



**CITY OF ARANSAS PASS  
STANDARDS MANUAL**

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## **INTRODUCTION**

The City of Aransas Pass, City Council adopted this updated Manual of Standards- for Construction and Development on the \_\_\_\_ day of\_\_\_\_, 2015. The Manual identifies standards that have been developed in order to ensure that engineers, owners, contractor, and the entire development community use uniform procedures and specifications for the development, design, and construction of projects as authorized by the City of Aransas Pass. It is not intended to establish legal standards of function or responsibility.

The information presented in this Manual does not cover all phases of a project. It is advised that additional references be consulted. It is understood that local conditions may require some modifications. Conformance with the description and guidelines contained herein does not necessarily guarantee approval by the City of Aransas Pass. All fees set forth by the City of Aransas Pass for permits, taps, inspections, etc., will be evaluated every October 1st and may increase based on cost for engineering services and regular cost increases for parts and labor.

## **SECTION I - PLANNING**

### **I – 1 General**

The purpose of this section is to outline the general parameters for proper consideration for Platting requirements in Aransas Pass, Texas. The following items must be submitted for approval of plats. All items listed below shall be performed by a Registered Professional Land Surveyor- Registered in Texas, hired by the developer.

#### **A. Construction Plans**

Four (4) sets of construction plans and profiles, signed by the Project Engineer, must be submitted to the Development Services Department for review and approval at least two weeks prior to the anticipated construction start date. After approval of the Construction Plans, and prior to beginning any construction, a pre-construction meeting must be scheduled between the Project Engineer, the contractor and City Staff (see requirements for pre- construction meeting). At such time the Project Engineer has satisfied all subdivision requirements, staff will issue a notice to proceed.

##### **1. Requirements for a Pre-Construction meeting**

- a. Contractor's Performance and Maintenance Bond – Prior to beginning construction, the developer's contractor or sub-contractor(s) must submit a performance bond equal to the cost of the construction of any work the contractor or sub-contractor(s) will be undertaking. Bond must be renewed and approved by the City Attorney. All cost estimates must be submitted and approved by the City.
- b. Excavation Permit – No excavations can be made in any street, alley or easement of the City without first obtaining an excavation permit. This permit is issued by the Public Works Department to any contractor who is licensed and bonded (see Street Pavement Cut Repair Section).

- c. Inspection Fee – Two (2) copies, signed and sealed by the Project Engineer, of detailed estimates for construction of all improvements must be submitted. The estimate is used as a base to figure the 3% inspection fee which must be paid before any construction can begin. The Project Engineer is responsible for advising the contractor to notify the Development Services Department 24 hours prior to starting any construction.
- d. Street Lights – The Project Engineer should submit a layout depicting the location of proposed street lights before the pre-construction meeting.
- e. Construction Materials Testing – A copy of all testing reports must be submitted to the City for approval. Contractor is responsible for contracting and scheduling all required construction materials testing.
- f. Approved Construction Plans

In the event that all the requirements for a pre-construction meeting are not met, and a Notice to Proceed is not issued, one of the following shall govern:

- i. The project engineer will resubmit new plans and/or missing items for another pre-construction meeting in accordance with the preliminary plat requirements approved by City Commission.
- ii. The engineer/developer may request to be placed back on the Planning and Zoning Commission for reconsideration of any proposed changes.

B. Final Plat Approval by the Planning and Zoning Commission

Once a notice to proceed is issued, the City will place the subdivision on the Planning and Zoning Commission agenda for final plat approval.

1. Requirements for Plat Recordation
  - a. Water and Sewer Tapping Fees – Along with the inspection fee, there will be a water and sewer tapping fee **which must be paid prior to the utility construction.** The cost for tapping fees can be obtained from the City's billing department.
  - b. Street Signs – Within the corporate limits of the city, the Developer shall install required street signs in accordance to city standards.
  - c. Construction Certificate – Upon completion of construction, a certificate signed by the Project Engineer shall be provided to the city, acknowledging that all improvements have been completed in accordance with the approved construction plans. The Contractor will also submit a certificate, for a one-year letter of warranty. The warranty shall become effective after the issuance of an acceptance notification by the Development Services Department.
  - d. Improvement Construction Approval – A city representative will inspect all the construction and inform the Development Services Department whether it conforms to the approved construction plans and specifications, and in according to city specifications. If satisfactory, the inspector will issue a clearance memorandum to the Development Services Department. The Development Services Department will notify the developer and engineer the improvements have been accepted as part of the overall system of the City of Aransas Pass. The City will then assume operations and maintenance.
  - e. As-built Construction Plans – The Project Engineer must submit to the Development Services Department. As-built plans, signed and sealed by the engineer of record. The City will not record the subdivision until the As-built drawings have been received (1-hard copy and 1 disk on AutoCAD).



A final inspection is scheduled by the Development Services Staff with all Department Heads and the Project Engineer at the site, at the request of the Project Engineer. If everything complies with the City of Aransas Pass requirements, the recordation process continues. Otherwise, another final inspection will be scheduled until all requirements are met. **A charge of \$300.00 will be paid by the Engineer/Developer for additional final inspection meetings, prior to rescheduling.**

C. Posting of Security

The construction of the required improvements must be completed prior to recording. If recording is requested prior to completion of the improvements, a security must be filed in the form of a performance bond, a trust agreement, or a letter of credit in the amount equal to the total cost of improvements plus 10% before the plat is recorded. Each of the three security options are explained in the City of Aransas Pass Subdivision Ordinance. Examples are provided at the end of the manual.

## **SECTION II – DRAINAGE**

II - 1 General

The purpose of this section is to outline the general parameters for proper design considerations of drainage requirements in Aransas Pass, Texas. By establishing guidelines for the orderly presentation of the design, a storm drainage system compatible with needs of Aransas Pass can be achieved. As with any design, all requirements, limitations and procedures cannot be identified; therefore, the responsibility of using sound Engineering judgment must be practiced.

II - 2 Master Drainage Plan & Policy

All drainage design must be coordinated with the City of Aransas Pass and with the latest approved Master Drainage Plans (state/county/city), which may exist. If applicable, the design must identify current floodways and flood boundary maps prepared by the Federal Emergency Management Agency and comply with all their requirements.

A. General Policy

1. All storm drainage facilities within the City of Aransas Pass and adjacent areas subject to its Extraterritorial Jurisdiction (ETJ) shall follow these policies, standards of design, and with the latest approved Master Drainage Plan Map (state/county/city) for the planning, design, construction, and operation of storm drainage facilities.
2. Peak flows for proposed improvements shall not be increased at any location for any storm frequency higher than the pre-developed 10-year storm.
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 pre-existing 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. The design must mitigate the total volume of fill within the 100-year flood plain.
4. Acceptable methods of regulation of peak flow achieved by on-site or off-site include parking lots, recreational areas, swales, ponds, reservoirs, channels, and yard areas below top of curb, provided water does not escape through curb openings, driveways. However, the design is not limited to those methods listed above. Bermed yards are not acceptable.

B. Outfall System

The drainage outfall system shall be designed to carry and/or store the run-off from a 10-year developed storm frequency. The outfall system consists of those systems shown on the latest approved City's Master Drainage Plan (state/county/city). The permanent outfall for any improvements within the county is County Drainage District's facilities.

**II - 3    Design Storm Frequencies**

Storm drainage planning requires establishment of standards to accomplish design objectives. Storm frequency is a basic criterion necessary in storm drainage design and refers to the magnitude of a storm. Therefore, the selected design frequency establishes the degree of protection desired. Initial storms, as referred to in this manual designate a storm frequency within a 10-year reoccurrence cycle. Run-off from an initial storm is normally intercepted and conveyed by a conveyance system consisting of inlets and a pipe system. A major storm refers to a rainfall having the probability of reoccurrence once every 100 years. Major storms are controlled and conveyed in open drainage systems. Design storm frequencies are as follows:

<b>TABLE II - 1: DESIGN STORM FREQUENCIES</b>	
<b>Area or Facility</b>	<b>Design Frequency (Developed)</b>
Enclosed Pipe System (Internal Subdivision)	10 years
Enclosed Pipe System (Outfall Master Drainage Plan)	10 years
Channels and Ditches (1)	25 years
Culverts and Bridges	25 years
Floodways Between Property Lines	100 years
(1) Channels and ditches shall have one (1') foot of freeboard	

**II - 4    Drainage Considerations**

Drainage design is an integral part of any new development. Proper planning and coordination of the drainage scheme, along with the development plans, is required to achieve an operational and economical storm drainage system. Lack of drainage consideration during the initial planning phase will lead to numerous complaints due to flooding and to added cost due to extension of the drainage system into areas not properly considered. Existing sites and re-development areas shall require appropriate detention measures to be designed and constructed.

A. Responsibility in Development

1. Developers must provide acceptable conveyance for storm waters from the development to the outfall at their expense. All drainage facilities shall be sized to provide capacity for the development. At the City's option, the City may require the drainage facilities from the development to the outfall to be oversized to include other land in the overall drainage basin delineated on the latest approved City's Master Drainage Plan (state/county/city).
2. A ten (10) year Developer's Reimbursement Contract may be entered into with the City for the costs of over sizing the offsite system for future development. Future development that connects to the system is ultimately responsible for reimbursement.
3. All on-site drainage construction development is the responsibility of the Developer.
4. All on-site detention facilities must be designed by a professional engineer in accordance with City's standards specified herein and placed within easements (only if detention pond ties into city drainage system). Access easements to the facility shall be provided (only if detention pond ties into city drainage system). Property owner will be responsible for maintenance of on-site detention facilities and easements within their property.
5. Internal enclosed pipe drainage systems shall be designed by a professional engineer for a 10-year storm return frequency. Offsite outfall and detention design shall be based on Table II - 1.
6. Drainage requirements not considered through the subdivision process will be addressed at building permit phase. At any rate, all new construction shall meet the city's drainage requirements.

**II - 5 Storm Water Spread Limit**

Streets function primarily to serve traffic, and for that reason, must be expected to have some degree of usability during periods of rainfall. Storm water spread limits are an effective way of defining the protection required to achieve that usability. The following water spread limits are established:

<b>TABLE II - 2: STORM WATER SPREAD LIMITS</b>	
<b>Street Classification</b>	<b>Permissible Storm Water Spread</b>
Major Thoroughfare (Divided)	10-year storm - 1 traffic lane must stay open in each direction
Minor Streets	10-year storm - 1 traffic lane must stay open
Residential Streets	10-year storm – water flow must not exceed top of curb

The permissible storm water spreads are based upon the initial storm frequencies (10-year), but consideration must be given to street conveyance of the major storm (100 year) and possible flooding. All streets shall be capable of conveying storm water from a major storm without flooding adjacent properties. Therefore, the maximum spread limits in streets for a major storm shall be the property lines. This requirement of utilizing the streets to convey the major storm run-off may require increasing the capacity of the enclosed drainage system.

**II - 6 Drainage System Requirements**

The complete drainage in an urban area is composed of: (1) The Conveyance System, consisting of inlets, storm water drains, and the associated appurtenances to convey the initial storm water run-off (10-year); and (2) The Major System for the major run-off (25-year to 100- year), which consists of swales, ditches, channels, floodways, and emergency overflows to prevent water encroachment into residential and commercial facilities.

A storm water drain system shall be required when the run-off exceeds the limitations established in Section II-5. Inlets and storm water drains shall be designed in accordance with applicable portions of this section. All pipe systems maintained as a public facility shall be constructed with reinforced concrete pipe (RCP), high density polyethylene (HDPE) pipe or other materials approved by the Director of Public Works. The drainage design shall include a plan and profile of storm water drainage improvements and shall include a plot of the design hydraulic grade line.

Reinforced concrete lined channels shall have a maximum side slope of 1.5:1 (horizontal to vertical). Unlined ditches shall be no steeper than 3:1 for stability and maintenance purposes. All channels, lined and unlined, shall have a 1-inch per foot traverse bottom slope to the centerline.

Unlined ditches will be considered for quantities larger than the equivalent flow of a 72- inch pipe. These channels shall provide one (1) foot of freeboard minimum. Additional freeboard shall be considered where wave action is anticipated.

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 ROW line to a point six (6) inches beneath the top of the headwall. All culverts shall have adequate reinforced concrete headwalls and/or wing walls for 3:1 fill slope with aprons at each end, see detail. Culvert ends shall be protected in accordance with Texas Department of Transportation, drainage facility placement. All culverts shall be designed by a professional engineer to provide sufficient clear zone to ensure vehicular safety.

Additional storm water drain criteria follow:

1. Minimum velocity with the pipe flowing full shall be three (3) feet per second.
2. Minimum storm water drainpipe diameter shall be eighteen (15) inches.
3. Pipe diameters shall not decrease downstream.
4. Pipe crowns at change sizes shall be set at the same elevation.
5. The Director of Public Works will permit minimum vertical and horizontal curves in the conduit only upon review and approval.
6. Street crowns shall be reduced for approximately 100 feet on each side of valley gutters.
7. A maximum of two valley gutter crossings may be used at intersections and shall not be placed at through-streets.
8. Utilization of on-site detention is required and must be approved by the City of Aransas Pass.
9. At streets with culverts or bridges, an emergency overflow shall be provided to contain the 100-year channel flow within the ROW lines.
10. Streets should be graded to avoid sumps and utilize the natural existing flow patterns.

11. The maximum length of gutter flow before run-off is intercepted by an underground storm sewer system is 500 feet from the high point to an inlet measured along the gutter (or a length meeting capacity). Water spread limits must also be achieved, as per Texas Department of Transportation manual.
12. Erosion and sediment control during construction shall be coordinated with the storm water drainage design and in accordance with the current Texas pollution discharge elimination system.
13. Discharge and outfall by use of agriculture field drains shall not be permitted.
14. Valley gutters may be allowed if approved by the City of Aransas Pass. Minimum size shall be 6-feet wide.
15. Storm water systems shall be constructed within the street rights-of-way only or on recorded easements.

## II - 7 Fees

### A. Off-site Outfall Drainage Costs

In areas where the City or another Developer has installed the Off-site Outfall Drainage Systems and a reimbursement policy and contract has been executed, 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 latest approved Master Drainage Plan (state/county/city) or as required by the City of Aransas Pass to the furthest upstream end of the development to a point of outfall discharge 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 latest approved Master Drainage Plan (state/county/city) and initiate a Reimbursement Contract.

3. Alternate methods of drainage and conveyance may be submitted to the City for approval. Detain on-site all run-offs in excess of the pre-development run-off rate and quantity. All detention areas must provide a method of drainage within a 48- hour period after the storm passes.

B. Detention Costs

The Developer is responsible for all on-site detention costs. Off-site detention proposals shall be subject to a case-by-case review by the City.

II - 8 Design Parameters

A. Hydrology

The primary consideration in any drainage study must begin with determination of rainfall in terms of intensity, duration, and frequency. The data to be used for calculating the amount of rainfall and the determination of run-off shall be that found in the Hydraulic Manual prepared and compiled by the Texas Department of Transportation Bridge Division – latest Edition.

The Rational Method will be used due to its general simplicity and acceptance. The Rational Method is based on the principal that if rain persists at a uniform rate, the run-off will equal the rate of rainfall. This solution method is applicable to small areas and shall not be applied to areas exceeding 200 acres.



The method is expressed by the formula:

$$Q = CiA$$

Where:

**Q** = Discharge in cfs. (cubic feet per second)

**C** = By land, use determination, Graph No. GR-1 may be used as allowed by the City.

**i** = Rainfall intensity in inches per hour at the time of concentration or average run-off velocity in feet per minute of flow divided into the distance in feet along the course. (i is determined from the I-D-F curves of the TXDOT Hydraulic Manual)

**A** = Area in acres of drainage basin

$$i = \frac{b}{(tc+d)e} \quad \text{for Aransas County:}$$

	<b>E</b>	<b>B</b>	<b>d</b>
<b>10 yr.</b>	<b>0.753</b>	<b>79</b>	<b>8.5</b>
<b>25 yr.</b>	<b>0.745</b>	<b>88</b>	<b>8.5</b>
<b>50 yr.</b>	<b>0.739</b>	<b>95</b>	<b>8.5</b>
<b>100 yr.</b>	<b>0.725</b>	<b>98</b>	<b>9.2</b>

**For Nueces County**

	<b>E</b>	<b>B</b>	<b>d</b>
<b>10 yr.</b>	<b>0.762</b>	<b>79</b>	<b>8.7</b>
<b>25 yr.</b>	<b>0.759</b>	<b>91</b>	<b>8.7</b>
<b>50 yr.</b>	<b>0.741</b>	<b>96</b>	<b>8.7</b>
<b>100 yr.</b>	<b>0.730</b>	<b>99</b>	<b>9.4</b>

**For San Patricio County**

	<b>E</b>	<b>B</b>	<b>d</b>
<b>10 yr.</b>	<b>0.759</b>	<b>78</b>	<b>8.7</b>
<b>25 yr.</b>	<b>0.757</b>	<b>91</b>	<b>8.7</b>
<b>50 yr.</b>	<b>0.743</b>	<b>96</b>	<b>8.7</b>
<b>100 yr.</b>	<b>0.733</b>	<b>100</b>	<b>9.4</b>

The Tables II-3 and II-4 show the adopted average velocities to be used to calculate minimum times of concentration, percentage of impervious area, street velocities and capacities to be used in the City of Aransas Pass.

**TABLE II - 3: AVERAGE VELOCITIES FOR  
TIME OF CONCENTRATION CALCULATIONS**

Areas	Slope in Percent %		
	.1 - .5	.6 - 3	4 - 7
Woodlands	0.10	0.10 - 1.5	1.5 - 2.5
Lawns/Pastures, Residential	0.15	0.20 - 2.5	2.5 - 3.5
Cultivated	0.25	0.30 - 3.0	3.0 - 4.0
Storm Sewer/Outlet Channels	Determine velocity with Manning's Formula		

**TABLE II - 4: PERCENTAGE OF IMPERVIOUS AREA**

Description	Plot Size (sq. ft.)	**Average Impervious Area %
Residential Estate	>43,560	9
Residential Dwelling	43,560	17
Residential Dwelling	21,780	38
Residential Dwelling	16,000	43
Residential Dwelling	10,000	46
Residential Dwelling R-2	7,500	46
Residential Dwelling R-1	6,000	50
Multiple-family Dwelling	Variable	72
Schools	Variable	35
Churches	Variable	85
Commercial District	Variable	85
Shopping Center District	Variable	85
Industrial District	Variable	72
Freeway	Variable	85
Open Land*	Variable	1

\* Open land in rural areas and public parks increased to 1.0 percent to account for roads, drives, and scattered buildings.

**B. Hydraulics**

Storm water is conveyed usually on the upper end of a drainage basin by inlets and storm water lines (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 Department of Transportation Bridge Division - latest Edition. Tables II-6, II-7, and II-8 show adopted Manning's Coefficients, minimum pipe slopes, maximum channel velocities and roughness coefficients for channels to be used in Aransas Pass, Texas.

**C. Complex and large drainage basins**

For drainage areas larger than 200 acres use TR-55, HEC-1, HEC-HMS, or other hydrologic methods as approved by the Director of Public Works.

<b>TABLE II –6: MANNING’S COEFFICIENT OF ROUGHNESS FOR PIPE</b>		
<b>Material</b>	<b>Value of n</b>	<b>Adopted n Value</b>
Concrete Monolithic Conduit	0.012 - 0.017	0.015
Concrete Pipe	0.011 - 0.015	0.013
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

Note:  $V = 1.486/n R^{2/3} S^{1/2}$  (Value where V= 3fps)

<b>TABLE II – 7: RECOMMENDED MAXIMUM CHANNEL VELOCITIES</b>	
<b>Channel Material</b>	<b>Maximum Channel Velocity (fps)</b>
Fine Sand	2.0
Coarse Sand	4.0
Fine Gravel	6.0
Earth	
<i>Sandy Silt</i>	2.00
<i>Silt Clay</i>	3.50
<i>Clay</i>	6.00
Grass Lined Earth	
<i>Bermuda Grass – Sandy Silt</i>	6.00
<i>Silt Clay</i>	8.00
Reinforced Concrete Lining	15.00

<b>TABLE II – 8: MANNING’S COEFFICIENT OF ROUGHNESS FOR CHANNELS</b>		
<b>Channel Type</b>	<b>n Values*</b>	
	Minimum	Maximum
Concrete	0.012	0.018
Cement rubble	0.017	0.030
Concrete gutter	0.015	0.020
Rock rip-rap	0.030	0.045
<i>Unlined Channel</i>		
Poor grass growth	0.025	0.035
Average grass growth	0.035	0.045
Dense grass growth	0.040	0.050
Stony beds, weedy bank	0.025	0.040
Rock cuts, smooth & uniform	0.025	0.035
Rock cuts, rugged & irregular	0.035	0.045
<i>Natural Stream Channel</i>		
Some grass & weeds; little or no brush	0.030	0.035
Dense growth of weeds, depth of flow materially greater than weed height	0.035	0.050
Some weeds, light brush on banks	0.035	0.050
Some weeds, heavy brush on banks	0.050	0.070
For trees within channels with branches submerged at high stage, increase all values above by:	0.010	0.020
<i>Pasture, no brush</i>		
Short grass	0.030	0.035
Tall grass	0.035	0.050
<i>Cultivated Areas</i>		
No Crop	0.030	0.040
Mature row crops	0.035	0.045
Mature Field crops	0.040	0.050
Heavy weeds, scattered brush	0.050	0.070
Wooded	0.120	0.160
*Maximum and minimum "n" values adopted from the Texas Department of Transportation		

II - 9     Detention

Continuous development that has occurred throughout the City of Aransas Pass has resulted in an increase both in the peak rates and the total volumes of storm water run-off. Therefore, land previously not subject to flooding has become flood-prone as a result of unregulated run-off from the subsequent development. Concurrently, land that was already flood-prone has experienced an increase in the frequency and severity of flooding. The use of detention ponds (basins that temporarily store storm water run-off) to reduce peak rates of run-off is an effort by the City of Aransas Pass and the County to reduce or eliminate these changes, as well as to help maintain the traditional character of the watershed.

The City's adopted methodology for small urban detention ponds centers around the Rational Method, which is essentially a simple equation used to calculate the peak flow rate of storm water run-off for a particular storm and a particular watershed. The equation is expressed as  $Q = CiA$ . "Q" is the peak flow rate. "C" is the run-off coefficient representing the ratio of peak flow rainfall intensity. "i" is the peak rainfall intensity which has a duration equal to the time required for run-off to collect from all points in the watershed (this time is referred to as the "time of concentration"). "A" is the area of the contributing watershed. Since this method yields only one piece of information (the peak flow rate), various modifications have been created in order to generate more information and thus simulate or more closely approximate real-life conditions. Two of these modifications are currently being used and accepted by the City of Aransas Pass and are called the Variable Rainfall Intensity Method (VRIM) and the Modified Rational Method (MRM).

Both the VRIM and MRM are attempts to produce workable models of desired storm water run-off patterns. These patterns, called hydrographs, are graphical representations of the changing flow rate of storm water run-off past a specified point over a prescribed period of time. The VRIM (See Graph No. GR-2, Figure I-iii) more closely resembles actual storm run-off hydrographs in shape and in total volume, due to its curvilinear shape and its run-off distribution with respect to time. Its peak flow rate is the same as that calculated by the basic Rational Method. The VRIM can be used for watersheds up to several hundred acres. However, it involves many more calculations (with corresponding time and effort) than the MRM, if not done with the aid of pre-programmed routines on a computer or programmable calculator. By contrast, the MRM (See Graph No. GR-2, Figure I-iv) is a series of straight-line hydrographs that are crude approximations of run-off hydrographs for storms of various durations.

A. Calculation of Detention Outlet Size

Detention pond discharges into an existing storm sewer line or existing ditch. The outlet size should be calculated to release the pre-developed rate (9.5 agricultural) only.

1. Maximum pool elevation at or below the design hydraulic grade line of the outfall. The discharge line shall be sized for the design storm within the outfall pipe flowing full.
2. Maximum pool elevation at or above the hydraulic grade line at the outfall. Provide a reducer or restrictor to be constructed inside the discharge line. The discharge line shall be sized for the design storm with the outfall pipe flowing full.
3. Reducer or restrictor pipes shall be sized as follows:
  - i. Use the orifice equation to calculate the required orifice size:

$$Q = CA \sqrt{2g} \sqrt{h}$$

$$D = Q^{1/2} / (2.25 h^{1/4})$$

Where:

- Q = Outflow discharge (pre-developed rate)
- C = 0.8 (Coefficient of discharge)
- A = Orifice area (SF)
- G = Gravity (32.2 ft/sec.<sup>2</sup>)
- H = Head (ft.)
- D = Orifice diameter (ft.)

- ii. Restrictor shall be either of the calculated required diameter or of the equivalent cross sectional area. The orifice diameter D shall be a minimum of 0.5 feet.

For each storm duration, the peak flow rate is calculated by the basic Rational Method; except that the intensity used is that for the time of storm duration rather than the time of concentration of the watershed.

The rising limb is a straight line from zero to the peak flow rate extending over a period of the "proposed" or "post-development" time of concentration. A straight line then continues across the graph at the peak flow rate until the storm duration time has been reached. The falling limb is a mirror image of the rising limb. This type of hydrograph is easy to produce, both mathematically and graphically, and is usually applicable for watersheds up to 25 acres.

The City of Aransas Pass has accepted various methods for determining detention pond storage volumes. All of the methods establish a "lower limit" line to approximate the assumed release rate of water from the pond. This line is applied to the inflow hydrograph for each storm duration. The enclosed area below the inflow hydrograph line and above release rate line constitutes the required storage volume for that particular storm. A range of storm duration that yields the absolute peak for all possible storm durations is used. This peak storage volume is the value that determines the final storage requirement.

The method currently endorsed by the City of Aransas Pass assumes a horizontal release rate line that extends across the entire graph and is equal to the maximum allowable release rate called "Peak Shaving". The outflow structure must take into account the early outflows in the storm and keep them at or below the corresponding values in the "existing" or "pre-development" hydrograph.

Storm water run-off from a particular watershed that does not flow through the detention pond, yet must be addressed in the design is called "by-pass" flows. The maximum allowable release rate must be reduced by the peak flows generated from areas that bypass the pond. The peak flows shall be calculated from the basic Rational Formula, using the time of concentration for the given area and the corresponding rainfall intensity for the specific return period of the storm. When multiple-pond systems are involved, the "Peak Shaving" method is not considered to be applicable for cascaded ponds, where the outflow from one pond flows into another pond. Cascaded ponds will require the application of a dynamic model. Multiple-pond systems that do not have cascaded ponds may be designed by this method, in which each sub-area to a given pond is treated as a separated design.

**For detention areas deeper than 3-feet, fencing shall be provided to protect the public.**

II - 10 Required Submittals

The following submittals shall be required as part of the drainage and engineering report on all improvements:

A. Preliminary Approval Phase

In order to properly review and consider projects and grant preliminary approval, the following items must be addressed and shown on the submittal.

1. A reproduction of that portion of the latest approved City's Master Drainage Plan (state/county/city) showing the relationship of the area to be improved and the proposed improvements to the City's outfall system.
2. Calculations for time of concentration; Q (peak allowable run-off or peak existing run-off prior to development); storage required, and pipe, channel or ditch sizing.
3. A site drainage plan at 1" = 50' showing;
  - a. Lot grading with minimum finished floor elevations
  - b. Street flow with preliminary elevations, grades, and flow
  - c. Proposed drainage improvements
  - d. Proposed method of detention
  - e. Existing and proposed one foot (or 0.50 foot if required) contour intervals to 150 feet outside of the subdivision boundaries, referenced to the latest National Geodetic Vertical Datum.
  - f. 100-year flood elevation and direction of overflow.
4. Certified statement by design Engineer stating FEMA's designated flood zone, anticipated high water elevation in a 100-year flood, and statement describing drainage pattern in the subdivision and the adequacy of the proposed plan for drainage. When required, a Conditional Letter of Map Revision (CLOMR) shall be submitted to FEMA, prior to preliminary approval.



**B. Construction Phase**

After preliminary plat approval has been granted by the City of Aransas Pass Planning and Zoning Commission (P&Z), the City will accept construction plans and specification for review. The submittal should include the following;

1. Four (4) complete sets of 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
  - e. All plans signed and sealed by a Registered Professional Engineer.
  - f. TCEQ rules and regulations, as it relates to storm water management shall be followed. A copy of the Notice of Intent (NOI) shall be submitted prior to approval. The approved copy shall be forwarded as soon as possible.
  - g. An approved CLOMR shall be presented to the City of Aransas Pass prior to final approval.
2. Cost Estimate for all drainage improvements signed and sealed by a Registered Professional Engineer and approved by the City.
3. After the City reviews the submittals, a meeting with the project engineer will be conducted to go over any comments. The engineer is responsible for making any adjustments/corrections to the plans and resubmitting for approval.

4. Upon approval of the construction documents, the City will schedule a Pre-Construction Meeting. The pre-construction conference will be held at the Public Works Conference Room or a designated location with the Developer, the Project Engineer, the Contractor and the City of Aransas Pass (Public Works Department, Utilities Department, Fire Department, Development Services Department, and Building Department), and all other parties as designated by the City. The four (4) sets of plans submitted shall be reviewed and upon approval, signed by the Director of Public Works. The signed plans (4 sets) shall be the "Official Construction Plans" for the project and will be distributed among the attendees (2-City, 2-project engineer).
5. A Notice to Proceed from the City of Aransas Pass shall be issued, delineating the proposed project and its required conditions.
6. Any changes, revisions and/or deletions from the approved sets of plans including change orders, shall be submitted to the Public Works Department (2 copies) for consideration. The Public Works Department shall consider the submittal, and issue a response. The City is not obligated to accept any improvements deviating from the approved construction plans or approved changes.

Certified copies of the as-built (copies on Mylar and on AutoCAD 2004 Compact Disk format), shall be furnished to the City upon completion of the improvements and verification by the project engineer (See Section IX).

## II - 11 Approved Materials

### A. Reinforced Concrete Pipe

Comply with requirements of ASTM C 76, Class III, minimum installed with flexible plastic (Bitumen) at all joints, tongue and groove joints. Gaskets shall comply with AASHTO M-198 75I, Type B, and shall be installed in strict accordance with pipe manufacturer's recommendations.

B. Polyvinyl Chloride (PVC) Pipe

PVC pipe is only permitted when specifically approved by the Director of Public Works. Pipe and fittings shall comply with ASTM D 3034, rated SDR 26. 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. PVC pipe is not permitted under streets.

C. Manholes

1. Cast-in-place and pre-cast Manholes
  - a. Cast-in-place Manholes shall be constructed of 3000 PSI concrete.
  - b. In accordance with ASTM C-478.

D. Inlets

1. Type A
2. Type C-C
3. Type C
4. Type F

E. Cast Iron Frames, Covers, and Grates

1. As approved by specifications.

F. Specification for Construction and Utility Castings

- Manhole Frames and Covers/Grates
- Catch Basin Inlets
- Curb and Gutter Inlets
- Ditch and Median Inlets
- Trench Drainage Inlets

1. Applicable Codes

a. Whenever reference is made to the furnishing of materials or testing thereof to conform to the Standards of any technical society, organization or body, it shall be constructed to mean the latest standard, code specification or tentative specifications adopted and published at the time of advertisement for bids, even though reference has been made to an earlier standard. Such standards are made a part hereof to the extent, which is indicated or intended.

b. The following are names and abbreviations of such groups:

AASHTO	for American Association of State Highway and Transportation Officials
ACI	for American Concrete Institute
AISC	for American Institute of Steel Construction
ANSI	for American National Standards Institute
API	for American Pipe Institute
ASA	for American Standards Association
ASCE	for American Society of Civil Engineers
ASTM	for American Society of Testing Materials
AWSC	for American Welding Society Code
AWWA	for American Water Works Association
CIPRA	for Cast Iron Pipe Research Association Fed. Spec. for Federal Specification
NCPI	for National Clay Pipe Institute
SDHPT	for State Department of Highways and Public Transportation
UL Inc.	for Underwriter's Laboratories, Inc.
UPPA	for Uni-Bell Plastic Pipe Association

c. Where no reference is made to a code, standard or specification, the Standard Specification of ASTM, AWWA, or ANSI, as appropriate, shall govern.

d. If the specifications and drawings show requirements that are in excess of codes and ordinances, then the specifications and drawings shall be followed. Should there be any conflicts between the specifications and drawings, and the codes and ordinances having jurisdiction, the Bidder shall report these in his bid.

2. General:

This specification is applicable for gray and ductile iron castings or frames, gates, rings, and covers that are for use by the City of Aransas Pass, Texas. Castings shall be manufactured by approved USA manufacturer. All manufacturers must be approved suppliers to the City of Aransas Pass. The approved manufacturer must be able to demonstrate that there is an acceptable quality control program at the producing foundry, prior to supplying castings.

3. Materials:

Gray iron castings shall be manufactured from iron conforming to ASTM A48 Class 35B, as noted in section 3.1 of AASHTO M306. Ductile iron castings shall be manufactured from iron conforming to ASTM A536. The iron material used in products provided shall have a minimum recycled material content of 75%. The recycled materials shall consist of post-consumer material.

4. Manufacture:

Castings shall be of uniform quality, free from sand holes, gas holes, shrinkage, cracks and other surface defects. Castings shall be reasonably smooth and well cleaned by shot blasting. For traffic service castings, bearing surfaces between manhole rings and covers or grates and frames shall be ground or machined with such precision to prevent rocking. As-cast dimensions may vary within accepted foundry tolerances as outlined in the Iron Castings Handbook published by the American Foundry Men's Society, Inc. nominally, casting dimensional tolerances shall be  $\pm 1/16$ " per foot. All published casting weights are average and approximate values and shall vary  $\pm 5\%$ . Castings shall be furnished painted or unpainted as specified by the purchaser.

5. Workmanship:

Castings shall show careful finished workmanship in all particulars. Castings which have been damaged either during manufacture or shipping may be rejected. Defects which would constitute poor workmanship include pinholes, shrink, crack, dirt, scab and slag.

6. Sampling:

Random checks on the castings may be conducted by the purchaser. These random checks shall be conducted in accordance with the AASHTO M306 Section 6.0 guidelines.

7. Proof Load Testing:

Traffic service castings shall have a first article proof load test conducted and the results of that proof load shall be made available to the purchaser upon request. The proof load shall be conducted in accordance with the method and procedure that is outlined in ASSHTO M306 Section 7.0, proof load testing. The casting shall be tested on a suitable and calibrated load testing machine and the casting shall hold a 40,000 pound proof load for one minute without experiencing any cracks or detrimental permanent deformation.

8. Inspection:

Inspections shall be in accordance with 9.1.1 (refer to #7 above-Proof Load Testing) or 9.1.2 of AASHTO M306. Results of these tests shall be furnished to the purchaser upon request. The heat or production date and product numbers, as cast on the casting shall be the basis of trace-ability and recording of the tests.

9. Certification:

A foundry certification shall be furnished to the purchaser stating that samples representing each lot have been tested, inspected, and are in accordance with this specification.

10. Marking:

Each casting shall be identifiable and show, at a minimum, the following: name of the producing foundry, country of manufacture (such as "Made in USA"). ASTM material designation, recycle symbol, individual part number, cast or heat date. Castings shall also include all lettering as shown on the specification drawings.

11. Records:

Test results for each lot of castings shall be maintained by the foundry for a minimum of seven years and shall be available to the purchaser upon request.

All materials, products, and workmanship shall be guaranteed for a period of 1-year from the written Date of Acceptance by the City and the date approved As-built drawings are submitted.

II – 13 Standard Details

The following list of Standard Details (see appendix B) show the adopted standards required by the City:

1. Standard Detail DR-1 Pre-Cast Type “A” Inlet
2. Standard Detail DR-2 Cast-in-place Type “A” Inlet
3. Standard Detail DR-3 Type “F” Inlet
4. Standard Detail DR-4 Type “C” Inlet
5. Standard Detail DR-5 Type “C-C” Inlet
6. Standard Detail DR-6 Pre-Cast Storm Concrete Manhole
7. Standard Detail DR-7 Cast-in-place Storm Concrete Manhole
8. Standard Detail DR-8 Trench backfill and Compaction Detail
9. Standard Detail DR-9 Valley Gutter Detail
10. Standard Detail DR-10 Typical Ditch Cross Section
11. Standard Detail DR-11 Cast-in-place Rip Rap
12. Standard Detail DR-12 Safety End Treatment
13. Standard Detail DR-13 Storm Manhole Cover Details

## **SECTION III – STREETS AND ROADWAYS**

### **III – 1    General**

The purpose of this section is to define the general requirements of street right-of-ways, pavement widths, pavement thickness, geometric alignments, and construction details. As conditions are encountered beyond the scope of this section, coordination with the City of Aransas Pass Public Works Department is required to establish new requirements and procedures.

### **III - 2    Master Plan**

All street designs must be coordinated with the City of Aransas Pass Comprehensive Master Plan, Aransas Pass Independent School District, Aransas/San Patricio/Nueces County and with Texas Department of Transportation (TXDOT). The Master Plan was developed for orderly growth in Aransas Pass. Major deviations from the Plan must be recommended by the Planning and Zoning Commission and approved by the City Council.

### **III - 3    Right-of-Ways and Paving Widths**

All street right-of-ways will be 50, 60, 80, 100, or 120 feet according to City of Aransas Pass Thoroughfare Plan for most paving widths. Detail drawings are provided with this section to depict those widths. Wider right-of-way widths may be required if construction of boulevards or state participation projects are anticipated. Judgments will be made at that time by the City of Aransas Pass, as circumstances require other widths. Consequently, right-of-ways may be increased or lessened subject to the placement and size of utilities to serve adjacent and connecting properties. All alleys must have a minimum right-of-way width of 20 feet.

For perimeter streets, collectors or higher classification, the City will decide at subdivision approval whether the perimeter street will be widened at this time or whether funds will be escrowed from the Developer for his/her share of the widening.

Factors contributing to the City's determination will be the condition of the existing pavement utilizing the city's ranking method as determined by the Director of Public Works, whether the grade of the existing street is satisfactory, availability of funding, traffic, and/or maintenance concerns. Drainage improvements for the subdivision will be required to include provisions for perimeter streets.



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<b>TABLE III-1 DESIGN STREET REQUIREMENTS</b>				
<b>R.O.W WIDTH</b>	<b>STREET WIDTH (B – B)</b>	<b>INTERSECTION CURB RADII</b>	<b>CITY WIDTH (Discretion)</b>	<b>PAVING SECTION Escrow</b>
Local 50'	34'	15'	7' C&G 1 side	8"/2"
Collector 60'	50' 2- lanes, 2 BL	20	13' C&G 1 side	8"/2"
Commercial 60'	42 2-lanes, 1CLTL	20	9' C&G 1 side	10"/3"
Industrial 60'	44 2-lanes, 1CLTL	30	10' C&G 1 side	12/4"
Minor Arterial 70'	60' 4 lanes, 2 BL	20	18' C&G 1 side	10"/2"
Major Arterial 80'	66' 4 lanes, 1 CLTL	20	21' C&G 1 side	10"/2"
100'	82' 4 lanes, 1CLTL, 2 BL	20	30' C&G 1 side	10"/3"
120'	100' 6 lanes, 1 Divided median, 2 BL	20	39' C&G 1 side	10"/3"

**Notes:**

1. Travel lanes: 12 feet wide; parking lanes: 8 feet wide.
2. Curb and Gutter: 2 feet wide each side for a total of 4 feet.
3. Continuous left-turn lane (CLTL) & Occasional left (OL) turn lanes: 14-16 feet wide, Divided Median; 16 feet wide, Bicycle lane (BL) 5- 8 feet wide.
4. Drainage must be provided for the perimeter street of the subdivision.
5. Escrow amounts shall be submitted to the City of Aransas Pass and sealed by a professional engineer for approval by the City.
6. Pavement section to be designed by a professional engineer.
7. City width- For widening of existing streets.

### III - 4 Geometrics

#### A. Provisions

Provision 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.

Off-center street intersections will not be permitted. The minimum distance between street offsets at intersections is 125 feet. All major and minor streets shall be continuous and in alignment with existing streets.

**B. Curve Requirements**

Minimum radius on local residential streets shall be based on design speeds; design curvature shall meet current AASHTO design requirements. Local residential streets shall have a minimum 300-foot radius. Special circumstances may require smaller radii that must be approved by the City Engineer based on design speed, sight distance, and other pertinent design considerations.

**C. Grades**

Major streets may have a maximum grade of 5%, unless the natural topography is such as to require steeper grades in which case 7.5% may be used for a maximum length of 200 feet. Minor streets may have a maximum grade of 7.5%. Local residential streets may have a maximum grade of 10%. All streets must have a minimum grade of at least 0.15%. Centerline grade changes with an algebraic difference of more than 2% 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. No vertical curve shall be less than 200 feet in length if the algebraic grade change difference is 2% or more. If the algebraic difference is less than 2%, the minimum length of vertical curve must be 100 feet. 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.

**D. Street Intersections**

Any street intersections not at 90 degree angle will be reviewed by the Director of Public Works on a case by case basis.

Curb radii at intersections shall be a minimum of 10 feet for local and residential streets and a minimum of 20 feet for all collector and major streets. Industrial & Commercial shall have 30 feet curb radii. All radii are measured to the back of curb.

Where sidewalks are adjacent to the street intersection, handicapped ramps shall be constructed to State and Federal Standards.

Corner clips shall be provided at a minimum 15 feet or as site requirements necessitate, 15 feet at residential and alleys, 25 feet at minor street intersections and 30 feet at industrial, commercial and/or state roads (as per city ordinance).

Concrete aprons will be required at intersection of collector streets (and wider streets). Concrete shall extend to the radius points.

E. Cul-de-sacs

The length of the entrance road leading to cul-de-sacs shall not exceed 500 feet. In residential areas, the turnaround shall have a minimum right-of-way radius of 56-feet and a minimum driving surface radius of 48-feet. In commercial or industrial areas, the turnaround shall have a minimum right-of-way radius of 100-feet and a minimum driving surface radius of 90- feet.

F. Curb and Gutter

All streets shall be constructed with 24-inch standard concrete curb and gutter. In industrial areas, streets shall have a 24-inch reinforced concrete curb & gutter.

G. Sidewalks

5-foot sidewalks are required on both sides of streets for all right-of-way widths excluding industrial areas. Handicap accessible ramps & landings at intersections shall not be located on manhole and/or other utility structures. Ramps shall be painted "safety red". Traffic signal or illumination poles, ground boxes, controller boxes, signs, and/or other utilities shall be placed so not to obstruct the accessible routes.

H. Gates and Islands

Gated subdivisions and islands within public street rights-of-way are not permitted.

Gated subdivision and islands for private streets will be considered as variances. Submittals for variance review shall include entrance layouts, gate controls specifications, site distance information and maintenance plans. Minimum gated width shall be 20-foot. A minimum distance of 40- feet from the street ROW is required for gates. Variance considerations will be reviewed by all affected City. Should a gated subdivision be allowed, the developer shall execute a “Hold Harmless” agreement with the City of Aransas Pass. A home owners association and/or deed restriction shall be recorded and a recorded copy must be provided to the City.

III - 5 Pavement Cross Section

A. Materials

The approved pavement sections may be constructed of a combination of lime stabilization, sub-grade, crushed flexible base material, and hot mix asphaltic concrete (known as flexible pavement). A pavement section may also be constructed of reinforced concrete pavement (known as rigid pavement). No seal coating of new construction will be allowed.

All crushed flexible base material used shall be Texas Department of Transportation Item 247, Type D, Grade 3 or better. In addition, the flexible base material shall meet a minimum California Bearing Ratio of 50. The material should be compacted in maximum eight-inch lifts to a minimum of 98% of ASTM D 1557 method D density. All finished flexible base material surfaces will be primed with MC-30 or MS-1 at a rate of 0.20 gallons per square yard.

All HMAC surfaces will be preceded by application of RC-2 or RC-250 tack coat at a rate not to exceed 0.10 gallons per square yard.

Hot mix asphaltic concrete surface material shall conform to the current Texas Department of Transportation Specification Item for Quality Control/ Quality Assurance of Hot Mix Asphaltic Concrete Pavement. The hot mix will meet all the other requirements of this item including production and moisture susceptibility. Field density will be required on large projects as deemed appropriate by the Director of Public Works. In addition to the requirements of the specification the asphaltic concrete will be required to meet a minimum asphalt content of 5.0% by weight of the total mixture.

Natural sub-grade, loose or distributed material beneath pavements to be constructed should be re-compacted to 95% of ASTM D 698, method D density in maximum six-inch lifts. Soils with PI greater than 15 but less than or equal to 25 will require stabilization. The Geotechnical Engineer of record will recommend the stabilization method, and the final percent content required.

For planning purposes the following specifications will be adhered to; soils with PI greater than 15 but less than or equal to 25 will require stabilization with 3% lime content by weight. Soils with PI greater than 25 but less than or equal to 35 will require lime stabilization with 4% lime content by weight. Soils with PI greater than 35 but less than or equal to 45 will require lime stabilization with 5% lime content by weight. Soils with PI greater than 45 will require lime stabilization with 6% lime content by weight.

Concrete used for concrete pavements shall have a minimum 28-day compressive strength of 3000 PSI and a 14-day flexure strength of 600 PSI. All other concrete will have a minimum 28-day compressive strength of 3000 PSI. The Director of Public Works will review all test results for substantial compliance.

**B. Design**

All pavements for arterial street sections shall be designed by a reputable construction materials testing laboratory/engineering firm. The design shall consider the requirements of the proposed street section and be based on the representative soils data taken from the project site. All soils data for design shall be taken during the design phase and submitted to the Director of Public Works for review prior to construction bidding.

All designs shall follow acceptable engineering procedures such as procedures used by the Texas Department of Transportation and AASHTO for flexible and rigid pavements.

Street shall be designed for 18-Kip Axle Repetitions with a 30-year design life as a minimum.

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

C. Minimum Pavement Thickness Requirements

The minimum pavement thickness shall be:

1. Flexible Pavement

- a. Residential Street - 6-inch sub-grade, 8-inch caliche base and 1 1/2-inch HMAC (proper compaction and testing required).
- b. Residential Collectors – 6-inch sub-grade, 8-inch caliche base and 2-inch HMAC (proper compaction and testing required).
- c. Thoroughfares – As designed by a Geotechnical Engineer
- d. Commercial - Cross section must be designed by an Engineer. At a minimum, it must be 10-inch stabilized sub-grade, 10-inch caliche and 3-inch HMAC (proper compaction and testing required) unless the geotechnical engineer justifies a different cross section.
- e. Industrial - Cross section must be designed by an engineer. At a minimum, it must be 12-inch stabilized sub-grade, 12- inch caliche and 4-inch HMAC (proper compaction and testing required) unless the geotechnical engineer justifies a different cross section.

2. Rigid Pavement

A rigid pavement cross section must be designed by an Engineer. At a minimum, residential streets shall have 6-inch stabilized sub-grade, and 6-inch concrete pavement, based on an approved design. Thickness design shall be submitted to the City of Aransas Pass for review and approval.

III - 6 Testing Requirements

Testing by an engineering/construction materials testing laboratory will be required. The Contractor/Developer will be responsible for cost associated with all testing for project. Testing will be required at different stages of construction as follows:

- A. Sub-grade: The PI will be determined prior to any work being performed on the sub-grade. If stabilization is required, gradation will be tested. For compaction and depth, a minimum of one test per each 1000 square yards or fraction thereof for street area will be required.

- B. Compacted caliche: For compaction and depth, a minimum of one test per 1000 square yards or fraction thereof for street area. A minimum one test per 3000 cubic yards or fraction thereof for caliche PI, gradation and wet ball.
  
- C. HMAC: A minimum of one test per 1500 square yards or fraction thereof for street area for thickness verification. Roadway density may need to be required on large projects and will be shown on the plans on a project by project basis as deemed necessary by the City Engineer. When roadway density is not required a rolling pattern will be established to determine the maximum compaction that can be achieved. A minimum of one test for asphalt content (by extraction or other acceptable method approved by the Director of Public Works) and production moisture susceptibility (Test Method Tex 530-C to yield a maximum 10% stripping) per 1000 tons or fraction thereof of HMAC. Submittal of a certified hot mix design is required from the supplier and to be approved by the Director of Public Works or his designated representative.
  
- D. Concrete: a) curb and gutter – one set of cylinders (set consisting of 3) to be broken at 7 and 28 days every 1500 linear feet of curb and gutter; b) pavement – one set of cylinder for every 1000 square yards, one set of beams (set consisting of 2 beams) for every 5000 square yards, slump and air for every 1000 square yards. A certified mix design from the supplier for every mix shall be approved by the Director of Public Works or his designated representative.
  
- E. Compaction testing will be required on all laterals for water, sewer and storm crossing streets and on all inlets. A minimum of 95 % compaction is required.

The developer, project engineer of record and/or contractor are responsible for ensuring that the proper testing requirements are met. A completed form identifying the testing and results will be submitted at the end of the project. The developer, project engineer of record and/or contractor shall also notify the City 24 hours in advance of any testing in order for City personnel to be present during the testing.

III - 7 Required Submittals

The following submittals shall be required as part of the street improvements:

A. Preliminary Approval Phase

In order to properly review and consider projects and grant preliminary approval, the following items must be addressed and shown on the submittals.

1. A reproduction of that portion of the City's Master Street Plan showing the relationship of the area to be improved and the proposed improvements to the City's street system.
2. A site plan at 1"=50' showing;
  - a. Proposed ROW widths
  - b. Proposed Street widths
  - c. Paving type and preliminary design
  - d. Street geometrics (curb data, centerline, etc.) on plan view
  - e. Proposed drainage flow direction
  - f. Street names (shall follow City of Aransas Pass established criteria)

B. Construction Phase

After preliminary plat approval has been granted by Planning and Zoning, the City will accept construction plans and specifications for review. The submittal should include the following;

1. Four (4) complete sets of plans, profiles, and specifications for all street improvements showing;
  - a. Street widths, grades, existing and proposed profiles;
  - b. Pavement designs, curb and gutter type, and design details;
  - c. Cross-sections;
  - d. Complete construction details;
  - e. All plans signed and sealed by a Registered Professional Engineer.



2. Cost Estimate for all street improvements signed and sealed by a Registered Professional Engineer and approved by the Director of Public Works.
3. After the City reviews the submittals, a meeting with the project engineer will be conducted to go over any comments. The engineer is responsible for making any adjustments/corrections to the plans and resubmitting for approval.
4. Upon approval of the construction documents, the City will schedule a Pre-Construction meeting. The pre-construction conference will be held at the City Hall or designated location with the Developer, the Project Engineer, the Contractor and the City of Aransas Pass (Public Works Department, Utilities Department, Fire Department and Development Services Department), and all other parties designated by the City. The four (4) sets of plans submitted shall be reviewed and upon approval, signed by the Director of Public Works or designee. The signed plans (4 sets) shall be the "Official Construction Plans" for the project and will be distributed among the attendees (2-City, 2- Project Engineer).
5. A Notice to Proceed from the City of Aransas Pass office shall be obtained delineating the proposed project and its required conditions.
6. Any changes revisions and/or deletions from the approved sets of plans including change orders, shall be submitted to the Public Works Department (3 copies) for consideration. The Public Works Department shall consider the submittal, and issue a response. The City is not obligated to accept any improvements deviating from the approved construction plans or approved changes.
7. Certified copies of the as-built drawings (hard copies and on AutoCAD Compact Disk format), shall be furnished to the City upon completion of the improvements and verification by the project engineer. (See Section IX).

III - 8 Street Pavement Cut Repair

Street pavement cut repairs will be allowed in special situations when authorized by the Public Works Department. A permit shall be required for all street cuts proposed during any construction. The Contractor shall pay for the associated fee of \$25.00 prior to the permit being issued. The fee exception shall be for city projects only. Approved permits for pavement cuts shall be issued by the Public Works Department with the following conditions:

- A. Permittee shall provide adequate signs, as required by the Texas Manual on Uniform Traffic Control Devices.
- B. Lines and grades shall be staked by permittee 24 hours in advance of construction for City inspection of other affected utilities.
- C. All backfill shall be performed in 8-inch loose layers, compacted to 95% STD Proctor. 3% cement stabilized backfill shall be placed from 18 inches below finished grade to top of sub-grade. The trench backfill and patch shall be tested prior to approval.
- D. The paving structure shall be replaced with 10" cement stabilized base (2 sacks per cubic yard) and 3" H.M.A.C.
- E. All paving cuts shall be saw-cut in straight lines.
- F. The patch on asphalt streets shall extend a minimum of 3-feet on either side of the trench. Concrete streets shall have an expansion joint where new concrete abuts old concrete and proper dowels.
- G. Street repair shall be performed within 48 hours of the cut.
- H. The Contractor/permittee shall repair any future trench settlement occurring during the warranty period of the project at no cost to the City.
- I. Any shrubbery, domestic plants or grass removed during construction shall be replanted and maintained by qualified personnel hired by the Contractor for a period of 3 months.
- J. Signs shall be removed and reinstalled by the permittee only under supervision of the Public Works Director.

- K. The issuance of the permit grants permission to work within City right-of-ways for the purpose of laying the proposed facility. The City does not guarantee a route free of obstructions 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.
- L. Existing pavement shall be removed by saw cutting and breaking out groove.
- M. The right-of-ways must be cleared of trash and excess dirt and left in a neat, clean condition upon completion of the installation, at the end of each working day.
- N. The top elevation of all utility lines 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 a curb and gutter section, the line shall be covered a minimum of 3-feet below the flowline of the gutter.

Where the City requires the boring method, overcutting in excess of over 1-inch in diameter shall be remedied by pressure grouting the entire installation of the bore.

III - 9 Warranty

All materials, products, and workmanship shall be guaranteed for a period of 1-year from the written Date of Acceptance by the City and approved As-built drawings are submitted.

III – 10 Standard Details

The following Standard Details (see appendix B) show the adopted standards required by the City:

1. Standard Detail STR-1	Typical Paving Detail for 34' B-to-B Street - Residential Local (50' R.O.W. w/ 5' U.E. and cul-de-sac minor streets)
2. Standard Detail STR-2	Typical Paving Detail for 50' B-to-B Street - Residential Collector (60'-R.O.W. w/ 10' U.E.)
3. Standard Detail STR-3	Typical Paving Detail for 42' B-to-B Street - Commercial (60' R.O.W.)
4. Standard Detail STR-4	Typical Paving Detail for 44' B-to-B Street - Industrial (60' R.O.W.)
5. Standard Detail STR-5	Typical Paving Detail for 60' B-to-B Street - Minor Arterial (70' R.O.W. w/ 10' U.E.)
6. Standard Detail STR-6	Typical Paving Detail for 66' B-to-B Street - Major Arterial (80' R.O.W. w/ 10' U.E.)
7. Standard Detail STR-7	Typical Paving Detail for 82' B-to-B Street - Major Arterial (100' R.O.W. w/ 10' U.E.)
8. Standard Detail STR-8	Typical Paving Detail for 100' B-to-B Street - Major Arterial (120' R.O.W. w/ 10' U.E.)
9. Standard Detail STR-9	Typical Paving Detail - 16' Alley (20' R.O.W. w/ 5' U.E.)
10. Standard Detail STR-10	Typical Sidewalk Location
11. Standard Detail STR-11	Typical Sidewalk Detail
12. Standard Detail STR-12	A.D.A. Sidewalk Ramp Detail
13. Standard Detail STR-13	Curb & Gutter and Valley Gutter
14. Standard Detail STR-14	Valley Gutter

## **SECTION IV - WATER AND WASTEWATER**

### **IV – 1    General**

The purpose of this section is to define the general requirements for the design of water and wastewater improvements, and to provide typical details of these improvements. The City of Aransas Pass Public Works Department, Fire Department Office, Texas Commission on Environmental Quality (TCEQ) and San Patricio Water shall be consulted if variations from these standards are anticipated.

### **IV - 2    Master Plan**

All water and wastewater design must be sized and located according to the land uses projected in the Comprehensive Master Plan. The City of Aransas Pass will periodically update its Water and wastewater Master Plan, which must be used as the design is developed. All developments within the City and its Extraterritorial Jurisdiction (ETJ) shall be properly connected to the approved water distribution system and wastewater collection system. All lines shall be extended to the plat's boundaries. Approvals for water lines shall be the shared responsibilities of the Public Works Department and the Fire Department. Approval for sewer lines shall be the responsibility of the Public Works Department. Areas not included in the City's master plan shall be designed in accordance with TCEQ requirements for public systems.

### **IV - 3    Water Improvements**

#### **a.    General Policies**

1.    All water mains that are made a part of or extended from the distribution system of the City of Aransas Pass shall be in conformance to these requirements.
2.    Pipe sizes required to serve the anticipated development shall not be less than:
  - a.    Single Family Residential
    - i.    Distribution and/or future extension– 6” (or Greater) diameter
    - ii.   Internal Service – 6” diameter with or without fire hydrant

- b. Multi-family & Commercial or Retail – 8” or 12” diameter (an 8” must be justified with fire flow calculations and sealed by a Professional Engineer)
  - c. Industrial-12-inch or better
  - d. Educational Facility – 12” diameter minimum (by the latest adopted fire code)
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. The Developer is responsible up to and including 12”, after which the City may participate.
4. The minimum water main diameter for lines with fire hydrants shall be 8” to 12” inches in commercial and 12” or better in industrial areas. All waterlines in multi-family and single-family areas and all lines with fire hydrants shall be looped (two sources) unless otherwise approved by the City of Aransas Pass Public Works Department and Fire Department
5. Meter Sizes:
  - a. Single Family Residential will be allowed one ¾” meter. Upgrades may be allowed per approval of the Director of Public Works or his representative.
  - b. Multi-family units (Duplex, Triplex, and Four-plex) will be required to have individual ¾” meter per unit.
  - c. Commercial and Retail will be required to have individual ¾” meters. Upgrades may be allowed per approval of the Director of Public Works or his representative.
  - d. Apartment Complex-Meter sizes will be per approval of the Director of Public Works or his representative. Apartment Complexes will be required to follow TCEQ regulations 30TAC Chapter 291.
6. Fire Department Connection (FDC) shall be independent of all other connections.
7. There shall be no connection made to any water main owned by or under the control of the City of Aransas Pass or any water main attached to the Aransas Pass distribution system by any person or persons, except employees or authorized agents of the City of Aransas Pass Public Works Department. Water valves shall only be operated by the City of Aransas Pass personnel.

8. Hydrant spacing shall be such that there will be a fire hydrant every 300 feet in “hose lay” length in commercial, industrial, educational facility areas and multi-family (four-plex or greater) areas.
9. Hydrant spacing shall be such that there will be a fire hydrant every 500 feet in “hose lay” length in duplex and residential areas.
10. All buildings in the City Limits (and ETJ developments) shall be within 500 feet in “hose lay” length of a standard city fire hydrant. The contractor is responsible for painting all fire hydrants as designated by the Fire Department.
11. All distances will be measured along Public rights-of-way or emergency access ways or as it relates to public safety and the continual unobstructed flow of traffic.

All thoroughfares with a Right-of-Way greater than 60-feet are designated as continual unobstructed thoroughfares.

12. Fire hydrants on designated thoroughfares shall be located on both sides of the street. Blue reflective markers and fire hydrant ring/pressure indicators shall be affixed on the pavement or fire hydrant to indicate the location and flow pressure of a fire hydrant. The curb shall be painted red 15’ on both sides of all fire hydrants and the words “Fire Lane – Tow Away Zone” painted in white 3” letters on the curb.
13. On cul-de-sac streets less than 400 feet in depth, hydrants shall be located at the entrance of the cul-de-sac. Hydrants shall be installed on tees in the water main with a minimum 6-inch diameter branch size. Valves shall be placed between the hydrant and tee.
14. No dead in mains will be allowed within the City of Aransas Pass. All water lines must be looped.
15. Valves shall be spaced at a maximum of 600 foot spacing, near pipe intersections and/or as directed by the Public Works Department or his agents. Valves shall also be located on any stub-outs for future main extension. All valves shall have a concrete collar and mud plug, as per detail.

16. Before being placed in service, the entire line, including service connections, shall be chlorinated. Chlorine may be applied 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.

Water shall be fed slowly into a new line with chlorine applied in amounts to produce a dosage as indicated:

<b>Table IV-2</b>	
<b>Dosage</b>	<b>Residence Time for Sterilization</b>
50 ppm	24 Hrs.
500 ppm	30 Minutes

After a color indicator has tested dosage or photocell and residence time is complete the line must be flushed before testing for bacteria. Water for testing, flushing, etc, will be at the Developer's expense, and he/she shall make arrangements with the City for the purchase of water. Flushing of water lines must be metered and have backflow devices. Flushing will be allowed only during low water demand periods. The following schedule will be enforced;

Month of November thru January- 7:00 am to 3:00 pm  
Months of February thru October- 7:00 am to 10:00 am

During high peak demands and summer season the Public Works Department may limit flushing to early morning hours only.

If flushing is not metered, an automatic charge of \$100 will occur and must be paid before any bacteriological samples are collected.



- a. Bacteriological Sample procedures
    - i. The City of Aransas Pass- Utility Department personnel will sample and analyze all bacteriological samples within the city limits. There will be a \$50 charge per sample. Payment shall be received in the form of money orders and cashiers or personal checks. **NO CASH WILL BE ACCEPTED.** Payments will be made at 601 N. Avenue "A" between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday.
    - ii. Samples will be collected Monday through Thursday between the hours of 8:00 a.m. and 3:00 p.m. All sampling and testing will adhere to TCEQ rules and regulations.
    - iii. Overdosing, causing a sample to be rejected will be charged as a regular sample.
    - iv. Results will be available after 10:00 am or 24 hours after the sample is taken. For results call the Public Works Department at 361-758-3111 Monday through Friday.
  - b. All metered facilities must adhere to TCEQ rules and regulations concerning backflow devices and City of Aransas Pass standards.
  - c. Annual Backflow permit fee – \$100.00
17. All lots shall be provided with service stub-outs and said service locations shall be permanently marked on the curb and the gutter with a "W" not less than 4 inches in size or in a manner approved by the City.
18. All water mains and appurtenances shall be tested for leakage in accordance with AWWA Standard C-900 for two hours. All air shall be removed from the water main before starting the test.

Leakage is defined as the quantity of water that must be supplied to the water main in maintaining the specified leakage test pressure. This quantity of water must be pumped with a pump of adequate head and capacity from a storage tank of such configuration that quantities of water pumped from the storage tank can be accurately calculated.

Test pressure shall be sustained at 150 PSI for two (2) hours unless otherwise specified. Maximum allowable leakage (L) in gallons per hour shall be according to the following formula:

$$L = \frac{ND \times P(1/2)}{3700}$$

where N is the number of joints in the length of pipeline tested; D is the nominal diameter of the pipe in inches; and P is the average test pressure in PSIG. The entire length of pipeline shall be tested as one length unless otherwise specified.

e. Design Standards

All water mains must be designed in accordance with Rules and Regulations for Public Water Systems by the Texas Commission on Environmental Quality, current edition.

f. Materials

All pipe, fittings, Fire Hydrants and materials shall be new and approved by the City of Aransas Pass Public Works Department before being installed. All water mains are to be one, or a combination of the following materials having cast or ductile iron outside diameters:

1. PVC or polyvinyl chloride pipe larger than 3 inches shall meet the requirements of AWWA C900 PVC. Pressure Pipe Class 150 DR 18 with ring-tie joints or C909 PVC Pressure Pipe Class 150.
2. Large diameter pipe materials shall be as approved by the City Director of Public Works.
3. Tapping sleeve and valve assembly shall be all MJ x MJ connection and all stainless steel sleeve:
  - a. Tapping sleeve to meet AWWA specifications with a minimum working pressure of 150 PSI.
  - b. Tapping valve shall meet AWWA specifications with a minimum working pressure of 150 PSI.
4. All bends and fittings will be cast iron (or brass) mechanical joint, 2 inches or larger (C.I.M.J.) meeting the specifications of ANSI/AWWA C-100-77.

5. All water services shall be 1-inch polyethylene tubing or copper unless otherwise approved by the Public Utilities Department. Dual water services shall not be allowed (see detail).
6. No galvanized pipe or fittings will be allowed (except for blow-off valve risers).
7. Valves, hydrants, and services shall installed be as shown on the Standard Details.
8. Fire Hydrants shall be of the brand approved by the City Public Works Department.
9. Meter Boxes will be 18" x 12" and will be purchased and installed by the contractor/developer or as directed by the Public Works Department. Meter boxes installed will be at finish grade. Meters that require a vault will be installed, at the expense of the contractor/developer and the lid must be stainless steel.

Water meters greater than 2-inch shall have a metered emergency by-pass with proper valve isolation (see detail).

g. Water Line Crossing within the City and ETJ.

1. Public and private utility crossings other than wastewater.

Where a water line crosses another utility other than a wastewater, a minimum of 2-foot of clearance must be maintained between the outside wall of the water line and the outside wall of the utility.

a. City crossing

All waterlines and wastewater crossings will be required to be encased in steel casing or as directed by the Director of Public Works.

2. Stream or ditch crossings.

a. Elevated Crossings:

- i. Underground crossings are preferred to elevated crossings.

- ii. Water lines shall be steel or restrained joint metallic pipe and shall extend a minimum of 15 feet beyond the last bend or to the right-of-way line, whichever is greater.
  - iii. Supporting water lines on existing or proposed bridges meeting the following criteria may be used, when approved in advance by the Director of Public Works.
    - 1. Have adequate structural capacity.
    - 2. Have sufficient clearance above bent cap elevation for installation under the bridge.
  - iv. Design elevated crossings with the elevation of the bottom of the water line above the low chord of the nearest adjacent bridge or a minimum 1-1/2-foot above the 100-Year Floodplain Elevation, whichever is greater.
  - v. Extend pipe from right-of-way to right-of-way crossings.
  - vi. Provide air release valves at the highest point of the waterline.
  - vii. Provide sufficient span length to accommodate the cross section of future widening of the stream or ditch, if available.
  - viii. Support the line on columns spaced to accommodate structural capacity of the pipeline considering deflection and loading.
  - ix. Base column support design on soil capacity, spacing, loading, and structural requirements.
  - x. Provide pedestrian pipe guards on elevated crossings, when applicable.
- b. Underground Crossings:
- i. Provide a minimum 5-foot clearance above top of pipe to the ultimate flow line of the ditch.
  - ii. Provide sufficient length to exceed the ultimate future development of the stream or ditch.
  - iii. Water lines shall be steel or restrained joint pipe and shall extend a minimum of 15 feet beyond the last bend or to the right-of-way line, whichever is greater.

h. State Highway and County Road Crossings

1. Extend carrier pipe from right-of-way to right-of-way.
2. Use welded steel pipe or restrained joint pipe in steel casing under existing and future roadway from a point 5 feet outside of the service road or outside of pavement toward the right- of-way, to a similar point on the other side of the highway across the right-of-way. For highway or roadway crossings with open-ditch sections, extend casing from right-of-way to right-of-way.
3. Where additional right-of-way has been acquired for future widening, the casing shall extend to within 10 feet of each right-of-way line.
4. Coordinate and obtain crossing permit with Regulatory Agency.

i. Railroad Crossings

1. For mainline and spur line railroad crossings, the water line shall be welded steel or restrained joint pipe within a steel casing which extends from right-of-way to right-of-way. Any deviation must be approved by the railroad companies.
2. Where there is a non-railroad right-of-way, extend casing 15 feet either side from the centerline of the outside rails.

**PROTECTION REQUIREMENTS AT  
WATER LINE – SANITARY SEWER CROSSINGS**

PRIMARY CONDITION	PROPOSED WATER EXISTING WASTEWATER				PROPOSED WATER PROPOSED WASTEWATER OR EXISTING WATER PROPOSED WASTEWATER			
	WATER OVER WASTEWATER		WATER UNDER WASTEWATER		WATER OVER WASTEWATER		WATER UNDER WASTEWATER	
SECONDARY CONDITIONS	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'
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	6a	3	6

\*PROTECTION REQUIREMENTS  
FOR WASTEWATER CROSSINGS  
SEE TCEQ RULES & REGULATIONS

(Unless Variance is granted by the TCEQ)

(All clearances shall be measured from outside wall to outside wall)

1. One, 20-foot joint, C-900, C-905 PVC, 150- PSI centered over sanitary sewer; 6-inch absolute minimum clearance.
2. If no evidence of wastewater leakage, center one joint of water line over wastewater; 24-inch absolute minimum clearance. If the wastewater line is leaking, the wastewater line shall be replaced with 150 PSI lined PVC pipe with appropriate adapters on all portions of the wastewater within 9 feet of the water line.
3. Not allowed.
4. Auger 9 feet minimum each side of wastewater. Place one 20-foot joint of C-900 PVC/C, 150 PSI, centered under wastewater. Fill bored hole with bentonite/clay mixture; 2-foot absolute minimum clearance or replace the existing wastewater with 150 PSI lined PVC pipe with appropriate adapters on all portions of the wastewater within 9 feet of the water line.
5. Minimum 18-foot joint of wastewater, 150 PSI lined PVC pipe centered at the water line, 6- inch absolute minimum clearance.
6.
  - a. Center a minimum 18-foot joint of wastewater, 150 PSI lined PVC pipe centered at waterline, and;
  - b. Use cement-stabilized sand backfill for all portions of the wastewater within 9 feet of the waterline, as measured perpendicularly from any point on the water pipe to the wastewater pipe (minimum 2.5 sacks cement per cubic yard of sand). The cement-stabilized sand bedding shall start at a point 6 inches below the bottom of wastewater to 6 inches above the top of wastewater and one quarter of the pipe diameter on the side of the wastewater.

**PROTECTION REQUIREMENTS AT  
WATER LINE – FORCE MAIN CROSSINGS**

PRIMARY CONDITION	PROPOSED WATER EXISTING WASTEWATER				PROPOSED WATER PROPOSED WASTEWATER OR EXISTING WATER PROPOSED WASTEWATER			
					WATER OVER WASTEWATER		WATER UNDER WASTEWATER	
SECONDARY CONDITIONS								
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	6a	3	6

**\*PROTECTION REQUIREMENTS  
FOR WASTEWATER CROSSINGS  
(SEE TCEQ RULES & REGULATIONS)  
(Unless Variance is granted by the TCEQ)**

(All clearances shall be measured from outside wall to outside wall)

1. Construct water line with a 20-foot steel section with all related appurtenances centered above the force main; 6-inch absolute minimum clearance.
2. Construct water line with one 20-foot joint of C-900, C-905 PVC centered above the force main.
3. Not allowed.
4. Auger 9 feet minimum each side of force main. Place one 20-foot joint of C-900 PVC, 150 PSI, centered under force main. Fill bored hole with bentonite/clay mixture; 2-foot absolute minimum clearance or replace the existing force main with 150 PSI lined PVC pipe with appropriate adapters on all portions of the force main within 9 feet of the water line.
5. Center a minimum 18-foot joint of force main, 150 PSI lined PVC pipe at water line, and use cement-stabilized sand backfill for all portions of the wastewater within 9 feet of the waterline, as measured perpendicularly from any point on the water pipe (minimum 2.5 sacks cement per cubic yard of sand). The cement-stabilized sand bedding shall start a point 6 inches below the bottom of wastewater to 6 inches above the top of wastewater and one quarter of the pipe diameter on the side of the wastewater.
6. Minimum 18-foot joint of wastewater force main, 150 PSI lined PVC pipe centered at the waterline.

j. Additional Requirements

1. Use electrically isolated flange joints for transitions between two dissimilar metallic pipes. Electrically isolate water lines from casing pipe and supports.
2. The carrier pipeline shall extend a minimum of 1 foot beyond the end of the casing to allow flanged joints to be constructed.
3. For welded steel bends, extend steel pipe a minimum of 5 feet beyond the bend.

k. Oil and Gas Pipeline Crossings

Coordinate with applicable agency.

l. Auger Construction

Use the following general criteria for establishing auger or bore sections:

1. Improved streets – Use auger construction to cross a street regardless of surface. Auger length shall be computed as roadway width at proposed bore location plus 5 feet to either side or roadway.
2. Driveways – Use auger construction to cross active driveways. Compute auger length as driveways width plus 1 foot to either side. Where proposed lines are in proximity and parallel to culvert pipes along roadside ditch streets, the length of bore shall be the same as the length of existing culvert.
3. Trees – Use auger construction to cross within 4 feet of trees, 6 inches and larger in diameter. Use a minimum of 8-foot auger length centered about the tree.

m. Circulation and Flushing for Water Quality

The layout of the water distribution system shall provide maximum circulation of water to prevent future problems of odor, taste, or color due to stagnant water.

1. Waterline shall be looped to the nearest available water source.



2. Provide a source of fresh water at each end or at multiple points of a subdivision. Provide ways to create circulation and place valves and fire hydrants to allow simple flushing of lines.
3. Avoid dead ends whenever possible. When necessary, isolate dead ends with a line valve, and equip with a blow-off, fire hydrant or flushing valve near the line's end.
4. Where stubs are provided for future extensions, isolate the stubs with a valve and do not allow service connections to stubs until extended. Place one full pipe joint between the valve and plug.

n. Interconnections

1. For interconnections between utility districts outside the City of Aransas Pass City Council, written approval must be given by the TCEQ.
2. A written agreement between the districts must be approved by the City and recorded in the county records and furnished to the City.

o. New Water Lines Constructed near Wastewater and Force Mains

1. New Water Lines Parallel to Wastewater and Force Mains: Locate water lines a minimum of 9 feet horizontally, outside wall to outside wall, when parallel to wastewater or force mains. Use the following procedure when 9-foot separation cannot be achieved:
  - a. When a new water line is to parallel an existing wastewater force main or gravity wastewater and the 9-foot minimum separation distance cannot be maintained, the existing wastewater shall be replaced with lined PVC pipe meeting ASTM specifications, having a minimum working pressure rating of 150 PSI or greater and equipped with pressure-type joints.

- b. The water lines and wastewater shall be separate by a minimum vertical distance of 2 feet, and a minimum horizontal distance of 4 feet, measured between the nearest outside walls of the pipes, and in all cases, the water line shall be located above the wastewater.
- 2. New Water Lines Crossing Wastewater and Force Mains.
  - a. No protection is required if the wastewater is 9 feet below the water line.

IV -4 Required Submittals

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

A. Preliminary Approval Phase

In order to properly review and consider projects and grant preliminary approval, the following items must be addressed and shown on the submittal.

- 1. A reproduction of that portion of the City's Master Water System Plan showing the relationship of the area to be improved and the proposed improvements to the City's water system.
- 2. A site utility plan at 1" = 50' showing:
  - a. Water main sizes
  - b. Valve locations
  - c. Fire hydrant locations
  - d. Tap locations to City's distribution system
  - e. Service locations and connections
  - f. Direction and proposed connection of projects done in phases
  - g. A table, based on the City of Aransas Pass's Standards assumptions\*, identifying number of connections and amount water to be consumed in gallons per day by the proposed subdivision.

\*Assumptions: Industrial, Residential, Multi-family, Commercial, Educational Facilities and Winter Texans

**B. Construction Phase**

After preliminary plat approval has been granted by Planning and Zoning Commission, the city will accept construction plans and specifications for review. The submittal should include the following;

1. Four (4) complete sets of plans, profiles, and specifications for all proposed water improvements showing:
  - a. Water lines, showing location, alignments and connections to existing water system
  - b. Valves, flush valves and fire hydrants showing location and spacing
  - c. Complete construction details
  - d. All plans signed and sealed by a Registered Professional Engineer.
2. Cost Estimates for all water improvements signed and sealed by a Registered Professional Engineer and approved by the Director of Public Works.
3. After the City reviews the submittals, a meeting with the Project Engineer will be conducted to go over any comments. The Project Engineer is responsible for making any adjustments/corrections to the plans and resubmitting for approval.
4. Upon approval of the construction documents, the City will schedule a Pre-Construction meeting. The pre-construction conference will be held at the Public Works conference room or a designated location with the Developer, the Project Engineer, the Contractor, and the City of Aransas Pass (Public Works Department, Fire Department, and Development Services Department), and all other parties designated by the City. The four-(4) sets of plans submitted shall be reviewed and upon approval, signed by Director of Public Works. The signed plans (4 sets) shall be the "Official Construction Plans" for the project and will be distributed among the attendees (2-City, 2-Project Engineer).
5. A Notice to Proceed from the City of Aransas Pass Public Works office shall be obtained delineating the proposed project and its required conditions.

6. Any changes revisions and/or deletions from the approved sets of plans including change orders, shall be submitted to the Public Works Department for consideration. The Public Works Department shall consider the submittal, and issue the response. The city is not obligated to accept any improvements deviating from the approved construction plans or approved changes.

Certified copies of the as built (Hard copies and on AutoCAD compact disk format), shall be furnished to the City upon completion of the improvements and verification by the Project Engineer (see Section IX).

#### IV - 5 Wastewater Improvements

##### A. General

1. All wastewater mains that are made a part of or extended from the collection system of the City of Aransas Pass shall be in conformance to these requirements.
2. Pipe sizes required to serve the anticipated development shall be properly sized based on estimated flows.

All development bordering planned extensions of major collection lines shown on the Master Wastewater Plan shall install the required pipe size up to and including 12" lines. The pipe shall be laid at the maximum depth required. The costs associated with the master plan extension are subject to the City of Aransas Pass' standard reimbursement policy. Wastewater lines shall be designed by a professional engineer and shall correspond to the proper capacity demand.

3. There shall be no service connection made to any wastewater main owned by or under the control of the City of Aransas Pass, or any wastewater main attached to the Aransas Pass Collection System by any person, or authorized agents without prior permission of the City of Aransas Pass Public Works Department.

4. Wastewater service stub-outs shall be provided for all lots. All sewer service locations shall be permanently marked on the curb and the gutter with an "S" not less than 4 inches in size or in a manner approved by the City.
5. Plastic/polyethylene barrier tape shall be installed from the point of the stub out and will extend 6 inches above finished grade of the lot. The barrier tape shall be green with white letters that reads SEWER.
6. Manhole spacing shall be in accordance with the Design Criteria for Sewerage Systems by the Texas Commission on Environmental Quality (TCEQ).
7. As allowed by this rule, the City of Aransas Pass Utility Department shall require that manholes be at a maximum of 500' spacing.
8. All wastewater mains and appurtenances shall be tested for exfiltration/infiltration in accordance with Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ).
9. Infiltration/Exfiltration Limitations: 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. 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. Copies of all test results shall be made available to the Public Works Department. Air tests, shall conform to the procedure described in ASTM C 828 or other appropriate procedures.
10. Deflection Test: Deflection tests shall be performed on all flexible and semi-rigid pipes. The test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of 5%. If the deflection test is run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.

11. Internal camera inspection will be conducted at the discretion of the Public Works Department.
12. Public Works Department will adhere to TCEQ-CMOM (capacity maintenance, operation and management) regulations. Any extensions to the system and dedicated to the City shall follow the same regulations.
13. Lift Stations
  - a. New lift stations will not be allowed unless the availability of an existing gravity collection system is farther away than 1- mile, or does not have the proper depth or capacity. In the event that a lift station is required, the design shall requirements shall be as follows;
    - i. Pump system shall be duplex,
    - ii. Wet well shall be sized for a collection basin
  - b. Connection to existing lift stations will only be allowed after design calculations show that the lift station can handle the additional flow. Upgrades and/or improvements will be required at the discretion of the Public Works Director.

**B. Design Standards**

All wastewater mains must be designed in accordance with Design Criteria for Sewage Systems by the TCEQ current addition in regards to design, pipe selection, bedding, protection, capacities, fencing, and access.

**C. Materials**

All pipe, fittings and materials shall be new and approved by the City Public Works Department before being installed. All wastewater mains are to be one, or a combination of the following materials:

1. Polyvinyl chloride (PVC)
  - a. Gravity uses – SDR 26 meeting services and mainline requirements of ASTM specification D – 3034
  - b. Force mains – SDR 21, SDR 26, Schedule 40 PVC & CL 160
  - c. Rubber gaskets to meet ASTM D – 1869, D – 361 or C – 443
  
2. Pumps for Lift Station shall a minimum of 4” and be equivalent or equal to:
  - a. Self-priming – Gorman Rupp
  - b. Submersible – Flight, Gorman Rupp, ABS

IV - 6 Required Submittals

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

A. Preliminary Approval Phase

In order to properly review and consider projects and grant preliminary approval, the following items must be addressed and shown on the submittal.

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. A site utility plan at 1”=50’ showing;
  - a. Wastewater main sizes
  - b. Manholes and/or lift stations
  - c. Grades and capacities
  - d. Tap locations to City's collection system
  - e. Service locations
  - f. Direction and proposed connection of projects done in phases
  - g. A table based on the City of Aransas Pass' Standards assumptions indicating the number of wastewater service connections and the effluent impact in gallons per day of wastewater that will be added to the City Collection/Treatment System.

**B. Construction Phase**

After preliminary plat approval has been granted by Planning and Zoning Commission, the City will accept construction plans and specifications for review. The submittal should include the following;

1. Four (4) complete sets of plans, profiles, and specifications for all proposed wastewater improvements showing;
  - a. Wastewater lines, showing location, alignment and connection to existing collection system
  - b. Manholes, showing location and spacing
  - c. Lift stations (if applicable), showing location, size, dimensions, depth, fencing, and access
  - d. Complete construction details
  - e. All plans signed and sealed by a Registered Professional Engineer.
2. Cost Estimate for all wastewater improvements signed and sealed by a Registered Professional engineer and approved by the Director of Public Works.
3. After the City reviews the submittals, a meeting with the project engineer will be conducted to go over any comments. The engineer is responsible for making any adjustments/corrections to the plans and resubmitting for approval.
4. Upon approval of the construction documents, the City will schedule a Pre-Construction Meeting. The pre-construction conference will be held at the Public Works conference room or designated location with the Developer, the Project Engineer, the Contractor and the City of Aransas Pass (Public Works Department, Fire Department, and Development Services Department), and all other parties designated by the City. The four (4) sets of plans submitted shall be reviewed and upon approval, signed by the Director of Public Works. The signed plans (4 sets) shall be the "Official Construction Plans" for the project and will be distributed among the attendees (2 – City, 2 – Project Engineer).
5. A Notice to Proceed from the City of Aransas Pass Public Works Office shall be issued delineating the proposed project and its required conditions.



6. Any changes, revisions and/or deletions from the approved sets of plans including change orders, shall be submitted to the Public Works Department for consideration. The Public Works Department shall consider the submittal. The City is not obligated to accept any improvements deviating from the approved construction plans or approved changes.

Certified copies of the as built (hard copies and on AutoCAD compact disk format), shall be furnished to the City upon completion of the improvements and verification by the Project Engineer (See Section IX).

IV - 7 Warranty

All materials, products, and workmanship shall be guaranteed for a period of 1-year from the written Date of Acceptance by the City and approved As-built drawings are submitted.

IV – 8 Standard Details

The following Standard Details (see appendix B) show the adopted standards required by the City:

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Standard Detail WTR-1</li> <li>2. Standard Detail WTR-2</li> <li>3. Standard Detail WTR-3</li> <li>4. Standard Detail WTR-4</li> <li>5. Standard Detail WTR-5</li> <li>6. Standard Detail WTR-6</li> <li>7. Standard Detail WTR-7</li> <li>8. Standard Detail WTR-8</li> <li>9. Standard Detail WTR-9</li> <li>10. Standard Detail SWR-1</li> <li>11. Standard Detail SWR-2</li> <li>12. Standard Detail SWR-3</li> <li>13. Standard Detail SWR-4</li> <li>14. Standard Detail SWR-5</li> </ol> | <ul style="list-style-type: none"> <li>Single Water Service Connection</li> <li>Fire Hydrant Installation Detail</li> <li>Typical Valve &amp; Valve Box Installation</li> <li>Thrust Block Details</li> <li>Waterline Offset Detail</li> <li>Backflow Prevention Device</li> <li>Meter/Backflow &amp; Vault</li> <li>Trench bedding (Water)</li> <li>Bore &amp; Casing Detail</li> <li>Wastewater Service Connection</li> <li>Typical Wastewater Drop Fiberglass Manhole Detail</li> <li>Wastewater Corrosion Resistant Manhole for Force Main Discharge</li> <li>Wastewater Cover Details</li> <li>Wastewater Trench Bedding</li> </ul> |
|---|--|

## **SECTION V - OFF-STREET PARKING LOTS**

### **V - 1    General**

This section is a guide in the design and layout of off-street parking facilities. Parking lot design should give full consideration to every design factor that improves access to and from adjoining streets, internal movements, maneuvering of cars, and convenience of patrons and security of vehicles. The average automobile is 18'-0" long and 6'-9" wide. Adding to these limits; allowances for opening doors, the relative skill of drivers, the turning radius of the average automobile and a margin for safety, the following standards have been established. Parking areas built to these specifications will allow 80 percent of all cars to park with relative ease in one maneuver. Some reduction in these standards may be necessary at times, but loss in efficiency will generally result.

In the larger lots, greatest economy of space can be accomplished by placing the stalls at right angles to the aisles. Acute-angle parking allows fewer stalls for a given length of curb or aisle than right-angle parking. However, a definite advantage is that the aisle may be narrow, thus permitting use of a lot too narrow for right-angle parking. Acute- angle parking requires that the first stall be placed a minimum distance from the property line or sidewalk. This is a safety measure to protect occupants of the sidewalk from vehicles backing out of the stall. Barrier curbs are essential when parking heads into an adjoining property line and at all times along a sidewalk. Their placement depends upon the angle for which the parking is planned except along a sidewalk where they will be parallel to the walkway abutting but not overlapping the sidewalk.

Circulation of cars within facilities requires consideration of entrance and exit locations, width of aisles and the angle of parking. One-way counter-clockwise movement is desirable where feasible and will reduce congestion. Entrances and exits should be held to a minimum to reduce conflict with street and sidewalk traffic, but it is highly desirable that exits and entrances be separated.

<b>TABLE V-1</b>		
<b>Minimum Pavement Thickness for All Weather Surface</b>		
	<b>Light Duty</b>	<b>Heavy Duty</b>
<b>Commercial Parking Area</b>	Asphalt - 1½"	Asphalt - 2"
	Caliche – 8"	Caliche – 10"
	Concrete - 4"	Concrete - 5"

V - 2 Standard Details

The following Standard Details (see appendix B) show the adopted standards required by the City:

1.	Standard Detail PKG-1	90° Degree Parking
2.	Standard Detail PKG-2	60° Degree Parking
3.	Standard Detail PKG-3	45° Degree Parking
4.	Standard Detail PKG-4	Typical Detail for Handicap Parking
5.	Standard Detail PKG-5	Typical Handicap Symbol Dimensions
6.	Standard Detail PKG-6	Handicap Parking Sign Installation Detail

## SECTION VI – BARRICADING PLAN AND CHANNELIZATION METHODS FOR TEMPORARY TRAFFIC OPERATIONS

### VI – 1 General

Problems of traffic control occur when traffic must be moved through or around road or street construction, maintenance operations, and utility work. Numerous standard sequences of signs or other control devices can be set up as an inflexible arrangement for all situations due to the variety of conditions encountered. All traffic control shall comply with the latest edition, Texas Manual of Uniform Traffic Control Devices. Traffic control plans shall be submitted to the City of Aransas Pass and signed and sealed by a professional engineer.

## SECTION VII – DRIVEWAY ENTRANCE STANDARDS

### VII - 1 General

The purpose of this section is to act as a guide for the construction of driveway approaches within right-of-ways. It should be stressed that these are typical designs. Any atypical design or changes to these designs must have a site plan and driveway layout which includes distances to nearest intersections and adjacent driveways approved by the Public Works Director. The Public Works Department criteria for driveway permits will follow the Texas Department of Transportation-Access Management Program Guidelines.

- A. For replacement of old driveways and all new driveways, a right-of-way permit must be obtained from the Public Works Department for an appropriate fee (see standard form).
- B. Where driveways enter State Highways or Farm to Market (FM) roads, the Contractor, prior to the issuance of a city permit, shall obtain a permit from the Texas Department of Transportation.
- C. Before a permit is granted, all Contractors working within public right-of-ways shall show proof of being bonded as provided in the Code of Ordinances. The right-of-way permit shall be valid for 30 calendar days after issuance. At the expiration of this time, a new permit and fee will be required if the construction has not been completed.
- D. All new multi-family and commercial driveways or replacements must have a plan approved by the Public Works Director. These plans will be used to make inspections and will be adhered to entirely. Any changes require approval of the Public Works Director.
- E. All curb and gutter to be replaced shall be removed to the nearest expansion joint on both sides of the area to be replaced. With the approval of the Public Works Director or his representative, the curb and gutter may also be saw-cut to provide a smooth joint.
- F. On all driveways, only the curb shall be removed. The new approach section shall follow the existing gutter line profile so that existing drainage is unobstructed.

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- G. Any curb and gutter that is removed shall be replaced within 48 hours, unless the City grants an extension. The penalty for failure to complete the construction shall be a fine of \$200.00 for each day of violation as provided by the Code of Ordinances.
- H. Before removal of curb is initiated, the Contractor shall notify the Public Works Department for an inspection. The City Inspector shall also be contacted before any concrete is poured to inspect the reinforcement.
- I. All street materials that are removed to allow for the front forms on the gutter and drive approach shall be replaced with the same or better materials.
- J. All driveways and curb shall be poured with 3000 PSI concrete.
- K. The concrete shall be placed on good select material that is approved by the Public Works Department or his representative. Such material shall be compacted to at least 95% of the standard proctor density. All reinforcing (bars @ maximum 16" center or 6 x 6 No. 6 wire mesh) shall be located 2 inches from the bottom of the poured concrete. New expansion joints of ½" asphalt board or equivalent material shall be placed at the points of new construction and at the right-of-way line.
- L. All sidewalks at driveways shall comply with A.D.A requirements.
- M. Only one driveway entrance, shall be allowed per 70-foot width (or less) frontage lots.

### VII – 2 Standard Details

The following Standard Details (see appendix B) show the adopted standards required by the City:

1	Standard Detail DWY-1	Driveway Approaches
2	Standard Detail DWY-2	Typical Driveway Reinforcement Detail – Single and Two-family Drives
3	Standard Detail DWY-3	Typical Driveway Reinforcement Detail - Multi-family and Commercial Drives
4	Standard Detail DWY-4	Typical Driveway Reinforcement Detail - Non-curb & gutter streets with shallow ditch crossing
5	Standard Detail DWY-5	Typical Driveway Reinforcement Detail - Non-curb & gutter streets with deep ditch crossing

## SECTION VIII - GENERAL REQUIREMENTS

### VIII - 1 General

- A. Additional requirements for development shall be as listed on the most current adopted City of Aransas Pass **Code for Subdivisions**. Copies may be obtained from the City of Aransas Pass.
- B. Additional requirements for development shall be as listed on the most current adopted City of Aransas Pass **Fire Department Construction and Development Guide**. Copies may be obtained from the City of Aransas Pass.
- C. Additional requirements for development shall be as listed on the most current adopted City of Aransas Pass "Park Land Dedication" (**Ordinance No. 0-99-49**). Copies may be obtained from the City of Aransas Pass.

As conditions are encountered beyond the scope of this section, coordination with the City of Aransas Pass is required to establish proper requirements and procedures.

### VIII – 2 Street Lights

Streetlights are required along all streets adjacent and within new subdivisions. The streetlight standard shall consist of a lighting fixture on an aluminum arm attached to a concrete or aluminum pole. The lights shall be spaced at 250-foot maximum or as approved by the Development Services Department. Intersections and cul-de-sacs may require additional lighting upon review by the Development Services Department. The lighting fixtures shall be high- pressure sodium with 27.5K lumens. Electrical power for the streetlights shall be underground. Street lighting plans shall be submitted for review at the time the preliminary plat is submitted. Coordination must be made with local electrical utility provider.

VIII – 3 Landscaping

The City of Aransas Pass requires at a minimum, the first 10-feet (adjacent to the right-of-way) of street yard area to be landscaped for any commercial or industrial use. Landscaping shall be defined as plants, shrubbery, grass, or trees that will be planted and maintained for the life of the facility. Maintenance will include appropriate ways to water the landscaping (i.e. sprinkler system) or another appropriate method. The landscaping plans shall be submitted for review at the time of building permit. Irrigation systems within the right-of-way shall be “drip irrigation” only.

VIII – 4 Utilities

All utilities within the City of Aransas Pass shall be underground. This includes electrical power, cable, telephone, and other utilities.



## SECTION IX – GEOGRAPHICAL INFORMATION SYSTEMS (GIS) REQUIREMENTS

### IX - 1 General

The City of Aransas Pass is working towards having the most comprehensive GIS in the Coastal Region. In order to accomplish this, all preliminary, amended and final projects done by owners, engineers and developers will submit all information in a digital format as outlined below. This will allow our City Staff to provide the most comprehensive information and exhibits to the Planning & Zoning and City Commissions.

- A. In accordance with Code of Ordinances, City of Aransas Pass (COCOAP) Article III. Plats Sec. 118-152, no data will need to be collected at this time. It will be made known to the developer what will be required of the developer concerning Geographical Information Requirements.
- B. In accordance with COCOAP Article III. Plats Sec. 118-177, Filing and Fees, along with all the requirements for filing, the applicant will provide the City of Aransas Pass Development Services Department a digital file of the PRELIMINARY development as outlined in the COCOAP. Digital standards are outlined below.
- C. Any AMENDMENTS to the development will be accompanied with a current digital file.
- D. In accordance with COCOAP Article III. Plats Sec. 118-202, Filing and Fees, along with all the requirements for filing, the applicant will provide the Development Services Department a digital file of the FINAL development as outlined in the COCOAP. Digital standards are outlined below.
- E. Prior to the plat being recorded, a digital file containing all AS-BUILTS will need to be turned into the COAPP.

Please note: Non-Compliance will result in delays in the subdivision process and recording.

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F. GIS Data requirements:

Format: DWG or DXF

Scale: 1:1

Layer Name	Description
Text1	Subdivision Name, Street Name, Lot Numbers, Block Numbers
Text2	All other text, dimensions, call outs etc
Easements	Canal, Drainage and all utility easements
Lot Lines	Property boundaries
Subdivision Boundary	Project Boundary
Water Distribution Proposed	Proposed Water Improvements on and off site
Sanitary Sewer Proposed	Proposed Sewer Improvements on and off site
Storm Sewer Proposed	Proposed Drainage Improvements on and off site
Water Distribution Existing	Existing Water System
Sanitary Sewer Existing	Existing Sewer System
Storm Sewer Existing	Existing Drainage System

NOTE: The City of Aransas Pass will require corrected state plane X and Y coordinates for all major components such as wastewater manholes, water valves & hydrants, primary property corners and easements, street lights, street signs, water meters, etc.

**APPENDIX A- FORMS**

**City of Aransas Pass-Standards Manual**

SAMPLE LETTER OF CREDIT FORM

City of Aransas Pass(THE CITY)

Date \_\_\_\_\_

Aransas Pass, Texas 78336

To Whom It May Concern:

At the request of \_\_\_\_\_, hereinafter referred to as "DEVELOPER" and for the development of \_\_\_\_\_ Subdivision;  
 City of Aransas Pass, County of \_\_\_\_\_, 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 (on-site)	\$ _____
A-1)	Water (off-site)	\$ _____
B)	Sewer (on-site)	\$ _____
B-1)	Sewer (off-site)	\$ _____
C)	Drainage (on-site)	\$ _____
C-1)	Drainage (off-site)	\$ _____
C-2)	SW3P	\$ _____
C-3)	Reimbursements	\$ _____
D)	Paving (on-site) (streets & alleys)	\$ _____
D-1)	Paving (off-site) (streets)	\$ _____
E)	Sidewalk (if applicable)	\$ _____
F)	Street Lighting	\$ _____
G)	Signalization and/or traffic control signs	\$ _____
H)	Laboratory Testing (3%)	\$ _____
I)	Contingency	\$ _____
J)	*Administrative Fee (3%)	\$ _____
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 bonafide 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, Director of Public Works, 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).

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.

1. 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 Bank and 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.

A 3% Administrative Fee (includes inspection fee) shall be paid to THE CITY by mail within five (5) working days after receipt of statement for same by THE INSTITUTION.

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\*NOTE: Line Items C-3, G, H and J 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 CITY only.

\_\_\_\_\_  
Name of Financial Entity

\_\_\_\_\_  
Name of Developer

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name & Title

\_\_\_\_\_  
Printed Name & Title

(SEAL)

ENGINEERING COMPANY

\_\_\_\_\_  
PROJECT ENGINEER SIGNATURE

ORIGINAL RECEIVED AND AGREED TO:  
CITY OF ARANSAS PASS

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED NAME & TITLE

\_\_\_\_\_  
PRINTED NAME & TITLE

SAMPLE REIMBURSEMENT CONTRACT FORM

REIMBURSEMENT CONTRACT

STATE OF TEXAS

§

COUNTY OF \_\_\_\_\_

§

Reimbursement Contract Must Be Filed and Approved Within 30 Days of the Subdivision Being Recorded.

THIS CONTRACT, made and entered into by and between the CITY OF ARANSAS PASS a Municipal Corporation, as authorized by Resolution of its Board of Commissioners, hereinafter called the CITY and \_\_\_\_\_, hereinafter called DEVELOPER.

WITNESSETH:

WHEREAS, DEVELOPER is the Developer of the following described property:

\_\_\_\_\_ and has extended a \_\_\_\_\_ as shown on a plan entitled Subdivision, Sheet, by \_\_\_\_\_ dated \_\_\_\_\_ hereinafter called the IMPROVEMENTS, from its present terminus to the above-described property, as approved by the City Commission and/or Utility Board on \_\_\_\_\_ and

WHEREAS, the actual cost of such improvement and the amount to be paid therefore, respectively, by the CITY and DEVELOPER is shown on Exhibit "A" attached hereto and made a part hereof; and

WHEREAS, in keeping with City policy, individuals who seek the extension of \_\_\_\_\_ on or adjacent to their property must advance the cost of construction thereof, and any individual who wishes to utilize the improvements must participate in the original cost by reimbursing either the DEVELOPER within seven years of the completion of those lines, or the CITY OF ARANSAS PASS after that date.

NOW, THEREFORE, IT IS AGREED BY AND BETWEEN THE PARTIES AS FOLLOWS:

DEVELOPER has deposited with CITY or made necessary arrangement for the payment to the CITY the sum of \_\_\_\_\_ to install improvements and other necessary appurtenances, which improvements become property of the CITY.

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WHEREAS, installation of the above described systems has been completed and is operational, and the CITY has approved its installation. The CITY promises and agrees to reimburse to the DEVELOPER, according to the schedule shown as Exhibit "B" attached hereto and made a part hereof, any pro rata share of the cost of the improvements that individual property owner pays upon approval of a subdivision plat, provided that the reimbursement occurs within seven (7) years of \_\_\_\_\_ the date of completion of the improvements. After that period of time, any reimbursed amounts will be retained by the City of Aransas Pass to offset bookkeeping costs and maintenance of the CITY.

WITNESS OUR HANDS in duplicate originals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

BY: \_\_\_\_\_  
CITY MANAGER

BY: \_\_\_\_\_  
DEVELOPER

ATTEST:  
  
\_\_\_\_\_  
City Secretary



CITY OF ARANSAS PASS UTILITY EXTENSION

POLICY SECTION I – DEFINITIONS

- A. City or City's Share: These words are always synonymous with the City of Aransas Pass's Public Works Department.
- B. City's Cost: The portion of the total cost of utility capacity in excess of the size required of the Developer and those immediate properties to be served.
- C. Developer- The person requesting the extension of utilities.
- D. Developer's Cost: The total cost of utilities (including the Developer's share of previous oversize lines, extra depth and lift stations to support the extension) sufficient to provide service (including fire protection); minus any pro rata shares paid at the time of installation, and the City's cost.
- E. Ordinance: City of Aransas Pass Ordinance No. 1445, as amended. Ordinance adopting Standards Manual & Utility Extension Policy.
- F. Pro Rata Share: The portion of the Developer's cost of the utilities that have been assessed to each individual property owner.
- G. Total Cost: The total cost of the utility including Engineering, administrative and contingency costs.
- H. Utilities: Pertaining to the installed cost including: labor, ditching, Engineering, and material of line, fire hydrants, valves, fittings, lift station, and other appurtenances necessary to furnish water and sewer service to a subdivision, plus any administrative charges.

SECTION II - EXTENSION TO DEVELOPMENTS OR PROPERTIES WITHIN THE CORPORATE LIMITS OF THE CITY OF ARANSAS PASS ETJ SHALL BE IN THE MANNER HEREIN PRESCRIBED

- A. The cost to the Developer or the person requesting the extension:
  - 1. The Developer will pay 100% of the total cost of extensions from existing City utilities including the cost of R.O.W. acquisition, for utilities per the master plan (including fire protection) for his development. DEVELOPER can petition for City participation.

The Developer's cost will be reduced by the amount the other assessed property owners (according to **Schedule I**) contribute at the time of the installation. If the Developer can obtain the pro rata shares from all the assessed property owners at the time of installation, the Developer's cost will be reduced to his pro rata share of the total cost.

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The Developer may recover the difference between the total cost of the utilities, excluding the City's costs, and the sum of his pro rata costs and any other properties pro rata costs paid at the time of installation. (See Paragraph 4).

2. It shall be the Developer's obligation to acquire right-of-way needed to extend utility lines from their present terminus or nearest location to Developer's property, the cost of which shall be reimbursable as set forth above. The location, width and cost of such right-of-way, the City may at its option, assist in acquiring same.
  
3. The Developer shall pay in cash or provide an unconditional guarantee from a financial institution, approved by the City, for the Developer's share of the utility extensions as determined by the City. Such guarantee shall be filed with the City Manager of the City of Aransas Pass in letter form, from the financial institution and signed by its principal loan officer. The letter shall state the name of the subdivision and shall list the improvements, which the Developer is required to provide. This payment or guarantee must be filed with the City Manager of the City of Aransas Pass, prior to final plat approval.
  
4. The Developer who contributed in excess of his pro rata charge for construction of a utility extension will be eligible for refunds. When assessed property owners who did not pay their pro rata charge request service and pay their share, plus the additional costs set out in Paragraph B-4, the money will be refunded to the Developer, up to the amount of overpayment. The City shall retain anything paid in excess of that amount.

**EXAMPLE:**

*The development to be served requires the capacity of 8" sewer and water lines. The City requires the additional capacity of 12" sewer and water lines to serve future extensions:*

<b>DEVELOPER'S COST</b>	
8" Waterline 1,320 feet @ \$4.00/lf	\$ 5,280
8" Sewerline 1,320 feet @ 8.00/lf	\$10,560
<b>TOTAL = \$15,840</b>	

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**CITY'S SHARE**

Difference between 8" and 12" Water 1,320 feet @ \$3.00/lf	\$ 3,960
Difference between 8" and 12" Sewer 1,320 feet @ \$3.00/lf	\$ 3,960
<b>TOTAL = \$ 7,920</b>	

**INITIAL OUTLAY**

Developer	15,840
Developer	\$ 7,920
<b>TOTAL - \$23,760</b>	

*Assuming six participating parcels have a pro rata share of the total cost of \$2,640 each (according to Schedule I), the Developer would receive \$13,200 (15,840 - 2,640) back as each parcel pays its \$2,640 share.*

Number of parcels paying their Pro Rata Share	Developer's Cost	Amount reimbursed by the Owners as they connect to the utility extensions
Original Cost	\$15,840	
1	\$13,200	\$2,640
2	\$10,560	\$5,280
3	\$7,920	\$7,920
4	\$5,280	\$10,560
5	\$2,640	\$13,200

- B. The cost to property owners where utilities are made available by the extension:
1. A pro rata charge shall be assessed to each property where utilities are made available. The charge will be made according to the terms of the attached Schedule I.
  2. The City may connect any future customer reasonably served from the utility extension, provided the customer has paid the pro rata charge and tapping fee.
  3. The entire cost of the utility extension minus any participation by the City or any other governmental agency must eventually be provided by the property owner or owners served by the extension.

4. Any customer not contributing the pro rata charge at the time of installation of the utility extension who request service at a later date, must pay the pro rata charge in full plus an additional fifteen percent (15%), plus the tapping fee before service will be installed. The fifteen percent (15%) surcharge shall be retained by the City to defray the cost of bookkeeping and financing for the utility extension and will be excluded from the computation for refunds.
5. Any condition not covered by those regulations or of such a nature that would result in an inequitable pro rata charge to any customers, will be negotiated by the City Council of the City of Aransas Pass at the time of installation of a proposed line extension.

**SECTION III - EXTENSION TO PROPERTIES OR DEVELOPMENTS OUTSIDE THE CORPORATE LIMITS OF THE CITY OF ARANSAS PASS SHALL BE IN THE MANNER HEREIN PRESCRIBED**

Properties outside the City limits that will be served by a utility extension will pay one and one-half (1½) times their pro rata share to the City, to offset the additional costs for the Utility System. Policies regarding payment, reimbursement of the Developer and the calculation and payment of pro rata shares of participating property owners are the same as in Section II.

**SECTION IV - UTILITIES WITHIN A SUBDIVISION**

Developers shall pay the entire cost of the provision of utilities within their subdivision in compliance with the Subdivision ordinance.

## SCHEDULE I - CALCULATING THE PRO RATA CHARGES

The pro rata charge for each property where utilities are to become available by installation of a utility extension will be based on a point system according to the length of frontage, acreage, and distance from the origin of the extension to the end point of frontage.

For properties adjoining the right-of-way where the extension is located or adjoining either side of an alley, easement or paved road, points will be computed as follows:

- 10 points per lineal foot of frontage
- 500 points per acre of land
- Points per acre per lineal foot of distance from origin of the extension to the end of the properties' frontage  $[(0.1 \times \text{the number of acres}) \times (\text{the length of the extension})]$

The monetary value of each point is obtained by dividing the total number of points for all properties concerned into the total cost of the line extension (less the amount of participation by the City or any other governmental agency). Each property shall then be assessed proportionally to its number of points.

For properties where adequate water and sewer lines are already available on one side, a credit shall be applied as follows: Reduce the total number of points for the property by fifty percent (50%) in the calculations (See Parcel A in the attached "Exhibit for Schedule I").

In making the calculations, it will be determined, in advance, which properties the utility extension is designed for and capable of serving. Each of these parcels of property will then be included in the calculations. If it is reasonable certain that a property will never tie on to the system, it will be omitted from the calculations. Any property owner wanting to connect to the utility extension which had not been included in the calculations would have to pay a pro rata share based on the number of points for his property times the same cost per point that was used to calculate the other properties shares.

Properties that do not front on the utility extension right-of-way, but will be served by the extension, are still subject to the pro rata assessment. The number of points are calculated the same way (Schedule I - but the points for the front footage are omitted). This is to offset the costs of extending a line from the utility extension to the property (See Parcel B on the attached "Exhibit for Schedule I").

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**SAMPLE CALCULATIONS FOR PRO-RATED CHARGES**

	Points	Cost per Points	Pro-Rated Charge
A = 3.67 x 500 = 1835			
A = 250 x 3.67 x 0.1 = 92			
A = 200 x 10 = 2000			
A = 3927 x 0.5	1964	.0862	169.30
B = 2.07 x 500 = 1035			
B = 550 x 2.07 x 0.1 = 114			
B = 300 x 10 = 3000	4149	.0862	357.64
C = 1.15 x 500 = 575			
C = 650 x 1.15 x 0.1 = 75			
C = 100 x 10 = 5000	1650	.0862	142.23
D = 5.74 x 500 = 2870			
D = 1150 x 5.74 x 0.1 = 660			
D = 500 x 10 = 500	8530	.0862	735.29
E = 2.75 x 500 = 1377			
E = 1550 x 2.75 x 0.1 = 427			
E = 0 x 10 = 0	1804	.0862	155.50
F = 1.84 x 500 = 920			
F = 1550 x 1.84 x 0.1 = 285			
F = 400 x 10 = 4000	5205	.0862	448.67
G = 4.59 x 500 = 2295			
G = 1550 x 4.59 x 0.1 = 711			
G = 500 x 10 = 5000	8006	.0862	692.12
H = 9.18 x 500 = 4590			
H = 1050 x 9.18 x 0.1 = 482			
H = 1000 x 10 = 10000	15072	.0862	1299.21
<b>TOTAL COST</b>	<b>46380</b>	<b>@ .0862</b>	<b>\$ 4000.00</b>

**APPENDIX B- STANDARD DETAILS**

Drainage

1	Standard Detail DR-1	Pre-Cast Type "A" Inlet
2	Standard Detail DR-2	Cast-in-place Type "A" Inlet
3	Standard Detail DR-3	Type "F" Inlet
4	Standard Detail DR-4	Type "C" Inlet
5	Standard Detail DR-5	Type "C-C" Inlet
6	Standard Detail DR-6	Pre-Cast Storm Concrete Manhole
7	Standard Detail DR-7	Cast-in-place Storm Concrete Manhole
8	Standard Detail DR-8	Trench backfill and Compaction Detail
9	Standard Detail DR-9	Valley Gutter Detail
10	Standard Detail DR-10	Typical Ditch Cross Section
11	Standard Detail DR-11	Cast-in-place Rip Rap
12	Standard Detail DR-12	Safety End Treatment
13	Standard Detail DR-13	Storm Manhole Cover Details

Street & Roadways

1	Standard Detail STR-1	Typical Paving Detail for 34' B-to-B Street- Residential Local (50'-R.O.W. w/ 5' U.E.) and cul-de-sac minor streets
2	Standard Detail STR-2	Typical Paving Detail for 50' B-to-B Street- Residential Collector (60'-R.O.W. w/ 10' U.E.)
3	Standard Detail STR-3	Typical Paving Detail for 42' B-to-B Street - Commercial (60' R.O.W.)
4	Standard Detail STR-4	Typical Paving Detail for 44' B-to-B Street - Industrial (60' R.O.W.)
5	Standard Detail STR-5	Typical Paving Detail for 60' B-to-B Street - Minor Arterial (70' R.O.W. w/ 10' U.E.)
6	Standard Detail STR-6	Typical Paving Detail for 66' B-to-B Street - Major Arterial (80' R.O.W. w/ 10' U.E.)
7	Standard Detail STR-7	Typical Paving Detail for 82' B-to-B Street - Major Arterial (100' R.O.W. w/ 10' U.E.)
8	Standard Detail STR-8	Typical Paving Detail for 100' B-to-B Street-Major Arterial (120' R.O.W. w/ 10' U.E.)
9	Standard Detail STR-9	Typical Paving Detail - 16' Alley (20' R.O.W. w/ 5' U.E.)
10	Standard Detail STR-10	Typical Sidewalk Location
11	Standard Detail STR-11	Typical Sidewalk Detail
12	Standard Detail STR-12	A.D.A. Sidewalk Ramp Detail
13	Standard Detail STR-13	Curb & Gutter and Valley Gutter
14	Standard Detail STR-14	Valley Gutter

## Water & Sewer

- |    |                       |   |
|----|-----------------------|---|
| 1  | Standard Detail WTR-1 | Single Water Service Connection                                     |
| 2  | Standard Detail WTR-2 | Fire Hydrant Installation Detail                                    |
| 3  | Standard Detail WTR-3 | Typical Valve & Valve Box Installation                              |
| 4  | Standard Detail WTR-4 | Thrust Block Details  |
| 5  | Standard Detail WTR-5 | Waterline Offset Detail   |
| 6  | Standard Detail WTR-6 | Backflow Prevention Device  |
| 7  | Standard Detail WTR-7 | Meter/Backflow & Vault  |
| 8  | Standard Detail WTR-8 | Trench bedding (Water)  |
| 9  | Standard Detail WTR-9 | Bore & Casing Detail  |
| 10 | Standard Detail SWR-1 | Sanitary Sewer Service Connection                                   |
| 11 | Standard Detail SWR-2 | Typical Sanitary Sewer Drop Fiberglass Manhole Detail               |
| 12 | Standard Detail SWR-3 | Sanitary Sewer Corrosion Resistant Manhole for Force Main Discharge |
| 13 | Standard Detail SWR-4 | Sanitary Sewer Cover Details  |
| 14 | Standard Detail SWR-5 | Sewer Trench Bedding  |

## Off- Street Parking Lots

- |   |                       |   |
|---|-----------------------|---|
| 1 | Standard Detail PKG-1 | 90° Degree Parking                        |
| 2 | Standard Detail PKG-1 | 60° Degree Parking                        |
| 3 | Standard Detail PKG-1 | 45° Degree Parking                        |
| 4 | Standard Detail PKG-1 | Typical Detail for Handicap Parking       |
| 5 | Standard Detail PKG-1 | Typical Handicap Symbol Dimensions        |
| 6 | Standard Detail PKG-1 | Handicap Parking Sign Installation Detail |

## Driveway Entrance Standards

- |   |                       |   |
|---|-----------------------|---|
| 1 | Standard Detail DWY-1 | Driveway Approaches   |
| 2 | Standard Detail DWY-2 | Typical Driveway Reinforcement Detail - Single and Two-family Drives                          |
| 3 | Standard Detail DWY-3 | Typical Driveway Reinforcement Detail - Multi-family and Commercial Drives                    |
| 4 | Standard Detail DWY-4 | Typical Driveway Reinforcement Detail - Non-curb & gutter streets with shallow ditch crossing |
| 5 | Standard Detail DWY-5 | Typical Driveway Reinforcement Detail - Non-curb & gutter streets with deep ditch crossing    |