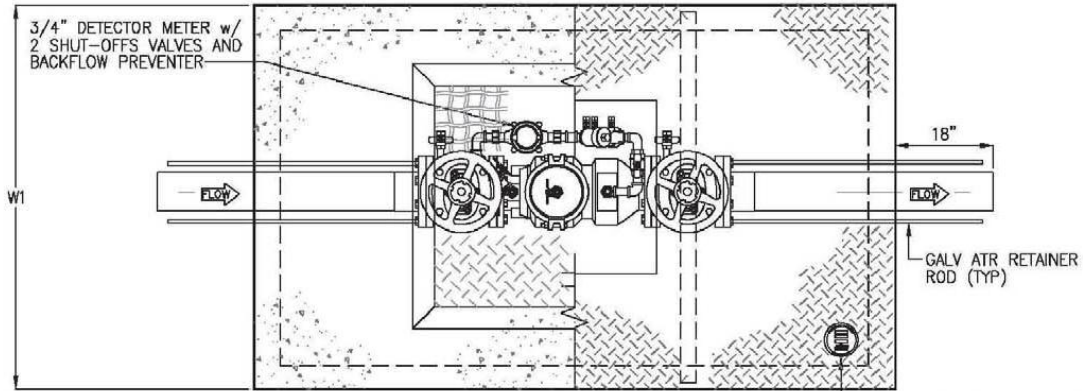
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CITY OF SAN JUAN
STANDARDS MANUAL
REDUCED PRESSURE
BACKFLOW PREVENTER



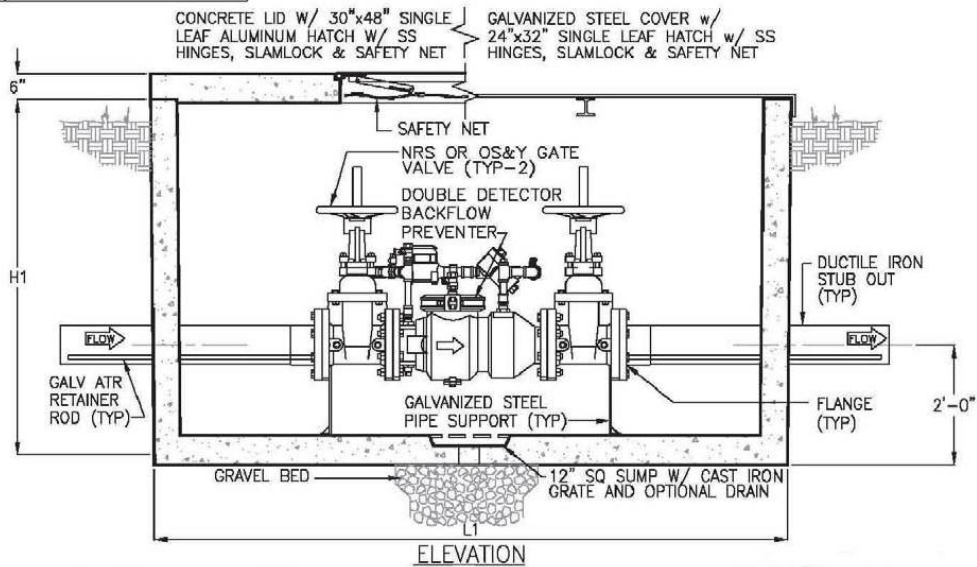
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MODEL	SIZE	L1	W1	H1	WEIGHT LBS
DDBP-03	3"	6'-0"	3'-6"	4'-0"	3,500
DDBP-04	4"	6'-0"	3'-6"	4'-0"	3,500
DDBP-06	6"	7'-10"	4'-4"	5'-6"	9,000
DDBP-08	8"	8'-8"	5'-0"	5'-6"	15,000
DDBP-10	10"	9'-0"	6'-0"	7'-0"	18,000
DDBP-12	12"	9'-0"	6'-0"	7'-0"	18,000

PLAN VIEW

NAMEPLATE INDICATING:
MFG: ParkUSA
888-611-PARK
WWW.PARKUSA.COM
MODEL: DDBP-AL-SL
DATE MANUFACTURED



ELEVATION

SPECIFICATIONS

CONCRETE: CLASS 1/II CONCRETE WITH DESIGN STRENGTH OF 3500-4500 PSI AT 28 DAYS. UNIT IS OF MONOLITHIC CONSTRUCTION AT FLOOR AND FIRST STAGE OF WALL WITH SECTIONAL RISER TO REQUIRED DEPTH.

REINFORCEMENT: GRADE 60 REINFORCED. STEEL REBAR CONFORMING TO ASTM A615 ON REQUIRED CENTERS OR EQUAL.

ACCESS COVER: 1/4" STEEL SKID-RESISTANT FLOOR PLATE WELDED TO 3" ANGLE FROM WITH (2) 3"x2-3/8" I-BEAM SUPPORTS. HATCH TO BE FURNISHED WITH 316 STAINLESS STEEL BOLTS AND HINGES

HATCHWAY: 1/4" ALUMINUM DIAMOND PLATE COVER WITH EXTRUDED ALUMINUM FRAME. HATCH TO BE FURNISHED WITH 316 STAINLESS STEEL SLAM LOCK & HINGES

ENGINEERING DATA

THE BACKFLOW ASSEMBLY SHALL BE FACTORY ASSEMBLED IN VAULT & HYDROSTATICALLY TESTED PRIOR TO DELIVERY. FIELD EXCAVATION & PREPARATION SHALL BE COMPLETE PRIOR TO DELIVERY. PIPE, VALVES AND FITTINGS OF THE ASSEMBLY SHALL BE APPROVED BY THE CITY OF SAN JUAN

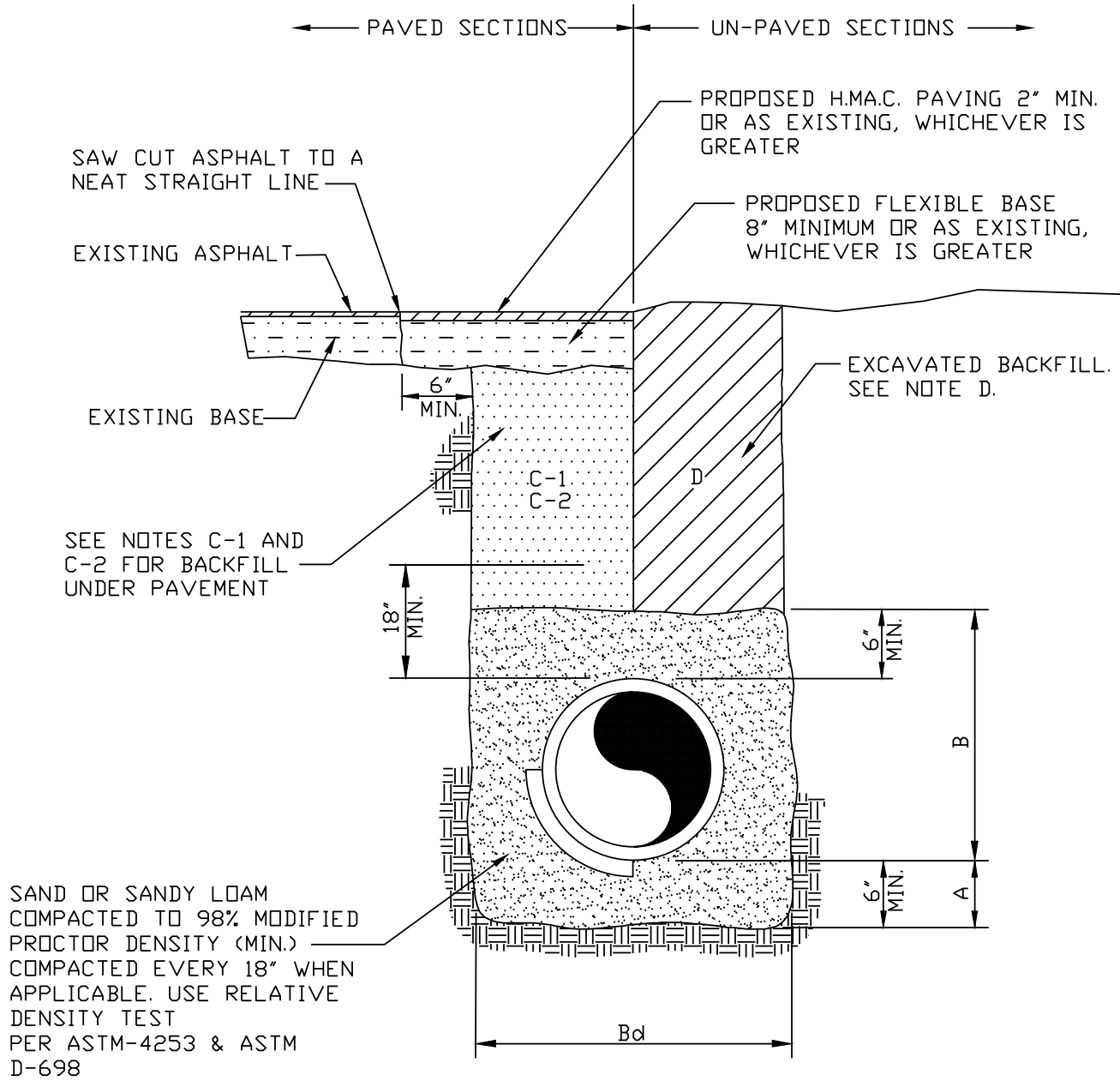


**CITY OF SAN JUAN
STANDARDS MANUAL
DOUBLE DETECTOR
BACKFLOW PREVENTOR**



APPENDIX 4

DRAINAGE & EROSION CONTROL DETAILS



CITY OF SAN JUAN
 STANDARDS MANUAL
 STORM SEWER TRENCH
 BEDDING



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NOTES:

- A. SAND BEDDING PLACED, HAND LEVELED, AND COMPACTED BEFORE PIPE IS LAID, UP TO BOTTOM OF PIPE (MIN. THICKNESS = 6").
- B. SAND BACKFILL PLACED AND COMPACTED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO 6" ABOVE THE TOP OF PIPE. WORK IN UNDER PIPE HAUNCHES AND COMPACT BY HAND TO SPRING LINE. USE VIBRATORY-TYPE COMPACTORS FOR LIFTS ABOVE THE SPRING LINE. MAXIMUM 6" LIFTS.
- Bd. MINIMUM TRENCH WIDTH: PIPE O.D. + 16" (FOR 16" PIPE AND SMALLER) OR PIPE O.D. X 1.25 + 12" (FOR 18" PIPE AND LARGER)
- C-1. (CITY STREETS, PARKING AREA, AND DRIVEWAYS) SELECT EXCAVATED BACKFILL MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 8" MAX. LIFTS.
- C-2 (STATE MAINTAINED ROADWAY) SAND/CEMENT STABILIZED BACKFILL WITH 7% PORTLAND CEMENT COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- D. EXCAVATED EARTH BACKFILL MECHANICALLY COMPACTED IN 12" MAX. LIFTS.
MINIMUM STANDARD PROCTOR DENSITY: 90% OUTSIDE RIGHT OF WAY; 95% INSIDE RIGHT OF WAY

EMBEDMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D 2321. EMBEDMENT MATERIAL SHALL BE CLASS II OR III WITH < 50% PASSING A No. 200 SIEVE AND PLASTICITY INDEX < 7.

WHERE THIS STANDARD CONFLICTS WITH THE RECOMMENDATION OF ANY GEOTECHNICAL REPORT, OBTAIN WRITTEN CLARIFICATION FROM THE UTILITY ENGINEER PRIOR TO CONSTRUCTION.

FOUNDATION PREPARATION USING COBBLES, GRAVEL, CEMENT STABILIZATION, OR OTHER METHODS AS DIRECTED BY THE ENGINEER SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE.

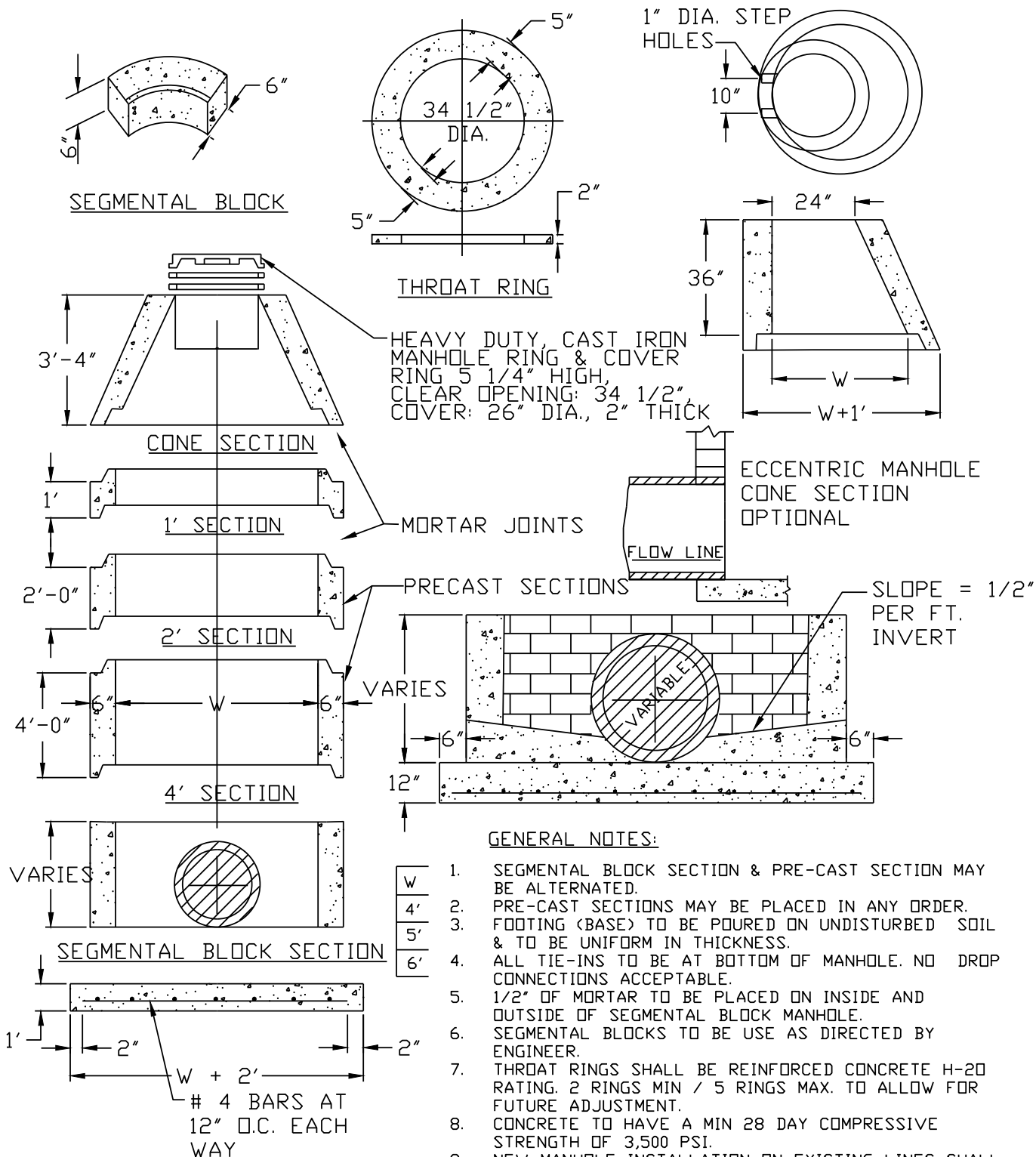
BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, AND COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 6" MAXIMUM LIFTS. STRUCTURE BACKFILL MATERIAL SHALL BE SAND.



CITY OF SAN JUAN
STANDARDS MANUAL
STORM SEWER TRENCH
BEDDING



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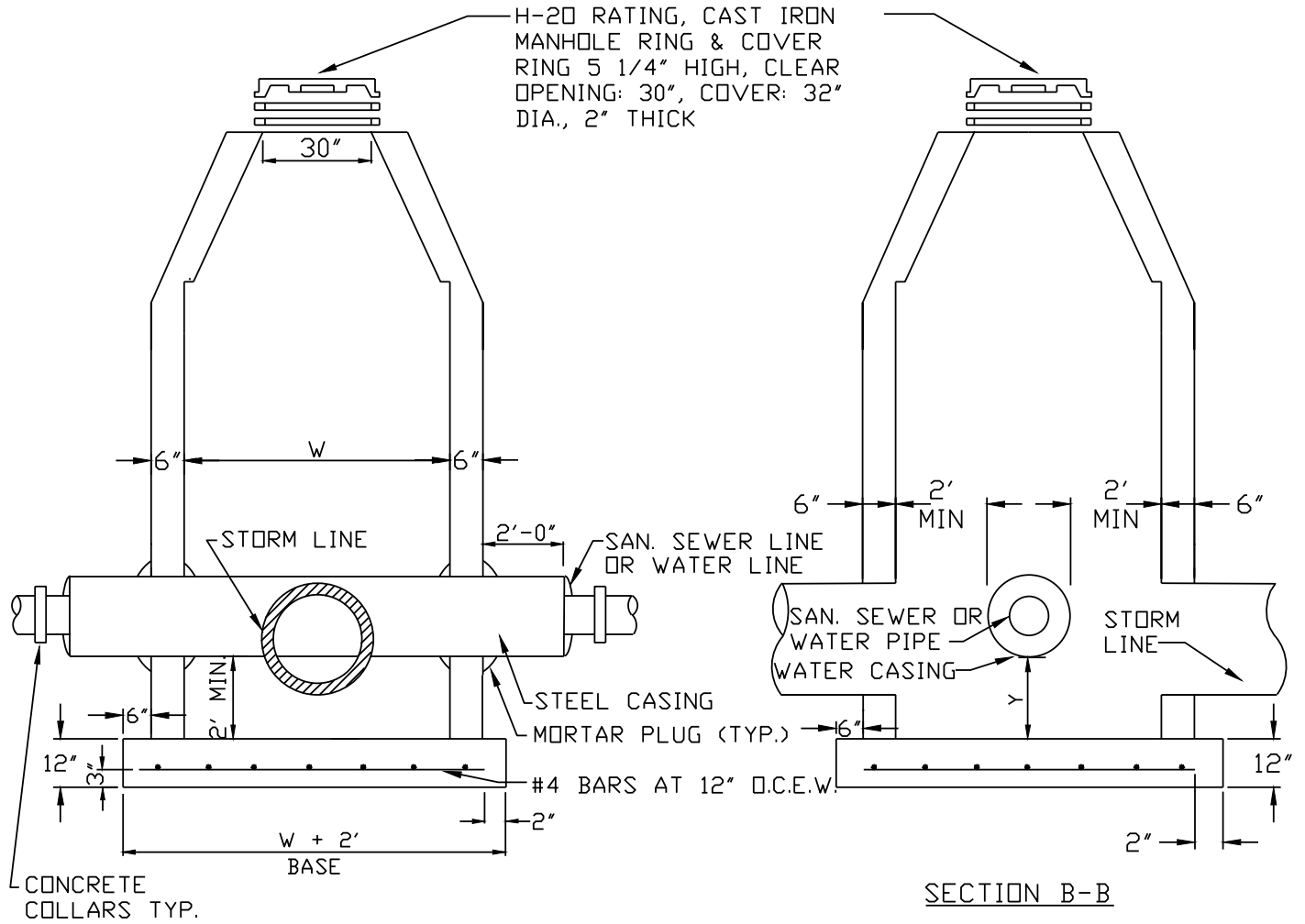


CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL CONCRETE STORM
CONFLICT MANHOLE



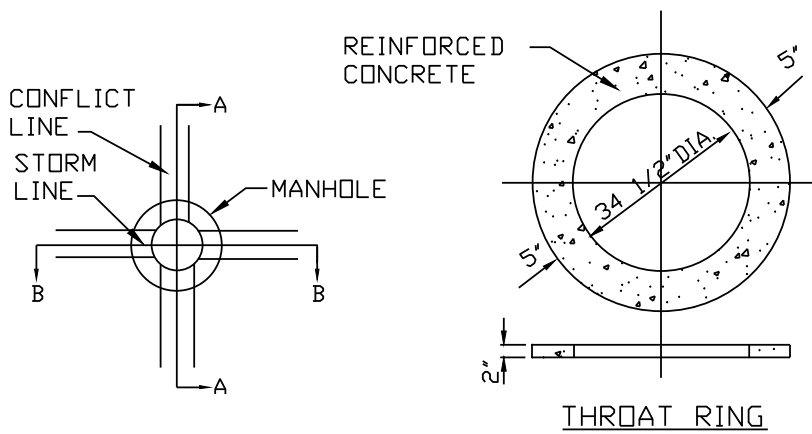
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GENERAL NOTES AS PER TYPICAL CONCRETE STORM MANHOLE DETAIL.



SECTION B-B

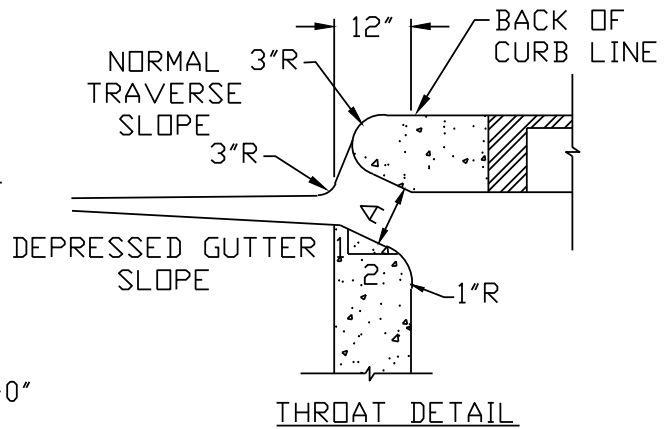
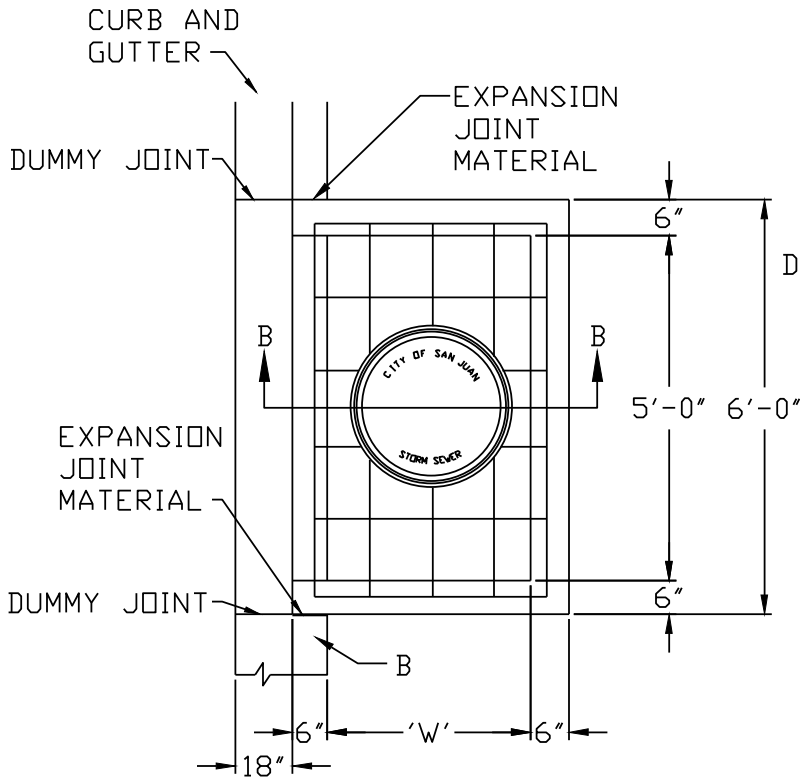
W	STORM PIPE DIAM.	Y
4'	24"	2'
5'	30"	2.5'
6'	36"	3'
	42"	3.5'
	48"	4'



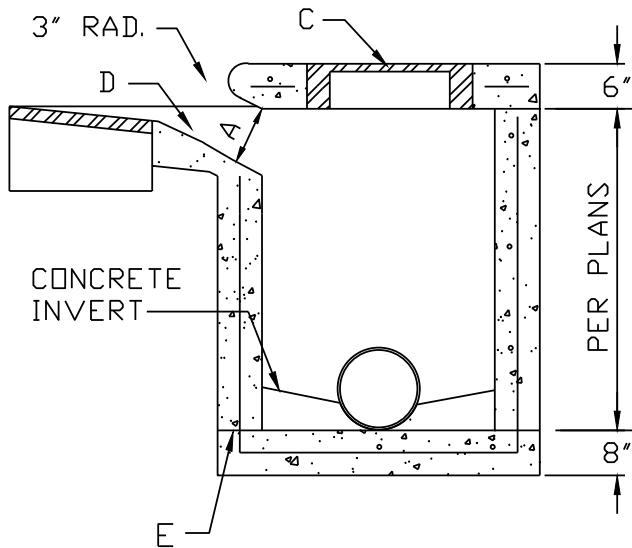
CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE CONFLICT
STORM SEWER MANHOLE



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TOP VIEW
TYPE "A" INLET



INLET TYPE	W	MAX. PIPE SIZE ALLOW (DIA.)
A	3'-0"	24"
A-1	4'-0"	36"
A-2	5'-0"	48"
A-3	6'-0"	60"

GENERAL NOTES:

1. TRANSITION NORMAL GUTTER TO INLET FLOW SLOPE APPROX. 3".
2. INLETS SHALL BE COMPOSED OF PRE-CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
3. 6" GRAVEL BEDDING IS REQUIRED
4. PATCH AND COVER WHERE PIPE IS CONNECTED WHEN INSTALLED.

CONSTRUCTION NOTES:

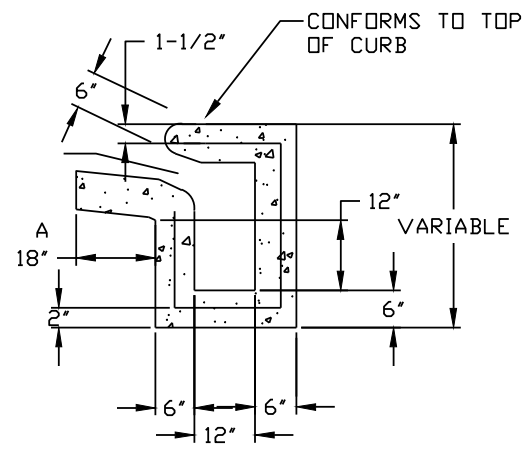
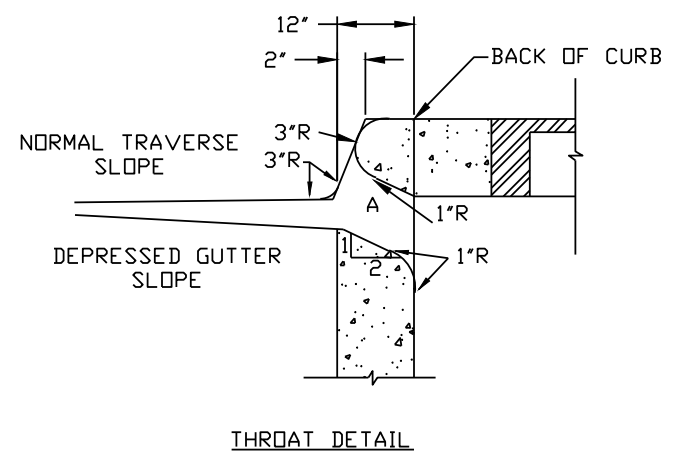
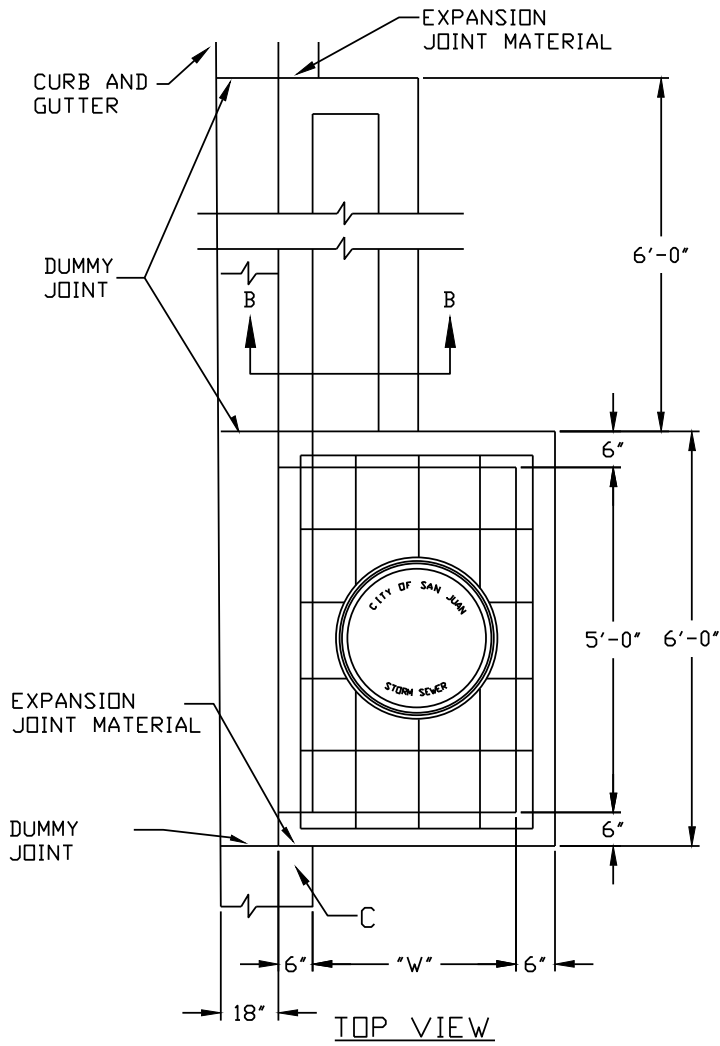
- A. 5" CLEAR OPENINGS.
- B. CURB & GUTTER SECTION.
- C. C.I. MANHOLE RING & COVER SHALL BE DOMESTIC.
- D. DEPRESS 2" BELOW NORMAL GUTTER.
- E. ALL REINFORCING NO. 4 BARS 12" O.C.E.W.



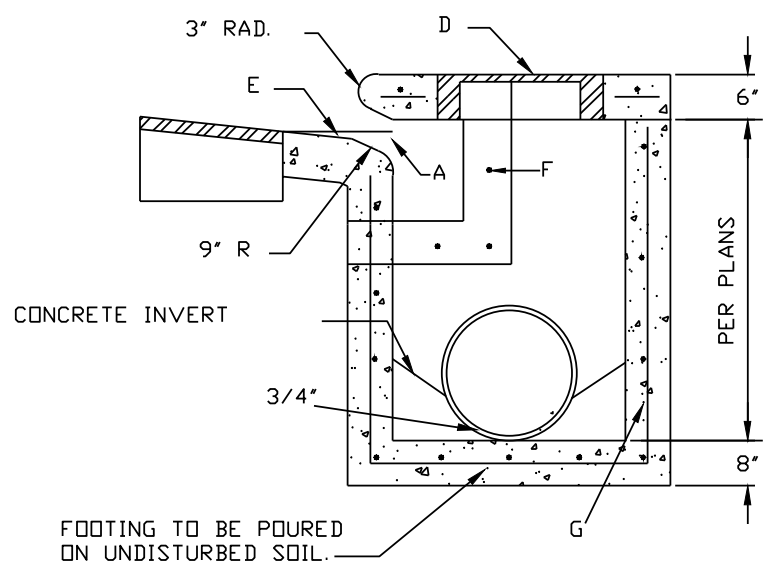
CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "A" INLET



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TYPE "A" INLET WITH INLET EXTENSION



INLET TYPE	W	MAX PIPE SIZE ALLOW (DIA.)
A	3'-0"	24"
A-1	4'-0"	36"
A-2	5'-0"	48"
A-3	6'-0"	60"

NOTE: FOR ON-GRADE INLET, INLET EXTENSION SHALL BE PLACED UPSTREAM.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "A" INLET WITH
EXTENSION



GENERAL NOTES:

1. SLOPE BOTTOM OF INLET EXTENSION 1/2" PER FOOT TOWARD INLET.
2. EXTENSION TO INLET TO BE MADE IN INCREMENTS OF 3'-0" OR 6'-0" ONLY.
3. INLET EXTENSION MUST BE APPROVED BY CITY OF SAN JUAN PRIOR TO CONSTRUCTION.
4. TRANSITION NORMAL GUTTER TO INLET FLOW SLOPE APPROX. 3".
5. INLETS SHALL BE COMPOSED OF PRE-CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
6. 6" GRAVEL BEDDING IS REQUIRED.

CONSTRUCTION NOTES:

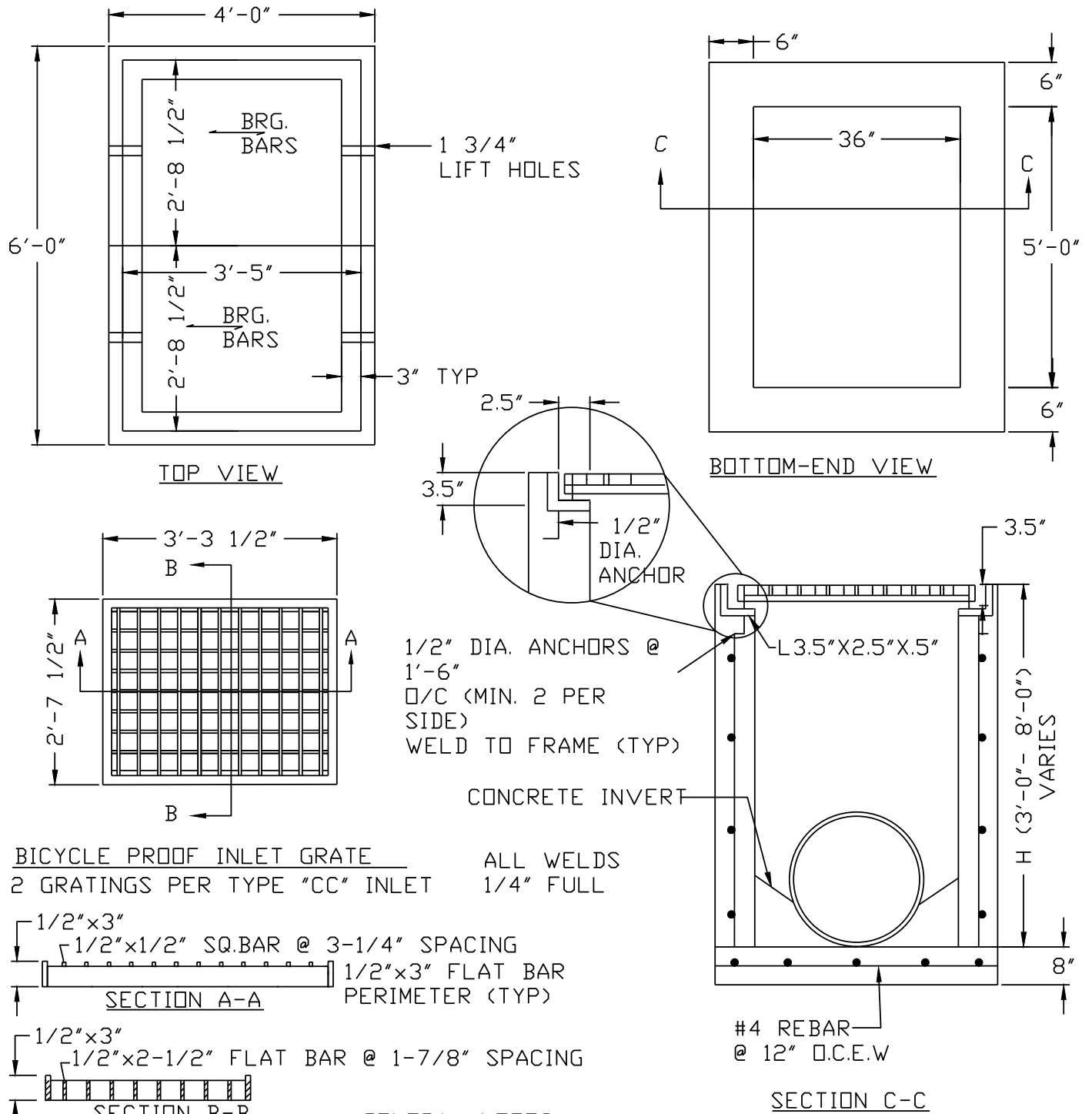
- A. 5" CLEAR OPENINGS.
- B. 6" X 6" CONCRETE SUPPORT USED WHEN EXTENSION BOX CALLED FOR.
- C. REGULAR CURB & GUTTER SECTION.
- D. C.I. MANHOLE RING & COVER SHALL BE DOMESTIC.
- E. DEPRESS 2" BELOW NORMAL GUTTER.
- F. DOWEL BARS. IF NOT PRE-CAST
- G. ALL REINFORCING NO. 4 BARS 12" O.C.E.W.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "A" INLET WITH
EXTENSION (NOTES)



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BICYCLE PROOF INLET GRATE
 2 GRATINGS PER TYPE "CC" INLET ALL WELDS 1/4" FULL

SECTION A-A
 1/2"x3"
 1/2"x1/2" SQ. BAR @ 3-1/4" SPACING
 1/2"x3" FLAT BAR PERIMETER (TYP)

SECTION B-B
 1/2"x3"
 1/2"x2-1/2" FLAT BAR @ 1-7/8" SPACING

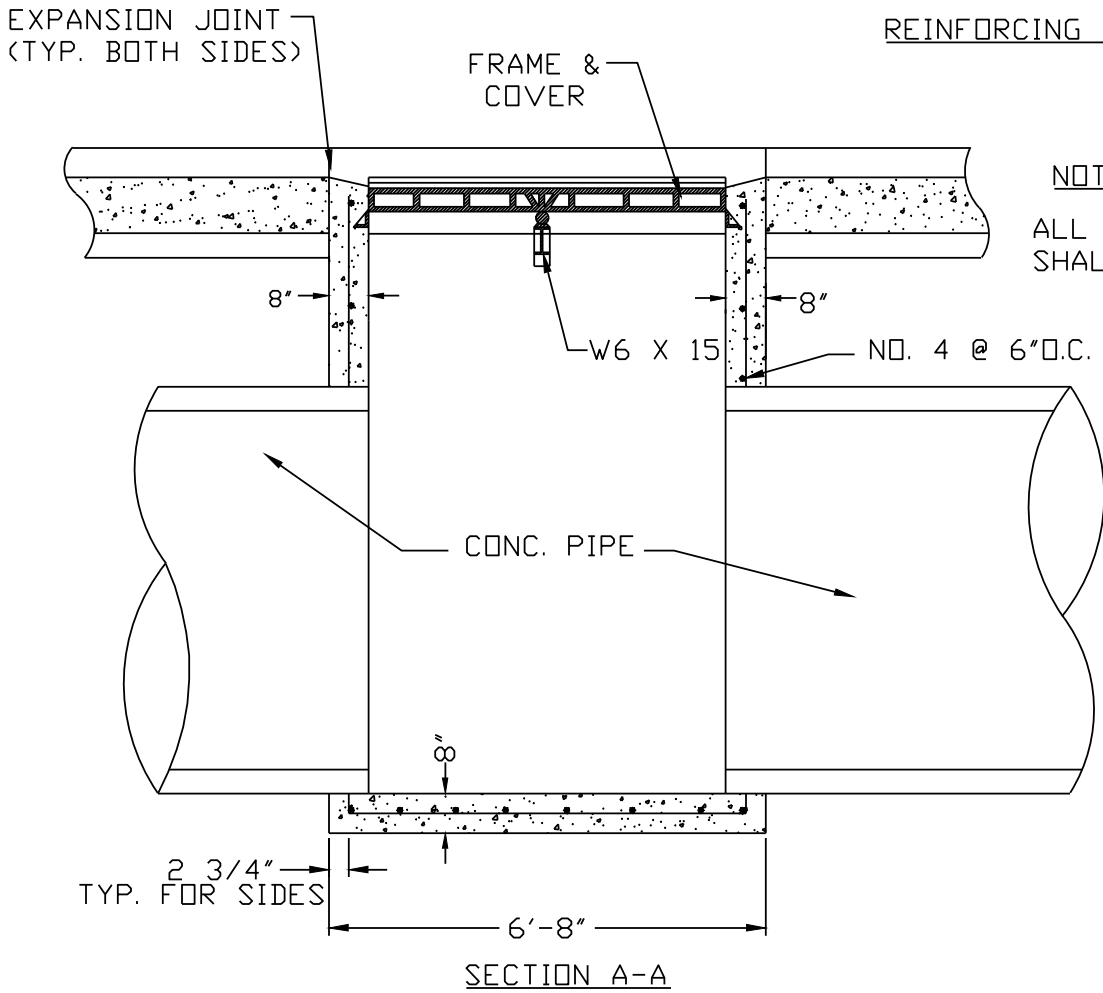
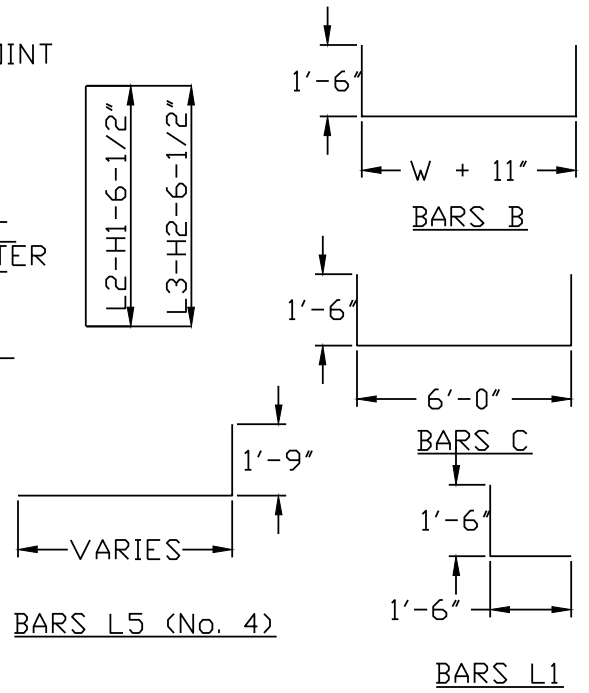
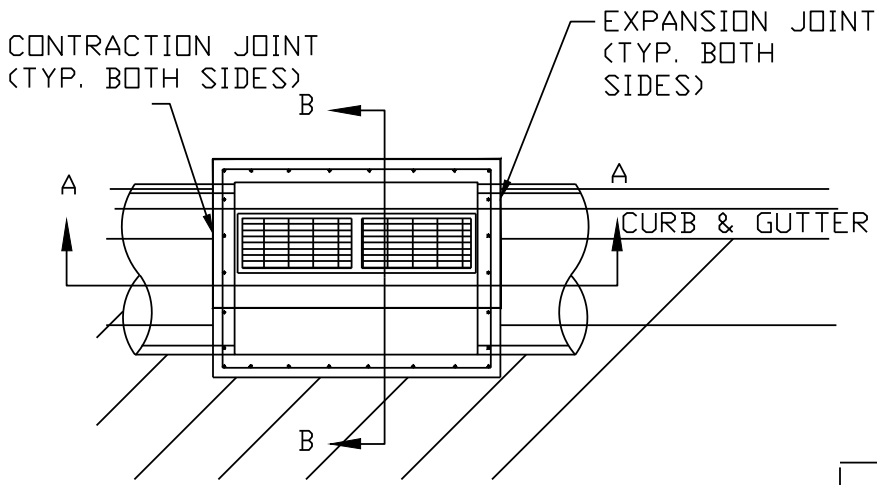
GENERAL NOTES:

1. REINFORCEMENT: #4 BARS AT 12" O.C. EACH WAY.
2. CONCRETE TO HAVE A MIN. 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I.
3. "H" DIMENSION AVAILABLE IN 6" INCREMENTS FROM 3'-0" TO 8'-0".
4. INLETS SHALL BE COMPOSED OF PRE-CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
5. 6" GRAVEL BEDDING IS REQUIRED.



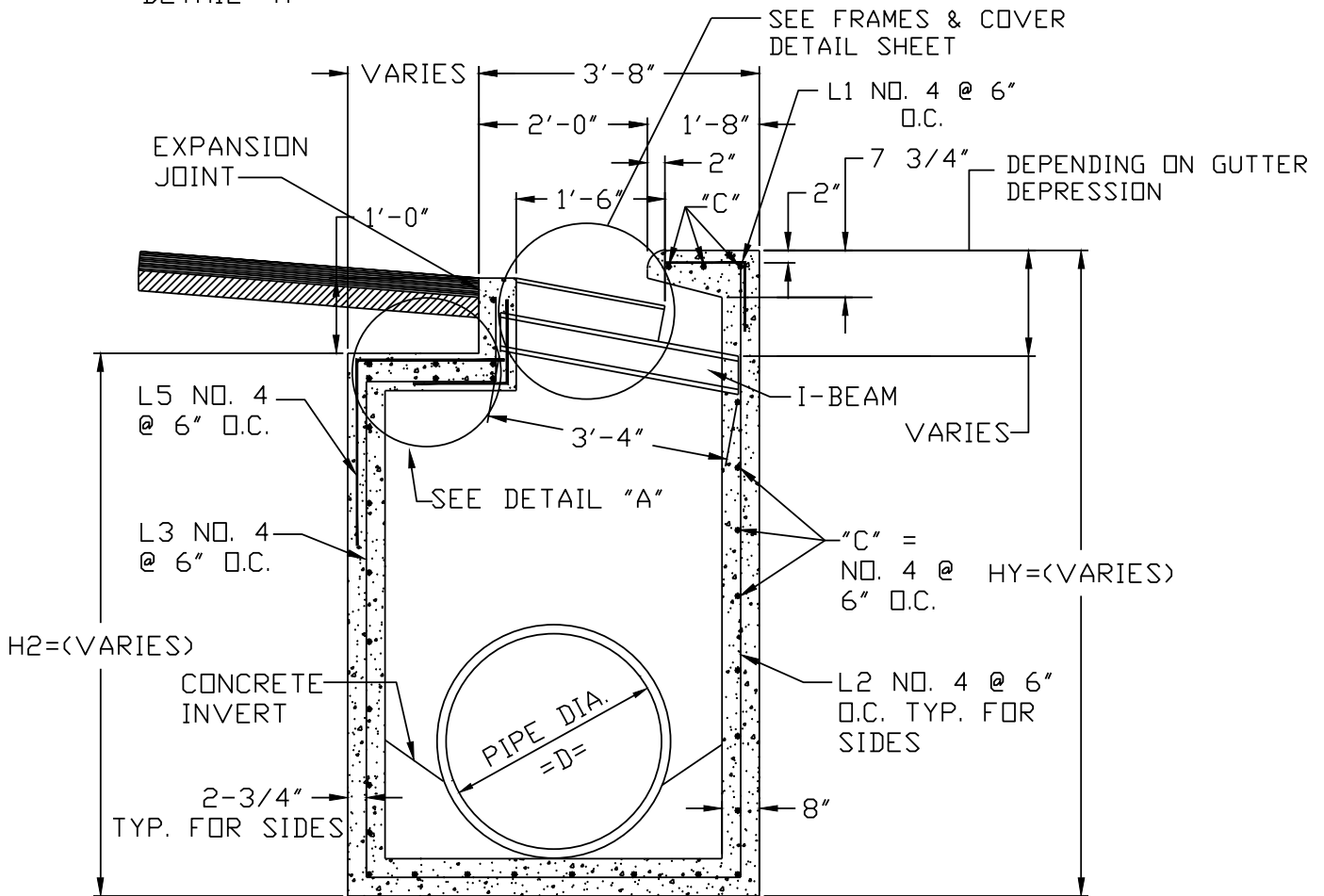
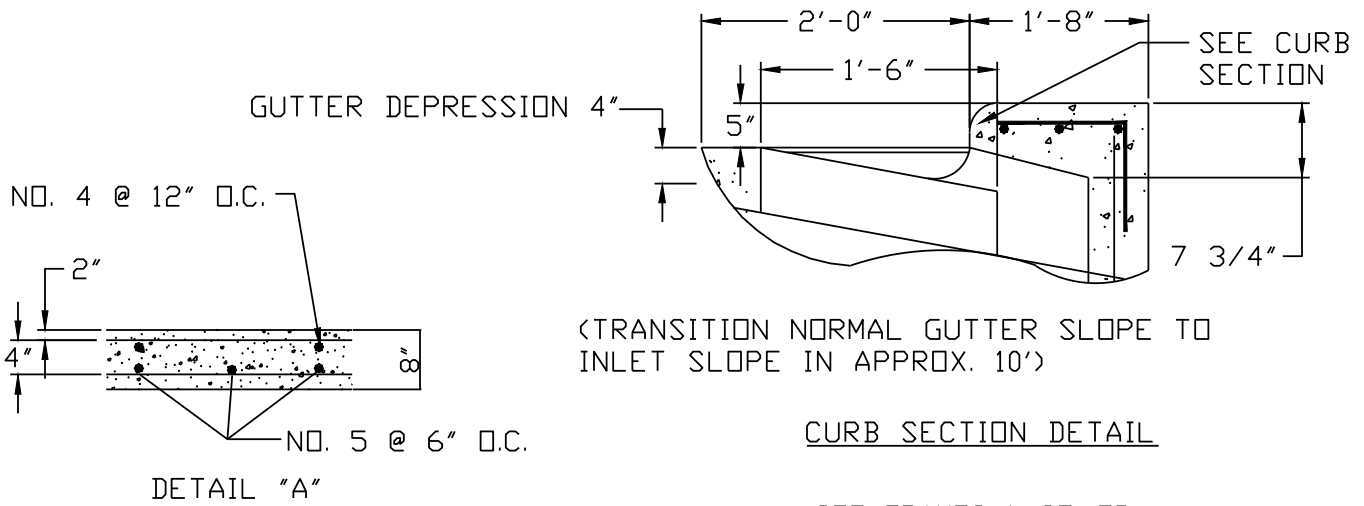
CITY OF SAN JUAN
 STANDARDS MANUAL
 TYPE "CC" INLET





CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET



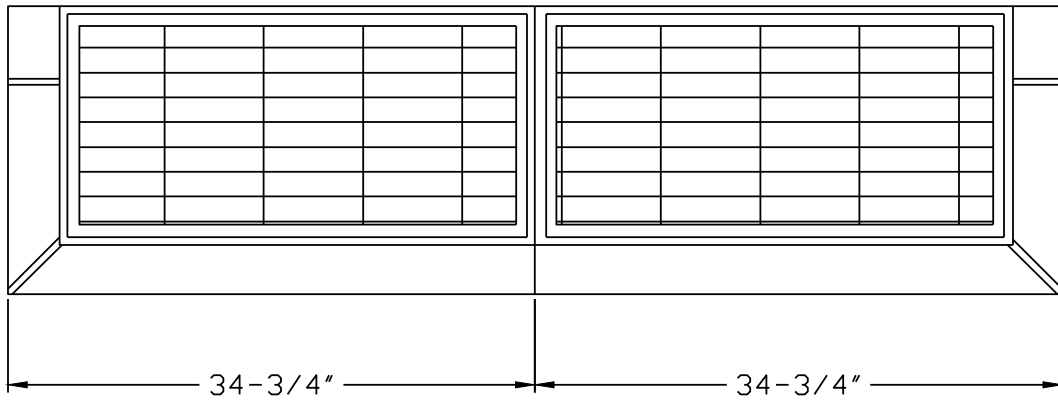


INLET TYPE	W	MAX PIPE SIZE ALLOW (DIA.)
F	3'-0"	24"
F-1	4'-0"	36"
F-2	5'-0"	48"
F-3	6'-0"	60"

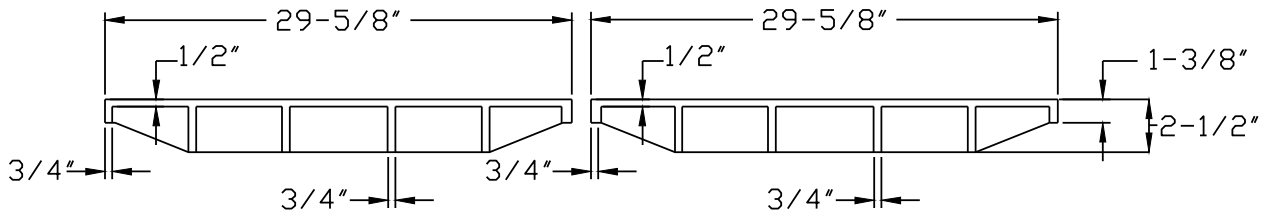


CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET

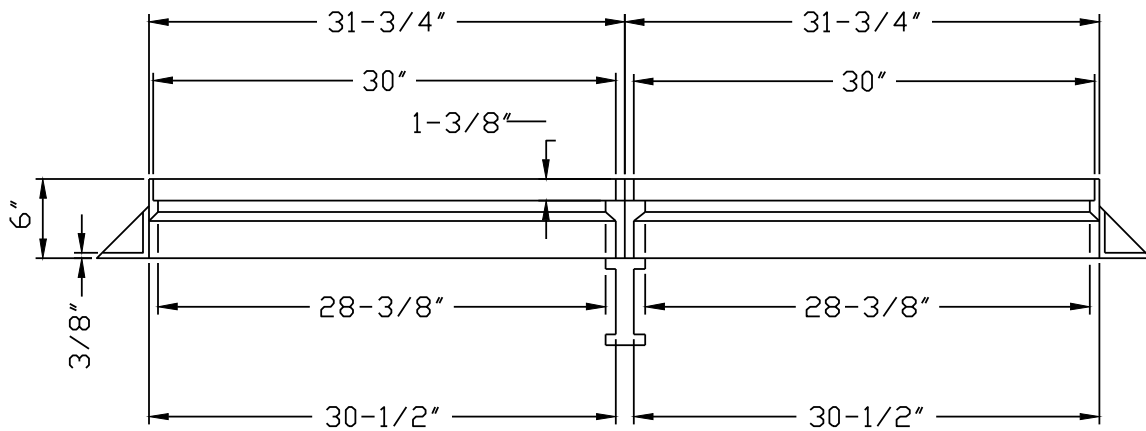




FRAMES AND COVER TOP VIEW



COVER SECTION



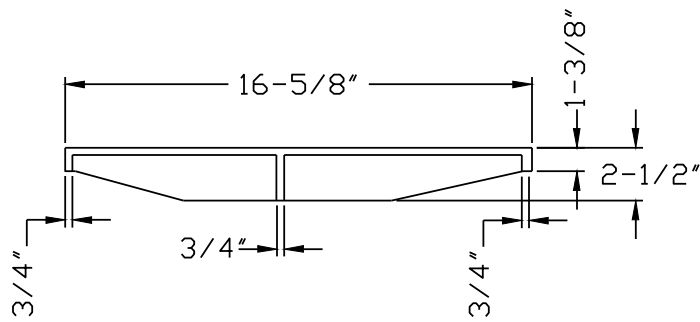
FRAME SECTION



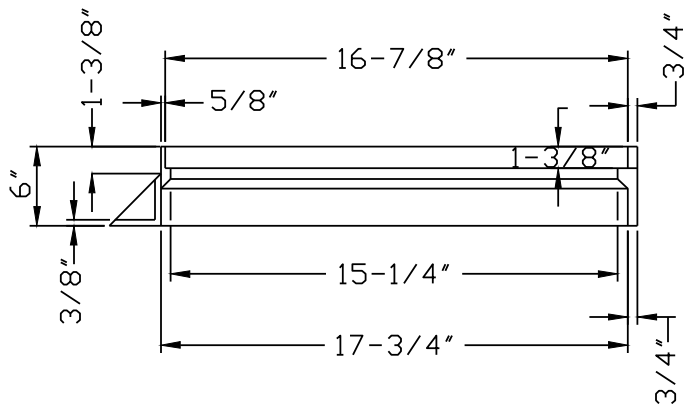
CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET



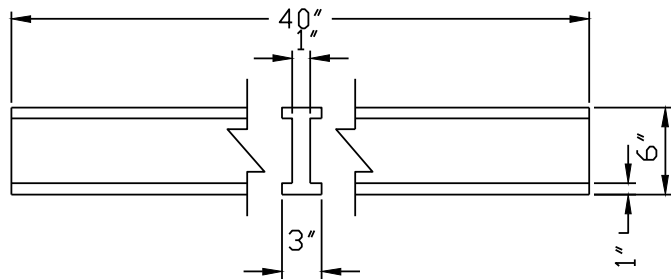
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COVER SECTION



FRAME SECTION



I-BEAM DETAILS (W6 X 15)

NOTES

1. ALL STEEL TO BE No. 4 BARS AT 6" SPACING IN BOTH DIRECTIONS.
2. SLOPE BOTTOM OF INLET EXTENSION 1/2" PER FT. TOWARD INLET.
3. ALL FRAMES AND GRATES USED IN PAVED AREAS SHALL BE A36 GR. 50 STRUCTURAL STEEL. ALL WELDING SHALL BE IN ACCORDANCE WITH ITEM "STEEL STRUCTURES" OR ITEM "FIELD WELDING" AS REQUIRED.
4. INLETS SHALL BE COMPOSED OF PRE-CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
5. 6" GRAVEL BEDDING IS REQUIRED IF UNSTABLE SOIL OR GROUND WATER IS FOUND.

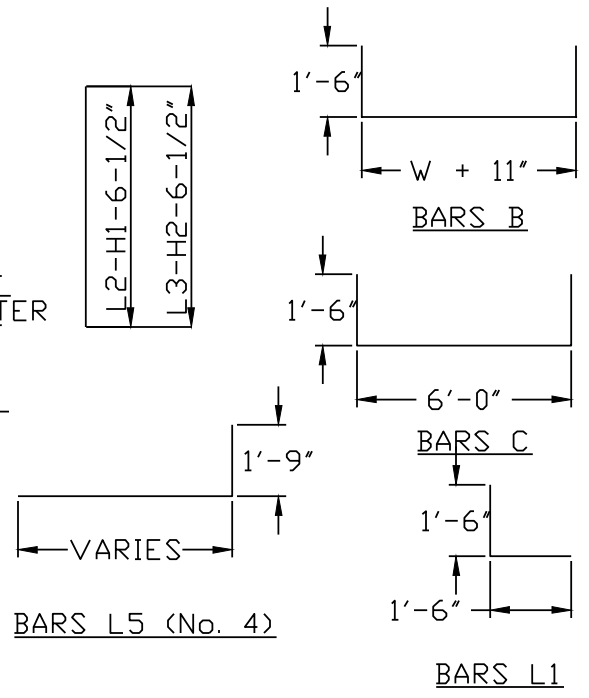
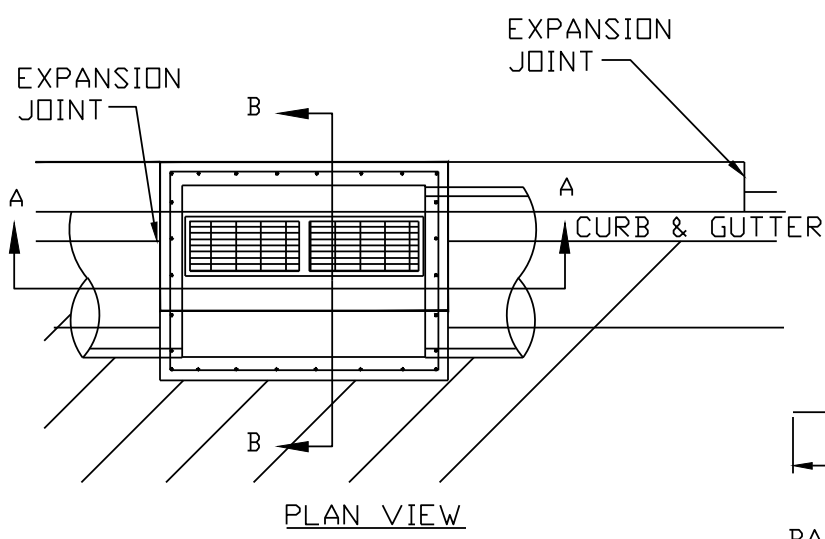
ESTIMATED WEIGHT - LBS.
 COVER 110 LBS. EACH
 FRAME 155 LBS. EACH
 I-BEAM 82 LBS.



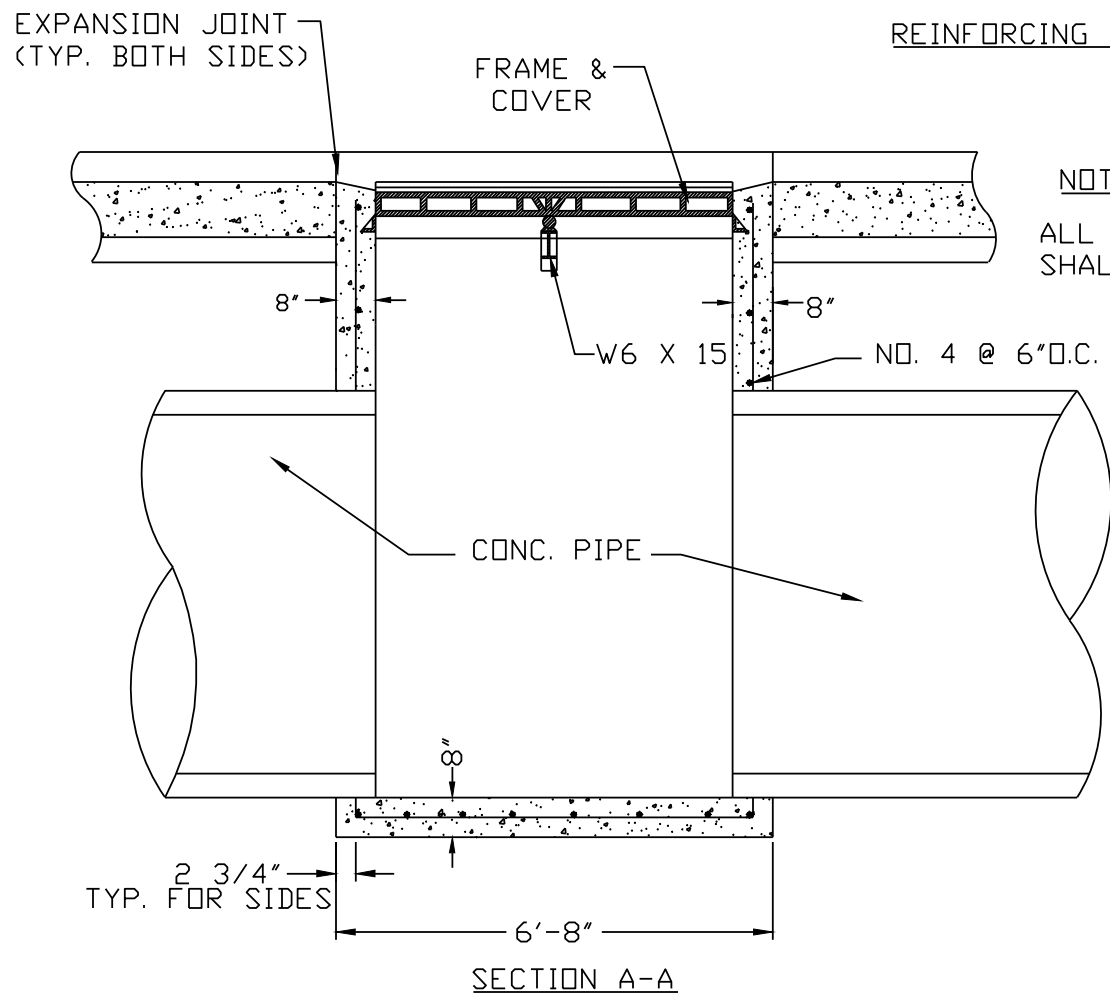
CITY OF SAN JUAN
 STANDARDS MANUAL
 TYPE "F" INLET



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REINFORCING STEEL DETAILS



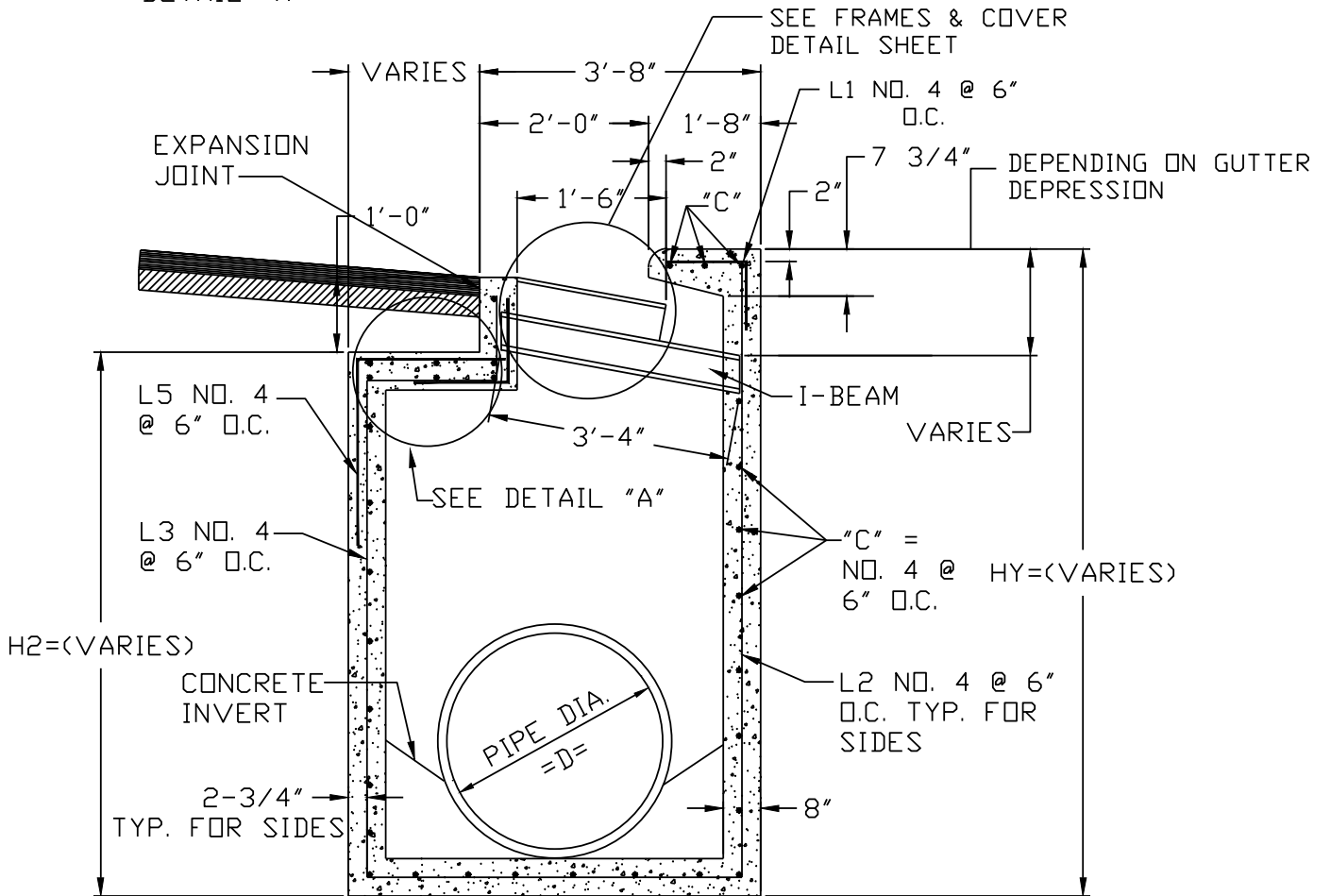
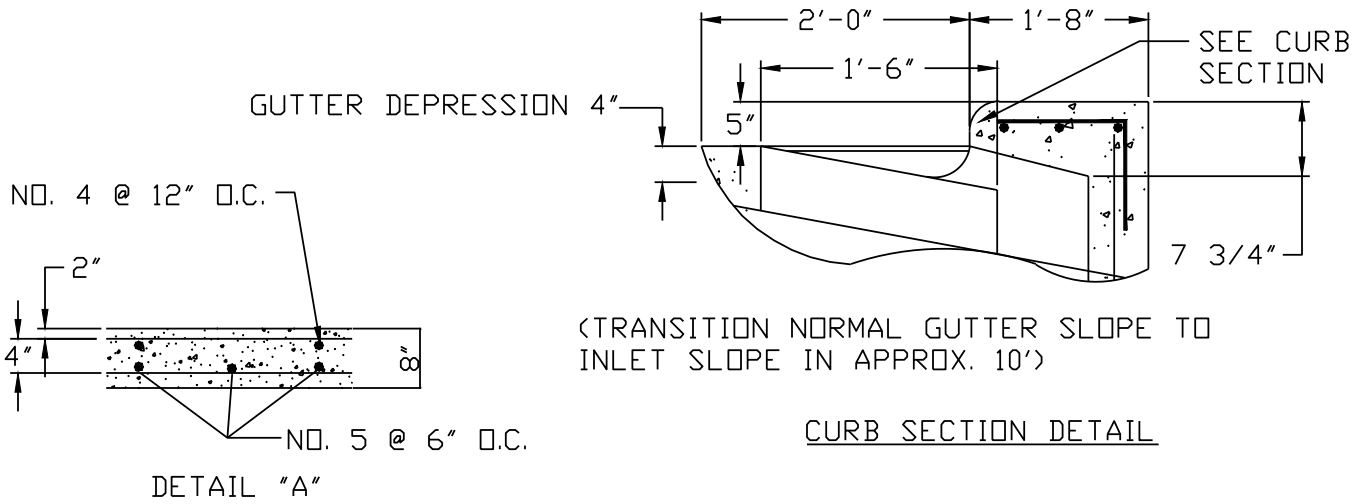
NOTE:
ALL REINFORCING BARS
SHALL BE GRADE 60.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET
W/ EXTENSION



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SECTION B-B

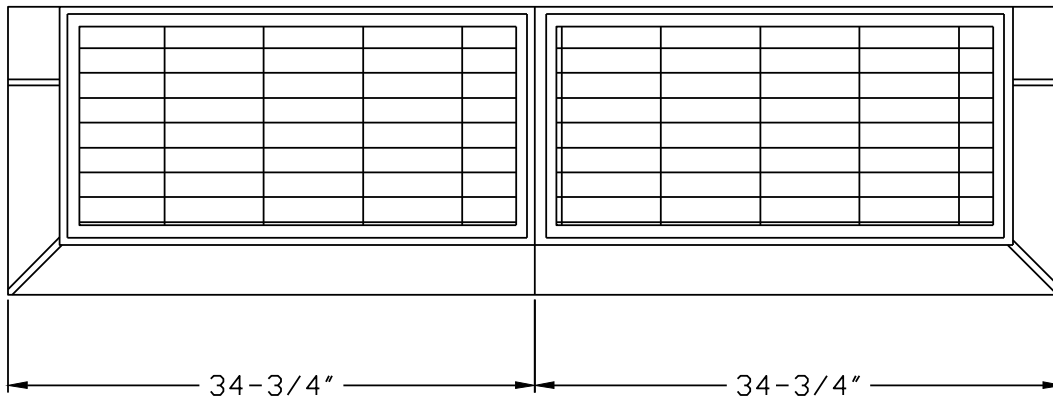
W	MAX PIPE SIZE ALLOW (DIA.)
3'-0"	24"
4'-0"	36"
5'-0"	48"
6'-0"	60"



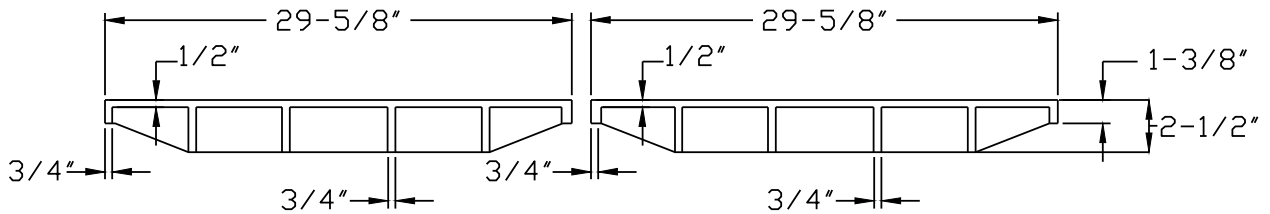
CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET
W/ EXTENSION



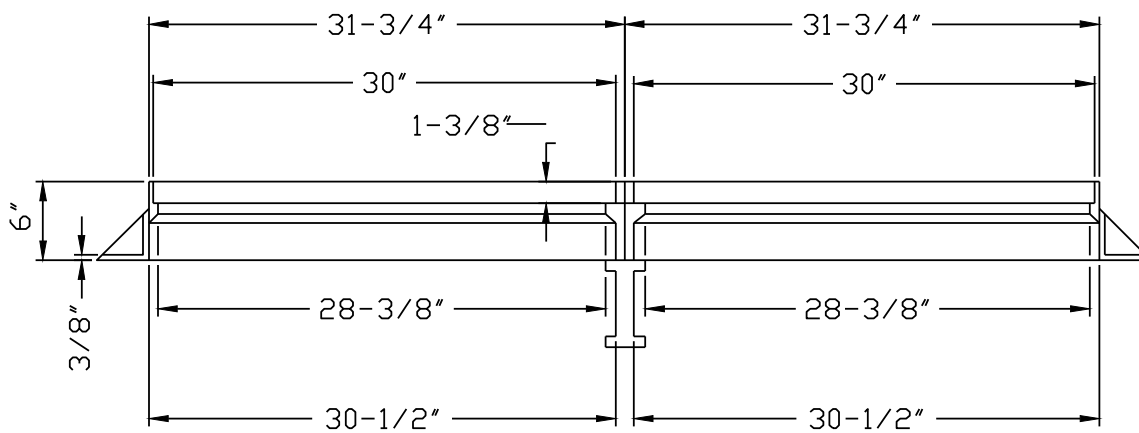
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FRAMES AND COVER TOP VIEW



COVER SECTION



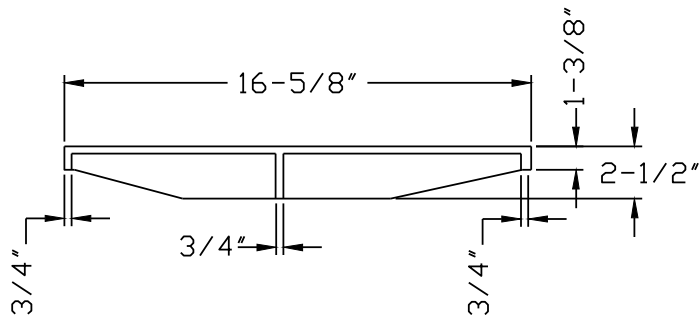
FRAME SECTION



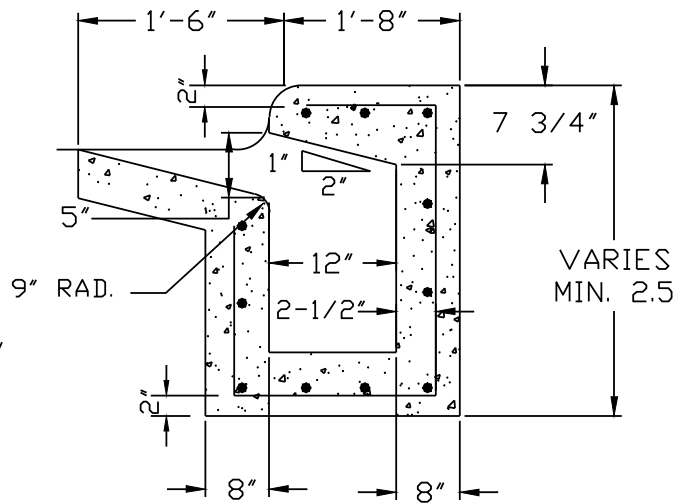
CITY OF SAN JUAN
STANDARDS MANUAL
TYPE "F" INLET
W/ EXTENSION



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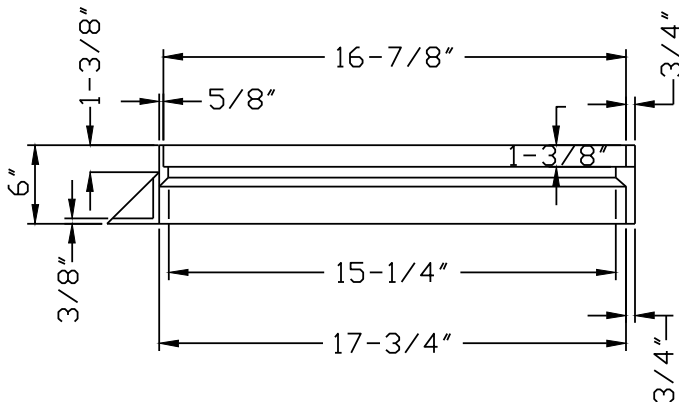


COVER SECTION



INLET EXTENSION

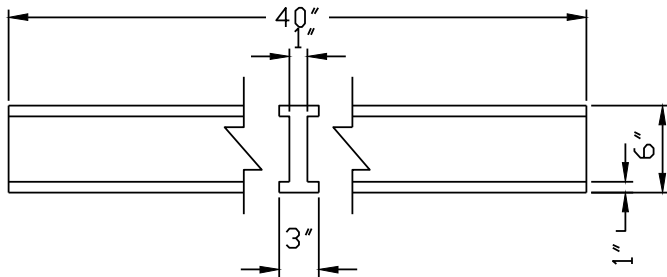
MATCH EXIST. CURB SECTION CURB CAN BE TYPE "A" (BARRIER) OR TYPE "B" (MOUNTABLE)



FRAME SECTION

NOTES

1. ALL STEEL TO BE No. 4 BARS AT 6" SPACING IN BOTH DIRECTIONS.
2. SLOPE BOTTOM OF INLET EXTENSION 1/2" PER FT. TOWARD INLET.
3. ALL FRAMES AND GRATES USED IN PAVED AREAS SHALL BE A36 GR. 50 STRUCTURAL STEEL. ALL WELDING SHALL BE IN ACCORDANCE WITH ITEM "STEEL STRUCTURES" OR ITEM "FIELD WELDING" AS REQUIRED.
4. INLETS SHALL BE COMPOSED OF PRE-CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
5. 6" GRAVEL BEDDING IS REQUIRED IF UNSTABLE SOIL OR GROUND WATER IS FOUND.



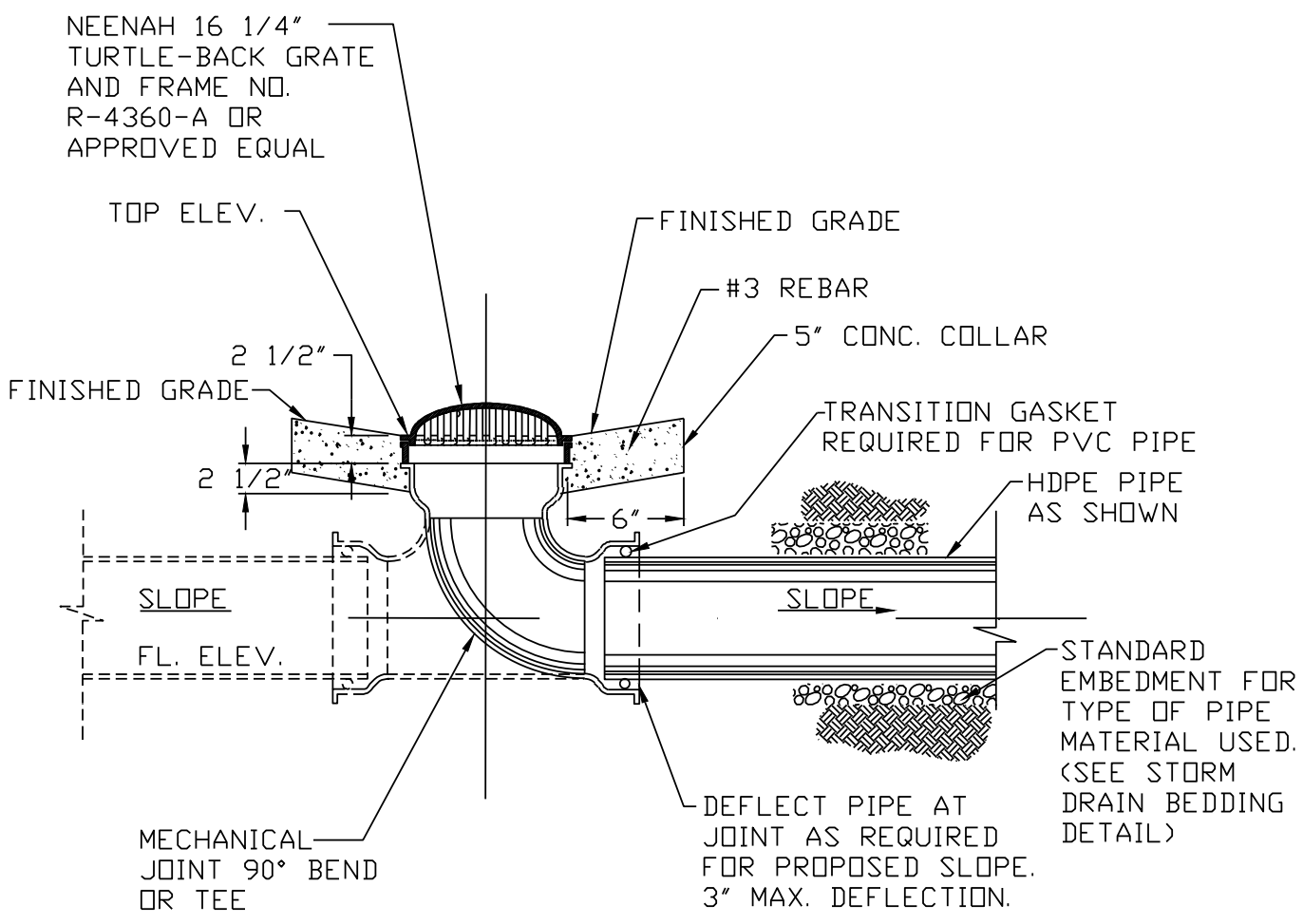
I-BEAM DETAILS (W6 X 15)

ESTIMATED WEIGHT - LBS.
 COVER 110 LBS. EACH
 FRAME 155 LBS. EACH
 I-BEAM 82 LBS.



CITY OF SAN JUAN
 STANDARDS MANUAL
 TYPE "F" INLET
 W/ EXTENSION



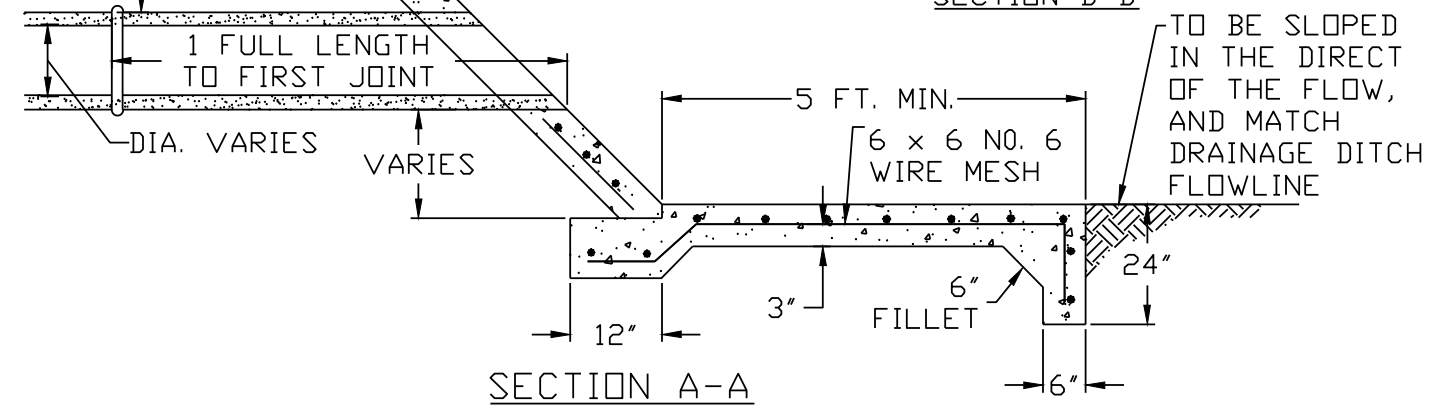
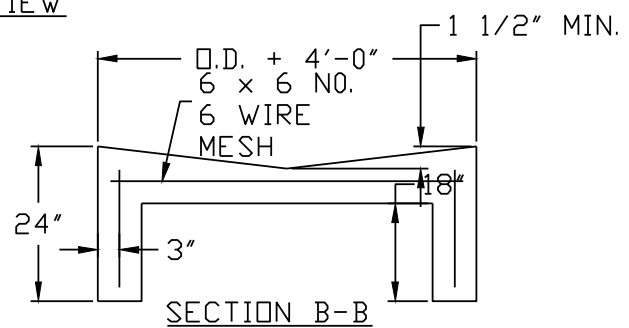
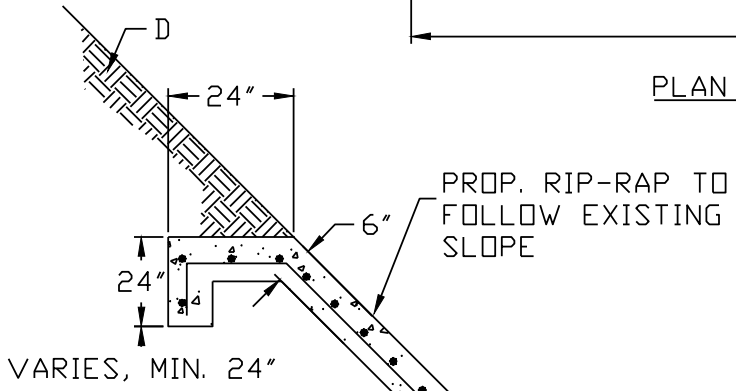
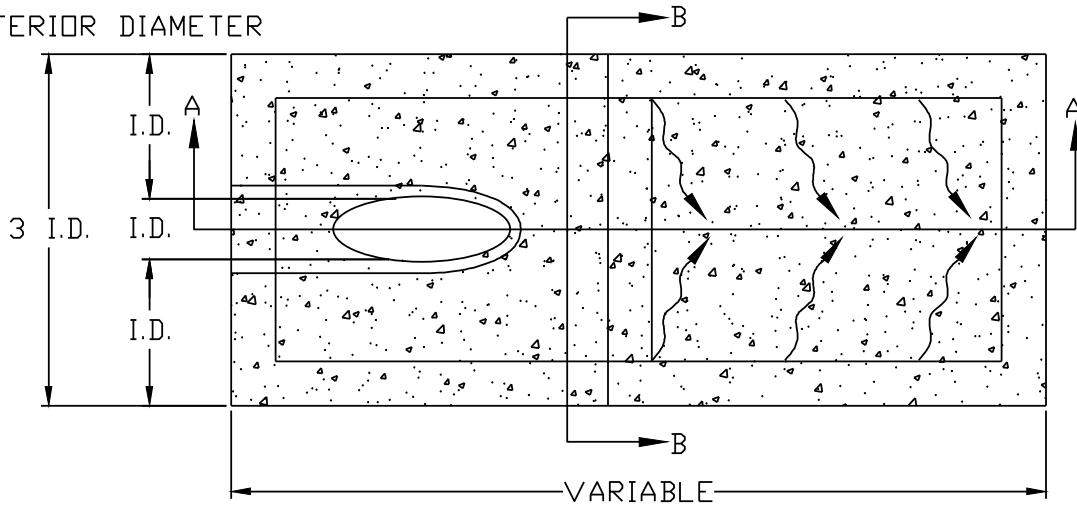


CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL LANDSCAPE INLET



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I.D. = INTERIOR DIAMETER



GENERAL NOTES:

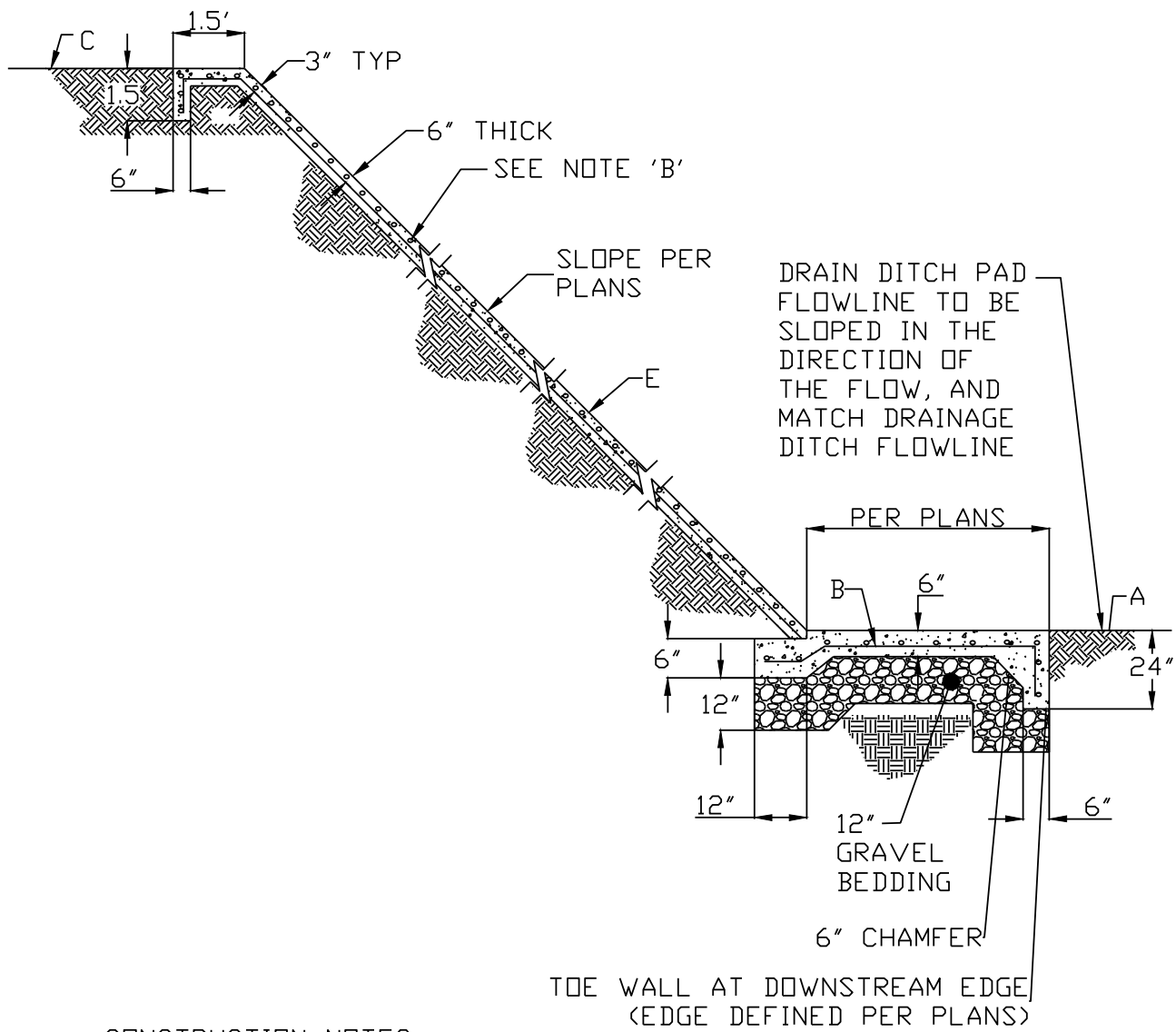
1. CONCRETE TO HAVE 3000 P.S.I. MIN. AT 28 DAY COMPRESSIVE STRENGTH.
2. ALL STEEL TO BE GRADE 60.
3. MIN. 95% COMPACTION STD. PROCTOR DENSITY
4. STANDARD DETAIL FOR CITY OF SAN JUAN DITCHES
5. 5-FOOT PAD SHOULD EITHER BE FLUSH WITH DRAIN DITCH FL OR HAVE MINIMUM SLOPE TO DRAIN DITCH FLOWLINE TO AVOID STAGNANT WATER



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE SLOPED END
SECTION



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CONSTRUCTION NOTES:

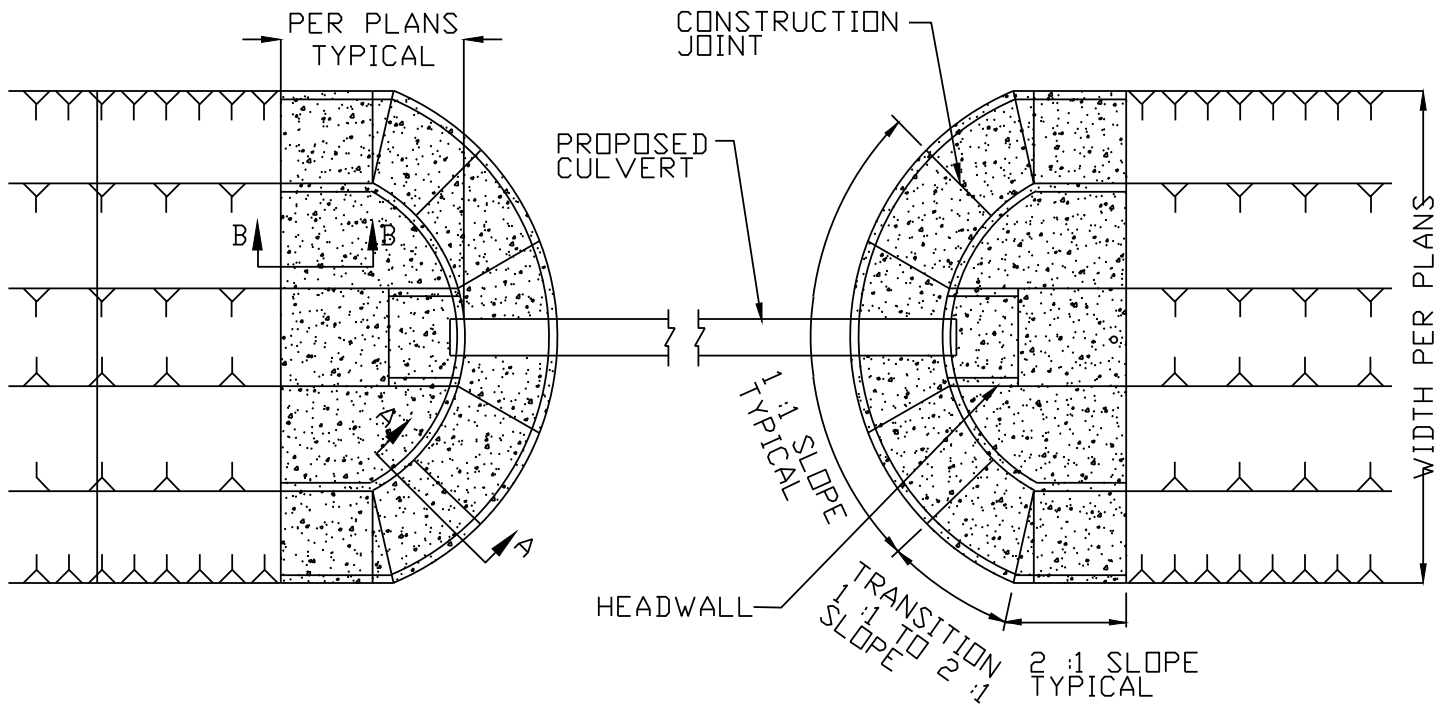
- A. DRAIN DITCH FLOW-LINE.
- B. 6"X6"X NO. 6 WIRE MESH
- C. MIN. 95% COMPACTION STD. PROCTOR DENSITY ON ALL FILL MATERIAL
- D. 5-FOOT PAD SHOULD EITHER BE FLUSH WITH DRAIN DITCH FLOWLINE OR HAVE A MINIMUM SLOPE TO DRAIN DITCH TO PREVENT STAGNANT WATER.
- E. CONCRETE RIP-RAP SHALL HAVE A MINIMUM THICKNESS OF 6" AND BE PLACED USING 3000 P.S.I. CONCRETE



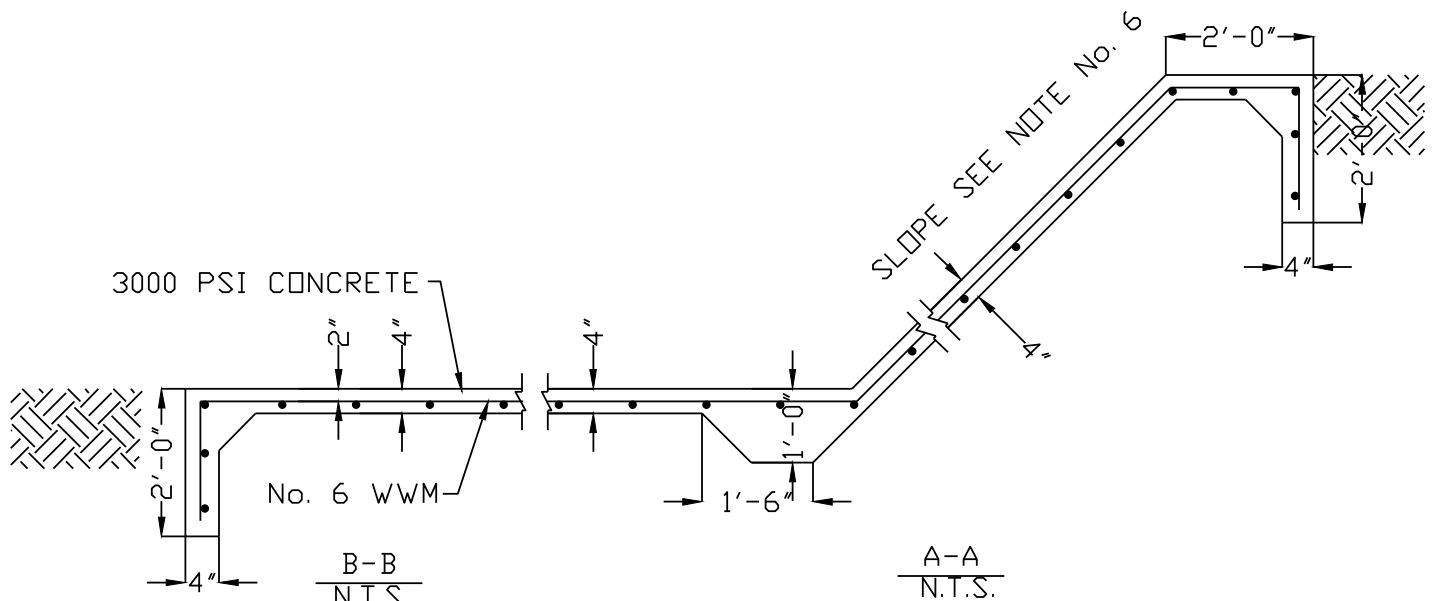
CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE RIP RAP SLOPE
PROTECTION
(1 OF 2)



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PLAN VIEW



PROFILES

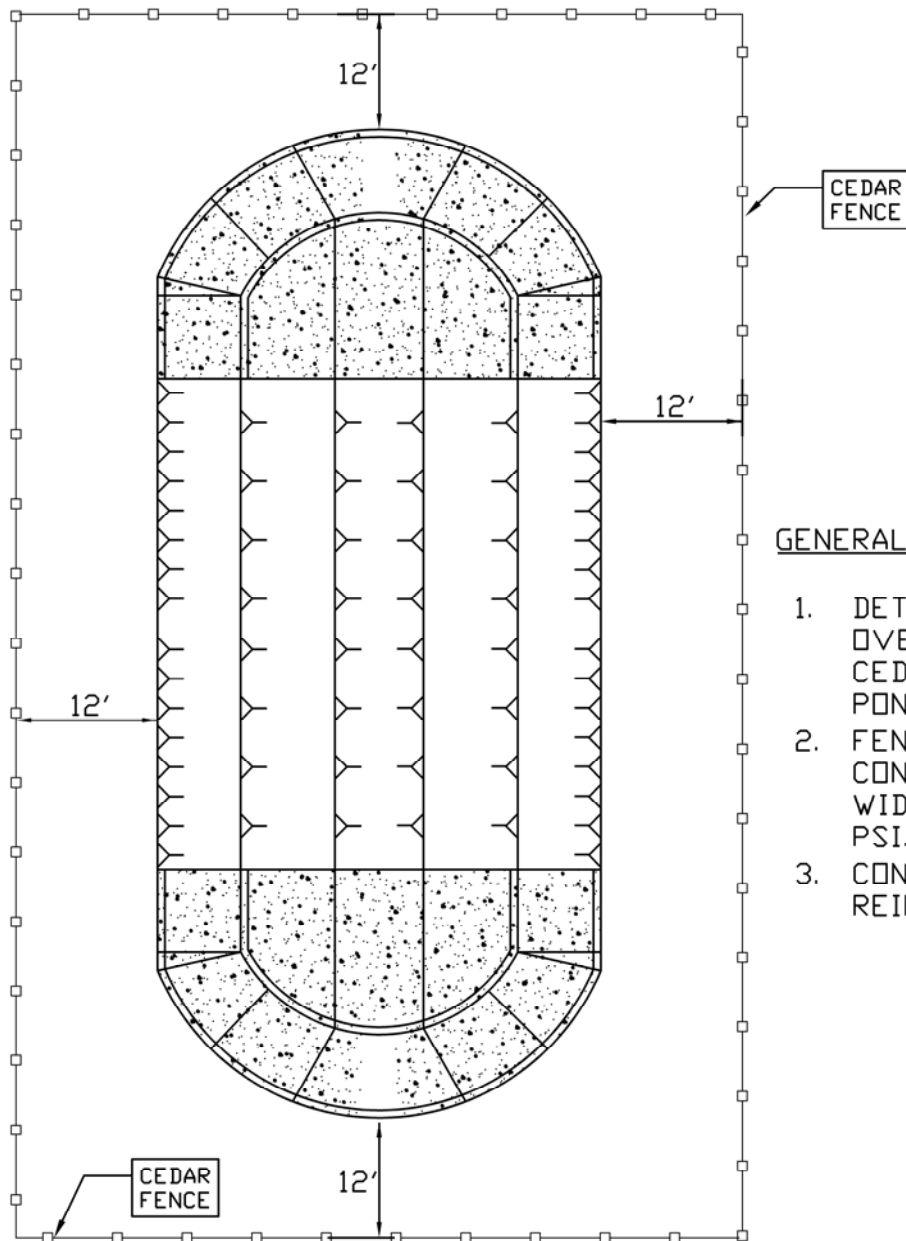
NOTES

1. 3000 PSI. CONCRETE REINFORCE WITH No. 6 WELDED WIRE MESH.
2. APPLY MEMBRANE CURING COMPOUND AT A RATE OF 1-GALLON / 180 S.F.
3. BROOM FINISH RIP-RAP.
4. CONSTRUCTION JOINT AT 10'-0" C-C.
5. EXPANSION JOINT AT 30'-0" C-C.
6. BEGIN SIDE SLOPE OF RIP-RAP AT 1:1 AND TRANSITION TO 2:1 SLOPE AS NOTED IN DETAIL.



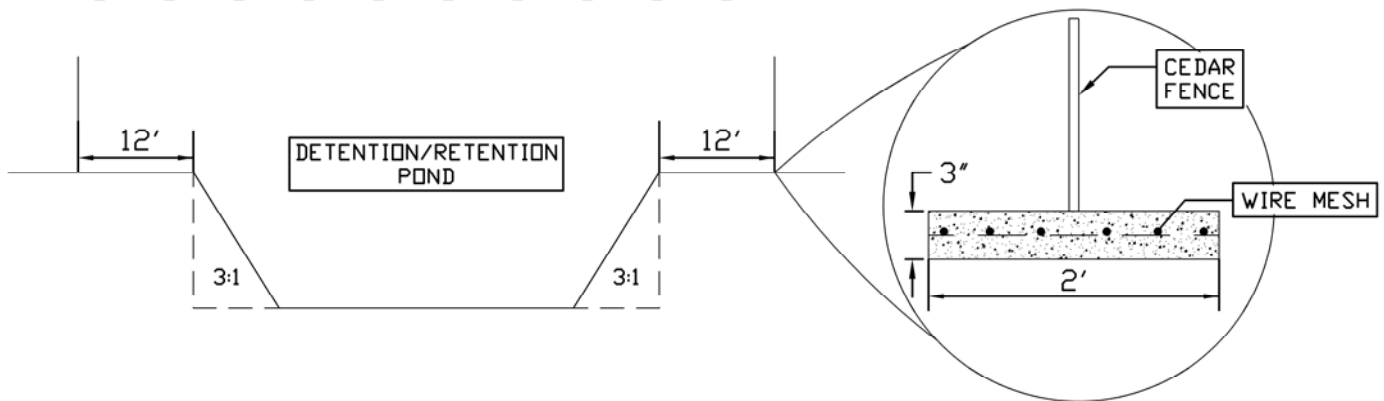
CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE RIP RAP SLOPE
PROTECTION
(2 OF 2)





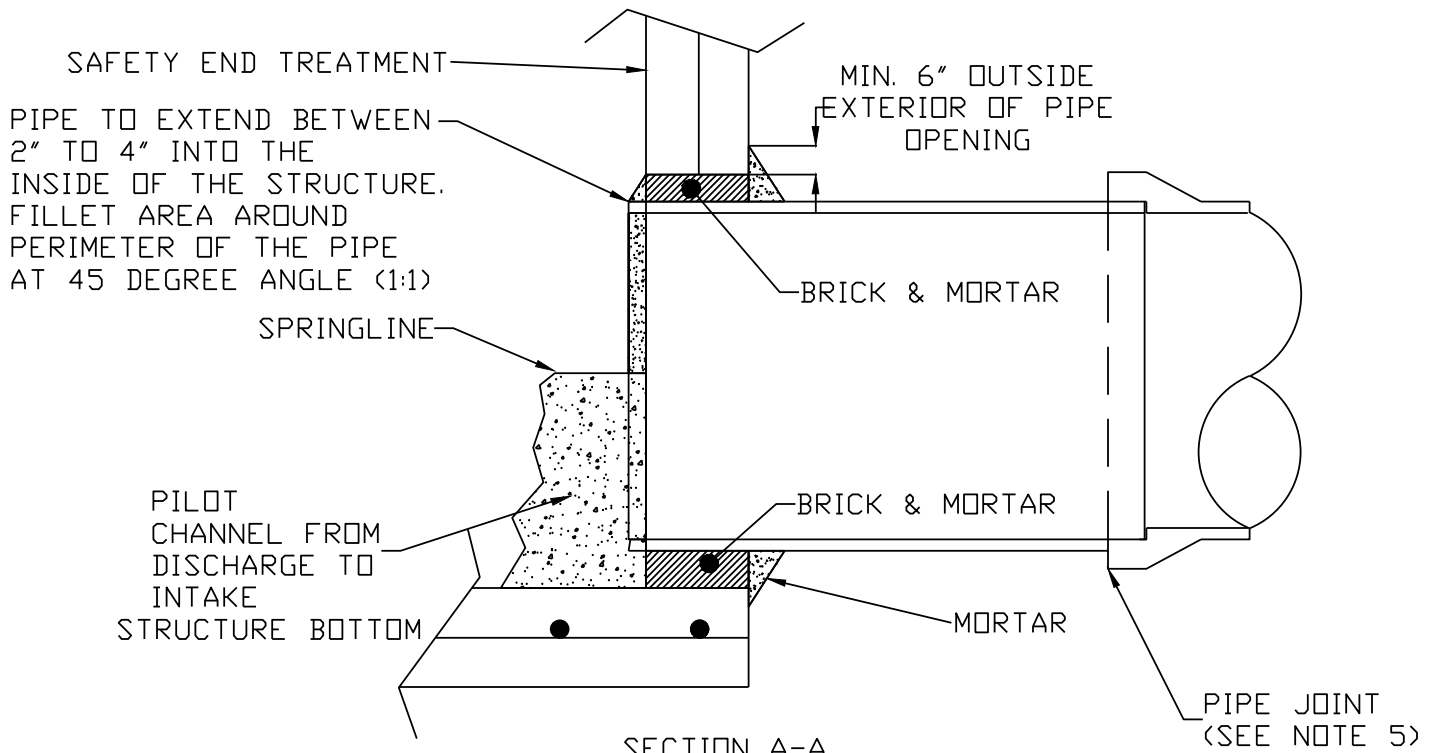
GENERAL NOTES:

1. DETENTION/ RETENTION PONDS OVER 3' DEEP WILL REQUIRE CEDAR FENCE 12' FROM THE POND.
2. FENCE LINE TO HAVE A CONCRETE FOUNDATION OF 2' WIDE BY 3" IN DEPTH AT 2500 PSI.
3. CONCRETE FOUNDATION TO BE REINFORCED WITH WIRE MESH

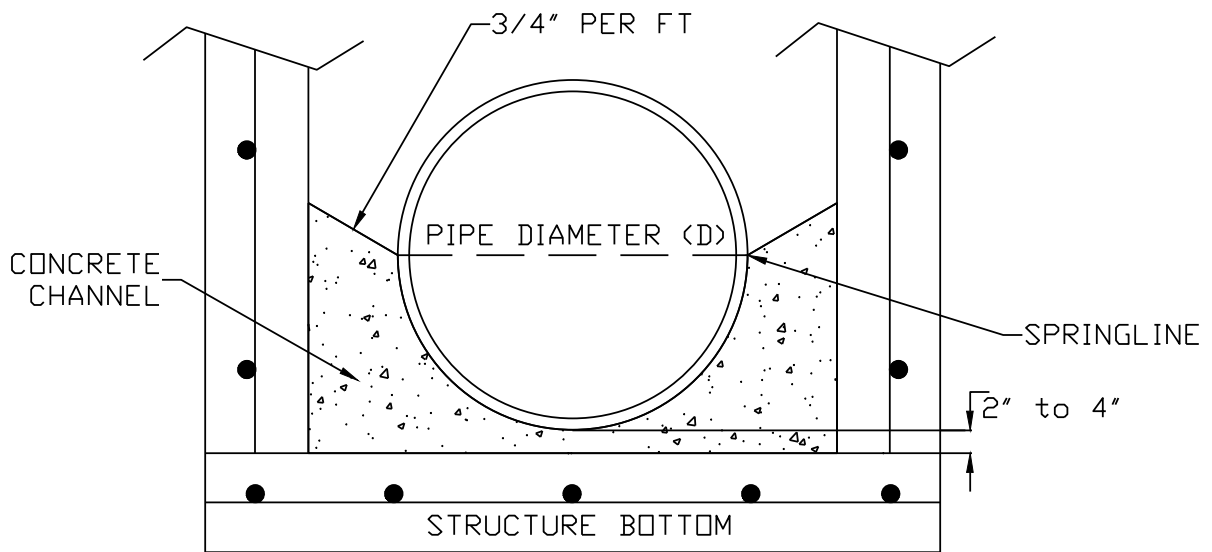


CITY OF SAN JUAN
STANDARDS MANUAL
DETENTION/RETENTION AREA
FENCE PERIMETER





SECTION A-A



SECTION B-B

GENERAL NOTES:

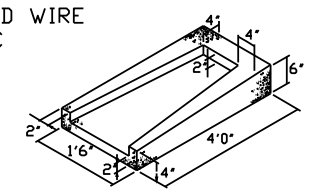
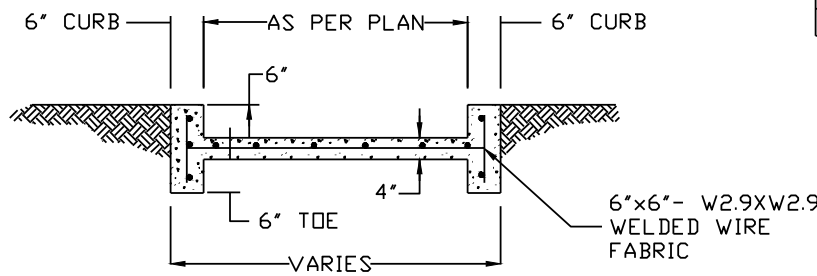
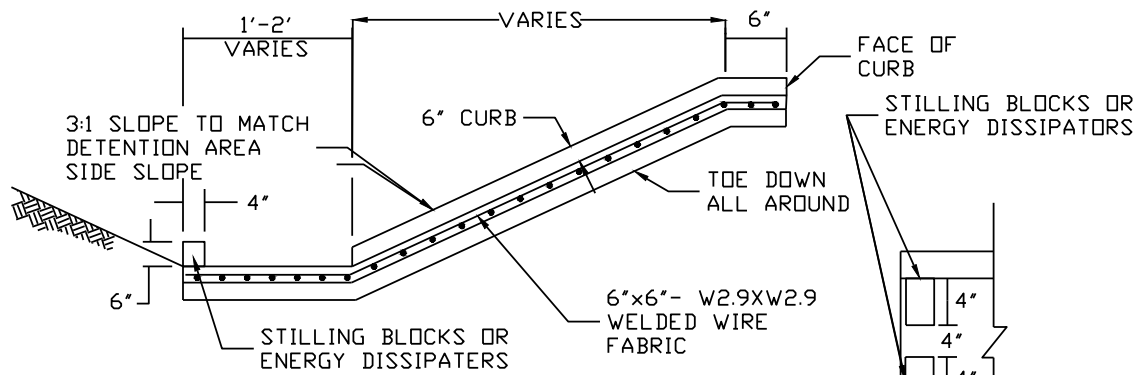
1. CONCRETE CHANNEL TO EXTEND THRU ENTIRE STRUCTURE, FROM INLET PIPE TO OUTLET PIPE.
2. CONCRETE TO HAVE A MIN. 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I.
3. ALL MORTAR TO BE NON-SHRINK MORTAR.
4. PIPE OPENING IN STRUCTURE TO BE NO MORE THAN 8 INCHES WIDER THAN THE OUTSIDE DIAMETER OF THE PIPE.
5. NO PIPE JOINTS ALLOWED WITHIN 3 FEET OF THE OUTSIDE WALL OF THE STRUCTURE.



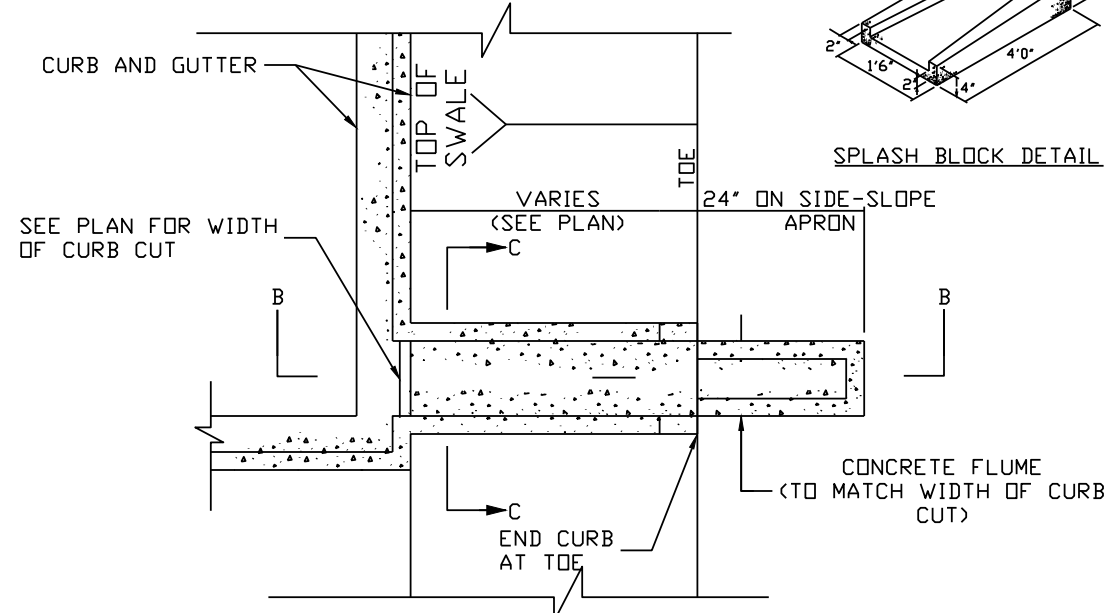
CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE PIPE
STRUCTURE CONNECTION



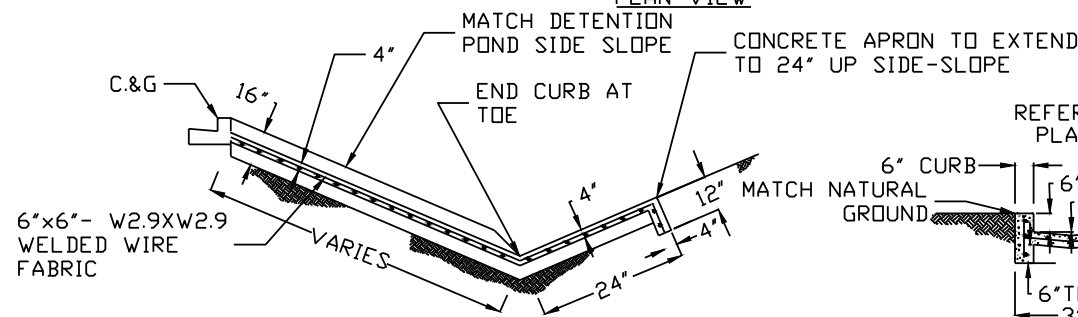
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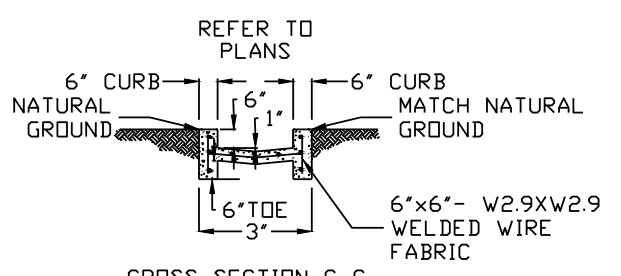
SPLASH BLOCK DETAIL



PLAN VIEW



CROSS SECTION B-B

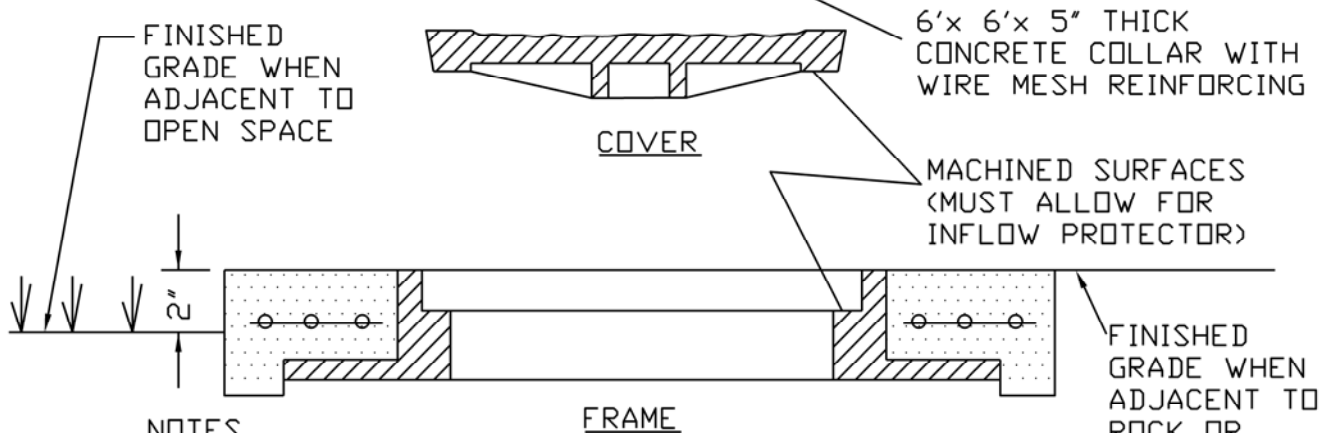
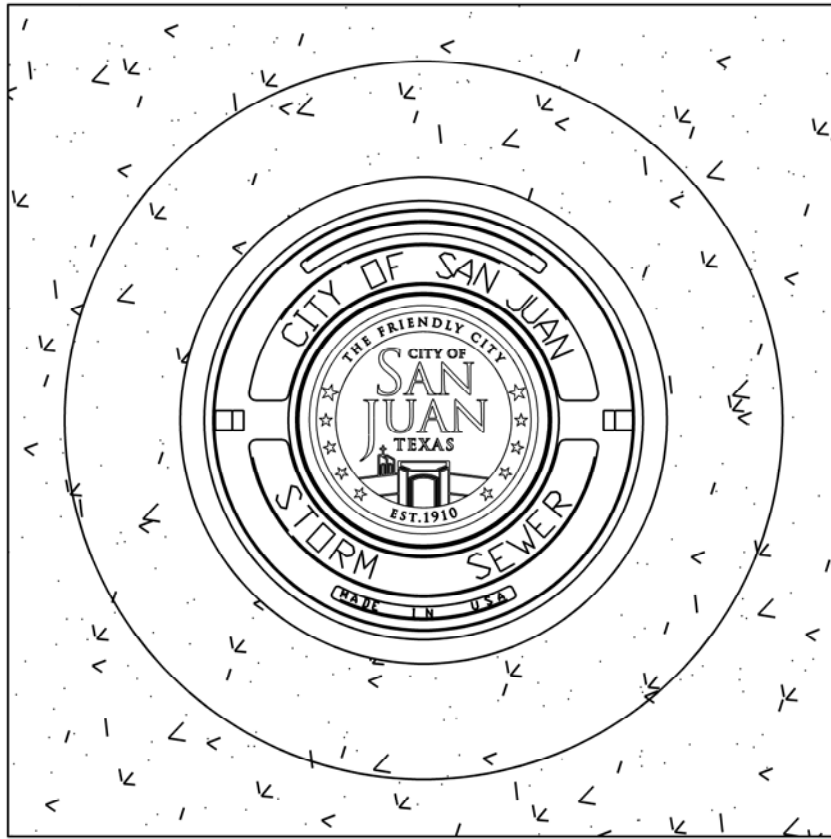


CROSS SECTION C-C



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL CONCRETE FLUME





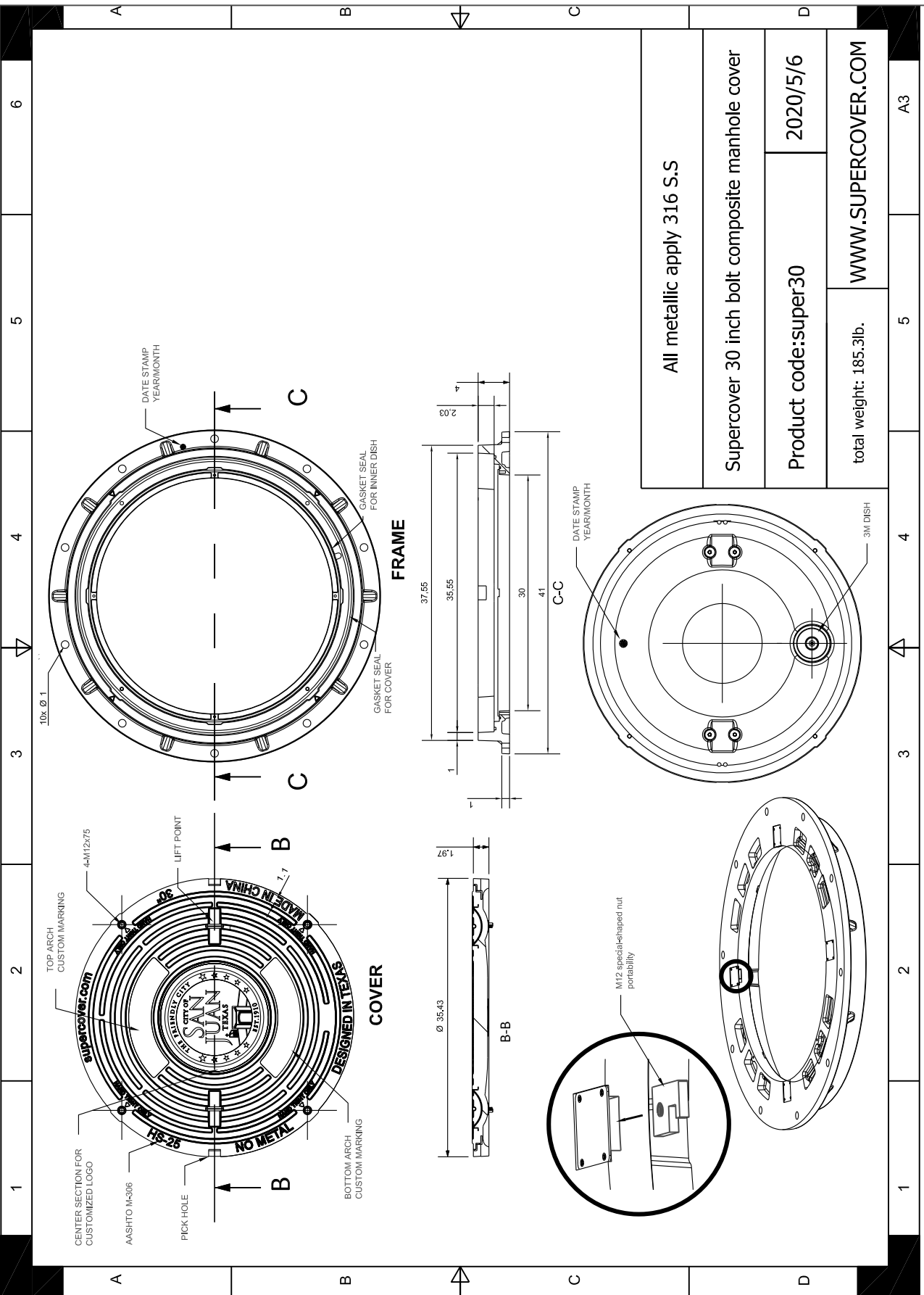
NOTES

1. COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
2. STANDARD FRAME AND COVER SIZE SHALL BE USED.
3. A STEEL MANHOLE RISER, APPROVED HDPE ADJUSTING RINGS OR ADDITIONAL BRICKS MAY BE USED TO ELEVATE EXISTING MANHOLE COVERS TO RESURFACED GRADE (MAX. 4" HEIGHT).
4. COVER SHALL FIT FLUSH WITH THE FRAME WITH THE INFLOW PROTECTOR INSTALLED.
5. NO MORE THAN 2 SPACERS TO BE INSTALLED.
6. CONCRETE TO BE POURED TO SYMBOLIZE DIAMOND SHAPE



**CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE COLLAR FOR
STORM SEWER MANHOLES**



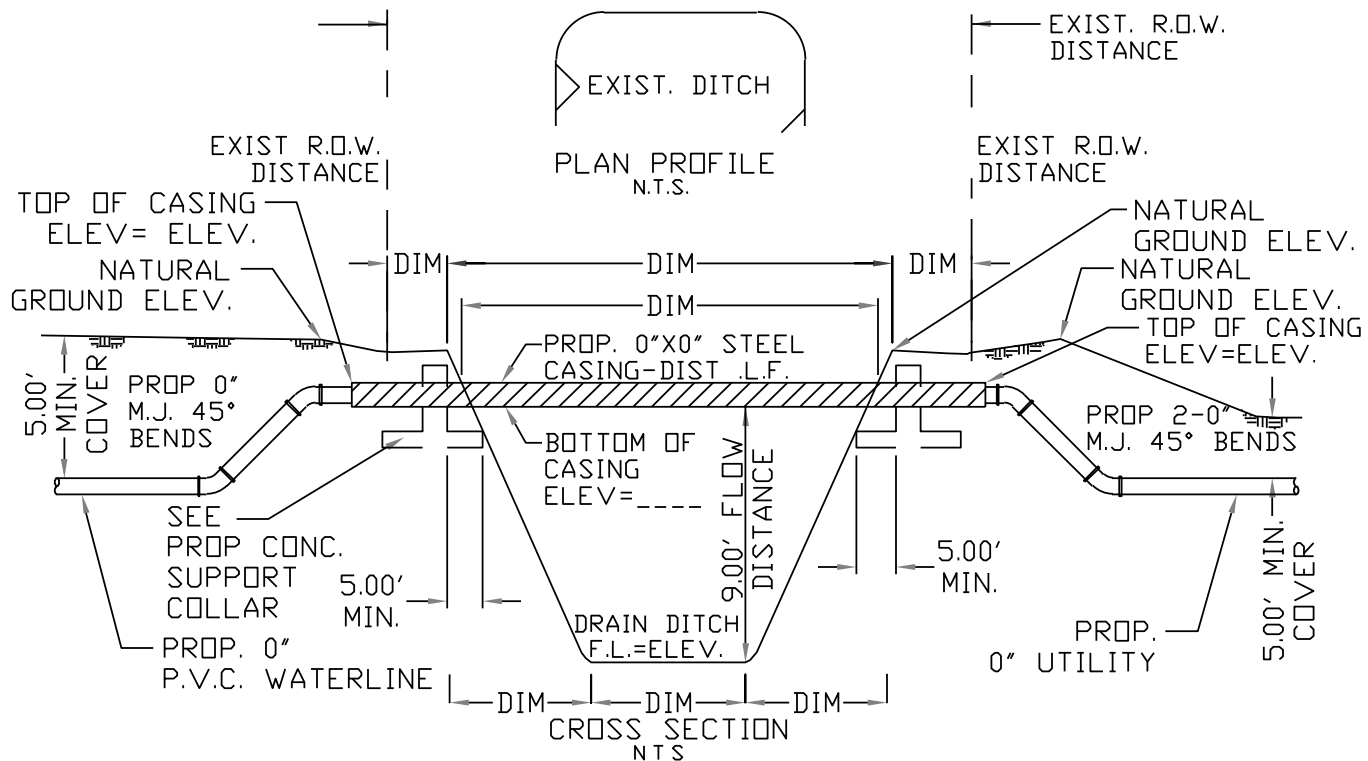
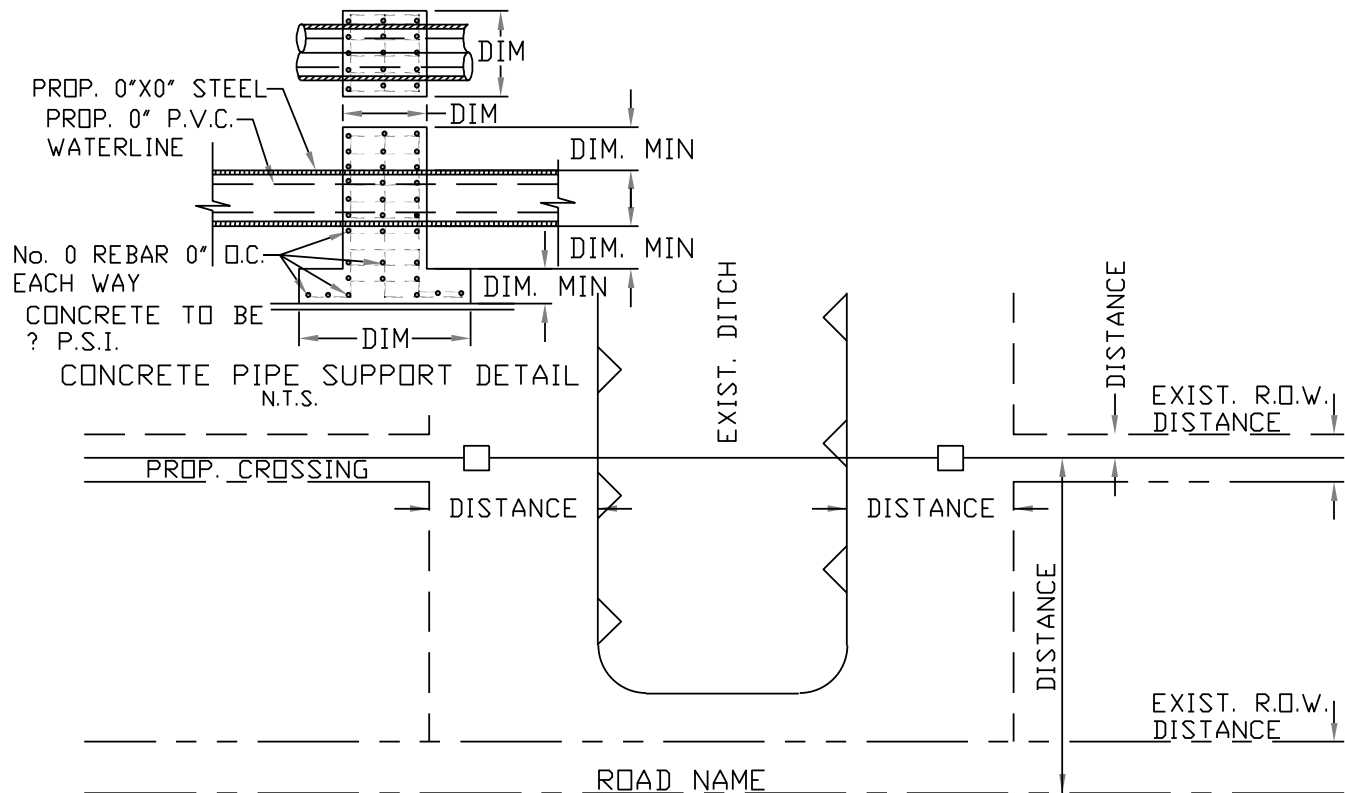


All metallic apply 316 S.S	
Supercover 30 inch bolt composite manhole cover	
Product code:super30	2020/5/6
total weight: 185.3lb.	WWW.SUPERCOVER.COM



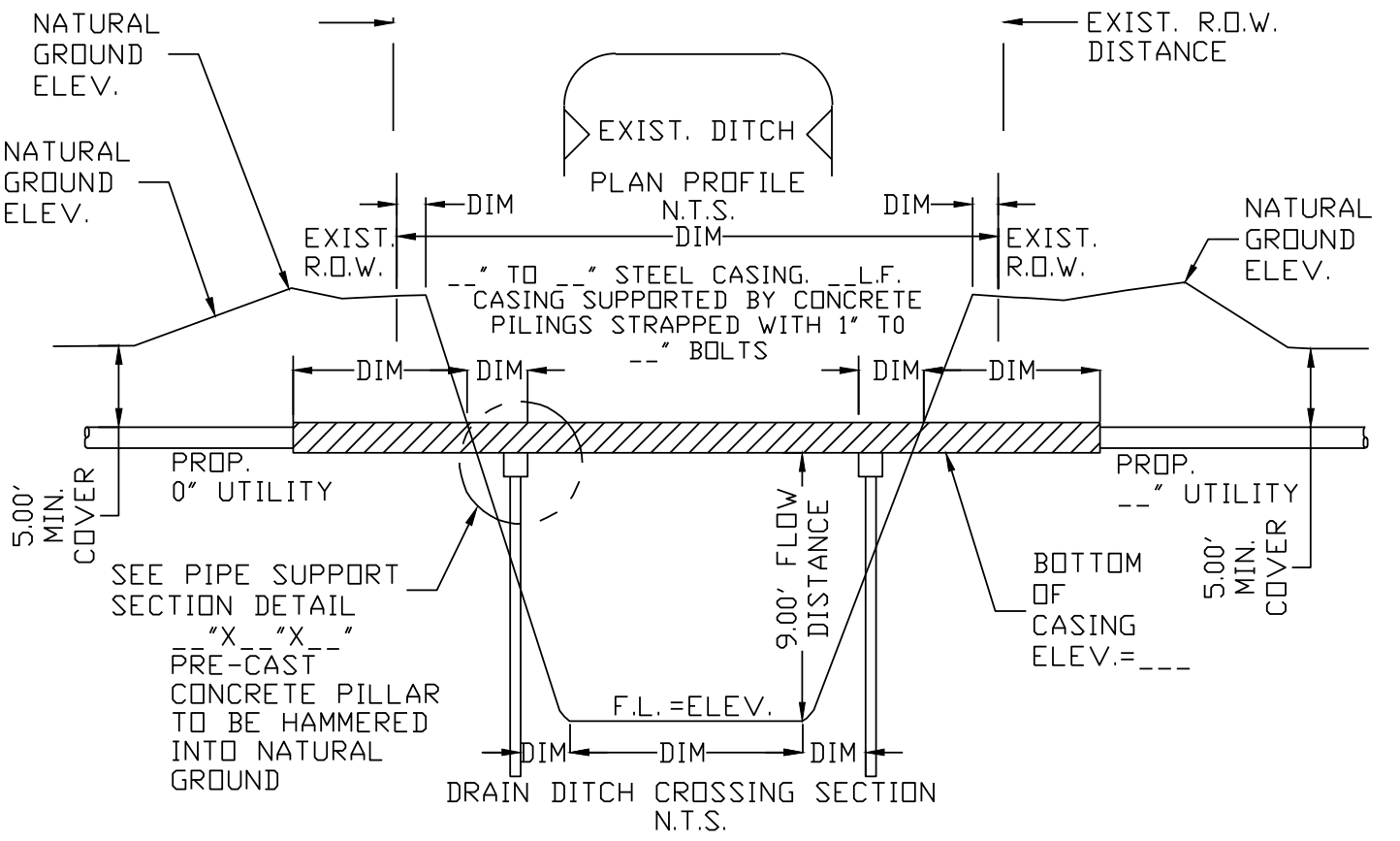
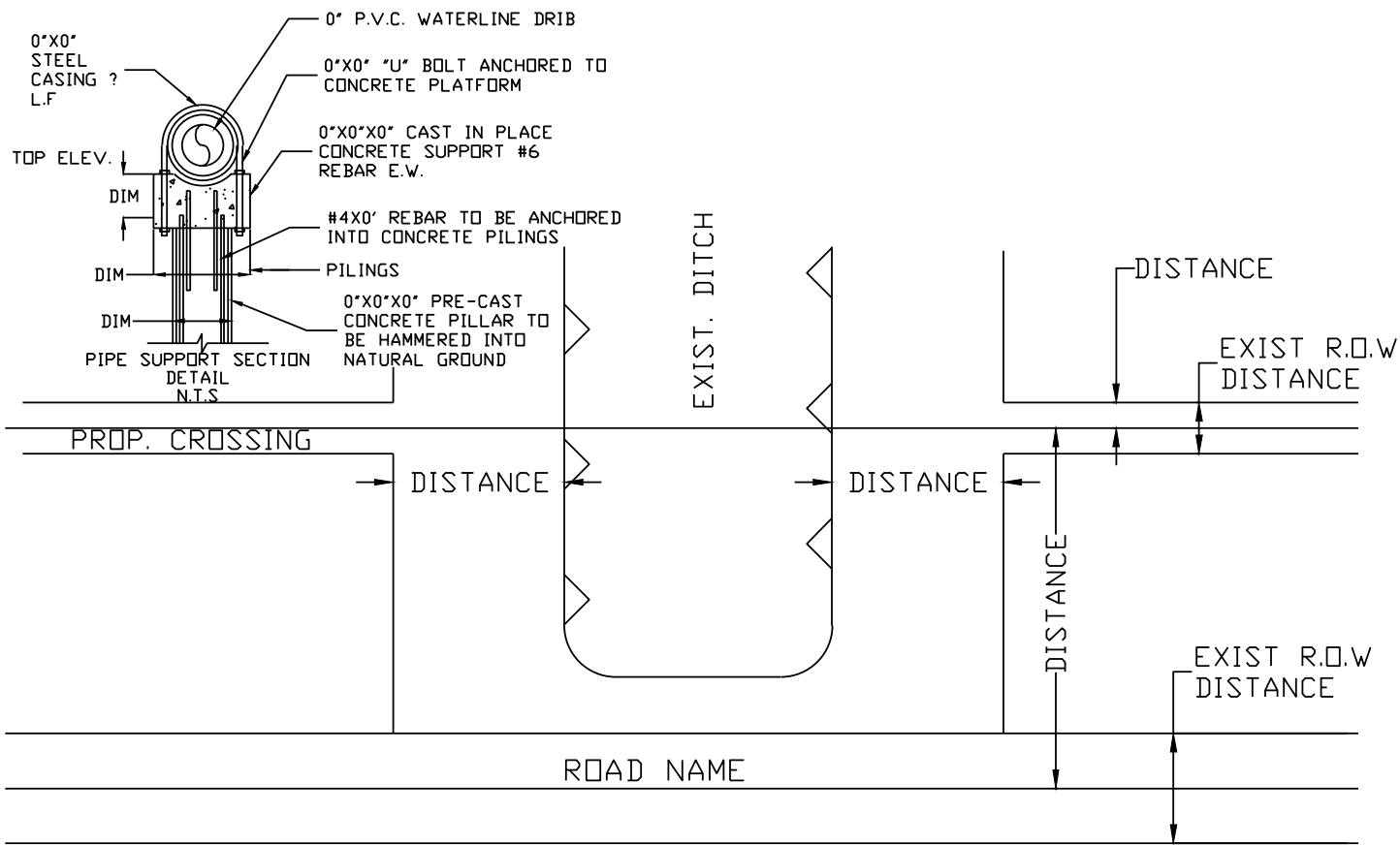
CITY OF SAN JUAN
 STANDARDS MANUAL
 STORM WATER LID COVER





CITY OF SAN JUAN
STANDARDS MANUAL
DRAIN DITCH
CROSSING-CONCRETE PILE
SUPPORT

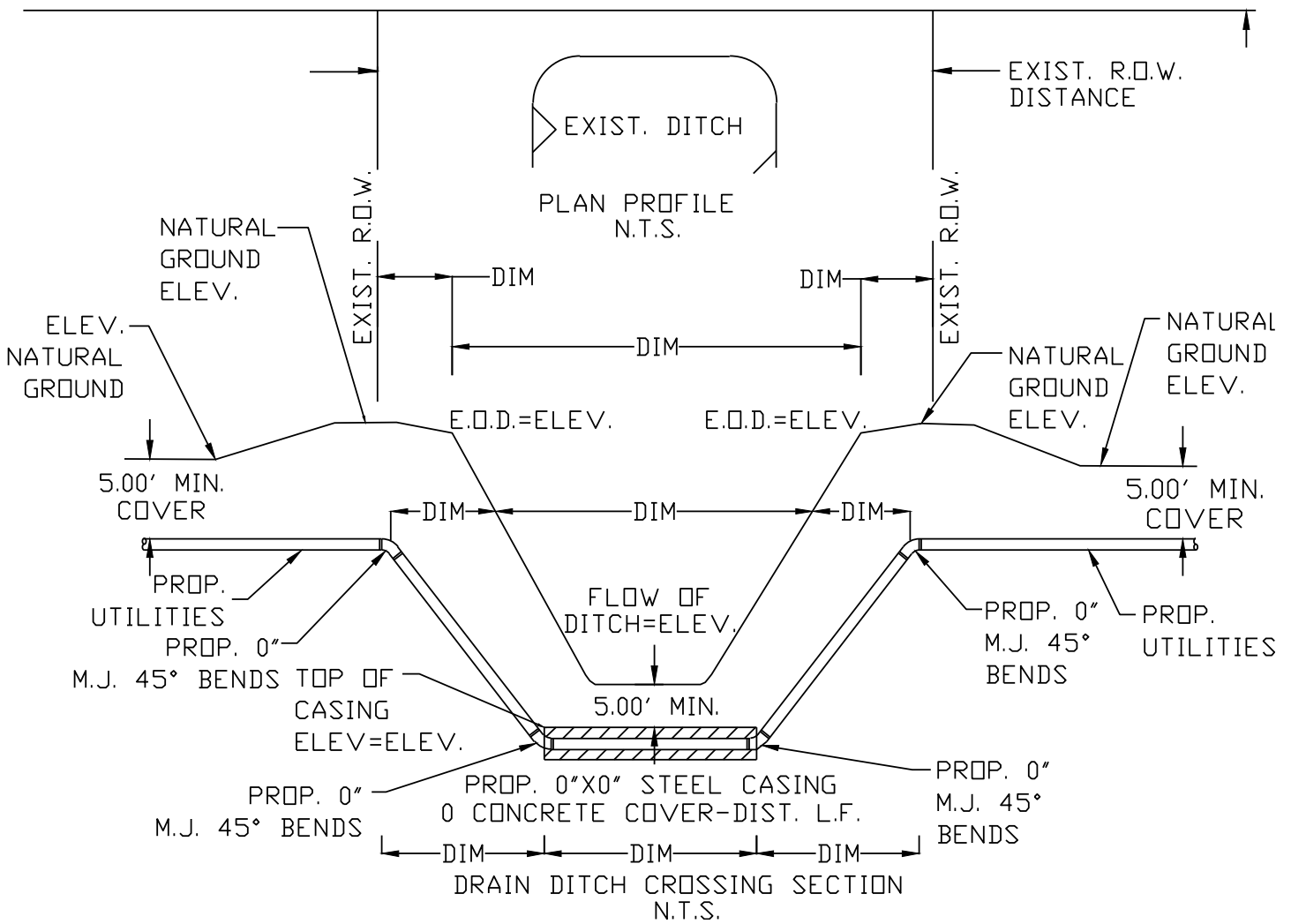
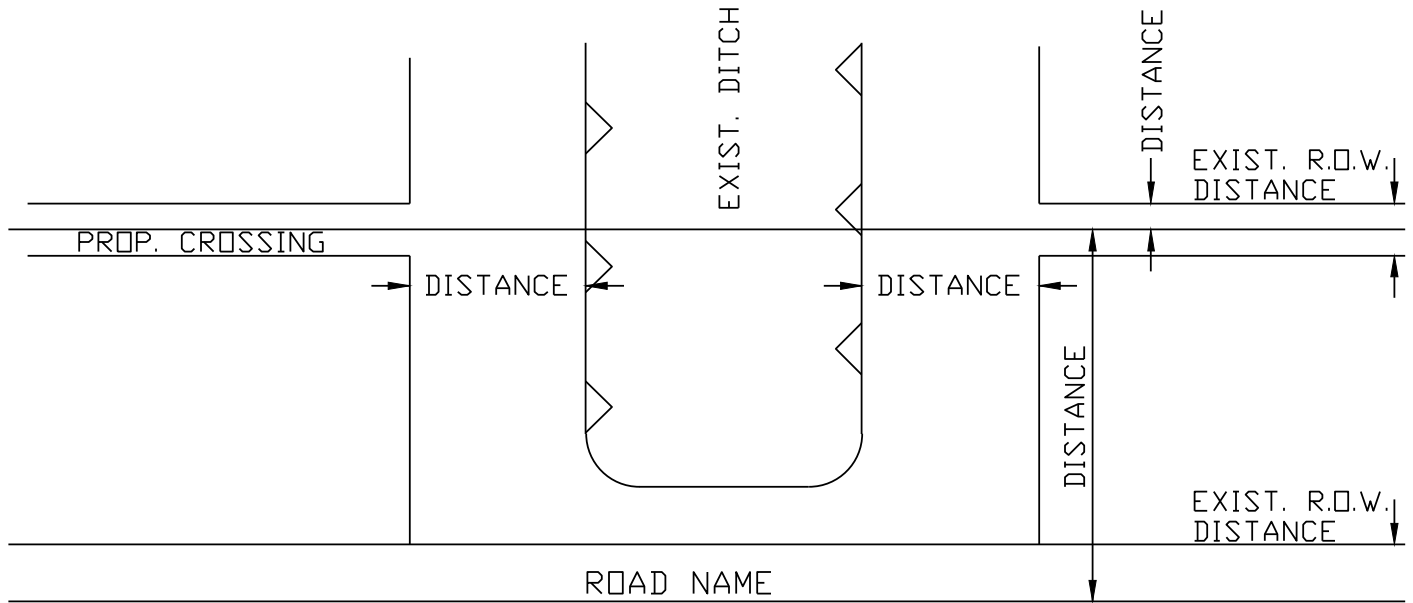




CITY OF SAN JUAN
STANDARDS MANUAL
DRAIN DITCH
CROSSING-PIPE SUPPORT



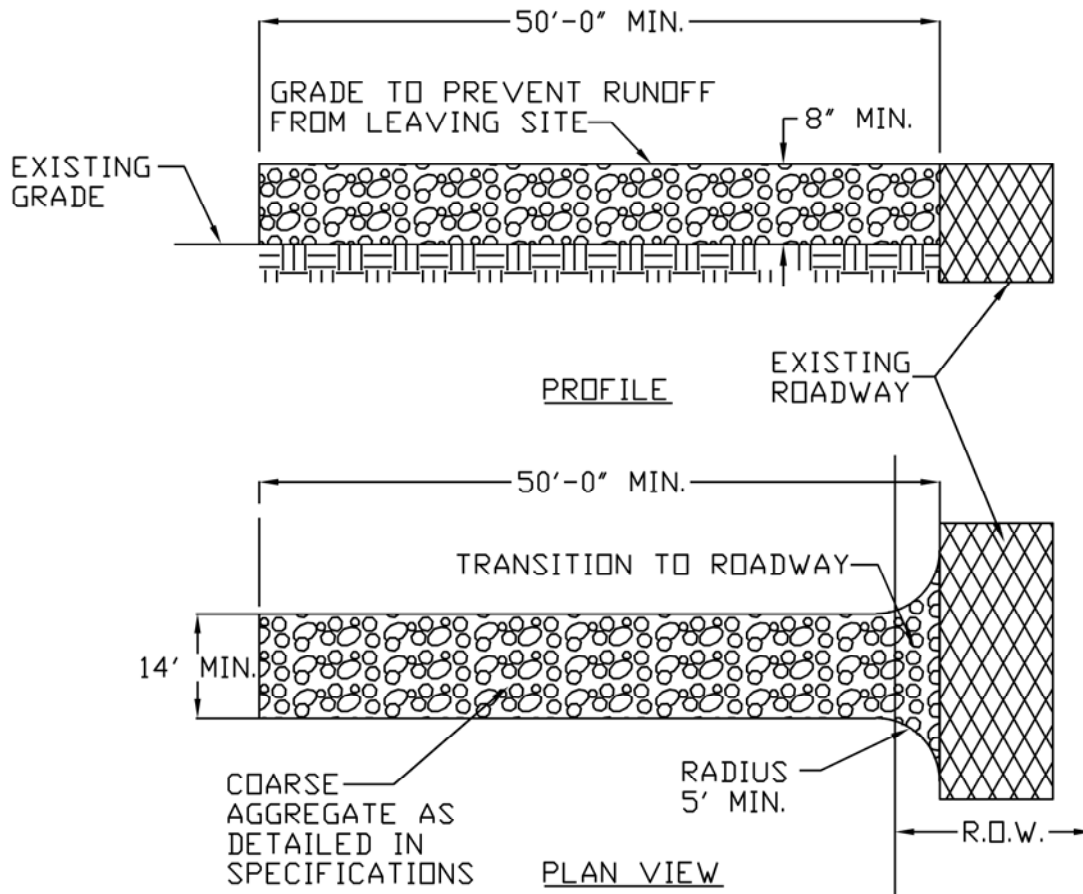
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CITY OF SAN JUAN
STANDARDS MANUAL
EXISTING DITCH CROSSING
CONCRETE PIPE SUPPORT



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GENERAL NOTES:

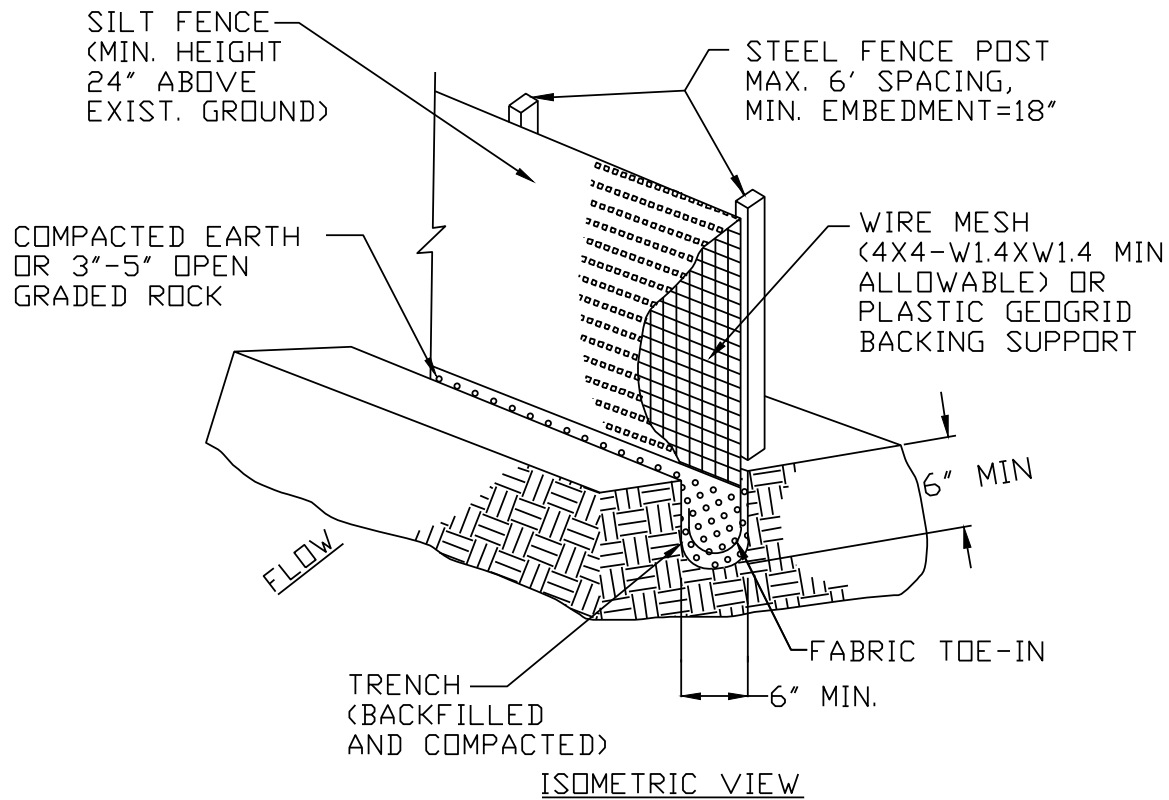
1. STONE SHALL BE 3 TO 5 INCH DIAMETER CRUSHED ROCK OR ACCEPTABLE CRUSHED CEMENT CONCRETE
2. WHEN NECESSARY, VEHICLES SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WITH DRAINAGE FLOWING AWAY FROM BOTH THE STREET AND THE STABILIZED ENTRANCE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE USING APPROVED METHODS.
3. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
4. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PAVED SURFACES. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE "A" CONDITIONS DEMAND. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PAVED SURFACES, MUST BE REMOVED IMMEDIATELY.
5. STABILIZED CONSTRUCTION EXIT TO BE REMOVED UPON COMPLETION OF CONSTRUCTION.



**CITY OF SAN JUAN
STANDARDS MANUAL
STABILIZED CONSTRUCTION
ENTRANCE OR EXIT**



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SILT FENCE NOTES:

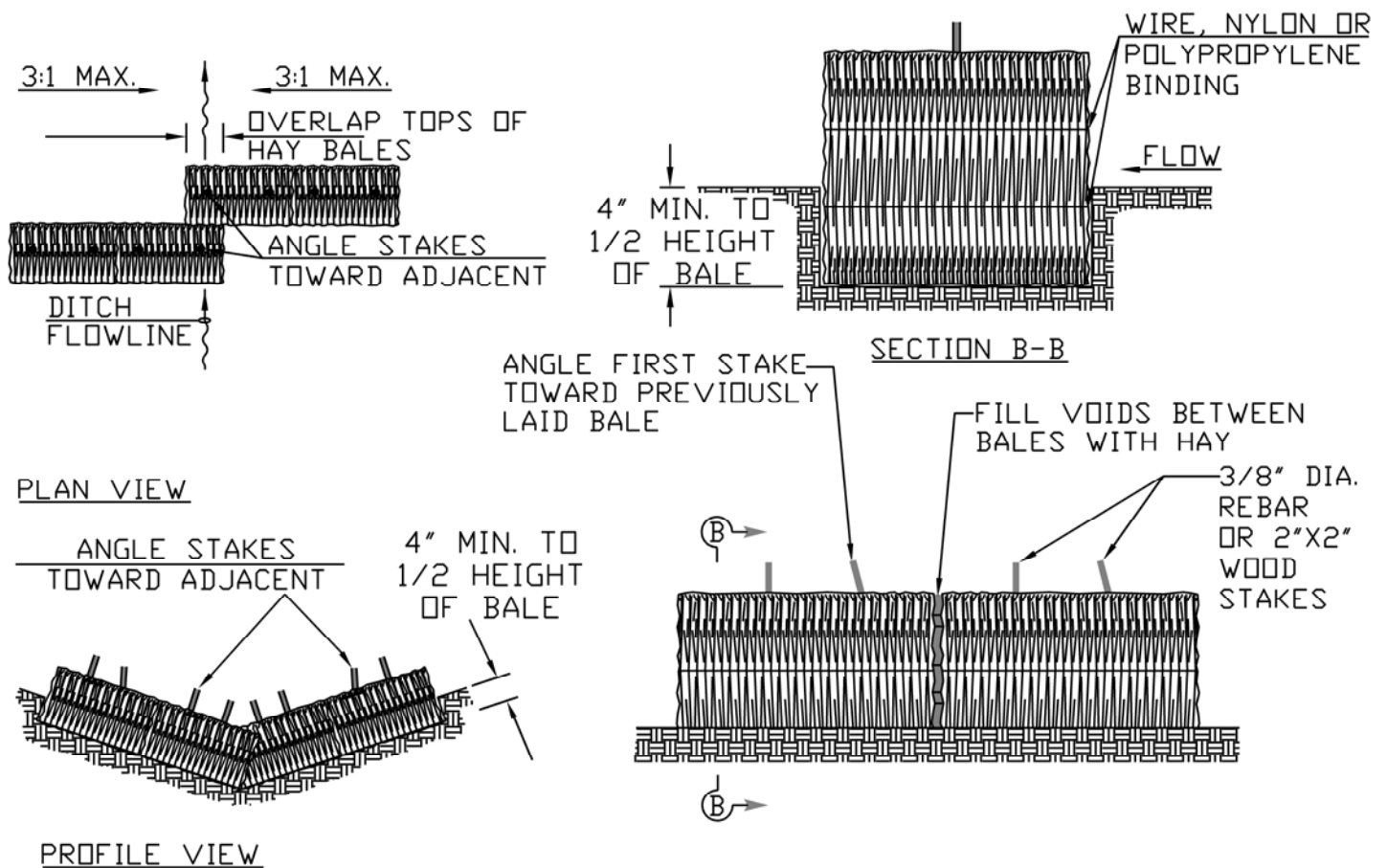
1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED WITH A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 18".
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE, AS NECESSARY, TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO BACKING SUPPORT, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. FABRIC SHALL OVERLAP AT ABUTTING ENDS A MINIMUM OF 3 FEET AND SHALL BE JOINED SUCH THAT NO BYPASS OR LEAKAGE OCCURS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.



CITY OF SAN JUAN
STANDARDS MANUAL
TEMPORARY SILT FENCE



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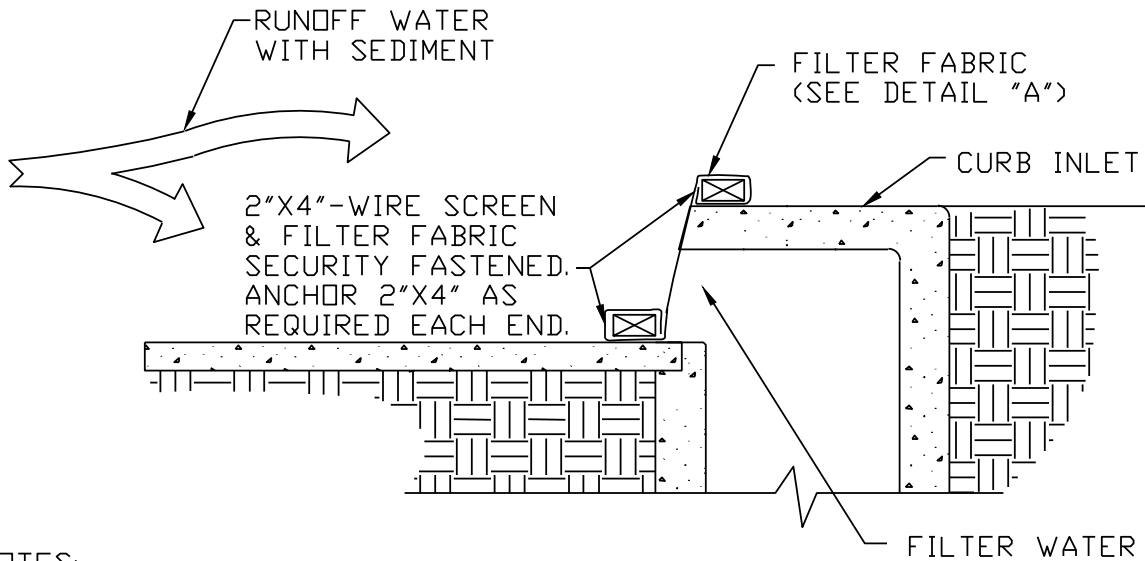
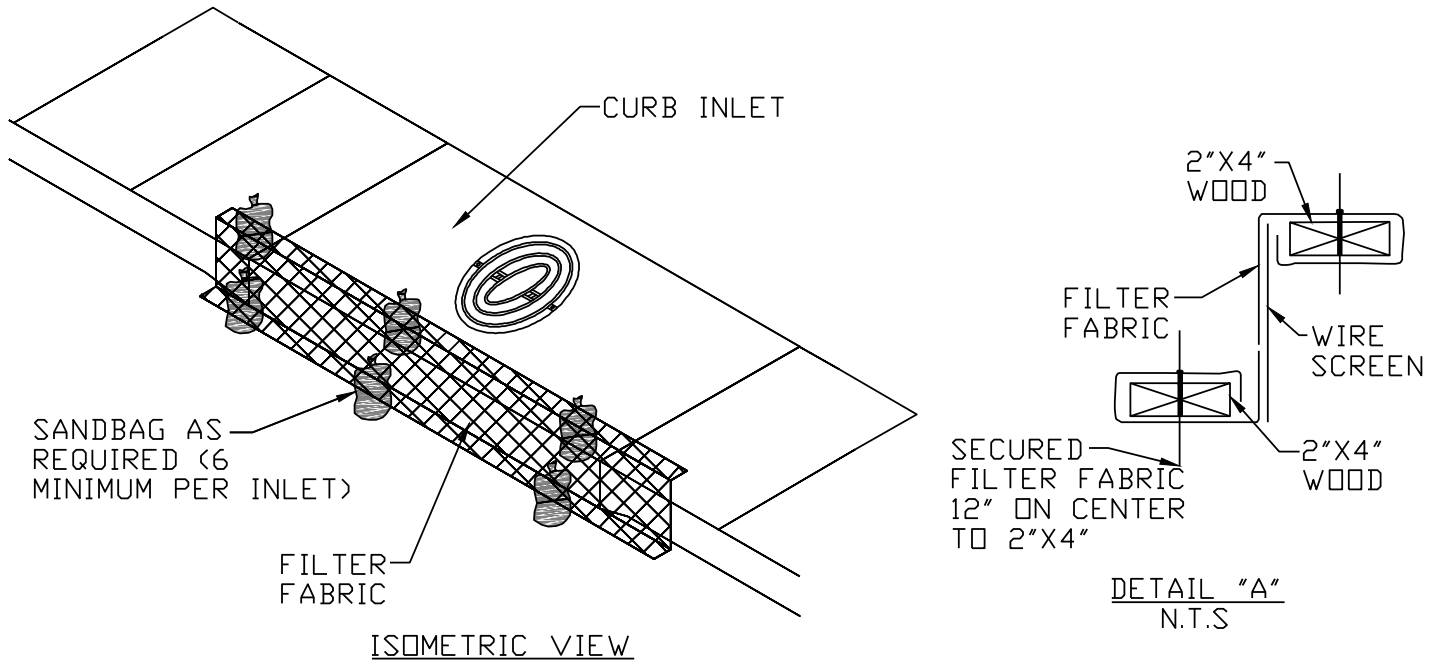
GENERAL NOTES:

1. HAY BALES SHALL BE A MINIMUM OF 30 IN LENGTH AND WEIGH A MINIMUM OF 50LBS
2. HAY BALES SHALL BE BOUND BY EITHER WIRE OR NYLON OR POLYPROPYLENE STRING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETATIVE MATTER.
3. HAY BALES SHALL BE EMBEDDED THE SOIL A MINIMUM OF 4" AND WHERE POSSIBLE, 1/2 THE HEIGHT OF THE BALE.
4. HAY BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY A BUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDING PARALLEL TO THE GROUND.
5. HAY BALES SHALL BE SECURELY ANCHORED IN PLACE WITH 3/8" DIA. REBAR ON 2"X2" WOOD STAKES, DRIVEN THROUGH THE BALES. THE FIRST STAKE SHALL BE ANGLED TOWARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.
7. BALES SHOULD BE REPLACED USUALLY EVERY 2 MONTHS OR MORE OFTEN DURING WET WEATHER WHEN LOSS OF STRUCTURAL INTEGRITY IS ACCELERATED.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL BALED HAY
INSTALLATION





NOTES:

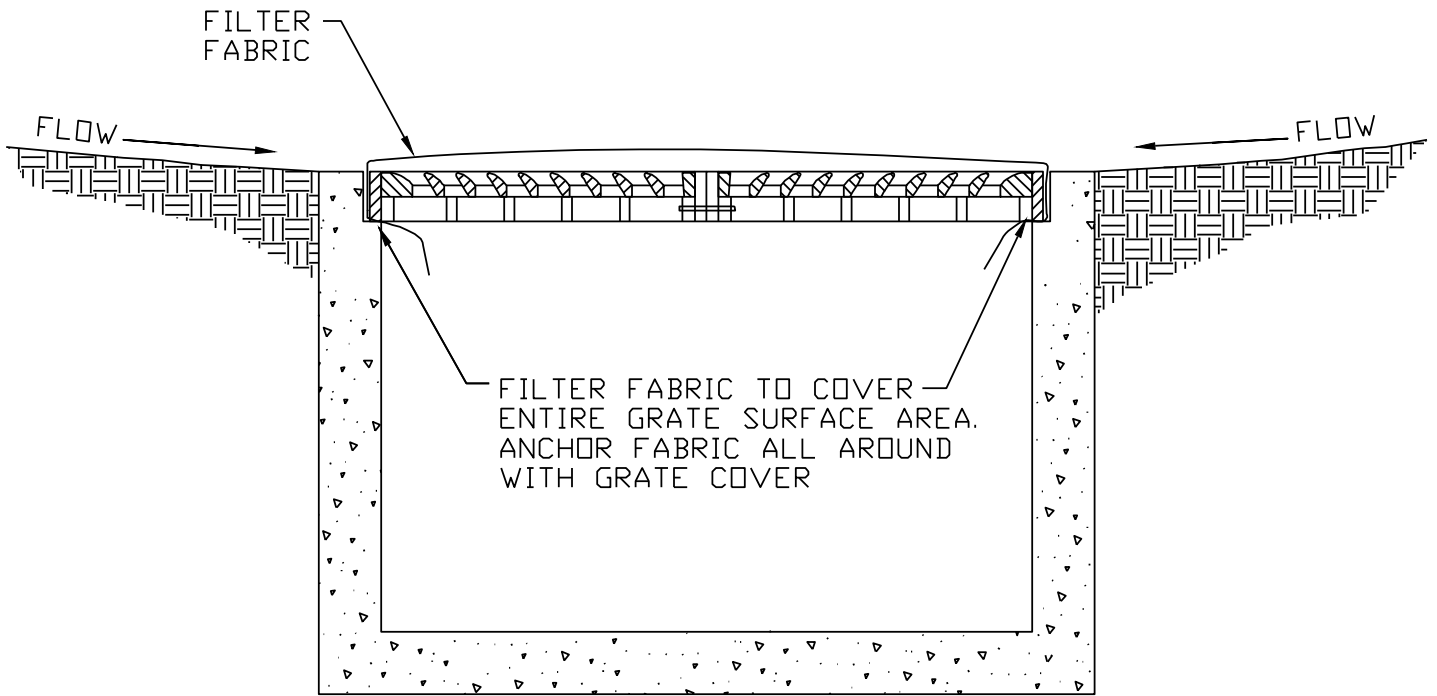
1. FILTER FABRIC CURB INLET PROTECTION TO BE REMOVED WHEN SITE IS FULLY STABILIZED
2. FILTER FABRIC TO BE CLEANED AFTER EACH RAIN EVENT
3. 2X4 LUMBER TO BE CUT AS REQUIRED TO FIT CONTOURS OF GUTTER LINE
4. ALL BAGS TO BE USED FOR INLET PROTECTION TO BE U.V. RESISTANT



**CITY OF SAN JUAN
STANDARDS MANUAL
FILTER FABRIC CURB
INLET PROTECTION**



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NOTES:

1. FILTER FABRIC CURB INLET PROTECTION TO BE REMOVED WHEN SITE IS FULLY STABILIZED
2. FILTER FABRIC TO BE CLEARED AFTER EACH RAIN EVENT AT EACH INLET

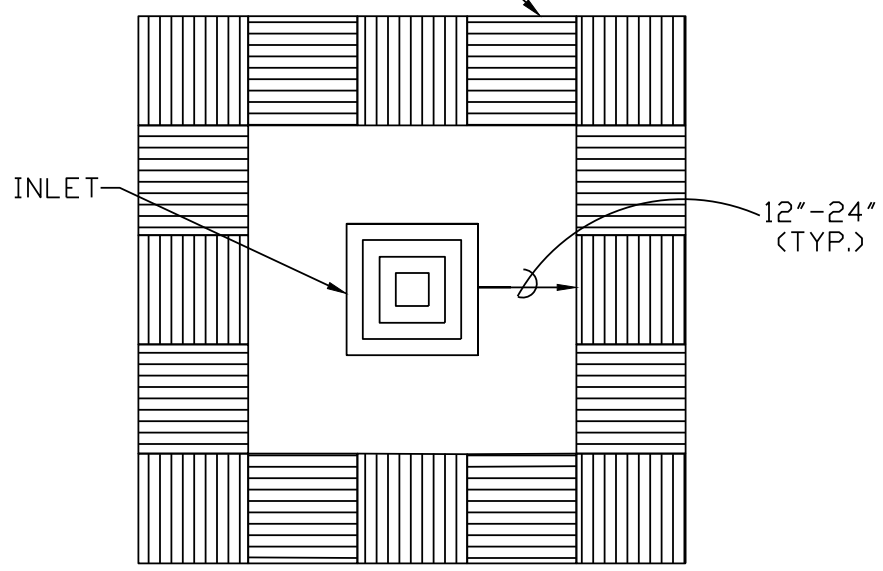


CITY OF SAN JUAN
STANDARDS MANUAL
FILTER FABRIC GRATE
INLET PROTECTION



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HAY BALES EMBEDDED 4" INTO GROUND. TWO STAKES PER BALE DRIVEN A MIN. OF 9" INTO GROUND.



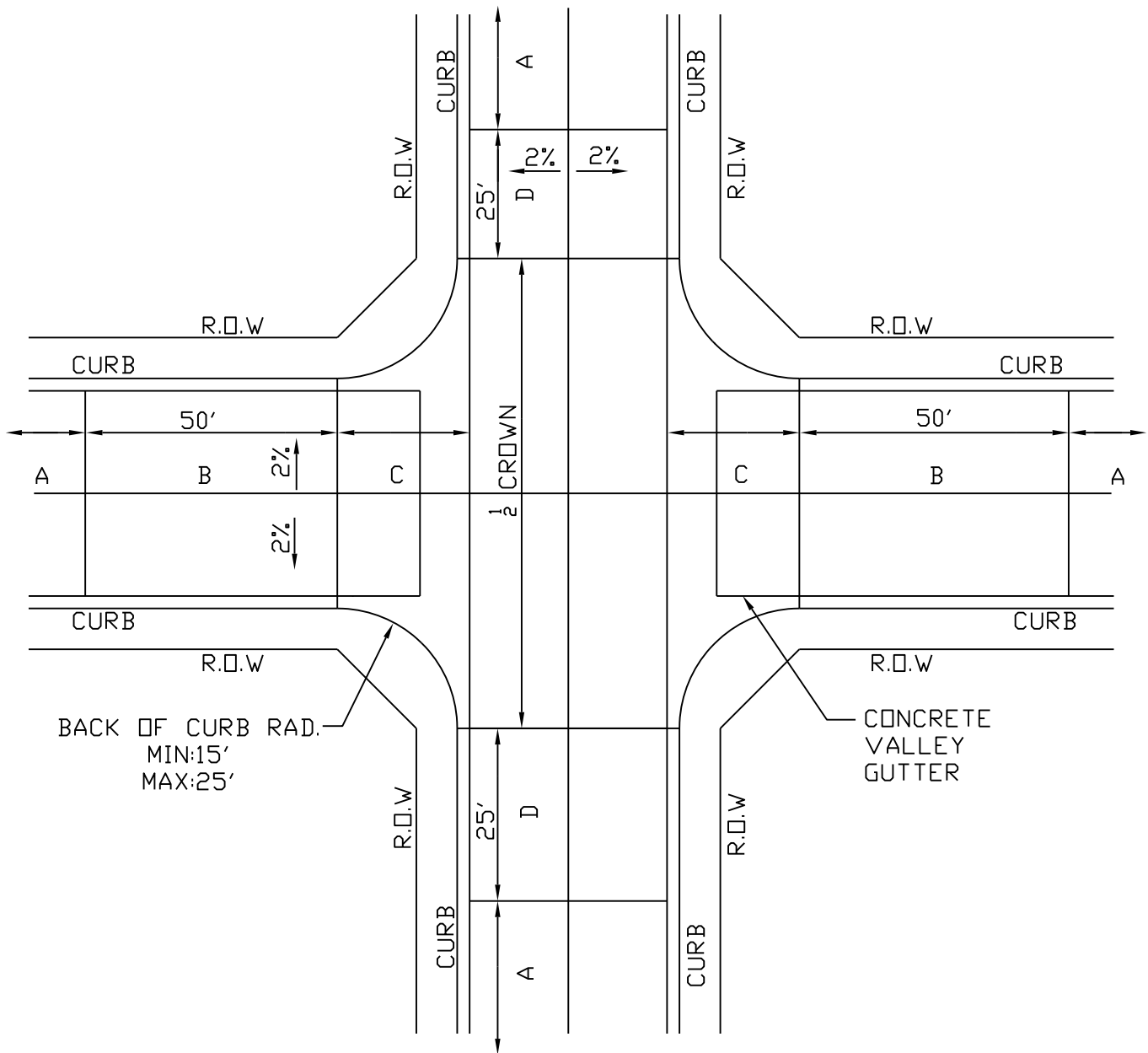
CITY OF SAN JUAN
STANDARDS MANUAL
BALED HAY INLET
PROTECTION



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APPENDIX 5

PAVING DETAILS



NOTE:
 TYPICAL FOR THE INTERSECTION OF TWO LOCAL STREETS.
 ALL OTHER INTERSECTIONS SHALL BE APPROVED BY THE CITY
 OF SAN JUAN.



CITY OF SAN JUAN
 STANDARDS MANUAL
 TYPICAL LOCAL STREET
 INTERSECTION
 SHEET 1 OF 2



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GENERAL NOTES:

1. REDUCE NORMAL CROWN TO NO CROWN SECTION WHEN APPROACHING PERPENDICULAR TO VALLEY GUTTER.
2. REDUCE NORMAL CROWN TO HALF CROWN SECTION WHEN STREET IS PARALLEL TO VALLEY GUTTER.
3. FOR "T" INTERSECTION THE THROUGH STREET WILL RETAIN NORMAL CROWN & THE LEG OF THE "T" WILL REDUCE NORMAL CROWN TO NO CROWN SECTION WHEN APPROACHING PERPENDICULAR TO VALLEY GUTTER.
4. CONSTRUCTION PLANS WILL DETAIL "T" INTERSECTION WHEN DRAINAGE FLOWS ACROSS THROUGH STREET OF INTERSECTION.
5. CONSTRUCTION PLANS WILL SPECIFY RADII CURB RETURNS.
6. VALLEY GUTTER SHALL BE 6 FEET WIDE PER STANDARD DETAIL.

CONSTRUCTION NOTES:

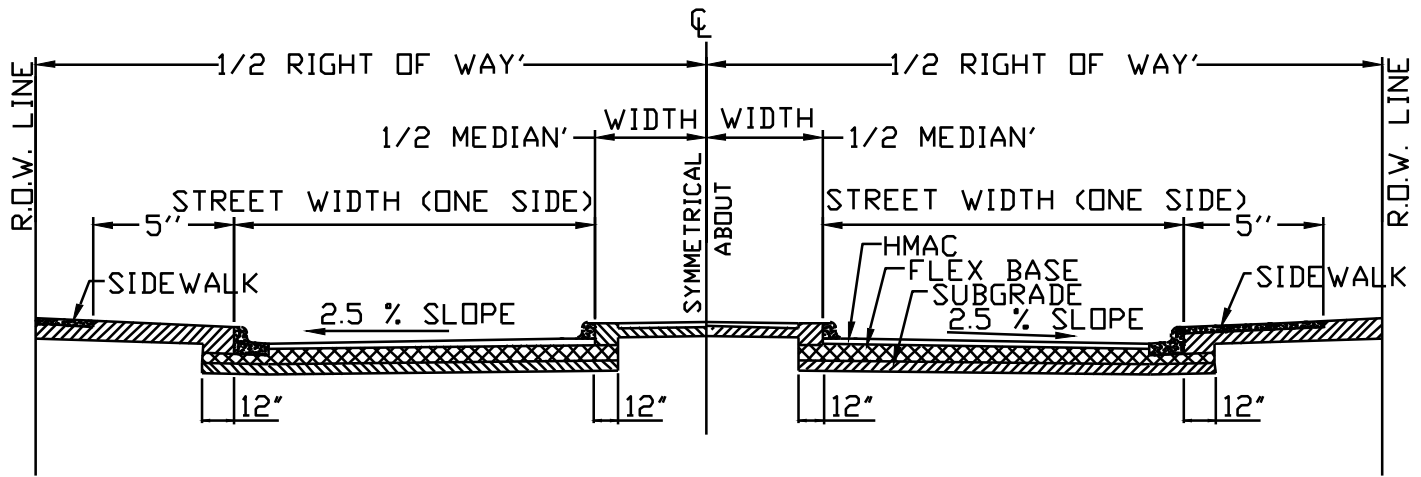
- A. NORMAL CROWN FOR RESIDENTIAL STREET.
- B. TRANSITION SECTION FROM FULL CROWN TO NO CROWN SECTION.
- C. NO CROWN SECTION.
- D. TRANSITION SECTION FROM FULL CROWN TO HALF CROWN SECTION.



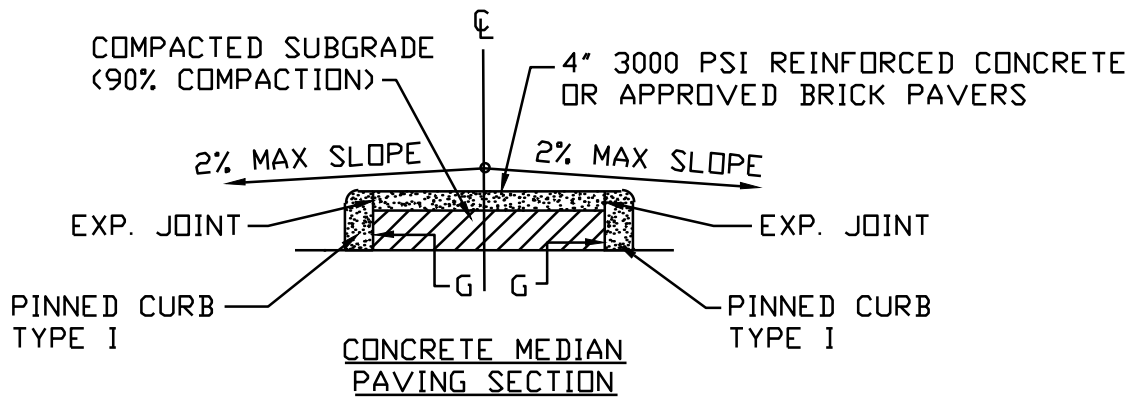
CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL LOCAL STREET
INTERSECTION
SHEET 2 OF 2



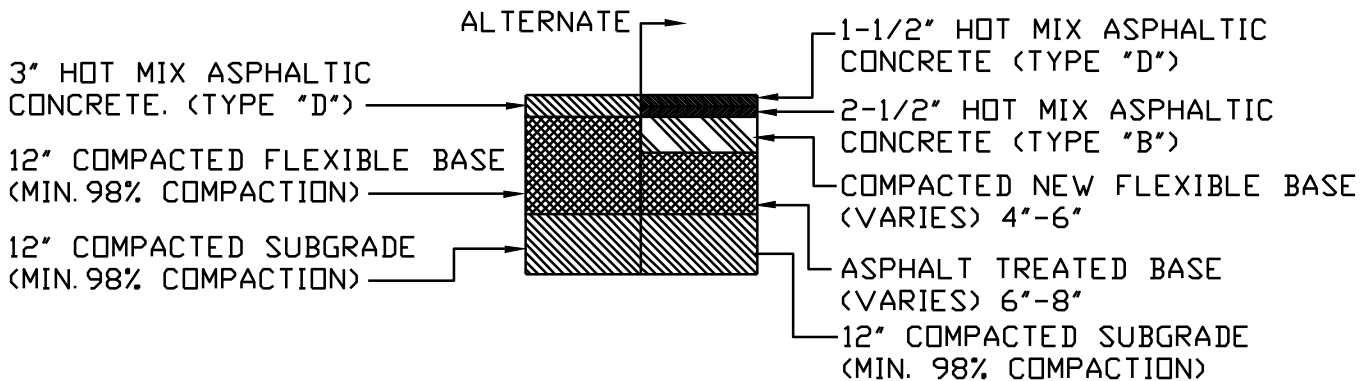
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TYPICAL PRINCIPAL ARTERIAL OR MINOR ARTERIAL STREET SECTION WITH MEDIAN



CONCRETE MEDIAN PAVING SECTION



PAVEMENT SECTION ASPHALT CONCRETE

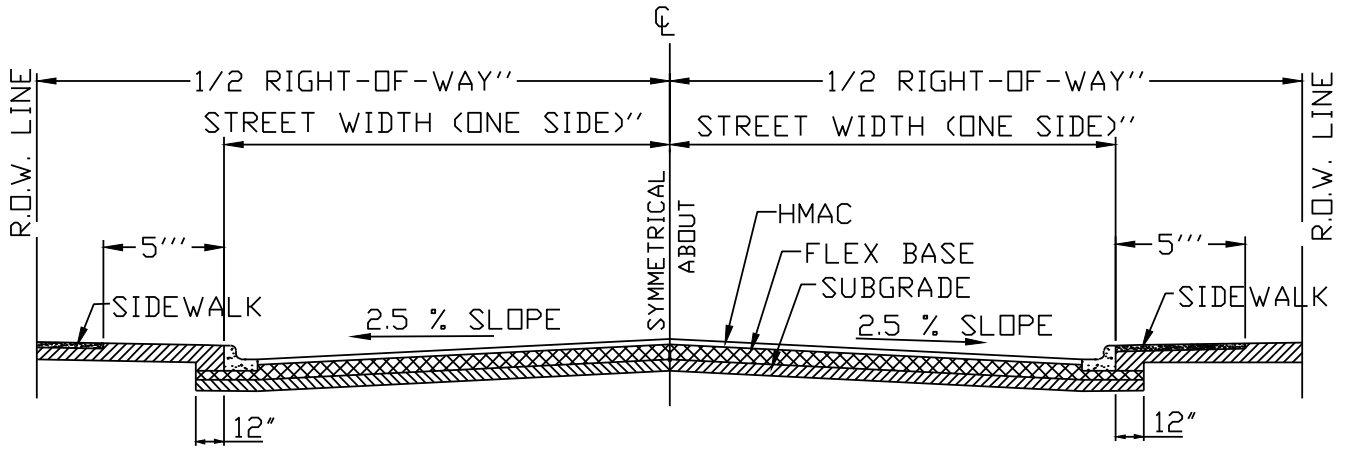
REINFORCED CONCRETE PAVEMENT MAY BE REQUIRED FOR HEAVY VEHICULAR TRAFFIC LOADS. DESIGN SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL.



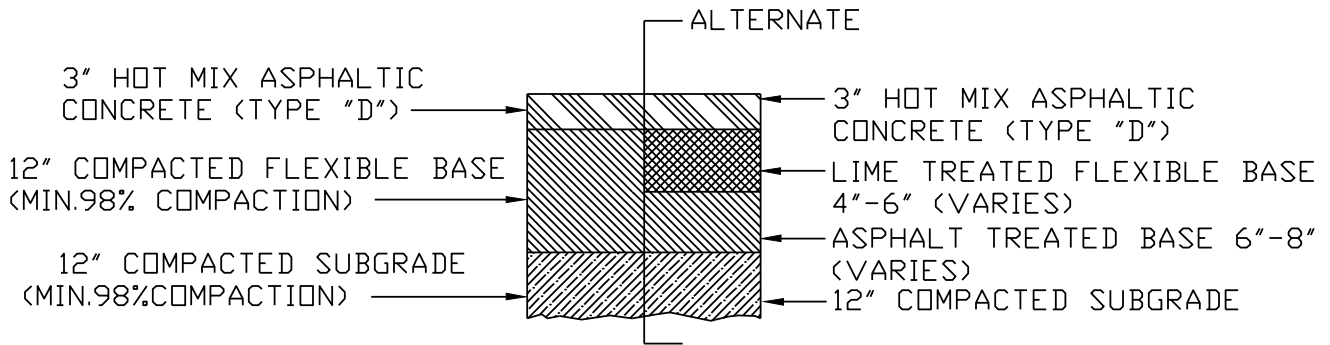
**CITY OF SAN JUAN
STANDARDS MANUAL
PRINCIPAL ARTERIAL/MINOR
ARTERIAL STREET SECTION
WITH MEDIAN**



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TYPICAL PRINCIPAL ARTERIAL OR MINOR ARTERIAL SECTION
WITHOUT MEDIAN



PAVEMENT SECTION
ASPHALT CONCRETE

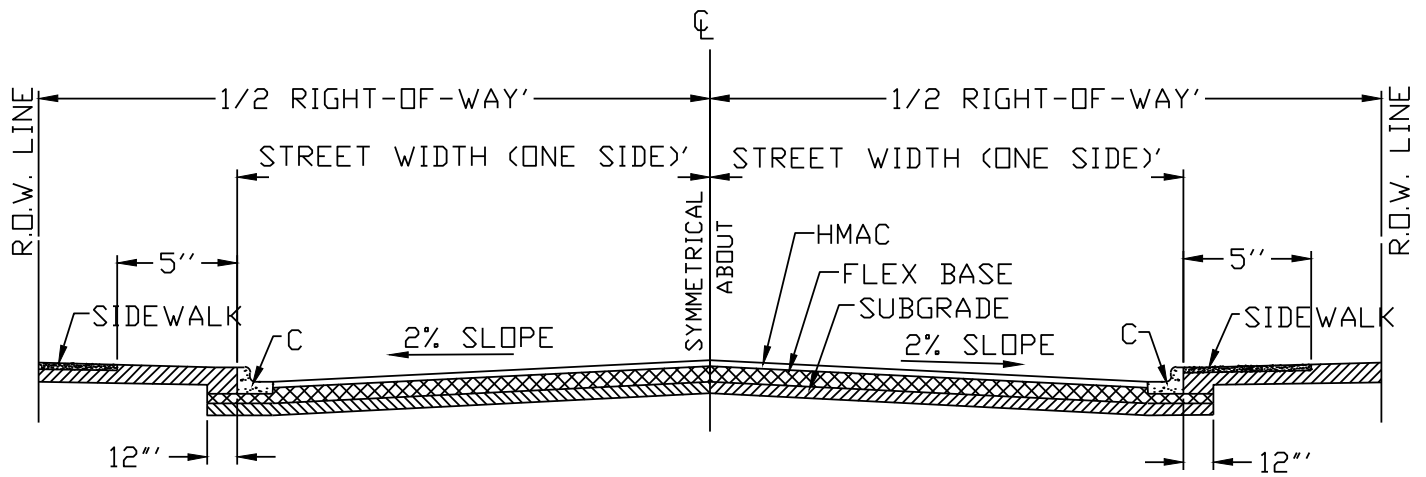
REINFORCED CONCRETE PAVEMENT MAY BE REQUIRED FOR HEAVY VEHICULAR TRAFFIC LOADS. DESIGN SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL.



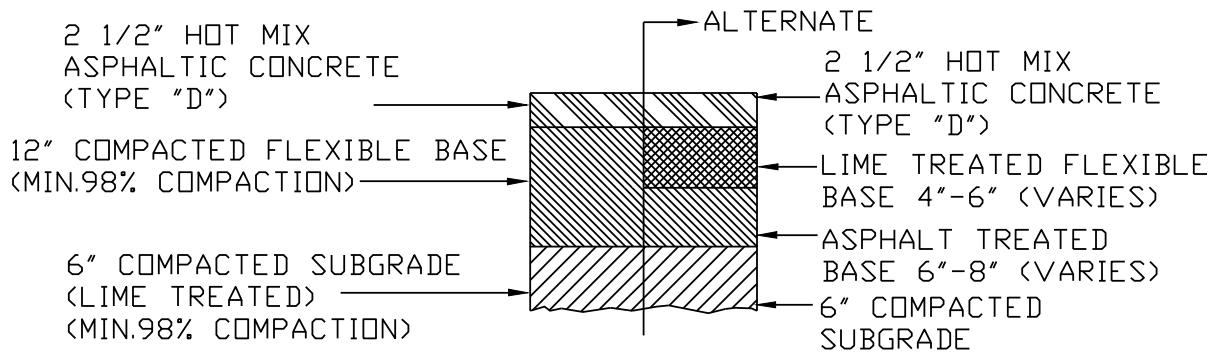
CITY OF SAN JUAN
STANDARDS MANUAL
PRINCIPAL ARTERIAL/MINOR
ARTERIAL STREET SECTION
WITHOUT MEDIAN



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TYPICAL COLLECTOR STREET SECTION



PAVEMENT SECTION
ASPHALT CONCRETE

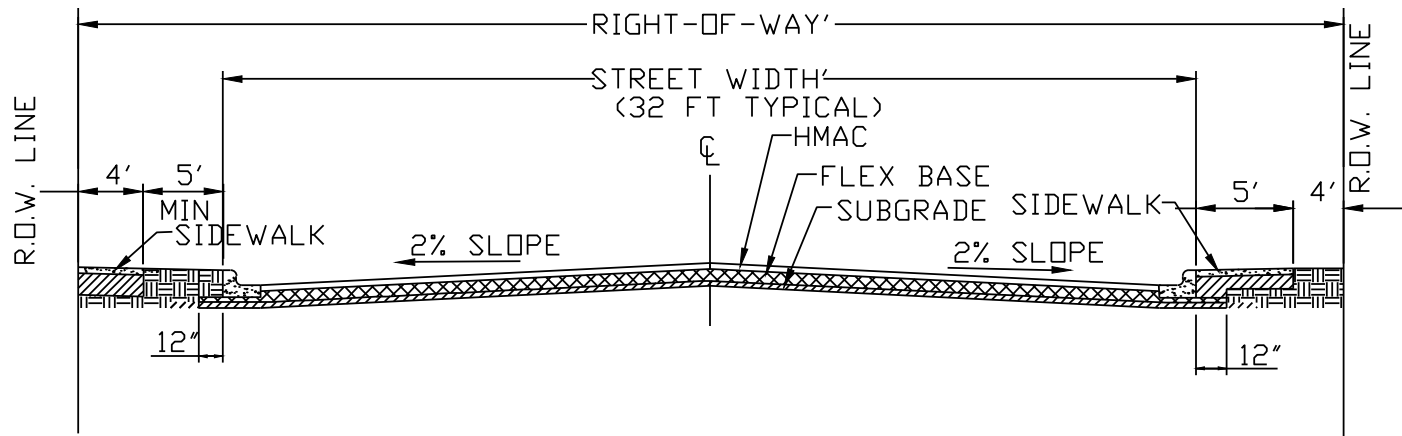
REINFORCED CONCRETE PAVEMENT MAY BE REQUIRED FOR HEAVY VEHICULAR TRAFFIC LOADS. DESIGN SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL.



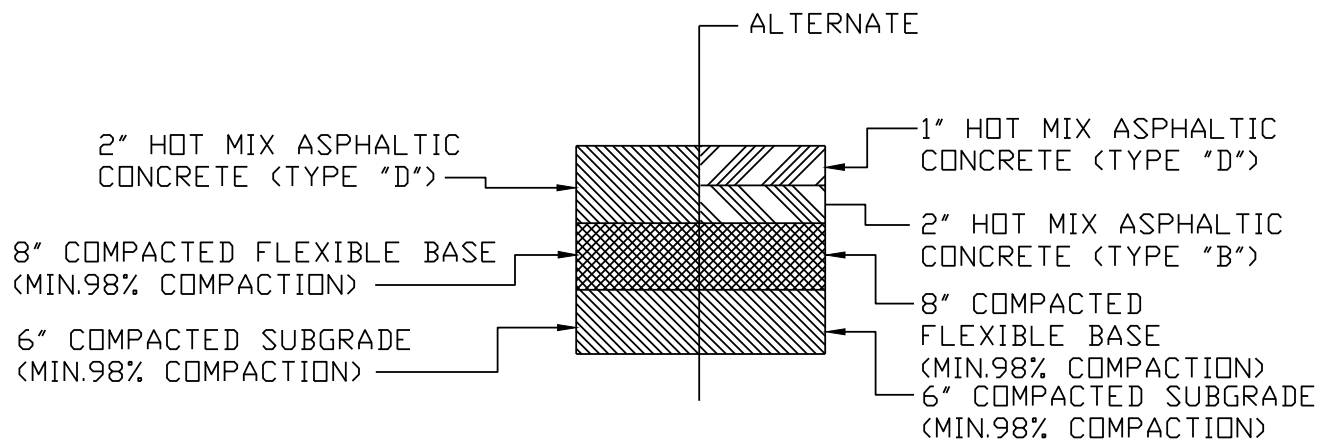
CITY OF SAN JUAN
STANDARDS MANUAL
COLLECTOR STREET SECTION



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TYPICAL LOCAL STREET SECTION



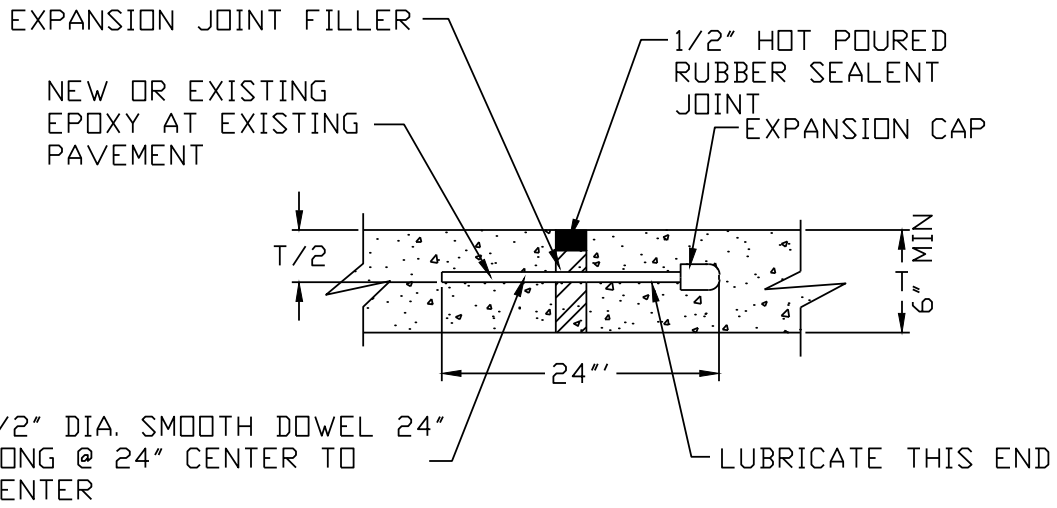
PAVEMENT SECTION
ASPHALT CONCRETE



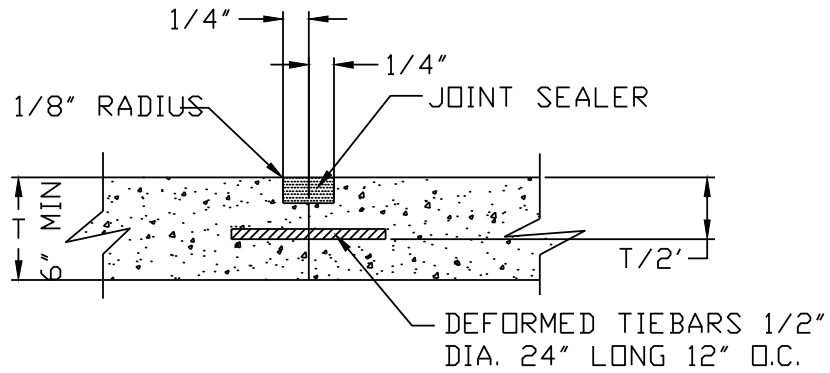
CITY OF SAN JUAN
STANDARDS MANUAL
LOCAL STREET SECTION



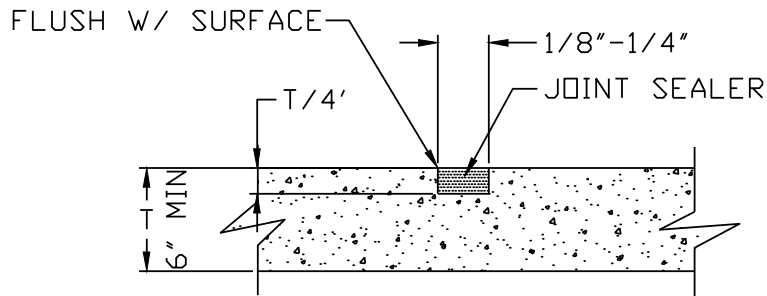
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EXPANSION JOINT



CONSTRUCTION JOINT



SAWED OR PREMOLDED STRIP
LONGITUDINAL OR TRANSVERSE

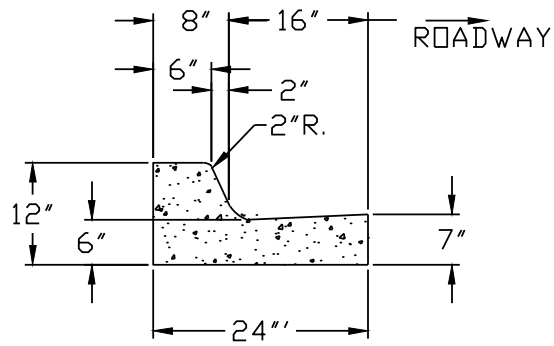
SAWED CONTRACTION JOINT



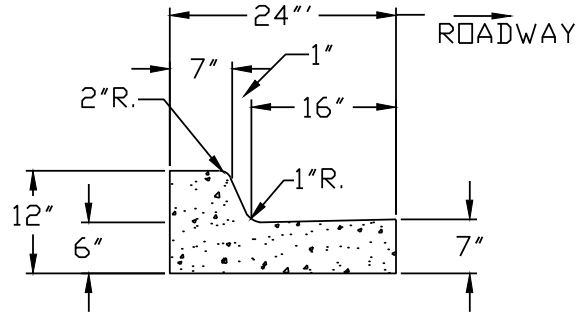
CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL CONCRETE JOINT



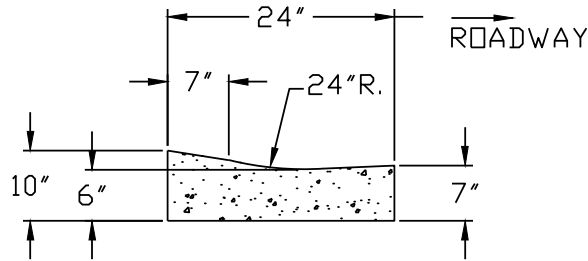
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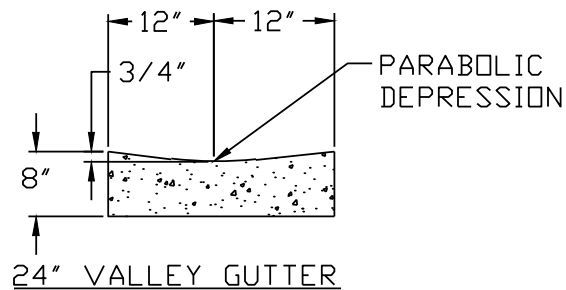
STANDARD CURB & GUTTER TYPE A



STANDARD CURB & GUTTER TYPE B



LAYDOWN CURB & GUTTER



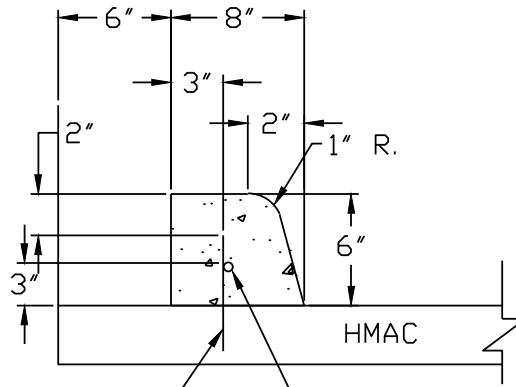
24" VALLEY GUTTER



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE CURB & GUTTER

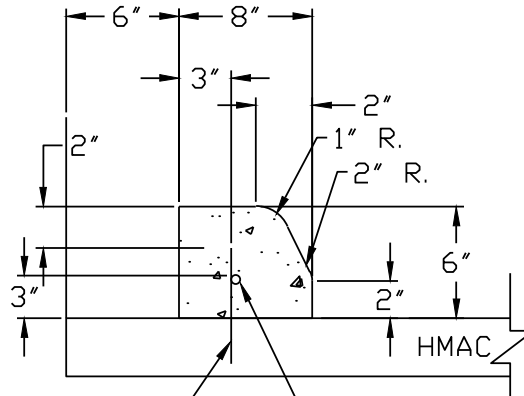


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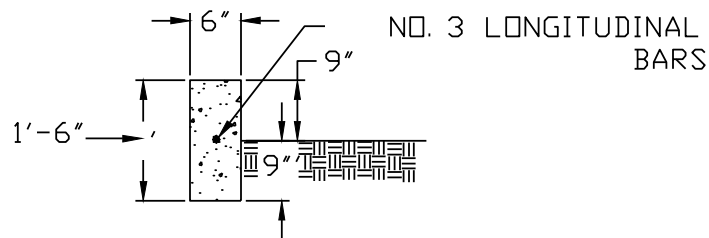
NO. 4 BARS 12"
DEEP @ 15" O.C. NO. 3 LONGITUDINAL BARS

PINNED CURB TYPE I



NO. 4 BARS 12"
DEEP @ 15" O.C. NO. 3 LONGITUDINAL BARS

PINNED CURB TYPE II



HEADER CURB



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE CURB & GUTTER
SHEET 2 OF 3



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GENERAL NOTES:

1. CURBS AND GUTTERS TO BE CONSTRUCTED OF 3000 PSI CONCRETE.
2. FOR NON-REINFORCED STANDARD CURB OR CURB & GUTTER PROVIDE SAWED CONTRACTION JOINTS 10' O.C. MAX. ALSO PROVIDE 1/2" EXPANSION JOINTS AT 30' O.C. MAX. AT POINTS OF CURVATURE, CURB INLETS, BOX CULVERTS, AT EACH SIDE OF DRIVEWAYS AND ADJACENT TO SIDEWALK.
3. FOR REINFORCED STANDARD CURB OR CURB & GUTTER PROVIDE SAWED CONTRACTION JOINTS 10' O.C. MAX AND EXPANSION JOINTS SHALL BE SPACED AT 120' O.C. MAX, AT POINTS OF CURVATURE, CURB INLETS, BOX CULVERTS, AT EACH SIDE OF DRIVEWAYS, AND ADJACENT TO SIDEWALKS.
4. EDGES NOT SPECIFIED WITH DIMENSIONS SHALL BE EDGED WITH A 3/8" EDGING TOOL.
5. A MEMBRANE CURING COMPOUND SHALL BE APPLIED TO EXPOSED CURB OR CURB & GUTTER AFTER THE SURFACE FINISH HAS BEEN COMPLETED AT A MIN. RATE OF 1 GAL/180 S.F. OF SURFACE AREA.
6. DESIGN ELEVATIONS TO BE GIVEN AT PC, PT AND MID POINT OF THE CURB RADII (FLOW OF CURB ELEVATION) AND AT INTERSECTIONS OF PROJECTED FLOWLINES (FLOWLINE ELEVATION).
7. ON UPSTREAM AND DOWNSTREAM ENDS OF THE INTERSECTION, VALLEY GUTTER CONSTRUCTION SHALL EXTEND TO THE END OF RETURNS.
8. THE VALLEY GUTTER TO BE REINFORCED WITH 6"X 6" X NO. 6 GA. WIRE MESH. OR NO. 3 @ 12" O.C.E.W. 4. INVERT OF VALLEY GUTTER TO EXTEND FROM FLOWLINE OF UPSTREAM CURB RETURN TO FLOWLINE OF DOWNSTREAM CURB RETURN.
9. FOR NEW CONSTRUCTION, VALLEY GUTTER SHALL BE CONSTRUCTED PRIOR TO ADJACENT PAVEMENT.
10. PRIOR TO CONSTRUCTION OF NEW VALLEY GUTTER ON EXISTING ACCEPTED STREETS, PAVEMENT SHALL BE REMOVED AS SHOWN ON PLANS.
11. FOR HANDICAP RAMP, SEE DETAIL.
12. EXISTING CURB OR PAVEMENT SHALL BE SAWCUT WHERE NECESSARY TO CONNECT TO PROPOSED VALLEY GUTTER.
13. 4" FLEXBASE SHALL EXTEND UNDER CURB AND GUTTER AND COMPACTED TO A MINIMUM 98% COMPACTION.



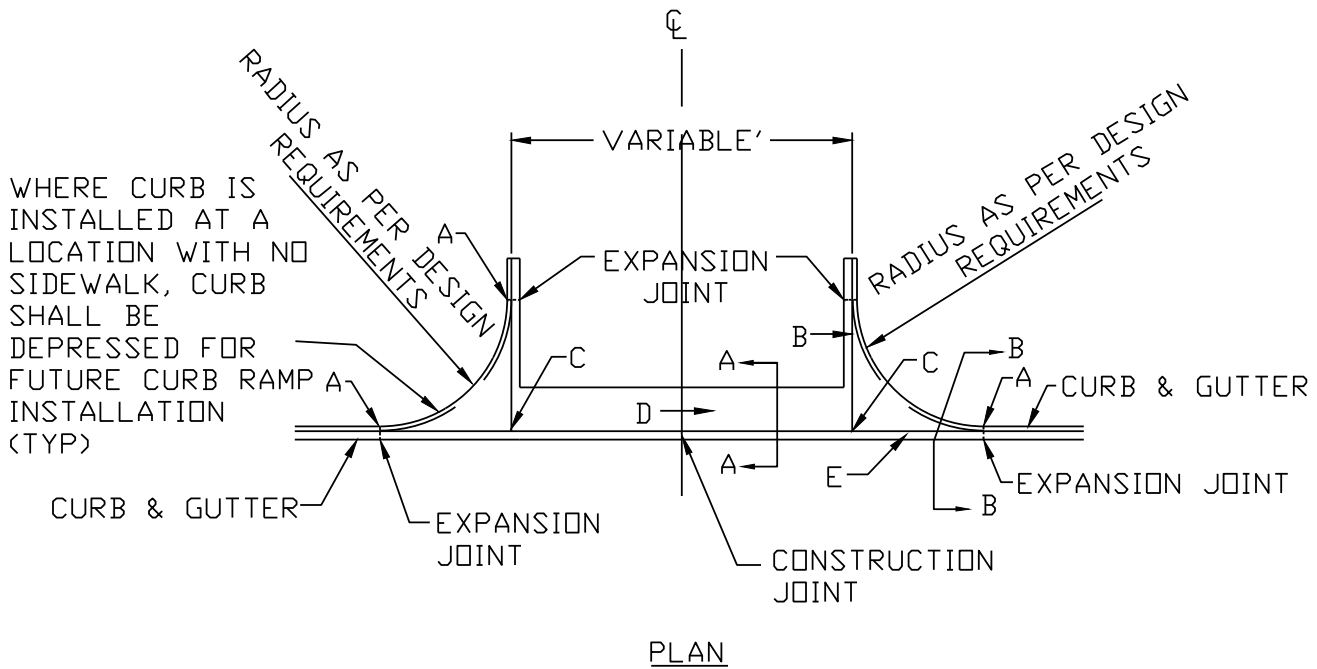
CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE CURB & GUTTER
SHEET 3 OF 3



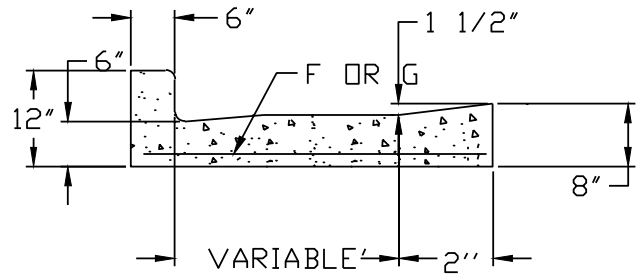
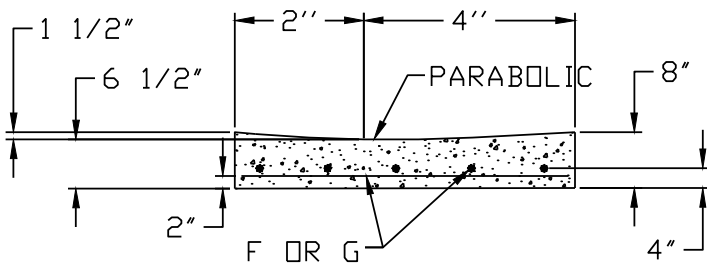
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NOTES:

1. REFER TO SHEET 2 OF 2 FOR GENERAL AND CONSTRUCTION NOTES
2. VALLEY GUTTER DESIGN TO BE APPROVED BY THE CITY OF SAN JUAN



WHERE CURB IS INSTALLED



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE VALLEY GUTTER
SHEET 1 OF 2



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GENERAL NOTES:

1. DESIGN ELEVATIONS TO BE GIVEN AT PC, PT AND MID POINT OF THE CURB RADII (FLOW OF CURB ELEVATION) AND AT INTERSECTIONS OF PROJECTED FLOWLINES (FLOWLINE ELEVATION).
2. ON UPSTREAM AND DOWNSTREAM ENDS OF THE INTERSECTION, VALLEY GUTTER CONSTRUCTION SHALL EXTEND TO THE END OF RETURNS.
3. THE VALLEY GUTTER TO BE REINFORCED WITH 6" X 6" X NO. 6 GA. WIRE MESH. OR NO. 3 @ 12" O.C.E.W.
4. INVERT OF VALLEY GUTTER TO EXTEND FROM FLOWLINE OF UPSTREAM CURB RETURN TO FLOWLINE OF DOWNSTREAM CURB RETURN.
5. FOR NEW CONSTRUCTION, VALLEY GUTTER SHALL BE CONSTRUCTED PRIOR TO ADJACENT PAVEMENT.
6. PRIOR TO CONSTRUCTION OF NEW VALLEY GUTTER ON EXISTING ACCEPTED STREETS, PAVEMENT SHALL BE REMOVED AS SHOWN ON PLANS.
7. VALLEY GUTTER SHALL BE PLACED USING 3000 P.S.I CONCRETE.
8. FOR HANDICAP RAMP, SEE DETAIL.
9. EXISTING CURB OR PAVEMENT SHALL BE SAWCUT WHERE NECESSARY TO CONNECT TO PROPOSED VALLEY GUTTER.

CONSTRUCTION NOTES:

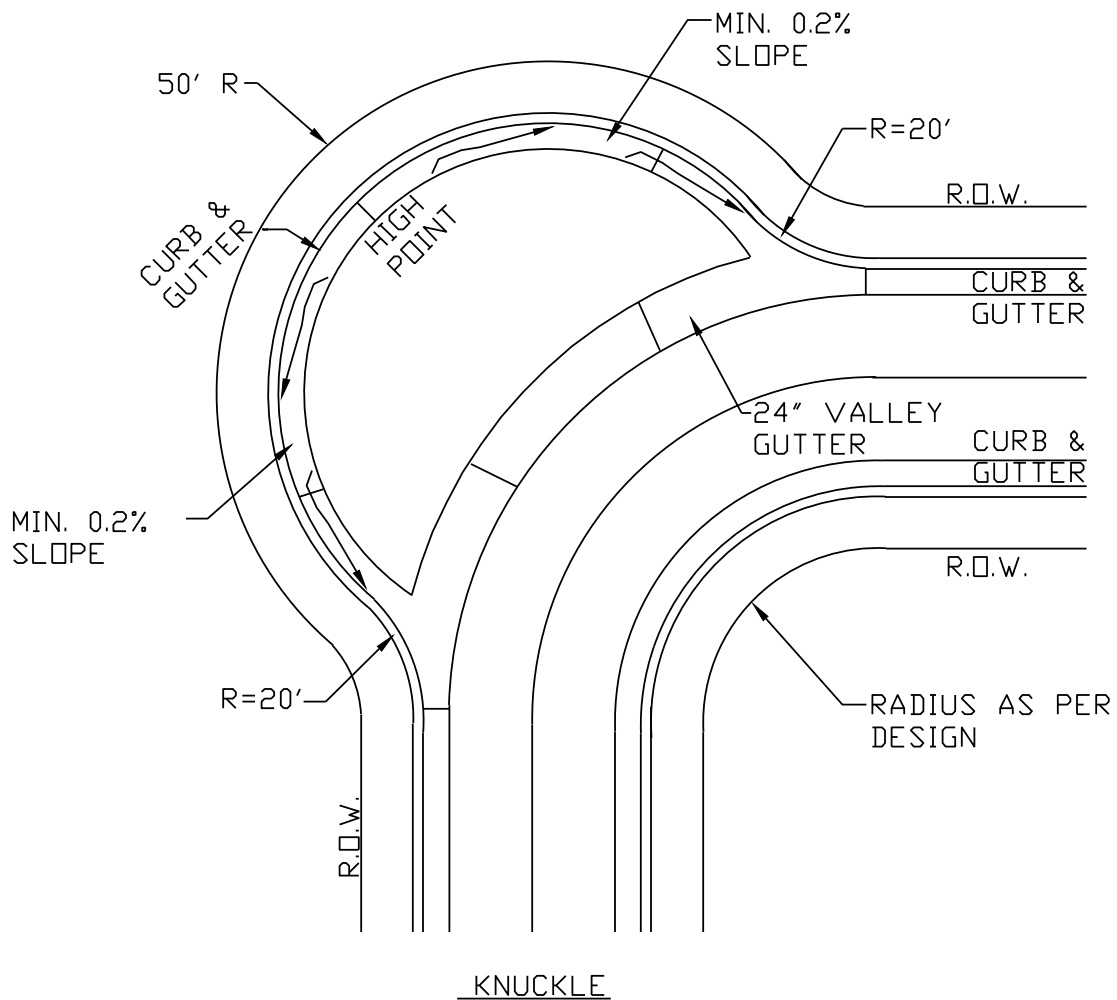
- A. END OF CURB RETURN, SEE NOTE 1.
- B. PROJECTED FLOW LINE OF 1 1/2" INVERT SEE NOTE 2.
- C. INTERSECTION OF FLOWLINES, SEE NOTE 1.
- D. DIRECTION OF FLOW
- E. FLOWLINE
- F. 6" X 6" NO. 6 GA. WIRE MESH
- G. NO. 3 BARS AT 12" O.C.E.W.
- H. THE 1 1/2" INVERT DEPTH MAY BE REDUCED TO IMPROVE DRIVEABILITY WITH APPROVAL FROM THE CITY OF SAN JUAN.



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE VALLEY GUTTER
SHEET 2 OF 2



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GENERAL NOTES

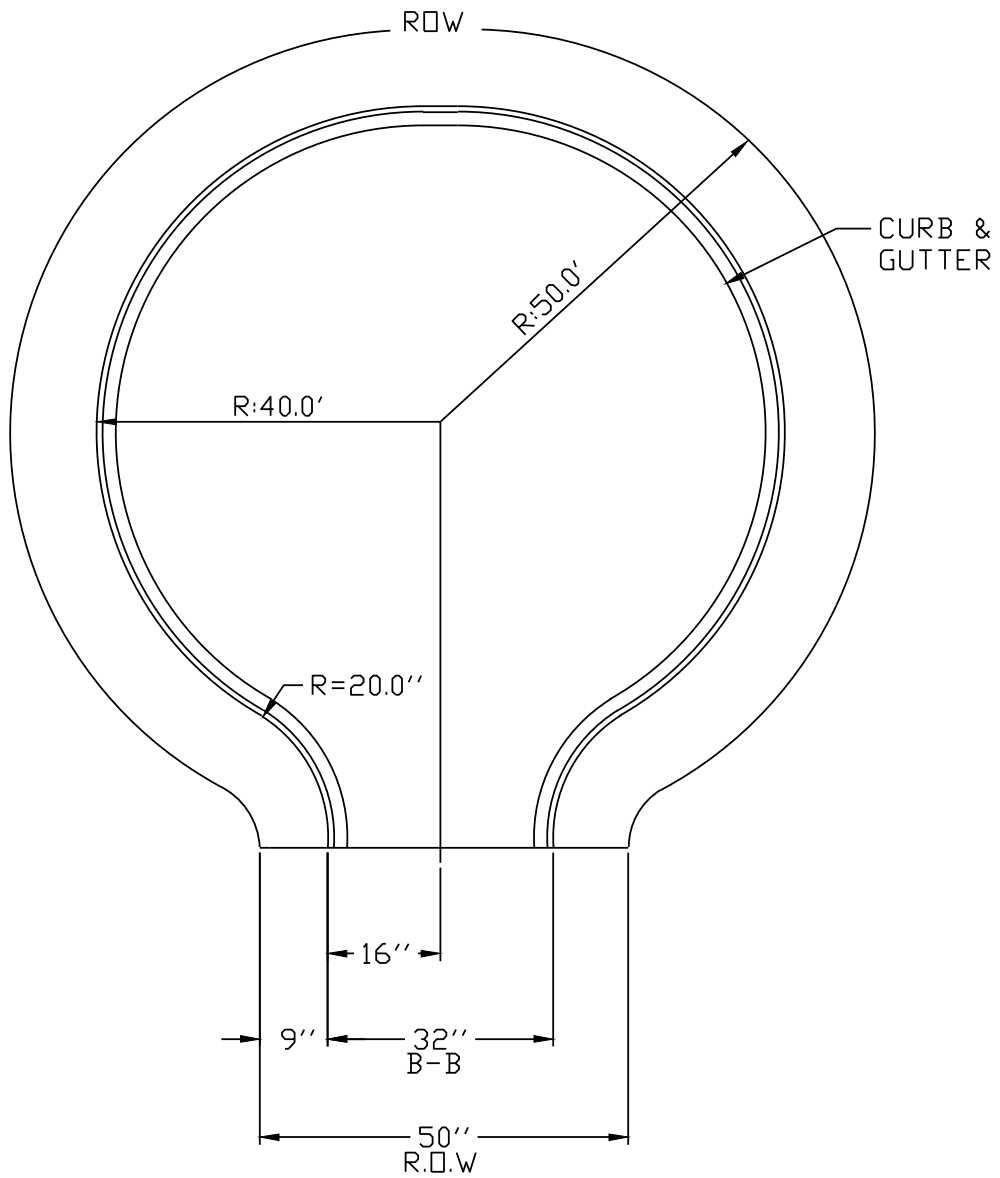
1. KNUCKLE REQUIRED AT INTERSECTIONS WHICH ARE NOT "+" , "T", OR "Y" INTERSECTIONS THAT HAVE PAVEMENT WIDTHS LESS THAN 40 FEET.
2. DEVIATIONS SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL PRIOR TO CONSTRUCTION.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL KNUCKLE DETAIL



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GENERAL NOTES:

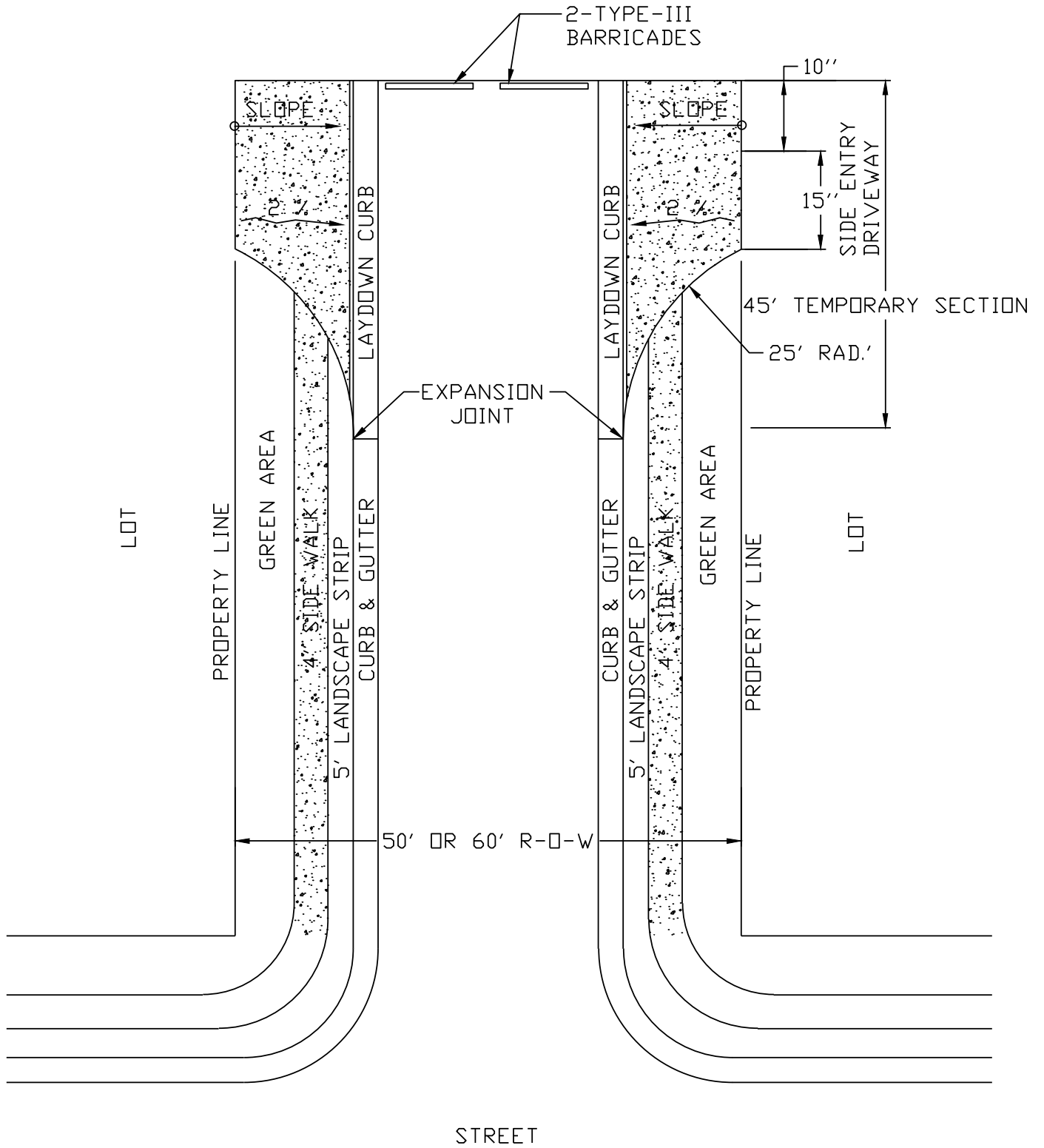
1. ANY DESIGN CALLING FOR A CUL-DE-SAC WITH LESS THAN A 40 FT. BACK OF CURB RADIUS MUST BE INDIVIDUALLY APPROVED BY THE CITY OF SAN JUAN.
2. LOCAL PAVEMENT SECTION SHALL BE USED FOR CUL-DE-SAC PAVEMENT.



**CITY OF SAN JUAN
STANDARDS MANUAL
CUL-DE-SAC DETAIL
(TEMPORARY OR PERMANENT)**



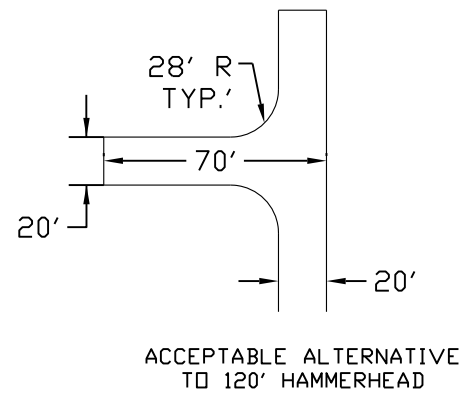
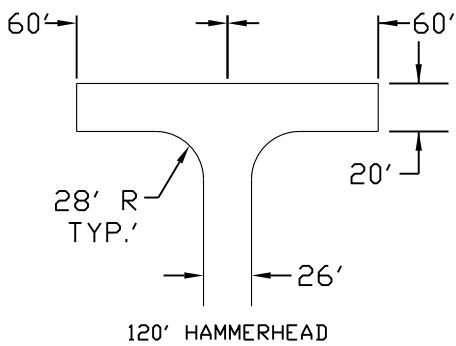
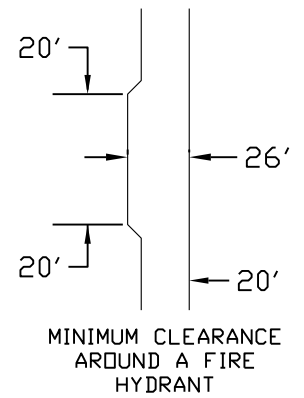
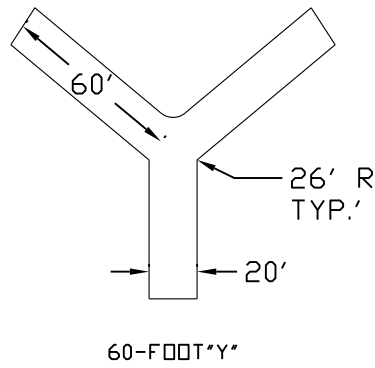
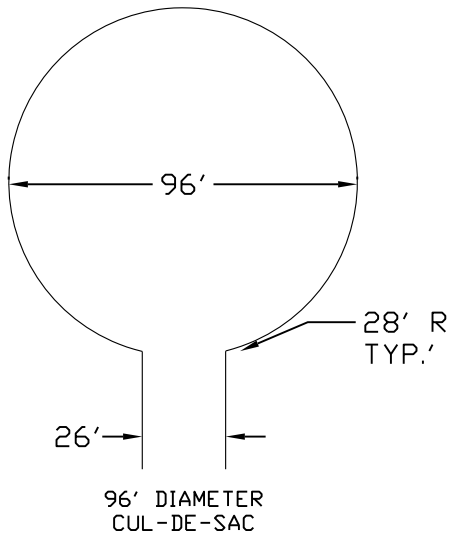
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CITY OF SAN JUAN
STANDARDS MANUAL
TEMPORARY HAMMERHEAD
TURN-AROUND



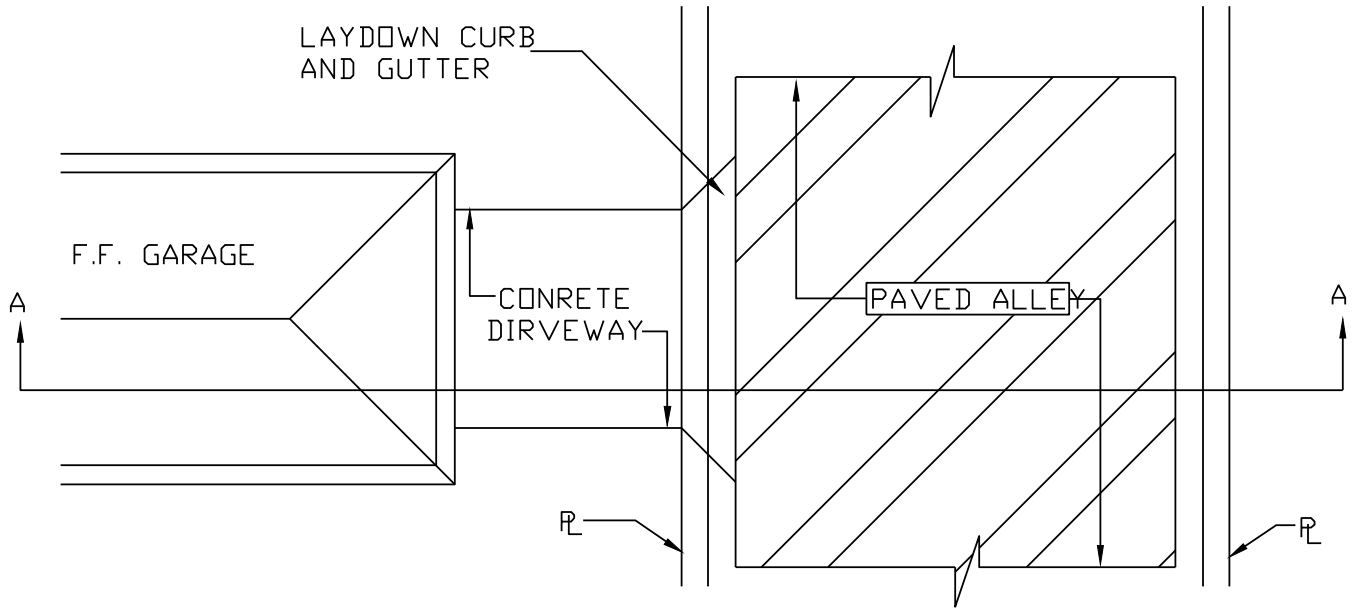
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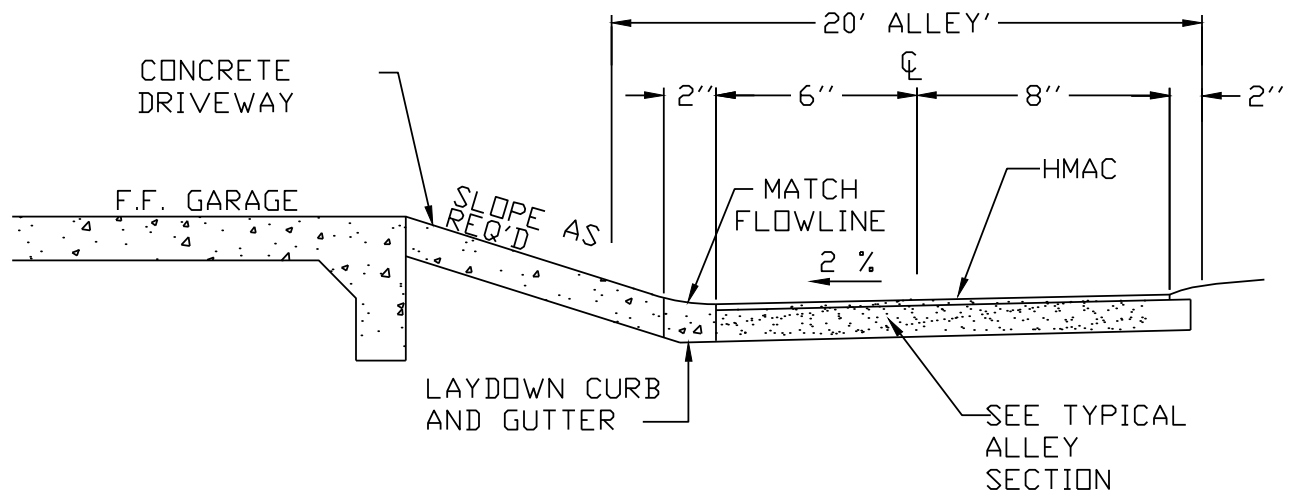
CITY OF SAN JUAN
STANDARDS MANUAL
FIRE APPARATUS
ACCESS ROADS



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PLAN VIEW



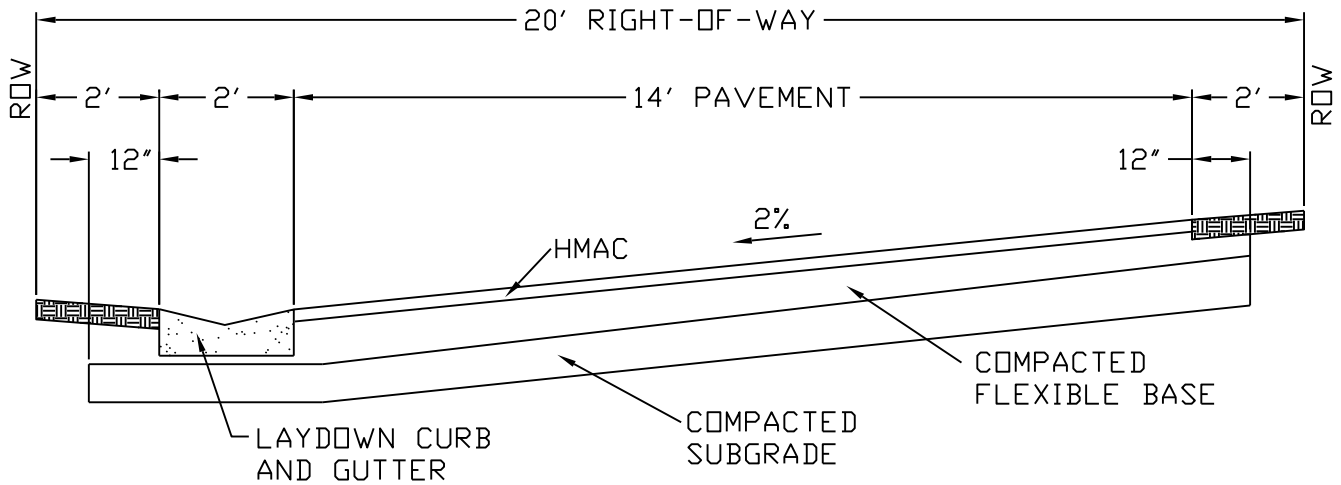
SECTION A-A



CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL ALLEY AND
DRIVEWAY DETAIL



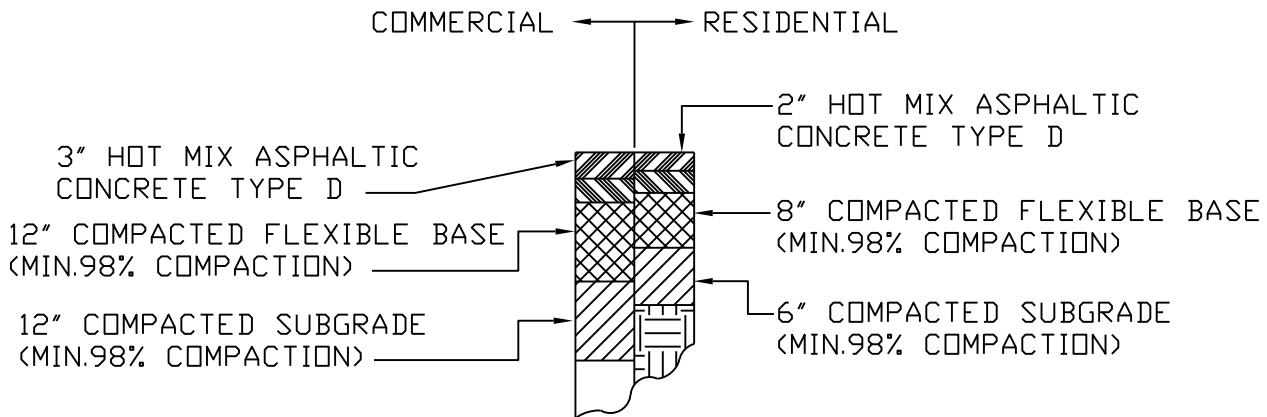
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ALLEY SECTION

NOTES:

- A. ALLEY GUTTER, SEE CURB AND GUTTER DETAIL FOR INFORMATION.
- B. TRANSVERSE SLOPE OF ALLEY PAVEMENT SURFACE SHALL BE 2% MIN.
- C. USE LOCAL STREET SECTION FOR RESIDENTIAL ALLEY. (SEE PVMT. DESIGN TABLE)
- D. USE PRINCIPLE ARTERIAL STREET SECTION FOR COMMERCIAL ALLEY.



PAVEMENT SECTION
ASPHALT CONCRETE

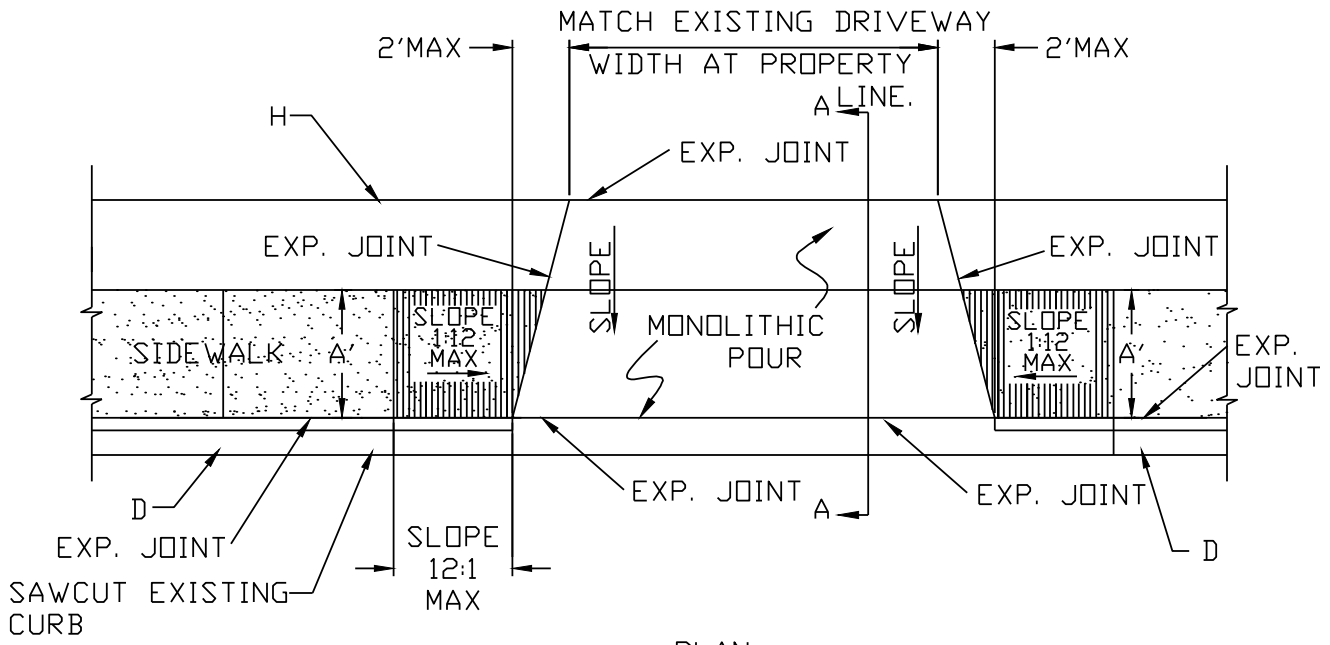
REINFORCED CONCRETE PAVEMENT MAY REQUIRED FOR HEAVY VEHICULAR TRAFFIC LOADS. DESIGN SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL.



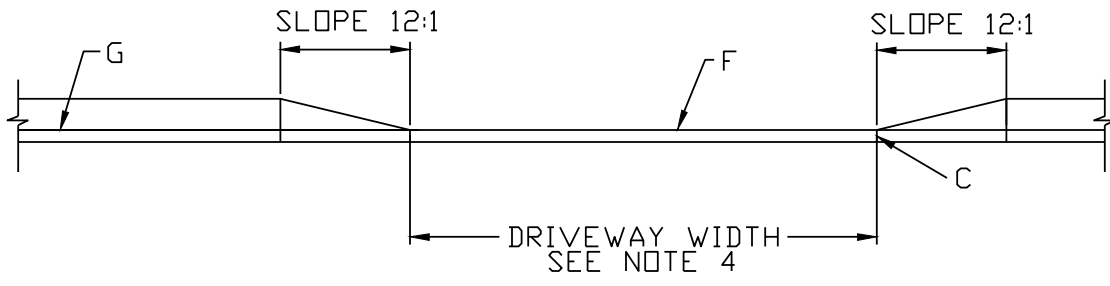
CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL ALLEY SECTION



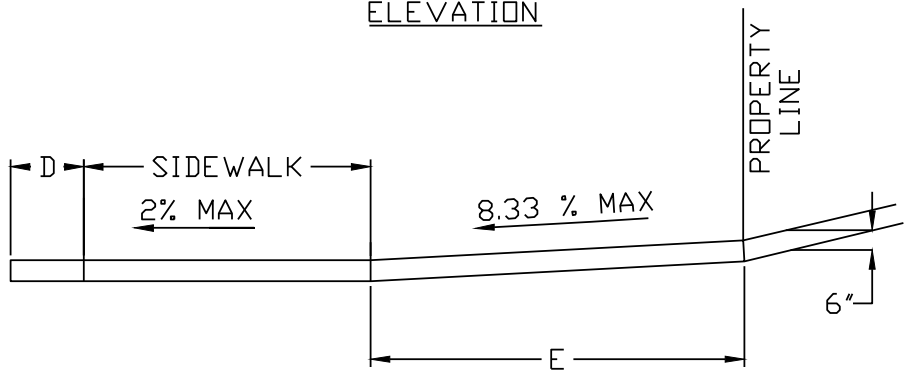
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PLAN



ELEVATION



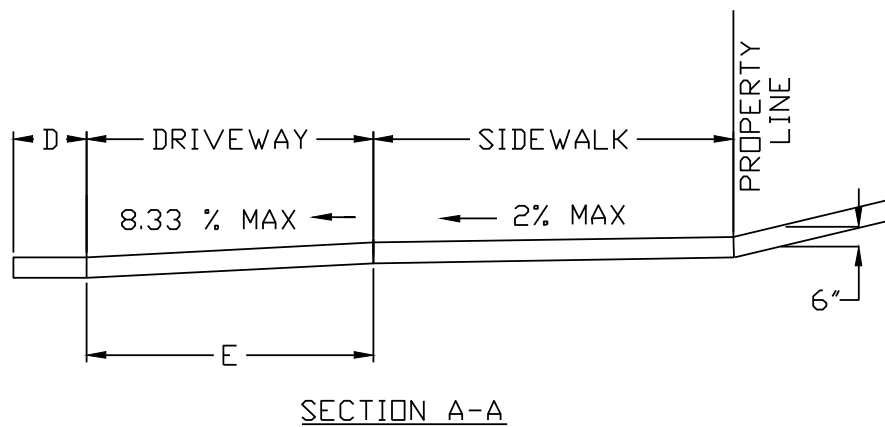
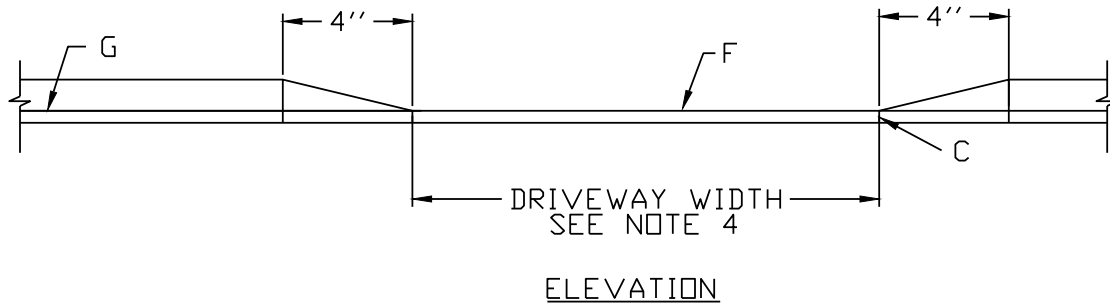
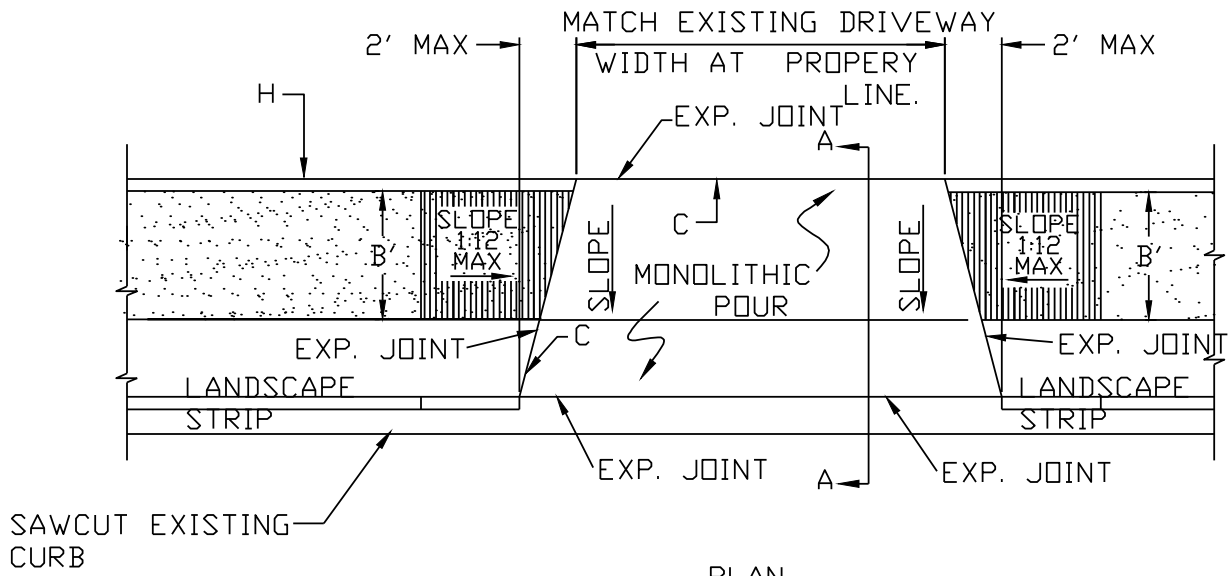
SECTION A-A



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE DRIVEWAY APRON
(SIDEWALK ADJACENT TO CURB)



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CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE DRIVEWAY APRON
(SIDEWALK OFFSET FROM CURB)



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GENERAL NOTES

1. DEVIATIONS FROM THESE STANDARDS SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL PRIOR TO CONSTRUCTION.
2. USE 1/2" EXPANSION JOINT WHERE SIDEWALK OR DRIVEWAY APRON ABUTS BUILDING, FENCES, WALLS OR OTHER IMMOVABLE OBJECTS.
3. DRIVEWAY APRON WIDER THAN 18 FT (NOMINAL) SHALL HAVE A SAWED CONSTRUCTION JOINT AT MIDPOINT. DRIVEWAY APRON WIDER THAN 36 FT. SHALL HAVE AN EXPANSION JOINT EQUALLY SPACED AT MID-POINT OF DRIVEWAY.
4. MAXIMUM DRIVEWAY APRON WIDTHS SHALL BE:
RESIDENTIAL: 24 FT MAX.
COMMERCIAL: 45 FT MAX.
5. SUBGRADE UNDER DRIVEWAY APRON SHALL BE COMPACTED TO 95% MIN. DENSITY TO A DEPTH OF 6".
6. DRIVEWAY APRON SHALL HAVE A MINIMUM THICKNESS OF 6" AND BE PLACED USING 3000 P.S.I. CONCRETE WITH 6"X6" WELDED WIRE MESH, NO. 3 BARS @ 12" O.C.E.W. OR NO. 4 @ 18" O.C.E.W.
7. CURB CUT MUST BE A MINIMUM OF 6 FT FROM SIDE YARD PROPERTY LINE.
8. CURB CUT MUST BE A MINIMUM OF 25 FT FROM THE PROJECTION OF THE CLOSEST THROUGHLANE AT A STREET INTERSECTION.
9. CONCRETE SHALL HAVE A BROOM FINISH. BRICK PAVERS, EXPOSED AGGREGATE, RIVER-BRICK FINISH, TILE ARE NOT PERMITTED WITHIN THE R.O.W.
10. MEMBRANE CURING COMPOUND SHALL BE APPLIED AT A MINIMUM OF 1 GALLON PER 180 SQUARE FEET OF AREA AFTER SURFACE FINISH HAS BEEN COMPLETED.
11. ALL CONCRETE APRONS SHALL INCLUDE SUBGRADE & BASE CONSISTENT WITH THE ADJACENT ROADWAY. THE COSTS FOR THE SUBGRADE AND BASE FOR THE CONCRETE APRON SHALL BE INCLUDED IN THE UNIT PRICE FOR THE CONCRETE APRON.
12. SIDEWALK TO BE PLACED SO THAT THEY ARE AT LEAST THREE (3) FEET FROM THE CURB OR IN LINE WITH EXISTING SIDEWALKS IN THE AREA.
13. SIDEWALK SHALL BE NOT LESS THAN FOUR (4) FEET IN WIDTH, AND FOUR (4) INCHES IN DEPTH, AND OF CONCRETE, STONE, OR MASONRY CONSTRUCTION (A GREATER WIDTH MAY BE REQUIRED IN MULTIFAMILY, COMMERCIAL, AND INDUSTRIAL AREAS).

CONSTRUCTION NOTES

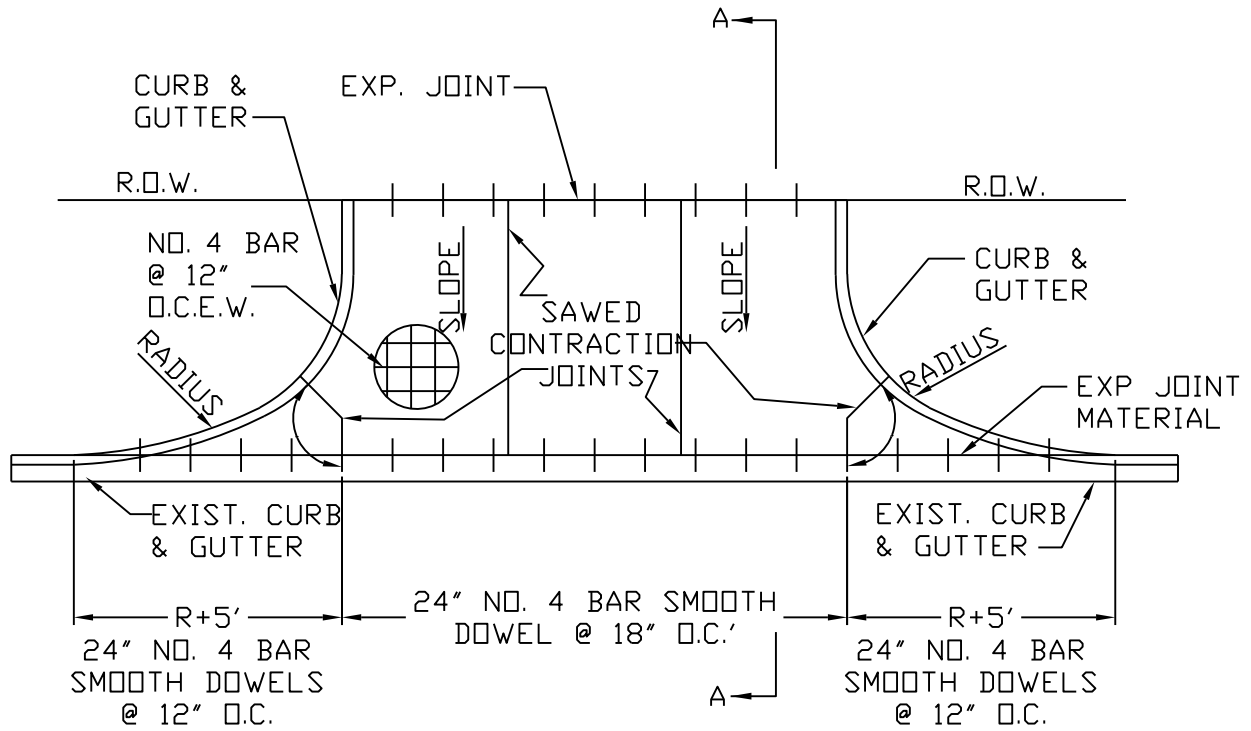
- A. CURB TYPE SIDEWALK.
- B. OFFSET SIDEWALK.
- C. 1/2" EXPANSION JOINT AT PROPERTY LINE ADJACENT SIDEWALK AND ALONG BACK OF CURB.
- D. CURB & GUTTER.
- E. SLOPE TO BE ADJUSTED TO PROVIDE A UNIFORM TRANSITION BETWEEN SIDEWALK & DRIVEWAY APRON 12:1 SLOPE MAX.
- F. TOP OF DRIVEWAY APRON.
- G. TOP OF CURB.
- H. PROPERTY LINE.



CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE DRIVEWAY APRON
GENERAL NOTES



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NOTE:

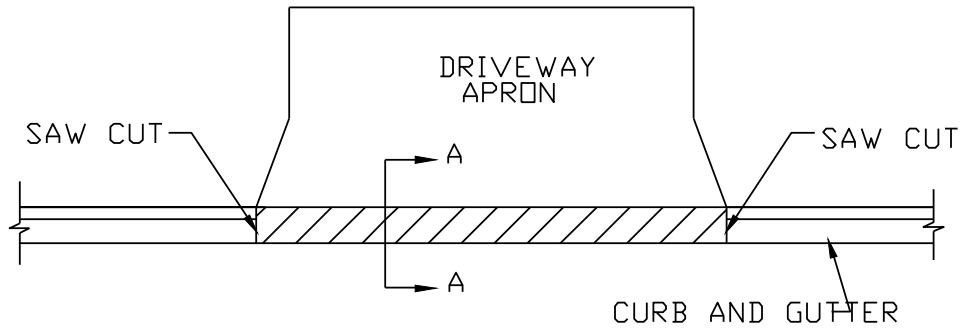
DRIVEWAY FOR INDUSTRIAL ZONED PROPERTY TO BE APPROVED BY THE CITY OF SAN JUAN.



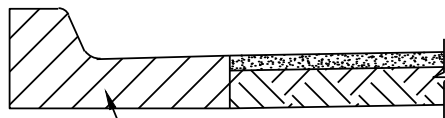
**CITY OF SAN JUAN
STANDARDS MANUAL
CONCRETE APRON TYPICAL
JOINT LAYOUT**



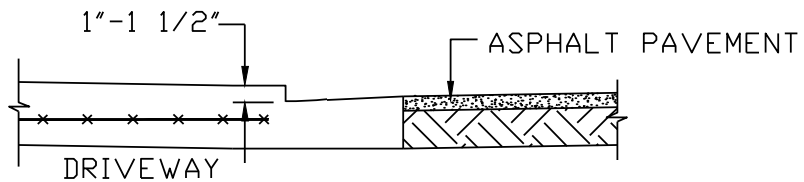
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PLAN VIEW



CURB GUTTER TO BE REMOVED
RE-POUR GUTTER MONOLITICALLY
WITH DRIVEWAY



SECTION A-A

NOTE:

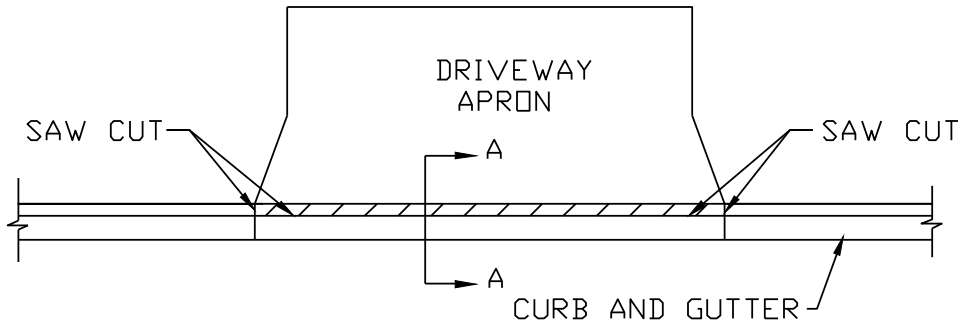
ANY PAVEMENT DAMAGE WILL REQUIRE A ASPHALT CUT AND RESTORE



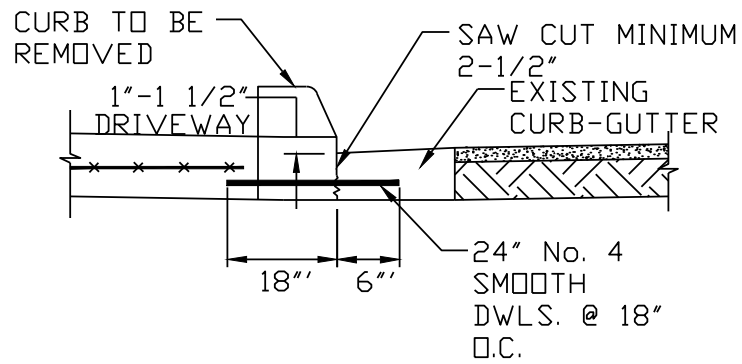
CITY OF SAN JUAN
STANDARDS MANUAL
CURB AND GUTTER SAWCUT
FOR DRIVEWAY DETAIL
OPTION 1



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PLAN VIEW

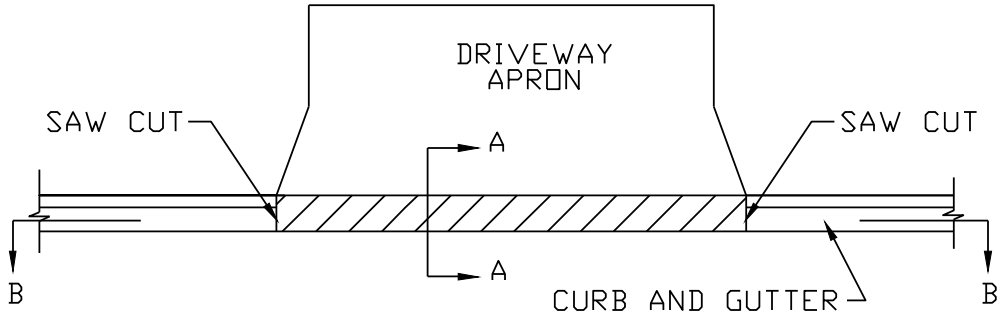


SECTION A-A

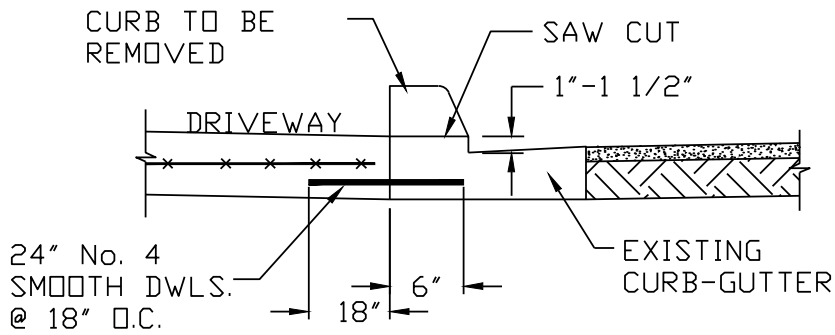


CITY OF SAN JUAN
STANDARDS MANUAL
CURB AND GUTTER SAWCUT
FOR DRIVEWAY DETAIL
OPTION 2

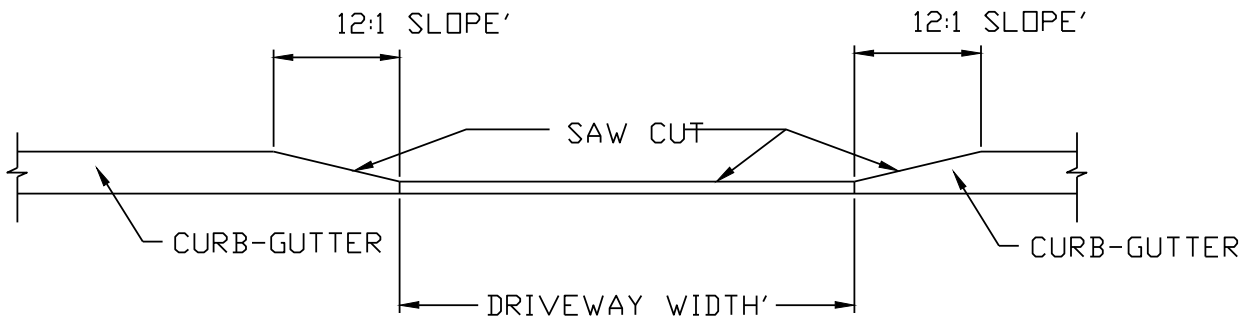




PLAN VIEW



SECTION A-A



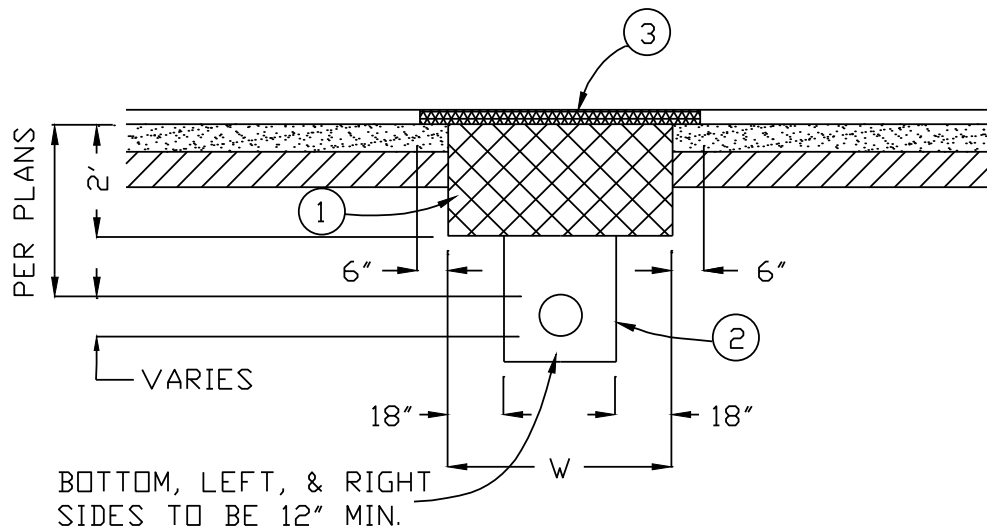
SECTION B-B



CITY OF SAN JUAN
STANDARDS MANUAL
CURB AND GUTTER SAWCUT
FOR DRIVEWAY DETAIL
OPTION 3



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NOTES:

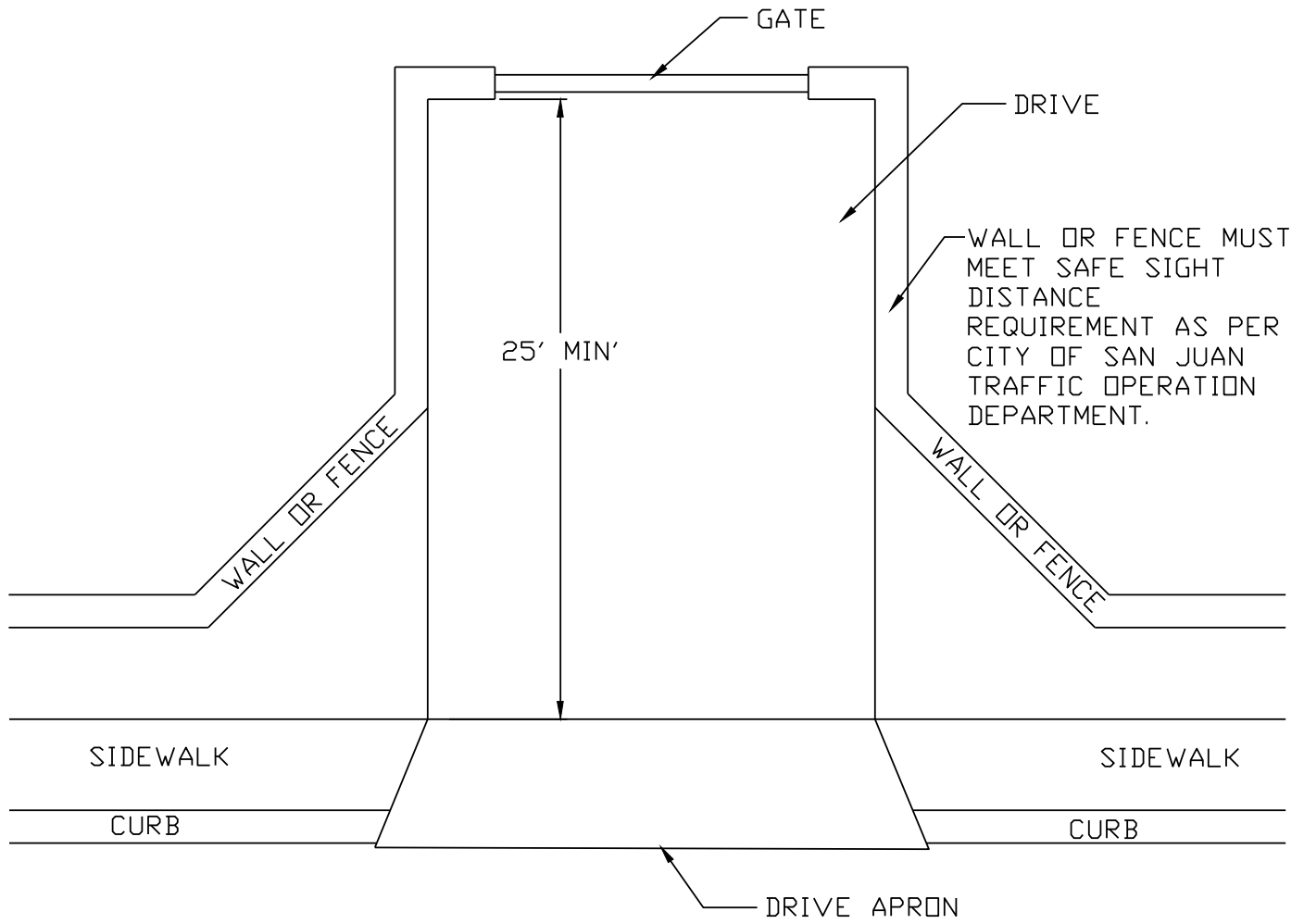
1. CONSTRUCT 2.0' DEEP X WIDTH AND LENGTH OF TRENCH WITH CALICHE. SEE SPECIFICATIONS #2 BELOW FOR COMPACTION REQUIREMENTS.
2. PROVIDE CLEAN BACKFILL. BACKFILL SHALL BE REPLACED IN 6" LAYERS. EACH LAYER SHALL BE MECHANICALLY COMPACTED TO A MINIMUM 95% DENSITY AS DETERMINED BY A ASHTO T-99, METHOD "C".
3. DITCH WIDTH $(W)+12"$, MATCH EXISTING TYPE AND THICKNESS OF ASPHALT OR TYPE S-III. PAYMENT FOR PAVEMENT REPAIRS SHALL BE BASED UPON MAXIMUM WIDTH EQUAL TO $W+1.0$ FEET UNLESS OTHERWISE INDICATED ON PLANS. ANY REPAIRS OUTSIDE OF MAX. PAY WIDTH SHALL BE PROVIDED AT NO COST TO THE OWNER.
4. REPLACED BASE MATERIAL OVER DITCH SHALL BE AS SHOWN ABOVE. BASE MATERIAL SHALL BE PLACED IN 6" LAYERS OR AS OTHERWISE APPROVED AND EACH LAYER THOROUGHLY MECHANICALLY COMPACTED TO (98%) DENSITY AS DETERMINED BY A ASHTO T-180.
5. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE LAPPED AND FEATHERED.
6. ALL PAVEMENT JOINTS SHALL BE MECHANICALLY SAW CUT IN A STRAIGHT LINE EXTENDING FROM ONE END OF PATCH TO THE OTHER UNLESS OTHERWISE APPROVED BY CITY INSPECTOR.
7. SURFACE MATERIAL WILL BE CONSISTENT WITH EXISTING SURFACE AND PLACED IN ACCORDANCE WITH CITY OF SAN JUAN REQUIREMENTS.
8. A MINIMUM OF TWO DENSITY TESTS SHALL BE TAKEN FOR EACH SIX (6) INCH LIFT OF SUBGRADE FOR EVERY 100 LINEAR FEET OR PAVEMENT REPAIR WHEN REPAIR IS LONGITUDINAL ALONG ROADWAY CENTERLINE OR AT EACH OPEN CUT CROSSING WHEN PERPENDICULAR TO ROADWAY CENTERLINE.
9. WHEN THE SPECIFIED COMPACTED BASE IS GREATER THAN SIX AND ONE-HALF $(6-1/2)$ INCHES THE BASE SHALL BE CONSTRUCTED IN TWO OR MORE COURSES.
10. PROCTORS FOR MATERIALS USED IN BACK-FILLING SHALL BE OBTAINED BY THE CITY'S CERTIFIED LABORATORY. DENSITY TESTS SHALL BE CONDUCTED BY THE CITY'S LABORATORY.
11. THE PERCENTAGE OF MAXIMUM DENSITY REQUIRED SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF SAN JUAN ENGINEERING DEPARTMENT STANDARD SPECIFICATIONS.
12. COST FOR ASPHALT REPAIR SHALL INCLUDE ALL TRENCH BACKFILL & COMPACTION, PAVEMENT SUBGRADE, BASE & ASPHALT PREPARATION, PLACEMENT AND COMPACTION.



**CITY OF SAN JUAN
STANDARDS MANUAL
ASPHALT REPAIR DETAIL**

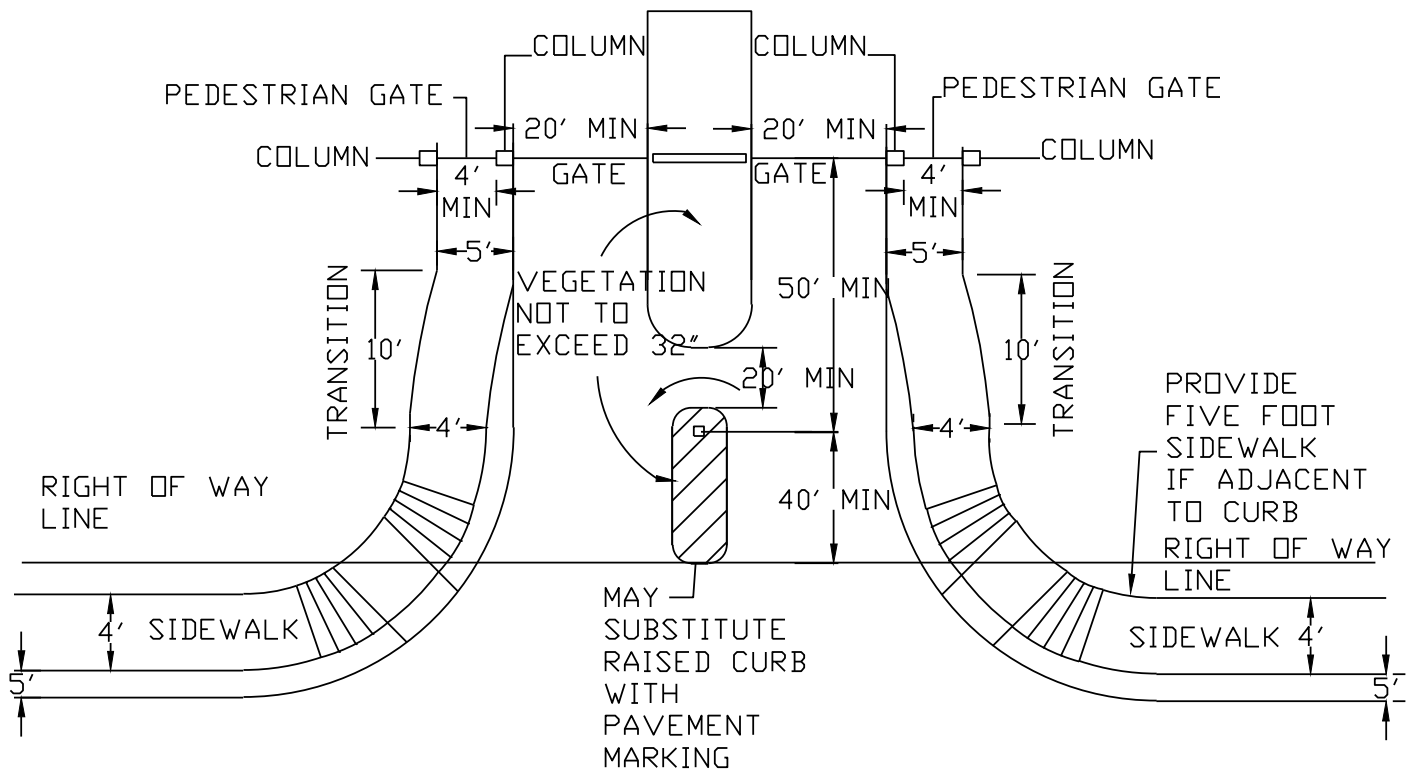


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**CITY OF SAN JUAN
STANDARDS MANUAL
RESIDENTIAL GATED DRIVEWAY**





GENERAL NOTES:

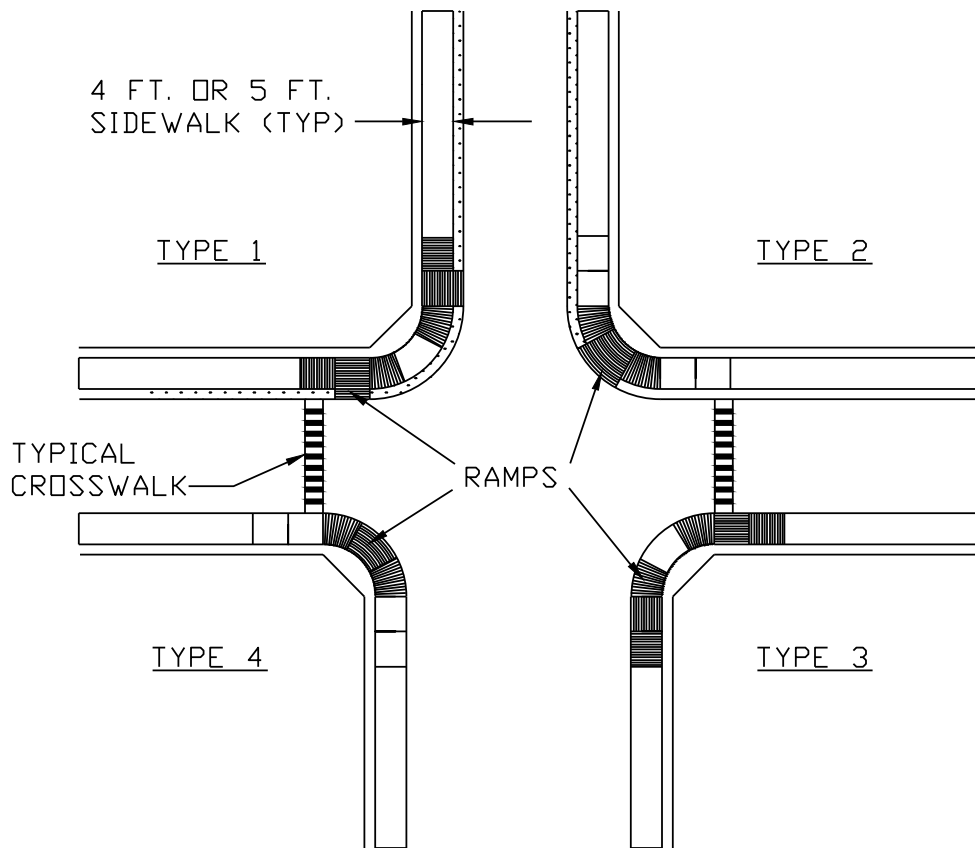
1. THE MINIMUM GATE WIDTH SHALL BE 20' FEET (6096MM) FOR NEW SUBDIVISIONS. FOR EXISTING SUBDIVISIONS, PROPOSED WIDTH MUST BE APPROVED BY FIRE DEPARTMENT.
2. GATES SHALL BE OF THE SWINGING TYPE.
3. CONSTRUCTION OF GATES SHALL BE OF MATERIALS THAT ALLOW MANUAL OPERATION BY ONE PERSON.
4. GATE COMPONENTS SHALL BE MAINTAINED IN AN OPERATIVE CONDITION AT ALL TIMES AND REPLACED OR REPAIRED WHEN DEFECTIVE.
5. ELECTRIC GATES SHALL BE EQUIPPED WITH A MEANS OF OPENING THE GATE BY FIRE DEPARTMENT PERSONNEL FOR EMERGENCY ACCESS. EMERGENCY OPENING DEVICES SHALL BE APPROVED BY THE CODE OFFICIAL.
6. MANUAL OPENING GATES SHALL NOT BE LOCKED WITH A PADLOCK OR CHAIN AND PADLOCK UNLESS THEY ARE CAPABLE OF BEING OPENED BY MEANS OF FORCIBLE ENTRY TOOLS MENU.
7. LOCKING DEVICE SPECIFICATIONS SHALL BE SUBMITTED FOR APPROVAL BY THE CODE OFFICIAL.



**CITY OF SAN JUAN
STANDARDS MANUAL
GATED ENTRANCE DETAIL**



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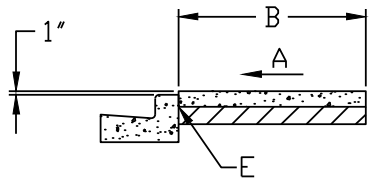
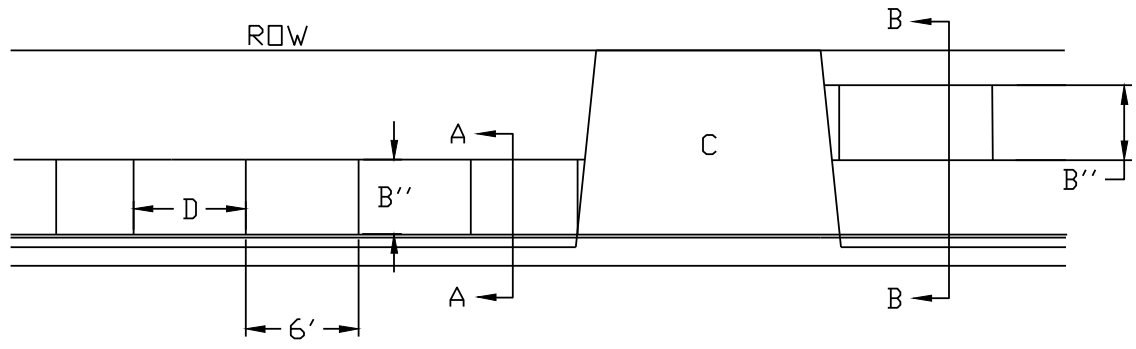
GENERAL NOTES:

1. WHERE AN INADEQUATE AREA FOR A WHEELCHAIR RAMP EXISTS, THE CITY OF SAN JUAN WILL SPECIFY LOCATION OF RAMP(S).
2. ALL CURB RADII ARE 25 FEET UNLESS OTHERWISE SPECIFIED.
3. WHEELCHAIR RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTION WHERE THERE IS AN EXISTING OR PROPOSED SIDEWALK AND CURB AND GUTTER. RAMPS SHALL ALSO BE PROVIDED AT LOCATIONS AT MID BLOCK IN THE VICINITY OF HOSPITALS, MEDICAL CENTERS AND ATHLETIC STADIUMS.
4. SLOPE SIDEWALK FROM P.C. OR P.T. OF CURB RETURN TO MID POINT OF CURB RETURN.

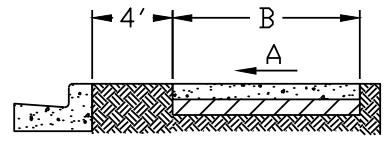


**CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL LOCATIONS OF
SIDEWALK AND RAMPS FOR
LOCAL COLLECTORS**

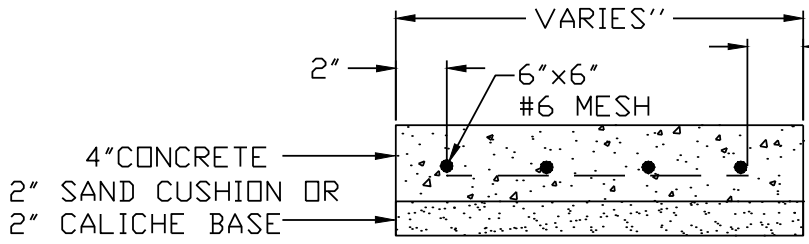




SECTION A-A
SIDEWALK ADJACENT TO CURB



SECTION B-B
SIDEWALK OFFSET MIN. 3 FT FROM CURB



NOTE

1. CONCRETE SHALL HAVE 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. SUBGRADE SHALL BE COMPACTED TO 90% MAX DENSITY.

GENERAL NOTES:

1. DEVIATIONS FROM THESE STANDARDS SHALL BE SUBMITTED TO THE CITY OF SAN JUAN FOR APPROVAL PRIOR TO CONSTRUCTION.
2. SIDEWALK SHALL BE CONSTRUCTED WITHIN STREET R.O.W.
3. PROVIDE 4' X 4' PASSING SPACE AT A MAXIMUM 200' INTERVALS, IF SIDEWALK IS LESS THAN 4' ON WIDTH (DRIVEWAY IS CONSIDERED A PASSING SPACE)

CONSTRUCTION NOTES:

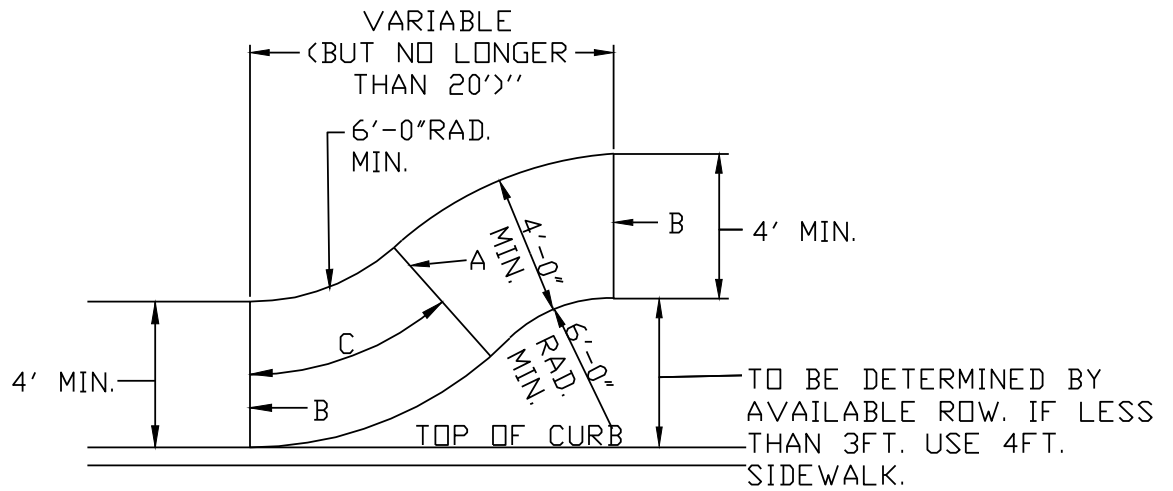
- A. CROSS-SLOPE AT 1.5% USUAL AND 2.0% MAX.
- B. SIDEWALK, WIDTH VARIES. 4 FT MINIMUM WHEN SETBACK 3 FT FROM THE CURB. 4 FT. MINIMUM WHEN ADJACENT TO THE CURB.
- C. SEE DRIVEWAY APRON DETAIL.
- D. CONTRACTION JOINTS EVERY 6 FT.; EXPANSION JOINT EVERY 30 FT. AND ALONG CURB AND GUTTER WHEN SIDEWALK ADJACENT TO CURB AND ALONG ANY STRUCTURE EXISTING.
- E. 1/2" EXPANSION JOINT.



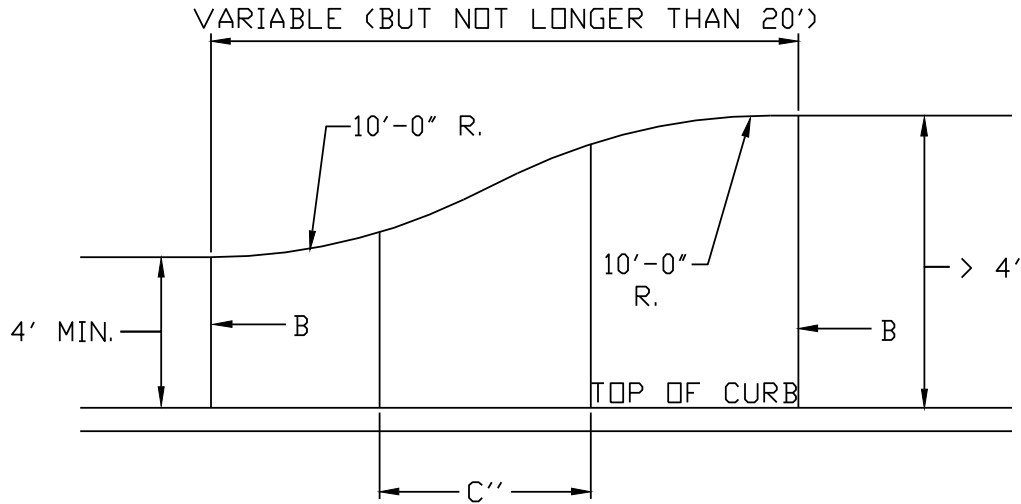
**CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL SIDEWALK DETAILS**



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CURB TYPE TO OFFSET TYPE



CURB TYPE WITH VARYING WIDTHS

CONSTRUCTION NOTES:

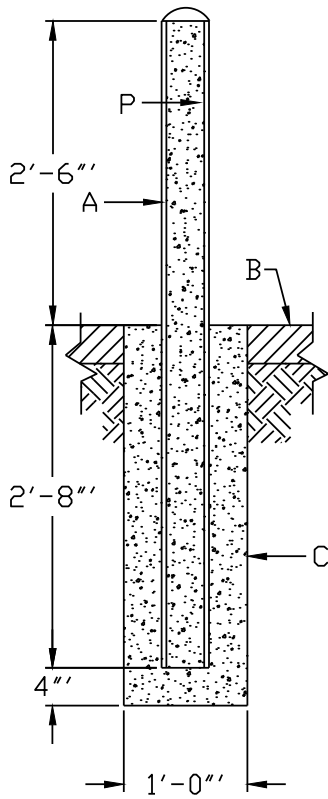
- A. WEAKENED PLAN JOINT ALIGNMENT TO BE RADIAL.
- B. 1/2" EXPANSION JOINT.
- C. CONSTRUCTION JOINTS SHALL NOT BE GREATER THAN 6 FEET ON CENTER BETWEEN EXPANSION JOINTS, MEASURED ALONG SIDEWALK.



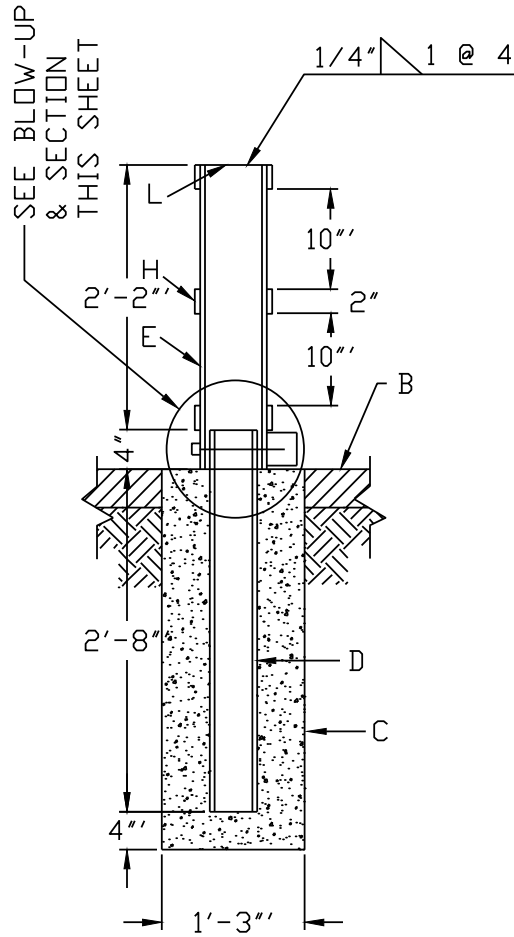
CITY OF SAN JUAN
STANDARDS MANUAL
TYPICAL SIDEWALK TRANSITION DETAILS



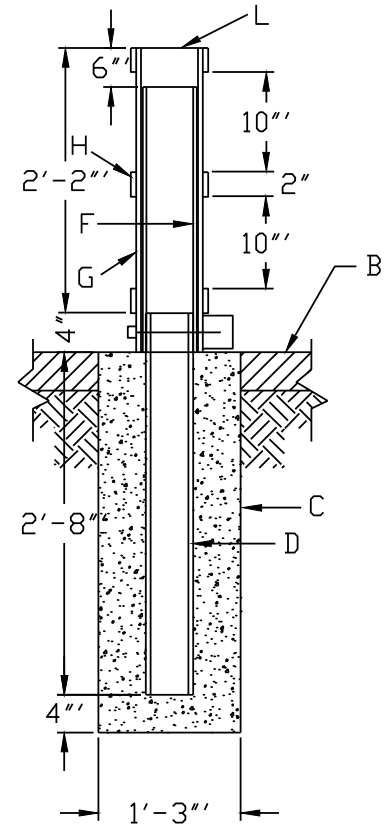
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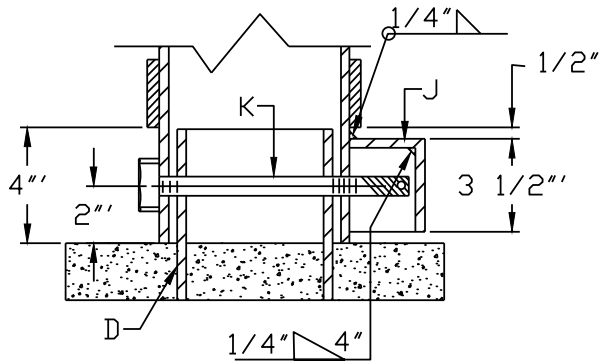
STATIONARY



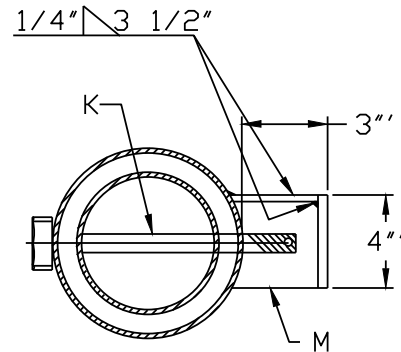
REMOVABLE



REMOVABLE BOLLARD WITH RUBBER SLEEVE



SECTION



PLAN
BLOW-UP



CITY OF SAN JUAN
STANDARDS MANUAL
STATIONARY AND
REMOVABLE BOLLARD DETAIL
SHEET 1 OF 2



GENERAL NOTES:

1. FOR SLEEVE, USE GATES NO. 37 WATER HOSE, DISCHARGE HOSE OR EQUIVALENT WITH 6.625" I.D., 7.29" O.D, 6 PLY WITH A BLACK NEOPRENE COVER.
2. WELDS ARE TO BE GROUND SMOOTH.
3. EXPOSED STEEL AND SLEEVE TO BE PAINTED WITH OIL BASE ALKYD PRIMER AND OIL BASE ALKYD ENAMEL. TOP COAT COLOR TO BE BRIGHT YELLOW.
4. OF BOLLARD SHOULD BE WELL AWAY FROM TRAFFIC ON MAJOR ROADWAYS & PREFERABLY AT THE R-O-W LINE. TRAFFIC ENGINEER SHOULD BE CONSULTED ON LOCATION WHEN NEAR TRAFFIC.
5. PIPES ARE NOT TO BE FILLED WITH CONCRETE WHEN PIPES ARE LOCATED WITHIN 15' OF STREET FLOWLINE. USE WELDED STEEL CAP INSTEAD.

CONSTRUCTION NOTES

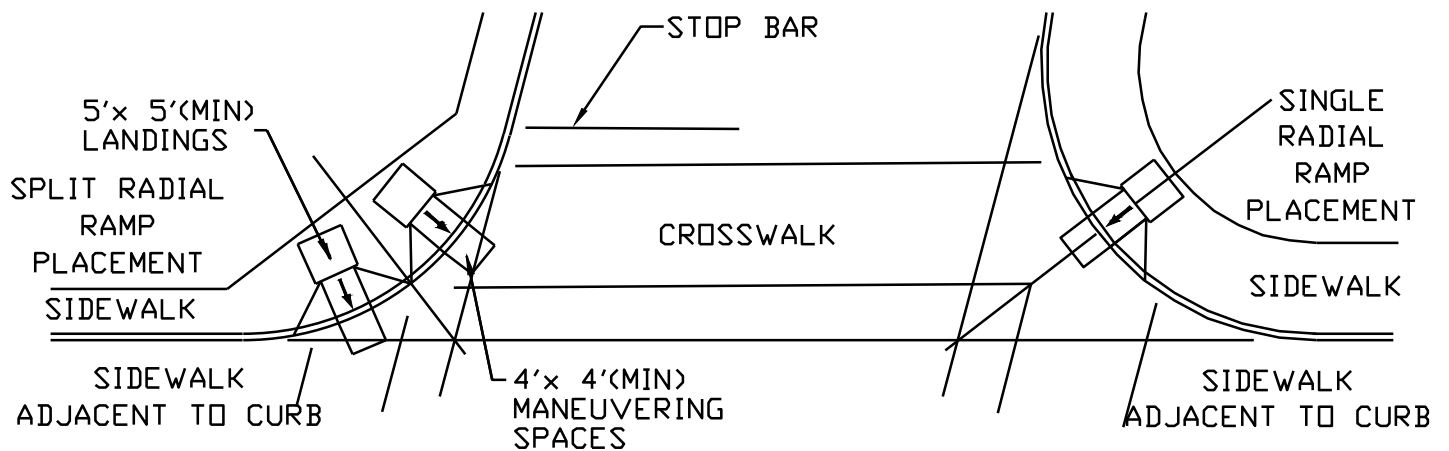
- A. 4" NOMINAL DIA. SCHEDULE 40 GALVANIZED STEEL PIPE, 5'-2" LONG. TO BE FILLED WITH CONCRETE PAINT PIPE BRIGHT YELLOW ABOVE FINISHED GRADE.
- B. PAVEMENT OR FINISHED GRADE.
- C. CONCRETE COLLAR 3000 P.S.I. AT 28 DAYS, WITH SMOOTH OR BROOM FINISH WHERE PAVEMENT IS ADJACENT.
- D. 5" NOMINAL DIA. SCHEDULE 40 GALVANIZED STEEL PIPE, 3'-0" LONG. TO BE FILLED WITH CONCRETE TO LEVEL SHOWN.
- E. 6" NOMINAL DIA. SCHEDULE 40 GALVANIZED STEEL PIPE, 2'-2" LONG. PAINT PIPE BRIGHT YELLOW. (REMOVABLE)
- F. 6" NOMINAL DIA. SCHEDULE 40 GALVANIZED 2'-0" LONG STEEL PIPE. (REMOVABLE)
- G. SLEEVE, 2'-2" LONG. PAINT BRIGHT YELLOW, SEE NOTE 1, THIS SHEET.
- H. 2" WIDE REFLECTIVE TAPE, AS APPROVED BY ENGINEER. LOCATE AROUND PIPE AS SHOWN.
- I. 1/4" THICK STEEL SAFETY GUARD BOX, OPEN ON ONE SIDE & BOTTOM. WELD ALL SEAMS.
- J. 3/4" X 8" GALVANIZED HEX. BOLT WITH A 3/8" DIA. HOLE FOR PADLOCK. (PADLOCK FURNISHED BY CITY).
- K. 1/4" X 6-5/8" DIA. GALVANIZED STEEL PLATE COVER, WELD TO PIPE.
- L. ALIGN WITH TRAFFIC FLOW IN EASEMENT OR BIKE PATH TO AVOID TRIPPING HAZARDS WITH BOX.



CITY OF SAN JUAN
STANDARDS MANUAL
STATIONARY AND
REMOVABLE BOLLARD DETAIL
SHEET 2 OF 2



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GENERAL NOTES

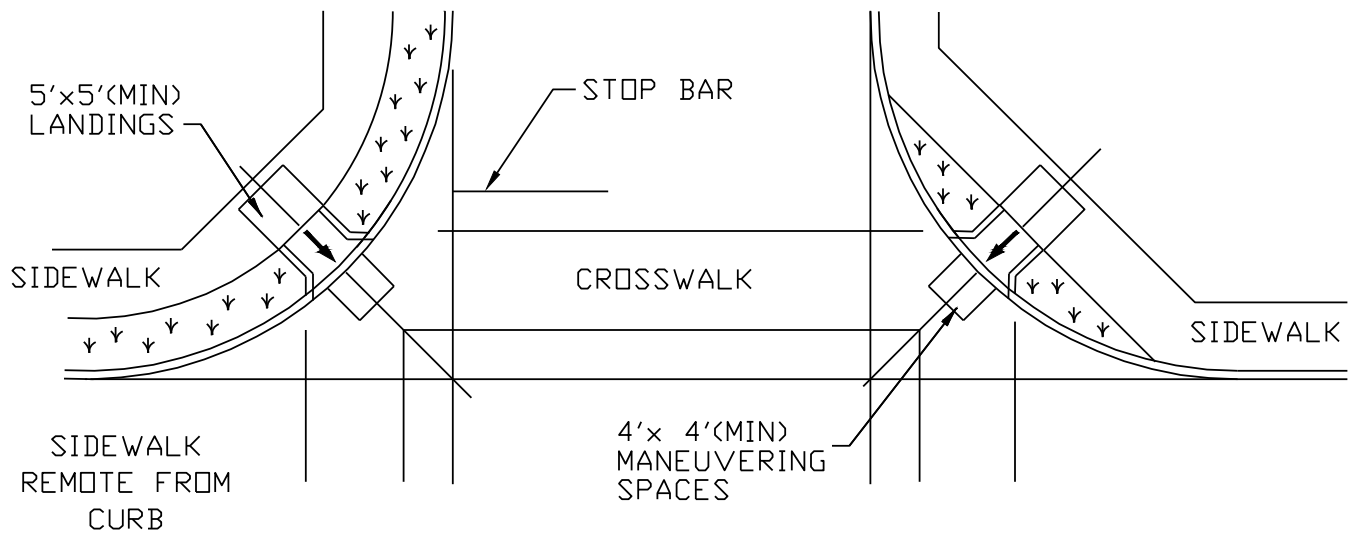
1. STREET GRADES AND CROSS SLOPES SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
2. RAMPS ARE SHOWN HERE WITHOUT DETECTABLE WARNINGS FOR SIMPLICITY. DETECTABLE WARNINGS ARE REQUIRED AT THE LOCATIONS SHOWN ON THE PED STANDARD (SHEETS 1 AND 2 OF 4) AND IN ACCORDANCE WITH THE DETAILS SHOWN BELOW.
3. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM 5' X 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.



**CITY OF SAN JUAN
STANDARDS MANUAL
SKEWED INTERSECTION
WITH "LARGE" RADIUS**



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GENERAL NOTES

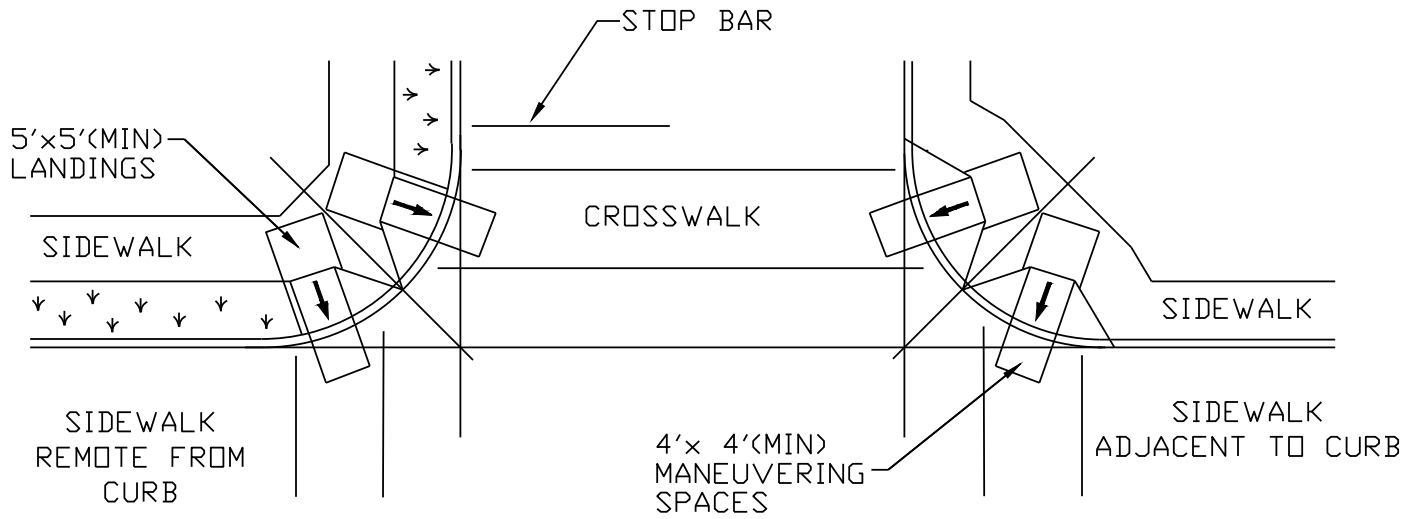
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CITY OF SAN JUAN
STANDARDS MANUAL
NORMAL INTERSECTION
WITH "LARGE" RADIUS



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GENERAL NOTES

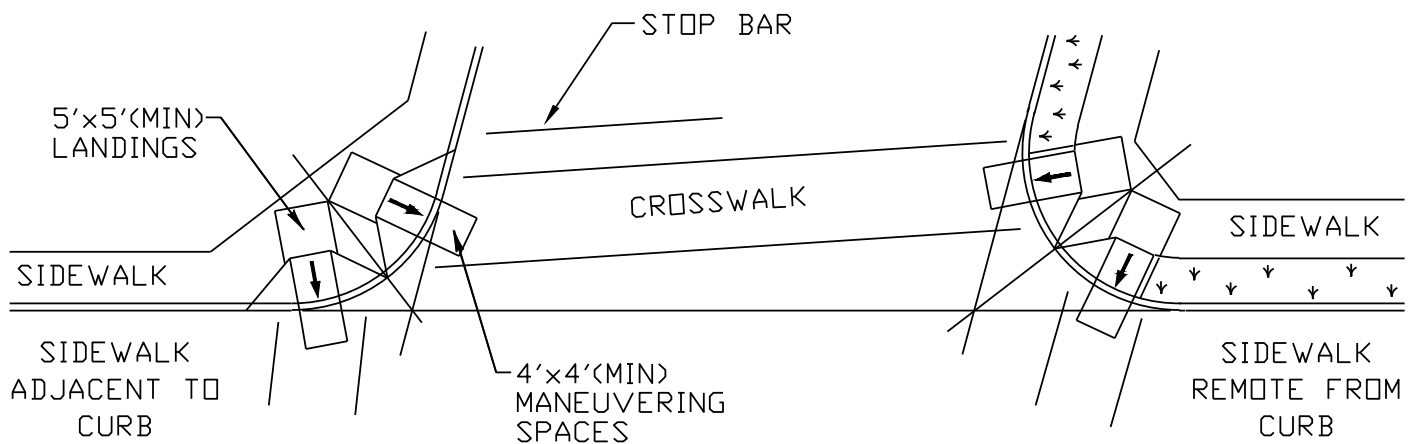
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CITY OF SAN JUAN
STANDARDS MANUAL
NORMAL INTERSECTION
WITH "SMALL" RADIUS



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GENERAL NOTES

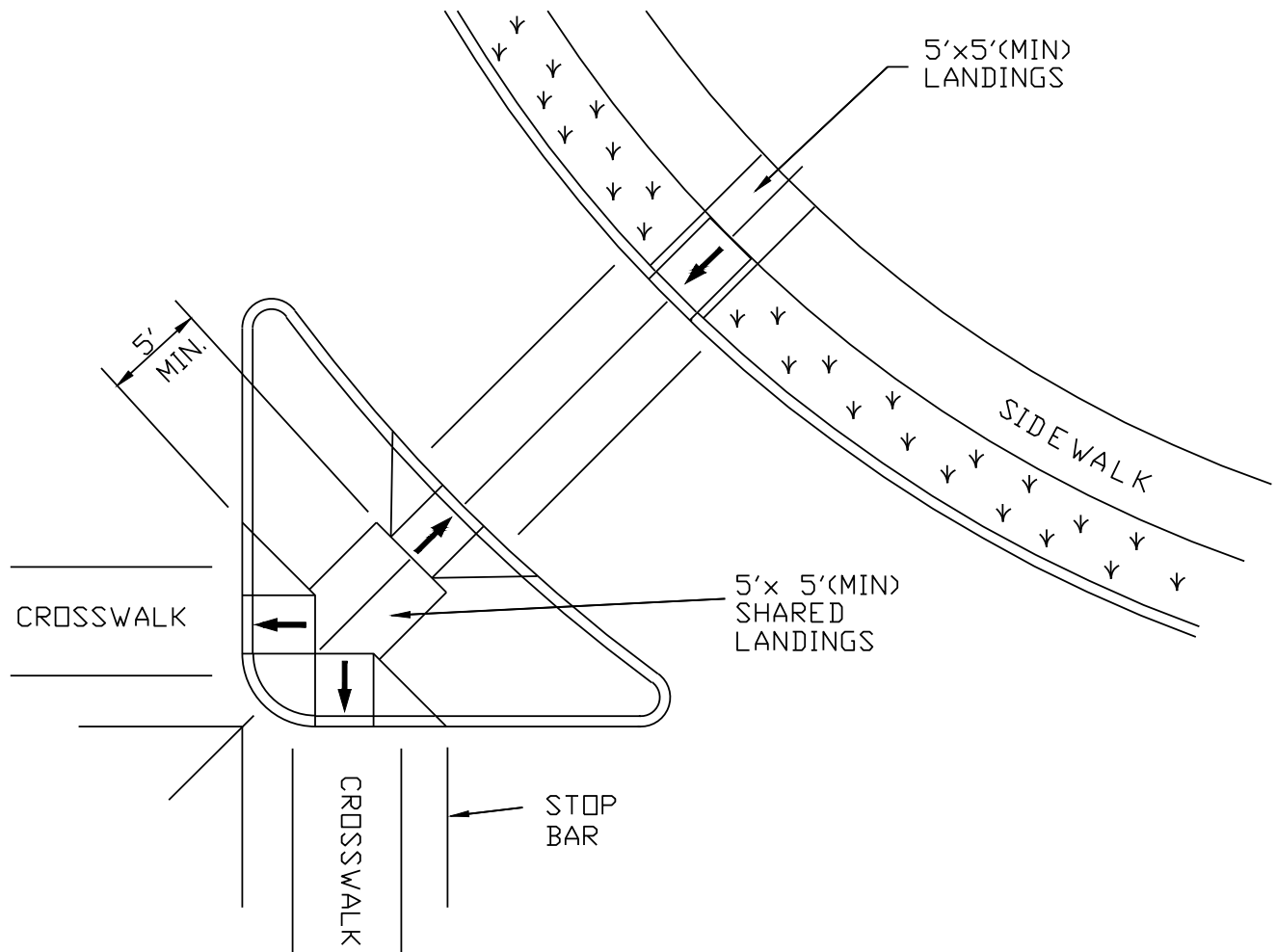
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3. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM 5' X 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.



CITY OF SAN JUAN
STANDARDS MANUAL
SKEWED INTERSECTION
WITH "SMALL" RADIUS



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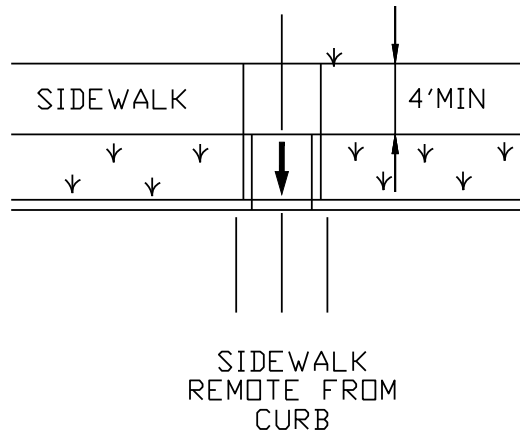
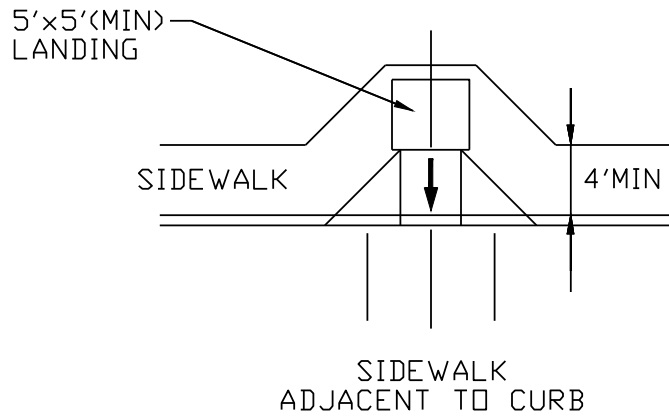
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3. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM 5' X 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.



<p>CITY OF SAN JUAN STANDARDS MANUAL</p> <p>INTERSECTION WITH FREE RIGHT TURN & ISLAND</p>	
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GENERAL NOTES

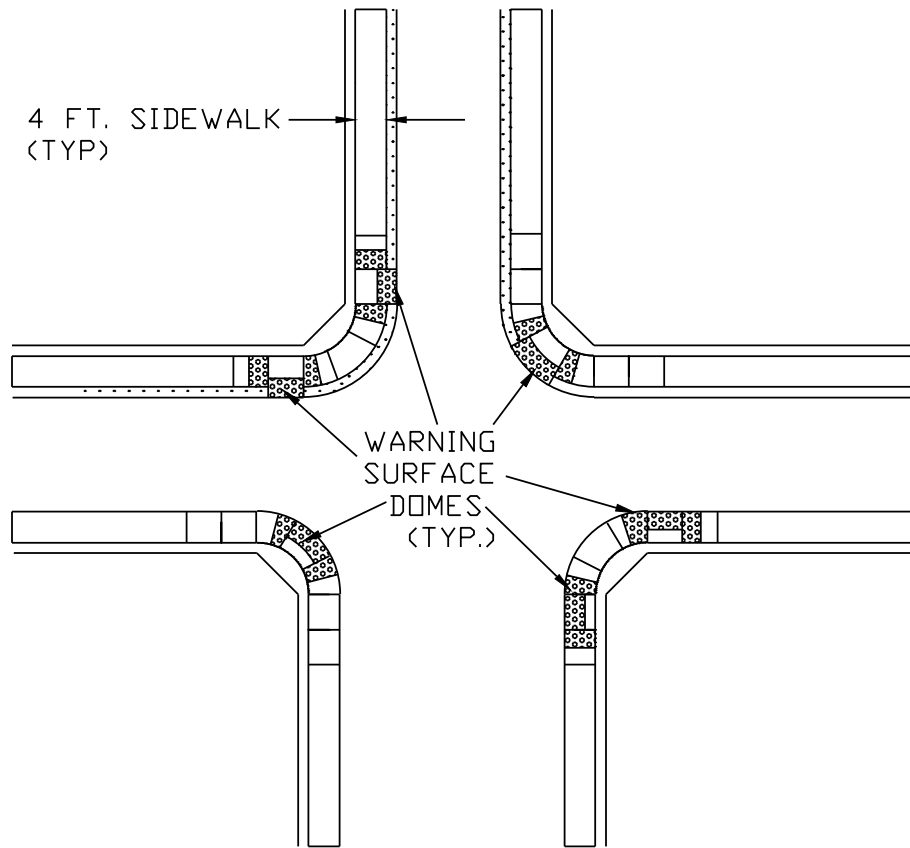
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3. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM 5' X 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.



**CITY OF SAN JUAN
STANDARDS MANUAL**
INTERSECTION WITH "LARGE"
MID-BLOCK PLACEMENT



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GENERAL NOTES:

1. WHERE AN INADEQUATE AREA FOR A WHEELCHAIR RAMP EXISTS, THE CITY OF SAN JUAN WILL SPECIFY LOCATION OF RAMP(S).
2. ALL CURB RADII ARE 25 FEET UNLESS OTHERWISE SPECIFIED.
3. WHEELCHAIR RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTION WHERE THERE IS AN EXISTING OR PROPOSED SIDEWALK AND CURB AND GUTTER. RAMPS SHALL ALSO BE PROVIDED AT LOCATIONS AT MID BLOCK IN THE VICINITY OF HOSPITALS, MEDICAL CENTERS AND ATHLETIC STADIUMS.
4. SLOPE SIDEWALK FROM P.C. OR P.T. OF CURB RETURN TO MID POINT OF CURB RETURN.



**CITY OF SAN JUAN
STANDARDS MANUAL**
TYPICAL LOCATIONS OF SIDEWALK
AND RAMPS FOR LOCAL COLLECTORS

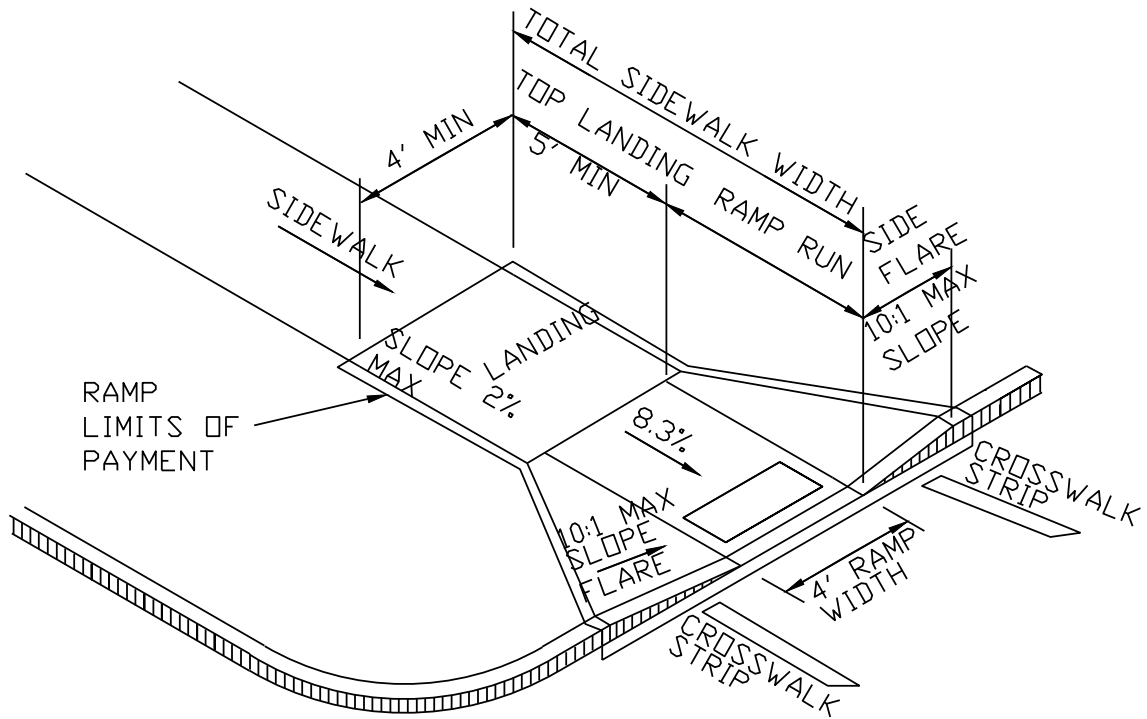


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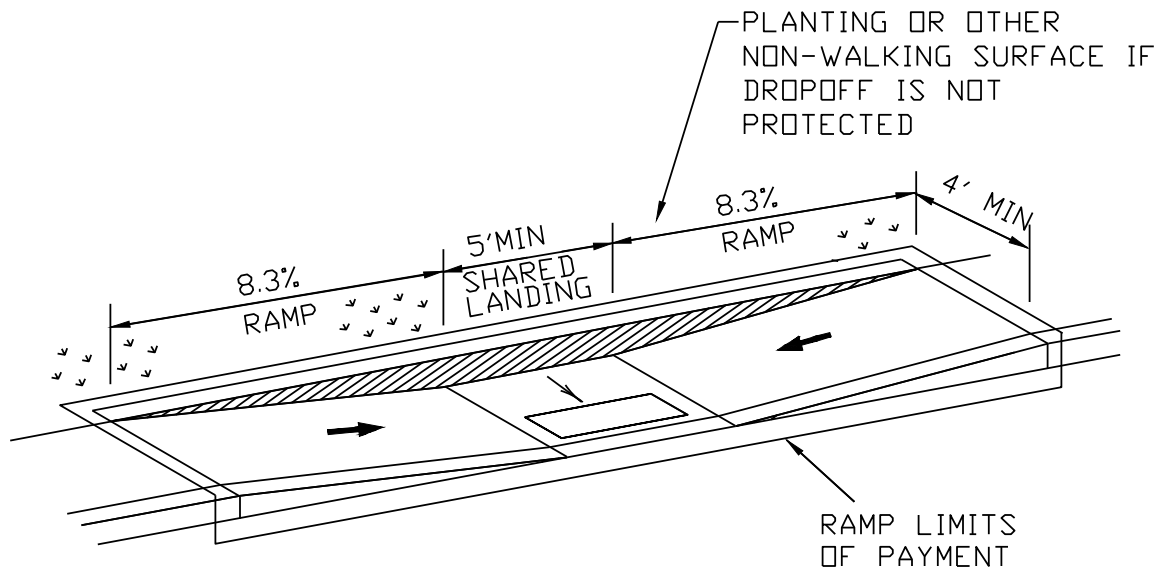
GENERAL NOTES:

1. PUBLIC SIDEWALK CURB RAMPS SHALL BE CONSTRUCTED IN THE PUBLIC RIGHT OF WAY AT LOCATIONS THAT WILL PROVIDE CONTINUOUS PEDESTRIAN CIRCULATION PATHS TO PEDESTRIAN AREAS, ELEMENTS AND FACILITIES IN THE PUBLIC RIGHT OF WAY AND TO ACCESSIBLE PEDESTRIAN ROUTES ON ADJACENT SITES. CURBED FACILITIES WITH SIDEWALKS AND THOSE WITHOUT SIDEWALKS ARE TO HAVE CURB RAMPS CONSTRUCTED AT ALL STREET INTERSECTIONS AND AT TURNOUTS THAT HAVE CURBED RETURNS. PARTIAL CURB RETURNS SHALL EXTEND TO THE LIMIT PRESCRIBED BY INDEX No. 515 TO ACCOMMODATE CURB RAMPS. RAMPS CONSTRUCTED AT LOCATIONS WITHOUT SIDEWALKS SHALL HAVE A LANDING CONSTRUCTED AT THE TOP OF EACH RAMP.
2. THE LOCATION AND ORIENTATION OF CURB RAMPS SHALL BE AS SHOWN IN THE PLANS. CURB RAMP RUNNING SLOPES AT UNRESTRAINED SITES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 0.02 OR FLATTER. TRANSITION SLOPES SHALL NOT BE STEEPER THAN 1:12.
3. WHEN ALTERING EXISTING PEDESTRIAN FACILITIES WHERE EXISTING SITE DEVELOPMENT PRECLUDES THE ACCOMMODATION OF A RAMP SLOPE OF 1:12, A RUNNING SLOPE BETWEEN 1:12 AND 1:10 IS PERMITTED FOR A RISE OF 6" MAXIMUM AND A RUNNING SLOPE OF BETWEEN 1:10 AND 1:8 IS PERMITTED FOR A RISE OF 3" MAXIMUM. WHERE COMPLIANCE WITH THE REQUIREMENTS FOR CROSS SLOPE CANNOT BE FULLY MET, THE MINIMUM FEASIBLE CROSS SLOPE SHALL BE PROVIDED. RAMP RUNNING SLOPE IS NOT REQUIRED TO EXCEED 8' IN LENGTH, EXCEPT AT SITES WHERE THE PLANS SPECIFY A GREATER LENGTH.
4. IF A CURB RAMP IS LOCATED WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP, THEN THE WALK SHALL HAVE TRANSITION SLOPES TO THE RAMP; THE MAXIMUM SLOPE OF THE TRANSITIONS SHALL BE 1:12. RAMPS WITH CURB RETURNS MAY BE USED AT LOCATIONS WHERE OTHER IMPROVEMENTS PROVIDED GUIDANCE AWAY FROM THAT PORTION OF CURB PERPENDICULAR TO THE SIDEWALK; IMPROVEMENTS FOR GUIDANCE ARE NOT REQUIRED AT CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC.
5. CURB RAMP DETECTABLE WARNING SURFACES SHALL EXTEND THE FULL WIDTH OF THE RAMP AND IN THE DIRECTION OF TRAVEL 24" FROM THE BACK OF CURB. DETECTABLE WARNING SURFACES SHALL BE CONSTRUCTED BY TEXTURING A TRUNCATED DOME PATTERN IN CONFORMANCE WITH U.S. DEPARTMENT OF JUSTICE A.D.A. STANDARDS FOR ACCESSIBLE DESIGN, A.D.A. ACCESSIBILITY GUIDELINES, SECTION 4.29.2. TRANSITION SLOPES ARE NOT TO HAVE DETECTABLE WARNINGS.
6. UNLESS OTHERWISE CALLED OUT IN THE PLANS, THE RAMP DETECTABLE WARNING SURFACE SHALL BE COLORED IN ACCORDANCE WITH SECTION 351 OF THE STANDARD SPECIFICATIONS.
7. WHERE A CURB RAMP IS CONSTRUCTED WITHIN EXISTING CURB, CURB AND GUTTER AND/OR SIDEWALK, THE EXISTING CURB OR CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE CURB TRANSITIONS OR TO THE EXTENT THAT NO REMAINING SECTION OF CURB OR CURB AND GUTTER IS LESS THAN 5' LONG. THE EXISTING SIDEWALK SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE TRANSITION SLOPE OR WALK AROUND OR TO THE EXTENT THAT NO REMAINING SECTION OF SIDEWALK IS LESS THAN 5' LONG.
8. ALPHA-NUMERIC IDENTIFICATIONS ARE FOR REFERENCE. (PLANS, PERMITS, ETC.)
9. PUBLIC SIDEWALK CURB RAMPS ARE TO BE PAID FOR AS FOLLOWS:RAMPS, RECONSTRUCTED SIDEWALKS, WALK AROUND SIDEWALKS, SIDEWALKS LANDINGS AND SIDEWALK CURBS ARE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR SIDEWALK CONCRETE, (___" THICK), SY. CURB TRANSITIONS AND RECONSTRUCTED CURBS ARE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR THE PARENT CURB, i.e., CURB CONC., (TYPE ___), LF OR CURB AND GUTTER CONC.,(TYPE ___), LF.

WHEN A SEPARATE PAY ITEM FOR THE REMOVAL AND DISPOSAL OF EXISTING CURB, CURB AND GUTTER, AND/OR SIDEWALK IS NOT PROVIDED IN THE PLANS, THE COST OF REMOVAL AND DISPOSAL OF THESE FEATURES SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR NEW CURB, CURB AND GUTTER AND/OR SIDEWALK RESPECTIVELY.



HANDICAP RAMP TYPE 1: PERPENDICULAR CURB RAMP



HANDICAP RAMP TYPE 2: PARALLEL CURB RAMP
(USE ONLY WHERE WATER WILL NOT POND IN THE LANDING.)

∇ ∇ DENOTES PLANTING OR NON-WALKING SURFACE.

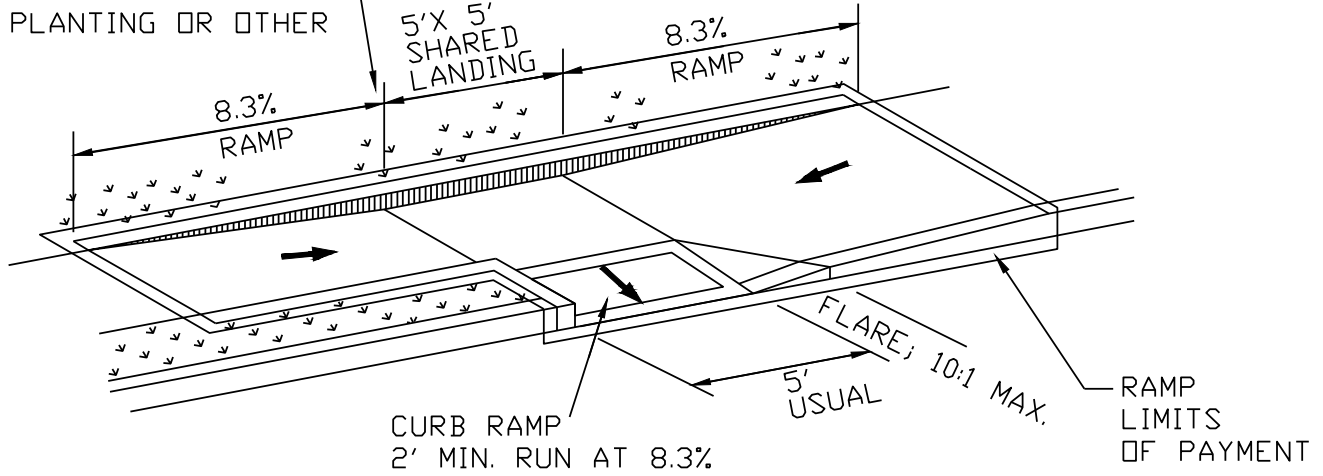


CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP
TYPE 1 & TYPE 2
(SHEET 1 OF 9)

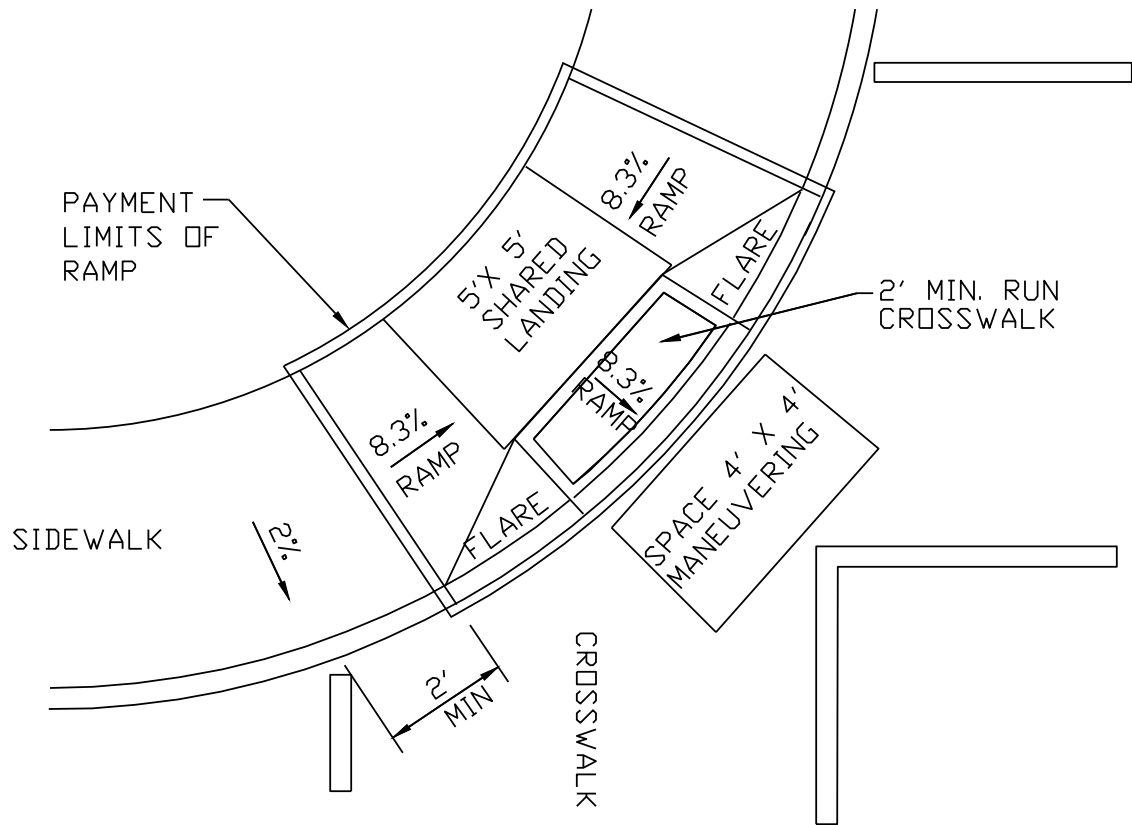


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IS NOT PROTECTED SURFACE IF DROPOFF NON-WALKING PLANTING OR OTHER



HANDICAP RAMP TYPE 3: PARALLEL CURB RAMP



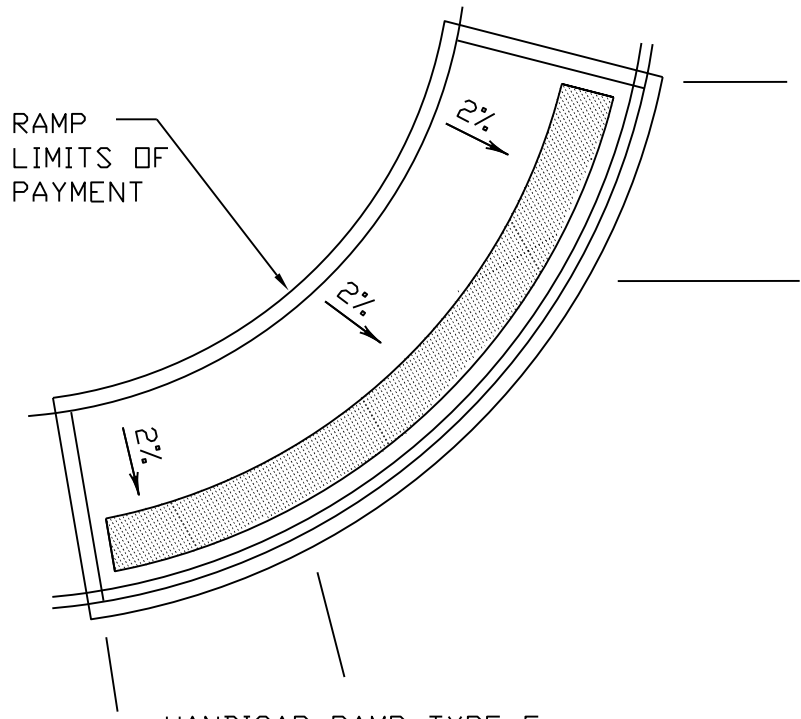
↙ ↘ DENOTES PLANTING OR NON-WALKING SURFACE. HANDICAP RAMP TYPE 4: DIAGONAL COMBINATION CURB RAMP PERPENDICULAR TO THE TANGENT OF THE CURB RADIUS AND CONTAINED IN CROSSWALK



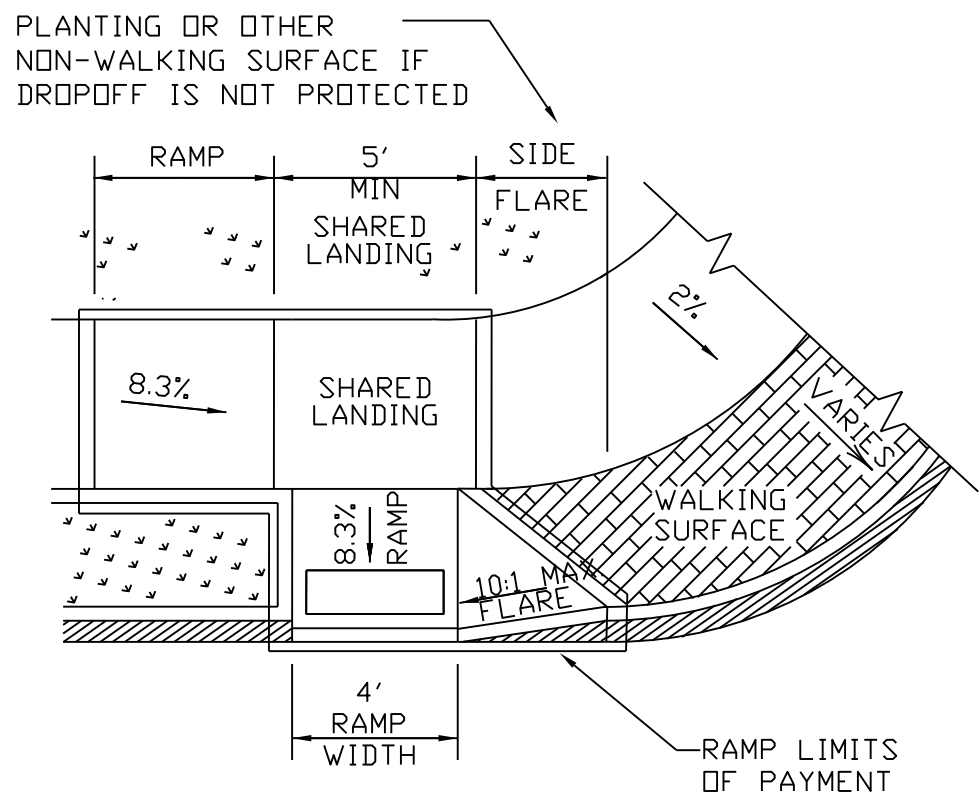
CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP
TYPE 3 & TYPE 4
(SHEET 2 OF 9)



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**HANDICAP RAMP TYPE 5:
FLUSH LANDING**



**HANDICAP RAMP TYPE 6:
COMBINATION CURB RAMPS**

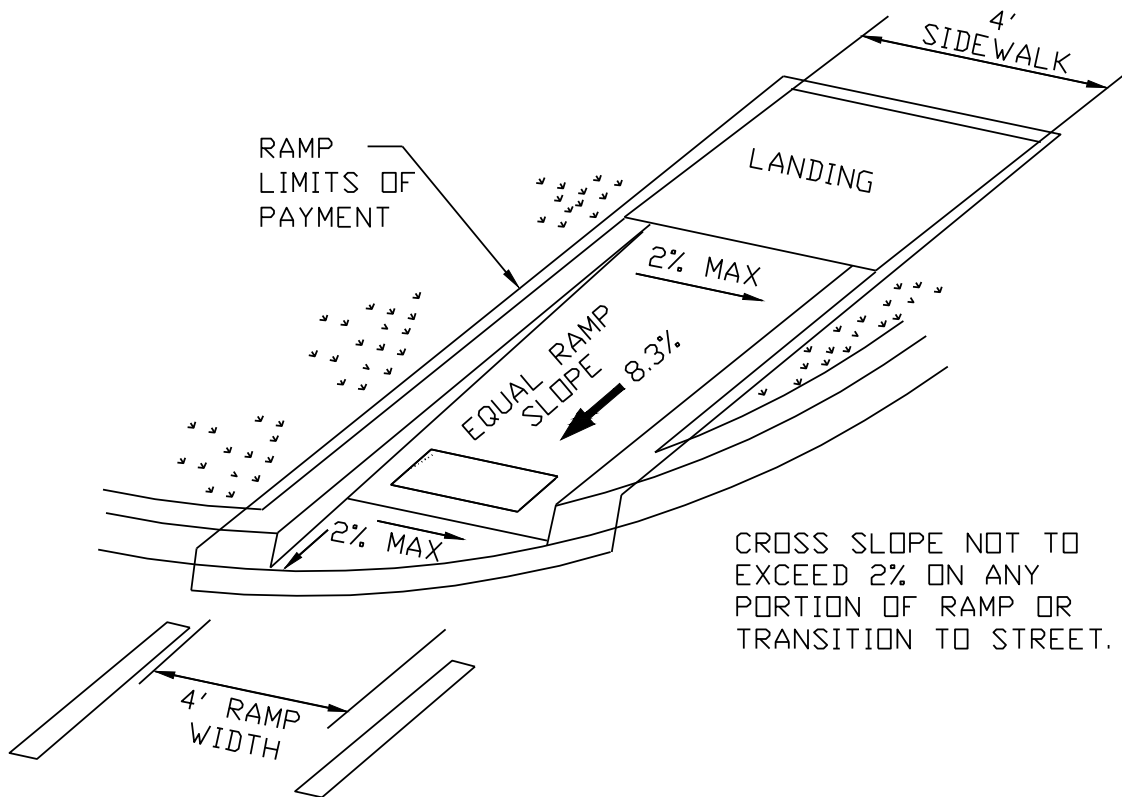
↙ ↘ DENOTES PLANTING OR NON-WALKING SURFACE.



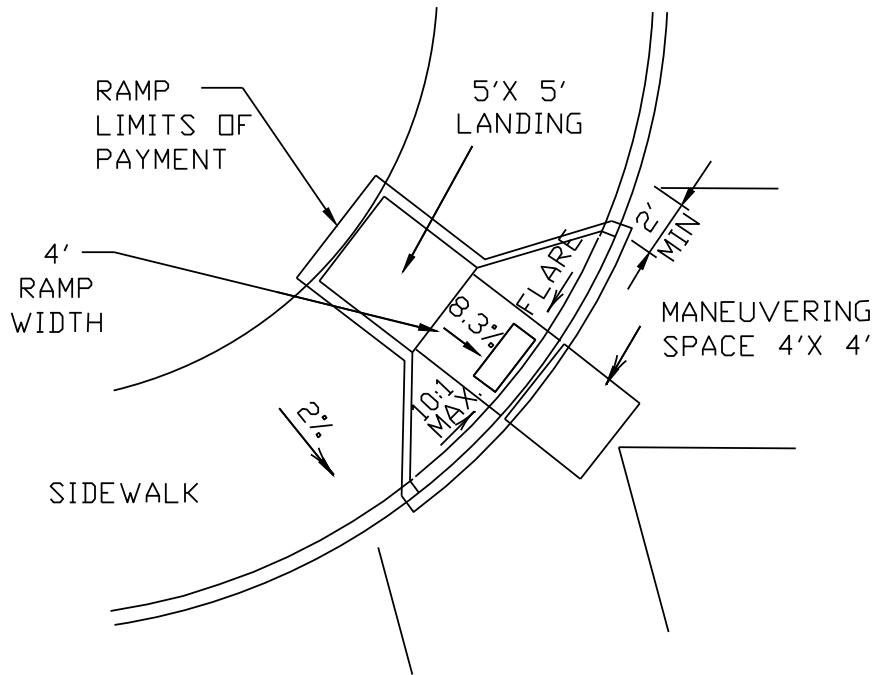
**CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP
TYPE 5 & TYPE 6
(SHEET 3 OF 9)**



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HANDICAP RAMP TYPE 7:
DIRECTIONAL RAMP WITHIN RADIUS (SIDEWALK SET BACK FROM CURB)



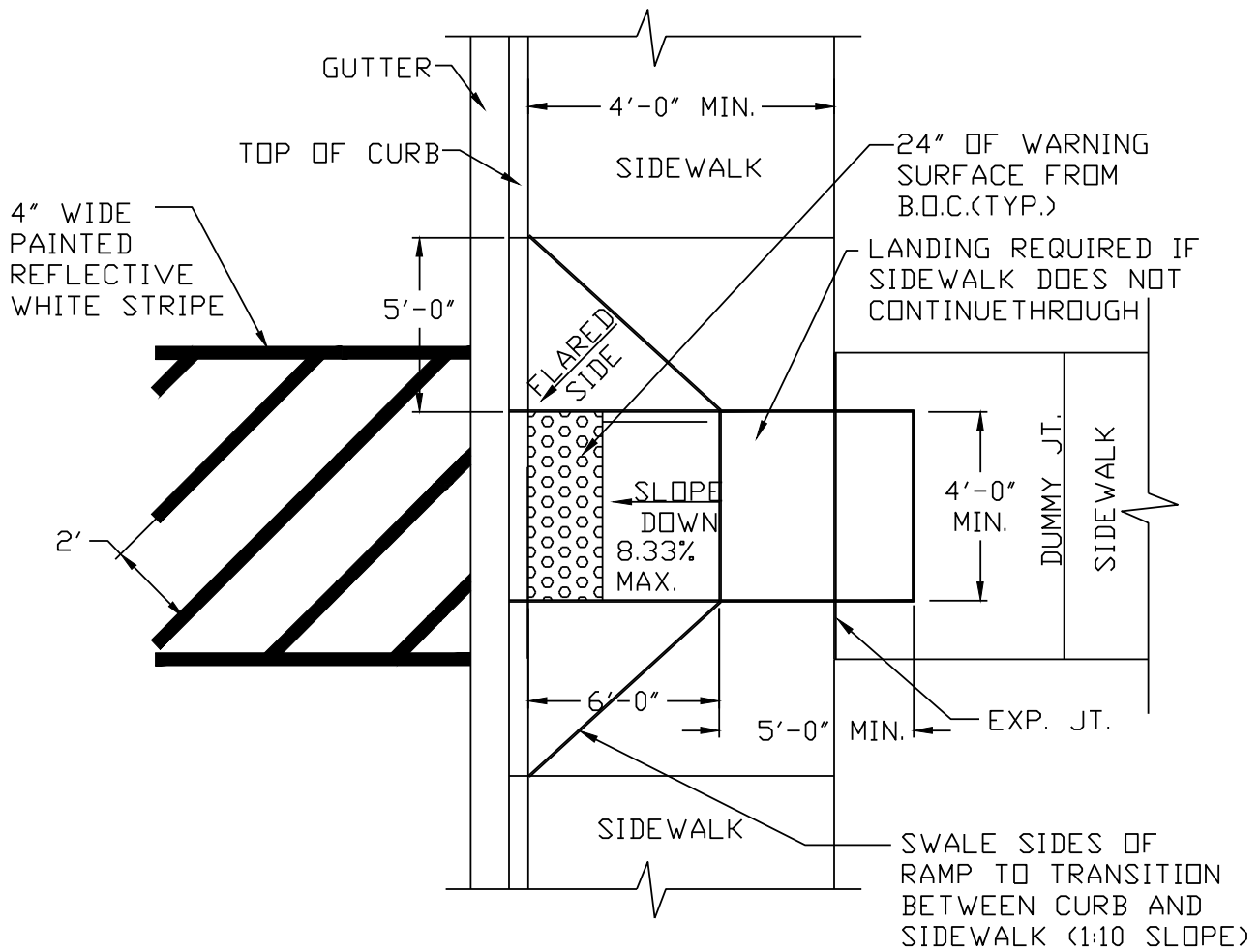
⌘ DENOTES
 PLANTING
 OR NON-WALKING
 SURFACE.

HANDICAP RAMP TYPE 8:
DIAGONAL CURB RAMP (FLARED SIDES)



CITY OF SAN JUAN
 STANDARDS MANUAL
 HANDICAP RAMP
 TYPE 7 & TYPE 8
 (SHEET 4 OF 9)





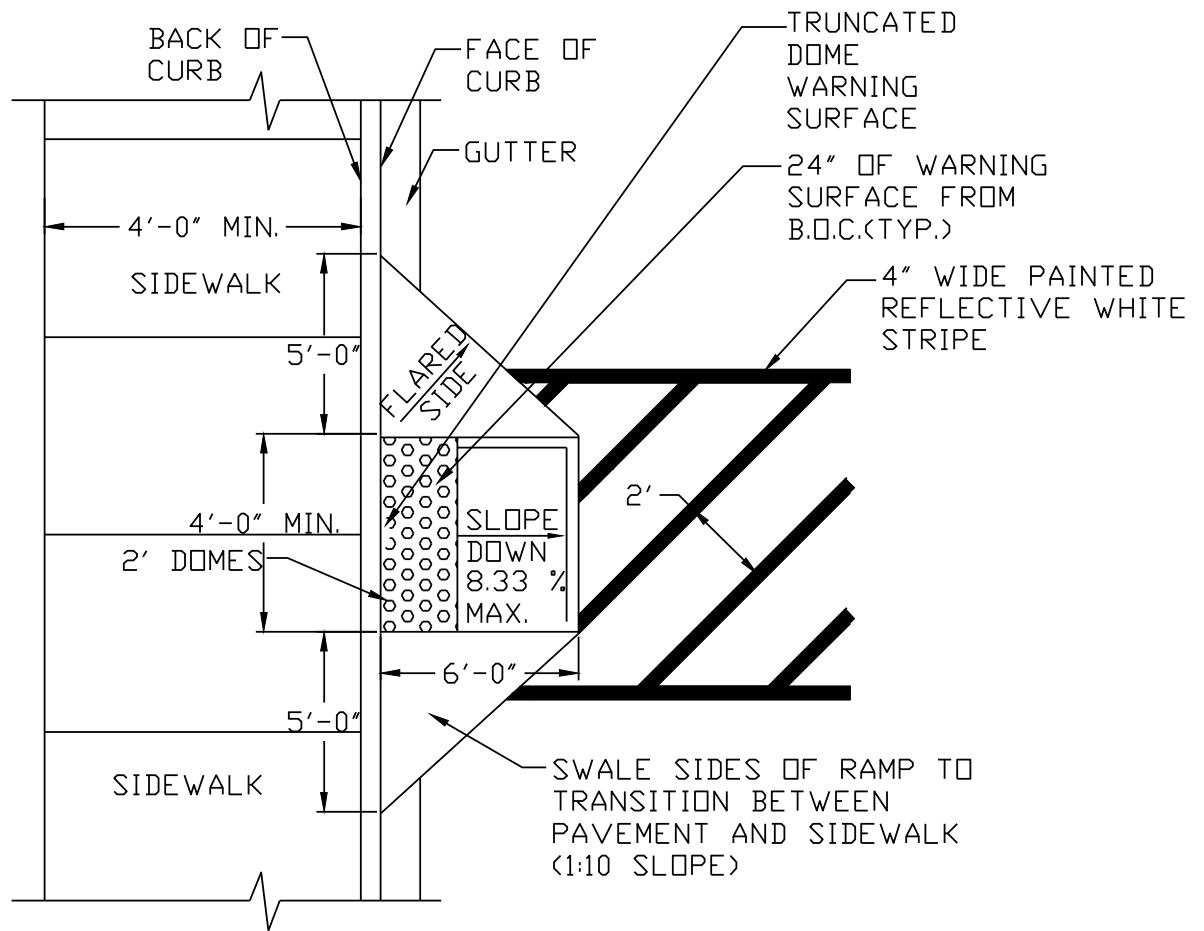
TYPICAL HANDICAP RAMP BUILT INTO SIDEWALK



CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP DETAIL
(SHEET 5 OF 9)



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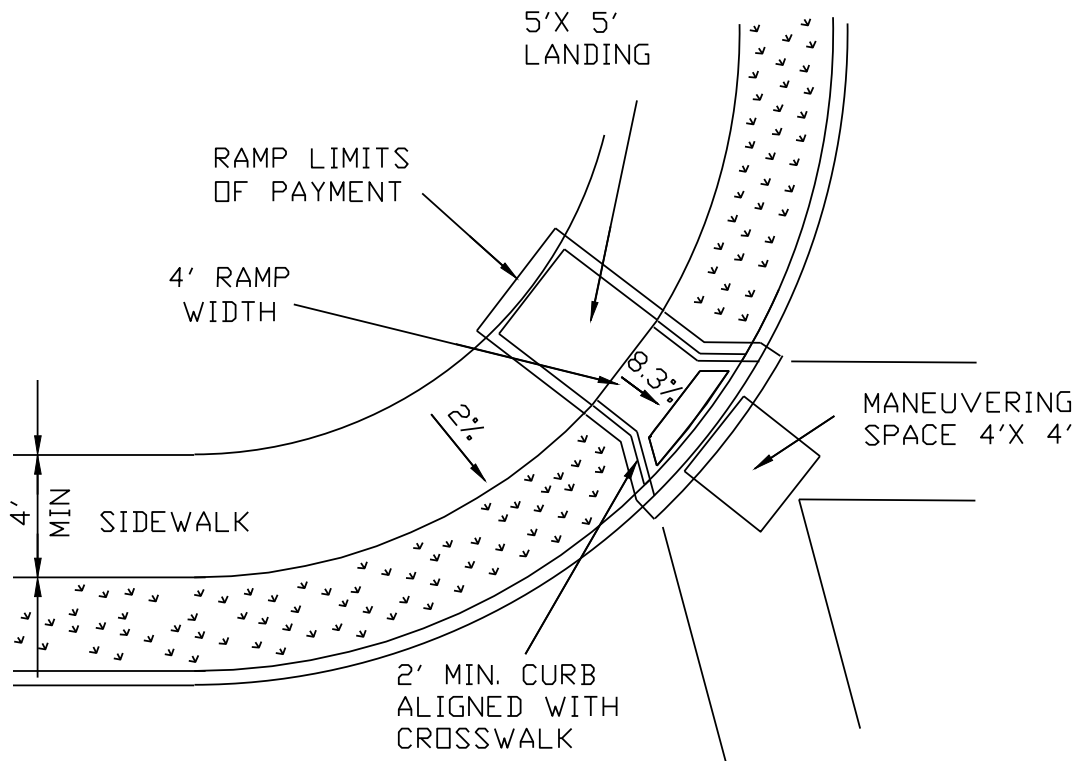
TYPICAL HANDICAP RAMP BUILT ON TOP OF PARKING LOT



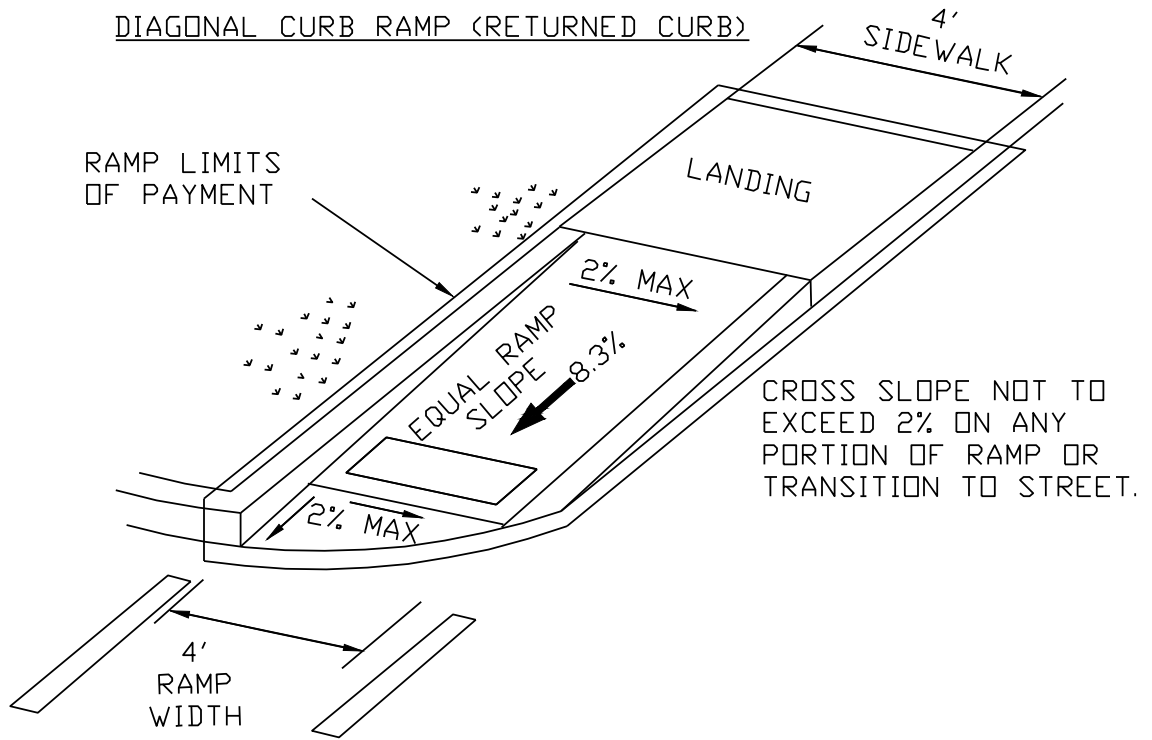
CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP DETAIL
(SHEET 6 OF 9)



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HANDICAP RAMP TYPE 9:
DIAGONAL CURB RAMP (RETURNED CURB)



HANDICAP RAMP TYPE 10:
DIRECTIONAL RAMP WITHIN RADIUS
(SIDEWALK ADJACENT TO CURB)

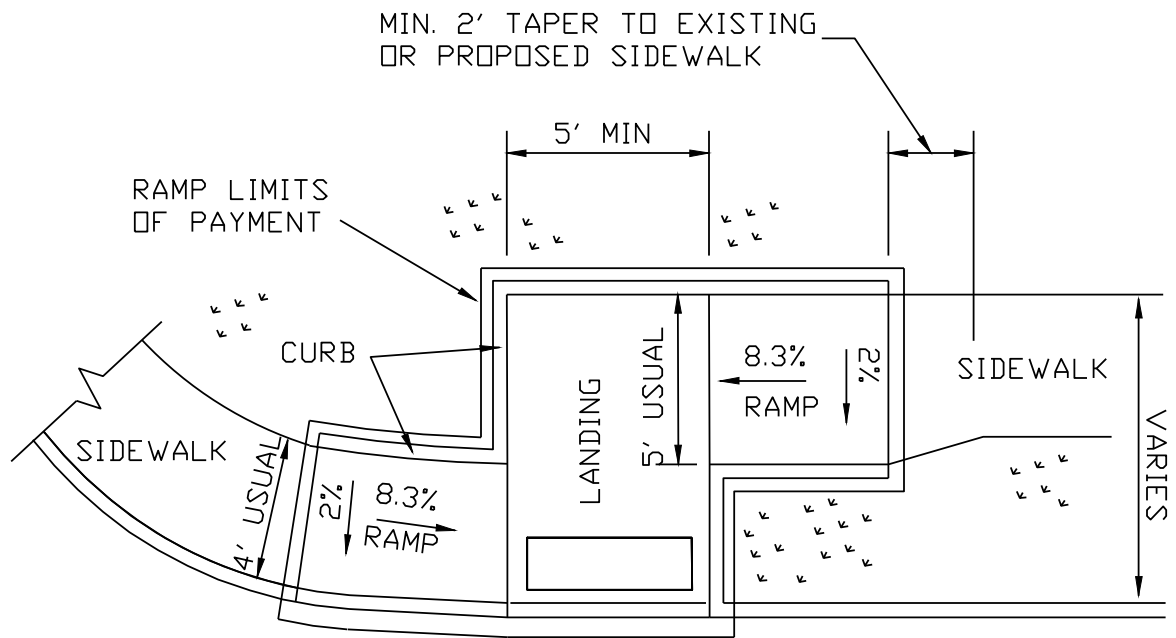
v v DENOTES PLANTING OR NON-WALKING SURFACE.



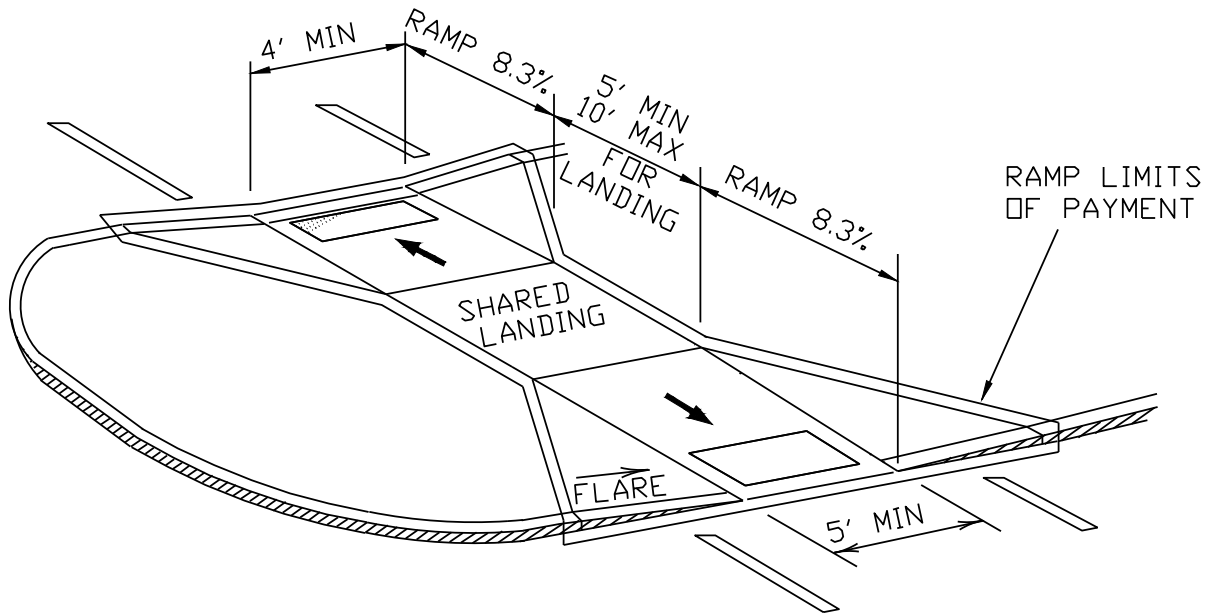
CITY OF SAN JUAN
 STANDARDS MANUAL
 HANDICAP RAMP
 TYPE 9 & TYPE 10
 (SHEET 7 OF 9)



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HANDICAP RAMP TYPE 11:
OFFSET PARALLEL CURB RAMP



HANDICAP RAMP TYPE 20:
CURB RAMPS AT MEDIAN ISLANDS

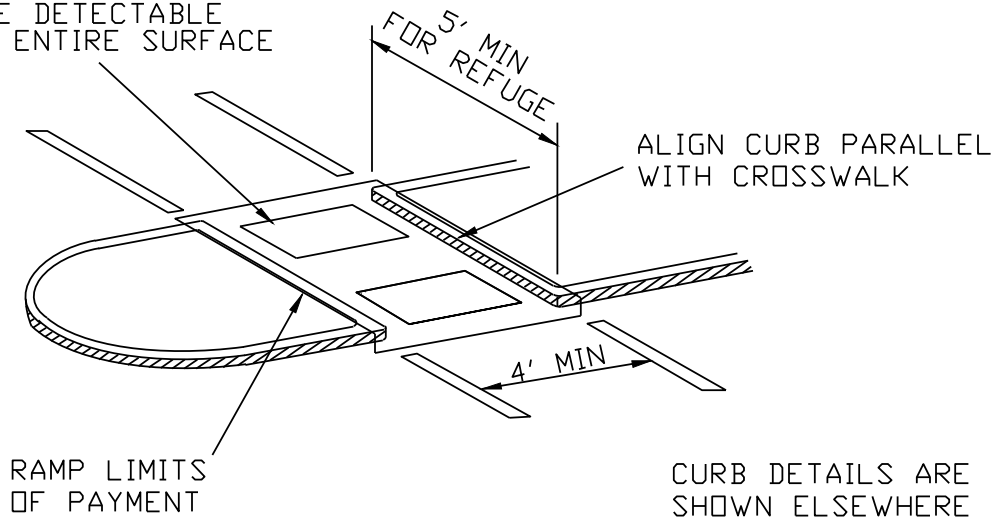
FF DENOTES
PLANTING
OR NON-WALKING
SURFACE.



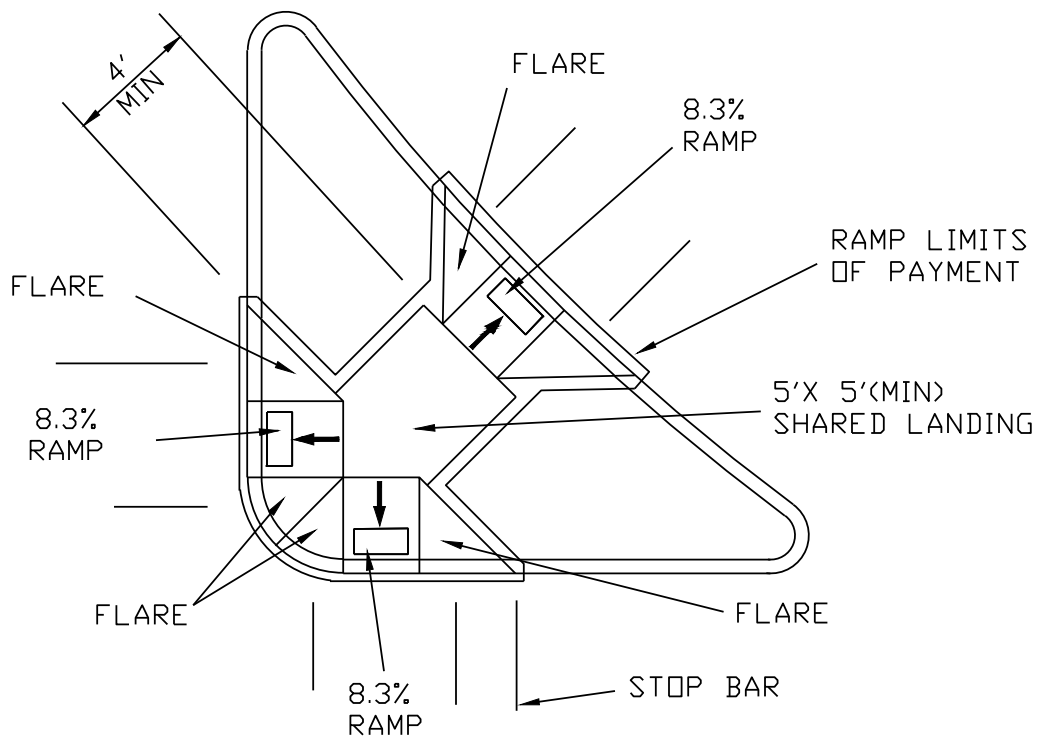
CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP
TYPE 11 & TYPE 20
(SHEET 8 OF 9)



2' STRIP IF CUT THROUGH IS GREATER THAN 4' IN LENGTH. OTHERWISE PLACE DETECTABLE WARNING ON THE ENTIRE SURFACE OF CUT THROUGH.



HANDICAP RAMP TYPE 21:
CURB RAMPS AT MEDIAN ISLANDS



HANDICAP RAMP TYPE 22:
COMBINATION ISLAND RAMPS

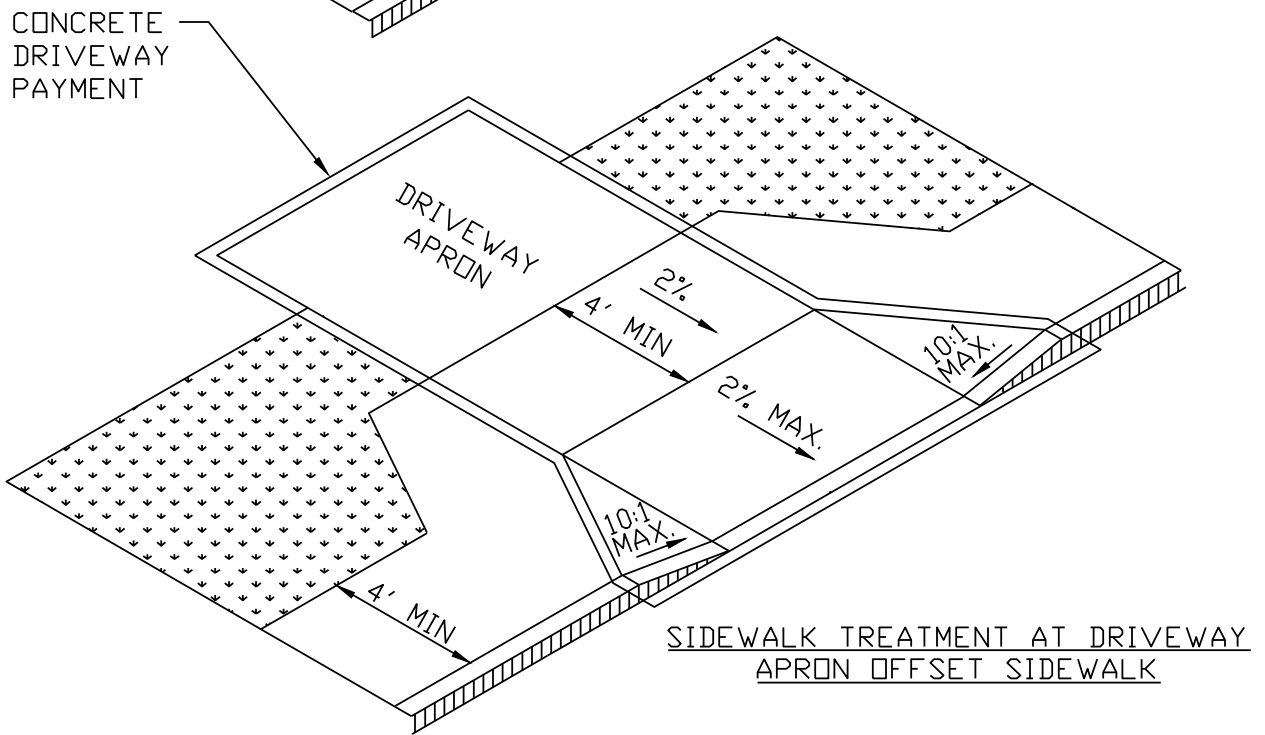
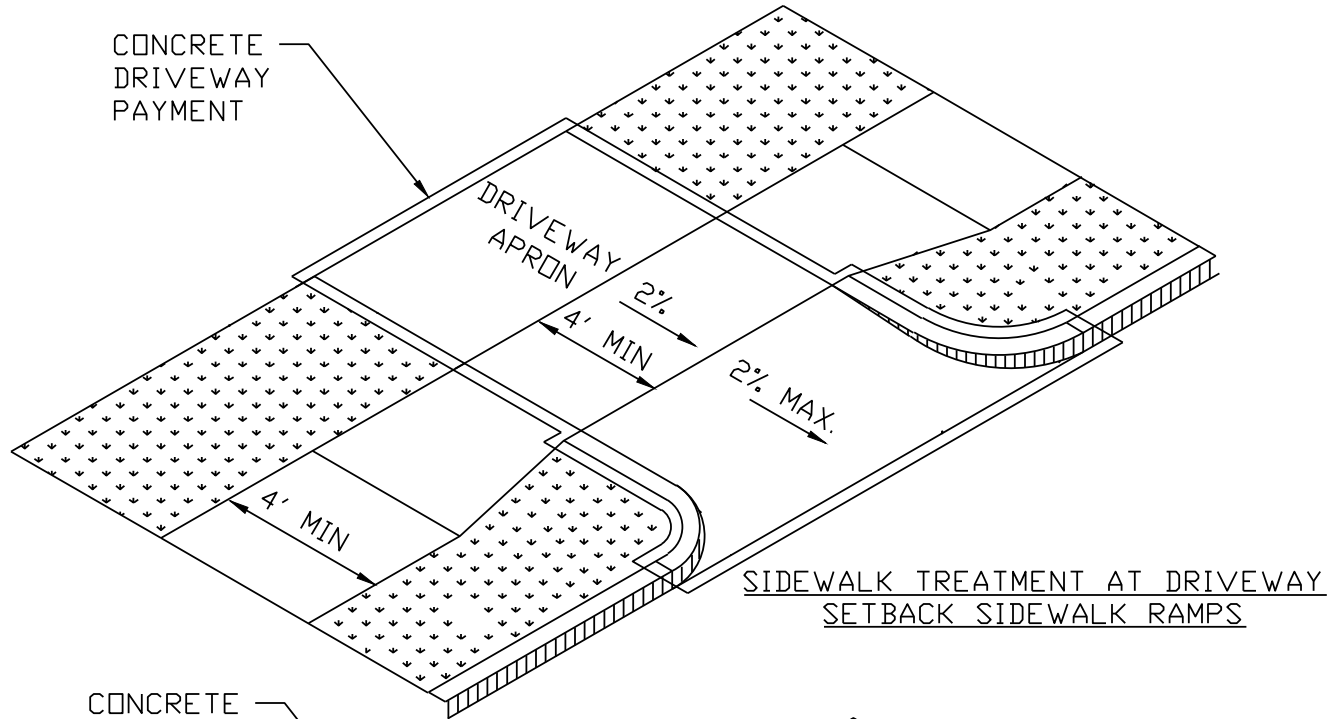
△ DENOTES PLANTING OR NON-WALKING SURFACE.





CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP RAMP
TYPE 21 & TYPE 22
(SHEET 9 OF 9)



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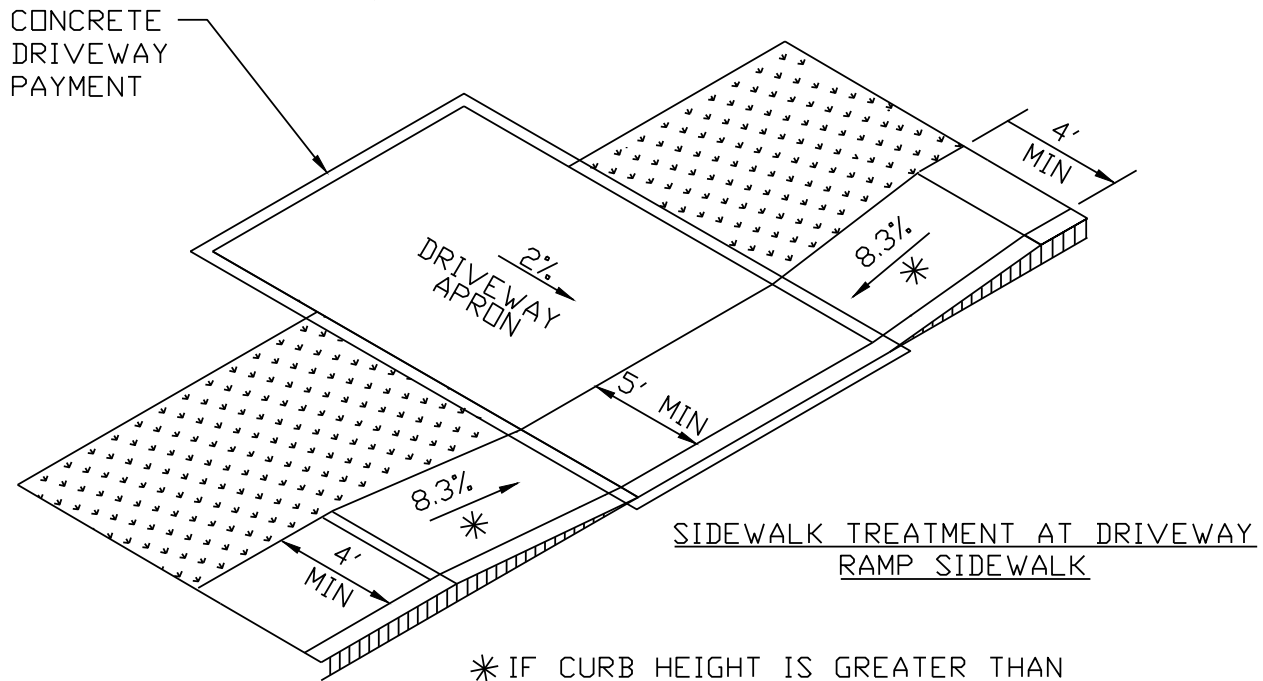
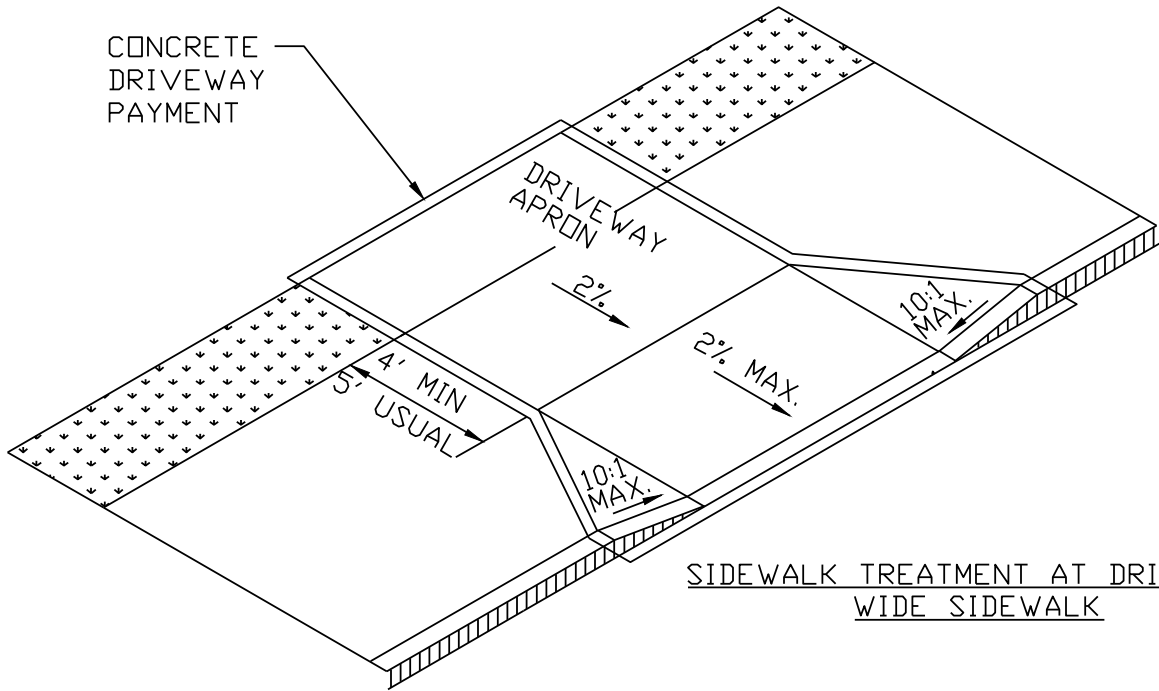


 DENOTES
 PLANTING
 OR NON-WALKING
 SURFACE.



CITY OF SAN JUAN
 STANDARDS MANUAL
 SIDEWALK TREATMENT AT DRIVEWAY
 (SHEET 1 OF 2)



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* IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING NOT REQUIRED.

⋄ DENOTES PLANTING OR NON-WALKING SURFACE.



CITY OF SAN JUAN
STANDARDS MANUAL
SIDEWALK TREATMENT AT DRIVEWAY
(SHEET 2 OF 2)



GENERAL NOTES

1. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 4.29 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. SHADED AREAS ON DETAILS INDICATE THE APPROXIMATE LOCATION FOR THE DETECTABLE WARNING SURFACE FOR EACH CURB RAMP TYPE.
5. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
6. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 10" FROM THE EXTENSION OF THE FACE OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
7. TXDOT MAINTAINS A LIST OF QUALIFIED DETECTABLE WARNING MATERIALS. DETAILS ARE PROVIDED HEREIN FOR THE PLACEMENT OF LANDSCAPE PAVERS. FOR OTHER MATERIALS, REFER TO THE MANUFACTURER'S PRODUCT MANUAL FOR PROPER INSTALLATION.



CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING
GENERAL NOTES



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GENERAL NOTES

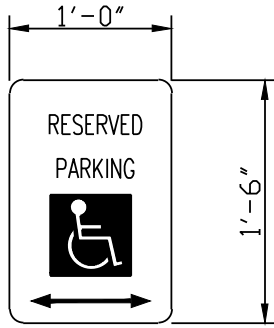
1. ALL SLOPES ARE MAXIMUM ALLOWABLE. THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. THE MINIMUM SIDEWALK WIDTH IS 4'. WHERE THE SIDEWALK IS ADJACENT TO THE BACK OF CURB, A 5' SIDEWALK WIDTH IS ENCOURAGED. WHERE A 5' SIDEWALK CAN NOT BE PROVIDED DUE TO SITE CONSTRAINTS, A MINIMUM 4' SIDEWALK WITH 5'X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' IS REQUIRED.
3. LANDINGS SHALL BE 5'X 5' MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
4. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X 4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
5. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2%.
6. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR BECAUSE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED. THERWISE, PROVIDE FLARED SIDES.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND 16 TAC 68.102.
8. TO SERVE AS A PEDESTRIAN REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 5' WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
9. SMALL CHANNELIZATION ISLANDS, WHICH DO NOT PROVIDE A MINIMUM 5'X 5' LANDING AT THE TOP OF CURB RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.
10. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE ENGINEER.
11. EXISTING FEATURES THAT COMPLY WITH TAS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
12. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
13. CURB RAMPS AND LANDINGS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH ITEM 531 "SIDEWALKS".
14. SEPARATE CURB RAMP AND LANDINGS FROM ADJACENT SIDEWALK AND ANY OTHER ELEMENTS WITH PREMOLD OR BOARD JOINT OF 3/4" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
15. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
16. CURBS SHOWN ON SHEET 1 WITHIN THE LIMITS OF PAYMENT ARE CONSIDERED PART OF THE CURB RAMP FOR PAYMENT, WHETHER IT IS CONCRETE CURB, GUTTER, OR COMBINED CURB AND GUTTER.
17. FLARE SLOPE SHALL NOT EXCEED 10% MEASURED ALONG CURB LINE.



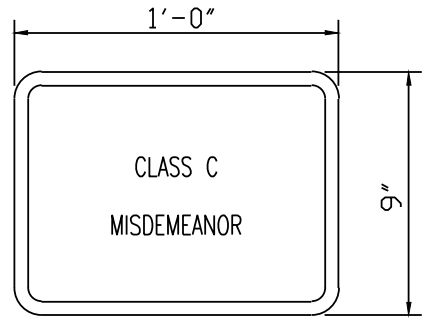
**CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING DETAILS
PEDESTRIAN FACILITIES GENERAL NOTES**



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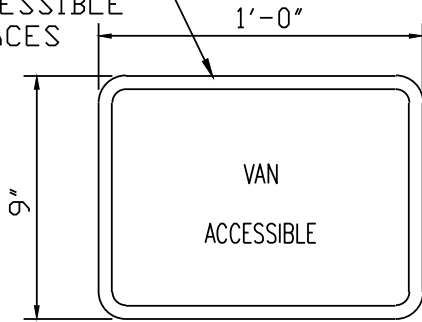


PRIMARY SIGN
N.T.S.

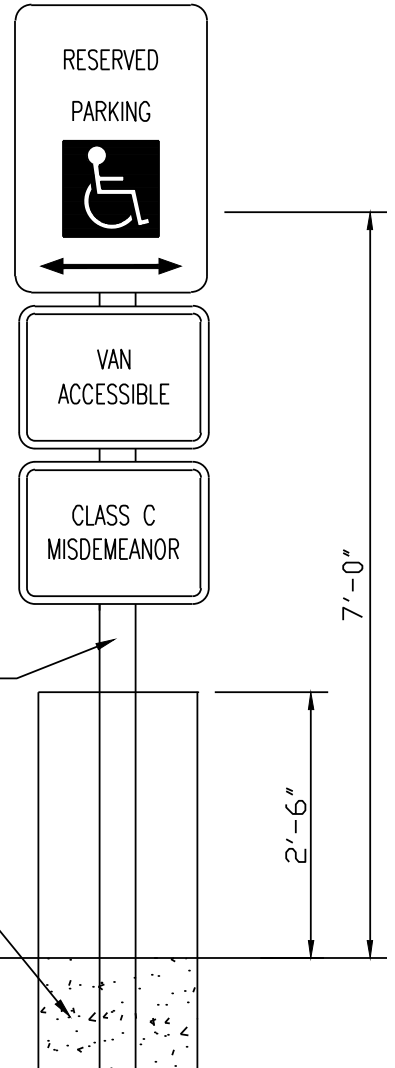


PENALTY SIGN
N.T.S.

SUBSTITUTE THIS SIGN FOR ONE SHOWN AT VAN ACCESSIBLE PARKING SPACES



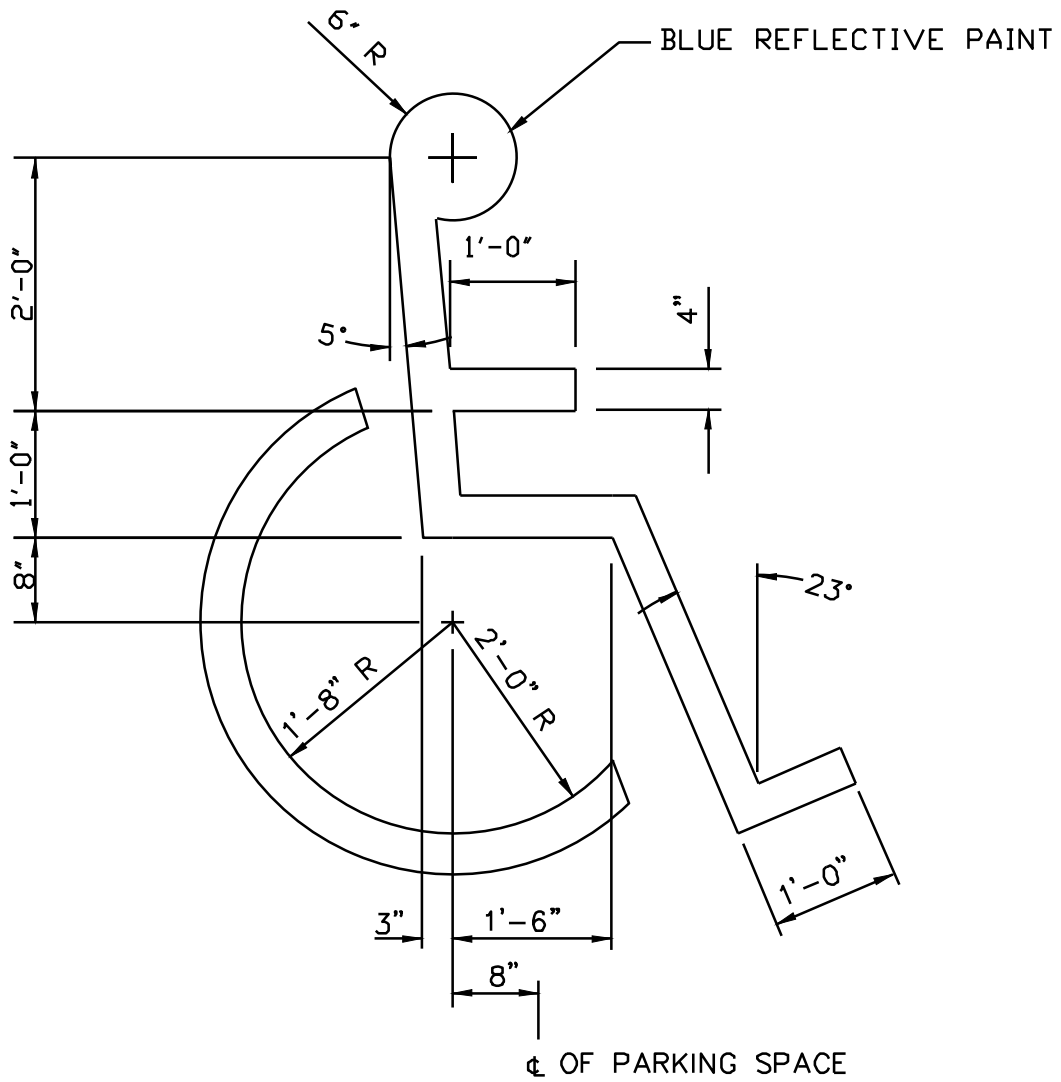
SUPPLEMENTARY SIGN
N.T.S.



CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP SIGN DETAIL



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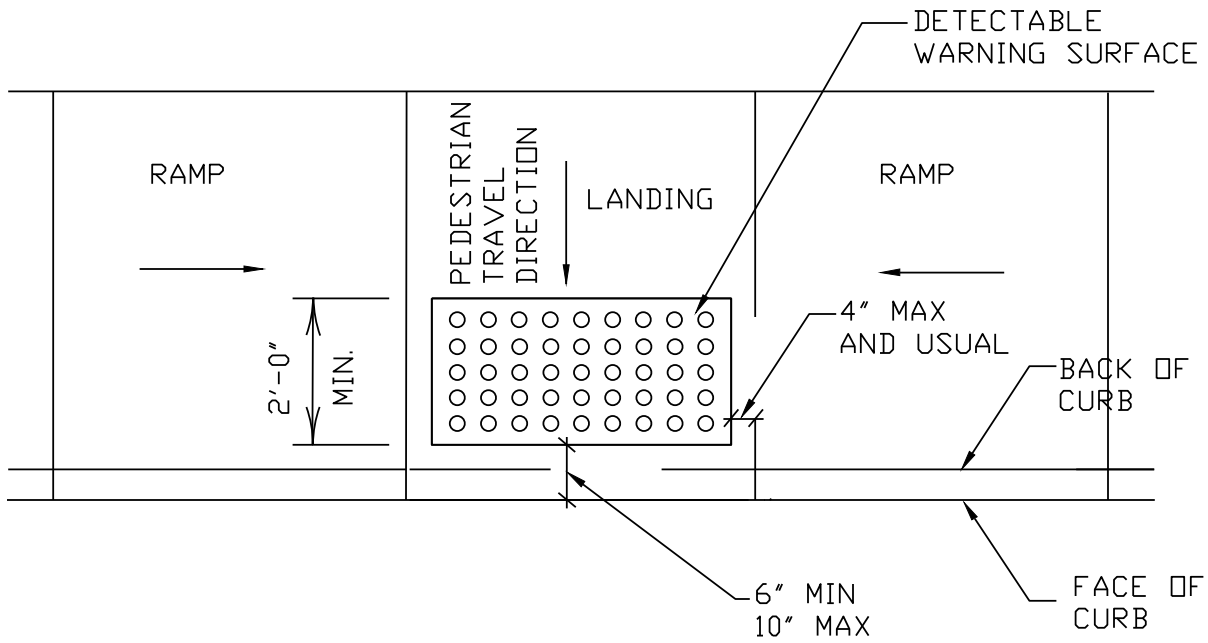


CITY OF SAN JUAN
STANDARDS MANUAL
HANDICAP SYMBOL DETAIL

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DETECTABLE WARNINGS



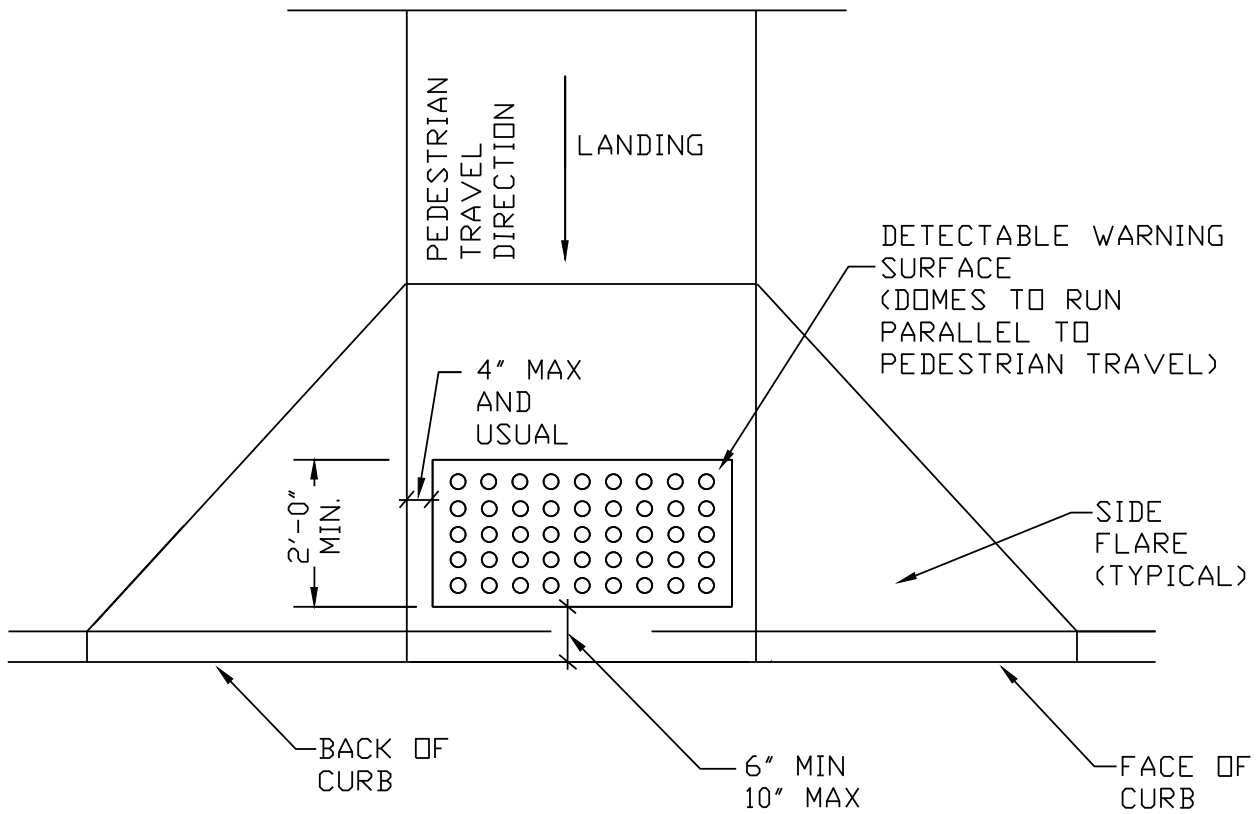
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING DETAIL
STREET EDGE



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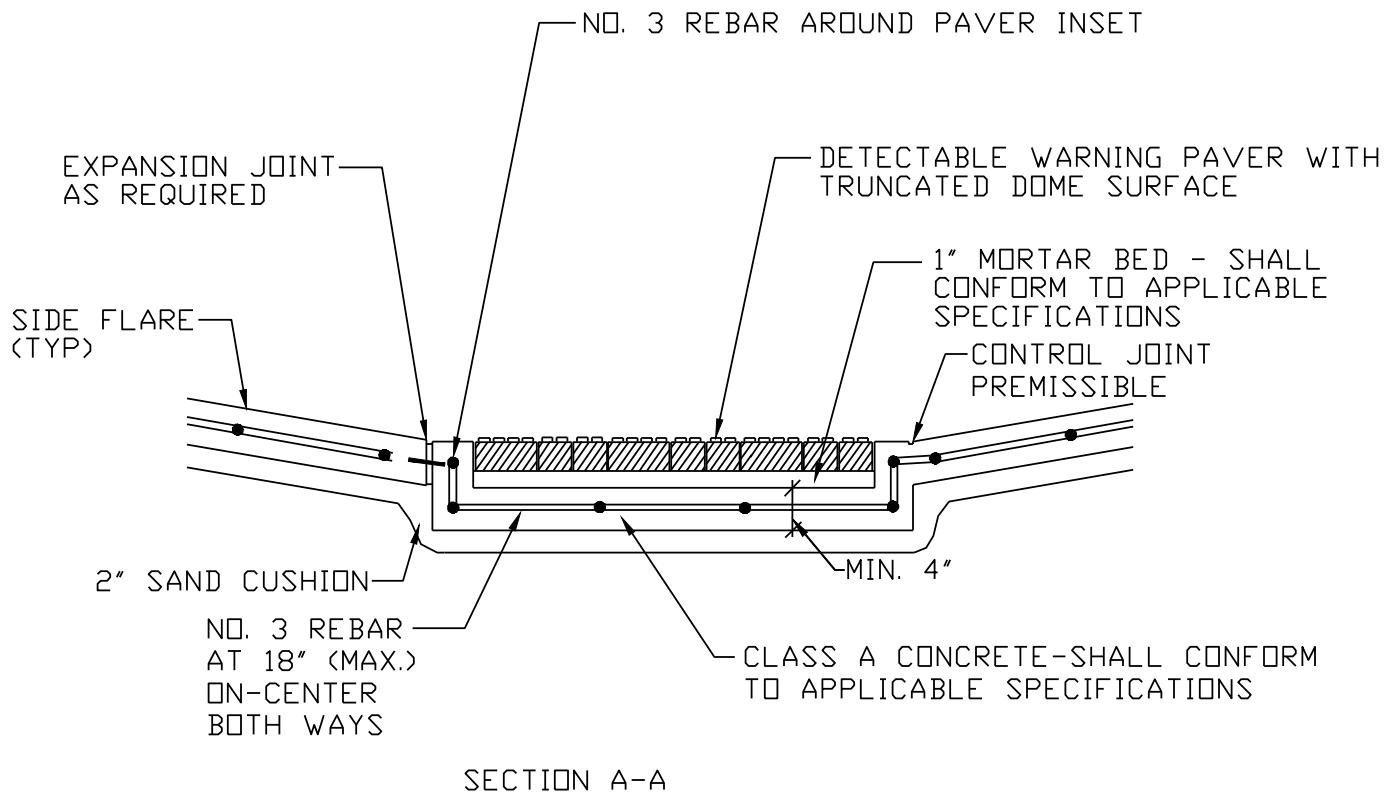
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING DETAILS



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FURNISH DETECTABLE WARNING PAVER UNITS MEETING ALL REQUIREMENTS OF ASTM C-936, C-33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.

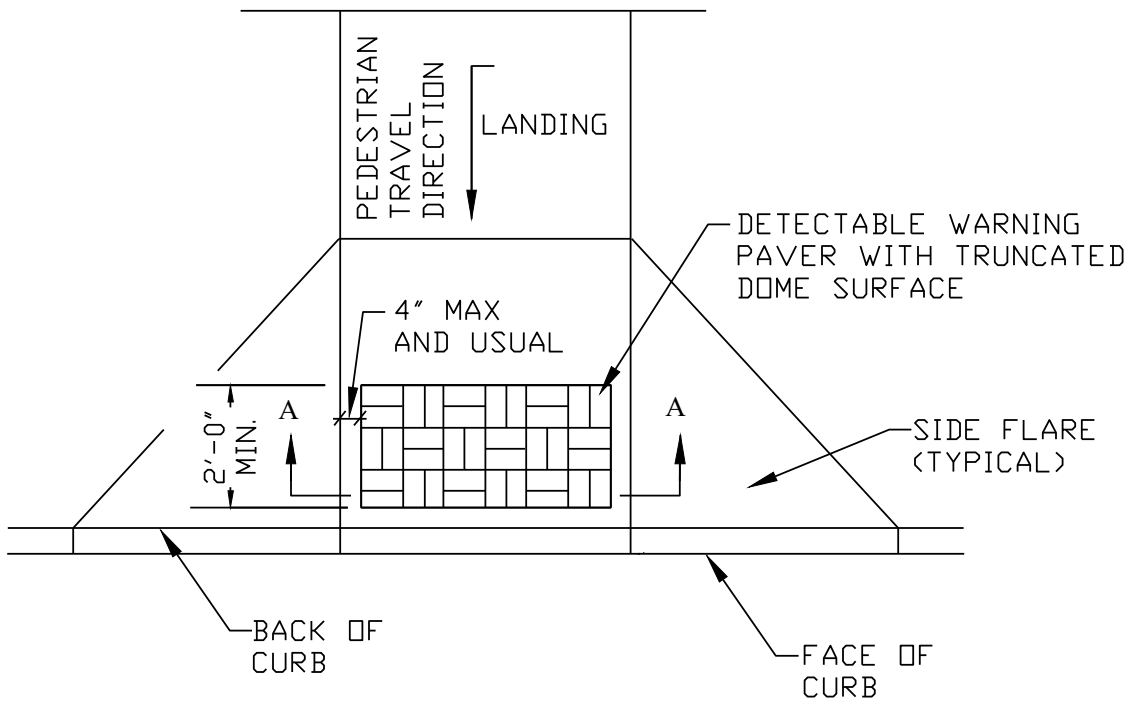
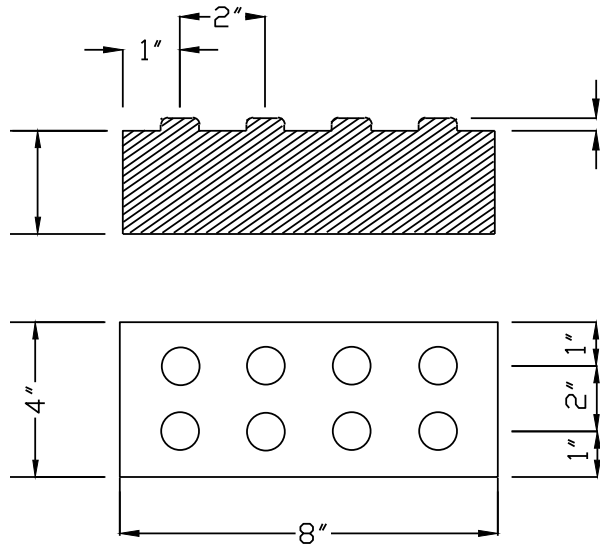
LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.



CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING
PAVER OPTIONS



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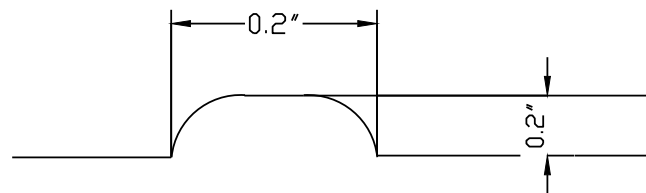
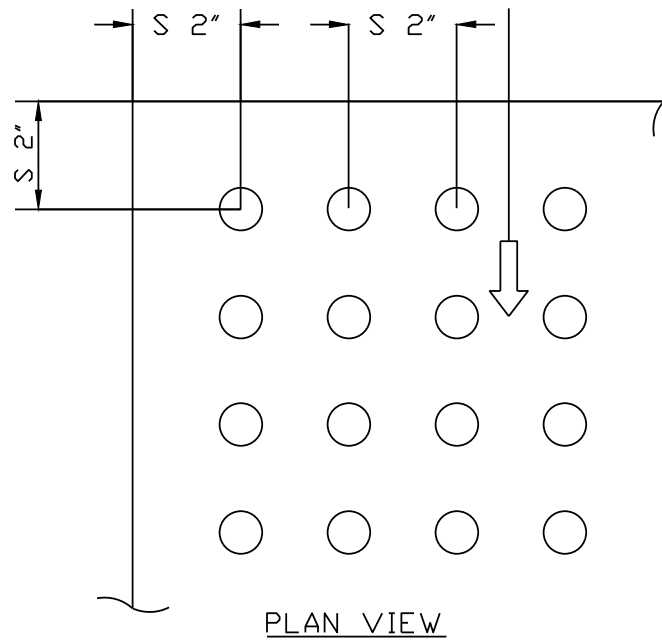
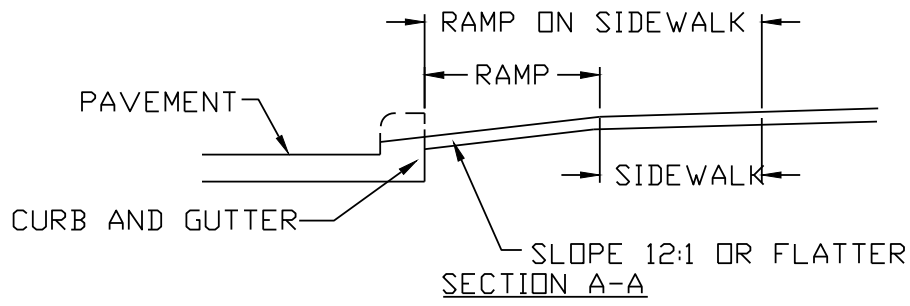
TRUNCATED DOME PATTERN CURB RAMP



CITY OF SAN JUAN
STANDARDS MANUAL
DETECTABLE WARNING
PAVER OPTIONS

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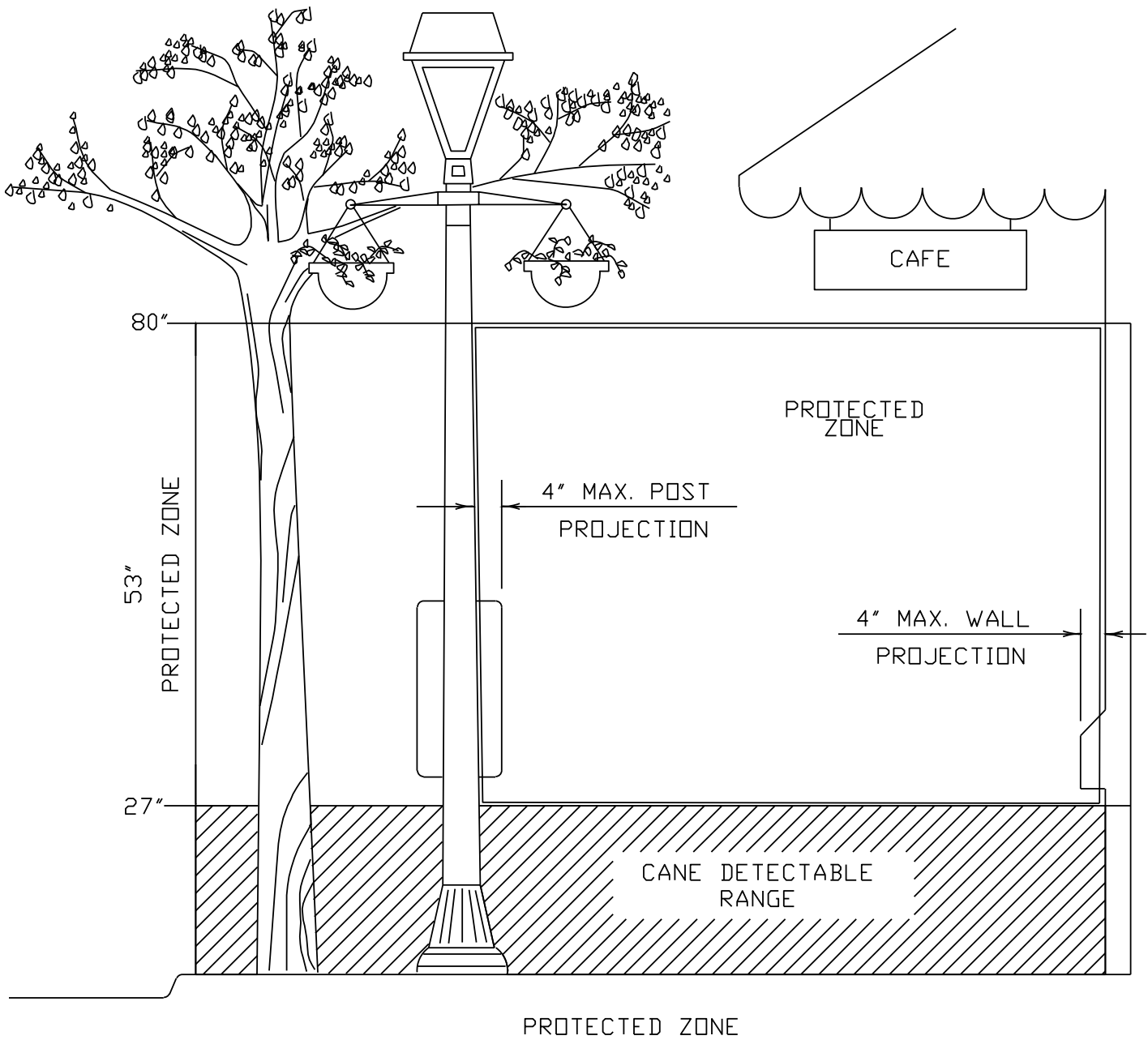




CITY OF SAN JUAN
STANDARDS MANUAL
CURB RAMP DETECTABLE WARNING



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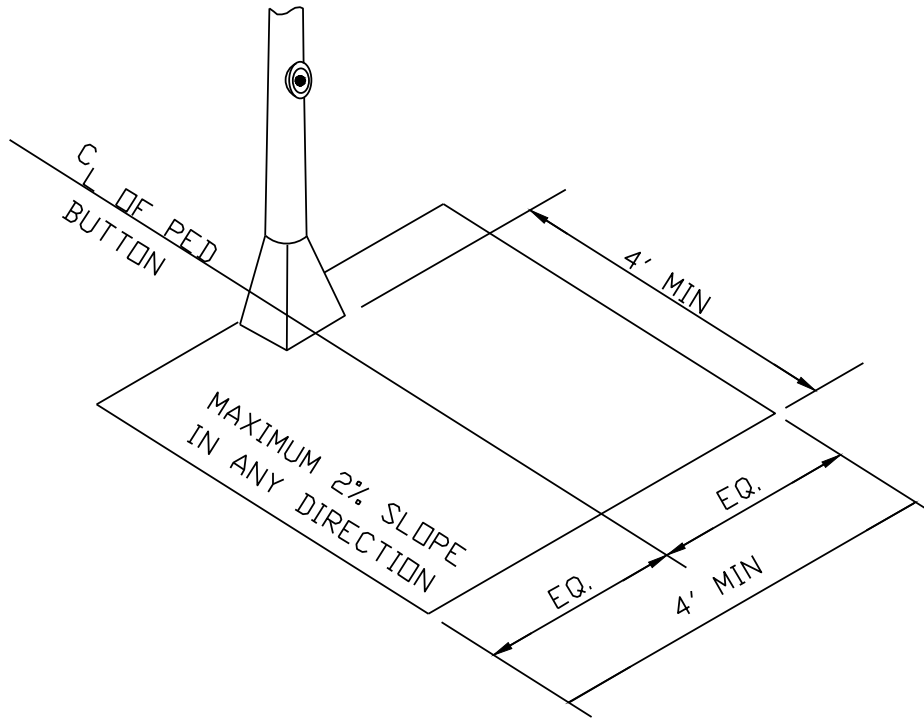
IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



CITY OF SAN JUAN
STANDARDS MANUAL
PEDESTRIAN FACILITIES
PROTECTED ZONES
(SHEET 2 OF 5)



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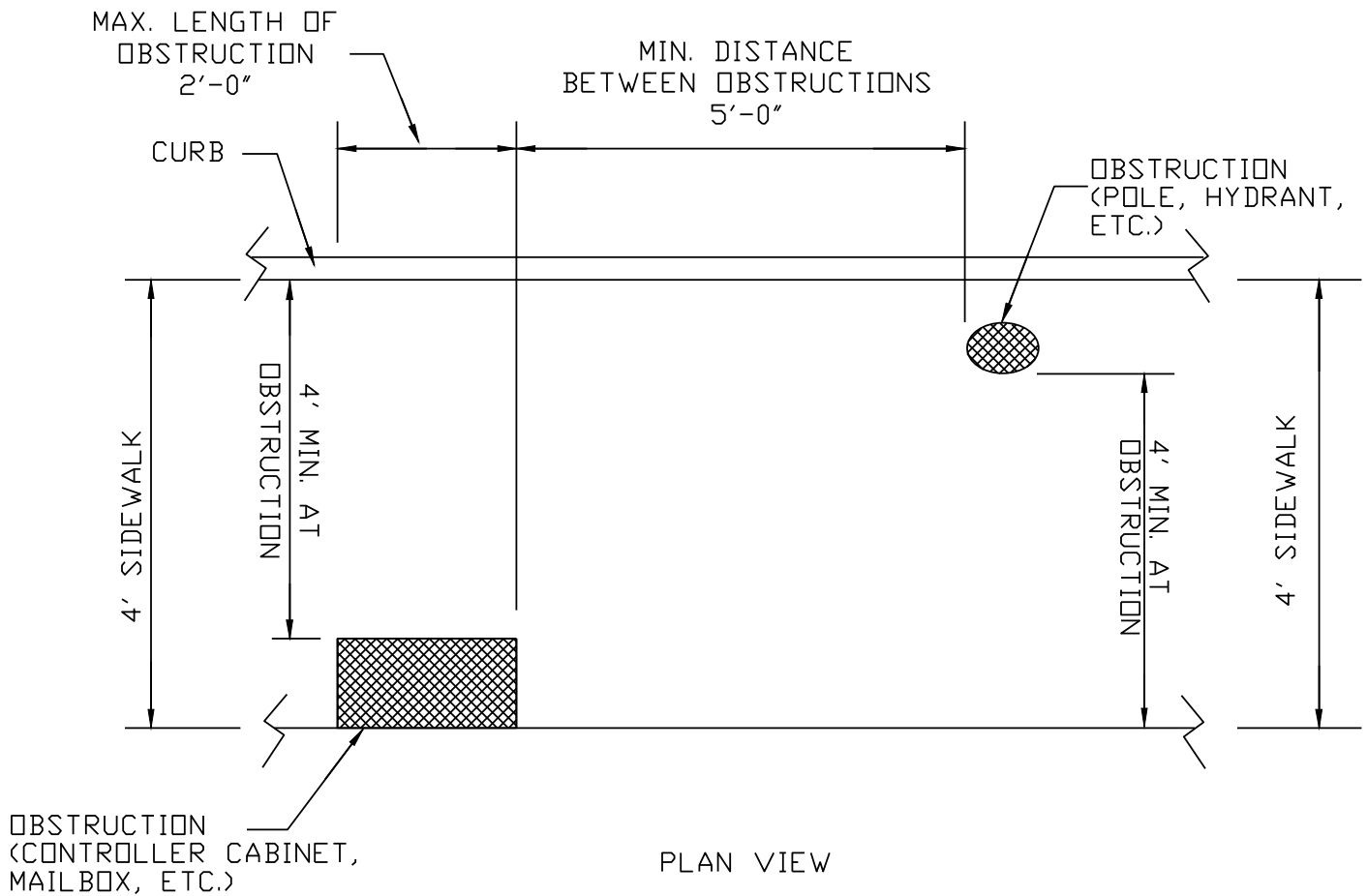
CLEAR GROUND SPACE CENTERED
AT PEDESTRIAN PUSH BUTTON



CITY OF SAN JUAN
STANDARDS MANUAL
PEDESTRIAN FACILITIES
GROUND SPACE CLEARANCE
(SHEET 3 OF 5)



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PLACEMENT OF STREET FIXTURES

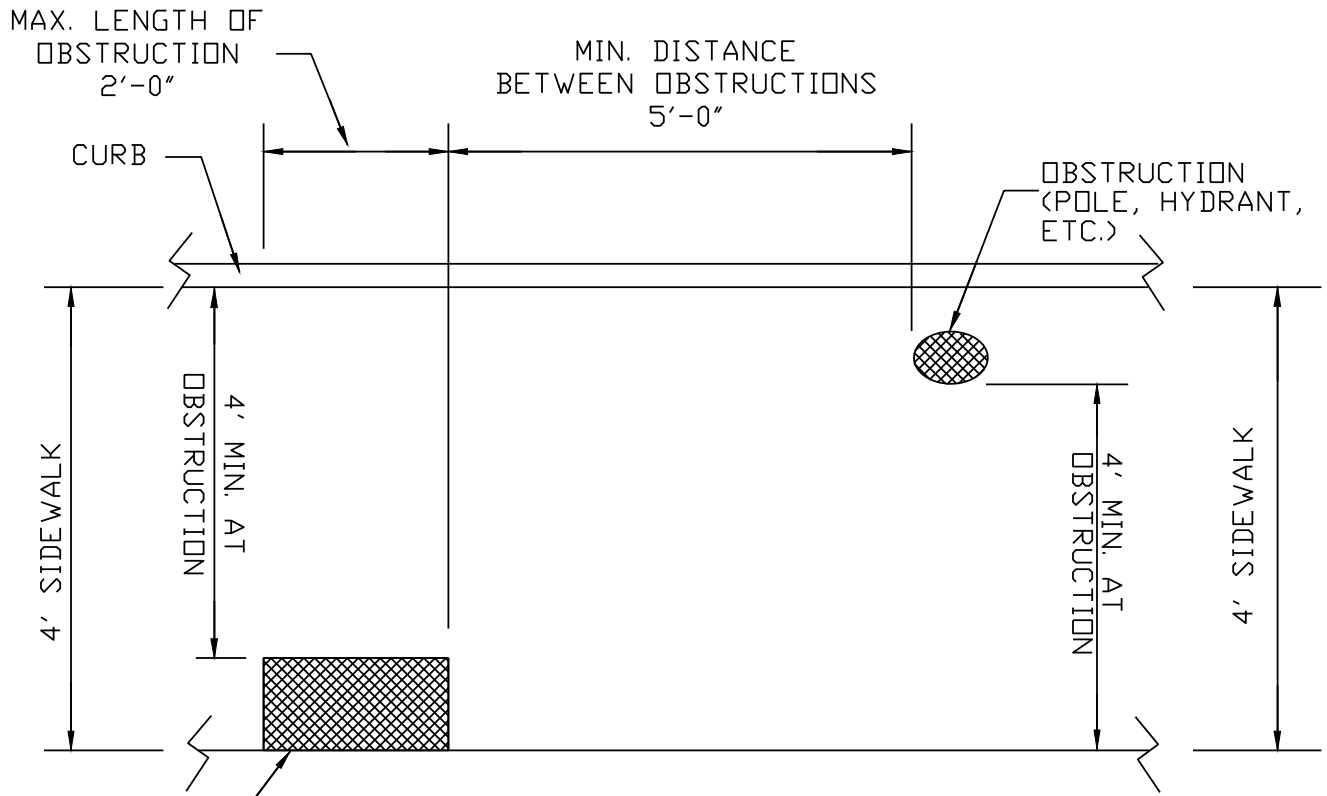
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



CITY OF SAN JUAN
STANDARDS MANUAL
PEDESTRIAN FACILITIES
GROUND SPACE CLEARANCE
(SHEET 4 OF 5)



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OBSTRUCTION
(CONTROLLER CABINET,
MAILBOX, ETC.)

PLAN VIEW

PLACEMENT OF STREET FIXTURES

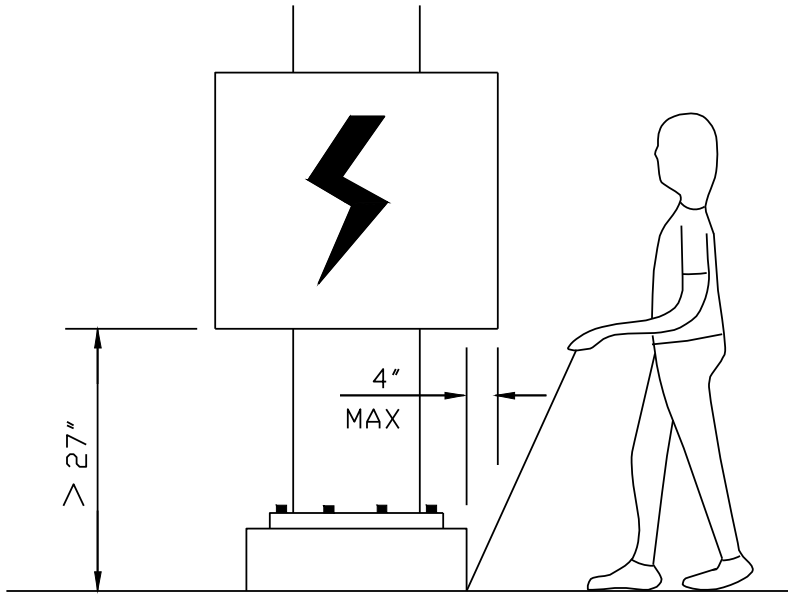
(ITEMS NOT INTENDED FOR PUBLIC USE.
MINIMUM 4' x 4' CLEAR GROUND SPACE
REQUIRED AT PUBLIC USE FIXTURES.)



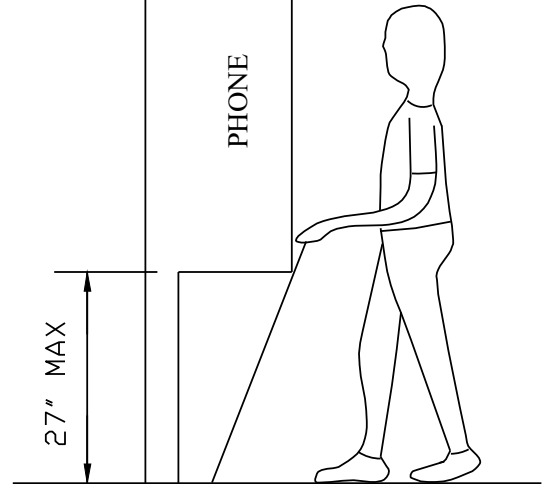
CITY OF SAN JUAN
STANDARDS MANUAL
PEDESTRIAN FACILITIES
GROUND SPACE CLEARANCE GENERAL NOTES
(SHEET 1 OF 5)



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WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR
VERTICAL CLEARANCE 80"



CITY OF SAN JUAN
STANDARDS MANUAL
PEDESTRIAN FACILITIES
DETECTION BARRIER
(SHEET 5 OF 5)



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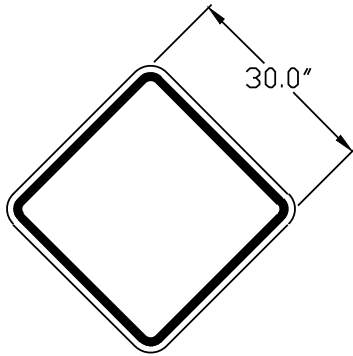
APPENDIX 6

TRAFFIC CONTROL DETAILS



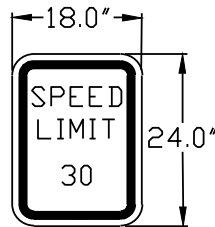
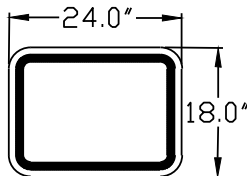
STOP SIGN DETAIL

1. 30" FLAT ALUMINUM, WITH A 0.080 THICKNESS
2. BACKGROUND TO BE HI-INTENSITY PRISMATIC GRADE SHEETING (WHITE)
3. LEGEND TO BE ELECTRO CUT FILM (EC FILM)(RED) OR SCREENED TRANSPARENT COLOR (RED)
4. SIGN TO BE SHEETED WITH A PROTECTIVE ANTIGRAFFITI OVERLAY FILM



WARNING SIGN DETAIL

1. WARNING SIGNS TO BE A 30" DIAMOND FLAT ALUMINUM RECTANGLE, WITH A 0.080 THICKNESS, ADVISORY PLAQUES TO BE 18" X 24", WITH A 0.080 THICKNESS
2. BACKGROUND TO BE FLUORESCENT DIAMOND GRADE SHEETING (YELLOW)
3. LEGEND TO BE COMMERCIAL GRADE SHEETING (BLACK)



SPEED LIMIT SIGN DETAIL

1. 30" X 24" FLAT ALUMINUM, WITH A 0.080 THICKNESS
2. BACKGROUND TO BE HI-INTENSITY PRISMATIC GRADE SHEETING (WHITE)
3. LEGEND TO BE COMMERCIAL GRADE SHEETING (BLACK)
4. SIGN TO BE SHEETED WITH A PROTECTIVE ANTIGRAFFITI OVERLAY FLIM

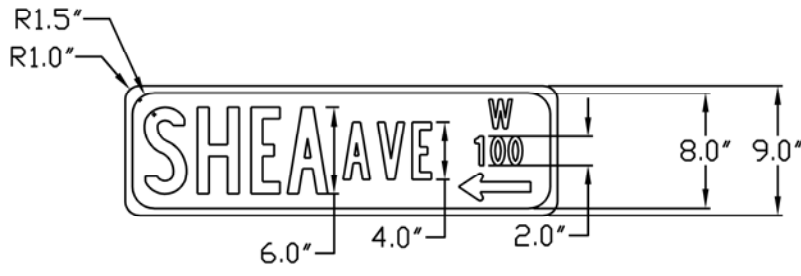
GENERAL NOTES

1. ALL MATERIALS TO BE NEW AND FREE FROM DEFECTS
2. SIGN LEGENDS SHALL MEET TMUTCD STANDARDS
3. ADVISORY SPEEDS TO BE BASED ON INCLINOMETER TEST AND APPROVED BY THE TRAFFIC OPERATIONS STAFF PRIOR TO INSTALLATION
4. SHEETING GRADE TO CONFORM WITH ASTM D 4956-01



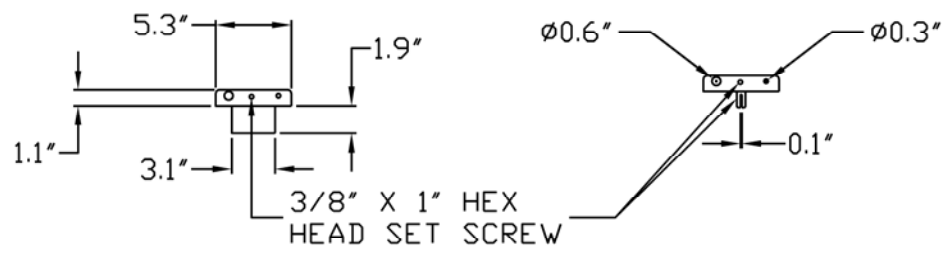
CITY OF SAN JUAN
STANDARDS MANUAL
SIGN MATERIAL STANDARDS





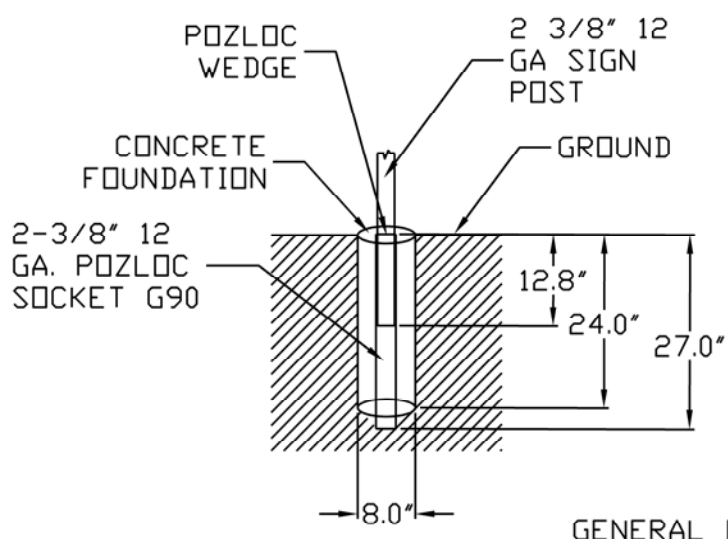
STREET NAME SIGN DETAIL

1. BE A 9" FLAT ALUMINUM RECTANGLE, WITH A 0.125 THICKNESS
2. BACKGROUND TO BE HI-INTENSITY PRISMATIC SHEETING (WHITE)
3. LEGEND TO BE ELECTRO CUT FILM (EC FILM) GREEN UNLESS OTHERWISE SPECIFIED BY THE CITY OF SAN JUAN
4. CENTERED VERTICALLY
5. FONT SHALL BE CLEAR VIEW TEXT STYLE



POST CAP AND CROSS BRACKET DETAIL

1. GALVANIZED STEEL
2. 0.20 THICKNESS



1. SIGN POST EXTENDS 12.8" BELOW GRADE
2. CONCRETE FOUNDATION EXTENDS 24" BELOW GRADE
3. POZLOC SOCKET EXTENDS 27" BELOW GRADE

BREAKAWAY SIGN INSTALLATION DETAIL

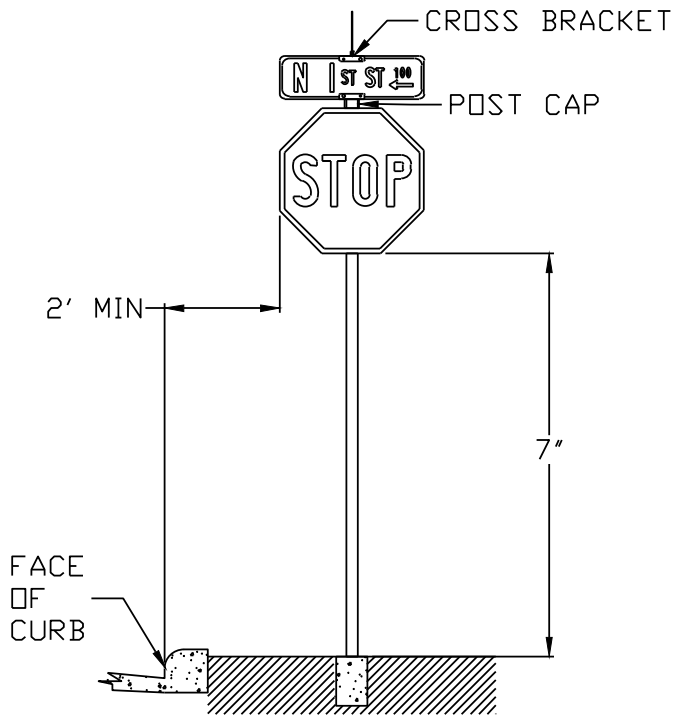
GENERAL NOTES

1. ALL MATERIALS TO BE NEW AND FREE FROM DEFECTS
2. SHEETING GRADE TO CONFORM WITH ASTM D 4956-01



CITY OF SAN JUAN
STANDARDS MANUAL
SIGN MATERIAL STANDARDS CONT.



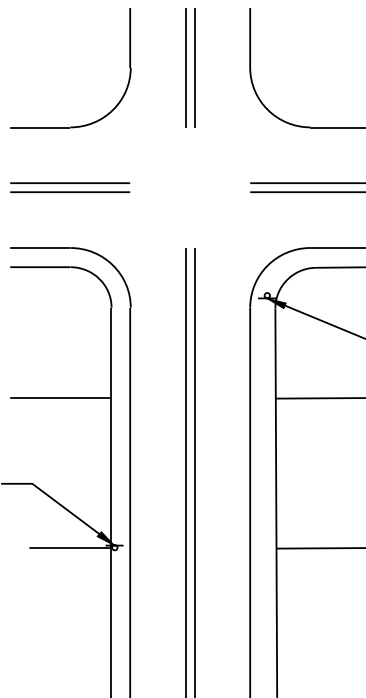


SIGN CLEARANCE DETAIL

1. 2-3/8" OD 12 GA. GALVANIZED STEEL SIGN POST
2. STREET NAME SIGNS TO HAVE 3/8" X 1" HEX HEAD SET SCREW THROUGH BRACKET ON SIGN CAP AND CROSS
3. MAINTAIN 32" ADA CLEARANCE ON ALL SIDEWALKS
4. INSTALL AT LEAST FIVE FEET AWAY FROM WOOD POWER POLES
5. INSTALL POST AT LEAST THREE FEET AWAY FROM ALL FIRE HYDRANTS

SIGN LOCATION DETAIL

WARNING/ SPEED LIMIT SIGNS TYPICALLY CENTERED ON PROPERTY LINE SPEED LIMIT SIGNS TYPICALLY 100 - 200 FT FROM INTERSECTION



STOP SIGN TO BE INSTALLED WITHIN 10 FEET OF POINT OF CURVATURE

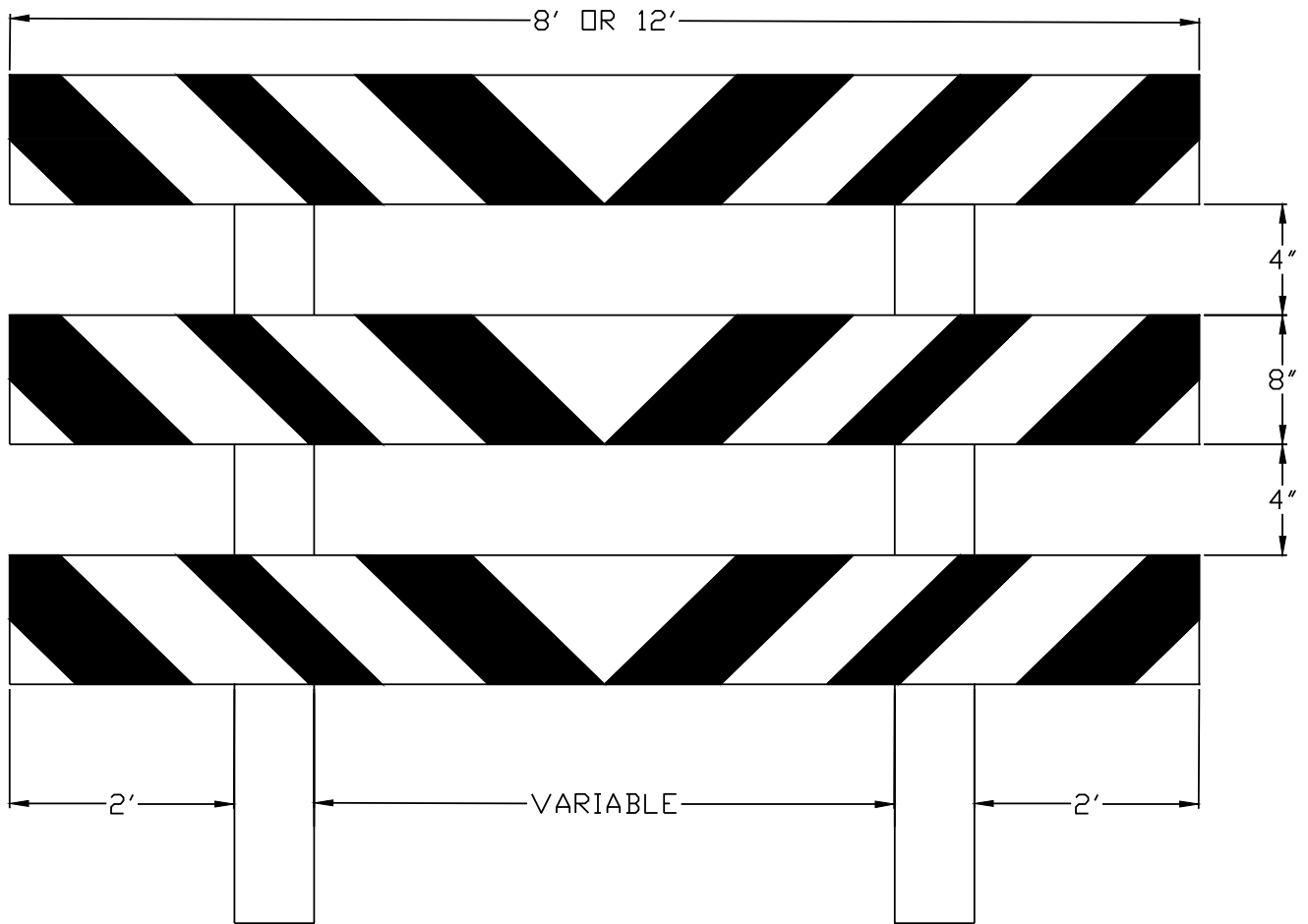
GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR LOCATING SPRINKLERS AND UTILITIES PRIOR TO INSTALLATION
2. SIGN SHALL BE INSTALLED ACCORDING TO APPROVED PLAN SHEETS
3. ANY DAMAGE TO EXISTING FENCES, WALLS, OR PRIVATE PROPERTY SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR
4. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING PREINSTALLATION AND POST INSTALLTION INSPECTS THROUGH THE CITY'S DESIGNATED INSPECTOR 24 HOURS PRIOR TO INSPECTION DURING NORMAL WORKING HOURS, MONDAY THROUGH FRIDAY



CITY OF SAN JUAN
STANDARDS MANUAL
SIGN LOCATION STANDARDS





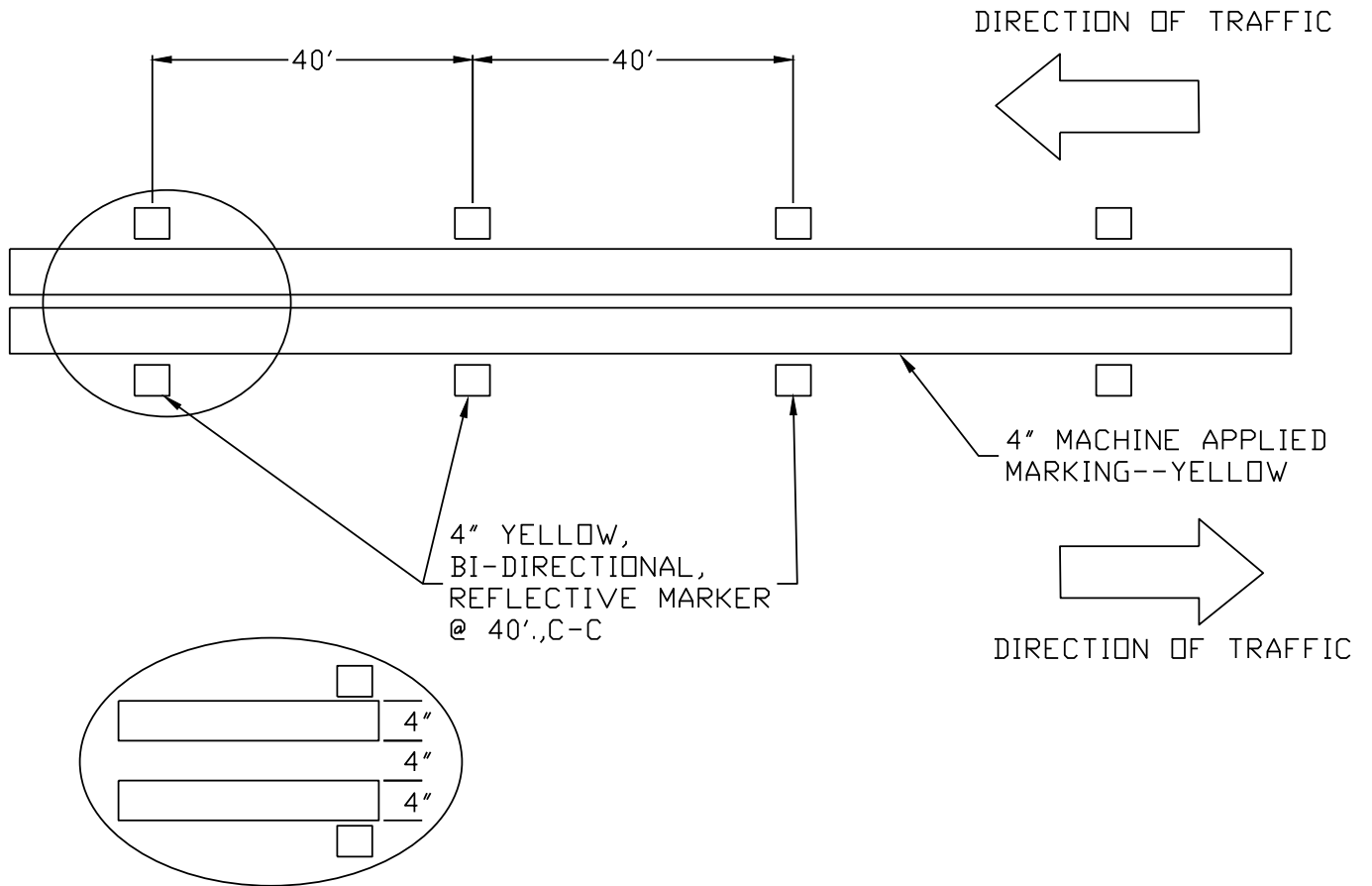
GENERAL NOTES

1. 8"X12" OR 8"X8' PANEL MADE OF HPPL PLASTIC MATERIAL.
2. SHEETING TO BE HI-PRISMATIC GRADE RED/WHITE.
3. 2-3/8 OD 12 GA. GALVANIZED STEEL POST.
4. SHOULD BE INSTALLED USING BREAKAWAY SIGN INSTALLATION SYSTEM (REFER TO BREAKAWAY SIGN INSTALLATION DETAIL).
5. SIGN TO BE SHEETED A PROTECTIVE ANTIGRAFFITI OVERLAY FILM.



CITY OF SAN JUAN
STANDARDS MANUAL
TYPE III PERMANENT
BARRICADE





LEGEND

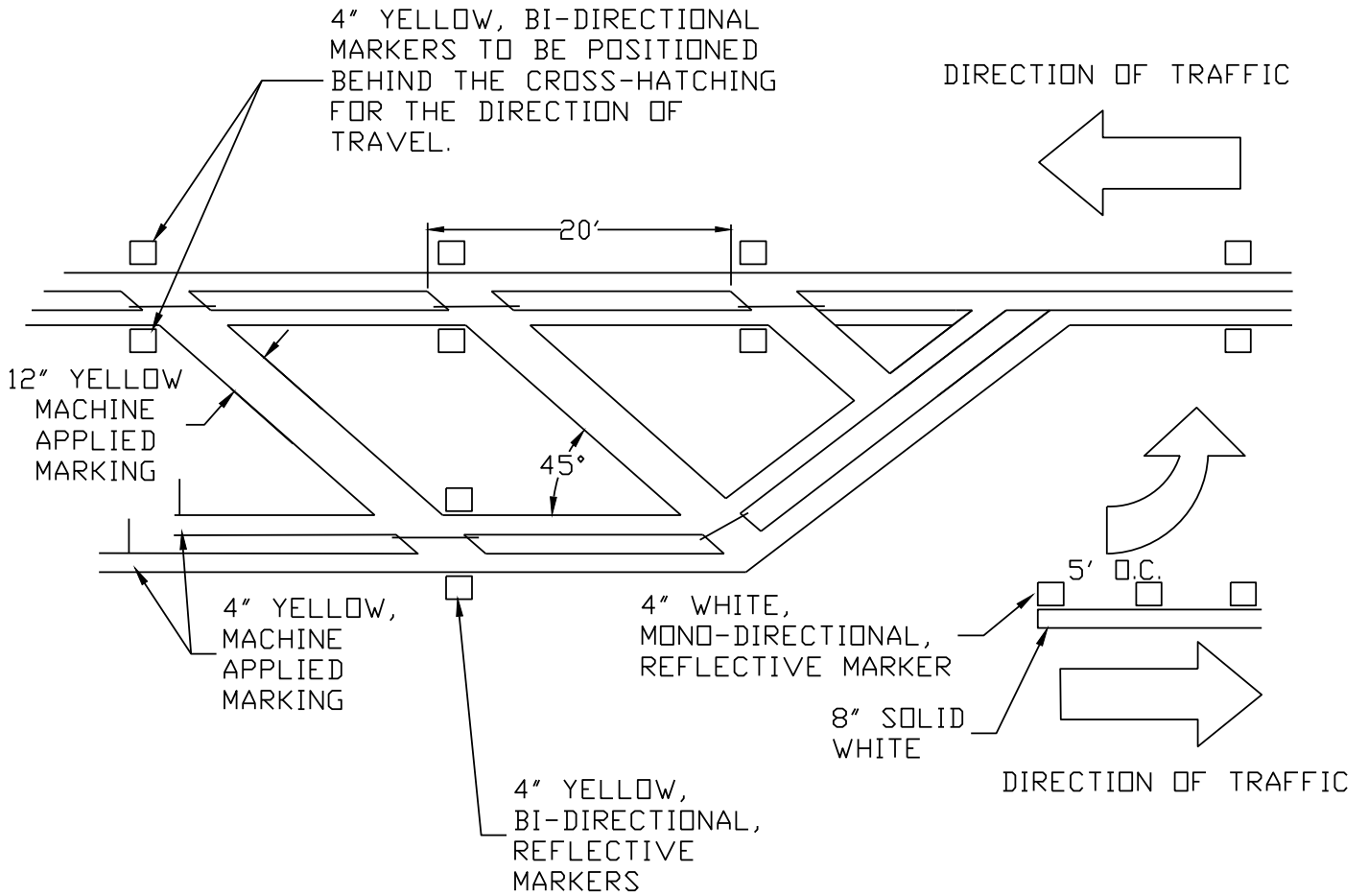
- YELLOW, BI-DIRECTIONAL, REFLECTIVE MARKER



CITY OF SAN JUAN
STANDARDS MANUAL
SOLID DOUBLE YELLOW CENTERLINE



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LEGEND

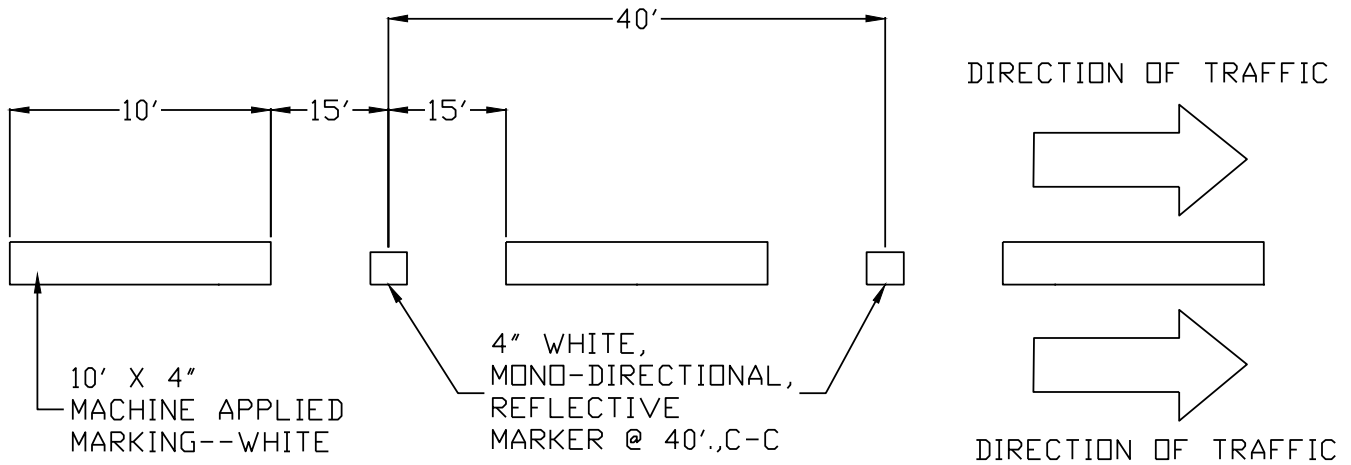
- YELLOW, BI-DIRECTIONAL, REFLECTIVE MARKER



CITY OF SAN JUAN
STANDARDS MANUAL
LEFT-TURN LANE CHENNELIZATION



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LEGEND

- WHITE, MONO-DIRECTIONAL, REFLECTIVE MARKER

GENERAL NOTES:

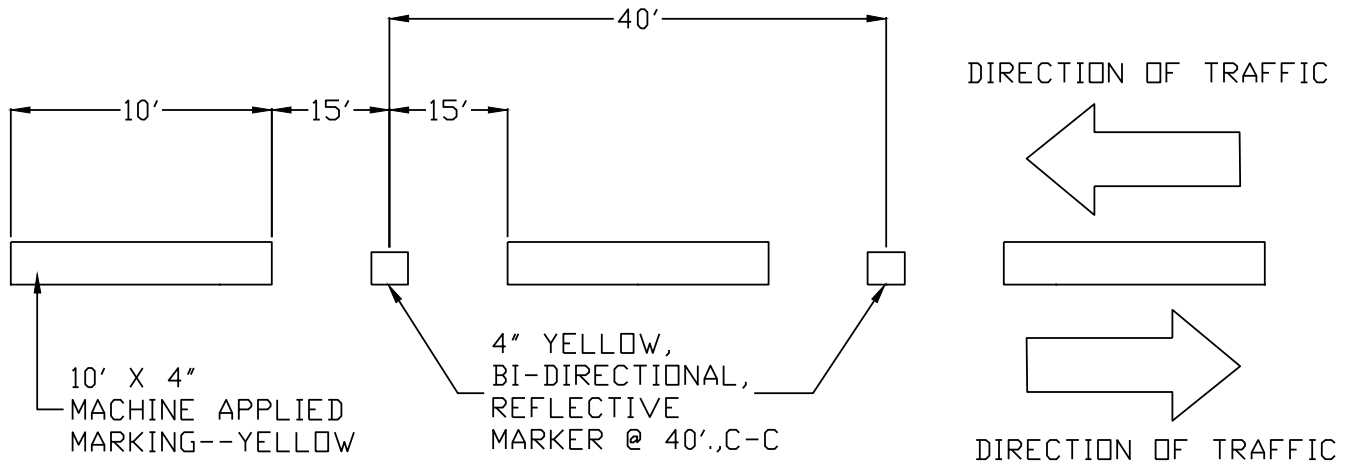
1. BREAK LANE LINE AT INTERSECTING STREETS:
 - TEE INTERSECTION, BREAK AT NEAR-SIDE ONLY
 - FOUR-WAY INTERSECTION, BREAK AT BOTH INTERSECTING STREETS



CITY OF SAN JUAN
STANDARDS MANUAL
SKIP WHITE LANE LINE



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LEGEND

- 4" YELLOW, BI-DIRECTIONAL, REFLECTIVE MARKER

GENERAL NOTES:

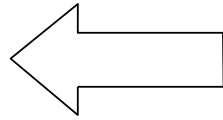
1. BREAK CENTERLINE AT INTERSECTING STREETS. TYPICAL 15 FT. BACK OF INTERSECTING STREET CURBLINE.



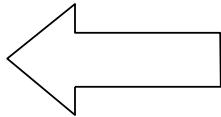
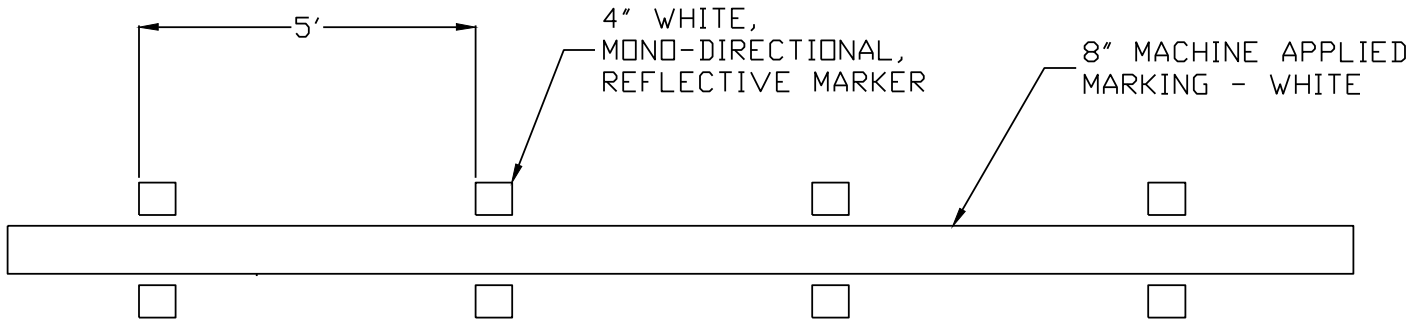
CITY OF SAN JUAN
STANDARDS MANUAL
SKIP YELLOW CENTERLINE



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DIRECTION OF TRAFFIC



DIRECTION OF TRAFFIC

LEGEND

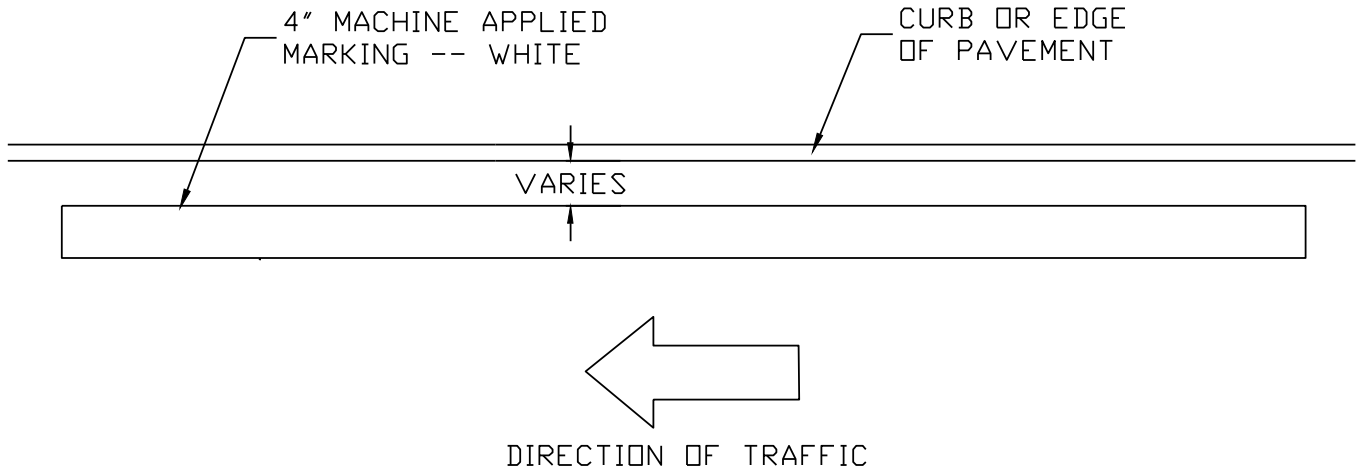
□ WHITE, MONO-DIRECTIONAL, REFLECTIVE MARKER



CITY OF SAN JUAN
STANDARDS MANUAL
SOLID WHITE LANE LINE



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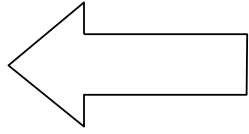


CITY OF SAN JUAN
STANDARDS MANUAL
SOLID WHITE EDGE LANE LINE

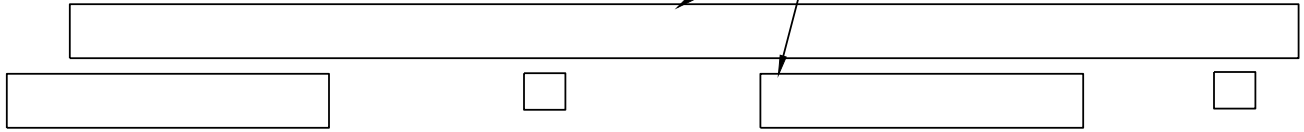
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DIRECTION OF TRAFFIC



4" MACHINE APPLIED MARKING -- YELLOW

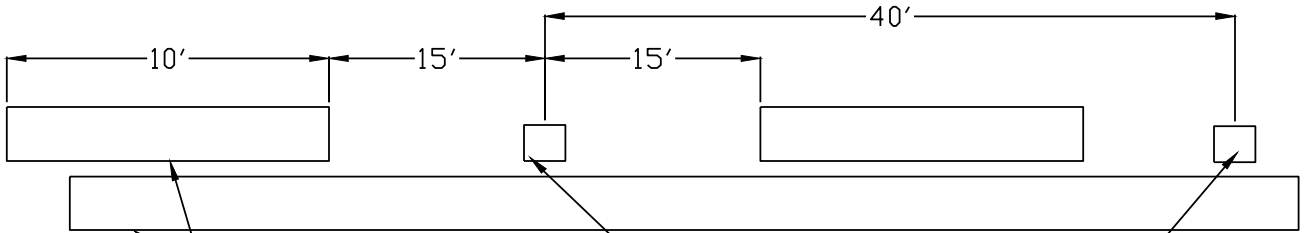


MACHINE APPLIED MARKING -- WHITE

SPACING BETWEEN ARROWS: 8'-16' TYPICAL

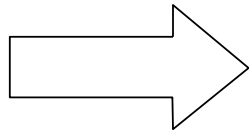


150' MIN. & 1500' MAX. (TO NEXT PAIR OF ARROWS)



4" MACHINE APPLIED MARKING -- YELLOW

4" YELLOW, BI-DIRECTIONAL, REFLECTIVE MARKER @ 40FT O.C



DIRECTION OF TRAFFIC

LEGEND

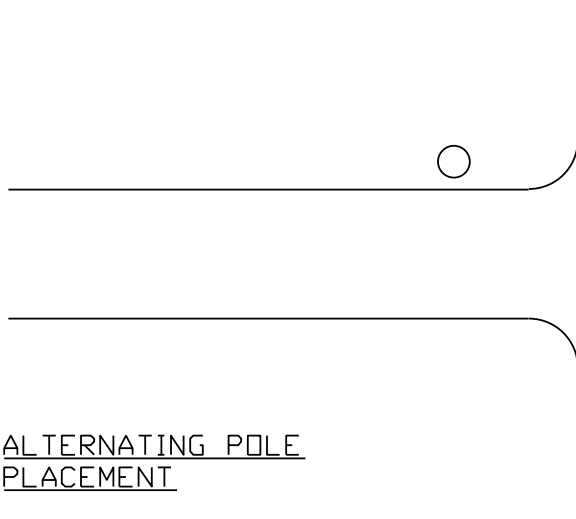
□ 4" YELLOW, BI-DIRECTIONAL, REFLECTIVE MARKER



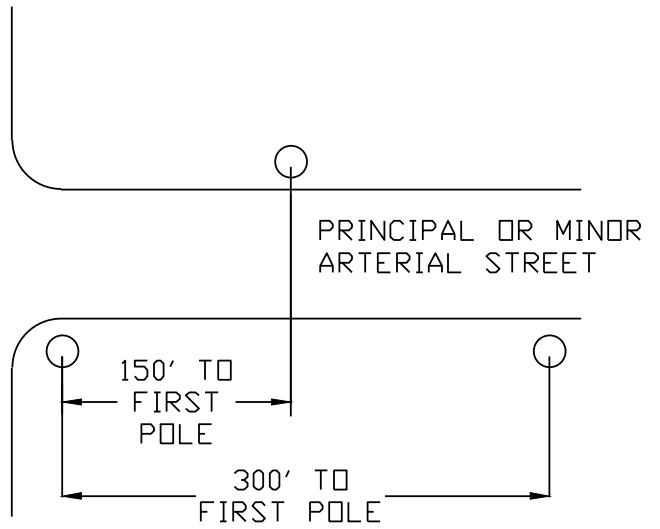
CITY OF SAN JUAN STANDARDS MANUAL TWO-WAY LEFT-TURN



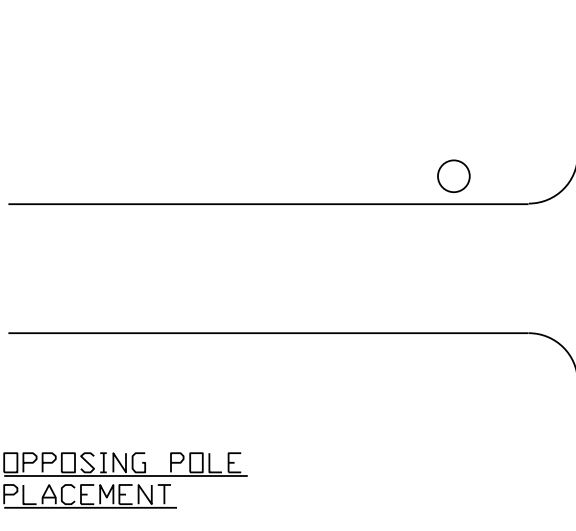
ALTERNATING POLE PLACEMENT



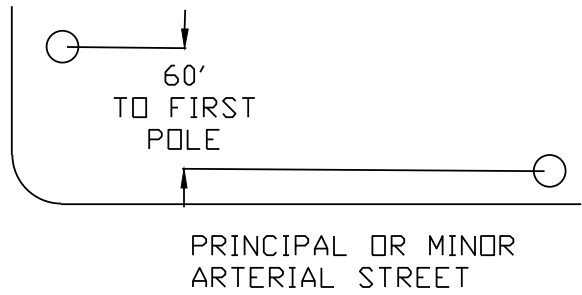
COLLECTOR SUB-COLLECTOR,
OR LOCAL ACCESS STREET



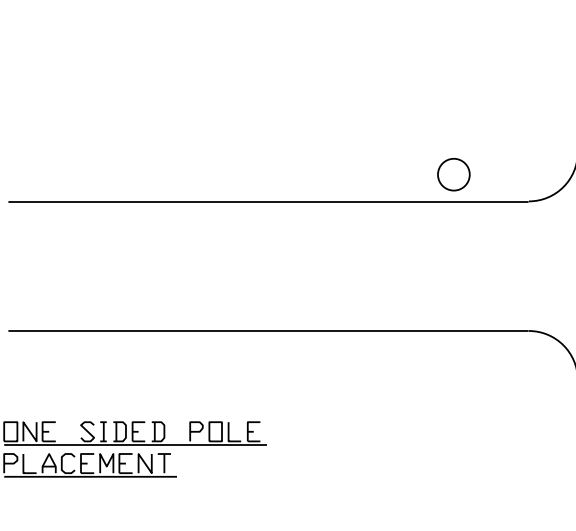
OPPOSING POLE PLACEMENT



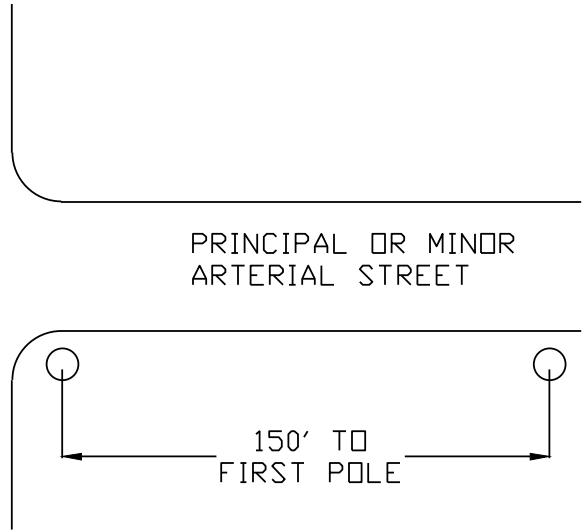
COLLECTOR SUB-COLLECTOR,
OR LOCAL ACCESS STREET



ONE SIDED POLE PLACEMENT



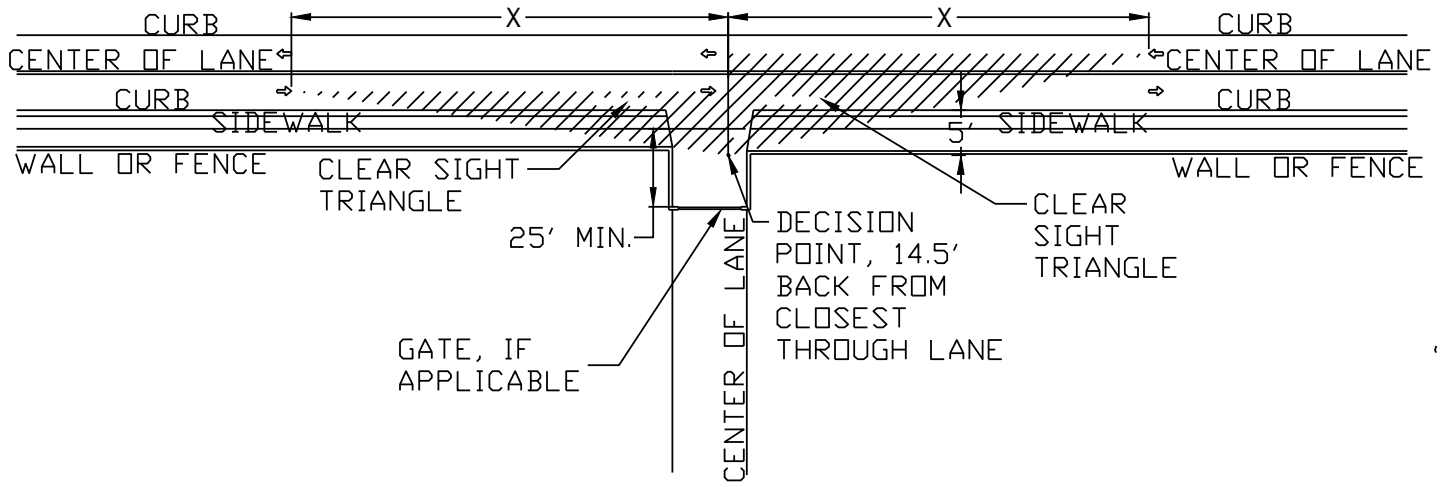
COLLECTOR SUB-COLLECTOR,
OR LOCAL ACCESS STREET



CITY OF SAN JUAN
STANDARDS MANUAL
STREET LIGHTING ARTERIAL ROADWAY



△
△



RIGHT TURN FROM STOP

LEFT TURN FROM STOP

DESIGN SPEED (MPH)	STOPPING SIGHT DISTANCE (FT)	INTERSECTION SIGHT DISTANCE FOR PASSENGER CARS	
		CALCULATED (FT)	DESIGN "X" (FT)
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
45	360	430.0	430
50	425	477.8	480
55	495	525.5	530
60	570	573.3	575
65	645	621.1	625
70	730	668.9	670
75	820	716.6	720
80	910	764.4	765

DESIGN SPEED (MPH)	STOPPING SIGHT DISTANCE (FT)	INTERSECTION SIGHT DISTANCE FOR PASSENGER CARS	
		CALCULATED (FT)	DESIGN "X" (FT)
15	80	165.4	170
20	115	220.5	225
25	155	275.6	280
30	200	330.8	335
35	250	385.9	390
40	305	441.0	445
45	360	496.1	500
50	425	551.3	555
55	495	606.4	610
60	570	661.5	665
65	645	716.6	720
70	730	771.8	775
75	820	826.9	830
80	910	882.0	885

GENERAL NOTES:

1. REFERENCE: AASHTO - GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (GREEN BOOK).

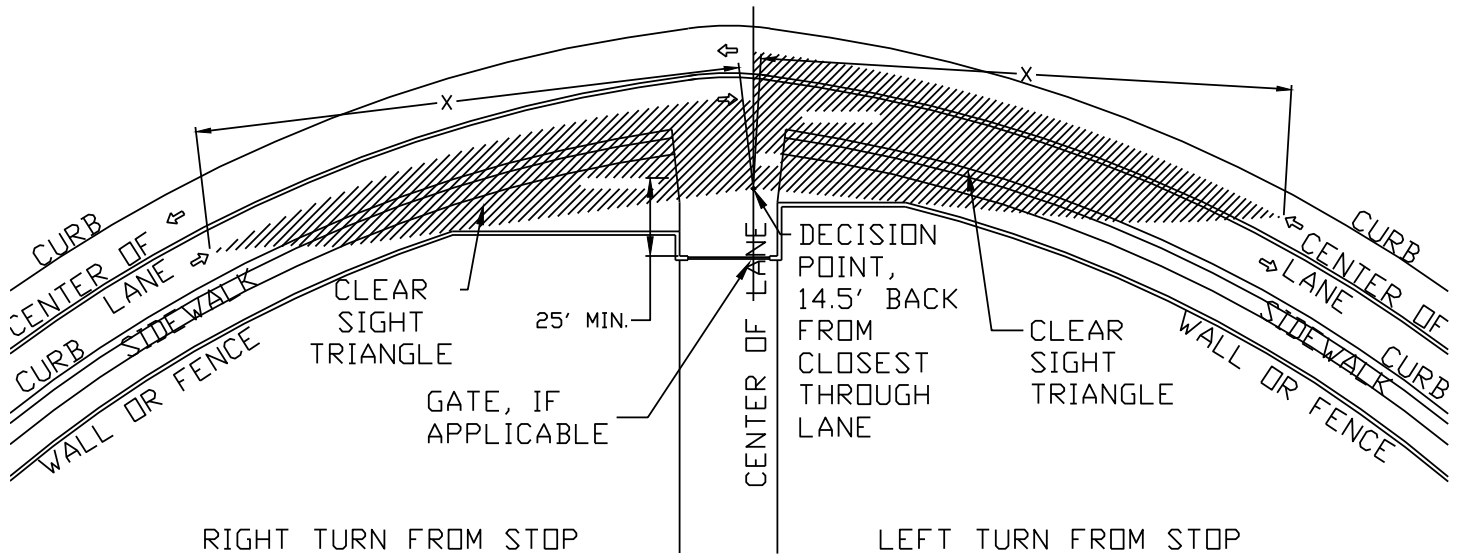


CITY OF SAN JUAN
STANDARDS MANUAL

INTERSECTION SIGHT DISTANCE FOR
TYPICAL INTERSECTION

△	
△	
△	





RIGHT TURN FROM STOP

LEFT TURN FROM STOP

DESIGN SPEED (MPH)	STOPPING SIGHT DISTANCE (FT)	INTERSECTION SIGHT DISTANCE FOR PASSENGER CARS	
		CALCULATED (FT)	DESIGN "X" (FT)
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
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50	425	551.3	555
55	495	606.4	610
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65	645	716.6	720
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75	820	826.9	830
80	910	882.0	885

GENERAL NOTES:

1. REFERENCE: AASHTO - GEOMETRIC DESIGN OF HIGHWAYS AND STREETS (GREEN BOOK).



**CITY OF SAN JUAN
STANDARDS MANUAL**

INTERSECTION SIGHT DISTANCE FOR
APPROACH ON A CURVE

△	
△	
△	

