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Sanitary Sewer System Standards and Specifications

Effective October 9, 2015

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**INSCRIPTION CANYON RANCH
SANITARY DISTRICT
SANITARY SEWER SYSTEM
STANDARDS AND SPECIFICATIONS**

Forward

Authority

These standards and specifications are promulgated by the Board of Directors of Inscription Canyon Ranch Sanitary District. Administration of the Standards and Specifications including interpretation, enforcement, revision, waiver, and variance is delegated by the Board of Directors to the District Manager or his appointed representative. Any variance request must be submitted in writing to the District Manager for review.

Effective Date

These standards and specifications shall be effective on October 9, 2015 and shall supersede all former Sanitary Sewer System Standards and Specifications of the Inscription Canyon Ranch Sanitary District.

Revisions, Amendments or Additions

These standards and specifications may be revised, amended, or added to from time to time. Such revisions, amendments, or additions shall be binding and in full force and effect upon adoption by the Board of Directors of Inscription Canyon Ranch Sanitary District. The Sanitary Sewer System Standards and Specifications of the Inscription Canyon Ranch Sanitary District are not intended to augment the Amended and Restated Development Agreement as recorded in the Official Records of Yavapai County Book 4873, Page 909 recorded April 13, 2012. Where District ordinance, policy, rule or standards conflicts with the aforementioned Amended and Restated Development Agreement, the Agreement's terms, conditions and standards shall prevail.

Inscription Canyon Ranch Sanitary District Control

These standards and specifications shall apply to the installation, operation, and maintenance of all sanitary sewer facilities under the ownership and/or control of the Inscription Canyon Ranch Sanitary District.

Notwithstanding any variance from these standards and specifications that occurred or was authorized in the past, or that may be authorized in the future, Inscription Canyon Ranch Sanitary District shall not be restricted or limited in the exercise of its lawful powers. No action in violation of these standards and specifications direct or indirect, of or by any person, including any owner, operator, agent of an owner or operator of any sewer facility in making any connection, disconnection, repair or otherwise doing work with respect to any sewer facility

served by the Inscription Canyon Ranch Sanitary District, shall continue after discovery of such violation, or the enforcement of corrective action as to such violation.

Organization and Interpretation of Standards and Specifications

These standards and specifications are composed of administrative procedures and requirements, technical engineering standards, detail drawings, construction plan notes, and exhibits. The interpretation of any section, or of differences between sections, shall be made by the District Manager or an appointed representative, and their interpretation shall be binding and controlling in its application. Whenever there is a conflict between these standards and specifications and any referenced standard, specification or code, the most stringent requirement shall apply and shall mean the latest edition.

Definitions

As used in these standards and specifications, unless the context shall otherwise require, the words defined in this paragraph shall have the meanings herein described:

Adjacent: A parcel of property shall be deemed adjacent to a sanitary sewer line when any portion of the easement or public way containing the sanitary sewer is coterminous with the parcel or any extension of the parcel reacted by an easement for utilities or a roadway easement.

Annexation Fee: A fee charged for annexation of real property to the District.

Applicant for Sewer Main Extension: Any person, association, corporation, entity, or government agency desiring sanitary sewer service for premises under their control and having entered into an agreement for extension of sewer mains with the District; often a subdivider or developer. Also referred to as Applicant.

Appurtenance: Item attached to a main structure to enable it to function, but not considered an integral part of it.

Assessment Area: Any of the Assessment Areas which may be part of an improvement district within the Inscription Canyon Ranch Sanitary District.

Best Management Practice: Any reasonable practice or procedure deemed to be necessary by the District Manager and/or his/her designee to prevent, abate or remedy the consequences of the introduction of unlawful pollutants or concentrations of pollutants in the District's sanitary sewer system by an industrial or commercial user to the extent technically and economically practical.

Best Professional Judgement: The highest quality technical opinion developed after consideration of all reasonably available and pertinent data or information.

Block: Means a parcel of land whether regular or irregular, which is bounded by streets, or by one or more streets and by one or more boundary lines of the Inscription Canyon Ranch Sanitary District.

Board, Governing Board, Board of Directors: The Board of Directors of the Inscription Canyon Ranch Sanitary District.

Capacity Fee: A fee charged to developments with a density greater than 2.2 E.D.U.'s per acre.

Contractor: In the context of these standards and specifications, a Contractor, personal representative or assignee of a contractor whom is licensed and bonded in the State of Arizona employed by an Applicant for a sanitary sewer extension.

Design Engineer: A civil engineer licensed to practice in the State of Arizona who is employed by the Applicant to perform engineering services.

Developer: Any person(s), corporation, partnership, or firm desiring municipal sewer, reclaimed water, and sewer service.

Development Fee: Means an applicable fee charged to developments for the review of plans and assessment of Capacity Fee.

Discharger: Any person who discharges or causes the discharge of waste water to the sewer system of the Inscription Canyon Ranch Sanitary District.

Dissolved Solids: The concentration of matter in the waste water consisting of colloidal particulate matter one micron in diameter or less, and both organic and inorganic molecules and ions present in solution.

District: The Inscription Canyon Ranch Sanitary District.

District Engineer: The engineering firm authorized by the Inscription Canyon Ranch Sanitary District to provide engineering services on behalf of the District.

District Fees: Fees set by the District Board or District Manager to offset expenses incurred by the District for review, improvement, repair and other activities which may be requested from or required by the District in the administration, management, improvement, operation and maintenance of the District.

District Manager: The chief executive office of the District designated by the District's Board of Directors.

Domestic User: Any private residential user that discharges wastes derived from ordinary living processes excluding any commercial or industrial wastes.

E.D.U.: Equivalent Dwelling Unit.

Fats, Oil or Grease (FOG): Non-petroleum fats, oils, and grease derived from animal or plant sources.

Flow: Volume of waste water.

Garbage: Solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the commercial handling, storage and sale of produce.

Gravity Grease Interceptor: A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept nonpetroleum fats, oils and greases (FOG) from a waste water discharge.

Grease Trap: A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept nonpetroleum fats, oils and greases (FOG) from a waste water discharge.

Health Department: Any reference in this standards and specifications to the “Department of Health” or “Health Department” shall be the Yavapai County Department of Health.

Holding Tank Waste Water: Any waste water from holding tanks such as vessels, chemical toilets, campers, trailers, septic tanks, sealed vaults, vacuum-pump trucks and holding tanks from pre-treatment systems.

Improvement District: Any Sewer Improvement District formed pursuant to Article 2, Chapter 14, Title 48 Arizona Revised Statutes within the Inscription Canyon Ranch Sanitary District.

Individual (private) Waste Water Disposal System: A septic tank, cesspool or similar self-contained receptacle or facility which collects and/or treats or otherwise disposes of waste water and which is not connected to the Inscription Canyon Ranch Sanitary District Sanitary System.

Industrial: Of or pertaining the industry, manufacturing, commerce, trade or business, as distinguished from domestic or residential.

Industrial Wastes: The liquid wastes or solid wastes from industrial manufacturing processes, trades or businesses as distinct from sanitary waste water.

Inspector: The authorized representative of the District assigned to a job-site to perform inspection services.

Interceptor, Trunk or Sewer Main: A sewer line which collects sewage from one or more laterals.

IPC: The current International Plumbing Code as approved by Yavapai County and revisions thereto.

Lateral or Submain Sewer: A sewer line which collects sewage from two or more service taps.

Lot: Means any portion, piece, parcel or subdivision of land or property, or property owned or controlled by any person.

Municipal Sewer Service: Sanitary sewer service provided for domestic, commercial, and industrial purposes.

Non-Domestic User: Any user that does not meet the criteria for categorization as a domestic user shall be considered a non-domestic user.

Outfall Sewer: The sewer line that conveys the sewage from interceptors to the final point of discharge or treatment.

Owner: Means the person who, on the day the action or proceeding is begun, possesses legal title to the lot by deed recorded in the Yavapai County Recorder’s office or the person in possession of the lot under claim of title or exercising acts of ownership over the lot for himself or herself or as the personal representative of the owner. Also referred to as Applicant.

Owner-Developer: A person, association, corporation, entity or government agency desiring a sanitary sewer main extension from the District. Also referred to as Applicant.

Permit: Written authorization required pursuant to this or any other regulations of the District for installation of any sewage works or connection of any sewage works to those of the District.

Pollutant: Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand or any industrial, municipal or agricultural waste.

Pollution: The manmade or man-induced alteration of the chemical, physical, biological and radiological integrity of water.

Private Sewer Line: Any sewer line not owned and maintained by the District.

Probationary Maintenance: Maintenance performed by the District during partial operation of facilities prior to final construction acceptance.

Public Sewer Line: A sewer line owned and maintained by the District.

Sanitary Sewer System or Waste Water System: Any devices, facilities, structures, equipment or works owned or used by the District for the purpose of the transmission, storage, treatment, recycling and reclamation of industrial and domestic wastes from within or without the District, including intercepting sewers, outfall sewers, collection lines, pumping, power and other equipment and their appurtenances, but excluding service lines.

Sewer: A pipe or conduit for carrying sewage.

Sewer Main Extensions: Extensions to the Sanitary Sewer Collections System owned and controlled by Inscription Canyon Ranch Sanitary District.

Sewer Service Line: All pipe, fittings, and appurtenances of the customer, including the connection to the District's Sewer Collection System, used for conveying waste water from the owner's property or premises to District owned sanitary sewer mains.

Sewer Service Area: A designated area from which sewage flows originate or contribute to the sewer system.

Suspended Solids (SS): Solids that either float on the surface or are suspended in water, sewage or other liquids and which are removable by laboratory filtering.

Tap or Sewer Tap: A physical connection to a District sewer main which, together with appropriate permits, effects sewer service to individual customers.

Tap Fee or Connection Fee: The initial sewer connection charge assessed against new users of the sanitary sewer system, except for those parcels assessed for sewer construction as part of an improvement district or assessment area.

User: Any person, owner or leasee of the real property who contributes, causes or permits the contribution of wastewater into the District's sanitary sewer system or is required to use the District's sanitary sewer system.

User Fee: The charge made to the user of sanitary sewer services by the District to defray the costs of operation, maintenance, replacement, or expansion of the sewage collection and treatment facilities of the District.

Waste Grease Bin (WGB): Any receptacle used to store used FOG collected from fryers, grills, and other similar devices.

Waste Water (Sewage): The combination of the liquid and water carried wastes from residences, commercial buildings, industrial plants and institutions, including polluted cooling water.

Waste Water Treatment Plant: Any arrangement of devices and structures used for treating sewage.

Warranty: Minimum warranty shall be per MAG Section 108.8 "Guarantee and Warranty Provisions". Warranty provisions may be extended or modified per the Agreement for Sewer Main Extension or other documentation approved by the District Board.

Work or Improvement: Any of the improvements authorized to be made by this article, the construction, reconstruction and repair of all or part of the improvements and labor, services, incidental expenses and materials.

Abbreviations

AAC:	Arizona Administrative Code
AASHTO:	American Association of State Highway and Transportation Officials
A.C.:	Asphalt Concrete
ADEQ:	Arizona Department of Environmental Quality
ANSI:	American National Standard Institute, Inc.
ASTM:	American Society of Testing and Materials
AZPDES:	Arizona Pollutant Discharge Elimination System
BMP:	Best Management Practices
D.I.:	Ductile Iron
ESMT:	Easement
EPA:	Environmental Protection Agency
FOG:	Fats, Oils and Greases
HDPE:	High-density Polyethylene
I.D.:	Inside Diameter
IPC:	International Plumbing Code
MAG:	Maricopa Association of Governments
MH:	Manhole
NPDES:	National Pollutant Discharge Elimination System

O&M: Operations & Maintenance
O.D.: Outside Diameter
OSHA: Occupational Safety and Health Administration
PL: Property Line
P/L: Property Line
PVC: Polyvinyl Chloride
R/W: Right-of-way
ROW: Right-of-way
TSS: Total Suspended Solids
WGB: Waste Grease Bin
YAG: Yavapai Association of Governments
YCES: Yavapai County Environmental Services

Chapter 1 - Sanitary Sewer Administrative Standards

A.1 General Development Information

The Inscription Canyon Ranch Sanitary District (ICRSD), also herein referred to as the "District", reserves the right to modify the requirements of this manual when special conditions justify it. Private development to be served with sewer service shall be adjacent to a sewer line. The developer is required to install the sewer lines, service taps, manholes, and appurtenances within and adjacent to his development as determined by the District. All sewer line designs shall provide for sufficient capacities and depths to service all of the tributary areas to the development by gravity or mechanical means, along with the development itself.

A sewer system infrastructure analysis shall be required for proposed developments determined by the District to have an impact on the sanitary sewer system. The developer of the property shall be responsible for all costs associated with the sewer system infrastructure analysis.

Under special conditions the District will accept a public sewer line on private property. All of the following conditions must be met:

1. The sewer line must serve property owned by more than one individual or developer.
2. The sewer line must be in a dedicated easement.
3. The sewer line must meet District construction standards.
4. The District must determine that the acceptance of the sewer line benefits the District.

Unless otherwise noted herein, all facilities construction shall conform to the ICRSD Sanitary Sewer System Standards and Specifications, Uniform Standard Specifications for Public Works Construction, Maricopa Association of Governments, most recent addition thereto (MAG Specs & MAG Details) as modified by the Yavapai Association of Governments (YAG), Yavapai County Environmental Services (YCES) requirements, Arizona Administrative Code (AAC) and the Arizona Department of Environmental Quality (ADEQ) Engineering Bulletin No. 11, whichever is most stringent.

A.2 District ownership of facilities and final plat information

All main sewer lines shall be owned by Inscription Canyon Ranch Sanitary District. District will repair all leaks and will remove all stoppages in the sewer main. The property owner is responsible for all leaks and stoppages in the service line. For that portion of the service line outside the boundary of the parcel of private property, the property owner is responsible for all stoppages and District is responsible for all structural defects or failures (including penetration of tree roots). In all cases, when a problem arises with a service line within the boundaries of the private property, the property owner is solely responsible.

The sewer facilities that will be owned by Inscription Canyon Ranch Sanitary District as described above shall become the sole property of the District when the District issues

final acceptance of such facilities. Full legal and equitable title thereto shall be vested in the Inscription Canyon Ranch Sanitary District, free and clear of any liens, without the requirement of any written document of transfer to the District or acceptance by the District.

All final plats shall contain the Inscription Canyon Ranch Sanitary District's plat dedication verbiage.

All construction plan cover sheets shall have the Inscription Canyon Ranch Sanitary District's owner information.

A.3 General requirements for sewer main extensions

1. Applicant shall request sewer service in writing. Developer shall include the following with their request:
 - a. Legal description of the property to be served.
 - b. Name and Address of project.
 - c. Name and Address of landowner.
 - d. Name and address of developer and the name and title of person authorized to sign agreements for owner, developer and/or applicant.
 - e. General description of project (single family residential, apartment, condo, market, shopping center, restaurant, store, etc.) with time schedule for development if know.
 - f. Include a recorded final subdivision plat and site plan if they are available. If a final plat has not be recorded, two black line copies of the most current preliminary plat shall be submitted. A recorded final plat must be furnished as soon as it becomes available.
2. Applicant must execute a line extension agreement prior to beginning construction of required facilities by providing four copies of the District's Application and Agreement for Sewer Main Extensions. Applicant shall pay all applicable District plan review and
3. Construction inspection fees. A fee schedule is available from the District upon request. Fees are subject to change without notice.
4. Applicant must provide a perpetual right of easement for all District owned sewer mains and related facilities to be placed on private property prior to beginning of construction. Unless otherwise mutually agreed upon in writing, the easement shall be free of physical encroachments, encumbrances or obstacles.
5. Geotechnical information may be required at the sole discretion of the District.
6. A written statement from the appropriate representative of the Yavapai County Planning Department approving the design of said facilities.

A.4 Specific requirements for Developer designed and built sewer main extensions

1. Developer shall prepare and submit sewer plans in accordance with the District's "Sanitary Sewer System Plan Submittal Procedures and General Requirements," refer to Section A.6.
2. District staff will be available to discuss plan development and design concepts. The developer is encouraged to contact the District prior to plan development for special instructions that may apply to a particular expansion.
3. Easements legal descriptions and exhibits for District owned facilities shall be required for all District owned facilities not within dedicated rights-of-ways. Easements shall have a minimum width of 10 feet and shall be centered about the centerline of the District owned facilities. The easement legal descriptions and exhibits shall be submitted on 8- 1/2" x 11" sheets and signed and sealed by a Professional Civil Engineer or Land Surveyor registered in the State of Arizona.
4. Developer must supply the District with a "Notice of Intent to Discharge for a Sewage Collection System" as issued by the Arizona Department of Environmental Quality (ADEQ). Notice of Intent forms are currently being administered by Yavapai County Environmental Services through a delegation agreement with ADEQ. An NOI must be issued prior to the commencement of construction.
5. Developer shall install materials approved in writing by the District. Where materials differ from preapproved materials, the Developer may request a change when the proposed materials meet or exceed the quality and performance of the preapproved materials. Any request shall be submitted to the District Manager for review and possible approval.
6. Developer shall construct system in accordance with the Standards and Specifications of the Arizona Department of Environmental (ADEQ), Maricopa Association of Governments (MAG), Yavapai Association of Governments (YAG) and the ICRSD.
7. District will conduct periodic inspections of the installation. District does not provide full time on-site inspection. Responsibility for proper installation rests with the developer. Such inspection, as District personnel may perform, in no way relieves the developer of this responsibility.
8. Developer shall not make any changes from approved plans and specifications without prior approval of the District. Change orders authorizing changes in the approved plans and specifications must be co-signed by the District and engineer of record prior to construction. The District co-sign does not release the design engineer and contractor from meeting all agency and regulatory requirements.
9. District will give final acceptance upon completion of all construction, including final adjustments of all manholes, air release valves, cleanouts, etc., and submittal of any other required documentation.

10. See Section A.9.5 for final acceptance requirements.
11. Developer shall provide unconditional lien releases from all contractors, subcontractors, and materials suppliers for all sewer construction.
12. Developer shall provide an "As-Built" plan of facilities installed. The "As-Built" plans shall include the vertical and horizontal locations of all pipe, bends, air release valves, manholes, sewer taps, etc. by station and offset. The plan must be produced on 4-mil mylar and certified for correctness by a Professional Civil Engineer or Land Surveyor registered in the State of Arizona. Reference the "As-Built" Chapter 2 section T.16 for detailed "As-Built" plan requirements. One set of 4-mil mylars, three sets of blue or black line "As-Built" plans and one copy of .pdf digital format files on DVD disk of the drawings are required upon approval by ICRSD.
13. Developer shall provide the results of all testing including copies of video DVD's and reports conducted on the installed facilities. Results shall be provided in both hardcopy and .pdf digital format files on DVD disk.

A.5 Plat Dedication Verbiage

The following plat dedication verbiage shall be on the final recorded plat if District owned facilities are outside of dedicated rights-of-ways and separate easements are not provided:

"SEWER EASEMENT "EASEMENTS" AS DESCRIBED IN THE PLAT ARE GRANTED TO INSCRIPTION CANYON RANCH SANITARY DISTRICT, AND THEIR SUCCESSORS AND ASSIGNS (COLLECTIVELY, "GRANTEE"), TO CONSTRUCT, OPERATE, AND MAINTAIN SEWER LINES AND APPURTENANT FACILITIES (COLLECTIVELY, "FACILITIES") UPON, ACROSS, OVER AND UNDER THE SURFACE OF THE EASEMENTS, TOGETHER WITH THE RIGHT TO OPERATE, REPAIR, REPLACE, MAINTAIN, AND REMOVE THE FACILITIES FROM THE PREMISES; TO ADD OR TO ALTER THE FACILITIES, AND TO PROVIDE GRANTEE WITH REASONABLE INGRESS AND EGRESS TO THE FACILITIES. GRANTEE WILL HAVE UNRESTRICTED ACCESS TO THE EASEMENT FOR THE ACTIVITIES DESCRIBED ABOVE AND FORMAL NOTIFICATION OR APPROVAL BY ANY ASSOCIATION PRIOR TO ACCESSING THE EASEMENT WILL NOT BE REQUIRED.

GRANTOR SHALL NOT ERECT, CONSTRUCT OR PERMIT TO BE ERECTED OR CONSTRUCTED ANY BUILDING OR OTHER STRUCTURE WITHIN THE LIMITS OF THE EASEMENT; PROVIDED, HOWEVER, GRANTOR SHALL HAVE THE RIGHT TO CONSTRUCT AND ERECT FENCES, TO INSTALL LANDSCAPING, PARKING FACILITIES AND DRIVEWAYS, AND TO ESTABLISH OTHER USES WHICH ARE NOT INCONSISTENT WITH USES WITHIN THE LIMITS OF SAID EASEMENT IN A MANNER WHICH WILL NOT UNREASONABLY INTERFERE WITH GRANTEE'S ACCESS TO THE FACILITIES.

THIS EASEMENT IS GRANTED SUBJECT TO THE CONDITION THAT GRANTEE SHALL HOLD GRANTOR AND GRANTOR'S SUCCESSORS AND ASSIGNS HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, LIABILITIES OR EXPENSES WHICH MAY RESULT FROM GRANTEE'S USE OF THE EASEMENT. BY ACCEPTING THE EASEMENT, THE GRANTEE AGREES TO EXERCISE REASONABLE CARE TO AVOID DAMAGE TO THE PREMISES AND ALL PROPERTY THAT MAY AT ANY TIME BE THEREON."

A.6 Sanitary Sewer System Plan Submittal Procedures and General Requirements

All plans for sewer main extensions, improvements and modifications shall be submitted to the Inscription Canyon Ranch Sanitary District for review and approval before any construction may occur. All plans must be approved by the District manager and/or District engineer prior to initiation of construction. Plans shall be submitted and reviewed in accordance with the following procedures and requirements.

A.6.1. Submittals

In order to initiate construction plan review the following items must be submitted to the District.

1. Construction Plans

Three sets of sanitary sewer system construction plans stamped and signed by a professional engineer licensed to practice in the State of Arizona. All plans and specifications submitted shall be in strict compliance with the Standards and Specifications contained herein and shall meet any special conditions that may be reasonably required. The design and installation of all facilities shall ensure development of an integrated sewer system. No work shall commence on any facilities until the plans and specifications are approved in writing by Inscription Canyon Ranch Sanitary District. Plans and specifications should not be submitted for work that will not be installed within one year of the approval date. See Section T.12 and Chapter 3 for plan and specifications requirements.

2. Applications and Agreements for Sewer Main Extensions

Four copies of the District's Application and Agreement for Sewer Main Extensions are required. All copies must be signed as originals by individuals authorized to sign on behalf of the Applicant.

3. Payment of Plan Review and Construction Inspection Fees

Payment of applicable District plan review and construction inspection fees are required. Fees for review vary and the District manager shall be contacted to determine applicable fees. Fees may include third party engineer review charges.

4. Subdivision Plat

One sepia mylar of the recorded subdivision plat. If the plat has not been recorded, three blue line copies of the most current preliminary plat shall be submitted. A sepia mylar of the recorded plat must be furnished as soon as it becomes available.

5. Geotechnical Information

Geotechnical information may be required at the sole discretion of the District.

6. County and Agency Approvals

The Yavapai County Environmental Services Department (YCES) has entered into an agreement to subrogate specific design review and approval authority from the Arizona Department of Environmental Quality (ADEQ). The applicant is responsible for coordinating, processing and securing all approvals from YCES, other County agencies as applicable and ADEQ as applicable.

A.6.2. Engineering

All plans and specifications submitted to the District for review, comment, and approval of a sanitary sewer system extension or modification shall be prepared by, or under the direct supervision of a professional engineer registered by the State of Arizona. Said professional engineer shall be responsible for preparation of the design plans and determining the material specifications. Field survey shall be conducted in accordance with Section A.6.3 All submitted plans and specifications shall include the professional engineer's seal prior to approval for construction.

The applicant, contractor, and professional engineer associated with said plans shall be responsible for the adequacy and satisfactory performance of the designs and the installation of all items therein, and any failure or unsatisfactory performance of the system, so constructed, shall not be a cause for action against the District. The District does not perform engineering services for any person or entity in connection with its review of plans or change orders. Approval of plans or change orders by the District signifies only that the plans meet the minimum requirements of these Standards and Specifications based upon the information provided to the District by the professional engineer and/or owner/developer and makes no finding, representation, or warranty that the system and associated components will perform any certain function.

If the professional engineer responsible for the plans disagrees with any changes made to the submitted plans that may be required by the District as a result of the District's review of the plans, such disagreement must be brought to the attention of the District for resolution prior to construction of the project set forth in said plans. The seal of the professional engineer on plans so corrected

and approved for construction will signify that he has reviewed, approved and authorized said corrected plans for construction.

A.6.3. Surveying

Line and grade for sewer mains shall be established by a professional engineer or by a surveyor licensed to practice in the State of Arizona or his authorized representative. Adequate information shall be provided to illustrate existing grades and relevant topographic and underground features which may impact the design and installation of the improvements.

A.6.4. Plan Review Process

Upon receipt of all information described under section A.6.1, the District will initiate review of the construction plans and other pertinent information. The plans will be reviewed by the District. If modifications to the plans are required, the plans will be returned to the design engineer for revision.

NOTE: The approval of sanitary sewer system construction plans signifies only that the plans meet the minimum requirements of the District's Standards and Specifications based on the information provided by the design engineer, Applicant, and contractor. Approval is not a representation or warranty that the system and associated components will perform any certain function.

Approved plans will be signed by the District manager or his authorized representative.

A.6.5. Expiration of Plan Approval

Plans and specifications are approved for a twelve (12) month period only. If construction has not begun within this twelve (12) month period, or if it has been halted and not restarted prior to expiration of the approval period, the plans must be resubmitted for review and approval. Additional fees may apply.

A.6.6. Preconstruction Meeting

When construction plans and all other pertinent information has been approved by the District, the approved plans will be retained by the District until a preconstruction meeting is held. The preconstruction meeting will be scheduled by the District upon request of the contractor, design engineer, or Applicant. Representatives of the Applicant, contractor, design engineer, District, must be in attendance at the preconstruction meeting.

A.6.7. Authorization to Proceed

Authorization to proceed will be issued, upon approval of plans by the District, payment of applicable District construction inspection fees, and completion of the preconstruction meeting. A copy of the construction plan review and construction inspection fee schedule is available upon request. Fees are subject to change without notice.

A.7 Easements and Licenses

A.7.1. General

The following procedures have been developed to provide guidelines for the timely submittal and processing of easements granted to the District and licenses granted by the District. The guidelines are designed to provide the District with accurate and uniform drawings, legal descriptions, ownership and specifications. Submittals that do not follow these procedures and required submittals will not be considered.

All information referenced in the submittal section of these procedures must be presented to, and processed by the District prior to approval.

A.7.2. Granting an Easement to the District Not Recorded as Part of a Subdivision Plat

When an Applicant or property owner is required to grant permanent easements to the District for the installation of sewer mains, the following procedures shall be followed:

1. Procedure:

The following items shall be submitted in one complete package to the District with the initial submittal of sanitary sewer construction plans as described in Section A.6.1.

Partial submittals or those not conforming to these requirements will be returned to the submitting party with a request to complete the submittal. Construction plans will not be approved until all items have been received and processed.

- a. The full and legal name of the property owner granting the easement and the names and titles of the persons authorized to sign the easement agreement and those who will attest the authorized signer, if applicable.
- b. A metes and bounds legal description of the proposed easement parcel prepared and stamped by a registered Arizona land

surveyor. The legal description must meet the following conditions.

- i. Tie: All parcels shall have a direct tie, or one with a maximum of two courses, to the nearest available recognized land corner (i.e., section corner, quarter section corner, range point). If the easement is located within a plotted subdivision, a tie shall be made to a lot corner, tract corner, or subdivision corner of that subdivision.
 - ii. All distances referenced in the legal description shall be to the nearest hundredth of a foot.
- c. A survey drawing of the easement legal description stamped by a land surveyor registered in the State of Arizona. The drawing must meet the following requirements.

Drawings that do not comply with these requirements are not acceptable.

- i. Size: Overall 8½ x 11 inches
 - ii. Title Block: Dimensions and lettering shall be to an appropriate recognized civil engineering scale.
 - iii. Scale: The drawing shall be to an appropriate recognized civil engineering scale. The scale used shall be large enough so that all dimensions are clearly shown. Whenever possible, the entire easement should be on one sheet. Break lines, except in the land corner ties, are not acceptable.
 - iv. Tie: All parcels shall have a direct tie, or one with a maximum of two courses, to the nearest available recognized land corner (i.e., section corner, quarter section corner, range point). If the easement is located within a platted subdivision, a tie shall be made to a lot corner, tract corner, or subdivision corner of that subdivision.
 - v. All distances shown on the drawing shall be to the nearest hundredth of a foot.
 - vi. A description of the monuments set at the ends of the line, which is the basis of the bearing, shall be supplied in the drawing or the bearing basis note.
- d. A copy of an overall site plan, which accurately shows the relationship of the following:

- i. The proposed sanitary sewer main, easement, and dedicated rights-of-way.
 - ii. All existing and proposed utilities on the site.
 - iii. Proposed structures, landscaping, and roadways on the site.
 - iv. Cross-sections of private roadways which are coincidental with sanitary sewer line easements and cross sections of public rights-of-way within which a sanitary sewer main is to be installed.
 - v. The perimeter distances and bearings or angles of the site and its relationship to the tie corner of the easement.
- e. A copy of a recorded or preliminary subdivision plat or development plan for the area or subdivision within which the sanitary sewer line easement is located, or any subdivision plat or a Planned Unit Development plan that directly relates to the easement(s) and depicts property boundaries.
2. **Document Preparation:** The District will prepare the easement agreement and return the document to the grantor for signatures.
 3. **Construction:** The construction of the sanitary sewer main shall not be authorized to commence until the easement is accepted by the District and the easement agreement has been recorded.

A.7.3. Obtaining a License to Use or Cross District Property or District Easements

When requesting permission to use or cross District property, an Applicant shall request a revocable license for routine right angle utility crossings of strip properties and easements, or for temporary uses. The following procedures shall be followed:

1. **Procedure:** A letter requesting the District's permission to use or cross its property shall be submitted to the District. The letter of request shall contain the exact name of the company, corporation, partnership, etc., that will own, operate, and maintain the proposed facilities, the names and titles of the persons authorized to sign the agreement, and include the following enclosures:
 - a. A legal description and survey drawing meeting the following requirements. Drawings that do not comply with these requirements are not acceptable:
 - i. Size: Overall 8½ x 11 inches

- ii. Title Block: Dimensions and lettering shall be to an appropriate recognized engineering scale.
 - iii. Scale: The drawings shall be to an appropriate recognized engineering scale. The scale used must be large enough so that all dimensions are clearly shown. Whenever possible, the entire crossing should be on one drawing. Break lines, except in the land corner ties are not acceptable.
 - iv. Tie: All crossings shall have a direct tie, or one with a maximum of two courses, to the nearest available recognized land corner (i.e., section corner, quarter section corner, range point, or the nearest available intersection of two dedicated public road right-of- way lines). All distances shown on the drawing shall be to the nearest hundredth of a foot.
 - v. All drawings shall have a typical profile of the crossing as shown on the specimens.
- b. A check payable to Inscription Canyon Ranch Sanitary District for the applicable preparation fee shall accompany the letter of request.
 - c. Requests should include prints of the plans of the overall job in the area of the crossing, when available, and prints of new or proposed subdivisions whenever this information would clarify or identify the location of the request.
2. **Document Preparation:** If the request for the License Agreement, after District review, is approved, the District will prepare the License Agreement and return the document to the Licensee for signatures. A copy of the completed Licensed Agreement shall be kept at the job site at all times.

A.8 Sanitary Sewer System Construction Procedures and General Requirements

Construction may commence pending approval of sanitary sewer system construction plans and completion of the preconstruction meeting. The District requires a minimum of 48 hours notice prior to initiation of construction.

A.8.1. Preconstruction Meeting Minutes

Minutes of the preconstruction meeting will be sent to all parties in attendance and other interested parties. The Applicant shall ensure compliance with all provisions and requirements stipulated in the minutes. Any questions or disagreements with the minutes must be brought to the attention of the District inspector in writing. The terms and conditions outlined in the preconstruction meeting minutes will be final unless modified in writing by the District.

A.8.2. Placing Survey Line

Correct alignment and elevation of the sewer mains as shown on the approved drawings is the responsibility of the Contractor. Hubs, stakes, or appropriate approved survey control markers shall be set on an offset line to mark the location of the centerline of the sewer main. Centerline hubs and stakes may be used in addition to the offset hubs and stakes; however, they may not be set in place of the offset hubs and stakes. Normal practice is to set the offset hubs and stakes 5 to 10 feet off the centerline of the sewer main. Survey points shall be set a maximum distance of 100 feet apart. All manholes must be staked for location and grade. All stakes shall be flagged to increase their visibility. Stakes shall be positioned so that the survey hub is between the stake and the sewer main. The side of the stake facing the sewer main shall be marked to show the point being referenced and the distance from the hub to the centerline of the sewer main. The back side of the stake shall be stationed. Grade stakes shall be set at each hub and shall state the vertical distance from the top of the hub to the top of the pipe.

Sufficient pipe shall be staked to ensure continual work progress. No pipe shall be installed without line and grade stakes.

A.8.3. Inspections

Installation of all new sanitary sewer facilities within the District shall be inspected by the District inspector or the District's designee.

Inspection of the staked alignment and elevations by the District does not relieve the Contractor in any manner from the responsibility for field errors.

All appropriate permits shall be on the job-site and shall be available for inspection by the District inspector before starting and during construction.

The District shall not supervise nor set out work or give line and grade stakes.

All materials used shall be subject to the inspection and acceptance of the District. Failure or neglect on the part of the District to condemn or reject work materials not in accordance with these Standards and Specifications shall not be construed to imply acceptance should their inferiority become evident.

After receipt of approved plans from the District, the contractor shall give at least 48 hours notice to the District prior to starting construction.

A minimum of 48 hours notice shall be provided to the District inspector prior to backfill work above the spring line of the installed pipe. Backfill work may proceed prior to the end of the notice period if the construction has been inspected and accepted by the District inspector. This requirement may be waived at the discretion of the District inspector.

Inspection should in no way be considered a guarantee of the contractor's work. Construction inspection does not relieve the contractor of his obligation to

construct facilities in accordance with these Standards and Specifications, and the approved construction plans.

The Applicant is responsible for reimbursement of all costs related to the District's construction inspection.

If construction work is halted for more than three (3) working days, 24 hour notice must be given to the District's inspector prior to restarting construction. This requirement may be waived at the discretion of the District inspector.

A.8.4. Contractors

All Contractors shall be registered with the Arizona Register of Contractors and have the appropriate license classifications and have adequate bonding and insurance to cover the cost of the Contract work. The District Board maintains the sole discretion to accept or reject the Contractor(s) as the Board may deem to be in the District's best interest. Specific bonding and insurance requirements shall be provided by the District Manager as approved by the District Board.

No work shall commence until a preconstruction meeting has been conducted and the contractor has an approved set of plans and specifications in his possession. All work shall be performed in strict compliance with the approved plans and specifications and shall be inspected by the District.

Contractors performing all work for both main extensions and private pipe extensions shall be competent, licensed firms with adequate manpower and equipment to accomplish the work in accordance with these specifications. A representative of the contractor shall be present at the job-site whenever work is being conducted by subcontractors.

A.8.5. Phasing of Construction

Unless designated on the approved construction plans or approved in the preconstruction meeting minutes, phasing of a construction project will generally not be allowed. A desire to obtain acceptance and release for sewer taps on only a portion of a construction project designated on the approved plans requires the written approval of the District. A request for said approval must be submitted in writing and should include a description and drawing of the exact limits of the phased construction.

A.8.6. Field Changes

Field changes required by the presence of underground or aboveground conflicts which require a change in the project design shall be brought to the attention of the District Manager. The Design Engineer shall be contacted by the Contractor to determine the need for a proposed design modification. If a

plan modification is required, Engineer shall submit the changes for review by the District Manager and third party design reviewer, if needed. Approval of the changes by the District does not preclude the need to determine if other agency reviews are also required prior to construction.

Problems which may require sound field judgment, in lieu of strict interpretation of the specifications, shall be resolved by the Design engineer and the Contractor to the satisfaction of the District Manager.

If the District Manager determines the changes to be substantive, the District Board may be requested to review the changes prior to approval.

A.9 Sanitary Sewer System Construction Acceptance Procedures and General Requirements

Pending completion of construction, the District will accept the facilities for probationary maintenance in accordance with the following procedures and requirements.

A.9.1. Conditions for Acceptance of Construction

The following conditions must be met and information submitted and approved by the District prior to approval of construction and release of any sewer main for service.

1. The sewer main(s) and all appurtenances have been installed to the satisfaction of the District Inspector, all notes and field measurements have been made, and three full size blue line prints, one full size reproducible mylar prints and one copy of .pdf digital format files on DVD disk of the as-built drawings have been supplied to, and approved by, the District inspector.
2. The sewer mains have been successfully tested to the requirements designated in the technical specification section of this publication.
3. All compaction test results required by the District inspector have been submitted and accepted.
4. Developer shall provide the results of all testing including copies of video DVD's and reports conducted on the installed facilities. Results shall be provided in both hardcopy and .pdf digital format files on DVD disk.
5. All easements have been accepted and recorded by the District.
6. The Applicant has submitted a letter to the District inspector documenting the construction costs for the project.
7. The District's Easement Certification form including drawings identifying the "as constructed" location of sewer mains and appurtenances within the boundaries of recorded easements has been submitted and accepted by the District inspector. Certification

drawings must be signed and stamped by a registered Land surveyor licensed to practice in the State of Arizona. The drawings are in addition to the full size “as built” drawings described in paragraph 1 above. Examples of easement certification submittals are available upon request.

8. One full size reproducible mylar copy of the recorded subdivision plat has been provided.
9. All plan review and construction inspection fees have been paid.
10. A recorded copy of the subdivision's homeowners association covenants and/or bylaws have been submitted to the District (if applicable).
11. The Applications and Agreements for Sewer Main Extensions have been signed by the District manager for construction approval and initiation of probationary maintenance.

A.9.2. Execution of Application and Agreement for Sanitary Sewer Main Extensions

Upon District approval of all items listed in section A.9.1 above, the Applications and Agreements for Sewer Main Extensions will be dated and signed by the District manager. Execution of the Applications shall constitute District acceptance of the facilities for probationary maintenance and initiation of the warranty period.

The probationary maintenance and warranty period shall be as designated in the Applications and Agreements for Sewer Main Extensions. The Applicant guarantees all facilities against failure for a minimum period of one year from the date of acceptance. In addition, the condition of all manholes and other appurtenances remains the Applicant's responsibility until streets are paved and all facilities inspected and accepted by the District.

A.9.3. Maintenance During Warranty

Maintenance performed by the District during the warranty period consists of inspection and routine maintenance of the facilities. All remedial repairs and non-routine maintenance remains the responsibility of the Applicant. Failure of the Applicant to have all repairs carried out when requested by the District shall result in the District conducting the repairs at the Applicants expense.

A.9.4. Issuance of Sewer Taps Permits

No sewer tap permits shall be issued nor sewer taps allowed until the Applications and Agreements for Sewer Main Extensions have been executed for acceptance of construction.

A.9.5. Final Acceptance

Final acceptance and conveyance of the facilities to Inscription Canyon Ranch Sanitary District shall occur as specified in the Applications and Agreements for Sewer Main Extensions, but no sooner than one year after probationary acceptance or after street paving, whichever is later. Final acceptance shall be subject to re-inspection of all facilities by the District and correction of any deficiencies by the Applicant.

After proper notice, failure of the Applicant to correct deficiencies found during final inspection shall be cause for the District to correct the deficiencies at Applicant's expense. Upon reimbursement of the expenses to the District, a final acceptance notice will be issued.

A.10 Responsibility of the Applicant, Design Engineer and Contractor

The following summarizes the responsibilities of the Applicant, design engineer and contractor.

A.10.1. Responsibility for Design

The Applicant is responsible for ensuring that the sanitary sewer construction plans are designed to accommodate the sewer service requirements of the planned development. The District reviews construction plans in order to promote compliance with the minimum standards of the District and does not guarantee the adequacy of the plans to perform any certain function nor to protect against any specific condition applicable to the proposed construction site.

The District is not performing engineering services for the Applicant. It is the responsibility of the Applicant, his engineer and contractor to prepare the design and plans, determine the material specifications and soil conditions, and construct the project in accordance with the specifications of the Inscription Canyon Ranch Sanitary District.

A.10.2. Preconstruction Meeting

The contractor shall be responsible for arranging a preconstruction meeting prior to the start of any construction. Representatives of the District, Applicant, design engineer, and contractor must be represented at this meeting.

A.10.3. Notice of Initiation of Construction

The contractor is responsible for notifying the District at least 48 hours prior to the start of any construction. If work is suspended for any period of time after initial start-up, the contractor must notify the District's inspector 48 hours prior to re-starting construction, unless waived by the District inspector.

A.10.4. Construction in Accordance with Approved Plans

The contractor is responsible for performing construction in accordance with District standards and specifications and the construction plans approved by the District. The contractor must notify the District's inspector of any modifications to the approved plans prior to accomplishing construction contemplated by the modifications. Failure of the District Manager or District Board to approve proposed changes in writing will require that construction be completed in accordance with the approved plans.

A.10.5. Verifying Location of Existing Facilities

At all points of connection of new sanitary sewer mains to existing District facilities, the contractor will be responsible for excavating and verifying the location of such facilities prior to the installation of new facilities.

A.10.6. Termination of Service and Submittal of Plan for Bypass Pumping

If it is necessary to shut down any portion of the existing sewer system and thereby terminate service to existing customers, the contractor must notify the District inspector at least 48 hours prior to the need to terminate service and submit a plan for bypass pumping to avoid a disruption in service to District customers. The contractor shall be fully responsible for carrying out all bypass pumping measures prescribed by the District.

A.10.7. Inspections

District shall provide part time inspection services. A minimum of 48 hours notice shall be provided to the District inspector prior to backfill work above the spring line of the installed pipe. Backfill work may proceed prior to the end of the notice period if the construction has been inspected and accepted by the District inspector. Any pipe covered prior to inspection and approval or prior to the end of the 48 hour notification period may require excavation by the Contractor to allow for inspection. This excavation shall be at the discretion of the District inspector or District Manager and shall be accomplished at no expense to the District.

A.10.8. Repairs During Warranty Period

The Applicant shall be responsible for providing repair services to all portions of the construction project during the warranty period. The District reserves the right to perform any cleaning, repairs, or other maintenance, during the warranty period at the expense of the Applicant if the Applicant fails to correct deficiencies in the time limits requested by the District or in the case of an emergency.

The Applicant shall be responsible for the correct alignment and cleanliness of all sewer pipe and manholes during the warranty period or until the street is paved, whichever is longer. Written notification of deficiencies discovered during this period will be provided by the District. If the deficiencies are not corrected during the time limits requested by the District, the corrections shall be completed by the District at the expense of the Applicant.

A.10.9. Payment of Plan Review and Construction Inspection Fees

The Applicant is responsible for payment of all fees associated with the District's plan review and construction inspection services prior to commencement of construction plan review. Fee schedules are available from the District upon request. Fees are subject to change without notice.

A.10.10. Variance to District Specifications

The Applicant may request a variance to materials specifications in writing. Such requests will be reviewed by the District manager on a case by case manner. In the case where third party engineering review is required, the Applicant shall be billed by the District for the review charges.

A.11 Relocation of District Facilities

The following provisions shall apply to requests to relocate existing District facilities.

A.11.1. Responsibility for Relocation Costs.

The cost to relocate any existing District owned facility or facilities shall be the responsibility of, and paid by, the entity engaging in the activity that necessitates the relocation, including, but not limited to, any county, city, town, special district, regulated public entity or private party.

A.11.2. Definition.

“Cost of relocation” includes all costs and expenses properly attributable to the requested relocation, including, but not limited to, costs for survey, right-of-way acquisition, design engineering, inspection, materials, construction, permits and licenses, transportation, administrative overhead, and any reasonable costs necessarily incurred to modify or repair any other District facility where such repair or modification is made necessary by the relocation.

A.11.3. Increased Capacity.

Nothing herein contained shall prevent the District from requiring an increase in the capacity of or the over-sizing of the relocated facility; provided, however, that should the same occur, the District will be responsible for paying that share of the relocation cost attributable to said increase in capacity or over-sizing.

A.11.4. Performance of the Work.

The District shall have the right to design and construct, or cause to be designed and constructed, the facility or facilities to be relocated, all costs to be paid by the party requesting relocation in accordance with this policy statement. The District, at its option, may allow the party requesting relocation to design and construct the relocation of any District facility, provided the same is done pursuant to a written agreement entered into between the District and the relocating party, which is approved by the District’s Board of Directors, and which allocates the cost of relocation in accordance with this policy statement.

A.11.5. Determination of the Extent and Necessity for Relocation.

In all cases, the necessity and extent of any relocation of District facilities shall be made by the District.

A.11.6. Policy Considerations.

The allocation of relocation costs is intended to be fair and equitable to all parties and promote sound public policy by distributing said costs to the beneficiaries of the new project rather than adding them to the costs previously assumed by the District’s taxpayers and customers. In addition, by imposing relocation costs upon the entity that seeks to disturb the status quo, the District seeks to:

1. Deter over-zealous and needless project planning by creating an economic incentive to avoid unnecessary utility relocations;

2. Recognize and promote the District's legitimate monetary and budgetary expectations with regard to the construction of its facilities and the useful life thereof;
3. Recognize the physical, legal and practical limitations and constraints on the District to defray the cost of relocations required by other entities; and
4. Reduce waste and the allocation of scarce resources.

A.11.7. Procedure for Requesting Relocation.

The following procedures shall apply to all requests to relocate sanitary sewer mains and appurtenances owned by the Inscription Canyon Ranch Sanitary District. In all cases the necessity and extent of the relocation of facilities shall be determined by the District.

1. A written request for relocation of a District owned sanitary sewer main or appurtenance shall be submitted to the District manager. The letter shall contain at least the following information.
 - a. Name, address, telephone number and contact person for the party requesting relocation.
 - b. Description of facility to be relocated.
 - c. Location of existing facility.
 - d. Proposed location and description of relocated facility, if known.
 - e. Reason for proposing relocation.
 - f. Requested time schedule for accomplishing the relocation.
 - g. Ownership of property where existing facility is located and ownership of property proposed for the relocated facility.
 - h. Disposition of existing facility (abandoned in place or removed).
2. If the District determines that it may be possible to accommodate the relocation request a meeting will be scheduled between the District and the requesting party to discuss specific details regarding the proposed relocation.
3. Following the meeting between the requesting party and District representatives, the District will decide at its sole discretion whether it is in the best interest of the District to design and relocate the facility or if the party requesting relocation will be allowed to design and relocate the facility. However, regardless of who designs and relocates District facilities, all costs associated with the relocation including, but not limited to, administrative, engineering, legal,

construction materials, and labor costs shall be the responsibility of the party requesting said relocation.

4. At the discretion of the District a Utility Relocation Agreement defining the rights, duties, and obligations of the District and the party requesting relocation shall be prepared by the District's attorney.
5. The relocation will proceed in accordance with the Utility Relocation Agreement

Chapter 2 - Sanitary Sewer System Technical Standards and Specifications

T.1 General Master Plan Criteria for Wastewater Collection Systems

A hydraulic analysis must be performed for the proposed wastewater collection system and submitted as part of the Master Plan. The design methodology shall be presented and appropriately referenced. The results of this analysis shall be presented in tabular form with at least the following information presented: pipe number, to/from manhole number, pipe size, pipe slope (slopes which are greater than minimum design shall be noted), average daily flow, peak hour flow, d/D ratio at peak hour, and velocity at peak hour. An analysis of sewer force mains must be performed, including impacts due to pump surge, and submitted as part of the master plan. Force main hydraulic losses shall be performed using the Darcy-Wiesbach equation. A 24"x36 color exhibit showing flow contributing area, sewer line number and manhole number locations, flow direction, property boundaries, contour elevations, etc. shall be submitted as part of the Master Plan. The Master Plan shall be signed and sealed by a Registered Professional Engineer and submitted to Inscription Canyon Ranch Sanitary District (ICRSD) for review and approval.

Analysis performed for residential service connections to existing platted lots may be limited to average daily flow, peak hour flow, type of discharge and verification of lot service included in the sewer master plan design. Additional information required for pressure service connections include system pressure head requirements at the point of service, flow velocity, and proposed grinder pump system with pump curves and design operating head. Design shall meet all requirements of Arizona Administrative Code R18-9-E301. Additional design requirements for non-residential discharges shall be coordinated with the District Manager prior to start of design. The following table summarizes some of the design requirements for sewer main line and service connections.

<i>Sewer Depth of Cover</i>	<i>6'-0" minimum for gravity and pressure sewers</i>
<i>Rim Elevations</i>	<i>Above 100 year floodplain</i>
<i>Manning's Roughness Coefficient</i>	<i>n=0.013</i>
<i>Sewer Pipe Material</i>	<i>PVC SDR 35 ASTM D-3034 for gravity mains. PVC SDR 35 ASTM D-3034 for gravity service. Force Mains (Consult District) Low Pressure Sewer less than 3 " PVC Schedule 80 ASTM D-1785 Low Pressure Sewer 3" and Larger (Consult District for material) PVC Schedule 40 ASTM-C-1785 for pressure service (PVC Schedule 80 if over 5 feet deep)</i>
<i>Gravity Sewer Velocities</i>	<i>2.0 fps minimum at peak hour 2.0 fps minimum at average daily flow for trunk lines. 10.0 fps maximum</i>
<i>Manhole Spacing</i>	<i>500 ft. maximum or less as determined from horizontal and vertical alignment needs. Reference A.A.C R18-9-E301</i>
<i>Cleanouts</i>	<i>For dead end gravity mains less than 200 ft.</i>
<i>Sewer Capacity Ratio</i>	<i>d/D=0.75 maximum at peak hour</i>
<i>Minimum Pipe Diameter</i>	<i>Gravity Main 8" minimum Gravity Sewer Service 4" Pressure Sewer Service 1½"</i>
<i>Minimum Manhole Diameter</i>	<i>4', except 5' for pipe 10 feet deep or greater with 30" frame and cover. Note: Manhole covers shall be shall be labeled "Sewer"</i>
<i>Force Main Velocities</i>	<i>3.0 fps minimum 7.0 fps maximum</i>
<i>Low Pressure Sewer Velocities</i>	<i>3.0 fps minimum 7.0 fps maximum</i>
<i>Force Main and Low Pressure Sewer Air Release</i>	<i>Sized and located per manufacturer's recommendation at high points</i>
<i>Private Service Grinder Pump</i>	<i>To be determined in sewer design report and noted on all Final Plats.</i>

<p>Wash Crossings</p>	<p><i>All sewer lines that cross washes or channels shall be sleeved in DIP casings. The depth requirement for placing sewer lines under washes or channels shall be based on the 100-year flow rate of the wash or channel as shown in the table below.</i></p> <table border="1" data-bbox="755 420 1360 871"> <thead> <tr> <th data-bbox="755 420 1058 562">100-year Flow Rate</th> <th data-bbox="1058 420 1360 562">Min. Depth from bottom of wash to Top of Pipe</th> </tr> </thead> <tbody> <tr> <td data-bbox="755 562 1058 611">1 to 49 cfs</td> <td data-bbox="1058 562 1360 611">5 feet</td> </tr> <tr> <td data-bbox="755 611 1058 659">50 to 99 cfs</td> <td data-bbox="1058 611 1360 659">6 feet</td> </tr> <tr> <td data-bbox="755 659 1058 707">100 to 499 cfs</td> <td data-bbox="1058 659 1360 707">7 feet</td> </tr> <tr> <td data-bbox="755 707 1058 871">Greater than 499 cfs</td> <td data-bbox="1058 707 1360 871">Scour Depth (based on Scour Analysis) plus 3 feet; minimum of 7 feet</td> </tr> </tbody> </table> <p><i>Details on the determination of the 100-year flow rate shall be submitted to the District for review. The Scour analysis shall be in accordance with the Arizona “State Standard for Watercourse System Sediment Balance (SS5-96), Guideline 2, Level 1, as published by the Arizona Department of Water Resources (http://www.azwater.gov/azdwr/surfacewater/floodmanagement/statestandards.htm).</i></p> <p><i>The Scour analysis shall be submitted to the District for review for washes with a 100-year flow rate greater than 499 cfs.</i></p>	100-year Flow Rate	Min. Depth from bottom of wash to Top of Pipe	1 to 49 cfs	5 feet	50 to 99 cfs	6 feet	100 to 499 cfs	7 feet	Greater than 499 cfs	Scour Depth (based on Scour Analysis) plus 3 feet; minimum of 7 feet
100-year Flow Rate	Min. Depth from bottom of wash to Top of Pipe										
1 to 49 cfs	5 feet										
50 to 99 cfs	6 feet										
100 to 499 cfs	7 feet										
Greater than 499 cfs	Scour Depth (based on Scour Analysis) plus 3 feet; minimum of 7 feet										

<p>Manhole Invert Drops</p> <p><i><45° direction change</i></p> <p><i>≥45° direction change</i></p>	<p><i>0.1’ drop across manhole</i></p> <p><i>0.2’ drop across manhole</i></p>
<p>Manhole Lining</p>	<p><i>Reliner Inside Drop System by Reliner/Duran Inc. or approved equal for:</i></p> <ul style="list-style-type: none"> <i>• All manholes connected to a force main.</i> <i>• MAG Std. Dtl. 426 Type ‘A’ drop manholes if the sewer lines serves more than 200 homes</i> <i>• MAG Std. Dtl. 426 Type ‘B’ drop manholes except for sewer lines that serve less than 50 homes.</i>

The above summary table provides a partial listing of the sewer main and service connection requirements and it is the project engineer's responsibility to design the project to all District and regulatory agency criteria.

Curvilinear Alignments

SDR 35 PVC Sewer Pipe

Pipe Diameter	Laying Length	Max. Deflection Angle	Max. Offset per Joint of pipe	Min. Curve* Radius
8" – 15"	12.5'*	2.5	6.5"	287'
8" – 15"	20'	2.5	10.5"	458'

* The use of reduced pipe lengths must be clearly noted on the construction plans for contractor's attention.

PVC ASTM D1785 Low Pressure Sewer Pipe

Pipe Diameter	Laying Length	Max. Offset	Min. Curve* Radius
1 ½"	20'	50"	48'
2"	20'	40"	59'
2 ½"	20'	30"	72'

* All curvature results from the bending of the pipe lengths. There is no deflection allowed at the joint.

No bends in sanitary sewer service lines are allowed. The developer shall endeavor to use existing sanitary sewer lines that have been stubbed out to property by previous construction.

T.2 Sewer System Material Specifications

Collection Mains:	SDR35 PVC sewer in accordance with M.A.G. Specifications, ASTM D3034
Sewer Service:	SDR35 PVC sewer pipe in accordance with M.A.G. specifications and ASTM D3034.
Manhole:	Precast concrete in accordance with M.A.G. Specifications, except that all manholes shall have no steps installed.
Manhole Liner:	Manholes that meet any of the following criteria shall be lined with <i>Reliner Inside Drop System by Reliner/Duran Inc. or approved equal for:</i> <ul style="list-style-type: none">○ <i>All manholes connected to a force main.</i>○ <i>MAG Std. Dtl. 426 Type 'A' drop manholes if the sewer lines serves more than 200 homes</i>○ <i>MAG Std. Dtl. 426 Type 'B' drop manholes except for sewer lines that serve less than 50 homes.</i>
Manhole Cover:	Cast iron in accordance with M.A.G. Specifications. Manholes on 8 and 10 inch diameter sewers that are less than 10 feet deep shall be 4 foot diameter with 24-inch frame and cover. Manholes on 8 and 10 inch diameter sewers that are 10 feet deep or greater shall be 5 foot diameter with 30-inch frame and cover. On 12-inch diameter and larger sewer lines, manholes shall be 5 foot diameter with a 30 inch frame and cover.
All other Items:	In accordance with M.A.G. Specifications as modified by Y.A.G. Standard Details and ICRSD Standard Details and Specifications
Force Mains:	<i>Less than 3" diameter - PVC Schedule 80 ASTM D1735</i> <i>3" diameter or larger - See District on materials.</i>
Marking Posts:	At ends of service stubs, 2X4 post with wire per General Sewer Notes in Chapter 3 of the District Standards and Specifications.

T.3 Gravity Sewer Lines

1. Unless otherwise specified, all gravity sewer lines shall be constructed of SDR35 PVC pipe conforming to ASTM D3034. A certificate shall be furnished from the manufacturer attesting that the pipe meets the necessary ASTM requirements.
2. All mains and interceptors shall be constructed at a sufficient depth to serve the ultimate drainage area as determined by the Sanitary District Master Plan.
3. Sewer lines shall NOT be placed in less than a 10 foot easement with at least 5 foot wide easement on the sewer side of the property line. The easement must be adequate to allow access by District personnel and equipment to perform all operation and maintenance of the facilities within.
4. All sewers shall be parallel to property lines or center lines or as close to parallel as possible. They shall not cross and re-cross the center line except in special cases approved by the District Manager.
5. The minimum horizontal distance from a sewer line to any parallel underground utility shall be 10 feet unless a lesser distance is approved by the District Manager. In no case, shall the distance be less than 6 feet.
6. Slopes of gravity sewer lines shall be sufficient to maintain a minimum velocity of 2.0 feet per second flowing full.
7. The maximum velocity in a gravity sewer line shall not exceed 10 fps unless otherwise approved by the District Manager.
8. The maximum velocity generated at the entrance to a drop manhole shall be no greater than 6 fps.
9. All gravity sewer mains shall be 8-inch diameter or larger.
10. All sewer lines shall have a minimum of 6 feet of cover, unless otherwise approved by the District Manager.
11. All water and sewer line separations shall be per Arizona Administrative Code R18-5-502c.
12. When a sewer line is constructed such that it crosses under a retaining wall or other structure, the sewer line must be sleeved with a larger sized pipe approved by the District.
13. Where ductile iron pipe is allowed or required and is coupled to pipe of any other

material type, rigid cast couplings shall be used.

14. All bolts used in fittings for underground installation shall be stainless steel. Deviations may be approved by the District Manager when conditions warrant the use of another material.
15. Pipe fittings utilized in the construction of any sewer line will be those approved for that specific type of service.
16. In all new construction, in-line wyes shall be used instead of saddles for connection sewer services. Deviations may be approved by the District Manager in certain situations. Approval must be determined prior to installation.
17. All sewer stubs shall end with a plug or cap and must have a 2x4 installed from the end of the plug or cap up to 2 feet above grade. The 2x4 shall have #10 wire wrapped around it to assist in location the stub in case the 2x4 is broken off at grade. 2x4's must be painted green. Metal 2x4's without wire are also acceptable.
18. Where ductile iron pipe is allowed or required, pipe shall be of the appropriate class and shall be installed with a liner or coating acceptable to the District Manager.
19. Where ductile iron pipe is allowed or required, the pipe shall be poly-wrapped.

T.4 Manholes

1. Manholes shall be installed as follows:
 - a. At all changes in grade,
 - b. At all changes in alignment.
2. The maximum manhole spacing for all sewers is 500 feet.
3. Manholes on 8 and 10 inch diameter sewers that are less than 10 feet deep shall be 4 foot diameter with 24-inch frame and cover.
4. Manholes on 8 and 10 inch diameter sewers that are 10 feet deep or greater shall be 5 foot diameter with 30-inch frame and cover.
5. On 12-inch diameter and larger sewer lines, manholes shall be 5 foot diameter with a 30 inch frame and cover.
6. Elevation drops across manholes shall be as follows:
 - a. .1 ft. drop for all angles less than 45 degrees.
 - b. .2 ft. drop for all angles 45 degrees and larger.

7. All manholes shall be constructed of precast concrete sections. Top sections shall be per MAG standard detail 420 with Type "A" top unless otherwise specified.
8. Watertight manhole covers conforming to MAG Standard Detail 424 shall be provided for all manholes in a direct path of surface runoff or ponding including but not limited to areas of floodplains, floodways or washes.
9. A clean-out shall be installed on the end of the line if the line will not be extended. The spacing to the clean-out shall not be more than 200 feet. If the end of the line is more than 200 feet from the previous manhole, then a manhole must be installed instead of a clean-out.
10. Sewer taps in manholes shall be constructed with the tap invert 4 inches above the highest sewer invert at the manhole.
11. When sewer lines of different sizes enter the same manhole, the smaller pipe shall not have its crown lower than the crown of the larger pipe. The crowns of the pipe must be on the same level or the crown of the smaller above the crown of the larger pipe.
12. All manholes and cleanouts require a concrete collar at finished grade.

T.5 Raising Manholes to Finished Grade

1. Any damaged grade rings will be replaced.
2. Grout work is required at all joints and will be free from cracks.
3. A sponge finish of Thoroseal or equivalent is required.
4. Where grade rings cannot be used, bricks are acceptable but must be mortared in and coated with a sponge finish of Thoroseal or equivalent. No voids will be allowed.
5. Any live manholes buried in the construction process must be uncovered and brought to grade within three calendar days.

T.6 Pump Station & Force Main Minimum Requirements

1. Pump stations will not be considered unless a gravity option is not economically, technically or legally feasible.
2. Pumps shall be of the submersible design as manufactured by Flygt, Fairbanks-Morse, Myers, Wemco, or as approved by the District Manager.

3. Pumping systems shall have at least one redundant pump.
4. Wet wells shall be six-foot diameter minimum.
5. A hatch cover system shall be provided. Engineer shall contact the District Manager for information regarding the most current system being used by the District.
6. An odor control system shall be provided as determined by the District Manager.
7. A fixed standby generator shall be provided unless otherwise specified by the District Manager.
8. A telemetry system for remote monitoring of pump station conditions shall be provided which is compatible with the system currently in use by the District.
9. Standby generator and controls shall be installed in a concrete block enclosure consistent in design with any architectural requirements of the District, homeowners association, or the appropriate local governmental entity.
10. The entire facility shall be enclosed by an eight foot tall concrete block wall. A minimum 12 foot wide gate shall be provided for access into the facility.
11. A slop sink, water heater, and eye wash shall be provided in the enclosure.
12. Unless otherwise specified by the District Manager, wet wells shall be sized such that at peak design flows, a minimum of one hour storage shall be available.
13. The interior of the enclosure shall be designed such that the controls are separated from the standby power source by a wall.
14. Above ground yard piping shall be ductile iron pipe with an interior coating designed for sewage and which is acceptable to the District Manager.
15. A meter, as approved by the District shall be installed in accordance with manufacturer's recommendations.
16. The material for force mains 3-inches in diameter and larger shall be approved by the District Manager.
17. All force mains smaller than 3-inches in diameter shall be Schedule 80 PVC.
18. Force mains and lift stations shall meet all requirements of AAC R18-9-E301.

T.7 Low Pressure Sewer Minimum Requirements

1. All low pressure sewer lines less than 3-inches in diameter shall be PVC Schedule 80 per ASTM D1785. A certificate shall be furnished from the manufacturer attesting that the pipe meets the necessary ASTM requirements.
2. Materials for low pressure sewer lines 3-inch and larger shall be determined by the District Manager or Board. Recommendations for materials shall be provided by the Applicant's engineer.
3. Installation of low pressure sewer lines shall meet water and sewer separation requirements as set forth in AAC R18-5-502c.
4. Low pressure sewer lines shall NOT be placed in less than a 10 foot easement with at least 5 foot wide easement on the sewer side of the property line. The easement must be adequate to allow access by District personnel and equipment to perform all operation and maintenance of the facilities within.
5. All sewers shall be parallel to property lines or center lines or as close to parallel as possible. They shall not cross and re-cross the center line except in special cases approved by the District Manager.
6. The minimum horizontal distance from a low pressure sewer line to any parallel underground utility shall be 10 feet unless a lesser distance is approved by the District Manager. In no case, shall the distance be less than 6 feet.
7. The minimum velocity in a low pressure sewer line shall not be less than 3 feet per second unless otherwise approved by the District Manager.
8. The maximum velocity in a low pressure sewer line shall not exceed 7 feet per second unless otherwise approved by the District Manager.
9. All sewer lines shall have a minimum of 5 feet of cover, unless otherwise approved by the District Manager.
10. When a sewer line is constructed such that it crosses under a wall or other structure, the sewer line must be sleeved with a larger sized pipe approved by the District.
11. Pipe fittings utilized in the construction of any sewer line will be those approved for that specific type of service. All PVC fittings shall be Schedule 80, ASTM D1785.

12. All branch line connections shall be installed with a shutoff valve and flushing station on branches upstream of the connection per ICRSD Standard Details PS-04 and PS-05.
13. Flushing stations shall be installed a minimum 400 feet intervals.
14. Air release valve assemblies shall be installed at all high points in the low pressure sewer per ICRSD Standard Detail PS-06.
15. Discharge of low pressure sewer line into a manhole shall be per ICRSD Standard Detail PS-07.
16. Test all low pressure lines at 50 psi or more above the design working pressure.
17. Low pressure sewer service laterals shall be installed per ICRSD standard Detail PS-02.

T.8 Gravity Sewer Taps and Service Laterals

1. All sewer tap laterals shall be constructed to the lot line (property line) or interior edge of the PUE (if exists) whichever is further onto the property. At the end of each lateral with a 2x4 installed vertically from the plug or cap up to 2 feet above grade. These 2x4's shall have #10 steel wire wrapped around them to aid in located the lateral. 2x4's must be painted green and the depth of the service (from grade to top of cap or plug) shall be marked on the 2x4. Metal 2x4's without wire are also acceptable.
2. Single family homes shall be provided with a 4 inch tap and lateral.
3. Multiple family homes and apartments shall be provided with no less than a 6 inch tap and lateral.
4. Proposed tap locations are to be shown on all plans but may be changed if necessary in the field if approved by the District Manager.
5. Laterals installed under retaining walls shall be sleeved with at least the next largest diameter pipe approved by the District.

T.9 Pressure Sewer Taps and Service Laterals

1. All low pressure sewer tap laterals shall be constructed to the lot line (property line) or interior edge of the PUE (if exists) whichever is further onto the property. Installation shall be per ICRSD Standard Detail PS-02. Locators at the end of each lateral shall

be a 2x4 installed vertically from the plug or cap up to 2 feet above grade. These 2x4's shall have #10 steel wire wrapped around them to aid in locating the lateral. 2x4's must be painted green and the depth of the service (from grade to top of cap or plug) shall be marked on the 2x4. A 2" conduit painted green or Metal 2x4's without wire are also acceptable.

2. Single family homes shall be provided with a single 1 ½ - inch tap and lateral per ICRSD Standard Detail PS-02.
3. Multiple family homes and apartments shall have tap or taps provided at the request of the applicant. Taps in excess of 1 ½ - inch shall require District review and approval.
4. Proposed tap locations are to be shown on all plans but may be changed if necessary in the field if approved by the District Manager.
5. Laterals installed under retaining walls shall be sleeved with at least the next largest diameter pipe approved by the District.
6. The connection between ejector pump force main and a gravity sewer tap must be constructed using a glue type fitting.
7. All service laterals shall have restrained or thrust blocked fittings including end caps.

T.10 Bedding & Backfill

1. Bedding and backfill shall be per YAG Standard Details 2.01 and 2.02 except bedding shall be select material and free from rock greater than 3/4 inch in size. A minimum of 4 inches of bedding material may be used for low pressure sewer construction less than 3-inches in diameter except where special conditions dictate greater bedding depths. This same material shall be used to a depth of 12 inches above the top of the pipe. Minimum backfill compaction shall meet County right-of-way requirements. Backfill within ICRSD easements shall be compacted to 90% density except areas surrounding any structures, exposed utilities, under sidewalks, or within a roads and driveways have a minimum density of 95% per ASTM D 698. Water settlement shall not be used for compaction. Where special conditions dictate, a soils investigation shall be performed and geotechnical recommendations shall be incorporated.
2. Unless otherwise specified, screened native material may be used as backfill in non-ROW areas provided that no material is greater than 8 inches in size (at its largest dimension) and that no brush, trash or other deleterious material is used.
3. Adequate compaction tests shall be taken. Locations and frequency of testing may be

adjusted by the District Manager if the District Manager or inspector determines additional testing is needed. If any test failures are experienced, the District Manager reserves the right to require additional testing at no expense to the District.

T.11 Private Sewers

The District will determine whether sewer infrastructure is to be public or private. All private sewers shall conform to District design standards and are subject to District inspection.

The District will not be responsible for the operation and maintenance of any private sewer infrastructure. The District's O&M responsibilities cease at the connection of the private sewer to the District's main line which must be made in a manhole (except single family service laterals).

T.12 Construction Plans and Specifications

1. General

- a. All construction plans shall be made from actual field surveys by a land surveyor registered in the State of Arizona, referenced to land corners or other official survey control points and be of sufficient accuracy so that the facilities can be accurately staked for installation and can be readily located after installation for maintenance, tapping and control. All construction plans shall show sufficient adjacent area to identify the relationship between proposed new facilities and existing facilities. All construction plans shall also be prepared and signed by a professional engineer who is qualified and registered by the State of Arizona to practice in a particular field of competency required by the type of improvements.
- b. The specifications shall at a minimum, include the Standard General Sewer Notes included in Section 3.0.
- c. All plans shall be submitted on 24 x 36 inch sheets. The sheets shall be single profile. The plans shall be drawn to an engineering scale, architectural scales are not allowed.
- d. There are no specific engineering scale requirements, however, 1"=20' and 1"=40' are the preferred horizontal scale. The vertical scale for profiles is preferred to differ from the horizontal scale by a factor of 10.
- e. All lettering and symbols shall be 1/8 inch, minimum, so as to be legible when plans are reduced to half size.

- f. All sewer line and utility crossings shall be shown in both plan and profile views.
- g. All elevations shown on the plans shall be referenced to the benchmark listed on the cover sheet.
- h. As-builts of original plan sheets shall be provided on mylar and be sufficiently clear to produce clear prints and sepias. Electronic files of As-builts shall also be submitted in pdf format.
- i. Submittals for planned development shall additionally show all existing and proposed structures, driveways, and parking facilities and shall include a combined utility plan (existing and proposed).

T.13 Construction Drawings

- a. Cover sheet shall contain:
 - i. Vicinity or Location Map.
 - ii. Index of drawings.
 - iii. List of quantities of facilities to be installed.
 - iv. If a subdivision, name of subdivision, developer, developer's address, and phone number.
 - v. The engineer's name, address and phone number.
 - vi. The following ICRSD information shall be on the cover sheet of the plans:

**Sewer Utility:
Inscription Canyon Ranch
Sanitary District
P.O. Box 215
Chino Valley, Arizona 86326
(928) 636-1725**

- vii. Space for approval signatures with titles of each official (Inscription Canyon Ranch Sanitary District, Yavapai County, and Arizona Department of Environmental Quality (if applicable)).

- viii. If all or a portion of the improvements shown on the plans are within the jurisdiction of the State/County, acquire the appropriate permit. Indicate the permit number on the cover sheet.
- ix. Identify utility companies serving the area and the date the plans were submitted to each of them for conflict review.
- x. Benchmark adjusted to Yavapai County Datum.
- xi. Abbreviations
- xii. Legend

b. Key map shall indicate:

- i. All streets, alleys, easements, lots, splits and parcels. Streets shall be identified by name and lots or parcels by number or letter as the case may be.
- ii. All (existing and proposed) sewer lines (gravity or force mains), clean- outs, manholes, lift stations, grinder pumps, wastewater treatment plants shall be shown.
- iii. Direction of flow.
- iv. Phase limits (if applicable).
- v. If a subdivision, identify the model phase.
- vi. Index of sheets indicated by single line with arrows indicating beginning and end of sheet.
- vii. Manholes shall be numbered consecutively and the numbers indicated.

c. The following current district standard notes shall be shown:

- i. Sewer General Notes

d. Detail sheet shall include all relevant detail drawings such as but not limited to:

- i. A service tap detail showing the standard tap location, minimum 6 foot separation between water and sewer,
 - ii. A manhole service tap detail,
 - iii. Trench detail
 - iv. Low pressure sewer system fittings, valve assemblies, flushing stations, air release valves, etc.
- e. Each Plan and profile sheet shall indicate:
 - i. Title Block on each sheet
 - ii. Job title.
 - iii. Sheet number.
 - iv. North arrows to orient each line.
 - v. Any reference to local bench marks or temporary bench marks including location, datum, elevation and monument type.
 - vi. Centerline of drainage channels.
 - vii. 100 year flood plain boundaries.
 - viii. Existing or proposed retention and/or detention basin location boundaries and elevations (topography).
 - ix. Location and dimensions of dedicated streets, easements and rights-of- ways including street names.
 - x. All existing or proposed utilities (i.e. Water, elect, telephone, cable tv, etc.) including storm drain with size and location within rights-of-ways and/or easements.
 - xi. All existing or proposed obstructions such as vaults, catch basins, traffic islands, curbs, gutters, etc.

- xii. Lots to be served, including lot and/or block numbers.
- xiii. Proposed alignment of the sanitary sewer main(s) and the location of all proposed sanitary sewer facilities such as manholes, wyes, sewer taps, elder valves, clean-outs, and sizes shown. Match lines to indicate sheets that lines continue on.
- xiv. A centerline profile of streets (existing or proposed) showing a profile of all existing or proposed sanitary sewer mains, existing ground and proposed finished grade shall be shown on profile with elevations. Profiles shall include street grades, horizontal and vertical curve data. Any proposed or existing utility crossing the proposed sanitary sewer mains.
- xv. Match lines and sheet references called out in plan and profile.

T.14 Reclaimed Water System Material Specifications

- 1. All Items: Consult with District.

T.15 Minimum Design Standards for Reclaimed Water Delivery Lines

- 2. Reclaimed water delivery lines shall be constructed of pipe material approved by the District Manager. The pipe material shall be purple or covered in purple poly-wrap.
- 3. Purple identification and locating tape shall be installed in the trench 1 foot above any reclaimed water delivery pipe. The tape shall be imprinted with the words "reclaimed water-non-potable".
- 4. All reclaimed water delivery lines shall have a minimum cover of 5 feet.
- 5. Pumping systems shall include at least one redundant pump.
- 6. All pumping systems shall be metered using a Sparling Tiger Mag.
- 7. Gate valves shall be installed in the system at a distance no greater than 2000 feet apart.
- 8. Air release or air-vac valves shall be installed in a vault which allows access for maintenance.

9. Valve boxes and meter boxes shall be purple in color.
10. Valve boxes and meters boxes located in washes or in unpaved surfaces shall be installed with a concrete collar.
11. Meet all requirements of Arizona Administrative Code R18-9-602.

T.16 “As-Built” Plan Review Requirements

1. Plans size 24x36 (two blue or blackline copies), each submittal until approved.
2. Plans must be fully approved and signed by all required agencies.
3. Stamped and signed by a Professional Civil Engineer or Land Surveyor registered in the State of Arizona.
4. Station and offset on all sewer manholes, clean-outs and other facilities.
5. Swing ties to fixed points may be required for commercial projects that do not have a roadway centerline for stationing within a reasonable distance from the project.
6. Distances from lot lines to sewer taps.
7. Call out sewer pipe lengths between fittings and branches.
8. Elevations for all DIP sections regardless of pipe diameter.
9. As-Built profiles for all sewer lines 8” and larger including manhole rim and invert elevations.
10. As-built all changes in pipe materials and size.
11. Correct street names, addresses and lot numbers.
12. Submit As-Built plans per requirements set forth in Section A.4.12.
13. The District’s receipt and approval of as-builts is a condition to the District’s final approval of sewer facilities.

Wastewater “As-Built” Certification

The following “As-Built” certification shall appear on the cover sheet of the plans.

Wastewater “As-Built” Certification

I hereby certify that the “As-Built” measurements as shown hereon were made under my supervision or as noted, and are correct to the best of my knowledge after due review. Additionally, I hereby certify that all mains and services have been installed within the limits of easements dedicated to Inscription Canyon Ranch Sanitary District or inside dedicated street rights-of-ways or public utility easements.

Engineer’s Seal

T.17 Inspection and Testing

1. The District shall be notified at least 48 hours in advance of any required inspection or testing. The District reserves the right to contract with a qualified firm to perform daily inspections as required.
2. All testing shall be performed by firms qualified to perform such tests.
3. All gravity sewer lines shall be air tested in accordance with “Standard Testing Method for Installation of Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air” per ASTM F1417. Force mains and low pressure sewer lines shall be hydrostatically tested per MAG Standard Specification Section 610. Test pressures shall be 50 psi or higher than the design working pressure.
4. All manholes shall be water tested in accordance with AAC R18-9-E301.D.3.
5. A minimum of four compaction tests are required manhole to manhole. Locations for testing will be determined by the District. If any test failures are experienced, the District reserves the right to require additional testing at no expense to the District.

6. All new gravity sewer lines shall be televised. Any defects in materials or workmanship observed shall be corrected. No standing water or reverse grades shall be allowed. The cost of final TV inspection shall be included in the project review and inspection fee. The contractor shall reimburse the District for all costs associated with any other TV inspections performed by the District.
7. Deflection testing per MAG Specification Section 615 is required by the District.
8. All grease, oil, or sand interceptors will be tested by filling the entire structure with water (to the rim elevation). There shall be a 24 hour period for structure to become saturated with water before an actual 24 hour test is monitored. No leakage shall be allowed. Tests will be witnessed by the District.
9. A letter certifying the passing test results must be received by the District prior to acceptance.
10. If contractor proceeds with construction before having an inspection per Section A.8.3, contractor will be required to expose the pipeline, manhole, etc., at no cost to District, to permit inspection by the Construction Inspector. The required exposure of pipeline, manhole, etc., by contractor shall not deem acceptance of facility. District reserves the right to reject any facility not properly scheduled for inspection by District for any reason. The rejection shall be final.

Chapter 3 – Sanitary Sewer Notes

SS.1 Sanitary Sewer General Notes

1. ALL WORK SHALL CONFORM TO MARICOPA ASSOCIATION OF GOVERNMENTS (MAG), YAVAPAI ASSOCIATION OF GOVERNMENTS (YAG), ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) REQUIREMENTS, ADEQ BULLETIN NO. 11 & THE INSCRIPTION CANYON RANCH SANITARY DISTRICT (ICRSD) DESIGN STANDARDS & SPECIFICATIONS, WHICHEVER IS MOST STRINGENT.
2. ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIREMENTS SHALL BE COMPLIED WITH.
3. ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY REQUIREMENTS SHALL APPLY WHEN MORE STRINGENT THAN THE MAG, YAG OR ICRSD STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION; MORE SPECIFICALLY WHERE THEY PERTAIN TO MAXIMUM ALLOWABLE SEWER LINE/PRESSURE SEWER LINE EXFILTRATION-INFILTRATION RATES.
4. THE CONTRACTOR MUST OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM ICRSD, YAVAPAI COUNTY, ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY AND OTHER REGULATORY AGENCIES AS NEEDED PRIOR TO CONSTRUCTION.
5. PROJECT ENGINEER SHALL BE RESPONSIBLE FOR SUBMITTING TRAFFIC CONTROL PLANS WHICH SHALL BE MADE A PART OF THE PLAN REVIEW REQUEST TO THE COUNTY ENGINEER FOR APPROVAL (IF APPLICABLE).
6. ALL PLANS APPROVED BY THE ICRSD ARE NULL & VOID ONE YEAR FROM DATE OF SIGNATURE IF CONSTRUCTION HAS NOT STARTED
7. ALL TRENCHES & BEDDING SHALL BE PER YAG DETAILS 2-01P & 2-02P. BEDDING MATERIAL SHALL NOT BE LARGER THAN ¾-INCH GRADATION BEDDING DEPTH MAY BE REDUCED FOR LPS SEWER MAINS SMALLER THAN 3-INCH DIAMETER IF APPROVED BY THE DISTRICT MANAGER.
8. ALL GRAVITY SANITARY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC), UNLESS OTHERWISE NOTED, IN ACCORDANCE WITH MAG SPECIFICATIONS. A CERTIFICATE SHALL BE FURNISHED FROM THE MANUFACTURER ATTESTING THAT THE PIPE MEETS SDR-35 ASTM D3034 REQUIREMENTS.
9. ALL PRESSURE SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC), UNLESS OTHERWISE NOTED, IN ACCORDANCE WITH MAG SPECIFICATIONS. A CERTIFICATE SHALL BE FURNISHED FROM THE MANUFACTURER ATTESTING THAT THE PIPE MEETS THE REQUIRED ASTM REQUIREMENTS, PVC SCHEDULE 80, ASTM D-1785.
10. ANY QUANTITIES SHOWN ON PLANS ARE NOT VERIFIED BY ICRSD OR DISTRICT MANAGER

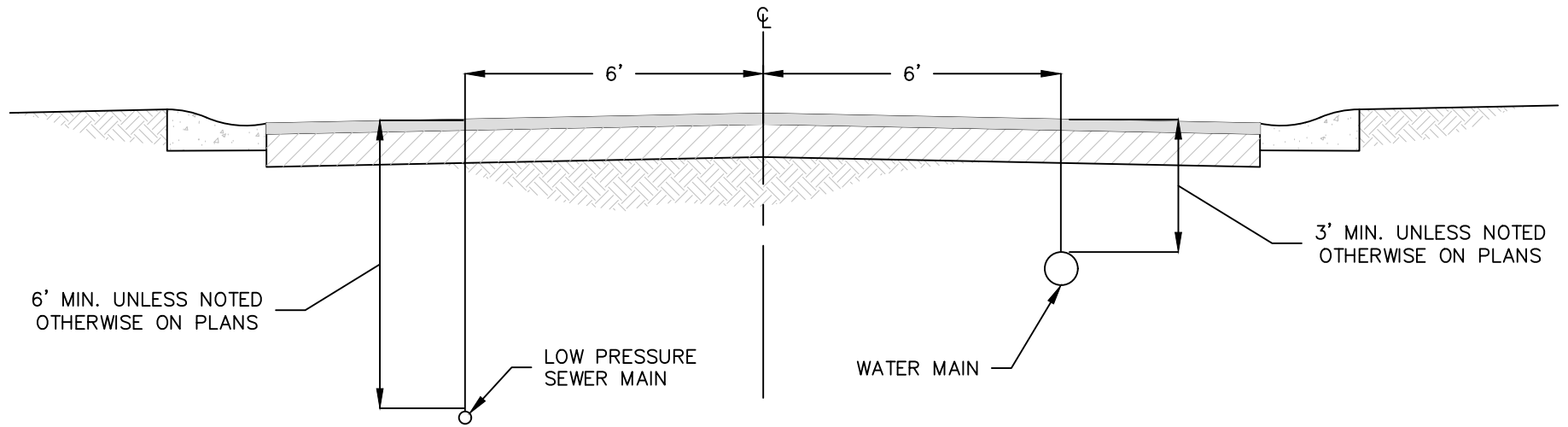
11. ALL REVISIONS TO ORIGINAL PLANS MUST BE APPROVED BY THE DISTRICT MANAGER PRIOR TO CONSTRUCTION. ANY UNAPPROVED REVISIONS ARE SUBJECT TO REMOVAL & REPLACEMENT AT CONTRACTOR'S EXPENSE
12. CONTRACTOR SHALL NOTIFY 'BLUE STAKE' AT 1-800-STAKEIT (1-800-782-5348) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
13. THE CONTRACTOR IS TO UNCOVER ALL EXISTING LINES BEING TIED INTO & VERIFY GRADES & ELEVATIONS BEFORE ANY OTHER CONSTRUCTION
14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UNDERGROUND PIPELINES, TELEPHONE & ELECTRICAL CONDUITS & STRUCTURES IN ADVANCE OF ANY CONSTRUCTION & OBSERVE ALL POSSIBLE PRECAUTIONS TO AVOID ANY DAMAGE TO SUCH. ICRSD WILL NOT GUARANTEE ANY LOCATION OF UNDERGROUND FACILITIES OR OMISSION OF SAME.
15. COMPLIANCE WITH ALL COUNTY, STATE, AND FEDERAL RULES AND REGULATIONS PERTAINING TO JOB SAFETY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
16. THE CONTRACTOR SHALL PROVIDE SUFFICIENT MEN & EQUIPMENT ON THE JOB AT ALL TIMES DURING CONSTRUCTION TO COMPLY WITH SPECIFICATIONS & TO COMPLETE THE WORK
17. THE DISTRICT MANAGER SHALL BE NOTIFIED 48 HOURS PRIOR TO THE START OF ANY WORK. THE DISTRICT MANAGER SHALL BE NOTIFIED 48 HOURS PRIOR TO START OF ANY TESTING.
18. ALL WORK & MATERIALS WHICH DO NOT CONFORM TO THE SPECIFICATIONS ARE SUBJECT TO REMOVAL & REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
19. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE OF THE DISTRICT MANAGER OR HIS REPRESENTATIVE IS SUBJECT TO REMOVAL & REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
20. BACKFILLING SHALL NOT BE STARTED UNLESS 48 HOURS NOTICE HAS BEEN PROVIDED TO THE SANITARY DISTRICT MANAGER OR EARLIER IF DISTRICT INSPECTION HAS BEEN PERFORMED.
21. ALL FRAMES, COVERS, VALVE BOXES, & MANHOLES SHALL BE ADJUSTED TO FINISH GRADE UPON COMPLETION OF PAVING, UTILITY, OR RELATED CONSTRUCTION.
22. ALL SEWER TAP LATERALS SHALL BE CONSTRUCTED TO THE LOT LINE OR INTERIOR EDGE OF THE PUE WHICHEVER IS FURTHER ONTO THE PROPERTY. A PLUG OR CAP MUST BE INSTALLED AT THE END OF EACH LATERAL WITH A 2X4 INSTALLED VERTICALLY FORM THE PLUG OR CAP UP TO 2 FEET ABOVE GRADE. THESE 2X4'S SHALL HAVE #10 STEEL WIRE WRAPPED AROUND THEM TO AID IN THE LOCATING THE LATERAL. THE 2X4 SHALL BE PAINTED GREEN AND THE DEPTH OF THE SERVICES (FROM

- GRADE TO TOP OF CAP OR PLUG) SHALL BE MARKED ON THE 2X4. METAL 2X4'S WITHOUT WIRE ARE ALSO ACCEPTABLE.
23. WATER-SEWER SEPARATION SHALL BE PURSUANT TO AAC R-18-5-502C.
 24. GRAVITY SEWER LINE DEFLECTION TESTS SHALL BE DONE ON 100% OF ALL LINES.
 25. THE TOTAL LENGTH OF THE GRAVITY SEWER LINE SHALL BE TESTED FOR UNIFORM SLOPE BY LAMP LIGHTING, REMOTE CAMERA, OR SIMILAR METHOD APPROVED BY THE DEPARTMENT AND THE RESULTS RECORDED.
 26. COVER EACH GRAVITY SEWER LINE WITH AT LEAST 3 FEET OF EARTH COVER MEETING THE REQUIREMENTS OF "RIGID PIPE BEDDING FOR SANITARY SEWERS" (WWM 104) REVISED JULY 2002, & "FLEXIBLE PIPE BEDDING FOR SANITARY SEWERS" (WWM 105), REVISED JULY 2002, PUBLISHED BY PIMA COUNTY WASTEWATER MANAGEMENT.
 27. ADEQUATE COMPACTION TESTS SHALL BE TAKEN. LOCATIONS AND FREQUENCY OF TESTING MAY BE ADJUSTED BY THE DISTRICT MANAGER IF THE DISTRICT MANAGER OR INSPECTOR DETERMINES MODIFIED TESTING IS NEEDED. IF ANY TEST FAILURES ARE EXPERIENCED, THE DISTRICT RESERVES THE RIGHT TO REQUIRE ADDITIONAL TESTING AT NO EXPENSE TO THE DISTRICT.
 28. ANY PREVIOUSLY TESTED SEWER LINES BROKEN DURING THE INSTALLATION OF OTHER ADJACENT UTILITIES WILL BE REPAIRED AND RETESTED TO THE SATISFACTION OF THE SANITARY DISTRICT MANAGER.
 29. SEWER FORCE MAIN AND LPS LINES SHALL BE DESIGNED AND CONSTRUCTED OF A MATERIAL SUITABLE FOR SANITARY SEWER PRESSURE PIPE PER ICRSD STANDARD DESIGN AND SPECIFICATIONS. SEWER LINES SHALL BE PRESSURE TESTED TO A MINIMUM OF 50 PSI ABOVE DESIGN WORKING PRESSURE AT THE LOWEST POINT IN THE SYSTEM FOR A MINIMUM OF 4 HOURS IN ACCORDANCE WITH AAC R18-9.
 30. PRIOR TO PROJECT ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE DISTRICT WITH A VIDEO DVD & A HARD COPY REPORT OF ALL OF THE MAIN LINES INSTALLED & SERVICES AND NEW OR REPLACED PRIVATE SERVICES.
 31. ACCEPTANCE OF THE COMPLETED WORK WILL NOT BE GIVEN UNTIL 3 MIL MYLAR & CAD FORMAT DIGITAL 'AS-BUILT' PLANS ON YAVAPAI COUNTY DATUM & COORDINATES HAVE BEEN SUBMITTED BY A REGISTERED PROFESSIONAL ENGINEER AND APPROVED BY THE DISTRICT MANAGER.
 32. SEWER MANHOLES EXFILTRATION TESTS SHALL BE DONE ON 100% OF ALL LINES. VACUUM TESTING IN ACCORDANCE WITH 'AGENCY' STANDARDS MAY BE USED IN LIEU OF EXFILTRATION TEST. THE CONTRACTOR SHALL TEST EACH MANHOLE USING ONE OF THE FOLLOWING TEST PROTOCOLS:

- A.) WATERTIGHTNESS TESTING BY FILLING THE MANHOLE WITH WATER. THE CONTRACTOR SHALL ENSURE THAT THE DROP IN WATER LEVEL FOLLOWING PRESOAKING DOES NOT EXCEED 0.0034 OF TOTAL MANHOLE VOLUME PER HOUR

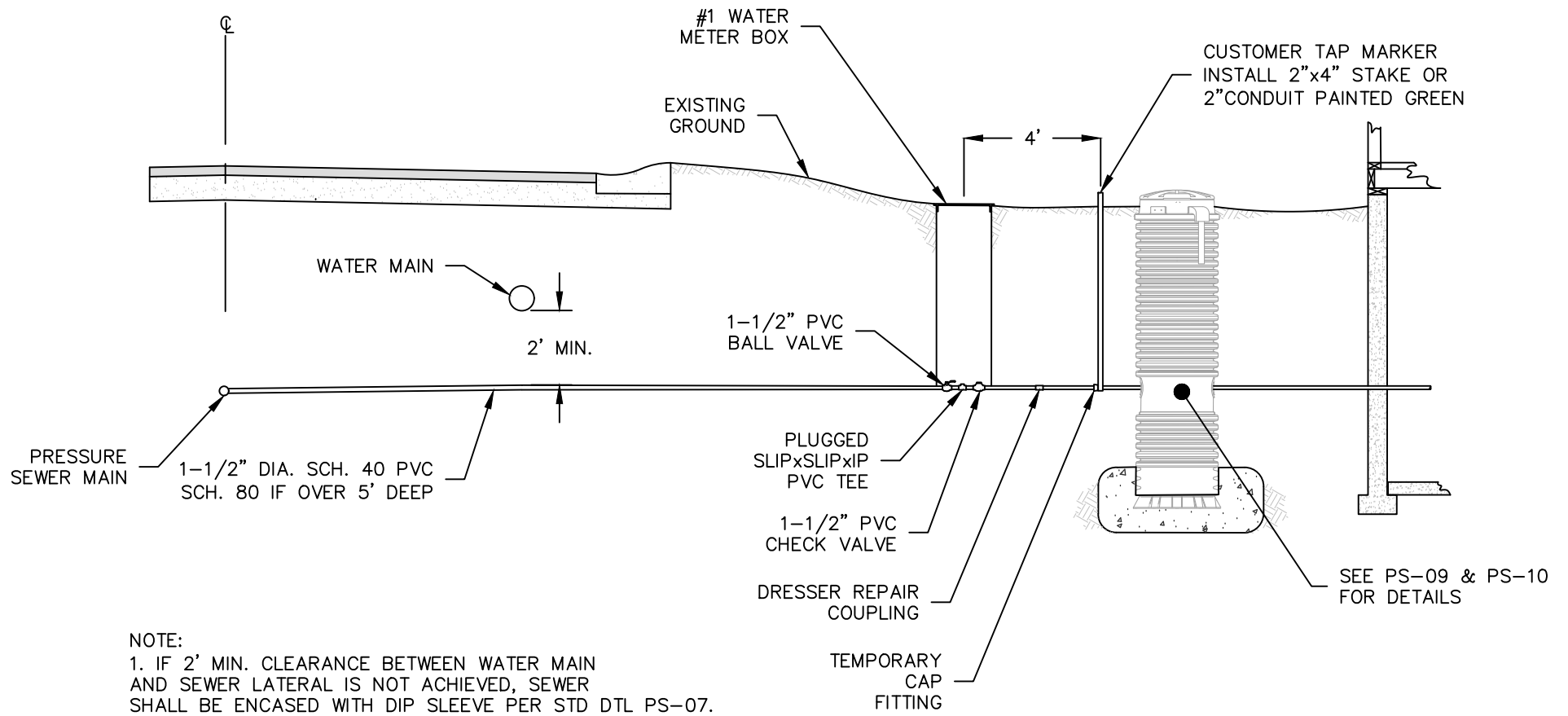
- B.) NEGATIVE AIR PRESSURE TESTING USING THE "STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY NEGATIVE AIR PRESSURE" (VACUUM) TEST, C1244-02e1 (2002), PUBLISHED BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS. THIS MATERIAL IS INCORPORATED BY REFERENCE & DOES NOT INCLUDE ANY LATER AMENDMENTS OR EDITIONS OF THE INCORPORATED MATERIAL, & MAY BE VIEWED AT THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY, 1110 W. WASHINGTON, PHOENIX, AZ. 85007, OR OBTAINED FROM THE AMERICAN SOCIETY FOR TESTING & MATERIALS INTERNATIONAL, 100 BAR HARBOR DRIVE, WEST CONSHOHOCKEN, PA. 19428-2959.

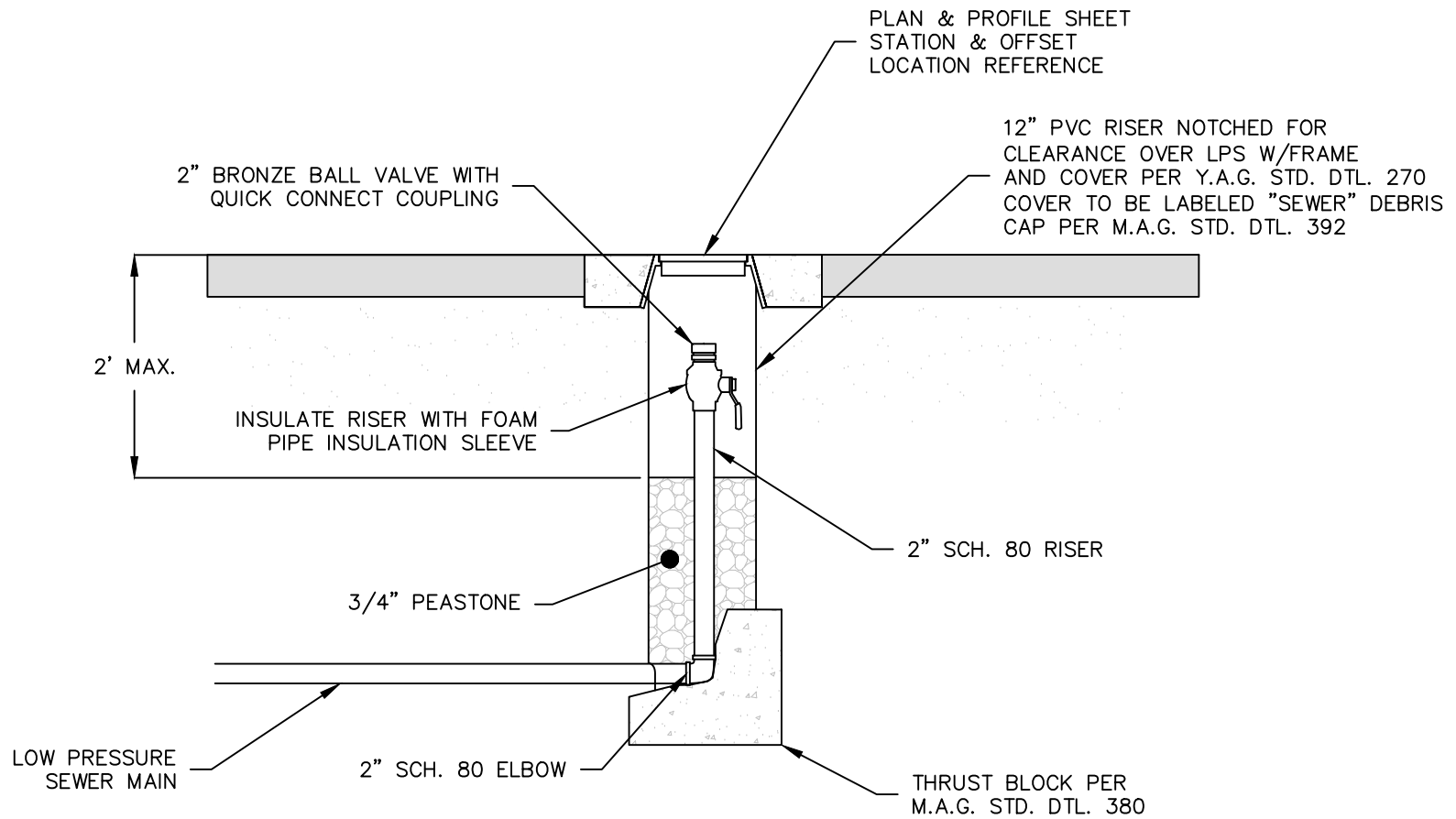
Chapter 4 – ICRSD Details

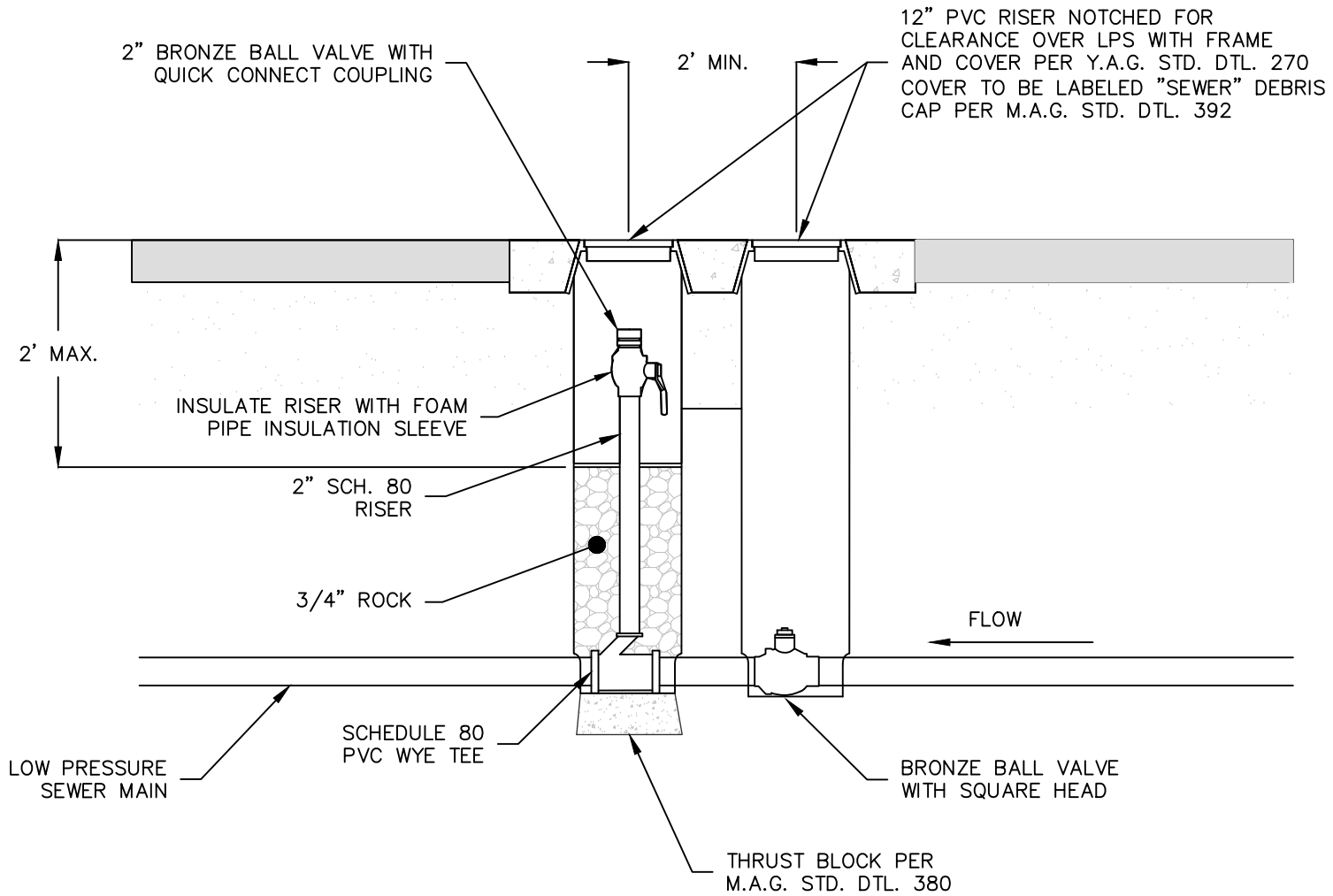


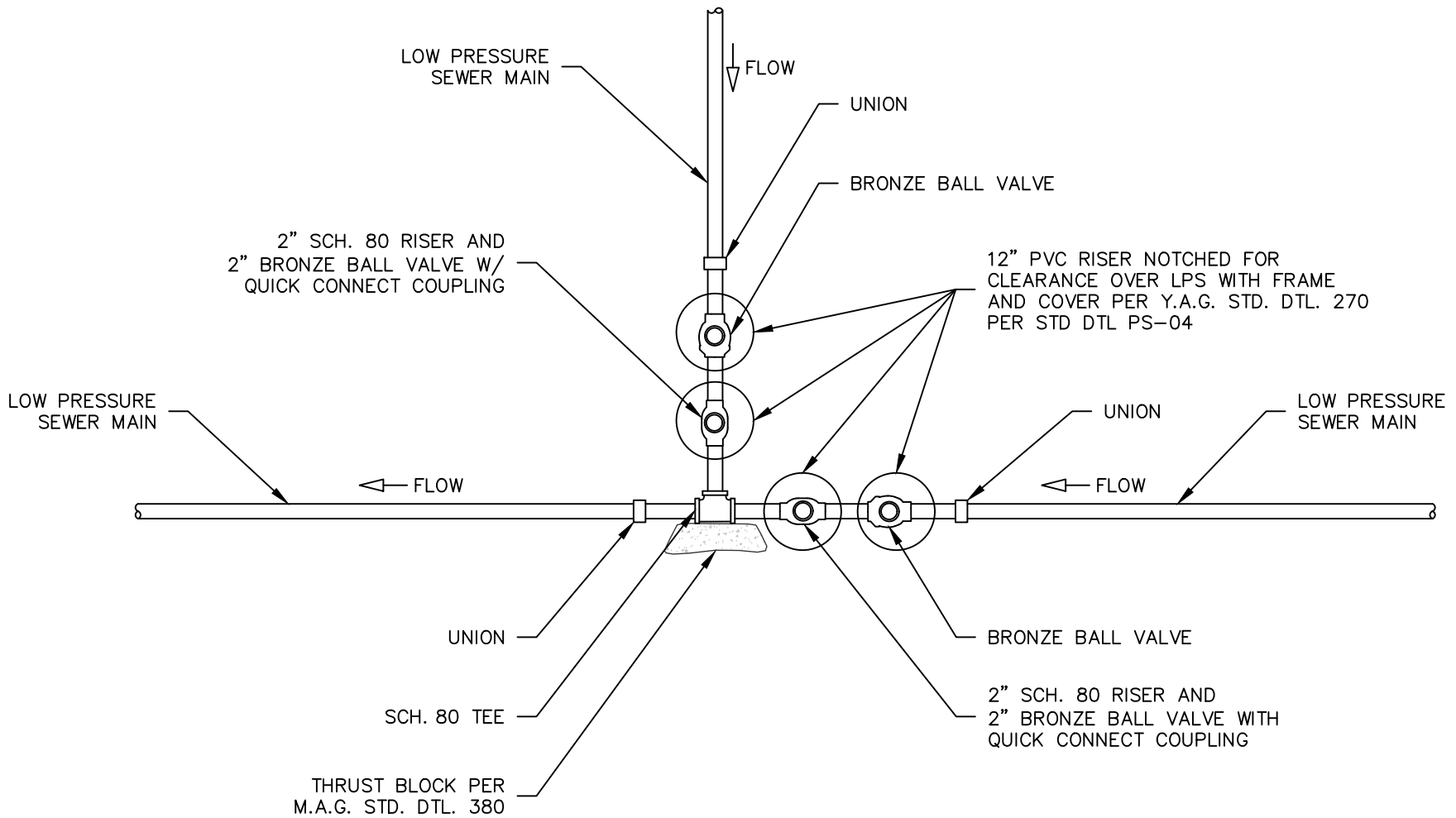
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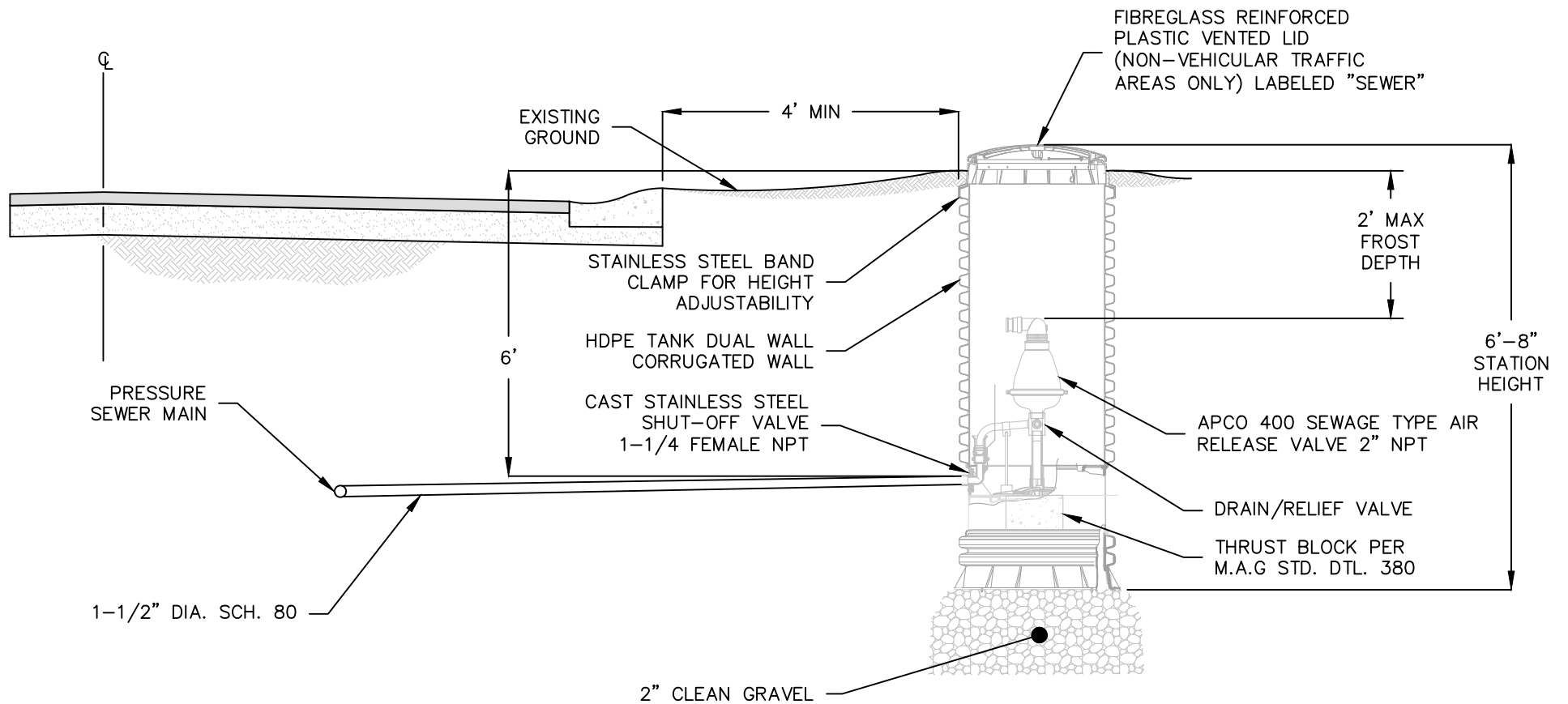
1. WATER AND SEWER MAIN SIZES VARY. SEE PLANS FOR DETAILS.
2. WATER AND SEWER MAIN LOCATIONS RELATIVE TO THE CENTERLINE SHOWN ON DETAIL ARE TYPICAL. SOME ROADS MAY HAVE THE WATER AND SEWER MAIN LOCATED ON OPPOSITE SIDES OF THE CENTERLINE. SEE PLAN SHEETS FOR WATER AND SEWER MAIN LOCATIONS RELATIVE TO THE CENTERLINE.
3. HORIZONTAL WATER AND SEWER MAIN LOCATIONS RELATIVE TO THE CENTERLINE AT CUL-DE-SACS VARY FROM THE DETAIL SHOWN. SEE PLAN SHEETS FOR WATER AND SEWER MAIN LOCATIONS AT CUL-DE-SACS.
4. WATER MAIN AND SEWER MAIN DEPTHS SHOWN ARE FROM FINISHED PAVED SURFACE AND ARE TYPICAL. WATER AND SEWER MAIN DEPTHS MAY VARY AT CULVERT LOCATIONS, INTERSECTIONS, OR OTHER POINTS OF CONFLICT. SEE PLANS FOR ADDITIONAL INFORMATION.
5. CONSTRUCT TRENCH FOR WATER AND SEWER MAIN PER DETAIL SHEET.

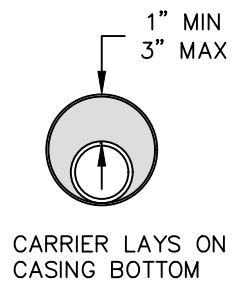
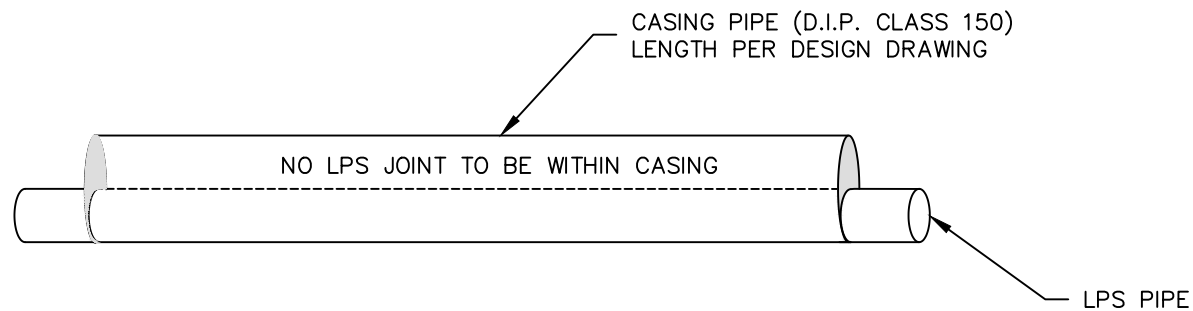






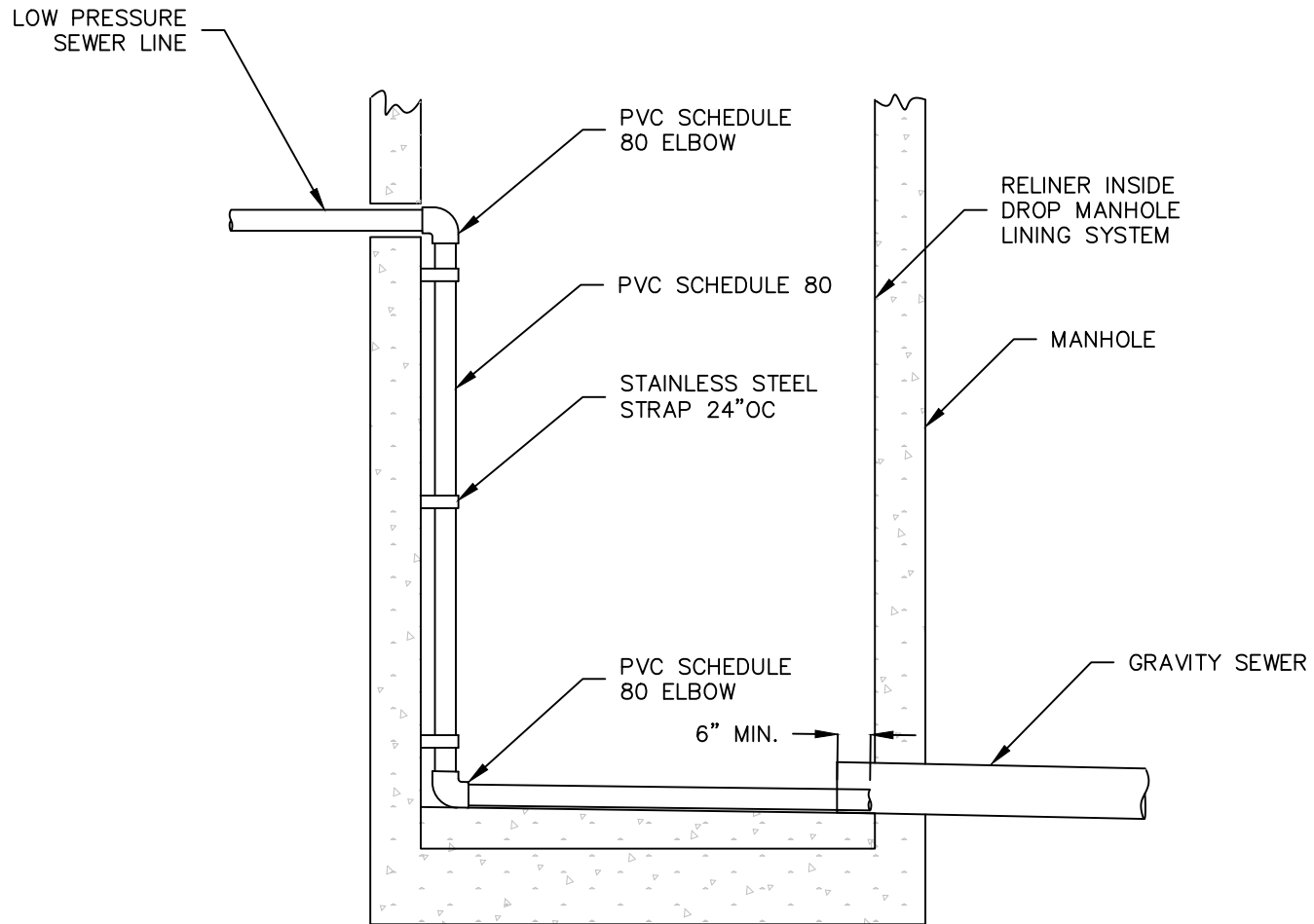






NOTE:

1. SEAL ANNULAR SPACE AT BOTH ENDS WITH POLYURETHANE GROUT AND CASING END SEALS.
2. MINIMUM DR RATING FOR PRESSURE APPLICATION IS 17.0
3. VERTICAL SEPERATION PER M.A.G. 404-1,& 404-2.



NOTE:
 1. BUILDING TO PUMP ASSEMBLY
 DISTANCE MAY REQUIRE ADDITIONAL
 SEPARATION TO AVOID STRUCTURAL
 BEARING LOAD ON ASSEMBLY.

