ENGINEERING CONSTRUCTION PLANS FOR

OSTEOMED CORPORATION

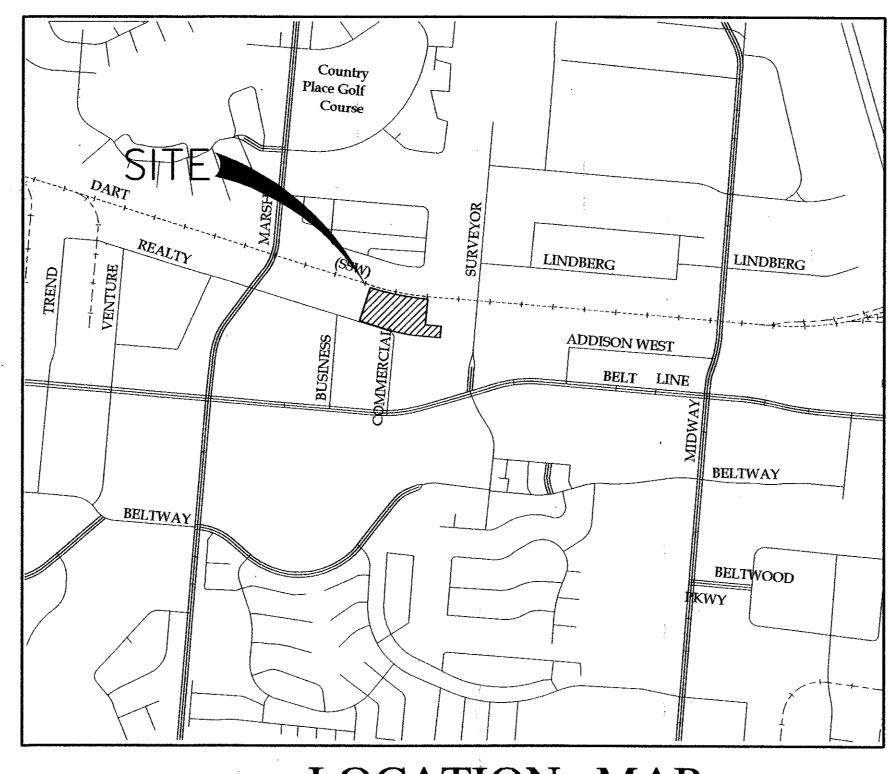
GRADING, PAVING AND DRAINAGE IMPROVEMENTS THE TOWN OF ADDISON, TEXAS

OWNER

OSTEOMED CORPORATATION 3750 REALTY ROAD ADDISON, TX 75001

ENGINEER

HALFF ASSOCIATES, INC. 8616 NORTHWEST PLAZA DR. DALLAS, TX. 75225 (214) 346-6200 CONTACT: DENNIS J. CHOVAN, P.E.



LOCATION MAP NOT TO SCALE



ENGINEERS . ARCHITECTS . SCIENTISTS . PLANNERS . SURVEYORS 8616 NORTHWEST PLAZA DRIVE

* PREPARED BY SMR LANDSCAPE ARCHITECTURE

SHEET INDEX

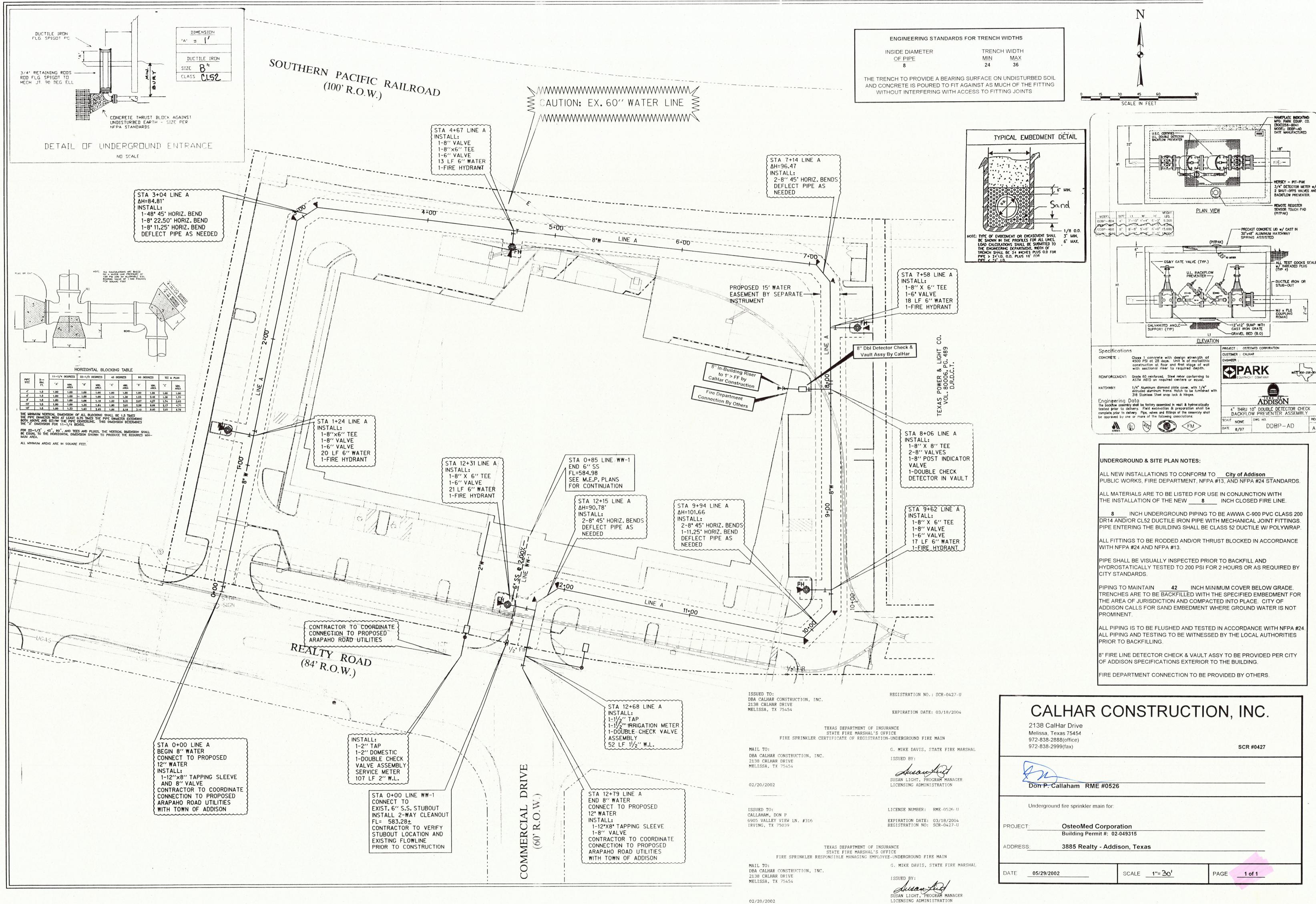
COVER SHEET EROSION CONTROL PLAN C1.2 EROSION CONTROL NOTES AND DETAILS EROSION CONTROL NOTES EROSION CONTROL NOTES DRAINAGE AREA MAP C3.2 GRADING PLAN C4.1 PAVING AND DIMENSIONAL CONTROL PLAN C4.2 PAVING AND DIMENSIONAL CONTROL DETAILS STORM DRAINAGE CALCULATIONS STORM DRAINAGE PLAN STORM DRAINAGE PROFILES C5.3 C5.4 STORM DRAINAGE DETAILS WATER AND WASTEWATER PLAN C6.1 * L1.1 LANDSCAPE PLAN * L1.2 LANDSCAPE SPECIFICATIONS * L1.3 IRRIGATION SPECIFICATIONS

"AS-BUILT PLAN BASED ON CONTRACTOR'S RECORD DRAWINGS"

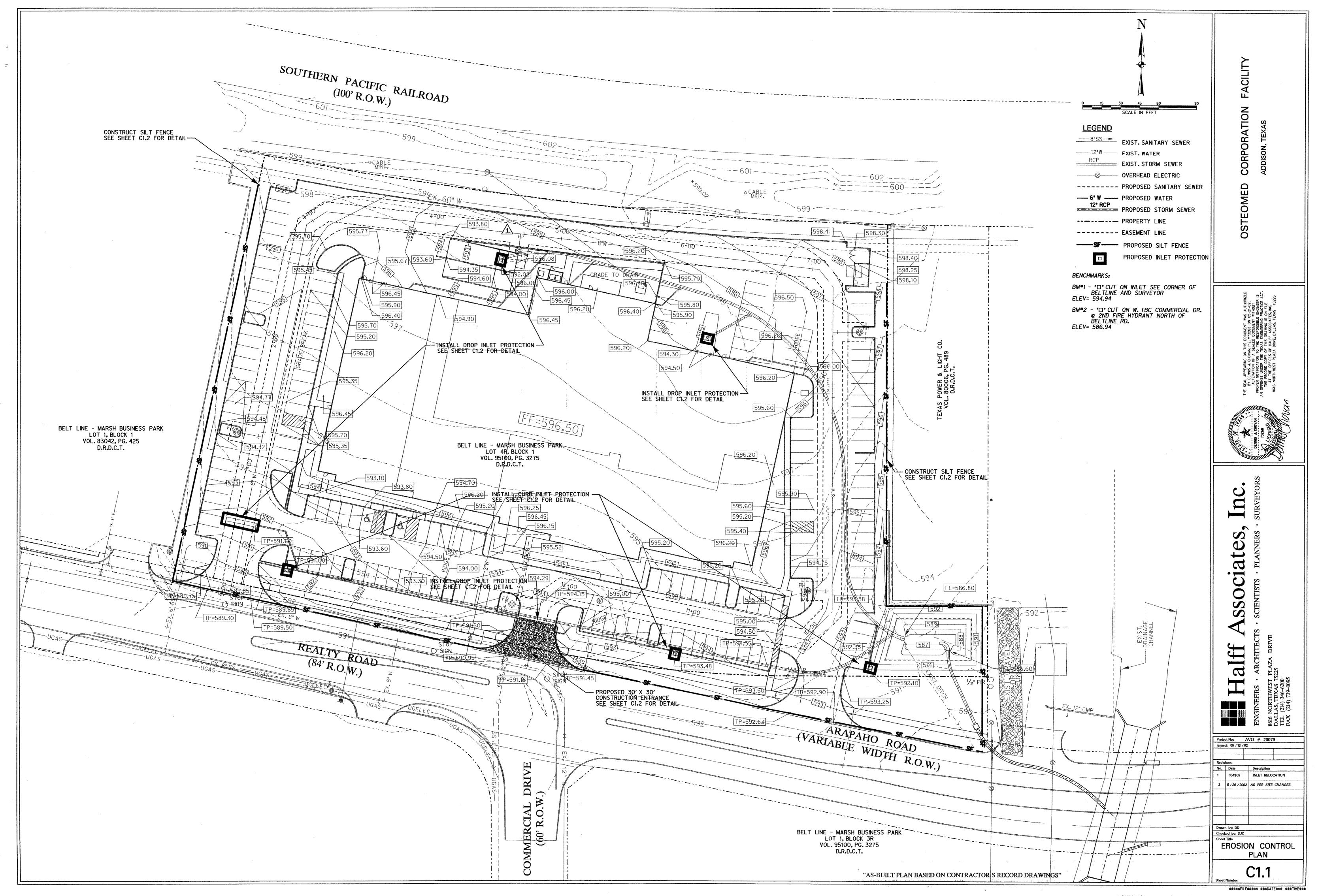
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SIDE SLOPE 2:1 OR FLATTER CONCENTRATED FLOW (NOT FOR USE IN PERIMETER PROTECTION) - 3 TO 4 INCHES CROSS SECTION **WOVEN WIRE** SHEATHING OPEN GRADED ROCK: 4-8" DIAMETER-STREAM FLOW 3-5" DIAMETER-OTHER CONDITIONS ISOMETRIC VIEW

GETTING INTO THE STREET SITE DEPTH < 150 FT FROM **ENTRANCE** L=50 FT FOR SITE DEPTH > 150 FT FROM ENTRANCE = 5' MIN. W=WIDTH AT POINT TRANSITION TO ROADWAY GRADE TO DRAIN AWAY FROM STABILIZATION AND PAVED ENTRANCE R.O.W.

> TEMPORARY CONSTRUCTION ENTRANCE DETAIL NTS

PLAN VIEW

GENERAL NOTES

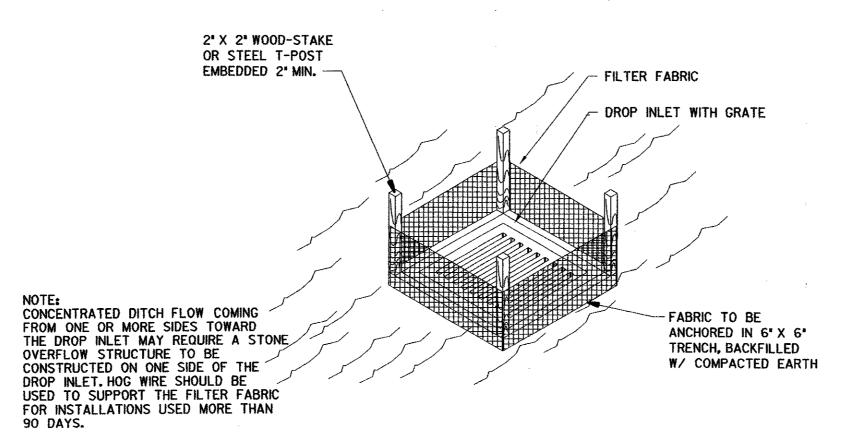
- 1. IT IS THE INTENT OF THE INFORMATION PROVIDED ON THIS SHEET AND WITHIN THE SPECIFICATIONS TO BE USED AS THE GENERAL GUIDELINES OF THE STORM WATER POLLUTION PREVENTION PLAN FOR THIS PROJECT TO ESTABLISH A MINIMUM BASIS COMPLIANCE WITH FEDERAL REGULATIONS.

 E CONTRACTOR SHALL PREPARE THE STORM WATER POLLUTION PREVENTION PLAN

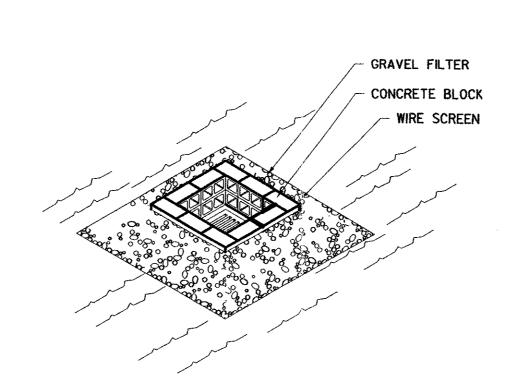
 ID BE SOLELY RESPONSIBLE FOR ITS IMPLEMENTATION.

 E STORM WATER POLLUTION PREVENTION PLAN SHALL MEET THE REQUIREMENTS

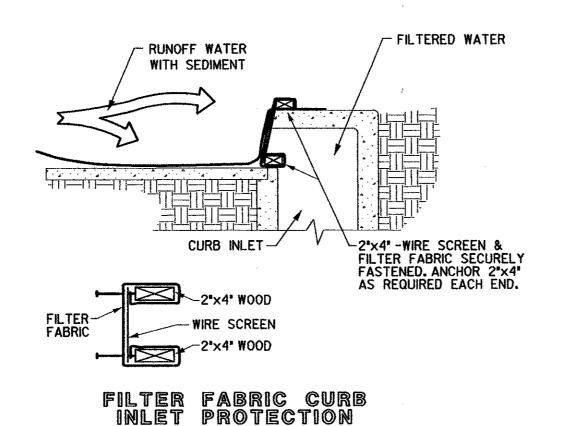
 T FORTH IN THE ENVIRONMENTAL PROTECTION AGENCY'S (EPA) NPDES GENERAL PERMITS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES' PUBLISHED IN THE SEPTEMBER 9, 1992 FEDERAL REGISTER.
- 2. THE STORM WATER POLLUTION PREVENTION PLAN SHOULD ADDRESS THREE GOALS: A) DIVERSION OF UPSLOPE WATER AROUND DISTURBED AREAS OF THE SITE;
 B) LIMIT THE EXPOSURE OF DISTURBED AREAS TO THE SHORTEST DURATION POSSIBLE: AND C) REMOVAL OF SEDIMENT FROM STORM WATER BEFORE IT LEAVES THE SITE.
- 3. THE CONTRACTOR SHALL MAKE THE STORM WATER POLLUTION PREVENTION PLAN AVAILABLE, UPON REQUEST, TO EPA
- 4. THE CONTRACTOR MUST AMEND PLANS WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE PLAN, OR WHEN THE EXISTING PLAN PROVES INEFFECTIVE. MODIFICATIONS INCLUDING DESIGN AND ALL ADDITIONAL MATERIALS AND WORK SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
- 5. STABILIZATION MEASURES ARE TO BE INSPECTED AT A MINIMUM OF ONCE EVERY 7 DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES. REPAIRS AND INADEQUACIES REVEALED BY THE INSPECTION MUST BE IMPLEMENTED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION.
- 6. AN INSPECTION REPORT THAT SUMMARIZES INSPECTION ACTIVITIES AND IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN SHALL BE RETAINED AND MADE PART OF THE PLAN.
- 7. ALL CONTRACTORS AND SUBCONTRACTORS IDENTIFIED IN THE PLAN MUST CERTIFY AS TO AN UNDERSTANDING OF THE NPDES GENERAL PERMIT BEFORE CONDUCTING ANY ACTIVITY IDENTIFIED IN THE POLLUTION PREVENTION PLAN.
- 8. THE CONTRACTOR SHALL ADOPT APPROPRIATE CONSTRUCTION SITE MANAGEMENT PRACTICES TO PREVENT THE DISCHARGE OF OILS, GREASE, PAINTS, GASOLINE, AND OTHER POLLUTANTS TO STORM WATER. APPROPRIATE PRACTICES CAN INCLUDE:
 - DESIGNATING AREAS FOR EQUIPMENT MAINTENANCE AND REPAIR; REGULAR COLLECTION OF WASTES; CONVENIENTLY LOCATED WASTE RECEPTACLES; AND DESIGNATING AND CONTROLLING EQUIPMENT WASHDOWN.
- 9. THE CONTRACTOR SHALL AMEND OR MODIFY THIS PLAN AS REQUIRED BY CONSTRUCTION MEANS, METHODS AND SEQUENCE. MODIFICATIONS SHALL NOT COMPROMISE THE INTENT OF THE REQUIREMENTS OF THE LAW AND THIS PLAN. MODIFICATIONS SHALL NOT BE BASIS FOR ADDITIONAL COST TO THE OWNER.
- 10. AREAS OF CONSTRUCTION ELSEWHERE ON THE JOBSITE SHALL CONFORM TO THE DETAILS SHOWN ON THE PLANS.
- 11. BORROW AREAS, IF EXCAVATED, SHALL BE PROTECTED AND STABILIZED UTILIZING THE PLAN DETAILS. ALL WORK SHALL CONFORM TO GOVERNMENTAL REQUIREMENTS AND BECOME PART OF THE STORM WATER POLLUTION PREVENTION PLAN (SWP3). THE OWNER SHALL BE DONE BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO
- 12. ALL NON-PAVED AREAS SHALL BE MULCHED AND SEEDED WITH EROSION PROTECTION IMMEDIATELY UPON COMPLETION OF FINAL GRADING. THIS INCLUDES ALL DITCHES AND EMBANKMENTS. THE CONTRACTOR SHALL MAINTAIN FINAL GRADING AND KEEP SEEDED AREAS WATERED UNTIL FULLY ESTABLISHED AND ACCEPTED BY OWNER.
- 13. THE CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION EXIT AT ALL TRAFFIC EXIT POINTS PRIOR TO EXITING ONTO ANY PAVED ROADWAY. EXIT SHALL BE CONSTRUCTED AS DETAILED THIS SHEET.
- 14. THE CONTRACTOR SHALL CONSTRUCT A SILT FENCE (SF)
 AT ALL LOCATIONS SHOWN ON PLANS. THE SF SHALL BE CONSTRUCTED
- 15. THE CONTRACTOR SHALL DESIGNATE MATERIAL AND EQUIPMENT STORAGE AREAS MUTUALLY AGREED TO BY OWNER. THE STORAGE AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE AND THE SURFACE STABILIZED WITH A MINIMUM OF 2 INCHES OF CRUSHED ROCK OR GRAVEL. REINFORCED FILTER BARRIER SHALL BE INSTALLED AROUND THE STORAGE AREAS TO PREVENT ANY EROSION FROM LEAVING THE SITE.
- 16. THIS DRAWING FOR ROUGH GRADING ONLY.
- 17. THIS IS NOT A STORMWATER POLLUTION PLAN, FOR USE IN PREPARATION OF SWP3 ONLY.



FILTER FABRIC DROP INLET PROTECTION NTS



BLOCK AND GRAVEL DROP INLET PROTECTION

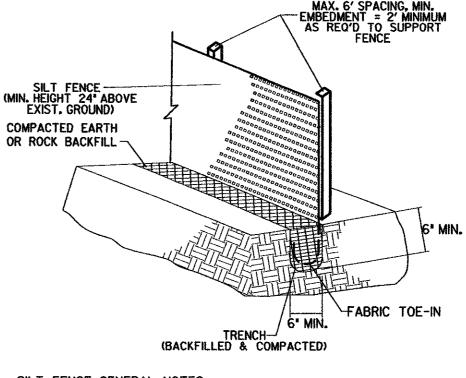


SCALE: N.T.S.

GENERAL NOTES:

- 1. WOVEN FABRIC SANDBAGS FILLED WITH COARSE SAND (MINIMUM WEIGHT 40 LBS.) MAY BE USED INSTEAD OF STAKES FOR PAVED AREAS. STRENGTHEN THE STABILITY OF HAY BALES IN NON-PAVED AREAS. AT LEAST TWO (2) ROWS OF SAND BAGS SHALL BE UTILIZED FOR A MINIMUM ADDITIONAL HEIGHT OF 12 INCHES.
- 2. WHEN SILT REACHES A DEPTH OF 6 INCHES, IT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

- SANDBAGS MAY BE USED OPTIONALLY IN CONJUNCTION WITH STAKES, TO



SILT FENCE GENERAL NOTES:

- 1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED WITH A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
- 2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
- 3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
- 4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHALL BE A 6" DOUBLE OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
- 5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
- 6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
- 7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

GENERAL NOTES:

- 1. WOVEN WIRE SHEATHING SHALL HAVE MAXIMUM OPENING OF ONE (1) INCH AND A MINIMUM WIRE SIZE OF 20 GAUGE AND SHALL BE SECURED WITH SHOAT RINGS.
- 2. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION PROPERLY.
- 3. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
- 4. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

"AS-BUILT PLAN BASED ON CONTRACTOR'S RECORD DRAWINGS"

Project No: AVO # 20079 Issued: 05 /13 /02 No. Date

Drawn by: DD Checked by: DJC **EROSION**

CONTROL NOTES

Large volumes of solid waste are often generated at construction sites including: packaging, pallets, wood waste, concrete waste, soil, electrical wiring, cuttings, and a variety of other materials. The solid waste management

Solid Waste Management

practice lists techniques to minimize the potential of storm water contamination from solid waster through appropriate storage and disposal practices.

These practices should be a part of all construction practices. By limiting the trash and debris on site, storm water quality is improved along with reduced clean up requirements at the completion of the project.

The solid waste management practice for construction sites is based on proper storage and disposal practices by construction workers and supervisors. key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the recommendations and procedures are followed. Following are lists describing the targeted materials and recommended procedures:

□Targeted Solid Waste Materials Paper and cardboard containers Plastic packaging Styrofoam packing and forms Insulation materials (non-hazardous) Wood pallets Wood cuttings Pipe and electrical cuttings Concrete, brick, and mortar waste Shingle cuttings and waste Roofing tar Steel (cuttings, nails, rust residue) Gypsum board cuttings and waste Sheathing cuttings and waste Miscellaneous cutting and waste Food waste Demolition waste

Storage Procedures

□ Wherever possible, minimize production of solid waste materials. Designate a foreman or supervisor to oversee and enforce proper solid waste procedures. ☐ Instruct construction workers in proper solid waste procedures. Degregate potentially hazardous waste from non-hazardous construction site debris. □ Keep solid waste materials under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff. ☐ Store waster materials away from drainage ditches, swales and catch basins. Do not allow trash containers to overflow. Do not allow waste materials to accumulate on the ground.

□ Prohibit littering by workers and visitors. DPolice site daily for litter and debris. ☐ Enforce solid waste handling and storage procedures.

silt fence to remove debris.

□ If feasible, segregate recyclable wastes from non-recyclable waste materials and dispose of properly. General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill). □ Use waste facilities approved by local jurisdiction. DRunoff which comes into contact with unprotected waste shall be directed into structural treatment such as

□ Educate all workers on solid waste storage and disposal procedures. ☐ Instruct workers in identification of solid waste and hazardous waste. DHave regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety

Quality Control

□ Foreman and/or construction supervisor shall monitor on-site solid waste storage and disposal procedures. Discipline workers who repeatedly violate procedures.

□ Job-site waste handling and disposal education and awareness program. □ Commitment by management to implement and enforce Solid Waste Management Program. □ Compliance by workers. □ Sufficient and appropriate waste storage containers. ☐ Timely removal of stored solid waste materials. □ Possible modest cost impact for additional waste storage containers. □ Small cost impact for training and monitoring.

Clearly mark on all solid waste containers which materials are acceptable.

LIMITATIONS

Minimal overall cost impact.

Only address non-hazardous solid waste. One part of a comprehensive construction site management program. Hazardous Waste Management

The hazardous waste management BMP addresses the problem of storm water polluted with hazardous waste through spills or other forms of contact. The objective of the Management Program is to minimize the potential of stormwater contamination from common construction site hazardous wastes through appropriate recognition, handling, storage and disposal practices.

It is not the intent of this Management Program to supersede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Suspected job-site contamination should be immediately reported by regulatory authorities and protective actions taken. The General Permit requires reporting of significant spills to the National Response Center (NRC) at (800) 424-8802.

PRIMARY USE

These management practices along with applicable OSHA and EPA guidelines should be incorporated at all construction sites which use or generate hazardous wastes. Many wastes such as fuel, oil, grease, fertilizer and pesticide are present at most construction sites.

INSTALLATION, APPLICATION AND DISPOSAL CRITERIA

The hazardous waste management techniques presented here are based on proper recognition, handling, and disposal practices by construction workers and supervisors. Key elements of the management program are education, proper disposal practices, as well as provisions for safe storage and disposal. Following are lists describing the targeted materials and recommended procedures:

☐ Targeted Hazardous Waste Materials

Paints Solvents Stains Wood preservatives Cutting oils Greases Roofing tar Pesticides Fuels & lube oils

Lead based paints (Demolition) Storage Procedures

□ Wherever possible, minimize production of hazardous materials. ☐ Minimize generation of hazardous wastes on the job-site. □ Segregate potentially hazardous waste from non-hazardous construction site debris. Designate a foreman or supervisor to oversee hazardous materials handling procedures. DKeep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under

☐ Store waste materials away from drainage ditches, swales and catch basins. Use containment berms in fueling and maintenance areas and where the potential for spills is high. □Ensure that adequate hazardous waste storage volume is available. □ Ensure that hazardous waste collection containers are conveniently located. Do not allow potentially hazardous materials to accumulate on the ground. □ Enforce hazardous waste handling and disposal procedures. DClearly mark on all hazardous waste containers which materials are acceptable for the container.

Regularly schedule hazardous waste removal to minimize on-site storage.

Education

☐ Use only reputable, licensed hazardous waste haulers.

□ Instruct workers in identification of hazardous waste. DEducate workers on potential dangers to humans and the environment from hazardous wastes.

☐ Instruct workers on safety procedures for common construction site hazardous wastes. □ Educate all workers on hazardous waste storage and disposal procedres. Have regular meetings to discuss and reinforce identification, handling and disposal procedures (incorporate in regular safety seminars).

☐ Establish a continuing education program to indoctrinate new employees.

Quality Assurance

DForeman and/or construction supervisor shall monitor on-site hazardous waste storage and disposal DEducate and if necessary, discipline workers who violate procedures. DEnsure that the hazardous waste disposal contractor is reputable and licensed.

□ Job-site hazardous waste handling and disposal education and awareness program. Commitment by management to implement hazardous waste management practices. □ Compliance by workers.

□ Sufficient and appropriate hazardous waste storage containers. Timely removal of stored hazardous waste materials. □ Possible modest cost impact for additional hazardous storage containers.

□ Small cost impact for training and monitoring. DPotential cost impact for hazardous waste collection and disposal by licensed hauler - actual cost depends on type of material and volume.

This practice is not intended to address site-assessments and pre-existing contamination. Major contamination, large spills and other serious hazardous waste incidents require immediate response from Demolition activities and potential pre-existing materials, such as asbestos, are not addressed by this program. Site

specific information on plans is necessary. Contaminated soils are not addressed. One part of a comprehensive construction site waste management program. Lime Stabilization BMP

Lime stabilization is used extensively in the North Central Texas region to stabilize pavement subbases for roadways/parking lots and other paved surfaces. Hydrated lime is applied to the soil and mixed through disking and other techniques, then allowed to cure. This practice will reduce the potential for runoff to carry lime offsite, where it may impact aquatic life through changing the pH balance of streams, ponds and other water bodies.

This BMP consists of a series of techniques that should be implemented when lime is required for soil stabilization.

Each of the techniques listed can be used under a variety of conditions. The engineer should determine the applicability of the technique based on site conditions such as available open space, quantity of area to be stabilized, proximity of nearby water courses and other BMP's employed at the site. The use of diversion dikes and interceptor swales (see appropriate fact sheets) to divert runoff away from areas to be stabilized can be used in conjunction with these techniques to reduce the impact of the lime.

DESIGN CRITERIA

☐ The contractor shall limit lime operations to that which can be thoroughly mixed and compacted by the end of each work day. □ No traffic other than water trucks and mixing equipment shall be allowed to pass over the spread lime until after completion of mixing.

reduce runoff velocity. Geotextile fabrics such as those used for silt fence should not be used to address lime since the grain size of lime is significantly smaller than the equivalent opening size of the fabric.

☐ For areas which phasing of lime operations is impractical, use of a curing seal such as Liquid Asphalt, Grade MC-250 or MC-800 applied at a rate of 0.15 gallons per square yard of surface can be used to

Areas adjacent and downstream of stabilized areas shall be roughened to intercept lime from runoff and

□Use of sediment basins with a significant (>36 hour) drawdown time is encouraged for large stabilized areas (see Sediment Basin BMP).

Lime Stabilization BMP

These techniques are part of an overall plan to reduce pollutants from an active construction site. In the case of pollution due to lime, prevention of contamination is the only effective method to address this pollutant. Proper application and mixing along with avoiding applications when there is a significant probability of rain will reduce

MAINTENANCE REQUIREMENTS

Concrete Waste Management

Concrete waste at construction sites comes in two forms; 1) excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition. Both forms have the potential to impact water quality through storm water runoff contact with the waste.

PRIMARY USE Concrete waste is present at most construction sites. This BMP should be utilized at sites in which concrete waste is

concrete waste.

demolition activities.

Requirements

APPLICATIONS A number of water quality parameters can be affected by introduction of concrete - especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregate dust are also generated from both fresh and demolished concrete waste.

Current Unacceptable Waste Concrete Disposal Practices Dumping in vacant areas on the job-site. □ Illicit dumping off-jobsite. Dumping into ditches or drainage facilities.

□Use pre-determined disposal sites for waste concrete.

Recommended Disposal Practices □ Avoid unacceptable disposal practices listed above. Develop pre-determined, safe concrete disposal areas. Provide a washout area with a minimum of 6 cubit feet of containment area volume for every 10 cubic yards of concrete poured.

□ Never dump waste concrete illicitly or without property owners knowledge and consent.

Treat runoff from storage areas through the use of structural controls as required. Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).

The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.

□ Employees violating disposal or equipment cleaning directives must be re-educated or disciplined if

□Supervisors must be made aware of the potential environmental consequences of improperly handled

Demolition Practices □ Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface □ Where appropriate, construct sediment traps or other types of sediment detention devices downstream of

□ Prohibit dumping waste concrete anywhere but pre-determined areas. □ Assign pre-determined truck and equipment washing areas. □ Educate drivers and operators on proper disposal and equipment cleaning procedures. □Minimal cost impact for training and monitoring.

□ Concrete disposal cost depends on availability and distance to suitable disposal areas. □ Additional costs involved in equipment washing could be significant.

LIMITATIONS This concrete waste management program is one part of a comprehensive construction site waste management

"AS-BUILT PLAN BASED ON CONTRACTOR'S RECORD DRAWINGS"

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EROSION CONTROL NOTES

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I. INTRODUCTION

This storm water pollution prevention information has been prepared to assist the contractor in preparing a storm water pollution prevention plan (SWPPP) for construction activities for Lot 4R, Block 1, Belt Line - Marsh Business Park. The information includes elements necessary for compliance with the nationwide general permit for construction activities administered by the Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System (NPDES) program.

The purpose of this information is to provide guidelines for preventing soil and pollutants that originate on the site from flowing into natural surface water bodies. The contractor's SWPPP shall terminate as soon as completed construction area is finally stabilized as defined in Part VII of this document.

According to Clayton Napier from the United States Department of the Interior Fish and Wildlife Service, there are two species indigenous to Denton County that should be noted. The blackcapped vireo and the interior least tern are federally listed as endangered and threatened, respectively

The nationwide general permit for construction activities provides for each of the following types of non-storm water discharges, which are anticipated at this project.

- Water used to wash vehicles or control dust.
- 2. Potable water sources, such as flushing new water distribution pipes.

A Storm Water Pollution Prevention Plan must be implemented and accommodate the different stages of development and comply with all known local and state sanitary, septic and erosion/sedimentation requirements.

The storm water management controls included on this sheet focus on providing control of pollutant discharges with practical approaches that utilize readily available techniques, expertise, materials and equipment.

II. SITE EVALUATION AND DESIGN

SITE INFORMATION

This project is being constructed on material consisting of CH clay and CL calcareous clay. This material overlies the Austin Chalk Formation, which consists of gray, hard, chalky limestone interbedded with thinner beds of calcareous shale, according to the Geotechnical Investigation prepared by Reed Engineering Group. Since information was not available on quality of runoff from the site, information regarding quality is not included. The name of the receiving body of water for the site is Rawhide Creek.

SITE PLAN DESIGN

Site grading was designed to match grades on the adjacent streets, while trying to match the amount of fill to the amount of cut on the site. Once the grades connecting the site to the streets were determined, grades over the site area, as well as the finished floor of the future building pads, were determined by trying to minimize the amount total cut and fill required to achieve the desired grades. Visual inspection found no evidence of wetlands at this site. Storm water runoff will leave the site in an underground, reinforced concrete pipe storm sewer system. All slopes on site were designed to be no greater than a four to one to protect the stability of the slopes. Silt fences were designed to be constructed on the down slope boundaries of the site to eliminate the loss of as much erodible soil as possible.

The planned project, also known as Osteomed, consists of a future office/manufacturing building. The soil disturbing activities which will be taking place during the current phase of construction of this facility are: clearing, excavation, stockpiling, rough grading, drainage utility installation, and seeding and planting.

POLLUTION PREVENTION SITE MAP The Contractor shall prepare an Erosion Control Plan. This plan shall show the areas of soil that will be disturbed during construction, as well as the mechanisms that will be used to combat erosion. Filter fabric will be used at proposed and existing curb inlets to keep sediment from entering the storm sewer system. The silt fence around the site, as previously mentioned, will keep runoff from the site from carrying soil away. Most drainage will leave the site in the underground storm sewer system discharge into the existing natural channel to the northwest. Some areas will drain to the existing adjacent city streets where runoff will be collected in the public inlet and storm sewer systems.

III. SITE ASSESSMENT

The area to be disturbed covers an area of approximately 4.3 acres. The drainage areas can be seen on sheet C2.1 in the engineering site plan package. The runoff coefficient for the developed site has been determined to be 0.90 as per the Town of Addison "Drainage Criteria Manual".

IV. CONTROL DESIGN

EROSION AND SEDIMENT CONTROLS

The EPA requires that areas of the construction site that were disturbed in the past but will not be redisturbed for 21 days or more be stabilized by the 14th day after the last disturbance. Temporary seeding/permanent seeding/mulching should be used to stabilize these disturbed areas

A silt fence, as previously mentioned, should be constructed. This device is described in detail on sheet Cl.2 in this set. Lime stabilization may also be used to prevent erosion.

OTHER CONTROLS

It is the responsibility of the operator to identify and prevent contamination of non-storm water discharges using controls that may or may not be given in this set. All solid construction site waste materials will be collected in containers. The containers will be emptied periodically and trucked away from the site. Methods of concrete waste management, solid waste management, and hazardous waste management can be found on sheet C1.3 in this set.

A stabilized construction entrance and vehicle washing racks will be installed to alleviate tracking of site soil off the site. This construction entrance described on sheet C1.2 in this set.

INSPECTION AND MAINTENANCE OF CONTROLS

Each control element should be inspected once every seven days, using the inspection form similar to the one on this sheet. Always inspect each element after rain storms greater than 0.5 inches in depth.

If the silt fence becomes clogged, it should be cleaned. If it is impossible to clean, it should be removed and replaced. Soil should not be allowed to collect to above one half of the height of

The void areas in the aggregate in the construction entrance should not be filled with sediment. If this is the case, the aggregate must be washed or replaced. Regrading and top dressing with additional stone will keep the entrance from becoming inefficient.

The filter fabric designed to surround each inlet must be inspected for signs of deterioration. Sediment should be removed from behind fabric if it reaches a depth of six inches.

SEQUENCE OF MAJOR ACTIVITIES

Phase I – site grading Silt fence to be installed and stabilized construction entrance to be constructed. Inlet protection to be installed on all existing inlets

Phase II - site storm drainage and utility installation Entrance, inlet protection, and silt fence to be maintained.

STATE AND LOCAL REQUIREMENTS There are no known state and local requirements which would interfere with or change this storm water pollution prevention information.

V. CERTIFICATION AND NOTIFICATION

CERTIFY THE POLLUTION PREVENTION PLAN A copy of a certification statement, to be signed by the owner and all contractors and subcontractors responsible for implementing measures in the Pollution Prevention Plan appears on this sheet. This form should be duplicated as needed.

NOTICE OF INTENT

Washington, DC 20460

A notice of intent should be submitted to EPA's central processing center postmarked within 48 hours of beginning construction. A NOI form can be obtained from the EPA. The address to send the completed NOI form is:

Storm Water Notice of Intent (4203) USEPA 401 M. Street, SW

VI. CONSTRUCTION AND IMPLEMENTATION

Controls shall be implemented according to procedures listed in the Best Management Practices (BMP) sheets published by the North Central Texas Council of Governments (NCTCOG) on sheet C1.3 in this set.

INSPECT AND MAINTAIN CONTROLS

Based on the results of an inspection, as described above, any necessary modification to the control elements in this plan will be implemented within seven (7) calendar days. The Inspection Reports will be kept on file as part of the Storm Water Pollution Prevention Plan for at least three years from the date that the site is finally stabilized. The Inspection Report will state whether the site was in compliance or identify any incidents of non-compliance. Each report shall be signed, dated, and contain a certification statement as described in accordance with part VI.G. of the NPDES General Permit.

It is the responsibility of the Operator to maintain effective pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more controls than are shown on the Plan. For example, localized concentrations of surface runoff or unusually steep areas could require additional silt fence, or other structural controls. Assessing the need for, and implementing additional controls will be a continuing aspect of the SWPPP until a section has achieved final stabilization.

The SWPPP intends to control water-borne and liquid pollutant discharges by some combination of interception, filtration and containment. Parties implementing the SWPPP must remain alert to the need to periodically refine and update the SWPPP in order to accomplish the intended

MAINTAIN RECORDS OF CONSTRUCTION ACTIVITIES

The operator should keep records of: -Dates when major grading activities occur in a particular area -Dates when construction activities cease in an area, temporarily or permanently -Dates when an area is stabilized, temporarily or permanently

UPDATE/CHANGE PLAN

The SWPPP must accurately reflect site features and operations. When necessary, the SWPPP must be changed to reflect actual conditions. The operator is responsible for changing the SWPPP if it is observed that pollutant discharge from the site is not being minimized.

RELEASES OF REPORTABLE QUANTITIES

EPA has issued regulations found in 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302. that define what Reportable Quantity (RQ) levels are for spills of oil and hazardous substances. In the case of an RQ release during construction, the following steps must be taken: -Notify the National Response Center immediately at (800) 424-8802 -Submit a written description of the release to the EPA Regional office providing the date and circumstances of the release and steps to be taken to prevent another release -Modify the pollution prevention plan to include the above information

PLAN LOCATION AND ACCESS

A copy of the Pollution Prevention Plan must be kept available at the construction site from beginning to final stabilization. All records and reports required by the permit, and all data used to complete the NOI must be retained for 3 years after the completion of site stabilization. These plans must be made available upon request to the Director, and/or the State or local agency who is approving erosion and sediment control plans, or storm water management plans. If site storm water runoff is discharged into a municipal separate storm sewer system, the plans must be made available upon request to the municipal operator of the system.

VII. FINAL STABILIZATION/NOTICE OF TERMINATION

The notice of termination (NOT) will be submitted after final stabilization of the project. Final stabilization occurs when there is a uniform perennial vegetative cover of 70% over the area of the site, or equivalent measures such as rip rap for the areas of the site not covered by permanent structures or pavement. The NOT states that construction activities are complete, the site is stabilized, and no longer has a discharge associated with an industrial or construction activity covered under the permit. Once the permit has been terminated, permittees are relieved of their responsibility. This notice should be sent to the same address listed for the Notice of Intent.

NAME OF OWNER: OSTEOMED CORPORATION ADDRESS: 3750 REALTY ROAD ADDISON, Texas 75001-4311 TELEPHONE NUMBER: (972) 241-3401

The representative of the owner for the above named construction site must be identified and must sign the following certification statement.

Certification Statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system. or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name:	Date:
Title:	
CONTRACTORSUBCONTRACTOR	CERTIFICATION
Name of Contractor or Subcontractor:	
Address:	

Certification Statement:

Type of Construction Service to be Provided:

Telephone Number:

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination Systems (NPDES) permit that authorizes the storm water discharge associated with industrial activity from the

construction site identified as part of thi	s certification.	
Name:	Date:	
Title:		

Inspection Report

DATE:	

TITLE: REASON FOR INSPECTION: Weekly 1/2" Rain (Circle One)

PROJECT NAME:

VIOLATIONS NOTED:

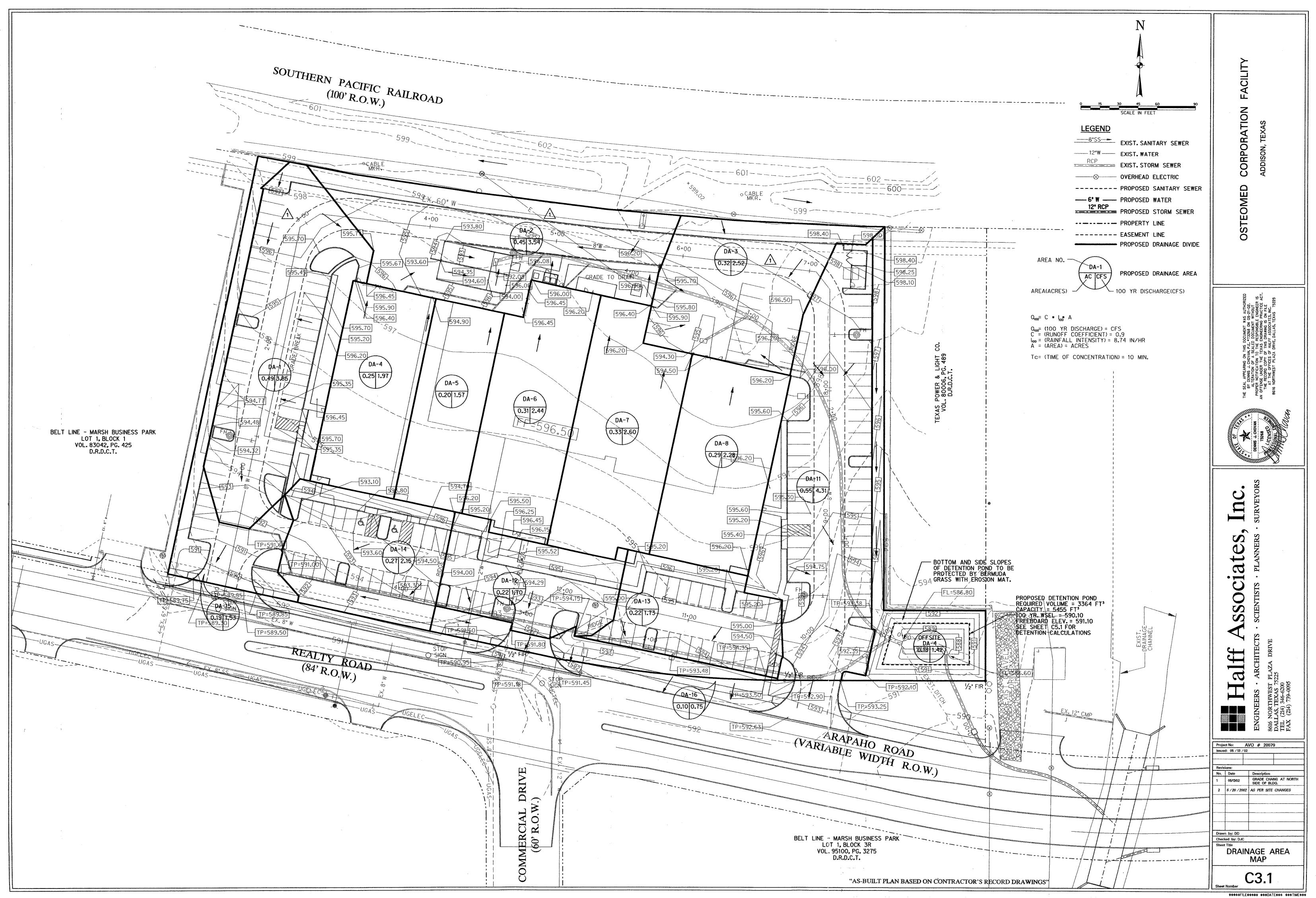
SITE CONDITIONS:		
EROSION AND SEDIMENTATION CONTROLS	IN CONFORMANCE	EFFECTIVE
Inlet Protection	YES /NO /NA	YES /NO
Stabilization	YES /NO /NA	YES /NO
Silt Fence	YES /NO /NA	YES /NO
Other	YES /NO /NA	YES /NO

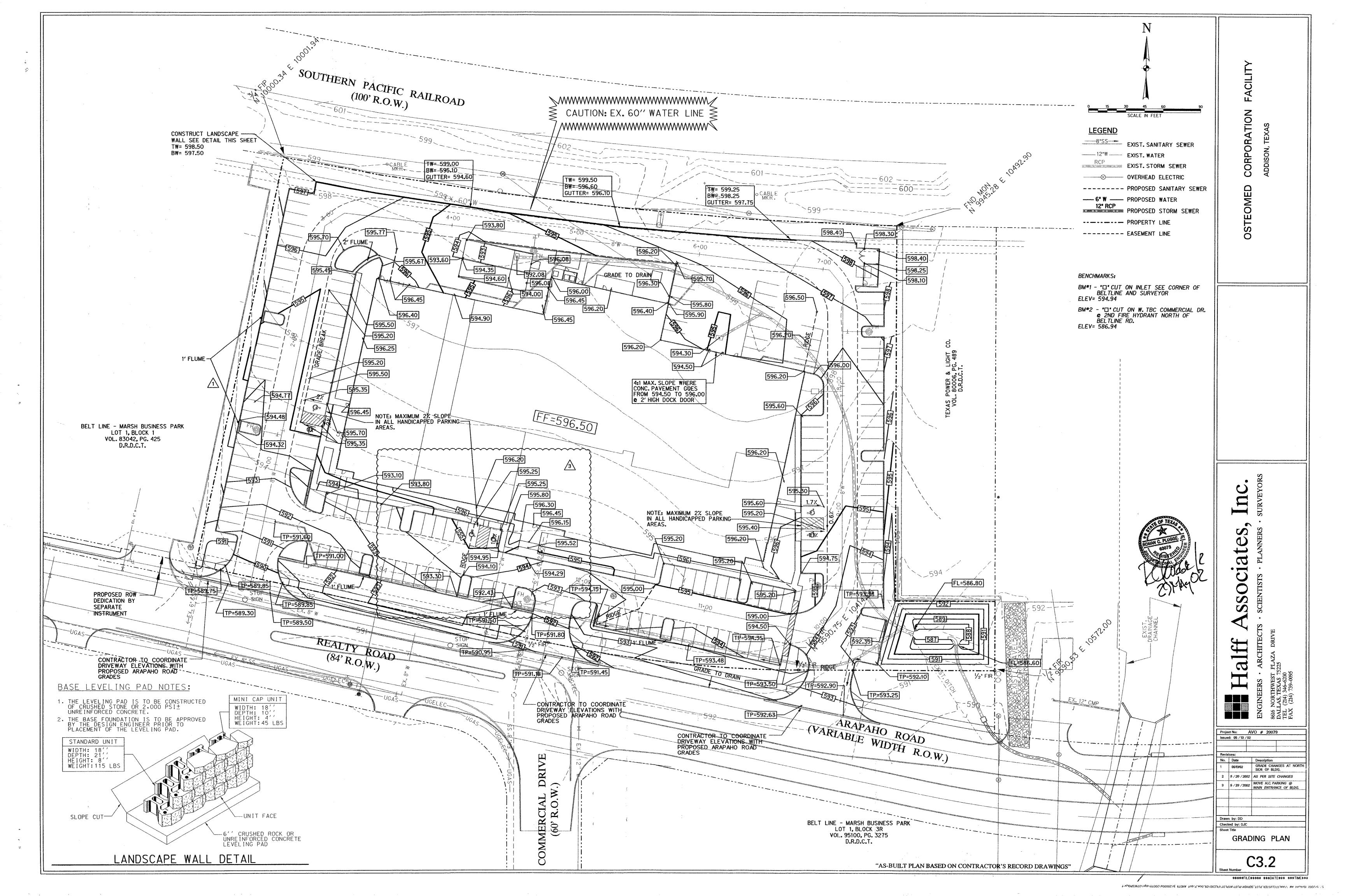
RECOMMENDED REMEDIAL ACTIONS: _

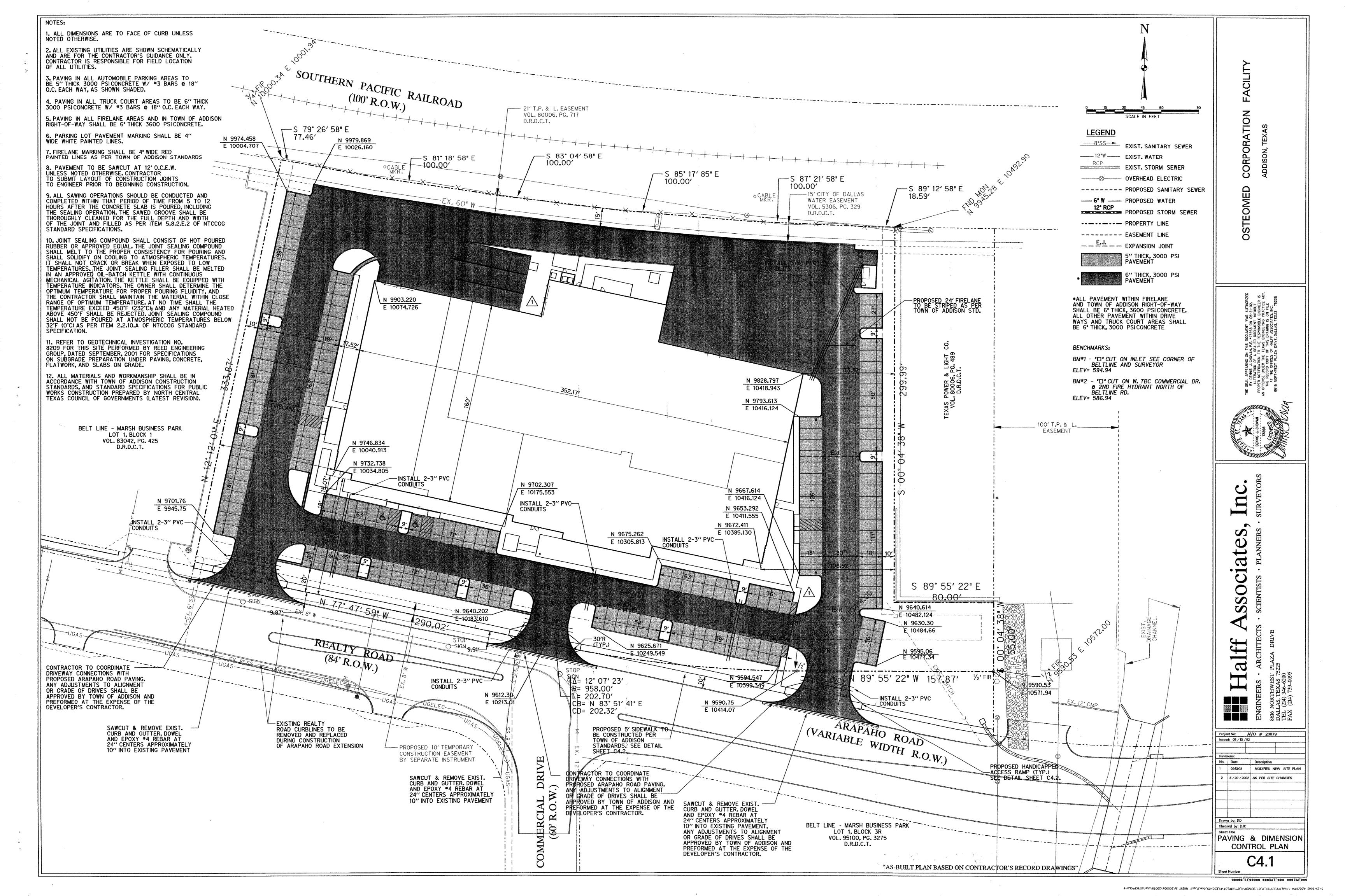
COMMENTS:

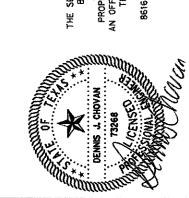
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

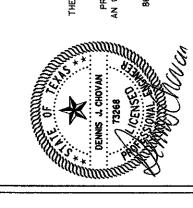
the positions, or line and improvement for knowing violations.	
INSPECTOR: DATE:	
Signature	











Inc ate

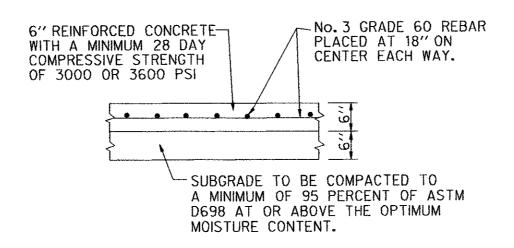
• 0 S alff

Project No: AVO # 20079 Issued: 05 /13 /02 No. Date Description Drawn by: DD Checked by: DJC

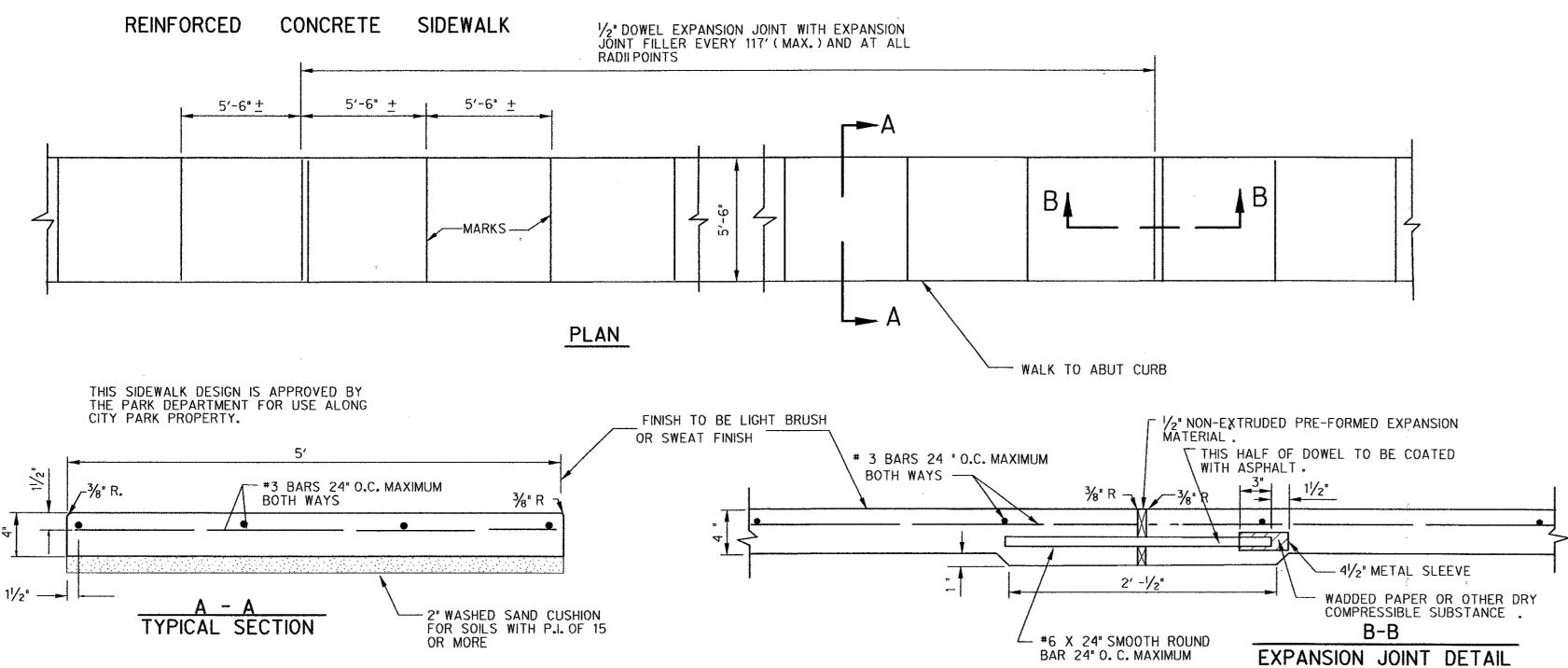
PAVING & DIMENSION CONTROL DETAILS

No. 3 GRADE 60 REBAR PLACED AT 18" ON - CENTER EACH WAY. SUBGRADE TO BE COMPACTED TO A MINIMUM OF 95 PERCENT OF ASTM D698 AT OR ABOVE THE OPTIMUM MOISTURE CONTENT.

TYPICAL 5" PAVEMENT SECTION N.T.S.



TYPICAL 6" PAVEMENT SECTION N.T.S.



FOR SIDEWALK WIDTH (SEE PLANS) EXPANSION -- COLORED CONCRETE (TYP) SEE NOTE 6 FOR SIDEWALK
WIDTH (SEE PLANS) **PLAN**

CURB RAMP NOTES:

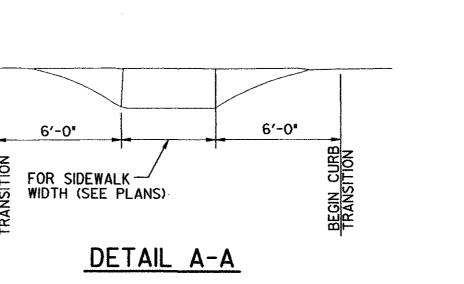
1.DETAILS ON THIS PLAN APPLY TO ALL CONSTRUCTION OR RECONSTRUCTION OF CURBS & SIDEWALKS.

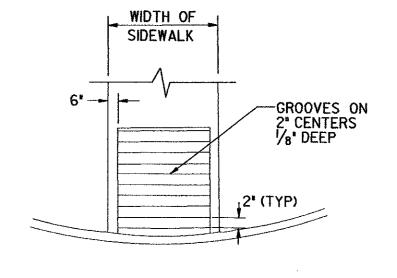
2. RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTIONS OR WHERE THERE IS PROPOSED SIDEWALK AND CURB. RAMPS MAY ALSO BE PLACED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

3. GROOVES SHALL BE PROVIDED ON ALL RAMPS.

4. A 48" LANDING SHALL BE PROVIDED AT THE TOP OF CURB RAMPS WITH A MAXIMUM SLOPE OF 2% IN ALL DIRECTIONS. 5. CURB RAMPS SHALL BE LOCATED ENTIRELY WITHIN ANY CROSSWALK MARKINGS.

6. THE FULL WIDTH AND DEPTH OF THE CURB RAMP CONCRETE SHALL BE COLORED WITH LAMBERT COLOR HARDNER, COLOR 219-1096 SUPER IRON BLACK, OR EQUAL. THE CONTRACTOR SHALL FOLLOW THE MANUFACTUER'S RECOMMENDED INSTALLATION PROCEDURE'S AND AN APPLICATION RATE OF 1.35 POUNDS OF COLOR HARDENER PER SQUARE YARD OF CONCRETE.





GROOVE DETAIL

"AS-BUILT PLAN BASED ON CONTRACTOR'S RECORD DRAWINGS"

\$\20\2002 1:21:10 PM //HALFFCLUSTER_PLOT_SERVER\PLOT\MTPLOT\FLE0Q\09_00e_P.qcf AH379 j;\200006\20079\dgn\079CPPQ2.prf

6" REINFORCED CONCRETE WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH ---OF 3000 PSI

NOTES:

1. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL- PLASTERED BEFORE POURING SIDEWALK 2. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN. 3. FOR SIDEWALKS AGAINST EXISTING CURB, KEYWAY SHALL BE REPLACED WITH 6" LONG #3 BARS DRILLED 4" INTO EXISTING BACK CURB AND EPOXY GROUTED ON 24" CENTERS. 4. PAYMENT FOR KEYWAY SUBSIDIARY TO SIDEWALK LUG PAY ITEM.

5. PAYMENT FOR EXCAVATION, BORROW, SUBGRADE STABILIZATION, AND COMPACTION IS SUBSIDIARY TO CONCRETE SIDEWALK PAY ITEM. 6. LIME STABLIZATION OR SELECT BORROW MATERIAL FOR SUBGRADE IS REQUIRED WHEN SOIL P.I. IS GREATER THAN 18. LIMITS OF SUBGRADE STABILIZATION ARE MINIMUM

7. BACKFILL FOR SIDEWALK SUBGRADE SHALL BE LIME STABILIZED SOIL OR SELECT BORROW MATERIAL HAVING A P.I. NOT LESS THAN 10 NOR GREATER THAN 18.
8. SIDEWALK BACKFILL AND SUBGRADE SHALL BE COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES TO 95% OF ASTM D698 DENSITY WITH A MOISTURE WITHIN -2% TO -4% OF OPTIMUN MOISTURE.

9. 1/2 "EXPANSION JOINTS SHALL BE PROVIDED AT STREET EXPANSION JOINTS AND AT A MAXIMUM 40 FOOT SPACING IN LINE WITH STREET SAW JOINTS; A TOOL MARKED GROOVE SHALL BE PROVIDED IN LIME WITH INTERMEDIATE STREET SAW JOINTS.

<u></u>			·																			
RUNOFF COLLECTION POINT (INLET OR MANHOLE)		DISTANCE BETWEEN COLLECTION POINTS	INCREMENTAL DRAINAGE AREA				TOTAL "CA"	TIME OF UPSTREAM STATION (MINUTES)	DESIGN STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	STORM WATER RUNOFF "Q"	SELECTED STORM SEWER SIZE	SLOPE OF HYDRAULIC GRADIENT "S"	VELOCITY IN SEWER BETWEEN COLLECTION	VELOCITY HEAD V22/2g (FT)	HEAD LOSS COEFFICIENT "Kj"	VELOCITY HEAD LOSS @ UPSTREAM	FLOW TIME IN SEWER (L/V*60) (MINUTES)	TIME AT DOWNSTREAM STATION (MINUTES)	HYDRAULIC GRADE LINE DOWNSTREAM	HYDRAULIC GRADE LINE UPSTREAM	TOP OF GRATE
UPSTREAM STATION	DOWNSTREAM STATION		AREA NUMBER	AREA TOTAL	RUNOFF COEFFICIENT "C"	INCREMENTAL "CA"					(CFS)		(FT/FT)	POINTS "V" (FPS)			STATION KjV2/2g (FT)			(1)	(2)	
LINE A																						
63	0	63	Total Area - Detention			<u></u>					28.2	24"	0.015	8.84	1.21	1.25	1.52	0.12	10.12	588.75	589.70	593.15
		T I			T		Ţ	T		 			T		· · · · · · · · · · · · · · · · · · ·		<u></u>	T		<u> </u>		-
LINE B											****											
				·																		
507	472	35	DA-2	0.45 0.45	0.9	0.41	0.41	10.0	100	8.74	3.58	24	0.0003	1.14	0.02	0.6	0.01	0.5	10.5	592.06	592.07	592.08
472	434	38	DA-4+DA-5	0.45 0.90	0.9	0.41	0.81	10.5	100	8.61	6.97	24	0.0009	2.21	0.08	0.6	0.05	0.3	10.8	591.99	592.02	595.42
434	362	72	DA6	0.31 1.21	0.9	0.28	1.09	10.8	100	8.54	9.31	24	0.0017	2.96	0.14	0.6	0.08	0.4	11.2	591.83	591.95	596.42
362	303	59	DA-7	0.33 1.54	0.9	0.30	1.39	11.2	100	8.45	11.75	24	0.0027	3.74	0.22	0.6	0.12	0.3	11.5	591.62	591.78	597.42
303	237	66	DA-3	0.32 1.86	0.9	0.29	1.67	11.5	100	8.39	14.01	24	0.0038	4.46	0.31	0.6	0.19	0.2	11.7	591.32	591.57	598.42
237	10	227	DA-8	0.29 2.15	0.9	0.26	1.94	11.7	100	8.35	16.20	24	0.0051	5.15	0.41	0.6	0.25	0.7	12.4	590.10	591.26	599.42
10	0	10	DA-1 + DA-11-14	1.75 3.90	0.9	1.58	3.51	12.4	100	8.16	28.64	33	0.0029	4.82	0.36	0.6	0.22	0.03	12.4	590.10	590.13	592.00
LINE C																						
493	486	7	DA-14	0.27 0.27	0.9	0.24	0.24	10.0	100	8.74	2.12	18	0.0004	1.20	0.02	0.6	0.01	0.10	10.1	591.80	591.80	591.50
486	265	221	DA-1	0.49 0.76	0.9	0.44	0.68	10.1	100	8.72	5.93	18	0.0032	3.35	0.18	0.6	0.11	1.1	11.2	590.99	591.70	593.50
265	178	87	DA-12	0.22 0.98	0.9	0.20	0.88	11.2	100	8.45	7.44	21	0.0022	3.09	0.15	0.6	0.09	0.5	11.7	590.82	591.01	594.08
178	22	156	DA-13	0.22 1.20	0.9	0.20	1.08	11.7	100	8.33	9.00	21	0.0032	3.74	0.22	0.6	0.13	0.7	12.4	590.28	590.78	592.60
22	0	22	DA-11	0.55 1.75	0.9	0.5	1.58	12.4	100	8.16	12.85	2:4	0.0032	4.09	0.26	0.6	0.16	0.1	12.5	590.19	590.26	592.60

 Λ

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

MAY 16, 2002

RunoffCoefficientC =
DrainageArea-A =
Time ofCancentration-tc=
Maximum Outflow Rate-Q =

tC = 1,10,2 -A = 1,10,5,10,0 -tc = 1,11,15,10, mirutes -0 = 28,2,2,15

			Inflow	Inflow	Outflow	Outflow	Storage
uration	intensity	Depth	D ischarge	Volume	Duration	Volme	Vol.me
m inutes)	(inches/hr)	(inches)	Q=CiA	Cu.Ft.	(m inutes)	Cu.Ft.	Cu.Ft.
5	10.56	0.88	37.7	11,319	17	13,959	(2,640
10		1.48	31.7	19.037	22	18,189	848
15		1.89	27.0	24.311	27	22,419	1,892
20		2.33	25.0	30.013	32	26,649	3,364
30	5.80	2.90	20.7	37,302	42	35,109	2,193
40	5.00	3.33	17.9	42.876	52	43,569	(693
50	4.40	3.67	15.7	47.164	62	52,029	(4.865
60	0.00	3.96	14.1	50,937	72	60,489	(9.552)
70	0.10	4.32	13.2	55,524	82	68,949	(13,425)
80	97.70	4.53	12.1	58,311	92	77,409	(19,098
90		4.65	11.1	59,812	102	85,869	(26,057
120		5.30	9.5	68,173	132	111,249	(43,076)
180	1,00	5.78	6.9	74,347	192	162,009	(87,662)
360	1 1 1 0	6.98	4.2	89,782	372	314,289	(224,507)
720	0.73	8.80	2.6	113.193	732	618,849	(505,656
1440	0.40		1.4	122,840	1,452	1,227,969	(1.105.129
		<u> </u>		Required	StarageVolume	3,364	oubic feet
						0.08	car e feet

Halff Associates, Inc.

Bolica School Sc

Revisions:

No. Date Description

1 05/13/02 COMPUTATION CHANGE

2 5 /20 /2002 AS PER SITE CHANGES

Drawn by: DD

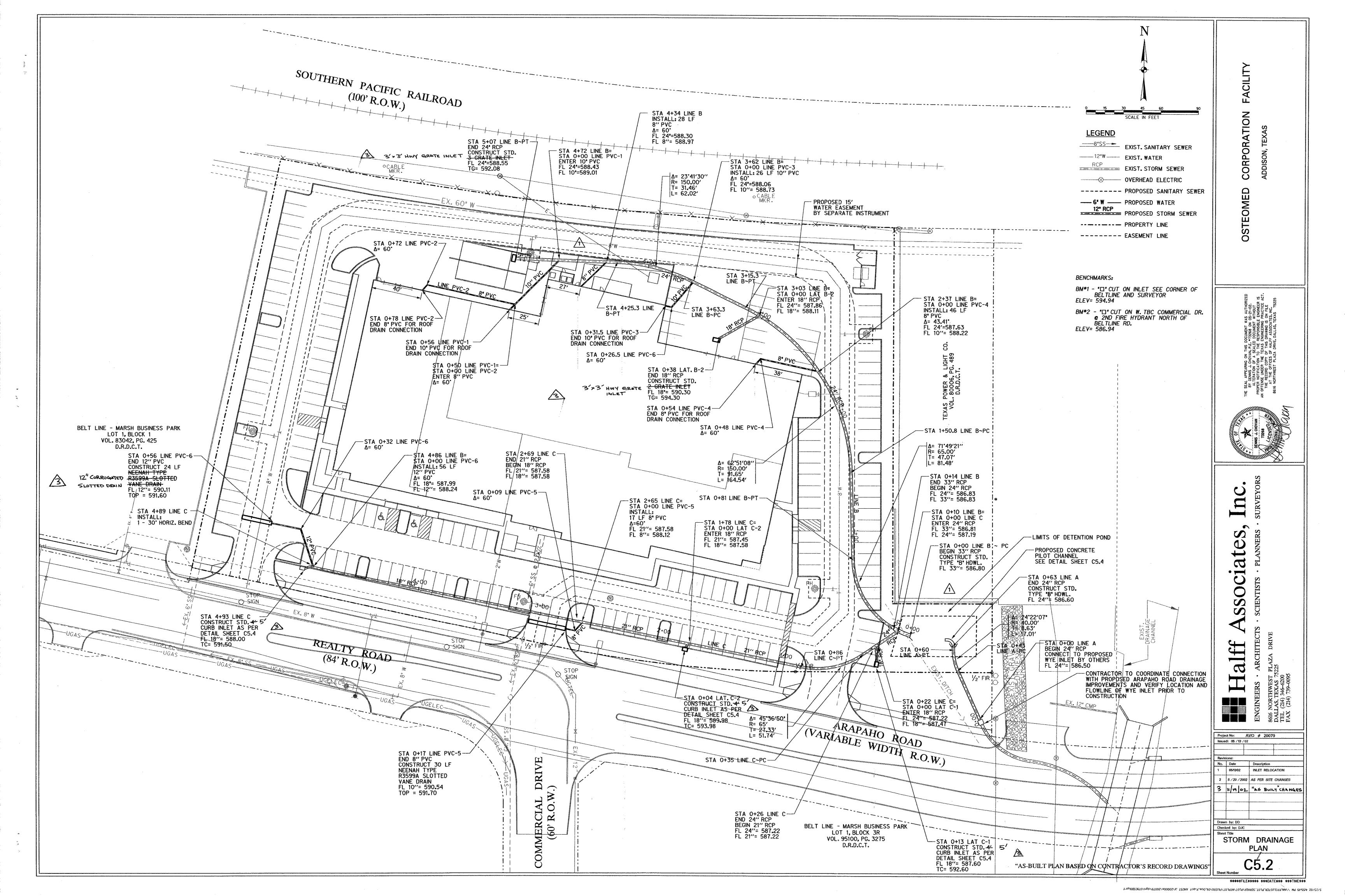
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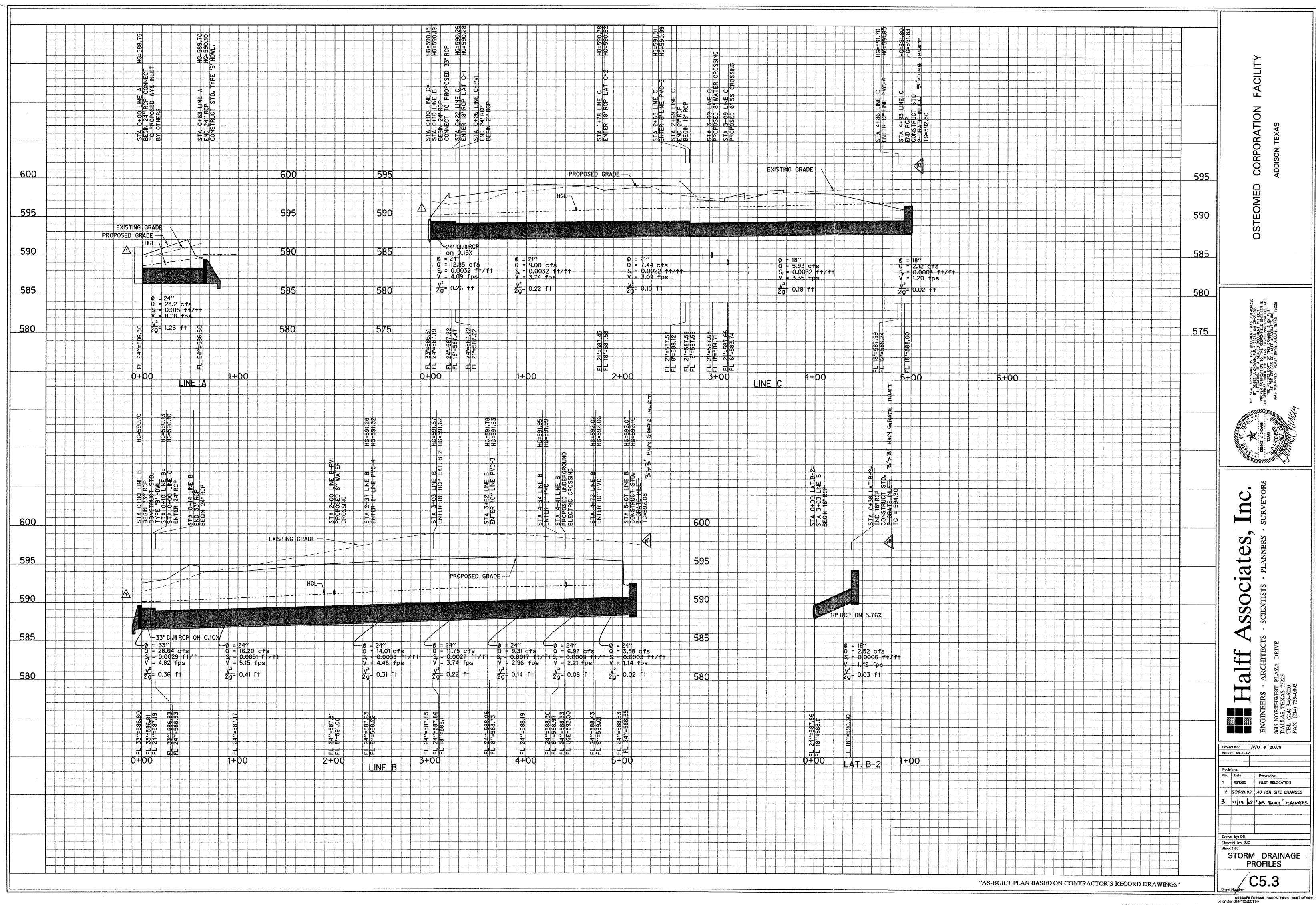
Sheet Title

STORM DRAINAGE

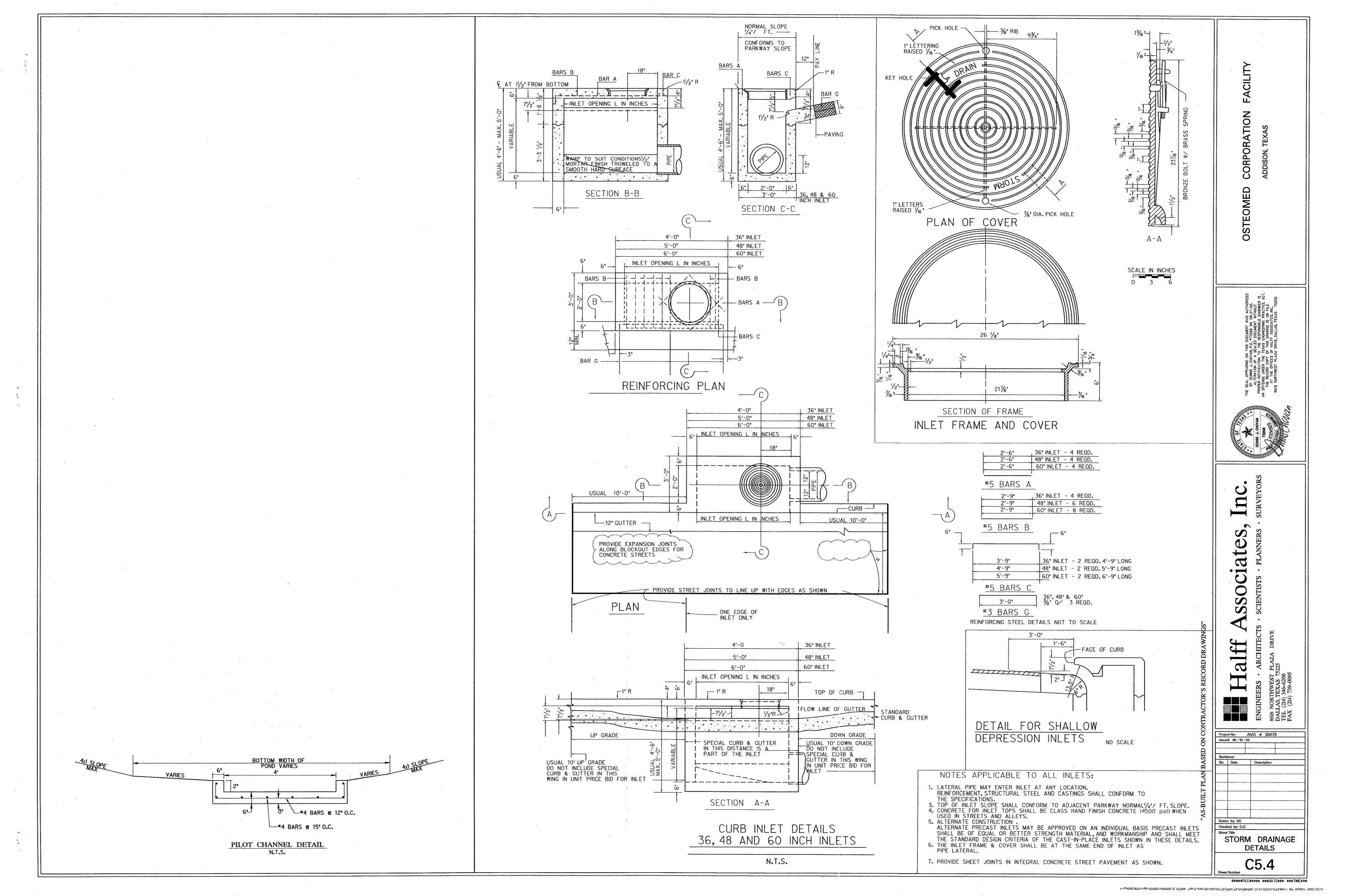
CALCULATIONS

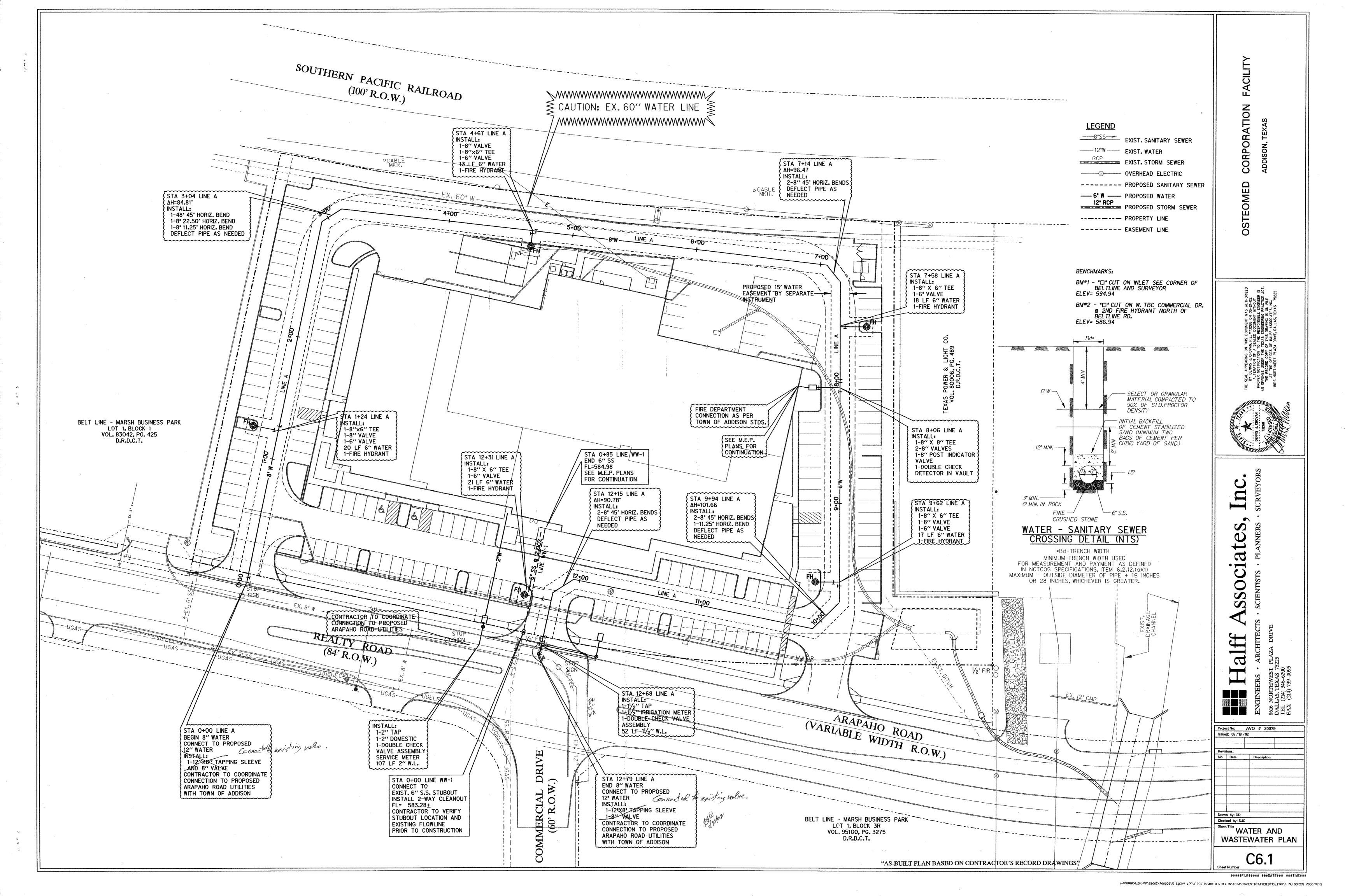
"AS-BUILT PLAN BASED ON CONTRACTOR'S RECORD DRAWINGS"





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Requirements: 20% of gross site to be landscape

Requirements: 20' buffer along street frontage (1) tree 4" cal. per 20 l.f., (8) shrubs per 20 l.f.

(12) trees, 4" cal. (14) trees, 4" cal.

(112) shrubs, 5 gal. (156) shrubs, 5 gal.

Requirement: 10% of the parking area must be landscape

(23) trees , 4" cal.

- 1. Fine grade areas to achieve final contours indicated.
- 2. Adjust contours to achieve positive drainage away from buildings. Provide uniform rounding at top and bottom of slopes and other breaks in grade. Correct irregularities and areas where water may
- below final finish grade. Contractor to coordinate operations with
- Contractor shall provide (2") two inches of imported topsoil on all
- 5. Imported topsoil shall be natural, friable soil from the region, known as bottom land soil, free from lumps, clay, toxic substances, roots, debris, vegetation, stones, containing no salt and black to brown in
- 6. All lawn areas to be fine graded, irrigation trenches completely settled, and finish grade approved by the Architect prior to
- Fine grade areas to achieve final contours indicated. Leave areas to receive topsoil 3" below final desired grade in planting areas and 1"
- Adjust contours to achieve positive drainage away from buildings. Provide uniform rounding at top and bottom of slopes and other breaks in grade. Correct irregularities and areas where water may
- All lawn areas to receive solid sod shall be left in a maximum of 1" below final finish grade. Contractor to coordinate operations with
- Contractor to coordinate with on-site Construction Manager for
- Plant sod by hand to cover indicated area completely. Insure edges of sod are touching. Top dress joints by hand with topsoil to fill
- Roll grass areas to achieve a smooth, even surface, free from
- Water sod thoroughly as sod operation progresses.
- Contractor shall maintain all lawn areas until final acceptance. This shall include, but not limited to: mowing, watering, weeding, cultivating, cleaning and replacing dead or bare areas to keep plants
- and shall provide replacement from local supply if necessary.
- 10. If installation occurs between September 1 and March 1, all sod areas to be over-seeded with Winter Ryegrass, at a rate of (4)

LANDSCAPE NOTES

- 1. Contractor shall verify all existing and proposed site elements and notify Architect of any discrepancies. Survey data of existing conditions was supplied by others.
- Contractor shall locate all existing underground utilities and notify Architect of any conflicts. Contractor shall exercise caution when working in the vicinity of underground utilities.
- 3. Contractor is responsible for obtaining all required landscape and irrigation permits.
- Contractor to provide a minimum 2% slope away from all structures.
- 5. All planting beds and lawn areas to be separated by steel edging. No steel to be installed adjacent to sidewalks or curbs.
- 6. All landscape areas to be 100% irrigated with an underground automatic irrigation system.
- 7. All lawn areas to be Solid Sod Bermudagrass, unless otherwise noted on the drawings.

MAINTENANCE NOTES

- 1. The Owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscape.
- 2. All landscape shall be maintained in a neat and orderly manner at all times. This shall include mowing, edging, pruning, fertilizing, watering, weeding and other such activities common to landscape maintenance.
- 3. All landscape areas shall be kept free of trash, litter, weeds and other such material or plants not part of this plan.
- 4. All plant material shall be maintained in a healthy and growing condition as is appropriate for the season of the year.
- 5. All plant material which dies shall be replaced with plant material of equal or better value.
- 6. Contractor shall provide separate bid proposal for one year's maintenance to begin after final acceptance.

MEINHARDT & ASSOCIATES ARCHITECTS, P.L.L.C 14900 LANDMARK SUITE 650 DALLAS TEXAS 75254

> STEVEN M. RAHN, INC. The Brewery Building 703 McKinney Ave. Suite 438 LB 107 Dallas, Texas 75202 Tel 214.871.0083 Fax 214.871.0545

CHECKED BY:

email smr@smr-la.com

These documents are for Design Review and NOT intended for Construction or Permit Purposes They were prepared by, or under the supervision of: Brian Denis Adams, Tx. Lic. #1761 Steven M. Rahn, Inc.

PROGRESS SET - FOR REVIEW ONLY

12.07.01

PRELIMINARY LANDSCAPE PLAN

SHEET:

PART 1 - GENERAL 1.1 REFERENCED DOCUMENTS

Refer to bidding requirements, special provisions, and schedules for additional requirements.

A. Work included: Furnish all supervision, labor, materials, services, equipment and appliances required to complete the work covered in conjunction with the landscaping covered in these specifications and landscaping plans, including:

Planting (trees, shrubs, and grass)
Bed preparation and fertilization
Notification of sources Water and Maintenance until final acceptance

1.3 REFERENCE STANDARDS

A. American Standard for Nursery Stock published by American Association of Nurserymen: 27 October 1980, Edition; by American National Standards Institute, Inc.

(Z60.1)-plant material. American Joint Committee on Horticultural Nomenclature: 1942 Edition of Standardized

Texas Association of Nurserymen, Grades and Standards. Hortis Third, 1976 - Cornell University.

1.4 NOTIFICATION OF SOURCES AND SUBMITTALS

A. The Contractor shall, within ten (10) days following acceptance of bid, notify the Architect/Owner of the sources of plant materials and bed preparation required

for the project. B. Samples: Provide representative quantities of sandy loam soil, mulch, bed mix material, gravel, and crushed stone. Samples shall be approved by Architect before use on

C. Product Data: Submit complete product data and specifications on all other specified

 D. Submit three representative samples of each variety of ornamental trees, shrubs, and groundcover plants for Architect's approval. When approved, tag, install, and maintain as representative samples for final installed plant materials.

E. File Certificates of Inspection of plant material by state, county, and federal authorities with Architect, if required. F. Soil Analysis: Provide sandy loam soil analysis if requested by the Architect.

A. General Contractor to complete the following punch list: Prior to Landscape Contractor initiating any portion of landscape installation, General Contractor shall leave planting bed areas three (3") inches below finish grade of sidewalks, drives and curbs as shown on the drawings. All lawn areas to receive solid sod shall be left one (1") inch below the finish grade of sidewalks, drives, and curbs. All construction debris shall be removed prior to

B. General Contractor shall provide topsoil as described in Section 02200 - Earthwork. C. Storage of materials and equipment at the job site will be at the risk of the Landscape Contractor. The Owner cannot be held responsible for theft or damage.

Section 02900 - 01

PART 3 - EXECUTION

3.1 BED PREPARATION & FERTILIZATION

4" DIA. PERFORATED

PVC PIPE W/ CAP-

PAINTED BLACK

Landscape Contractor to inspect all existing conditions and report any deficiencies to the Owner

B. All planting areas shall be conditioned as follows:

1. Prepare new planting beds by scraping away existing grass and weeds as necessary. Till existing soil to a depth of six inches prior to fertilizer and compost application. Apply fertilizer as per manufacturer's recommendations. Add six (6") inches of compost and till into a depth of six (6") inches of the native soil. Apply organic fertilizer such as Sustane or Green Sense at the rate of twenty (20) pounds per one thousand (1,000) square feet.

2. All planting bed areas shall receive a two (2") inch layer of specified mulch. 3. Backfill for tree pits shall be as follows: Use existing topsoil on site, free from large clumps, rock, debris, caliche, subsoils, etc.,, placed in nine (9") inch layers and watered in thoroughly.

Areas to be Solid Sod Bermudagrass: Blocks of sod should be laid joint to joint, (staggered joints) after fertilizing the ground first. Roll grass areas to achieve a smooth, even surface. The joints between the blocks of sod should be filled with

2X DIAMETER

OF ROOTBALL

NOT TO SCALE

topsoil where they are evidently gaped open, then watered thoroughly.

2. Areas to be Hydromulch Common Bermudagrass: Hydromulch with bermudagrass seed at a rate of two (2) pounds per one thousand (1,000) square feet. Use a 4' x 8' batter board against the bed areas.

Section 02900 - 05

1.6 MAINTENANCE AND GUARANTEE

The Landscape Contractor will be held responsible for the maintenance of all work from the time of planting until final acceptance by the Owner. No trees, shrubs, groundcover or grass will be accepted unless they show a healthy growth and satisfactory foliage conditions.

 Maintenance shall include watering of trees and plants, cultivation, weeding, spraying, edging, pruning of trees, mowing of grass, cleaning up and all other work necessary of maintenance. A written notice requesting final inspection and acceptance should be submitted to the Owner at least seven (7) days prior to completion. An on-site inspection by Owner and Landscape Contractor will be completed prior to written acceptance. After final acceptance of installation, the Landscape Contractor will not be required to do any of the above listed work.

Trees shall be guaranteed for a twelve (12) month period after acceptance. Shrubs and groundcover shall be guaranteed for twelve (12) months. The Contractor shall replace all dead materials as soon as weather permits and upon notification of the Owner. Plants, including trees, which have partially died so that shape, size, or symmetry has been damaged, shall be considered subject to replacement. In such cases, the opinion of the Owner shall be final.

Plants used for replacement shall be of the same kind and size as those originally planted and shall be planted as originally specified. All work, including materials, labor and equipment used in replacements, shall carry a twelve (12) month guarantee. Any damage, including ruts in lawn mmediately repaired.

b. At the direction of the Owner, plants may be replaced at the start of the next year's planting season. In such cases, dead plants shall be removed from the premises immediately. C. When plant replacements are made, plants, soil mix, fertilizer and mulch are to be utilized as originally specified and reinspected for full compliance with Contract requirements. All replacements are to be

The Owner agrees that for the guarantee to be effective, he will water plants at least twice a week during dry periods and cultivate beds once a month after final

The above guarantee shall not apply where plants die after acceptance because of injury by storms, hail, freeze, insects, diseases, injury by humans, machines or theft.

4. Acceptance for all landscape work shall be given after final inspection by the Owner provided the job is in a completed, undamaged condition, and there is a stand of grass in all lawn areas. At this time, the Owner will assume maintenance

1.7 QUALITY ASSURANCE

A. General: Comply with applicable Federal, State, County, and Local regulations governing landscape materials and work.

B. Personnel: Employ only experienced personnel who are familiar with the required work. Provide full-time supervision by a qualified foreman acceptable to Landscape Architect. Make contact with suppliers immediately upon obtaining notice of contract acceptance to select and book materials. Develop a program of maintenance

(pruning and fertilization) which will insure the purchased materials will meet and/or exceed project specifications. Landscape Architect will provide a key identifying each tree location on site.
 Written verification will be required to document material selection, source and

delivery schedules to site. 3. Owner and/or Architect shall inspect all plant materials, when reasonable, at place of growth for compliance with requirements for genus, species, cultivar/variety,

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-DO NOT CUT CENTRAL LEADER

-REFERENCE PLAN FOR TREE TYPE

-RUBBER HOSE

2 STRANDS NO. 12 GAUGE GALVANIZED WIRE, TWISTED

-2" HIGH WATERING RING

(3) METAL T-POST PAINTED

BLACK TRIANGULAR SPACING.

-FINISH GRADE SCARIFY SIDES

ROOTBALL, DO NOT DISTURB. TOP

-NATIVE SOIL, REF. SPECIFICATIONS

NOTE: LOCATE STAKES OUTSIDE

OF TREE WELL. POSITION STAKES

TO SECURE TREE AGAINST SEASONAL

-CRUSHED ROCK

PREVAILING WINDS.

-OF ROOTBALL TO BE SET 1" ABOVE

EXISTING GRADE. REMOVE TOP 1/3 BURLAP.

-2" LAYER MULCH, REF. SPECIFICATIONS

3.2 INSTALLATION

A. Maintenance of plant materials shall begin immediately after each plant is delivered to the site and shall continue until all construction has been satisfactorily accomplished. B. Plant materials shall be delivered to the site only after the beds are prepared and are ready for planting. All shipments of nursery materials shall be thoroughly protected from the drying winds during transit. All plants which cannot be planted at once, after delivery to the site, shall be well protected against the possibility of drying by wind and sun. Balls of earth of B & B plants shall be kept covered with soil or other acceptable material. All plants remain the property of the Contractor until final acceptance.

C. Position the trees and shrubs in their intended location as per plan. D. Notify the Landscape Architect for inspection and approval of all positioning of plant

E. Excavate pits with vertical sides and horizontal bottom. Tree pits shall be large enough to permit handling and planting without injury to balls of earth or roots and shall be of such depth that, when planted and settled, the crown of the plant shall bear the same relation to the finish grade that it did to soil surface in place of growth.

3.2 INSTALLATION (cont.)

1.7 QUALITY ASSURANCE

A. Preparation

PART 2 - PRODUCTS

2.1 PLANTS

C. Selection of Plant Material: (cont.)

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

be observed upon arrival at job site.

6. Remove rejected plant material immediately from site.

Architect and his decision as to their acceptability shall be final.

B. Quantities: the drawings and specifications are complimentary; anything called for on one and not the other is as binding as if shown and called for on both. The plant schedule is an aid to bidders only. Confirm all quantities on

4. Owner and/or Architect retains the right to further inspect all plant material upon arrival at the site and during installation for size and condition of root balls, limbs, branching habit, insects, injuries, and latent defects.

Owner and/or Architect may reject unsatisfactory or defective material at any time during the process of work. Remove rejected materials from the site immediately. Plants damaged in transit or at job site shall be rejected.

1. Balled and Burlapped (B&B) Plants: Dig and prepare shipment in a manner that will not damage roots, branches, shape, and future development.

2. Container Grown Plants: Deliver plants in rigid container to hold ball shape and

1. Deliver packaged materials in sealed containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and 2. Deliver only plant materials that can be planted in one day unless adequate storage and watering facilities are available on job site.

3. Protect root balls by heeling in with sawdust or other approved moisture retaining material if not planted within 24 hours of delivery.

Protect plants during delivery to prevent damage to root balls or desiccation of leaves. Keep plants moist at all times. Cover all materials during transport.

5. Notify Architect of delivery schedule 72 hours in advance so plant material may

To avoid damage or stress, do not lift, move, adjust to plumb, or otherwise manipulate plants by trunk or stems.

A. General: Well-formed No. 1 grade or better nursery grown stock. Listed plant heights are from tops of root balls to nominal tops of plants. Plant spread refers to nominal outer width of the plant, not to the outer leaf tips. Plants will be individually approved by the

C. Quality and size: Plant materials shall conform to the size given on the plan, and shall be healthy, symmetrical, well shaped, full branched, and well rooted. The plants shall be free from injurious insects, diseases, injuries to the bark or roots, broken branches, objectionable disfigurements, insect eggs and larvae and are to be of specimen quality.

D. Approval: All plant materials shall be subject to the approval of the Owner and/or Landscape Architect. All plants which are found unsuitable in growth, or in any unhealthy, badly shaped, or undersized condition, will be rejected by the Landscape Architect, either before or after planting, and shall be removed at the expense of the Landscape Contractor and replaced with acceptable plants as specified.

diameter and height requirements of the plant schedule. Balled and Burlapped shall be firm, neat, slightly tapered, and well wrapped in burlap. Any tree loose in the ball or with broken ball at time of planting will be rejected. Balls shall be ten (10") inches in diameter for each one (1") inch of trunk diameter, measured six

a. Nomenclature conforms to customary nursery usage; for clarification, the term "multi-trunk" defines a plant having three (3) or more trunks of nearly equal diameter.

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F. Pruning: All pruning of trees and shrubs, as directed by Landscape Architect shall be executed by Landscape Contractor at no additional cost to the Owner

E. Trees shall be healthy, full branched, well shaped, and shall meet the trunk

F. Shrub and tree pits shall be no less than two (2') feet, twenty-four (24") inches wider than the lateral dimension of earth ball and six (6") inches deeper than its vertical dimension. Remove and haul from site all rocks or stones over one (1") inches in diameter. Plants should be thoroughly moist before removing containers.

G. Dig a wide, rough sided hole exactly the same depth as the height of the ball, especially at the surface of the ground. The sides of the hole should be rough and jagged, never slick or glazed.

H. Percolation Test: Fill the hole with water. If the water level does not percolate within 24 hours, the tree needs to be moved to another location or have pier hole drainage added.

I. Backfill only with 5 parts existing soil or sandy loam and 1 part bed preparation. When hole is dug in solid rock, topsoil from the same area should not be used. Carefully settle by watering to prevent air pockets. Remove the burlap from the top 1/3 of the ball, as well as all nylon, plastic string and wire mesh. Container trees will usually be pot bound, if so follow standard nursery practice of 'root scoring'.

J. Do not wrap trees.

(6") inches above ball.

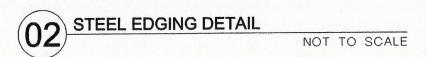
L. Mulch the top of the ball. Do not plant grass all the way to the trunk of the tree. Leave the area above the top of the ball unplanted and mulch with at least two (2") inches of specified mulch.

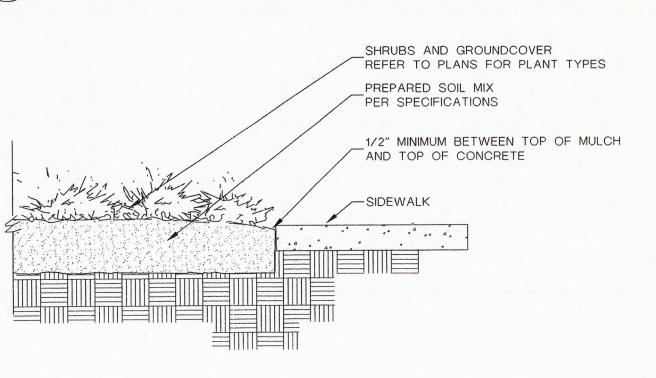
M. All plant beds and trees to be mulched with a minimum settled thickness of two (2") inches over the entire bed or pit.

obstruction below ground: In the event rock or underground construction work of obstructions are encountered in any plant pit excavation work to be done under this section, alternate locations may be selected by the Owner. Where locations cannot be changed, the obstructions shall be removed to a depth of not less than three (3') feet below grade and no less than six (6") inches below bottom of ball when plant is properly set at the required grade. The work of this section shall include the removal from the site of such rock or underground obstructions encountered at the cost of the Landscape Contractor. cost of the Landscape Contractor.

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SHRUBS AND GROUNDCOVER REFER TO PLANS FOR PLANT TYPES PREPARED SOIL MIX PER SPECIFICATIONS -MULCH PER SPECIFICATIONS 1/8" X 4" GREEN STEEL EDGING WITH STAKES -1/2" MAXIMUM -LAWN NOTE: NO STEEL EDGING TO BE INSTALLED ALONG SIDEWALKS





SIDEWALK / MULCH DETAIL no steel along sidewalks NOT TO SCALE 2.2 SOIL PREPARATION MATERIALS

A. Sandy Loam:

Friable, fertile, dark, loamy soil, free of clay lumps, subsoil, stones and other extraneous material and reasonably free of weeds and foreign grasses. Loam

containing Dallasgrass or Nutgrass shall be rejected.

Physical properties as follows: Clay-between 7-27 percent Silt-between 15-25 percent Sand-less than 52 percer

Organic matter shall be 3%-10% of total dry weight.

If requested, provide a certified soil analysis conducted by an approved soil testing laboratory verifying that sandy loam meets the above requirements.

B. Organic Material: Compost with a mixture of 80% vegetative matter and 20% animal waste. Ingredients should be a mix of course and fine textured material.

C. Premixed Bedding Soil as supplied by Vital Earth Resources, Gladewater, Texas; Professional Bedding Soil as supplied by Living Earth Technology, Dallas, Texas or Acid Gro Municipal Mix as supplied by Soil Building Systems, Dallas, Texas or approved equal.

D. Sharp Sand: Sharp sand must be free of seeds, soil particles and weeds. E. Mulch: Double Shredded Hardwood Mulch, partially decomposed, dark brown. Living Earth Technologies or approved equal.

F. Organic Fertilizer: Fertilaid, Sustane, or Green Sense or equal as recommended for required applications. Fertilizer shall be delivered to the site in original unopened containers, each bearing the manufacturer's guaranteed statement of analysis.

G. Commercial Fertilizer: 10-20-10 or similar analysis. Nitrogen source to be a minimum 50% slow release organic Nitrogen (SCU or UF) with a minimum 8% sulfur and 4% iron, also microsulticate.

H. Peat: Commercial sphagnum peat moss or partially decomposed shredded pine bark or other approved organic material.

2.3 MISCELLANEOUS MATERIALS

A. Steel Edging: Shall be Ryerson "Estate Curbing", 1/8"x4" with stakes 4' on center. B. Staking Material for Shade Trees:
1. Post: Studded T-Post, no.1 Armco with anchor plate; 6'-0" length; paint black Wire: 12 gauge, single strand, galvanized wire. Rubber hose: 2 ply, fiber reinforced hose, minimum 1/2 inch inside diameter.

C. Gravel: Washed native pea gravel, graded 1 in. to 1-1/2 in. D. Filter Fabric: Mirafi 140N by Celanese Fibers Marketing Company, Available at Loftland Co., (214) 631-5250 or approved equal.

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3.2 INSTALLATION (CONT.)

O. Trees and large shrubs shall be staked as site conditions require. Position stakes to secure tree against seasonal prevailing winds.

P. Pruning and Mulching: Each area shall be pruned in accordance with standard horticultural practice to preserve the natural character of the plant and in the manner fitting its use in the landscape design.

 Dead wood or suckers and broken or badly bruised branches shall be removed General tipping of all branches is not permitted. Pruning shall be done with clean sharp tools. Immediately after planting operations are completed, all tree pits shall be covered with a layer of specified mulch two (2") inches in depth. This limit of the specified mulch for trees shall be the diameter of the plant pit.

Q. Steel Curbing Installation:

 Curbing shall be aligned as indicated on plans. 2. All steel curbing shall be free of kinks or abrupt bends.

3. Top of curbing shall be 1/2" maximum higher than existing grade.

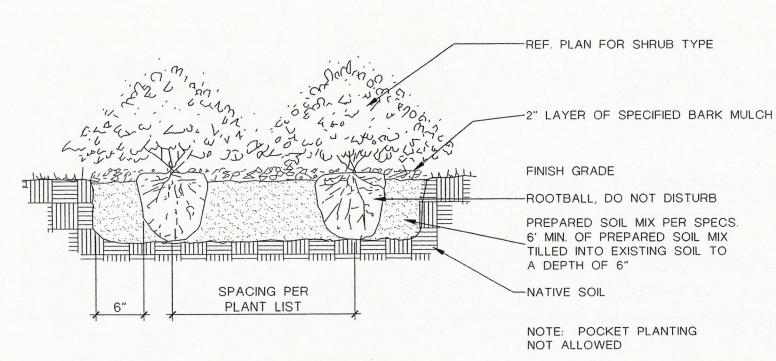
 Stakes are to be installed on the planting bed side of the curbing, as opposed to the grass side. Do not install steel edging along sidewalks.

6. Cut steel edging at 45 degree angle where edging meets sidewalk. 3.3 CLEANUP AND ACCEPTANCE

A. Cleanup: During the work, the premises shall be kept neat and orderly at all times. Storage areas for all materials shall be so organized that they, too, are neat and orderly. All trash and debris shall be removed from the site as work progresses. Keep paved areas clean by sweeping or hosing at end of each days' work.

END OF SECTION

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NOT TO SCALE

PROGRESS SET - FOR REVIEW ONLY ISSUED 12.07.01 These documents are for Design Review and NOT intended for Construction or Permit Purposes They were prepared by, or under the supervision of Brian Denis Adams, Tx. Lic. #1761

Steven M. Rahn, Inc.

AS SHOWN



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MEINHARDT & ASSOCIATES ARCHITECTS, P.L.L.C 14900 LANDMARK SUITE 650 DALLAS TEXAS 75254 72 980-8980

> landscape architecture STEVEN M. RAHN, INC. The Brewery Building 703 McKinney Ave. Suite 438 LB 107 Dallas, Texas 75202 Tel 214.871.0083 Fax 214.871.0545 email smr@smr-la.com

CHECKED BY: SHEET:

PART 1 - GENERAL

- A. Provide complete sprinkler installation as detailed and specified herein, including furnishing all labor, materials, and equipment for the proper installation. Work includes but is not limited to: Trenching and backfill
 - Automatic controlled system Upon completion of installation, supply drawings showing details of construction including location of mainline piping, manual and automatic valves, electrical supply to valves, and specifically exact location of automatic valves.
- B. NOTE: All sleeves as shown on plans will be furnished by General Contractor. Meter and power source to be provided by General Contractor.
- 1.2 RELATED WORK SPECIFIED ELSEWHERE
- See Irrigation Plans. See plans for controller, heads, and valves. ection 02900-Landscape Section 02811-Underground Irrigation Sleeve and Utility Conduits

1.3 APPLICABLE STANDARDS

- A. America Standard for Testing and Materials (ASTM)- Latest edition. D2241 Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
 - D2464 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Thread, Schedule 80 D2455 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
 - D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings D2287 Flexible Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings Pipe F656 Poly Vinyl Chloride (PVC) Solvent Weld Primer D2855 Making Solvent- Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings

1.4 MAINTENANCE AND GUARANTEE

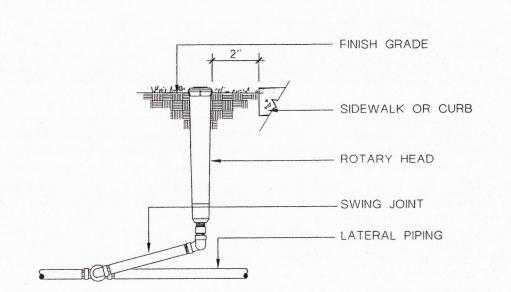
- A. Materials and workmanship shall be fully guaranteed for one (1) year after final
- B. Provide maintenance of system, including raising and lowering of heads to compensate for lawn growth, cleaning and adjustment of heads, raising and lowering of shrub heads to compensate for shrub growth, for one (1) year after completion of installation.
- C. Guarantee is limited to repair and replacement of defective materials or workmanship, including repair of backfill settlement.

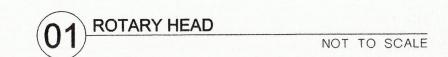
Section 02810 - 01

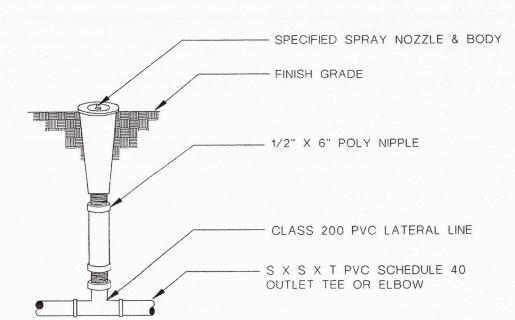
- A. Sprinkler Mains: Test sprinkler main only for a period of twelve (12) to fourteen (14) hours under normal pressure. If leaks occur, replace joint or joints and repeat test.
- B. Complete tests prior to backfilling. Sufficient backfill material may be placed in trenches between fittings to insure stability of line under pressure. In each case, leave fittings and couplings open to visual inspection for full period of test.

A. After installation has been completed, make final adjustment of sprinkler system in preparation for Landscape Architect's final inspection. Completely flush system to remove debris from lines and turning on system. Check sprinklers for proper operation and proper alignment for direction of flow. Check each section of spray heads for operating pressure and balance to other sections by use of flow adjustment and top of each valve. Check nozzling for proper coverage. Prevailing wind conditions may indicate that arch of angle of spray should be other than shown on drawings. In this case, change nozzles to provide correct coverage.

> END OF SECTION Section 02810 - 05







POP-UP LAWN SPRAY ASSEMBL NOT TO SCALE

- Procedure: Comply with Division I requirements. Product Data: Submit copies of equipment maufacturer's specifications and literature for
- Comply with Division I requirements.
- Locate by written dimension, routing of mainline piping, remote control valves and When dimensioning is complete, transpose work to mylar reproducible tracings. tracings will be provided by Architect. Submit completed tracings prior to final acceptance. Mark tracings "Record Prints
- Provide three complete operation manuals and equipment brochures neatly bound in Quick Coupler Keys: Provide 3 coupler keys with boiler drains attached using brass reducer. Controller Keys: Provide two sets of keys to controller enclosure(s).
- Use of materials differing in quality, size, or performance from those specified will only be allowed upon written approval of Owner/Landscape Architect. The decision will be based on comparitive ability of material or article to perform fully all pruposes of mechanics and general design considered to be possessed by item specified.
- Bidders desiring to make a substitution for specified sprinklers shall submit manufacturer's catalog sheet showing full specification of each type sprinkler proposed as a substitute, including discharge in GPM maximum allowable operating pressure at Approval of substitute sprinkler shall not relieve Contractor of his responsibility
- demonstrate that final installed sprinkler system will operate according to intent of originally designed and specified system. It is the responsibility of the Irrigation Contractor to demonstrate that final installed sprinkler system will operate according to intent of originally originally designed and specified system. If Irrigation Contractor notes any problems in head spacing or potential coverage, it is his responsibility to notify the Landscape Architect in writing, before proceeding with work. Irrigation Contractor guarantees 100% coverage of all areas to be

A. Perform testing required with other trades, including earthwork, paving, and plumbing, to avoid unnecessary cutting, patching and boring. B. Water Pressure: Prior to starting construction, determine if static water pressure is as

- A. Coordinate installation with other trades, including earthwork, paving, and plumbing, to
- avoid unnecessary cutting, patching and boring. B. Coordinate to ensure that electrical power source is in place. Coordinate system installation with work specified in other sections and coordinate with landscape installer to ensure plant material is uniformly watered in accordance with intent

PART 2 - PRODUCTS

shown on drawings.

ELEVATION

- A. Mainline: Piping from water source to operating valves. This portion of piping is subject to surges, being a closed portion of sprinkler system. Hydrant lines are considered a part
- of sprinkler main. B. Lateral Piping: Lateral piping is that portion of piping from operating valve to sprinkler heads. This portion of piping is not subject to surges, being an "open end" portion of

Section 02810 - 02

- FINISHED GRADE

OUTLET TEE OR ELL

(LENGTH AS REQUIRED)

SCHEDULE 40 PVC STREET ELL

FLEXIBLE PVC

2.2 POLY VINYL CHLORIDE PIPE (PVC PIPE)

2.4 COPPER TUBE FITTINGS

2.6 SCHEDULE 80 PVC NIPPLES

2.7 MATERIALS - See Irrigation Plan

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

be compatible with PVC pipe furnished.

A. Cast brass or wrought copper, sweat-solder type.

Sprinkler heads in lawn area as specified on plan.

Copper Tubing (City Connection): Type "M"

exact location with Landscape Architect.

24V Wire: Size 14. Type U.F.

planted trees or shrubs.

A. PVC pipe shall be manufactured in accordance with commercial standards noted herein.

with the following information: manufacturer's name, pipe size, type of pipe, and material,

SDR number, product standard number, and the NSF (National Sanitation Foundation)

C. PVC Pipe Fittings: Shall be of the same material as the PVC pipe specified and shall

B. Marking and Identification: PVC pipe shall be continuously and permanently marked

A. Hard, straight, lengths of domestic manufacture only. No copper tube of foreign

A. Type UF with 4-64" insulation which is Underwriter's Laboratory approved for direct

A. Composed of Standard Schedule 40 PVC Fittings and PVC meeting noted standards.

B. Polyethylene nipples six (6") inches long to be used on all 1804 and 1806 pop-up

Refer to drawing for backflow prevention requirements and flow valve. Coordinate

A. Staking: Before installation is started, place a stake where each sprinkler is to be

B. Excavations: Excavations are unclassified and include earth, loose rock, rock or any

for compaction and contains no lumps, clods, rock, debris, etc. Special backfill specifications, if furnished take preference over this general specification.

Backfill: Flood or hand-tamp to prevent after settling. Hand rake trenches and

adjoining area to leave grade in as good or better condition than before installation.

such a manner as to avoid damage to plantings. Do not dig within ball of newly

Piping Layout: Piping layout is diagrammatic. Route piping around trees and shrubs in

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located, in accordance with drawing. Staking shall be approved by Landscape Architect

combination thereof, in wet or dry state. Backfill trenches with material that is suitable

Electric valves to be all plastic construction as indicated on plans.

underground burial when used in a National Electric Code Class II Circuit (30 volts AC

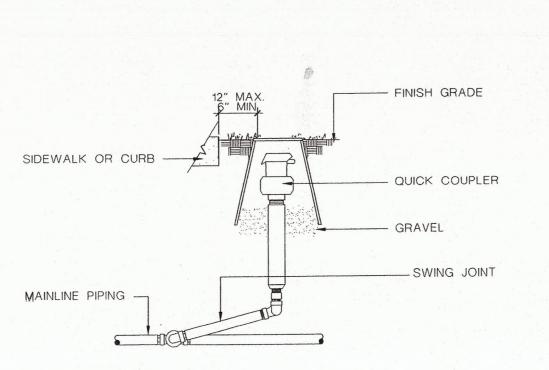
No clamps or wires may be used. Nipples for 1812 heads and shrub risers to be nominal one-half (1/2") inch diameter by eight (8") inches long, where applicable.

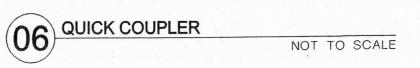
extrusion or any so-called irrigation tubing (thin wall) shall be used.

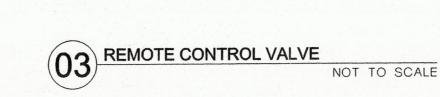
SPECIFIED SPRAY NOZZLE AND BODY CLASS 200 PVC LATERAL LINE S X S X T PVC SCHEDULE 40 PVC - MALE ADAPTER (MIPT X S)

- VALVE BOX FLUSH WITH FINISH GRADE - PEA GRAVEL REMOTE CONTROL VALVE WITH 24" LONG LOOP OF CONTROL WIRE 45 DEGREE ELL - SCHEDULE 40 PVC FITTINGS

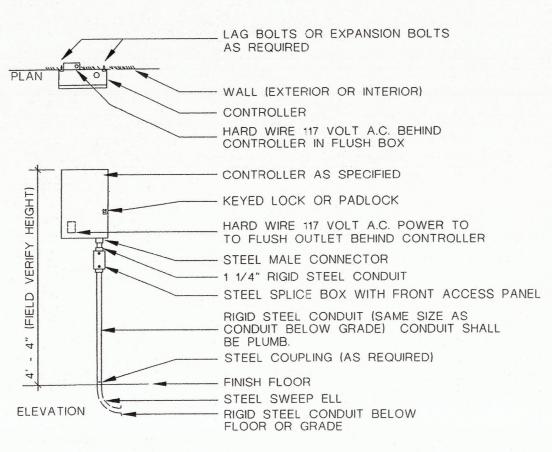








ISOMETRIC



VALL MOUNTED CONTROLLER NOT TO SCALE 3.2 PIPE INSTALLATION

- A. Sprinkler Mains: Install a four (4") inch minimum trench with a minimum of eighteen (18")
- B. Lateral Piping: Install a four (4") inch wide minimum trench deep enough to allow for installation of sprinkler heads and valves, but in no case, with less than twelve (12") inches
- C. Trenching: Remove lumber, rubbish, and large rocks from trenches. Provide firm, uniform bearing for entire length of each pipe line to prevent uneven settlement. Wedging or blocking of pipe will not be permitted. Remove foreign matter or dirt from

inside of pipe before welding, and keep piping clean by approved means during and after laying of pipe.

3.3 PVC PIPE AND FITTING ASSEMBLY

- A. Solvent: Use only solvent recommended by manufacturer to make solvent-welded joints. Thoroughly clean pipe and fittings of dirt, dust and moisture before applying

PVC to metal connection: Work metal connections first. Use a non-hardening pipe

dope such as Permatex No. 2 on threaded PVC adapters into which pipe may be

welded. 3.4 COPPER TUBING AND FITTING ASSEMBLY

A. Clean pipe and fitting thoroughly and lightly sand pipe connections to remove residue from pipe. Attach fittings to tubing in an approved manner using 50-50 soft solid core

- 3.5 SHRUB SPRAY HEADS (FIXED) A. Shrub Spray Heads: Supply in accordance with materials list, with nozzling in accordance with drawings. Drawings indicate size of nozzling and degree of arc. Determine correct degree of arc of nozzle (if conditions warrant) by area to be covered
- and by wind conditions that may affect coverage. Height: Install heads on PVC Schedule 80 risers sufficiently high to water under shrubs and plants, or as directed by the Landscape Architect.

3.6 POP-UP SPRAY HEADS

Supply pop-up spray heads in accordance with materials list and plan. Attach sprinkler to lateral piping with a semi-flexible polyethylene nipple not less than tree (3") inches or more than six (6") inches long.

A. Supply valves in accordance with materials list and sized according to drawings. Install valves in a level position in accordance with Manufacturer's Specifications. See plan

for typical installation of electric valve, valve box.

3.8 WIRING

- A. Supply wiring from the automatic sprinkler controls to the valves. No conduit will be required for U.F. wire unless otherwise noted on the plan. Wire shall be tucked under
- B. A separate wire is required from the control to each electric valve. A common neutral wire is also required from each control to each of the valves served by each particular
- C. Bundle multiple wires and tape them together at ten (10') foot intervals. Install ten (10") inch expansion coil at not more than one hundred (100') foot intervals. Make splices waterproof.

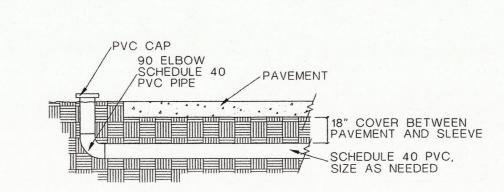
3.9 AUTOMATIC SPRINKLER CONTROLS

A. Supply in accordance with Irrigation Plan. Install according to manufacturer's

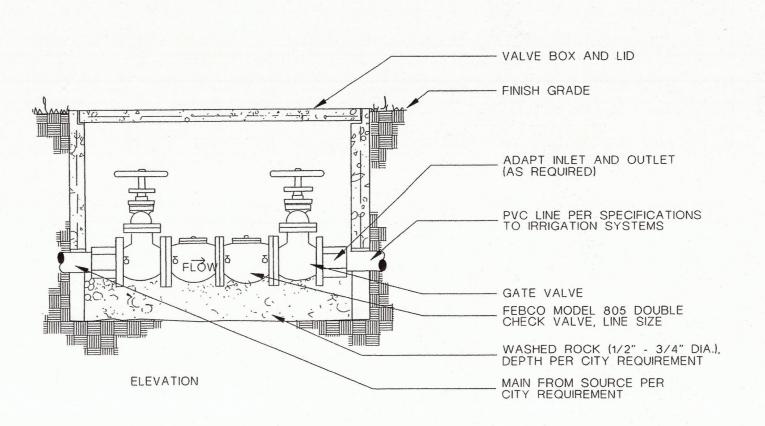
Section 02810 - 04

SLEEVING NOTES

- Contractor shall lay sleeves and conduits at twenty-four (24") inches below finish grade of the top of pavement.
- 2. Contractor shall extend sleeves one (1') foot beyond edge of all pavement.
- Contractor shall cap pipe ends using PVC caps.
- 4. All sleeves shall be Schedule 40 PVC pipe.
- 5 Contractor shall furnish Owner and Irrigation Contractor with an 'as-built' drawing showing all sleeve locations.



04) SLEEVE DETAIL NOT TO SCALE



BACKFLOW PREVENTER NOT TO SCALE

RRIGATION SPECIFICATIONS

IRRIGATION LEGEND

- WEATHERMATIC LX-4 POP-UP LAWN HEAD WEATHERMATIC LX-12 POP-UP SHRUB HEAD
- WEATHERMATIC TURBO ROTARY FC
- WEATHERMATIC TURBO ROTARY PC
- 106.5 BUBBLER (2 PER TREE)
- WEATHERMATIC 11000 SERIES ELECTRIC VALVE
- WEATHERMATIC V075R QUICK COUPLER

 - CONTROLLER, SIZE AS INDICATED
- WATER METER, SIZE AS INDICATED D.C.A., SIZE AS INDICATED
 - **PVC CLASS 200 LATERAL LINE**

PVC SCHEDULE 40 SLEEVING

- PVC CLASS 200 MAINLINE



IRRIGATION NOTES

- 1. All sprinkler equipment numbers reference the Weathermatic equipment catalog unless otherwise indicated.
- 2. LAWN SPRAY HEADS are LX-4 installed as per detail shown.
- SHRUB SPRAY HEADS are LX-12 installed as per detail shown.
- 4. ELECTRIC CONTROL VALVES shall be #11000 CR installed per detail shown. Size valves as sown on plan. Valves shall be installed in value boxes large enough to permit manual operation,
- 5. QUICK COUPLING VALVES shall be #VO75R installed per detail shown. Swing joints shall be constructed using 3/4" Schedule 80 elbows. Contractor shall supply owner with three (3) #CO75

removal of solenoid and/or valve cover without any earth excavation.

- couplers and three (3) #10 swivel hose ells as part of this contract. 6. AUTOMATIC CONTROLLER shall be installed at location shown.
- Power (120V) shall be located in a junction box within five (5') feet of controller location by other trades. 7. All 24 volt valve wiring is to be UF 14 single conductor. All wire
- splices are to be permanent and waterproof. 8. SLEEVES shall be installed by General Contractor. Sleeve
- material shall be Schedule 40. Size as indicated on plan. 9. Ten days prior to start of construction, Landscape or Irrigation

Contractor shall verify static water pressure. If static pressure is

less than 50 P.S.I., do not work until notified to do so by Owner.

- 10. All main line and lateral piping to a minimum of 12 inches of cover. All piping under paving shall have a minimum of 18" of cover.
- 11. The Irrigation Contractor shall coordinate installation of the system with the Landscape Contractor so that all plant material will be watered in accordance with the intent of the plans and
- specifications. The Irrigation Contractor shall select the proper arc and radius for each nozzle to insure 100% and proper coverage of all lawn areas and plant material. All nozzles shall be Weathermatic 5500 Series. All nozzles in parking lot islands and planting beds shall be low

be allowed to spray on building. IRRIGATION PERFORMANCE SPECIFICATIONS

angle to minimize over spray on pavement surfaces. No water will

- 1. All sprinkler equipment numbers reference the Weathermatic equipment catalog.
- 2. ELECTRIC CONTROL VALVES shall be: #11000 CR installed per detail shown. Valves shall be installed in valve boxes large enough to permit manual operation, removal of solenoid and/or valve cover without earth excavation.
- 3. QUICK COUPLING VALVES shall be: #VO75R, 1" Quick Coupler with vinyl yellow cover installed per detail shown. Swing joints shall be constructed using 3/4" Schedule 80 elbows. Contractor shall supply owner with three (3) couplers and three (3) swivel hose ells as part of this contract.
- 4. SLEEVES shall be: PVC Schedule 40.
- 5. MAINLINE PIPE shall be: PVC Class 200 or better, SDR-21 Solvent
- 6. LATERAL PIPE shall be: PVC Class 200 or better, SDR-21 Solvent 7. HEADS shall be: TORO S700 C FC 3.0 SA, groundlevel installation,
- spacing shall be 25'-0" 40'-0". 8. All 24 volt valve wiring is to be UF 14 single conductor. All wire splices are to be permanent and waterproof.
- 9. Irrigation Notes, Details and Specifications shall be used as a directive for irrigation layout and installation. All main line and lateral piping shall have a minimum of 12 inches of
- 11. Contractor shall submit head layout and material list to Architect for review and approval prior to installation.

cover. All piping under paving shall have a minimum of 18 inches of

- 12. Plans shall be drawn to scale. Contractor shall submit 'as-built' record drawing of complete irrigation system to owner.
- 13. Square spacing of heads shall not be permitted. All heads to be "head-to-head" spacing.

14. Contractor shall be responsible for verifying conditions of existing

the integrity of existing irrigation where possible, including but not limited to irrigation controller, meter, sleeving, etc.

15. Contractor shall perform site visit prior to bidding and construction,

irrigation system. Contractor shall be responsible for maintaining

- to review extent of existing irrigation system. 16. The irrigation contractor shall coordinate installation of the system with the landscape contractor so that all plant material will be watered in accordance with the intent of the plans and
- specifications. The irrigation contractor shall select the proper arc and radius for each nozzel to insure 100% and proper coverage of all lawn areas

PROGRESS SET - FOR REVIEW ONLY ISSUED These documents are for Design Review and

NOT intended for Construction or Permit Purposes.

They were prepared by, or under the supervision of:

Brian Denis Adams, Tx. Lic. #1761 Steven M. Rahn, Inc.

MEINHARDT & ASSOCIATES ARCHITECTS, P.L.L.C 14900 LANDMARK SUITE 650 DALLAS TEXAS 75254 972 980-8980

STEVEN M. RAHN, INC. The Brewery Building 703 McKinney Ave. Suite 438 LB 107 Dallas, Texas 75202 Tel 214.871.0083 Fax 214.871.0545

email smr@smr-la.com 12-07-01 DRAWN BY: CHECKED BY:

SHEET:

AS SHOWN