

# BRIGHAM CITY REST AREA: SOUTHBOUND - LANDSCAPE UPGRADES

369 MILE MARKER, BRIGHAM CITY, UT 84302

## OWNER

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## SURVEY

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## VICINITY MAP



## **BID ALTERNATES**

ADD ALTERNATE 1 - C-101, C-201, C-501 REPLACE STORM DRAIN BOX

ADD ALTERNATE 2 - C-101, C-501, L-101, L-201 ADD SYNTHETIC TURF FOR PET AREA INSTALL CONCRETE CURBING AROUND TREES **REVISE IRRIGATION SYSTEM** 

ADD ALTERNATE 3- C-101, C-501 CHAINLINK FENCE TO BE BLACK VINYL COATED INSTEAD OF GALVANIZED

ADD ALTERNATE 4 - C-101, C-501, L-101, L-201 ADD CONCRETE PAD AROUND UTAH SIGN

## LANDSCAPE

DESIGN WEST ARCHITECTS 255 SOUTH 300 WEST LOGAN, UT 84321 PHONE: 435.752.7031 EMAIL: kenia@designwestarchitects.com CONTACT: KENI ALTHOUSE, LANDSCAPE ARCHITECT





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CUMENTS

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### **SECTION 00 0102** PROJECT INFORMATION

PART 1 GENERAL 1.01 PROJECT IDENTIFICATION PROJECT NAME: BRIGHAM CITY REST AREA: SOUTHBOUND - LANDSCAPE UPGRADES. THE OWNER, HEREINAFTER REFERRED TO AS OWNER: UTAH DIVISION OF FACILITIES AND CONSTRUCTION MANAGEMENT 1.02 NOTICE TO PROSPECTIVE BIDDERS A. PART OF THE INVITATION TO BID LETTER SENT BY THE OWNER. B. THE "STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR A SMALL PROJECT" A.I.A. DOCUMENT B155, LATEST EDITION ISSUED BY THE AMERICAN INSTITUTE OF ARCHITECTS FOR USE IN SMALL CONSTRUCTION CONTRACTS WITH A STIPULATED SUM AS THE SUGGESTED FOR OF CONTRACT AGREEMENT. C. THESE DOCUMENTS CONSTITUTE AN INVITATION TO BID AND REQUEST FOR QUALIFICATIONS FROM GENERAL CONTRACTORS FOR THE CONSTRUCTION OF THE PROJECT DESCRIBED 1.03 BID FORM A. PART OF THE INVITATION TO BID LETTER SENT BY THE OWNER. 1.04 PROJECT DESCRIPTION A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION OF A SMALL PROJECT" A.I.A. FORM A205 LATEST EDITIONS ARE A PART AND CONDITION OF EACH DIVISION OF THESE SPECIFICATIONS. B. PROJECT CONSISTS OF LANDSCAPING AT THE BRIGHAM CITY REST AREA WITH THE FOLLOWING AMENITIES: DEMOLITION, SITE, GRADING, LANDSCAPE AND IRRIGATION. 1.05 PROCUREMENT TIMETABLE A. THE OWNER RESERVES THE RIGHT TO CHANGE THE SCHEDULE OR TERMINATE THE ENTIRE PROCUREMENT PROCESS AT ANY TIME. 1.06 PROCUREMENT DOCUMENTS A. AVAILABILITY OF DOCUMENTS: COMPLETE SETS OF PROCUREMENT DOCUMENTS MAY BE OBTAINED AT THE FOLLOWING ADDRESS: DESIGN WEST ARCHITECTS 255 SOUTH 300 WEST LOGAN, UTAH 84321 KENI ALTHOUSE, PLA kenia@designwestarchitects.com END OF SECTION **SECTION 01 3000** ADMINISTRATIVE REQUIREMENTS PART 1 GENERAI **1.01 CONSTRUCTION SCHEDULE** A. THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ARCHITECT AND OWNER, A BAR-CHART TYPE PROGRESS SCHEDULE FOR THE ENTIRE PROJECT, WITHIN SEVEN (7) DAYS AFTER AWARD OF CONTRACT. PROVIDE A SEPARATE BAR FOR EACH WORK ITEM LISTED IN THE SCHEDULE OF VALUES. INCLUDE APPROPRIATE TIME FOR PROJECT MOBILIZATION, PROCUREMENT OF PRODUCTS, REVIEW AND RETURN OF SHOP DRAWINGS, INSTALLATION, TESTING, FINAL CLEANUP AND INSTALLATION TIME FOR WORK UNDER SEPARATE CONTRACTS. IDENTIFY EACH CALENDAR DAY THROUGHOUT THE SCHEDULE. HIGHLIGHT CRITICAL PATH ELEMENTS OF THE SCHEDULE THAT ARE IMPORTANT TO COMPLETE THE WORK ON TIME. CORRELATE THE ORGANIZATION OF THE SCHEDULE WITH THE DATE OF SUBSTANTIAL COMPLETION INDICATED IN THE OWNER-CONTRACTOR AGREEMENT. 1.02 PROJECT COORDINATION & ADMINISTRATION A. COORDINATE THE WORK OF THE COMPLETE PROJECT TO ASSURE AN EFFICIENT AND ORDERLY SEQUENCE OF INSTALLATION OF CONSTRUCTION ELEMENTS, AND FOR INSTALLATION OF ITEMS FURNISHED AND INSTALLED BY OTHERS, WITH PROVISIONS FOR ACCOMMODATING OTHER ITEMS TO BE INSTALLED LATER. UTILIZE SPACE EFFICIENTLY TO MAXIMIZE ACCESSIBILITY FOR OTHER INSTALLATIONS, AND FOR MAINTENANCE. 1.03 PRE-CONSTRUCTION MEETING A. MEET WITH THE OWNER'S DESIGNATED CONSTRUCTION REPRESENTATIVE BEFORE STARTING CONSTRUCTION. DISCUSS PROCEDURES AND REQUIREMENTS FOR SITE ACCESS, WORK HOURS, PARKING, DELIVERIES AND RECEIVING, DEBRIS AND WASTE RECEPTACLES, TEMPORARY BARRICADES, AND CONSTRUCTION OPERATIONS THAT MAY BE OFFENSIVE. 1.04 MAINTENANCE OF CONSTRUCTION DOCUMENTS A. THE CONTRACTOR SHALL MAINTAIN AT THE PROJECT SITE, A "RECORD SET OF CONSTRUCTION DOCUMENTS" AND THE FOLLOWING RELATED DRAWINGS OR DOCUMENTS PREPARED BY OTHERS: SHOP DRAWINGS AND DATA SHEETS PREPARED BY THE MANUFACTURERS, FABRICATORS, AND SUPPLIERS. B. DO NOT CONSTRUCT ANY PORTION OF THE WORK RELATED TO THESE DRAWINGS AT ANY TIME WITHOUT SUCH DRAWINGS BEING AVAILABLE AT THE PROJECT SITE. C. "AS BUILT" DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR. DRAWINGS SHALL INDICATE THE SIZE AND DIMENSIONS OF ALL CONCEALED AND UNDERGROUND WORK, AND SHALL INDICATE DEPTH OF MAJOR CONDUIT AND PIPING. 1.05 PERMITS AND LOCAL CODES A. THE LAWS IN FORCE AT THE BUILDING LOCATION SHALL GOVERN. THESE INCLUDE THE

PART 3 EXECUTION

3.01 PROGRESS MEETINGS

ACCEPTED PROPOSED SCHEDULE.

SECTION 01 7800 - CLOSEOUT SUBMITTALS.

- STANDARDS, FEDERAL, STATE, COUNTY AND MUNICIPAL LAWS. PART 2 PRODUCTS - NOT USED
- A. SCHEDULE AND ADMINISTER MEETINGS THROUGHOUT PROGRESS OF THE WORK AT MAXIMUM MONTHLY INTERVALS. B. ATTENDANCE REQUIRED: JOB SUPERINTENDENT, MAJOR SUBCONTRACTORS AND C. RECORD MINUTES AND DISTRIBUTE COPIES WITHIN TWO DAYS AFTER MEETING TO PARTICIPANTS 3.02 CONSTRUCTION PROGRESS SCHEDULE WITHIN 10 DAYS. COMPLETE SCHEDULE FOR REVIEW.
- C. WITHIN 10 DAYS AFTER JOINT REVIEW, SUBMIT COMPLETE SCHEDULE. D. SUBMIT UPDATED SCHEDULE WITH EACH APPLICATION FOR PAYMENT. 3.03 SUBMITTALS FOR REVIEW 1. PRODUCT DATA. 2. SHOP DRAWINGS SAMPLES FOR SELECTION. SAMPLES FOR VERIFICATION. CONTRACT DOCUMENTS.
- 3.04 SUBMITTALS FOR INFORMATION

- B. SUBMIT FOR ARCHITECT'S KNOWLEDGE AND CONTRACT ADMINISTRATOR OR FOR OWNER. NO ACTION WILL BE TAKEN. 3.05 SUBMITTALS FOR PROJECT CLOSEOUT A. SUBMIT CORRECTION PUNCH LIST FOR SUBSTANTIAL COMPLETION. B. SUBMIT FINAL CORRECTION PUNCH LIST FOR SUBSTANTIAL COMPLETION. C. WHEN THE FOLLOWING ARE SPECIFIED IN INDIVIDUAL SECTIONS, SUBMIT THEM AT PROJECT

7. OTHER TYPES INDICATED

INFORMATION:

1. DESIGN DATA.

CERTIFICATES.

3. TEST REPORTS.

INSPECTION REPORTS

5. MANUFACTURER'S INSTRUCTIONS

MANUFACTURER'S FIELD REPORTS.

- CLOSFOUT. 1. PROJECT RECORD DOCUMENTS. 2. OPERATION AND MAINTENANCE DATA. 3. WARRANTIES 4. BONDS.
- 5. OTHER TYPES AS INDICATED. D. SUBMIT FOR OWNER'S BENEFIT DURING AND AFTER PROJECT COMPLETION. 3.06 NUMBER OF COPIES OF SUBMITTALS
- A. DOCUMENTS FOR REVIEW: 1. SMALL SIZE SHEETS, NOT LARGER THAN 8-1/2 X 11 INCHES: SUBMIT THE NUMBER OF COPIES THAT CONTRACTOR REQUIRES. PLUS TWO COPIES THAT WILL BE RETAINED BY
- ARCHITECT. ELECTRONIC COPIES ARE ACCEPTABLE AND ENCOURAGED. B. DOCUMENTS FOR INFORMATION: SUBMIT TWO COPIES. ELECTRONIC COPIES ARE
- ACCEPTABLE AND ENCOURAGED. C. SAMPLES: SUBMIT THE NUMBER SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS; ONE OF
- WHICH WILL BE RETAINED BY ARCHITECT. 1. AFTER REVIEW. PRODUCE DUPLICATES. 2. RETAINED SAMPLES WILL NOT BE RETURNED TO CONTRACTOR UNLESS SPECIFICALLY SO
- STATED 3.07 SUBMITTAL PROCEDURES
- A. SHOP DRAWING PROCEDURES:
- 1. PREPARE ACCURATE, DRAWN-TO-SCALE, ORIGINAL SHOP DRAWING DOCUMENTATION BY INTERPRETING THE CONTRACT DOCUMENTS AND COORDINATING RELATED WORK.
- 2. GENERIC, NON-PROJECT SPECIFIC INFORMATION SUBMITTED AS SHOP DRAWINGS DO NOT MEET THE REQUIREMENTS FOR SHOP DRAWINGS.

- LATEST EDITIONS OF THE INTERNATIONAL BUILDING CODE. INTERNATIONAL MECHANICAL CODE, INTERNATIONAL PLUMBING CODE, NATIONAL ELECTRIC CODE, LIFE SAFETY CODE, ANSI 117.1 AND LOCAL ORDINANCES. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL
- NECESSARY BUILDING PERMITS AND FOR INSPECTION SERVICES OF LOCAL AUTHORITIES AND HIS OWN BUSINESS LICENSES. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF OCCUPATIONAL SAFETY AND HEALTH
- SUPPLIERS, OWNER, ARCHITECT, AS APPROPRIATE TO AGENDA TOPICS FOR EACH MEETING.
- A. IF PRELIMINARY SCHEDULE REQUIRES REVISION AFTER REVIEW, SUBMIT REVISED SCHEDULE B. WITHIN 20 DAYS AFTER REVIEW OF PRELIMINARY SCHEDULE, SUBMIT DRAFT OF PROPOSED 1. INCLUDE WRITTEN CERTIFICATION THAT MAJOR SUBCONTRACTORS HAVE REVIEWED AND
- A. WHEN THE FOLLOWING ARE SPECIFIED IN INDIVIDUAL SECTIONS, SUBMIT THEM FOR REVIEW:
- B. SUBMIT TO ARCHITECT FOR REVIEW FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE C. SAMPLES WILL BE REVIEWED ONLY FOR AESTHETIC, COLOR, OR FINISH SELECTION.
- D. AFTER REVIEW, PROVIDE COPIES AND DISTRIBUTE IN ACCORDANCE WITH SUBMITTAL PROCEDURES ARTICLE BELOW AND FOR RECORD DOCUMENTS PURPOSES DESCRIBED IN
- A. WHEN THE FOLLOWING ARE SPECIFIED IN INDIVIDUAL SECTIONS, SUBMIT THEM FOR

- B. SEQUENTIALLY NUMBER THE TRANSMITTAL FORM. REVISE SUBMITTALS WITH ORIGINAL NUMBER AND A SEQUENTIAL ALPHABETIC SUFFIX. C. IDENTIFY PROJECT, CONTRACTOR, SUBCONTRACTOR OR SUPPLIER; PERTINENT DRAWING AND DETAIL NUMBER, AND SPECIFICATION SECTION NUMBER, AS APPROPRIATE ON EACH
- D. APPLY CONTRACTOR'S STAMP, SIGNED OR INITIALED CERTIFYING THAT REVIEW, APPROVAL VERIFICATION OF PRODUCTS REQUIRED, FIELD DIMENSIONS, ADJACENT CONSTRUCTION WORK, AND COORDINATION OF INFORMATION IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE WORK AND CONTRACT DOCUMENTS. E. FOR EACH SUBMITTAL FOR REVIEW, ALLOW 15 DAYS EXCLUDING DELIVERY TIME TO AND
- FROM THE CONTRACTOR. F. IDENTIFY VARIATIONS FROM CONTRACT DOCUMENTS AND PRODUCT OR SYSTEM LIMITATIONS THAT MAY BE DETRIMENTAL TO SUCCESSFUL PERFORMANCE OF THE COMPLETED WORK.
- G. PROVIDE SPACE FOR CONTRACTOR AND ARCHITECT REVIEW STAMPS. H. WHEN REVISED FOR RESUBMISSION, IDENTIFY ALL CHANGES MADE SINCE PREVIOUS SUBMISSION I. DISTRIBUTE REVIEWED SUBMITTALS AS APPROPRIATE. INSTRUCT PARTIES TO PROMPTLY
- REPORT ANY INABILITY TO COMPLY WITH REQUIREMENTS. J. SUBMITTALS NOT REQUESTED WILL NOT BE RECOGNIZED OR PROCESSED. END OF SECTION

### **SECTION 01 4000 QUALITY REQUIREMENTS**

### PART 1 GENERAL 1.01 SUBMITTALS A. TESTING AGENCY QUALIFICATIONS:

- 1. PRIOR TO START OF WORK, SUBMIT AGENCY NAME, ADDRESS, AND TELEPHONE NUMBER, AND NAMES OF FULL TIME REGISTERED ENGINEER AND RESPONSIBLE OFFICER. B. TEST REPORTS: AFTER EACH TEST/INSPECTION, PROMPTLY SUBMIT TWO COPIES OF REPORT TO ARCHITECT AND TO CONTRACTOR.
- C. CERTIFICATES: WHEN SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS, SUBMIT CERTIFICATION BY THE MANUFACTURER AND CONTRACTOR OR INSTALLATION/APPLICATION SUBCONTRACTOR TO ARCHITECT, IN QUANTITIES SPECIFIED FOR PRODUCT DATA.
- 1. INDICATE MATERIAL OR PRODUCT CONFORMS TO OR EXCEEDS SPECIFIED REQUIREMENTS. SUBMIT SUPPORTING REFERENCE DATA, AFFIDAVITS, AND CERTIFICATIONS AS APPROPRIATE.

## PART 2 PRODUCTS - NOT USED

### ART 3 EXECUTION 3.01 CONTROL OF INSTALLATION

- A. MONITOR QUALITY CONTROL OVER SUPPLIERS, MANUFACTURERS, PRODUCTS, SERVICES, SITE CONDITIONS, AND WORKMANSHIP, TO PRODUCE WORK OF SPECIFIED QUALITY. B. COMPLY WITH MANUFACTURERS' INSTRUCTIONS, INCLUDING EACH STEP IN SEQUENCE.
- C. SHOULD MANUFACTURERS' INSTRUCTIONS CONFLICT WITH CONTRACT DOCUMENTS, REQUEST CLARIFICATION FROM ARCHITECT BEFORE PROCEEDING.
- D. COMPLY WITH SPECIFIED STANDARDS AS MINIMUM QUALITY FOR THE WORK EXCEPT WHERE MORE STRINGENT TOLERANCES, CODES, OR SPECIFIED REQUIREMENTS INDICATE HIGHER STANDARDS OR MORE PRECISE WORKMANSHIP.
- E. HAVE WORK PERFORMED BY PERSONS QUALIFIED TO PRODUCE REQUIRED AND SPECIFIED QUALITY. F. VERIFY THAT FIELD MEASUREMENTS ARE AS INDICATED ON SHOP DRAWINGS OR AS
- INSTRUCTED BY THE MANUFACTURER. G. SECURE PRODUCTS IN PLACE WITH POSITIVE ANCHORAGE DEVICES DESIGNED AND SIZED TO WITHSTAND STRESSES, VIBRATION, PHYSICAL DISTORTION, AND DISFIGUREMENT. 3.02 DEFECT ASSESSMENT
- A. REPLACE WORK OR PORTIONS OF THE WORK NOT CONFORMING TO SPECIFIED REQUIREMENTS.
- B. IF, IN THE OPINION OF THE ARCHITECT, IT IS NOT PRACTICAL TO REMOVE AND REPLACE THE WORK, ARCHITECT WILL DIRECT AN APPROPRIATE REMEDY OR ADJUST PAYMENT. END OF SECTION

### **SECTION 01 5639** TEMPORARY TREE AND PLANT PROTECTION

### PART 1 GENERAL 1.01 SECTION INCLUDES

- A. CONTRACTOR SHALL PROTECT AND AVOID DAMAGING EXISTING TREES, SHRUBS, LANDSCAPE, AND ADJACENT VEGETATION.
- PART 2 PRODUCTS NOT USED

### PART 3 EXECUTION 3.01 GENERAL

- A. VEHICULAR AND PEDESTRIAN TRAFFIC SHALL BE LIMITED TO AREAS MARKED. THRU-TRAFFIC AND STOCKPILING OF EQUIPMENT AND MATERIALS ARE NOT PERMITTED WITHIN MARKED ARFAS
- B. NO CONSTRUCTION ROADS ARE TO BE CREATED WITHIN THE DRIP LINES OF ANY TREES OR OTHER VEGETATION DESIGNATED TO BE SAVED WITHOUT APPROVAL OF LANDSCAPE ARCHITECT. 3.02 PROTECTED AREAS
- A. PROTECTED AREAS WILL BE DESIGNATED ON THE PLANS BY LANDSCAPE ARCHITECT. CONTRACTOR SHALL ADEQUATELY MARK AREAS. 1. NO ACCESS OF CONSTRUCTION VEHICLES OR WORKERS ON FOOT IS PERMITTED THROUGH PROTECTED AREAS.
- 2. NO MATERIAL SHALL BE STOCKPILED AND NO EQUIPMENT SHALL BE PARKED OR REPAIRED WITHIN THESE AREAS. 3.03 TREES AND PLANTINGS
- A. TREES DESIGNATED TO BE PRESERVED WITHIN THE LIMITS OF CONSTRUCTION, SHALL BE PROTECTED FROM DAMAGE ASSOCIATED WITH CONSTRUCTION. 3.04 EXCAVATED AREAS
- A. WHERE EXCAVATION FOR NEW CONSTRUCTION IS REQUIRED WITHIN DRIP LINE OF TREES, HAND CLEAR AND EXCAVATE TO MINIMIZE DAMAGE TO ROOT SYSTEMS. USE NARROW-TINE SPADING FORKS, COMB SOIL TO EXPOSE ROOTS, AND CLEANLY CUT ROOTS AS CLOSE TO EXCAVATION AS POSSIBLE.
- 1. COVER EXPOSED ROOTS WITH BURLAP AND WATER REGULARLY TO PREVENT ROOTS FROM DRYING OUT. BACKFILL WITH SOIL AS SOON AS POSSIBLE.
- 2. TEMPORARILY SUPPORT AND PROTECT ROOTS FROM DAMAGE UNTIL THEY ARE PERMANENTLY RELOCATED AND COVERED WITH SOIL.
- 3. COAT CUT FACES OF ROOTS MORE THAN 1-1/2 INCHES IN DIAMETER WITH AN EMULSIFIED ASPHALT OR OTHER APPROVED COATING FORMULATED FOR USE ON DAMAGED PLANT TISSUES 3.05 DAMAGE TO EXISTING VEGETATION

## A. ANY TREES DAMAGED DURING CONSTRUCTION SHALL BE IMMEDIATELY REPAIRED BY A

SQUARE FOOT OF DAMAGE.

- CERTIFIED ARBORIST ACCEPTABLE TO THE LANDSCAPE ARCHITECT AT THE CONTRACTOR'S FXPFNSF. B. ANY TREE JUDGED BY THE ACCEPTED CERTIFIED ARBORIST TO BE DAMAGED BEYOND REPAIR SHALL BE REMOVED AT CONTRACTOR'S EXPENSE.
- C. FOR EACH TREE ERRONEOUSLY REMOVED OR DAMAGED BEYOND REPAIR, AN ASSESSMENT WILL BE IMMEDIATELY WITHHELD FROM CONTRACTOR'S PROGRESS PAYMENTS. 1. THIS ASSESSMENT WILL BE EQUAL TO THE VALUE OF THE TREE PRIOR TO DAMAGE.
- 2. THIS ASSESSMENT WILL BE DETERMINED BY A TREE APPRAISER, SELECTED BY LANDSCAPE ARCHITECT AND PAID FOR BY CONTRACTOR. 3. THE COST FOR HIRING A TREE APPRAISER SHALL ALSO BE WITHHELD FROM
- CONTRACTOR'S PROGRESS PAYMENTS. D. CONTRACTOR SHALL REPLACE EACH DAMAGED TREE WITH NURSERY-GROWN MATERIAL OF SIMILAR SIZE AND OF THE SAME OR APPROVED SPECIES. 1. REPLACEMENT TREES SHALL BE THE GREATER OF A TWO (2)-INCH CALIPER OR SIZE
- EQUIVALENT TO THE SIZE OF THE DAMAGED TREE, BALLED AND BURLAPPED, AND PLANTED IN ACCORDANCE WITH THE PROVISIONS OUTLINED IN THESE SPECIFICATIONS. E. DAMAGED VEGETATION SHALL BE REPLACED BY CONTRACTOR WITH AN EQUAL VALUE PER

## END OF SECTION

### **SECTION 01 6000** PRODUCT REQUIREMENTS

- 1.01 SUBMITTALS A. PRODUCT DATA SUBMITTALS: SUBMIT MANUFACTURER'S STANDARD PUBLISHED DATA. MARK EACH COPY TO IDENTIFY APPLICABLE PRODUCTS, MODELS, OPTIONS, AND OTHER DATA. SUPPLEMENT MANUFACTURERS' STANDARD DATA TO PROVIDE INFORMATION
- SPECIFIC TO THIS PROJECT. B. SAMPLE SUBMITTALS: ILLUSTRATE FUNCTIONAL AND AESTHETIC CHARACTERISTICS OF THE PRODUCT, WITH INTEGRAL PARTS AND ATTACHMENT DEVICES, COORDINATE SAMPLE SUBMITTALS FOR INTERFACING WORK.

## PART 2 PRODUCTS

NAMED.

- 2.01 NEW PRODUCTS A. PROVIDE NEW PRODUCTS UNLESS SPECIFICALLY REQUIRED OR PERMITTED BY THE CONTRACT DOCUMENTS. 2.02 PRODUCT OPTIONS
- A. PRODUCTS SPECIFIED BY REFERENCE STANDARDS OR BY DESCRIPTION ONLY: USE ANY PRODUCT MEETING THOSE STANDARDS OR DESCRIPTION. B. PRODUCTS SPECIFIED BY NAMING ONE OR MORE MANUFACTURERS: USE A PRODUCT OF ONE OF THE MANUFACTURERS NAMED AND MEETING SPECIFICATIONS, NO OPTIONS OR
- SUBSTITUTIONS ALLOWED. C. PRODUCTS SPECIFIED BY NAMING ONE OR MORE MANUFACTURERS WITH A PROVISION FOR SUBSTITUTIONS: SUBMIT A REQUEST FOR SUBSTITUTION FOR ANY MANUFACTURER NOT

### PART 3 EXECUTION 3.01 SUBSTITUTION PROCEDURES

- A. SUBSTITUTION REQUESTS MUST BE SUBMITTED DURING THE BID PERIOD. BID QUESTIONS AND SUBSTITUTION REQUESTS WILL BE ADDRESSED BY THE ARCHITECT AND APPROVED BY CMU UNTIL 72 HOURS PRIOR TO THE BID DATE PUBLISHED BY THE CONSTRUCTION MANAGER.
- B. DOCUMENT EACH REQUEST WITH COMPLETE DATA SUBSTANTIATING COMPLIANCE OF PROPOSED SUBSTITUTION WITH CONTRACT DOCUMENTS.
- C. A REQUEST FOR SUBSTITUTION CONSTITUTES A REPRESENTATION THAT THE SUBMITTER: 1. HAS INVESTIGATED PROPOSED PRODUCT AND DETERMINED THAT IT MEETS OR EXCEEDS
- THE QUALITY LEVEL OF THE SPECIFIED PRODUCT. 2. WILL PROVIDE THE SAME WARRANTY FOR THE SUBSTITUTION AS FOR THE SPECIFIED
- PRODUCT 3. WILL COORDINATE INSTALLATION AND MAKE CHANGES TO OTHER WORK THAT MAY BE
- REQUIRED FOR THE WORK TO BE COMPLETE WITH NO ADDITIONAL COST TO OWNER. 4. WAIVES CLAIMS FOR ADDITIONAL COSTS OR TIME EXTENSION THAT MAY SUBSEQUENTLY BECOME APPARENT.
- D. SUBSTITUTION SUBMITTAL PROCEDURE: 1. SUBMIT THREE COPIES OF REQUEST FOR SUBSTITUTION FOR CONSIDERATION. LIMIT EACH
- REQUEST TO ONE PROPOSED SUBSTITUTION. 2. SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND CERTIFIED TEST RESULTS ATTESTING TO
- THE PROPOSED PRODUCT EQUIVALENCE. BURDEN OF PROOF IS ON PROPOSER. 3. THE ARCHITECT WILL NOTIFY CONTRACTOR BY ADDENDUM OF DECISION TO ACCEPT. END OF SECTION

### **SECTION 01 7000** EXECUTION AND CLOSEOUT REQUIREMENTS

- PART 1 GENERAL
- 1.01 PROJECT CONDITIONS A. GRADE SITE TO DRAIN. MAINTAIN EXCAVATIONS FREE OF WATER. PROVIDE, OPERATE, AND MAINTAIN PUMPING EQUIPMENT.
- B. DUST CONTROL: EXECUTE WORK BY METHODS TO MINIMIZE RAISING DUST FROM CONSTRUCTION OPERATIONS. PROVIDE POSITIVE MEANS TO PREVENT AIR-BORNE DUST FROM DISPERSING INTO ATMOSPHERE AND OVER ADJACENT PROPERTY
- C. EROSION AND SEDIMENT CONTROL: PLAN AND EXECUTE WORK BY METHODS TO CONTROL SURFACE DRAINAGE FROM CUTS AND FILLS, FROM BORROW AND WASTE DISPOSAL AREAS. PREVENT EROSION AND SEDIMENTATION.
- PART 2 PRODUCTS NOT USED

## PART 3 EXECUTION

3.05 CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

PART 3 EXECUTION

OF SUBSTANTIAL COMPLETION.

B. OPERATION AND MAINTENANCE DATA

WITHIN 10 DAYS AFTER ACCEPTANCE.

PART 2 PRODUCTS (NOT APPLICABLE

3.01 PROJECT RECORD DOCUMENTS

REVISIONS TO THE WORK:

3.02 OPERATION AND MAINTENANCE DATA

AND REPLACEMENT PARTS.

1. DRAWINGS.

2. ADDENDA.

INFORMATION.

PART 1 GENERAL

1.01 RELATED DOCUMENTS

THIS SECTION.

1.03 RELATED SECTIONS

REINSTALLED.

1.04 DEFINITIONS

1.05 SUBMITTALS

BELOW-GRADE IMPROVEMENTS.

TO OWNER READY FOR REUSE.

REMOVED AND REINSTALLED.

A. QUALIFICATION DATA: FOR DEMOLITION FIRM.

OPERATIONS ARE UNINTERRUPTED.

1.02 SECTION INCLUDES

3.03 WARRANTIES AND BONDS

- 3.01 GENERAL INSTALLATION REQUIREMENTS A. INSTALL PRODUCTS AS SPECIFIED IN INDIVIDUAL SECTIONS, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS, AND SO AS TO AVOID WASTE DUE TO NECESSITY FOR REPLACEMENT.
- B. MAKE VERTICAL ELEMENTS PLUMB AND HORIZONTAL ELEMENTS LEVEL, UNLESS OTHERWISE INDICATED. C. INSTALL EQUIPMENT AND FITTINGS PLUMB AND LEVEL, NEATLY ALIGNED WITH ADJACENT
- VERTICAL AND HORIZONTAL LINES, UNLESS OTHERWISE INDICATED. D. MAKE CONSISTENT TEXTURE ON SURFACES, WITH SEAMLESS TRANSITIONS, UNLESS OTHERWISE INDICATED.
- E. MAKE NEAT TRANSITIONS BETWEEN DIFFERENT SURFACES, MAINTAINING TEXTURE AND APPEARANCE.
- 3.02 PROGRESS CLEANING A. MAINTAIN AREAS FREE OF WASTE MATERIALS, DEBRIS, AND RUBBISH. MAINTAIN SITE IN A CLEAN AND ORDERLY CONDITION. 3.03 PROTECTION OF INSTALLED WORK
- A. PROTECT INSTALLED WORK FROM DAMAGE BY CONSTRUCTION OPERATIONS. B. PROVIDE SPECIAL PROTECTION WHERE SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS. C. REMOVE PROTECTIVE COVERINGS WHEN NO LONGER NEEDED; REUSE OR RECYCLE PLASTIC COVERINGS IF POSSIBLE
- 3.04 FINAL CLEANING A. USE CLEANING MATERIALS THAT ARE NON-HAZARDOUS.

ARCHITECT'S SUBSTANTIAL COMPLETION INSPECTION.

ARCHITECT'S SUBSTANTIAL COMPLETION FINAL INSPECTION.

OR "AS-BUILT" DOCUMENTS AS THEY ARE COMMONLY KNOWN.

3. CHANGE ORDERS AND OTHER MODIFICATIONS TO THE CONTRACT.

USE PROJECT RECORD DOCUMENTS AS MAINTENANCE DRAWINGS.

END OF SECTION

**SECTION 02 4119** 

SELECTIVE SITE DEMOLITION

OF SUBSTANTIAL COMPLETION IS DETERMINED.

A. DEMOLITION AND REMOVAL OF SELECTED SITE ELEMENTS.

B. SALVAGE OF EXISTING ITEMS TO BE REUSED OR RECYCLED.

FOR REUSE, AND REINSTALL THEM WHERE INDICATED.

END OF SECTION

**SECTION 01 7800** 

**CLOSEOUT SUBMITTALS** 

B. CLEAN INTERIOR AND EXTERIOR GLASS, SURFACES EXPOSED TO VIEW; REMOVE TEMPORARY LABELS, STAINS AND FOREIGN SUBSTANCES, POLISH TRANSPARENT AND GLOSSY SURFACES, VACUUM CARPETED AND SOFT SURFACES. C. REMOVE ALL LABELS THAT ARE NOT PERMANENT. DO NOT PAINT OR OTHERWISE COVER FIRE TEST LABELS OR NAMEPLATES ON MECHANICAL AND ELECTRICAL EQUIPMENT.

APPROPRIATE TO THE SURFACE AND MATERIAL BEING CLEANED.

- D. CLEAN EQUIPMENT AND FIXTURES TO A SANITARY CONDITION WITH CLEANING MATERIALS A. MAKE SUBMITTALS THAT ARE REQUIRED BY GOVERNING OR OTHER AUTHORITIES.
- B. NOTIFY ARCHITECT WHEN WORK IS CONSIDERED READY FOR SUBSTANTIAL COMPLETION. C. SUBMIT WRITTEN CERTIFICATION CONTAINING CONTRACTOR'S CORRECTION PUNCH LIST, THAT CONTRACT DOCUMENTS HAVE BEEN REVIEWED, WORK HAS BEEN INSPECTED, AND THAT WORK IS COMPLETE IN ACCORDANCE WITH CONTRACT DOCUMENTS AND READY FOR
- D. NOTIFY ARCHITECT WHEN WORK IS CONSIDERED FINALLY COMPLETE AND READY FOR E. COMPLETE ITEMS OF WORK DETERMINED BY ARCHITECT LISTED IN EXECUTED CERTIFICATE
- A. PROJECT RECORD DOCUMENTS: SUBMIT DOCUMENTS TO ARCHITECT FOR FINAL IMPLEMENTATION OF CHANGES DURING THE CONSTRUCTION PROCESS TO CREATE "RECORD"
- . WARRANTIES AND BONDS: FOR EQUIPMENT OR COMPONENT PARTS OF EQUIPMENT PUT INTO SERVICE DURING CONSTRUCTION WITH OWNER'S PERMISSION, SUBMIT DOCUMENTS
- A. MAINTAIN ON SITE ONE SET OF THE FOLLOWING RECORD DOCUMENTS; RECORD ACTUAL
- A. SOURCE DATA: FOR EACH PRODUCT OR SYSTEM, LIST NAMES, ADDRESSES AND TELEPHONE NUMBERS OF SUBCONTRACTORS AND SUPPLIERS, INCLUDING LOCAL SOURCE OF SUPPLIES B. PRODUCT DATA: MARK EACH SHEET TO CLEARLY IDENTIFY SPECIFIC PRODUCTS AND
- COMPONENT PARTS, AND DATA APPLICABLE TO INSTALLATION. DELETE INAPPLICABLE C. DRAWINGS: SUPPLEMENT PRODUCT DATA TO ILLUSTRATE RELATIONS OF COMPONENT
- PARTS OF EQUIPMENT AND SYSTEMS, TO SHOW CONTROL AND FLOW DIAGRAMS. DO NOT A. OBTAIN WARRANTIES AND BONDS, EXECUTED IN DUPLICATE BY RESPONSIBLE
- SUBCONTRACTORS, SUPPLIERS, AND MANUFACTURERS, WITHIN 10 DAYS AFTER COMPLETION OF THE APPLICABLE ITEM OF WORK. EXCEPT FOR ITEMS PUT INTO USE WITH OWNER'S PERMISSION, LEAVE DATE OF BEGINNING OF TIME OF WARRANTY UNTIL THE DATE
- A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND
- SUPPLEMENTARY CONDITIONS AND OTHER DIVISION 01 SPECIFICATION SECTIONS, APPLY TO
- A. DIVISION 31 2300 "EARTHWORK" FOR SITE CLEARING AND REMOVAL OF ABOVE- AND A. REMOVE: DETACH ITEMS FROM EXISTING CONSTRUCTION AND LEGALLY DISPOSE OF THEM
- OFF-SITE, UNLESS INDICATED TO BE REMOVED AND SALVAGED OR REMOVED AND B. REMOVE AND SALVAGE: DETACH ITEMS FROM EXISTING CONSTRUCTION AND DELIVER THEM
- C. REMOVE AND REINSTALL: DETACH ITEMS FROM EXISTING CONSTRUCTION, PREPARE THEM D. EXISTING TO REMAIN: EXISTING ITEMS OF CONSTRUCTION THAT ARE NOT TO BE REMOVED
- AND THAT ARE NOT OTHERWISE INDICATED TO BE REMOVED, REMOVED AND SALVAGED, OR
- B. SCHEDULE OF SELECTIVE DEMOLITION ACTIVITIES: INDICATE THE FOLLOWING: 1. DETAILED SEQUENCE OF SELECTIVE DEMOLITION AND REMOVAL WORK, WITH STARTING AND ENDING DATES FOR EACH ACTIVITY. ENSURE OWNER'S OTHER TENANTS' ON-SITE

- 2. INTERRUPTION OF UTILITY SERVICES. INDICATE HOW LONG UTILITY SERVICES WILL BE INTERRUPTED. 3. COORDINATION FOR SHUTOFF. CAPPING. AND CONTINUATION OF UTILITY SERVICES. 4. LOCATIONS OF PROPOSED DUST AND NOISE CONTROL, TEMPORARY PARTITIONS AND
- MEANS OF EGRESS, INCLUDING FOR OTHER TENANTS AFFECTED BY SELECTIVE DEMOLITION OPERATIONS. 5. COORDINATION OF OWNER'S CONTINUING OCCUPANCY OF PORTIONS OF EXISTING SITE AND OF OWNER'S PARTIAL OCCUPANCY OF COMPLETED WORK. 6. MEANS OF PROTECTION FOR ITEMS TO REMAIN AND ITEMS IN PATH OF WASTE REMOVAL
- FROM SITE. C. INVENTORY: AFTER SELECTIVE DEMOLITION IS COMPLETE, SUBMIT A LIST OF ITEMS THAT HAVE BEEN REMOVED AND SALVAGED.
- D. PREDEMOLITION PHOTOGRAPHS OR VIDEOTAPES: SHOW EXISTING CONDITIONS OF ADJOINING CONSTRUCTION AND SITE IMPROVEMENTS, INCLUDING FINISH SURFACES, THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY SELECTIVE DEMOLITION OPERATIONS. E. LANDFILL RECORDS: INDICATE RECEIPT AND ACCEPTANCE OF HAZARDOUS WASTES BY A LANDFILL FACILITY LICENSED TO ACCEPT HAZARDOUS WASTES.
- 1.06 QUALITY ASSURANCE A. DEMOLITION FIRM QUALIFICATIONS: AN EXPERIENCED FIRM THAT HAS SPECIALIZED IN DEMOLITION WORK SIMILAR IN MATERIAL AND EXTENT TO THAT INDICATED FOR THIS
- B. REGULATORY REQUIREMENTS: COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE BEGINNING SELECTIVE DEMOLITION. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- C. STANDARDS: COMPLY WITH ANSI A10.6 AND NFPA 241 D. PREDEMOLITION CONFERENCE: CONDUCT CONFERENCE AT PROJECT SITE. REVIEW METHODS AND PROCEDURES RELATED TO SELECTIVE DEMOLITION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
- 1. INSPECT AND DISCUSS CONDITION OF CONSTRUCTION TO BE SELECTIVELY DEMOLISHED. 2. REVIEW AND FINALIZE SELECTIVE DEMOLITION AND VERIFY AVAILABILITY OF MATERIALS, DEMOLITION PERSONNEL, EQUIPMENT, AND FACILITIES NEEDED TO MAKE PROGRESS AND AVOID DELAYS.
- 3. REVIEW REQUIREMENTS OF WORK PERFORMED BY OTHER TRADES THAT RELY ON SUBSTRATES EXPOSED BY SELECTIVE DEMOLITION OPERATIONS. 4. REVIEW AREAS WHERE EXISTING CONSTRUCTION IS TO REMAIN AND REQUIRES PROTECTION.
- 1.07 PROJECT CONDITIONS A. CONDITIONS EXISTING AT TIME OF INSPECTION FOR BIDDING PURPOSE WILL BE MAINTAINED BY OWNER AS FAR AS PRACTICAL. 1. BEFORE SELECTIVE DEMOLITION, OWNER WILL REMOVE THE ITEMS TO BE SALVAGED BY
- THE OWNER. COORDINATE OTHER ITEMS WITH THE ARCHITECT. B. NOTIFY ARCHITECT OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS
- BEFORE PROCEEDING WITH SELECTIVE DEMOLITION. C. HAZARDOUS MATERIALS: IT IS NOT EXPECTED THAT HAZARDOUS MATERIALS WILL BE ENCOUNTERED IN THE WORK. 1. HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER BEFORE START OF THE WORK OR
- HAVE BEEN REMOVED BY OWNER UNDER A SEPARATE CONTRACT. IF MATERIALS SUSPECTED OF CONTAINING HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB; IMMEDIATELY NOTIFY ARCHITECT AND OWNER. OWNER WILL REMOVE HAZARDOUS MATERIALS UNDER A SEPARATE CONTRACT. D. STORAGE OR SALE OF REMOVED ITEMS OR MATERIALS ON-SITE IS NOT PERMITTED.
- E. UTILITY SERVICE: MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS. 1. MAINTAIN FIRE-PROTECTION FACILITIES IN SERVICE DURING SELECTIVE DEMOLITION OPERATIONS. 1.08 WARRANTY
- A. EXISTING WARRANTIES: REMOVE, REPLACE, PATCH, AND REPAIR MATERIALS AND SURFACES CUT OR DAMAGED DURING SELECTIVE DEMOLITION, BY METHODS AND WITH MATERIALS SO AS NOT TO VOID EXISTING WARRANTIES.
- PART 2 PRODUCTS NOT USED

### PART 3 EXECUTION 3.01 EXAMINATION

- A. VERIFY THAT UTILITIES HAVE BEEN SHUT OFF AND READY TO BE CAPPED. B. SURVEY EXISTING CONDITIONS AND CORRELATE WITH REQUIREMENTS INDICATED TO
- DETERMINE EXTENT OF SELECTIVE DEMOLITION REQUIRED. C. INVENTORY AND RECORD THE CONDITION OF ITEMS TO BE REMOVED AND REINSTALLED AND ITEMS TO BE REMOVED AND SALVAGED.
- D. SURVEY OF EXISTING CONDITIONS: RECORD EXISTING CONDITIONS BY USE OF MEASURED DRAWINGS, PRECONSTRUCTION PHOTOGRAPHS, PRECONSTRUCTION VIDEOTAPES, AND TEMPLATES. E. PERFORM SURVEYS AS THE WORK PROGRESSES TO DETECT HAZARDS RESULTING FROM
- SELECTIVE DEMOLITION ACTIVITIES. 3.02 UTILITY SERVICES A. EXISTING SERVICES/SYSTEMS: MAINTAIN SERVICES/SYSTEMS INDICATED TO REMAIN AND
- PROTECT THEM AGAINST DAMAGE DURING SELECTIVE DEMOLITION OPERATIONS. A. SERVICE/SYSTEM REQUIREMENTS: LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF INDICATED UTILITY SERVICES AND OTHER SYSTEMS SERVING AREAS TO BE SELECTIVELY DEMOLISHED. 1. OWNER WILL ARRANGE TO SHUT OFF INDICATED SERVICES/SYSTEMS WHEN REQUESTED
- BY CONTRACTOR. 2. ARRANGE TO SHUT OFF INDICATED UTILITIES WITH THE OWNER. 3. IF SERVICES/SYSTEMS ARE REQUIRED TO BE REMOVED, RELOCATED, OR ABANDONED,
- BEFORE PROCEEDING WITH SELECTIVE DEMOLITION PROVIDE TEMPORARY SERVICES/SYSTEMS THAT BYPASS AREA OF SELECTIVE DEMOLITION AND THAT MAINTAIN CONTINUITY OF SERVICES/SYSTEMS. 3.03 PREPARATION
- A. SITE ACCESS AND TEMPORARY CONTROLS: CONDUCT SELECTIVE DEMOLITION AND DEBRIS-REMOVAL OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS WALKS, WALKWAYS, AND OTHER ADJACENT OCCUPIED AND USED FACILITIES. B. TEMPORARY FACILITIES: PROVIDE TEMPORARY BARRICADES AND OTHER PROTECTION REQUIRED TO PREVENT INJURY TO PEOPLE AND DAMAGE TO ADJACENT BUILDINGS AND
- FACILITIES TO REMAIN. 1. PROVIDE PROTECTION TO ENSURE SAFE PASSAGE OF PEOPLE AROUND SELECTIVE DEMOLITION AREA AND TO AND FROM OCCUPIED PORTIONS OF THE SITE. 2. PROVIDE TEMPORARY WEATHER PROTECTION, DURING INTERVAL BETWEEN SELECTIVE DEMOLITION OF EXISTING CONSTRUCTION ON EXTERIOR SURFACES, TO PREVENT WATER
- DAMAGE TO CRITICAL AREAS. C. TEMPORARY SHORING: PROVIDE AND MAINTAIN SHORING, BRACING, AND STRUCTURAL SUPPORTS AS REQUIRED TO PRESERVE STABILITY AND PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF CONSTRUCTION AND ITEMS TO REMAIN, AND TO PREVENT UNEXPECTED OR UNCONTROLLED MOVEMENT OR COLLAPSE OF CONSTRUCTION BEING DEMOLISHED. 1. STRENGTHEN OR ADD NEW SUPPORTS WHEN REQUIRED DURING PROGRESS OF SELECTIVE DEMOLITION.
- D. NO CLEARING, DEMOLITION, OR REMOVAL OF ANY KIND SHALL PROCEED UNTIL ALL EXISTING TREES, IMPROVEMENTS, ETC. TO BE REMOVED HAVE BEEN ESTABLISHED AND ARE INSPECTED AND DOCUMENTED BY THE OWNER.
- E. ESTABLISH NECESSARY CLEARING LIMITS WITHIN THE CONSTRUCTION LIMITS. MARK ALL TREES, SHRUBS, STRUCTURES, FENCES, CONCRETE, AND OTHER IMPROVEMENTS TO BE REMOVED
- F. WITHIN 10 FEET OF CLEARING LIMITS, INSPECT, PHOTOGRAPH WITH VIDEO TAPE, AND RECORD CONDITION OF CONCRETE SLABS, STRUCTURES, LANDSCAPING AND OTHER FEATURES TO REMAIN WHICH MIGHT BE AFFECTED BY WORK. ALLOW OWNER TO VIEW TAPE AND APPROVE PRIOR TO PROCEEDING WITH THE WORK. G. TREES, SHRUBS AND LAWN, AREAS TO RECEIVE PLANTING, FENCES, SPRINKLERS AND
- OTHER IMPROVEMENTS THAT ARE NOT TO BE REMOVED SHALL BE PROTECTED FROM DAMAGE OR INJURY. IF DAMAGED OR REMOVED, THEY SHALL BE RESTORED OR REPLACED IN AS NEARLY THE ORIGINAL CONDITION AND LOCATION AS IS REASONABLY POSSIBLE. TREES, SHRUBS, AND IMPROVEMENTS NOT TO BE REMOVED SHALL BE MARKED IN FIELD BY OWNER
- AND/OR SHOWN ON THE DRAWINGS H. GIVE REASONABLE NOTICE TO OWNER TO PERMIT HIM TO SALVAGE PLANTS, TREES, FENCES, SPRINKLERS AND OTHER IMPROVEMENTS WITHIN THE CONSTRUCTION LIMITS THAT MAY BE DESTROYED BECAUSE OF THE WORK.
- I. NOTIFY INTERESTED UTILITY COMPANIES TO BE PRESENT IF DISTURBING GROUND IN THE VICINITY OF UTILITIES.
- J. PROTECT ACTIVE UTILITY SYSTEMS ADJACENT TO OR UNCOVERED BY ANY EXCAVATION DURING SITE PREPARATION. K. MAINTAIN BENCHMARKS, MONUMENTS AND OTHER REFERENCE POINTS AND CONSTRUCTION
- L. PROTECT ALL IMPROVEMENTS TO REMAIN OR OUTSIDE OF CONSTRUCTION FROM TREE REMOVAL AND/OR PRUNING WORK.
- 3.04 CLEARING AND GRUBBING A. PRIOR TO ANY CONSTRUCTION, REMOVE UNSUITABLE SOILS AND VEGETATION FROM BELOW FOUNDATIONS, FLOOR SLABS, EXTERIOR CONCRETE FLATWORK, AND ASPHALT CONCRETE PAVEMENTS AND ROADS.
- 3.05 SELECTIVE DEMOLITION, GENERAL A. GENERAL: DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS AND AS FOLLOWS: 1. PROCEED WITH SELECTIVE DEMOLITION SYSTEMATICALLY 2. NEATLY CUT OPENINGS AND HOLES PLUMB, SQUARE, AND TRUE TO DIMENSIONS
- REQUIRED. USE CUTTING METHODS LEAST LIKELY TO DAMAGE CONSTRUCTION TO REMAIN OR ADJOINING CONSTRUCTION. USE HAND TOOLS OR SMALL POWER TOOLS DESIGNED FOR SAWING OR GRINDING, NOT HAMMERING AND CHOPPING, TO MINIMIZE DISTURBANCE OF ADJACENT SURFACES. TEMPORARILY COVER OPENINGS TO REMAIN. 3. CUT OR DRILL FROM THE EXPOSED OR FINISHED SIDE INTO CONCEALED SURFACES TO AVOID MARRING EXISTING FINISHED SURFACES.
- 4. DO NOT USE CUTTING TORCHES UNTIL WORK AREA IS CLEARED OF FLAMMABLE MATERIALS. MAINTAIN FIRE WATCH AND PORTABLE FIRE-SUPPRESSION DEVICES DURING FLAME-CUTTING OPERATIONS
- 5. REMOVE STRUCTURAL FRAMING MEMBERS AND LOWER TO GROUND BY METHOD SUITABLE TO AVOID FREE FALL AND TO PREVENT GROUND IMPACT OR DUST
- GENERATION 6. DISPOSE OF DEMOLISHED ITEMS AND MATERIALS PROMPTLY

- B. REMOVED AND SALVAGED ITEMS: CLEAN SALVAGED ITEMS.
- PACK OR CRATE ITEMS AFTER CLEANING. IDENTIFY CONTENTS OF CONTAINERS. 3. STORE ITEMS IN A SECURE AREA UNTIL DELIVERY TO OWNER.
- 4. TRANSPORT ITEMS TO OWNER'S STORAGE AREA ON-SITE.
- 5. PROTECT ITEMS FROM DAMAGE DURING TRANSPORT AND STORAGE. C. EXISTING ITEMS TO REMAIN: PROTECT CONSTRUCTION INDICATED TO REMAIN AGAINST DAMAGE AND SOILING DURING SELECTIVE DEMOLITION. WHEN PERMITTED BY ARCHITECT, ITEMS MAY BE REMOVED TO A SUITABLE, PROTECTED STORAGE LOCATION DURING SELECTIVE DEMOLITION AND CLEANED AND REINSTALLED IN THEIR ORIGINAL LOCATIONS
- AFTER SELECTIVE DEMOLITION OPERATIONS ARE COMPLETE. 3.06 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS A. TOPSOIL:
- 1. BEFORE ANY CONSTRUCTION ACTIVITY BEGINS, REMOVE TOPSOIL AND STOCKPILE FOR 2. TOPSOIL SHALL BE PROTECTED FROM CONTAMINATION BY WEEDS, DEBRIS, ETC. AND SHALL BE REPLACED, GRADED AND LIGHTLY COMPACTED BY CONTRACTOR AT COMPLETION OF PROJECT.
- B. CONCRETE: 1. DEMOLISH IN SECTIONS. CUT CONCRETE FULL DEPTH AT JUNCTURES WITH
- CONSTRUCTION TO REMAIN AND AT REGULAR INTERVALS, USING POWER-DRIVEN SAW, THEN REMOVE CONCRETE BETWEEN SAW CUTS.
- 2. CONCRETE SLABS-ON-GRADE: SAW-CUT PERIMETER OF AREA TO BE DEMOLISHED, THEN BREAK UP AND REMOVE.
- 3. CONCRETE SHALL BE REMOVED TO NEATLY SAWED EDGES WITH SAW CUTS MADE TO A MINIMUM DEPTH OF 4 INCHES. 4. CONCRETE SIDEWALK OR DRIVEWAY TO BE REMOVED SHALL BE NEATLY SAWED IN STRAIGHT LINES EITHER PARALLEL TO THE CURB OR AT RIGHT ANGLES TO THE
- ALIGNMENT OF THE SIDEWALK. NO SECTION TO BE REPLACED SHALL BE SMALLER THAN 30 INCHES IN EITHER LENGTH OR WIDTH. 5. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, IF THE SAWCUT WOULD FALL WITHIN 30 INCHES OF A CONSTRUCTION JOINT, EXPANSION JOINT, OR EDGE, THE CONCRETE SHALL BE REMOVED TO THE JOINT OR EDGE, EXCEPT THAT WHERE THE SAW CUT WOULD FALL
- WITHIN 12 INCHES OF A SCORE MARK, THE SAW CUT SHALL BE MADE IN AND ALONG THE SCORF MARK. 6. CURB AND GUTTER TO BE REMOVED SHALL BE SAWED TO A DEPTH OF 1-1/2 INCHES ON A NEAT LINE AT RIGHT ANGLES TO THE CURB FACE. C. ASPHALTIC CONCRETE PAVEMENT:
- 1. SAWING SHALL BE USED TO ENSURE THE BREAKAGE OF PAVEMENT ALONG STRAIGHT 2. DISPOSE OF ASPHALT PAVEMENT TO BE REMOVED AT A SUITABLE OFFSITE LOCATION IN
- ACCORDANCE WITH APPLICABLE LAWS AND ORDINANCES. D. FENCES AND MISCELLANEOUS OBSTRUCTIONS 1. NO DEMOLITION OR REMOVAL OF FENCES OR MISCELLANEOUS OBSTRUCTIONS SHALL PROCEED UNTIL CLEARANCE IS OBTAINED FROM THE OWNER.
- 3.07 DISPOSAL OF DEMOLISHED MATERIALS A. GENERAL: EXCEPT FOR ITEMS OR MATERIALS INDICATED TO BE RECYCLED, REUSED, SALVAGED, REINSTALLED, OR OTHERWISE INDICATED TO REMAIN OWNER'S PROPERTY, REMOVE DEMOLISHED MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM IN AN EPA-APPROVED LANDFILL. 1. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE.
- 2. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS. B. BURNING: DO NOT BURN DEMOLISHED MATERIALS. C. DISPOSAL: TRANSPORT DEMOLISHED MATERIALS OFF OWNER'S PROPERTY AND LEGALLY
- DISPOSE OF THEM. 3.08 CLEANING A. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS CAUSED BY SELECTIVE DEMOLITION OPERATIONS. RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE SELECTIVE DEMOLITION OPERATIONS BEGAN. END OF SECTION





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SYMBOL	DESCRIPTION
D-01	SAWCUT CURB
D-02	REMOVE SIGN - clear and grub
D-03	EXISTING UTAH SIGN AND FOOTINGS - preserve and protect
D-04	EXISTING POLLINATOR GARDEN - preserve and protect
D-05	EXISTING MOWSTRIP - preserve and protect
D-06	RELOCATE LIGHT POLE - remove and store, to be installed per site plan
D-07	EXISTING LIGHT POLE - preserve and protect
D-08	EXISTING SIGN - preserve and protect
D-09	EXISTING DELINEATOR POST - preserve and protect
D-10	EXISTING CURB - preserve and protect
D-11	RELOCATE EXISTING TRASH CANS - remove and store, to be installed per site plan
D-12	EXISTING TRASH RECEPTACLES - preserve and protect
D-13	RELOCATE ELECTRICAL BOX - remove and store, to be installed per site plan
D-14	EXISTING WATER SPIGOT - preserve and protect
D-15	REMOVE TREE - clear and grub
D-16	REMOVE STORM DRAIN BOX (ADD ALTERNATE 1)
<u>SYMBOL</u>	DEMOLITION DESCRIPTION
<pre>x x x x x x x x x x x x x x x x x x x</pre>	REMOVE TURF GRASS AND SALVAGE IRRIGATION - clear and grub, return all valves, rotor and intact irrigation boxes to owner
- — — — —	EXISTING TURF GRASS AND IRRIGATION - preserve and protect
	REMOVE CONCRETE - clear and grub
⊿	EXISTING CONCRETE - preserve and protect
	REMOVE MEDIAN TO PREPARE FOR NEW ASPHALT PAVING AND CURB - clear and grub
	REMOVE MEDIAN TO PREPARE FOR NEW CONCRETE PAVING AND CURB - clear and grul
C EX	T 51 Existing Tree / to Remain Existing







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	SECTION 05 5213	D. PROTECT EXISTING STRUCTURES AND OTHER ELEMENTS THAT
	PIPE AND TUBE RAILINGS <u>Part 1 General</u> 1.01 Section Includes A. Free-Standing Railings at Ramps. 1.02 Submittals	<ul> <li>3.05 TOPSOIL STRIPPING</li> <li>A. REMOVE SOD AND GRASS BEFORE STRIPPING TOPSOIL.</li> <li>B. STRIP TOPSOIL TO WHATEVER DEPTHS ARE ENCOUNTERED IN INTERMINGLING WITH UNDERLYING SUBSOIL OR OTHER WAST</li> <li>1. REMOVE SUBSOIL AND NON-SOIL MATERIALS FROM TOPSO</li> </ul>
	<ul> <li>A. SEE SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS, FOR SUBMITTAL PROCEDURES.</li> <li>B. SHOP DRAWINGS: INDICATE PROFILES, SIZES, CONNECTION ATTACHMENTS, ANCHORAGE, SIZE AND TYPE OF FASTENERS, AND ACCESSORIES.</li> <li>1. INCLUDE THE DESIGN ENGINEER'S SEAL AND SIGNATURE ON EACH SHEET OF SHOP DRAWINGS.</li> <li>1.03 QUALITY ASSURANCE</li> </ul>	WEEDS, ROOTS, AND OTHER WASTE MATERIALS. C. STOCKPILE TOPSOIL MATERIALS AWAY FROM EDGE OF EXCAVA WITH SUBSOIL. GRADE AND SHAPE STOCKPILES TO DRAIN SU PREVENT WINDBLOWN DUST. 1. LIMIT HEIGHT OF TOPSOIL STOCKPILES TO 120 INCHES. 2. DISPOSE OF EXCESS TOPSOIL AS SPECIFIED FOR WASTE MA
Е	<ul> <li>A. STRUCTURAL DESIGNER QUALIFICATIONS: PROFESSIONAL STRUCTURAL ENGINEER EXPERIENCED IN DESIGN OF THIS WORK AND LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, OR PERSONNEL UNDER DIRECT SUPERVISION OF SUCH AN ENGINEER.</li> <li><u>PART 2 PRODUCTS</u></li> <li>2.01 RAILINGS - GENERAL REQUIREMENTS</li> </ul>	<ol> <li>STOCKPILE SURPLUS TOPSOIL TO ALLOW FOR RE-SPREAD</li> <li>3.06 VEGETATION         <ul> <li>A. DO NOT REMOVE OR DAMAGE VEGETATION BEYOND THE LIMIT</li> <li>B. IN AREAS WHERE VEGETATION MUST BE REMOVED BUT NO CO OTHER THAN PERVIOUS PAVING, REMOVE VEGETATION WITH N SUBSOIL.</li> </ul> </li> </ol>
	<ul> <li>A. DESIGN, FABRICATE, AND TEST RAILING ASSEMBLIES IN ACCORDANCE WITH THE MOST STRINGENT REQUIREMENTS OF APPLICABLE LOCAL CODE.</li> <li>B. ALLOW FOR EXPANSION AND CONTRACTION OF MEMBERS AND BUILDING MOVEMENT WITHOUT DAMAGE TO CONNECTIONS OR MEMBERS.</li> <li>C. DIMENSIONS: SEE DRAWINGS FOR CONFIGURATIONS AND HEIGHTS.</li> <li>1. TOP RAILS AND POSTS: 1-1/4 INCH DIAMETER, ROUND.</li> <li>2.02 STEEL RAILING SYSTEM</li> <li>A STEEL TURE: ASTM A500/A500M CRADE B COLD FORMED STRUCTURAL TURING</li> </ul>	<ul> <li>C. VEGETATION REMOVED: DO NOT BURN, BURY, LANDFILL, OR INDICATED.</li> <li>1. CHIP, GRIND, CRUSH, OR SHRED VEGETATION FOR MULCHI PURPOSES; PREFERENCE SHOULD BE GIVEN TO ON-SITE US</li> <li>2. TREES: TREAT AS SPECIFIED FOR OTHER VEGETATION REM ROOTS TO DEPTH OF 18 INCHES (450 MM).</li> <li>D. RESTORATION: IF VEGETATION OUTSIDE REMOVAL LIMITS OR V FENCES IS DAMACED OR DESTROYED DUE TO SUBSEQUENT OF</li> </ul>
	<ul> <li>B. WELDING FITTINGS: FACTORY- OR SHOP-WELDED FROM MATCHING PIPE OR TUBE; SEAMS CONTINUOUSLY WELDED; JOINTS AND SEAMS GROUND SMOOTH.</li> <li>C. EXPOSED FASTENERS: NO EXPOSED BOLTS OR SCREWS.</li> <li>D. GALVANIZING: IN ACCORDANCE WITH REQUIREMENTS OF ASTM A123/A123M.</li> <li>E. SHOP AND TOUCH-UP PRIMER: SSPC-PAINT 15, COMPLYING WITH VOC LIMITATIONS OF</li> </ul>	A. REMOVE EXISTING ABOVE-GRADE AND BELOW-GRADE IMPROV NECESSARY TO FACILITATE NEW CONSTRUCTION. REFER TO I IMPROVEMENTS TO BE ABANDONED IN PLACE.
	<ul> <li>AUTHORITIES HAVING JURISDICTION.</li> <li>2.03 FABRICATION <ul> <li>A. ACCURATELY FORM COMPONENTS TO SUIT SPECIFIC PROJECT CONDITIONS.</li> <li>B. FIT AND SHOP ASSEMBLE COMPONENTS IN LARGEST PRACTICAL SIZES FOR DELIVERY TO SITE.</li> <li>C. FABRICATE COMPONENTS WITH JOINTS TIGHTLY FITTED AND SECURED. PROVIDE SPIGOTS</li> </ul> </li> </ul>	<ul> <li>B. REMOVE SLABS, PAVING, CURBS, GUTTERS, AND AGGREGATE</li> <li>1. UNLESS EXISTING FULL-DEPTH JOINTS COINCIDE WITH LINE SAW-CUT LENGTH OF EXISTING PAVEMENT TO REMAIN BEF PAVEMENT. SAW-CUT FACES VERTICALLY.</li> <li>2. PAINT CUT ENDS OF STEEL REINFORCEMENT IN CONCRETE CORROSION.</li> </ul>
	<ul> <li>AND SCEEVES TO ACCOMMODATE SITE ASSEMBLY AND INSTALLATION.</li> <li>D. WELDED JOINTS: <ol> <li>EXTERIOR COMPONENTS: CONTINUOUSLY SEAL JOINED PIECES BY INTERMITTENT WELDS AND PLASTIC FILLER. DRILL CONDENSATE DRAINAGE HOLES AT BOTTOM OF MEMBERS AT LOCATIONS THAT WILL NOT ENCOURAGE WATER INTRUSION.</li> <li>GRIND EXPOSED JOINTS FLUSH AND SMOOTH WITH ADJACENT FINISH SURFACE. MAKE EXPOSED JOINTS BUTT TIGHT, FLUSH, AND HAIRLINE. EASE EXPOSED EDGES TO SMALL UNIFORM RADIUS.</li> </ol> </li> <li>PART 3 EXECUTION <ol> <li>EXAMINATION</li> </ol> </li> </ul>	<ul> <li>A. REMOVE DEBRIS, JUNK, AND TRASH FROM SITE.</li> <li>B. LEAVE SITE IN CLEAN CONDITION, READY FOR SUBSEQUENT W</li> <li>C. CLEAN UP SPILLAGE AND WIND-BLOWN DEBRIS FROM PUBLIC</li> <li><b>3.09 DISPOSAL</b></li> <li>A. REMOVE SURPLUS SOIL MATERIAL, UNSUITABLE TOPSOIL, OBS MATERIALS, AND WASTE MATERIALS INCLUDING TRASH AND D OF THEM OFF OWNER'S PROPERTY.</li> <li>1. SEPARATE RECYCLABLE MATERIALS PRODUCED DURING S NON-RECYCLABLE MATERIALS. STORE OR STOCKPILE WIT OTHER MATERIALS AND TRANSPORT THEM TO RECYCLING</li> </ul>
D	<ul> <li>A. VERIFY THAT FIELD CONDITIONS ARE ACCEPTABLE AND ARE READY TO RECEIVE WORK.</li> <li>3.02 PREPARATION <ul> <li>A. CLEAN AND STRIP PRIMED STEEL ITEMS TO BARE METAL WHERE SITE WELDING IS REQUIRED.</li> <li>B. SUPPLY ITEMS REQUIRED TO BE CAST INTO CONCRETE WITH SETTING TEMPLATES, FOR INSTALLATION AS WORK OF OTHER SECTIONS.</li> </ul> </li> </ul>	END OF SECTION
	<ul> <li>3.03 INSTALLATION <ul> <li>A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.</li> <li>B. INSTALL COMPONENTS PLUMB AND LEVEL, ACCURATELY FITTED, FREE FROM DISTORTION OR DEFECTS, WITH TIGHT JOINTS.</li> <li>C. INSTALL RAILINGS IN COMPLIANCE WITH ADA STANDARDS FOR ACCESSIBLE DESIGN AT APPLICABLE LOCATIONS.</li> <li>D. ANCHOR RAILINGS SECURELY TO MOWSTRIP.</li> </ul> </li> <li>3.04 TOLERANCES <ul> <li>A. MAYIMUM VARIATION EROM BLUMB: 1/4 INCH (6 MM) REP ELOOP LEVEL, NON CUMULATIVE</li> </ul> </li> </ul>	STIE EXCAVATION AND ROUGH GRADIN PART 1 GENERAL 1.01 DESCRIPTION A. DEFINITIONS: 1. UNSUITABLE MATERIAL: DEBRIS AND/OR SOIL MATERIAL JU ENGINEER FOR SUPPORT OF SLABS OR OTHER SITE IMPRO' a. ENGINEER: SOILS ENGINEER EMPLOYED BY OWNER, EM INSPECTIONS AND MAKE APPROVALS. 1.02 OHALITY ASSUBANCE
	A. MAXIMUM VARIATION FROM PLOMB. 1/4 INCH (6 MM) PER FLOOR LEVEL, NON-COMOLATIVE. B. MAXIMUM OFFSET FROM TRUE ALIGNMENT: 1/4 INCH (6 MM). C. MAXIMUM OUT-OF-POSITION: 1/4 INCH (6 MM). END OF SECTION	<ul> <li>A. COMPACTION DENSITY TEST:</li> <li>A. COMPACTION DENSITY TEST:</li> <li>1. MODIFIED PROCTOR, ASTM-D 1557.</li> <li>B. LAYOUT WORK BY SURVEYOR OR CIVIL ENGINEER REGISTERED IDENTIFY BENCHMARK TO BE USED IN ESTABLISHING GRADES.</li> <li>C. OWNER WILL HIRE AN INDEPENDENT SOILS LABORATORY TO C AND DENSITY TESTS.</li> </ul>
	SECTION 31 1000 SITE CLEARING PART 1 GENERAL	D. TOLERANCES OF SUB-GRADE: 1) UNSURFACED AREAS: PLUS/MINUS 0.20 FT FROM RE 2) PAVED AREAS: PLUS/MINUS 0.10 FT FROM REQUIRE
	<ul> <li>1.01 SECTION INCLUDES <ul> <li>A. CLEARING AND PROTECTION OF VEGETATION.</li> <li>B. CLEARING AND GRUBBING.</li> <li>C. STRIPPING AND STOCKPILING TOPSOIL.</li> <li>D. REMOVING ABOVE- AND BELOW- GRADE SITE IMPROVEMENTS.</li> <li>E. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES.</li> <li>E. DEMOVAL OF EXISTING DERRIS.</li> </ul> </li> </ul>	<ul> <li>1.03 JOB CONDITIONS <ul> <li>A. PROTECT EXISTING FACILITIES, UTILITIES (OVERHEAD AND UNE PAVEMENT.</li> <li>1. REPAIR DAMAGED ITEMS.</li> <li>2. NOTIFY OWNER AND MAKE EMERGENCY REPAIR AS DIRECT</li> <li>B. PROTECT GRADED AREAS AGAINST EROSION.</li> </ul> </li> <li>1. DE ESTADUIOU ODADE WUEDE SETTI EMENT OD WASUUNC.</li> </ul>
С	<ul> <li>1.02 DEFINITIONS         <ul> <li>A. TOPSOIL: NATURAL OR CULTIVATED SURFACE-SOIL LAYER CONTAINING ORGANIC MATTER AND SAND, SILT, AND CLAY PARTICLES; FRIABLE, PERVIOUS, AND BLACK OR A DARKER SHADE OF BROWN, GRAY, OR RED THAN UNDERLYING SUBSOIL; REASONABLY FREE OF SUBSOIL, CLAY LUMPS, GRAVEL, AND OTHER OBJECTS MORE THAN 2 INCHES IN DIAMETER; AND FREE OF SUBSOIL AND WEEDS, ROOTS, TOXIC MATERIALS, OR OTHER NON-SOIL MATERIALS.</li> </ul> </li> </ul>	PART 2 PRODUCTS 2.01 MATERIALS A. FILL MATERIALS: 1. REASONABLY FREE OF ROOTS, ORGANIC MATERIAL, TRASH STONES LARGER THAN 6 IN. 2. ADD WATER TO DRY MATERIAL, AS REQUIRED.
	<ul> <li>1.03 MATERIAL OWNERSHIP         <ul> <li>A. EXCEPT FOR STRIPPED TOPSOIL OR OTHER MATERIALS INDICATED TO REMAIN OWNER'S PROPERTY, CLEARED MATERIALS SHALL BECOME CONTRACTOR'S PROPERTY AND SHALL BE REMOVED FROM PROJECT SITE.</li> <li>1.04 SUBMITTALS                  <ul></ul></li></ul></li></ul>	<ol> <li>ALLOW WET MATERIAL TO DRY, AS REQUIRED.</li> <li>FILL CAN ONLY BE OBTAINED ON SITE WHERE REMOVED FR GRADING.</li> <li>PROVIDE ADDITIONAL OFF-SITE BORROW OR FILL AS REQUI B. SURPLUS MATERIAL:</li> <li>REMOVE FROM SITE.</li> </ol>
	<ul> <li>AND PLANTINGS, ADJOINING CONSTRUCTION, AND SITE IMPROVEMENTS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY SITE CLEARING.</li> <li>B. SITE PLAN SHOWING: <ol> <li>AREAS FOR TEMPORARY CONSTRUCTION AND FIELD OFFICES.</li> </ol> </li> <li>C. RECORD DRAWINGS, ACCORDING TO SECTION 01 7823 PROJECT RECORD DOCUMENTS, IDENTIFYING AND ACCURATELY LOCATING CAPPED UTILITIES AND OTHER SUBSURFACE</li> </ul>	PART 3 EXECUTION 3.01 PREPARATION A. LAYOUT UNITS, STRUCTURES, PIPING, ROADS, PARKING AREAS THEIR ELEVATIONS. B. PERFORM OTHER LAYOUT WORK REQUIRED.
	<ul> <li>A. TRAFFIC: MINIMIZE INTERFERENCE WITH ADJOINING ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING SITE-CLEARING OPERATIONS.</li> <li>1. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS, OR OTHER ADJACENT OCCUPIED OR USED FACILITIES MITHOUT PERMISSION FROM OWNER AND AUTHORITIES HAVING</li> </ul>	<ul> <li>C. PREPARATION FOR EMBANKMENTS AND FILLS:</li> <li>1. REMOVE TOPSOIL OVER AREAS TO BE CUT AND FILLED THA REMOVED BY STRIPPING AND GRUBBING.</li> <li>2. BEFORE FILL IS STARTED, SCARIFY TO A MINIMUM DEPTH O PARKING LOTS, OR STREETS.</li> <li>3. BRING TO OPTIMUM MOISTURE CONTENT.</li> <li>4. COMPACT TO A MINIMUM 95 PERCENT.</li> <li>5. IN AREAS WHERE EXISTING GROUND SURFACE IS STEEPER HORIZONTAL BENCH SUBFACE IN ORDER TO SPREAD FILL</li> </ul>
	<ul> <li>JURISDICTION.</li> <li>PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS IF REQUIRED BY AUTHORITIES HAVING JURISDICTION.</li> <li>SALVABLE IMPROVEMENTS: CAREFULLY REMOVE ITEMS INDICATED TO BE SALVAGED AND STORE ON OWNER'S PREMISES WHERE APPROVED.</li> <li>UTILITY LOCATOR SERVICE: NOTIFY UTILITY LOCATOR SERVICE FOR AREA WHERE PROJECT IS LOCATED BEFORE SITE CLEARING.</li> <li>DO NOT COMMENCE SITE CLEARING.</li> </ul>	MATERIAL WILL BOND WITH EXISTING SURFACE. <b>3.02 GENERAL</b> A. EXCAVATE AND GRADE MATERIALS TO DESIGN ELEVATIONS. B. EXCAVATE AND GRADE SITE TO SUBGRADES OF PAVED AND UP C. EXCAVATE FOR MISCELLANEOUS FOOTINGS, SLABS, WALKS AND D. CUT AND FILL AS REQUIRED TO BRING EXISTING GRADES TO R E. FURNISH AND PLACE ADDITIONAL APPROVED MATERIAL REQU PROPER LINE AND GRADE
В	SEDIMENTATION CONTROL MEASURES ARE IN PLACE. PART 2 PRODUCTS 2.01 SOIL MATERIALS A. SATISFACTORY SOIL MATERIAL: AS SPECIFIED IN SECTION 31 2000 - EARTH MOVING 1. OBTAIN APPROVED BORROW SOIL MATERIALS OFF-SITE WHEN SATISFACTORY SOIL	<ul> <li>F. DURING CONSTRUCTION, SHAPE AND DRAIN EMBANKMENTS A</li> <li>G. MAINTAIN DITCHES AND DRAINS TO PROVIDE DRAINAGE.</li> <li>H. PROVIDE PUMPING IF REQUIRED.</li> <li>I. REMOVE UNSUITABLE MATERIALS WHICH CANNOT BE COMPAC REPLACE WITH SUITABLE MATERIAL.</li> <li>1. DISPOSE MATERIAL OFF SITE AS DIRECTED.</li> </ul>
	MATERIALS ARE NOT AVAILABLE ON-SITE. PART 3 EXECUTION 3.01 PREPARATION A. PROTECT AND MAINTAIN BENCHMARKS AND SURVEY CONTROL POINTS FROM DISTURBANCE DURING CONSTRUCTION. B. PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE DURING CONSTRUCTION	<ul> <li>J. REMOVE MATERIALS UNSUITABLE TO RECEIVE FILL AND REPLA</li> <li>3.03 CONSTRUCTION OF EMBANKMENTS AND FILLS</li> <li>A. CONSTRUCT EMBANKMENTS AND FILLS TO LINES AND GRADES</li> <li>B. MAKE COMPLETED FILL CORRESPOND TO SHAPE OF TYPICAL OF INDICATED REGARDLESS OF METHOD USED TO INDICATE SHAP AND GRADE OF WORK.</li> <li>C. INSURE THAT COBBLES LARGER THAN 4 IN, ARE NOT PLACED IN EARLY AND AND AND AND AND AND AND AND AND AND</li></ul>
	<ol> <li>RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO OWNER.</li> <li>3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL</li> <li>A. PROVIDE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT SOIL EROSION AND DISCHARGE OF SOIL-BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES AND WALKWAYS, ACCORDING TO REQUIREMENTS OF AUTHORITIES</li> </ol>	<ul> <li>D. PLACE MATERIAL IN LIFTS, MAXIMUM 8 IN LOOSE THICKNESS.</li> <li>E. PLACE LAYERS HORIZONTALLY AND COMPACT EACH LAYER TO PLACING ADDITIONAL FILL.</li> <li>F. COMPACT USING SUITABLE EQUIPMENT.</li> <li>1. CONTROL MOISTURE TO MEET REQUIREMENTS OF COMPACT</li> <li>2. PLACE MATERIALS WITHIN 3 PERCENT ABOVE TO 3 PERCENT</li> </ul>
	<ul> <li>HAVING JURISDICTION, SEDIMENT AND EROSION CONTROL DRAWINGS, A SEDIMENT AND EROSION CONTROL PLAN, SPECIFIC TO THE SITE, THAT COMPLIES WITH EPA 832/R-92-005 OR REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION, WHICHEVER IS MORE STRINGENT.</li> <li>B. INSPECT, REPAIR, AND MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED.</li> <li>C. REMOVE EROSION AND SEDIMENTATION CONTROLS AND RESTORE AND STABILIZE AREAS DISTURBED DURING REMOVAL.</li> </ul>	<ul> <li>G. UNDER ROADWAYS AND PARKING AREAS AND EXTENDING 1 FT LINE MEASURED PERPENDICULAR FROM CENTERLINE, COMPA DRY DENSITY.</li> <li>H. UNDER WALK PAVING, COMPACT TO 95 PERCENT MAXIMUM D</li> <li>I. FOR OTHER EMBANKMENTS AND FILLS NOT LISTED, COMPACT DRY DENSITY.</li> <li>J. UNDER PROPOSED BUILDING AND STRUCTURES, COMPACT TO</li> </ul>
	<ul> <li>3.03 SITE CLEARING AND GRUBBING <ul> <li>A. COMPLY WITH OTHER REQUIREMENTS SPECIFIED IN SECTION 01 7000.</li> <li>B. REMOVE OBSTRUCTIONS, GRASS, AND OTHER VEGETATION TO PERMIT INSTALLATION OF NEW CONSTRUCTION.</li> <li>C. FILL DEPRESSIONS CAUSED BY CLEARING AND GRUBBING OPERATIONS WITH SATISFACTORY</li> </ul> </li> </ul>	SECTION 31 23 00. END OF SECTION
А	SUIL MATERIAL UNLESS FURTHER EXCAVATION OR EARTHWORK IS INDICATED. 1. PLACE FILL MATERIAL IN HORIZONTAL LAYERS NOT EXCEEDING A LOOSE DEPTH OF 8 INCHES AND COMPACT EACH LAYER TO A DENSITY EQUAL TO ADJACENT ORIGINAL GROUND. 3.04 EXISTING UTILITIES AND BUILT ELEMENTS A. COORDINATE WORK WITH UTILITY COMPANIES; NOTIFY BEFORE STARTING WORK AND COMPLY WITH THEIR BEOLIIREMENTS: ORTAIN BEOLIIRED DEPMITS	SECTION 31 2300 EARTHWORK PART 1 GENERAL 1.01 RELATED DOCUMENTS A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INC SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTION
	<ol> <li>OWNER WILL ARRANGE TO SHUT OFF INDICATED UTILITIES WHEN REQUESTED BY CONTRACTOR.</li> <li>PROTECT EXISTING UTILITIES TO REMAIN FROM DAMAGE.</li> <li>DO NOT DISRUPT PUBLIC UTILITIES WITHOUT PERMIT FROM AUTHORITY HAVING JURISDICTION.</li> <li>NOTIFY ARCHITECT NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED UTILITY</li> </ol>	<ul> <li>1.02 SUMMARY</li> <li>A. THIS SECTION INCLUDES THE FOLLOWING: <ol> <li>PREPARING SUBGRADES FOR SLABS-ON-GRADE, WALKS, F PLANTINGS.</li> <li>EXCAVATING AND BACKFILLING FOR BUILDINGS AND STRUC</li> <li>DRAINAGE COURSE FOR SLABS-ON-GRADE.</li> </ol> </li> </ul>
7/15/2019 3:26:09 PM	INTERRUPTIONS. 2. DO NOT PROCEED WITH UTILITY INTERRUPTIONS WITHOUT ARCHITECT'S WRITTEN PERMISSION.	<ol> <li>SUBBASE COURSE FOR CONCRETE WALKS AND PAVEMENT</li> <li>BASE COURSE FOR ASPHALT PAVING.</li> <li>SUBSURFACE DRAINAGE BACKFILL FOR WALLS AND TRENC</li> </ol>

## TURES AND OTHER ELEMENTS THAT ARE NOT TO BE REMOVED.

### EVER DEPTHS ARE ENCOUNTERED IN A MANNER TO PREVENT DERLYING SUBSOIL OR OTHER WASTE MATERIALS.

) NON-SOIL MATERIALS FROM TOPSOIL, INCLUDING TRASH, DEBRIS, RIALS AWAY FROM EDGE OF EXCAVATIONS WITHOUT INTERMIXING ND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO

### PSOIL AS SPECIFIED FOR WASTE MATERIAL DISPOSAL. TOPSOIL TO ALLOW FOR RE-SPREADING DEEPER TOPSOIL.

- AGE VEGETATION BEYOND THE LIMITS INDICATED ON DRAWINGS. TION MUST BE REMOVED BUT NO CONSTRUCTION WILL OCCUR VING, REMOVE VEGETATION WITH MINIMUM DISTURBANCE OF THE
- DO NOT BURN, BURY, LANDFILL, OR LEAVE ON SITE, EXCEPT AS OR SHRED VEGETATION FOR MULCHING, COMPOSTING, OR OTHER
- ice should be given to on-site uses. CIFIED FOR OTHER VEGETATION REMOVED; REMOVE STUMPS AND
- TION OUTSIDE REMOVAL LIMITS OR WITHIN SPECIFIED PROTECTIVE ESTROYED DUE TO SUBSEQUENT CONSTRUCTION OPERATIONS,
- GRADE AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS F NEW CONSTRUCTION. REFER TO PROJECT PLANS FOR
- CURBS, GUTTERS, AND AGGREGATE BASE AS INDICATED. L-DEPTH JOINTS COINCIDE WITH LINE OF DEMOLITION, NEATLY XISTING PAVEMENT TO REMAIN BEFORE REMOVING EXISTING
- TEEL REINFORCEMENT IN CONCRETE TO REMAIN TO PREVENT
- ITION, READY FOR SUBSEQUENT WORK. /IND-BLOWN DEBRIS FROM PUBLIC AND PRIVATE LANDS. ATERIAL, UNSUITABLE TOPSOIL, OBSTRUCTIONS, DEMOLISHED
- IATERIALS INCLUDING TRASH AND DEBRIS, AND LEGALLY DISPOSE MATERIALS PRODUCED DURING SITE CLEARING FROM OTHER ERIALS. STORE OR STOCKPILE WITHOUT INTERMIXING WITH TRANSPORT THEM TO RECYCLING FACILITIES.

## EXCAVATION AND ROUGH GRADING

- : DEBRIS AND/OR SOIL MATERIAL JUDGED UNSUITABLE BY RT OF SLABS OR OTHER SITE IMPROVEMENTS. GINEER EMPLOYED BY OWNER, EMPOWERED TO CONDUCT
- OR OR CIVIL ENGINEER REGISTERED IN THE STATE OF UTAH. PENDENT SOILS LABORATORY TO CONDUCT IN PLACE MOISTURE
- EAS: PLUS/MINUS 0.20 FT FROM REQUIRED ELEVATIONS. LUS/MINUS 0.10 FT FROM REQUIRED ELEVATIONS. TIES, UTILITIES (OVERHEAD AND UNDERGROUND), SIDEWALKS,
- AKE EMERGENCY REPAIR AS DIRECTED. WHERE SETTLEMENT OR WASHING OCCURS AT NO EXTRA COST.
- OOTS, ORGANIC MATERIAL, TRASH, FROZEN MATTER, AND
- INED ON SITE WHERE REMOVED FROM EXCAVATING AND OFF-SITE BORROW OR FILL AS REQUIRED.
- ES, PIPING, ROADS, PARKING AREAS AND WALKS AND ESTABLISH
- AREAS TO BE CUT AND FILLED THAT WAS NOT PREVIOUSLY ED, SCARIFY TO A MINIMUM DEPTH OF 6 IN UNDER NEW ROADS,
- FING GROUND SURFACE IS STEEPER THAN ONE VERTICAL TO FOUR URFACE IN ORDER TO SPREAD FILL HORIZONTALLY SO THAT FILL
- TO SUBGRADES OF PAVED AND UNPAVED AREAS AS INDICATED. VEOUS FOOTINGS, SLABS, WALKS AND OTHER STRUCTURES. ) TO BRING EXISTING GRADES TO ROUGH GRADES. IONAL APPROVED MATERIAL REQUIRED TO BRING SUBGRADE TO
- SHAPE AND DRAIN EMBANKMENTS AND EXCAVATION.
- ERIALS WHICH CANNOT BE COMPACTED AS SPECIFIED AND
- ITABLE TO RECEIVE FILL AND REPLACE WITH SUITABLE MATERIAL. TS AND FILLS TO LINES AND GRADES RRESPOND TO SHAPE OF TYPICAL CROSS SECTION OR CONTOUR F METHOD USED TO INDICATE SHAPE, SIZE, AND EXTENT OF LINE
- RGER THAN 4 IN, ARE NOT PLACED IN UPPER 6 IN OF FILL OR
- MAXIMUM 8 IN LOOSE THICKNESS. ALLY AND COMPACT EACH LAYER TO SPECIFIED DENSITY PRIOR TO
- ) MEET REQUIREMENTS OF COMPACTION. THIN 3 PERCENT ABOVE TO 3 PERCENT BELOW OPTIMUM MOISTURE ARKING AREAS AND EXTENDING 1 FT BEYOND PROPOSED CURB DICULAR FROM CENTERLINE, COMPACT TO 96 PERCENT MAXIMUM
- MPACT TO 95 PERCENT MAXIMUM DRY DENSITY. AND FILLS NOT LISTED, COMPACT TO 90 PERCENT OF MAXIMUM
- G AND STRUCTURES, COMPACT TO DENSITY AS SPECIFIED IN
- PROVISIONS OF THE CONTRACT. INCLUDING GENERAL AND ONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS
- ES FOR SLABS-ON-GRADE, WALKS, PAVEMENTS, LAWNS, AND **KFILLING FOR BUILDINGS AND STRUCTURES.**
- CONCRETE WALKS AND PAVEMENTS.
- E BACKFILL FOR WALLS AND TRENCHES.

- B. RELATED SECTIONS INCLUDE THE FOLLOWING: 1. DIVISION 2 SECTION 02 4119 "SELECTIVE SITE DEMOLITION" FOR TEMPORARY CONTROLS AND SITE STRIPPING, GRUBBING, REMOVING TOPSOIL, AND PROTECTING TREES TO RFMAIN
- 1.03 DEFINITIONS A. BACKFILL: SOIL MATERIALS USED TO FILL AN EXCAVATION. 1. INITIAL BACKFILL: BACKFILL PLACED BESIDE AND OVER PIPE IN A TRENCH, INCLUDING HAUNCHES TO SUPPORT SIDES OF PIPE
- 2. FINAL BACKFILL: BACKFILL PLACED OVER INITIAL BACKFILL TO FILL A TRENCH. B. BASE COURSE: LAYER PLACED BETWEEN THE SUBBASE COURSE AND ASPHALT PAVING. C. BEDDING COURSE: LAYER PLACED OVER THE EXCAVATED SUBGRADE IN A TRENCH BEFORE LAYING PIPE.
- D. BORROW: SATISFACTORY SOIL IMPORTED FROM OFF-SITE FOR USE AS FILL OR BACKFILL. E. EXCAVATION: REMOVAL OF MATERIAL ENCOUNTERED ABOVE SUBGRADE ELEVATIONS. 1. BULK EXCAVATION: EXCAVATIONS MORE THAN 10 FEET (3 M) IN WIDTH AND PITS MORE
- THAN 30 FEET (9 M) IN EITHER LENGTH OR WIDTH. 2. UNAUTHORIZED EXCAVATION: EXCAVATION BELOW SUBGRADE ELEVATIONS OR BEYOND INDICATED DIMENSIONS WITHOUT DIRECTION BY ARCHITECT. UNAUTHORIZED EXCAVATION, AS WELL AS REMEDIAL WORK DIRECTED BY ARCHITECT, SHALL BE WITHOUT ADDITIONAL COMPENSATION.
- F. FILL: SOIL MATERIALS USED TO RAISE EXISTING GRADES. G. STRUCTURES: BUILDINGS, FOOTINGS, FOUNDATIONS, RETAINING WALLS, SLABS, TANKS,
- CURBS, MECHANICAL AND ELECTRICAL APPURTENANCES, OR OTHER MAN-MADE STATIONARY FEATURES CONSTRUCTED ABOVE OR BELOW THE GROUND SURFACE. H. SUBBASE COURSE: LAYER PLACED BETWEEN THE SUBGRADE AND BASE COURSE FOR ASPHALT PAVING, OR LAYER PLACED BETWEEN THE SUBGRADE AND A CONCRETE
- PAVEMENT OR WALK. I. SUBGRADE: SURFACE OR ELEVATION REMAINING AFTER COMPLETING EXCAVATION, OR TOP SURFACE OF A FILL OR BACKFILL IMMEDIATELY BELOW SUBBASE, DRAINAGE FILL, OR TOPSOIL MATERIALS.
- J. UTILITIES: UTILITIES INCLUDE ON-SITE UNDERGROUND PIPES, CONDUITS, DUCTS, AND CABLES, AS WELL AS UNDERGROUND SERVICES WITHIN BUILDINGS. 1.04 SUBMITTALS
- A. MATERIAL TEST REPORTS: FROM A QUALIFIED TESTING AGENCY INDICATING AND INTERPRETING TEST RESULTS FOR COMPLIANCE OF THE FOLLOWING WITH REQUIREMENTS INDICATED 1. CLASSIFICATION ACCORDING TO ASTM D 2487 OF EACH ON-SITE OR BORROW SOIL
- MATERIAL PROPOSED FOR FILL AND BACKFILL. 2. LABORATORY COMPACTION CURVE ACCORDING TO ASTM D 1557 FOR EACH ON-SITE OR BORROW SOIL MATERIAL PROPOSED FOR FILL AND BACKFILL. 1.05 PROJECT CONDITIONS
- A. NO ADDITIONAL MONIES FOR EXPORTING OR IMPORTING OF SOIL. 1. AS PART OF THE CONSTRUCTION DOCUMENTS, OWNER MAY HAVE PROVIDED
- CONTRACTOR WITH A TOPOGRAPHIC SURVEY PERFORMED BY MANUAL OR AERIAL MEANS. SUCH SURVEY WAS PREPARED FOR PROJECT DESIGN PURPOSES AND IS PROVIDED TO THE CONTRACTOR AS A COURTESY. IT IS EXPRESSLY UNDERSTOOD THAT SUCH SURVEY MAY NOT ACCURATELY REFLECT EXISTING TOPOGRAPHICAL CONDITIONS AND TYPICALLY WILL VARY FROM ACTUAL CONDITIONS BY A SIGNIFICANT DEGREE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ACTUAL EXISTING CONDITIONS BY WHATEVER MEANS THE CONTRACTOR DEEMS APPROPRIATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THEIR OWN EARTHWORK QUANTITIES AND NOT RELY ON ANY ESTIMATE PREPARED BY THE OWNER, ITS AGENTS OR OUTSIDE PARTIES. THE CONTRACTOR IS RESPONSIBLE AS PART OF ITS LUMP SUM BID PRICE FOR THE PROJECT. FOR IMPORTING OR EXPORTING SOILS TO ACHIEVE FINAL SUB-GRADES WITH SUITABLE SOILS PER THE PLANS AND SPECIFICATIONS. NO ADDITIONAL MONIES WILL BE ALLOWED BEYOND THE CONTRACTOR'S LUMP SUM BID PRICE FOR THE PROJECT, FOR THE EXPORTING OR IMPORTING OF SOILS.
- B. EXISTING UTILITIES: LOCATE EXISTING UNDERGROUND UTILITIES IN AREAS OF WORK. IF UTILITIES ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF SUPPORT AND PROTECTION DURING EARTHWORK OPERATIONS 1. SHOULD UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE
- ENCOUNTERED DURING EXCAVATION. CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATION. REPAIR DAMAGED UTILITIES TO SATISFACTION OF UTILITY OWNER
- 2. DO NOT INTERRUPT UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED IN WRITING BY ARCHITECT AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY UTILITY SERVICES ACCORDING TO REQUIREMENTS INDICATED: 3. NOTIFY ARCHITECT NOT LESS THAN SEVEN (7) DAYS IN ADVANCE OF PROPOSED UTILITY
- INTERRUPTIONS. 4. DO NOT PROCEED WITH UTILITY INTERRUPTIONS WITHOUT ARCHITECT'S WRITTEN
- PFRMISSION 5. CONTACT UTILITY-LOCATOR SERVICE FOR AREA WHERE PROJECT IS LOCATED BEFORE
- FXCAVATING C. PROTECTION OF PERSONS AND PROPERTY: BARRICADE OPEN EXCAVATIONS OCCURRING AS PART OF THIS WORK AND POST WITH WARNING LIGHTS. 1. OPERATE WARNING LIGHTS AS RECOMMENDED BY AUTHORITIES HAVING JURISDICTION.

### **PART 2 PRODUCTS** 2.01 SOIL MATERIALS

- A. GENERAL: PROVIDE BORROW SOIL MATERIALS WHEN SUFFICIENT SATISFACTORY SOIL MATERIALS ARE NOT AVAILABLE FROM EXCAVATIONS B. SATISFACTORY SOILS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP,
- AND SM. OR A COMBINATION OF THESE GROUP SYMBOLS: FREE OF ROCK OR GRAVEL LARGER THAN 4 INCHES (100 MM) IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER. C. UNSATISFACTORY SOILS: ASTM D 2487 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT, OR A COMBINATION OF THESE GROUP SYMBOLS.
- 1. UNSATISFACTORY SOILS ALSO INCLUDE SATISFACTORY SOILS NOT MAINTAINED WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT AT TIME OF COMPACTION. D. BACKFILL AND FILL: SATISFACTORY SOIL MATERIALS. E. SUBBASE: NATURALLY OR ARTIFICIALLY WELL GRADED MIXTURE OF NATURAL OR CRUSHED
- GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; WITH AT LEAST 70 PERCENT PASSING A 3/4- INCH (18-MM) SIEVE AND NOT MORE THAN 25 PERCENT PASSING A NO. 200 (0.075-MM) SIEVE. F. BASE COURSE: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED
- GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; CONFORMING TO THE 1 INCH GRADATION REQUIREMENTS OF SECTION 301 OF THE UDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION.
- G. ENGINEERED FILL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; WITH AT LEAST 70 PERCENT PASSING A 3/4-INCH (18-MM) SIEVE AND NOT MORE THAN 25 PERCENT PASSING A NO. 200 (0.075-MM) SIEVE.
- H. BEDDING: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2940; EXCEPT WITH 100 PERCENT PASSING A 1-INCH (25-MM) SIEVE AND NOT MORE THAN 8 PERCENT PASSING A NO. 200 (0.075-MM) SIEVE.
- I. DRAINAGE FILL: WASHED, NARROWLY GRADED MIXTURE OF CRUSHED STONE, OR CRUSHED OR UNCRUSHED GRAVEL; ASTM D 448; COARSE-AGGREGATE GRADING SIZE 57; WITH 100 PERCENT PASSING A 1-1/2- INCH (38-MM) SIEVE AND 0 TO 5 PERCENT PASSING A NO. 8 (2.36-MM) SIEVE.
- J. FILTER MATERIAL: NARROWLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, OR CRUSHED STONE AND NATURAL SAND; ASTM D 448; COARSE-AGGREGATE GRADING SIZE 67; WITH 100 PERCENT PASSING A 1-INCH (25-MM) SIEVE AND 0 TO 5 PERCENT PASSING A NO. 4 (4.75-MM) SIEVE. K. IMPERVIOUS FILL: CLAYEY GRAVEL AND SAND MIXTURE CAPABLE OF COMPACTING TO A
- DENSE STATE. 2.02 ACCESSORIES A. WARNING TAPE: ACID- AND ALKALI-RESISTANT POLYETHYLENE FILM WARNING TAPE
- MANUFACTURED FOR MARKING AND IDENTIFYING UNDERGROUND UTILITIES. 6 INCHES (150 MM) WIDE AND 4 MILS (0.1 MM) THICK, CONTINUOUSLY INSCRIBED WITH A DESCRIPTION OF THE UTILITY; COLORED AS FOLLOWS: B. DETECTABLE WARNING TAPE: ACID- AND ALKALI-RESISTANT POLYETHYLENE FILM WARNING
- TAPE MANUFACTURED FOR MARKING AND IDENTIFYING UNDERGROUND UTILITIES. MINIMUM 6 INCHES (150 MM) WIDE AND 4 MILS (0.1 MM) THICK, CONTINUOUSLY INSCRIBED WITH A DESCRIPTION OF UTILITY, WITH METALLIC CORE ENCASED IN A PROTECTIVE JACKET FOR CORROSION PROTECTION, DETECTABLE BY METAL DETECTOR WHEN TAPE IS BURIED UP TO 30 INCHES (750 MM) DEEP; COLORED AS FOLLOWS: 1. RED: ELECTRIC.
- 2. YELLOW: GAS, OIL, STEAM, AND DANGEROUS MATERIALS. 3. ORANGE: TELEPHONE AND OTHER COMMUNICATIONS.
- 4. BLUE: WATER SYSTEMS. 5. GREEN: SEWER SYSTEMS
- C. TRACE WIRE: INSULATED 10 GAGE COPPER, SUITABLE FOR DIRECT BURY.

### PART 3 EXECUTION 3.01 PREPARATION

- A. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT, AND OTHER HAZARDS CREATED BY FARTHWORK OPERATIONS. B. PROTECT SUBGRADES AND FOUNDATION SOILS AGAINST FREEZING TEMPERATURES OR
- FROST. PROVIDE PROTECTIVE INSULATING MATERIALS AS NECESSARY. C. PROVIDE EROSION-CONTROL MEASURES TO PREVENT EROSION OR DISPLACEMENT OF SOILS AND DISCHARGE OF SOIL-BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES AND WALKWAYS.
- 3.02 DEWATERING A. PREVENT SURFACE WATER AND GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA.
- B. PROTECT SUBGRADES FROM SOFTENING, UNDERMINING, WASHOUT, AND DAMAGE BY RAIN OR WATER ACCUMULATION. 1. REROUTE SURFACE WATER RUNOFF AWAY FROM EXCAVATED AREAS. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. DO NOT USE EXCAVATED TRENCHES AS
- TEMPORARY DRAINAGE DITCHES. 2. INSTALL A DEWATERING SYSTEM TO KEEP SUBGRADES DRY AND CONVEY GROUND WATER AWAY FROM EXCAVATIONS. MAINTAIN UNTIL DEWATERING IS NO LONGER REQUIRED.

### 3.03 EXPLOSIVES - NOT ALLOWED 3.04 EXCAVATION, GENERAL

A. UNCLASSIFIED EXCAVATION: EXCAVATION TO SUBGRADE ELEVATIONS REGARDLESS OF THE CHARACTER OF SURFACE AND SUBSURFACE CONDITIONS ENCOUNTERED. INCLUDING ROCK. SOIL MATERIALS, AND OBSTRUCTIONS.

- 1. IF EXCAVATED MATERIALS INTENDED FOR FILL AND BACKFILL INCLUDE UNSATISFACTORY SOIL MATERIALS AND ROCK, REPLACE WITH SATISFACTORY SOIL MATERIALS.
- 3.05 EXCAVATION FOR WALKS AND PAVEMENTS A. EXCAVATE SURFACES UNDER WALKS AND PAVEMENTS TO INDICATED CROSS SECTIONS, ELEVATIONS, AND GRADES. 3.06 APPROVAL OF SUBGRADE
- A. NOTIFY ARCHITECT WHEN EXCAVATIONS HAVE REACHED REQUIRED SUBGRADE. B. IF ARCHITECT DETERMINES THAT UNSATISFACTORY SOIL IS PRESENT, CONTINUE EXCAVATION AND REPLACE WITH COMPACTED BACKFILL OR FILL MATERIAL AS DIRECTED. C. PROOF ROLL SUBGRADE WITH HEAVY PNEUMATIC-TIRED EQUIPMENT TO IDENTIFY SOFT
- POCKETS AND AREAS OF EXCESS YIELDING. DO NOT PROOF ROLL WET OR SATURATED SUBGRADES. D. RECONSTRUCT SUBGRADES DAMAGED BY FREEZING TEMPERATURES. FROST. RAIN.
- ACCUMULATED WATER, OR CONSTRUCTION ACTIVITIES, AS DIRECTED BY ARCHITECT. 3.07 UNAUTHORIZED EXCAVATION A. FILL UNAUTHORIZED EXCAVATION UNDER FOUNDATIONS OR WALL FOOTINGS BY EXTENDING BOTTOM ELEVATION OF CONCRETE FOUNDATION OR FOOTING TO EXCAVATION BOTTOM, WITHOUT ALTERING TOP ELEVATION. LEAN CONCRETE FILL MAY BE USED WHEN APPROVED BY ARCHITECT.
- 1. FILL UNAUTHORIZED EXCAVATIONS UNDER OTHER CONSTRUCTION OR UTILITY PIPE AS DIRECTED BY ARCHITECT.

## 3.08 STORAGE OF SOIL MATERIALS

A. STOCKPILE BORROW MATERIALS AND SATISFACTORY EXCAVATED SOIL MATERIALS. STOCKPILE SOIL MATERIALS WITHOUT INTERMIXING. PLACE, GRADE, AND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO PREVENT WINDBLOWN DUST. 1. STOCKPILE SOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS. DO NOT STORE WITHIN DRIP LINE OF REMAINING TREES.

### 3.09 BACKFILL

- A. PLACE AND COMPACT BACKFILL IN EXCAVATIONS PROMPTLY, BUT NOT BEFORE COMPLETING THE FOLLOWING 1. CONSTRUCTION BELOW FINISH GRADE INCLUDING, WHERE APPLICABLE, DAMPPROOFING,
- WATERPROOFING, AND PERIMETER INSULATION. 2. SURVEYING LOCATIONS OF UNDERGROUND UTILITIES FOR RECORD DOCUMENTS.
- 3. INSPECTING AND TESTING UNDERGROUND UTILITIES. REMOVING CONCRETE FORMWORK.
- 5. REMOVING TRASH AND DEBRIS.

HAND-OPERATED TAMPERS.

WEIGHT ACCORDING TO ASTM D 1557:

THICKER THAN 6 FEET DEEP

SECTIONS, LINES, AND ELEVATIONS INDICATED.

1. LAWN OR UNPAVED AREAS: PLUS OR MINUS 0.2 FT (25 MM).

MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 1557

PREVIOUSLY COMPLETED WORK COMPLY WITH REQUIREMENTS.

PERFORMED AT THE FOLLOWING LOCATIONS AND FREQUENCIES:

SLAB, BUT IN NO CASE FEWER THAN THREE TESTS.

AND EROSION. KEEP FREE OF TRASH AND DEBRIS.

ARCHITECT; RESHAPE AND RECOMPACT

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

END OF SECTION

**SECTION 32 1216** 

ASPHALT PAVING

REQUIRED SURFACE TOLERANCES.

2. WALKS: PLUS OR MINUS 0.1 FT (13 MM).

3. PAVEMENTS: PLUS OR MINUS 0.1 FT (13 MM).

1. PLACE BASE COURSE MATERIAL OVER SUBBASE.

LESS, PLACE MATERIALS IN A SINGLE LAYER.

WEIGHT ACCORDING TO ASTM D 1557.

SPECIFIED COMPACTION IS OBTAINED.

PERCENT.

GRADES.

TOI FRANCES<sup>1</sup>

AS FOLLOWS:

GRADES

3.15 FIELD QUALITY CONTROL

FOOTING.

3.16 PROTECTION

CONDITIONS

RECONSTRUCT SURFACING.

POSSIBLE

PROPERTY

PART 1 GENERAL

**1.01 SECTION INCLUDES** 

E. SURFACE SEALER.

1.02 DEFINITIONS

1.03 SUBMITTALS

A. HOT-MIX ASPHALT PAVING.

C. AGGREGATE BASE COURSE.

B. ASPHALT SURFACE TREATMENTS.

D. SINGLE COURSE BITUMINOUS CONCRETE PAVING.

TESTED PHYSICAL AND PERFORMANCE PROPERTIES.

3.14 SUBBASE AND BASE COURSES

3.13 GRADING

6. REMOVING TEMPORARY SHORING AND BRACING, AND SHEETING. 7. INSTALLING PERMANENT OR TEMPORARY HORIZONTAL BRACING ON HORIZONTALLY SUPPORTED WALLS.

### 3 10 FILL A. PREPARATION: REMOVE VEGETATION, TOPSOIL, DEBRIS, UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE

- BEFORE PLACING FILLS. B. PLOW, SCARIFY, BENCH, OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4
- HORIZONTAL SO FILL MATERIAL WILL BOND WITH EXISTING MATERIAL. C. PLACE AND COMPACT FILL MATERIAL IN LAYERS TO REQUIRED ELEVATIONS AS FOLLOWS:
- 1. UNDER GRASS AND PLANTED AREAS, USE SATISFACTORY SOIL MATERIAL. 2. UNDER WALKS AND PAVEMENTS, USE SATISFACTORY SOIL MATERIAL.
- 3.11 MOISTURE CONTROL A. UNIFORMLY MOISTEN OR AERATE SUBGRADE AND EACH SUBSEQUENT FILL OR BACKFILL LAYER BEFORE COMPACTION TO WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT.
- 1. DO NOT PLACE BACKFILL OR FILL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST OR ICF 2. REMOVE AND REPLACE. OR SCARIFY AND AIR-DRY. OTHERWISE SATISFACTORY SOIL
- MATERIAL THAT EXCEEDS OPTIMUM MOISTURE CONTENT BY 2 PERCENT AND IS TOO WET TO COMPACT TO SPECIFIED DRY UNIT WEIGHT. 3.12 COMPACTION OF BACKFILLS AND FILLS A. PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES (200 MM) IN

### LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES (100 MM) IN LOOSE DEPTH FOR MATERIAL COMPACTED BY

- B. PLACE BACKFILL AND FILL MATERIALS EVENLY ON ALL SIDES OF STRUCTURES TO REQUIRED ELEVATIONS, AND UNIFORMLY ALONG THE FULL LENGTH OF EACH STRUCTURE. C. COMPACT SOIL TO NOT LESS THAN THE FOLLOWING PERCENTAGES OF MAXIMUM DRY UNIT 1. UNDER STRUCTURES, BUILDING SLABS, STEPS, AND PAVEMENTS, SCARIFY AND
- RECOMPACT TOP 6 INCHES (150 MM) OF EXISTING SUBGRADE AND EACH LAYER OF BACKFILL OR FILL MATERIAL AT 95 PERCENT. COMPACT TO 98 PERCENT FOR FILLS

### 2. UNDER WALKWAYS, SCARIFY AND RECOMPACT TOP 6 INCHES (150 MM) BELOW SUBGRADE AND COMPACT EACH LAYER OF BACKFILL OR FILL MATERIAL AT 95 PERCENT. 3. UNDER LAWN OR UNPAVED AREAS, SCARIFY AND RECOMPACT TOP 6 INCHES (150 MM) BELOW SUBGRADE AND COMPACT EACH LAYER OF BACKFILL OR FILL MATERIAL AT 90

### A. GENERAL: UNIFORMLY GRADE AREAS TO A SMOOTH SURFACE, FREE FROM IRREGULAR SURFACE CHANGES. COMPLY WITH COMPACTION REQUIREMENTS AND GRADE TO CROSS

- 1. PROVIDE A SMOOTH TRANSITION BETWEEN ADJACENT EXISTING GRADES AND NEW 2. CUT OUT SOFT SPOTS, FILL LOW SPOTS, AND TRIM HIGH SPOTS TO COMPLY WITH B. SITE GRADING: SLOPE GRADES TO DIRECT WATER AWAY FROM BUILDINGS AND TO PREVENT PONDING. FINISH SUBGRADES TO REQUIRED ELEVATIONS WITHIN THE FOLLOWING

## A. UNDER PAVEMENTS AND WALKS, PLACE SUBBASE COURSE ON PREPARED SUBGRADE AND

- 2. COMPACT SUBBASE AND BASE COURSES AT OPTIMUM MOISTURE CONTENT TO REQUIRED GRADES, LINES, CROSS SECTIONS, AND THICKNESS TO NOT LESS THAN 95 PERCENT OF
- 3. SHAPE SUBBASE AND BASE TO REQUIRED CROWN ELEVATIONS AND CROSS-SLOPE
- 4. WHEN THICKNESS OF COMPACTED SUBBASE OR BASE COURSE IS 6 INCHES (150 MM) OR 5. WHEN THICKNESS OF COMPACTED SUBBASE OR BASE COURSE EXCEEDS 6 INCHES (150 MM), PLACE MATERIALS IN EQUAL LAYERS, WITH NO LAYER MORE THAN 6 INCHES (150
- MM) THICK OR LESS THAN 3 INCHES (75 MM) THICK WHEN COMPACTED. B. PAVEMENT SHOULDERS: PLACE SHOULDERS ALONG EDGES OF SUBBASE AND BASE COURSE TO PREVENT LATERAL MOVEMENT. CONSTRUCT SHOULDERS, AT LEAST 12 INCHES (300 MM) WIDE, OF SATISFACTORY SOIL MATERIALS AND COMPACT SIMULTANEOUSLY WITH EACH SUBBASE AND BASE LAYER TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY UNIT
- A. TESTING AGENCY: OWNER WILL ENGAGE A QUALIFIED INDEPENDENT GEOTECHNICAL
- ENGINEERING TESTING AGENCY TO PERFORM FIELD QUALITY-CONTROL TESTING. B. ALLOW TESTING AGENCY TO INSPECT AND TEST SUBGRADES AND EACH FILL OR BACKFILL LAYER. PROCEED WITH SUBSEQUENT EARTHWORK ONLY AFTER TEST RESULTS FOR
- C. TESTING AGENCY WILL TEST COMPACTION OF SOILS IN PLACE ACCORDING TO ASTM D 1556, ASTM D 2167, ASTM D 2922, AND ASTM D 2937, AS APPLICABLE. TESTS WILL BE
- 1. SPOT FOOTINGS: MINIMUM OF 1 COMPACTION TEST FOR EACH LIFT FOR EACH SPOT
- 2. SIDEWALKS, CURBS, GUTTERS, PADS: MINIMUM OF 1 TEST FOR EACH LIFT FOR EACH 40 LINEAL FEET OR 1 TEST FOR EVERY 1000 SQ. FT. OR LESS OF PAVED AREA OR BUILDING
- D. WHEN TESTING AGENCY REPORTS THAT SUBGRADES, FILLS, OR BACKFILLS HAVE NOT ACHIEVED DEGREE OF COMPACTION SPECIFIED, SCARIFY AND MOISTEN OR AERATE, OR REMOVE AND REPLACE SOIL TO DEPTH REQUIRED; RECOMPACT AND RETEST UNTIL
- A. PROTECTING GRADED AREAS: PROTECT NEWLY GRADED AREAS FROM TRAFFIC, FREEZING, B. REPAIR AND REESTABLISH GRADES TO SPECIFIED TOLERANCES WHERE COMPLETED OR PARTIALLY COMPLETED SURFACES BECOME ERODED, RUTTED, SETTLED, OR WHERE THEY
- LOSE COMPACTION DUE TO SUBSEQUENT CONSTRUCTION OPERATIONS OR WEATHER 1. SCARIFY OR REMOVE AND REPLACE SOIL MATERIAL TO DEPTH AS DIRECTED BY
- C. WHERE SETTLING OCCURS BEFORE PROJECT CORRECTION PERIOD ELAPSES, REMOVE FINISHED SURFACING, BACKFILL WITH ADDITIONAL SOIL MATERIAL, COMPACT, AND
- 1. RESTORE APPEARANCE, QUALITY, AND CONDITION OF FINISHED SURFACING TO MATCH ADJACENT WORK, AND ELIMINATE EVIDENCE OF RESTORATION TO THE GREATEST EXTENT
- A. DISPOSAL: REMOVE SURPLUS SATISFACTORY SOIL AND WASTE MATERIAL, INCLUDING UNSATISFACTORY SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF OWNER'S
- A. HOT-MIX ASPHALT PAVING TERMINOLOGY: REFER TO ASTM D8 FOR DEFINITIONS OF TERMS.
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. INCLUDE TECHNICAL DATA AND

C. SAMPLES FOR VERIFICATION: FOR THE FOLLOWING PRODUCTS, IN MANUFACTURER'S STANDARD SIZES UNLESS OTHERWISE INDICATED: 1. EACH PAVING FABRIC, 12 BY 12 INCHES MINIMUM D. QUALIFICATION DATA: FOR QUALIFIED MANUFACTURER AND INSTALLER. E. MATERIAL CERTIFICATES: FOR EACH PAVING MATERIAL, FROM MANUFACTURER. F. MATERIAL TEST REPORTS: FOR EACH PAVING MATERIAL. 1.04 QUALITY ASSURANCE A. MANUFACTURER QUALIFICATIONS: PROVIDE COPY OF MANUFACTURES EXPERIENCE FOR VERIFICATION OF QUALIFICATIONS. B. INSTALLER QUALIFICATIONS: IMPRINTED-ASPHALT MANUFACTURER'S AUTHORIZED INSTALLER WHO IS TRAINED AND APPROVED FOR INSTALLATION OF IMPRINTED ASPHALT REQUIRED FOR THIS PROJECT. C. TESTING AGENCY QUALIFICATIONS: QUALIFIED ACCORDING TO ASTM D 3666 FOR TESTING

APPROVAL OF EACH JOB MIX PROPOSED FOR THE WORK.

2. JOB-MIX DESIGNS: FOR EACH JOB MIX PROPOSED FOR THE WORK.

B. SAMPLES: FOR EACH PAVING FABRIC, 12 BY 12 INCHES MINIMUM IF USED.

INDICATED. D. REGULATORY REQUIREMENTS: COMPLY WITH MATERIALS, WORKMANSHIP, AND OTHER APPLICABLE REQUIREMENTS OF CITY AND DOT FOR ASPHALT PAVING WORK. 1. MEASUREMENT AND PAYMENT PROVISIONS AND SAFETY PROGRAM SUBMITTALS INCLUDED IN STANDARD SPECIFICATIONS DO NOT APPLY TO THIS SECTION.

1. JOB-MIX DESIGNS: CERTIFICATION, BY AUTHORITIES HAVING JURISDICTION, OF

DIRECTED BY ARCHITECT AT NO ADDITIONAL COST TO OWNER.

GRADE, CROSS SECTION, AND THICKNESS WHEN COMPACTED.

2. SPREAD MIX AT MINIMUM TEMPERATURE OF 250 DEG F.

PULLS AND TEARS IN ASPHALT-PAVING MAT.

STRIPS OF A LESSER WIDTH ARE REQUIRED

HAND TOOLS TO SMOOTH SURFACE.

EXCESSIVE DISPLACEMENT.

TO THE FOLLOWING DENSITY:

HOT-MIX ASPHALT IS STILL WARM.

BATHS, OR DEPRESSIONS ARE LEFT AFTER PAVING.

SPECIFIED DENSITY AND SURFACE SMOOTHNESS.

UNTIL IT HAS COOLED AND HARDENED.

WITHIN THE FOLLOWING TOLERANCES:

1. SURFACE COURSE: 1/8 INCH.

ADDITIONAL COST TO OWNER.

ACCORDANCE WITH AI MS-2

DETERMINED ACCORDING TO ASTM D3549/D3549M

ACCORDING TO JOB-MIX SPECIFICATIONS.

ASTM D1188 OR ASTM D2726/2726M.

FINAL PAVEMENT THICKNESS.

FILLED

WERE TAKEN.

3.12 DISPOSAL

TESTED FOR COMPLIANCE WITH SMOOTHNESS TOLERANCES.

PAVEMENT, WITH NO FEWER THAN 3 CORES TAKEN.

3.11 FIELD QUALITY CONTROL

QUALITY CONTROL.

AND INSPECTIONS.

1. BASE COURSE: PLUS 1/3 INCH, NO MINUS.

2. SURFACE COURSE: PLUS 1/4 INCH, NO MINUS.

ENOUGH NOT TO BECOME MARKED.

RECEIVING EXCESS FOG SEAL.

D3910 AND ALLOW CURING

3.10 INSTALLATION TOLERANCES

100 PFRCFNT.

THOROUGHI Y

3.09 SURFACE TREATMENTS

DENSITY.

3.08 COMPACTION

WITHOUT ROLLER MARKS.

3.07 JOINTS

HIGH SIDE OF ONE-WAY SLOPES UNLESS OTHERWISE INDICATED.

BASE COURSE BEFORE PLACING ASPHALT SURFACE COURSE.

SMOOTHNESS AS OTHER SECTIONS OF HOT-MIX ASPHALT COURSE.

"ENDING A LANE" AND "RESUMPTION OF PAVING OPERATIONS.".

1. CLEAN CONTACT SURFACES AND APPLY TACK COAT TO JOINTS.

PAVEMENT FROM POSITION. HAND COMPACT IN AREAS INACCESSIBLE TO ROLLING

B. MACHINE PLACE HOT-MIX ASPHALT ON PREPARED SURFACE, SPREAD UNIFORMLY, AND

STRIKE OFF. PLACE ASPHALT MIX BY HAND TO AREAS INACCESSIBLE TO EQUIPMENT IN A

MANNER THAT PREVENTS SEGREGATION OF MIX. PLACE EACH COURSE TO REQUIRED

1. PLACE HOT-MIX ASPHALT SURFACE COURSE IN SINGLE LIFT IF DESIGN THICKNESS IS

MULTIPLE LIFTS WITH A MINIMUM THICKNESS OF 1.5-INCHES AND A MAXIMUM

LESS THAN 3-INCHES. IF DESIGN THICKNESS IS MORE THAN 3-INCHES, PLACE IN

3. BEGIN APPLYING MIX ALONG CENTERLINE OF CROWN FOR CROWNED SECTIONS AND ON

1. AFTER FIRST STRIP HAS BEEN PLACED AND ROLLED, PLACE SUCCEEDING STRIPS AND

D. PROMPTLY CORRECT SURFACE IRREGULARITIES IN PAVING COURSE BEHIND PAVER. USE

SUITABLE HAND TOOLS TO REMOVE EXCESS MATERIAL FORMING HIGH SPOTS. FILL

E. PERFORM ROLLING WITH CONSECUTIVE PASSES TO ACHIEVE EVEN AND SMOOTH FINISH

SECTIONS. CONSTRUCT JOINTS FREE OF DEPRESSIONS, WITH SAME TEXTURE AND

2. OFFSET LONGITUDINAL JOINTS, IN SUCCESSIVE COURSES, A MINIMUM OF 6 INCHES.

3. OFFSET TRANSVERSE JOINTS, IN SUCCESSIVE COURSES, A MINIMUM OF 24 INCHES.

CONSTRUCT TRANSVERSE JOINTS AT EACH POINT WHERE PAVER ENDS A DAY'S WORK

EITHER "BULKHEAD" OR "PAPERED" METHOD ACCORDING TO AI MS-22. FOR BOTH

6. COMPACT ASPHALT AT JOINTS TO A DENSITY WITHIN 2 PERCENT OF SPECIFIED COURSE

A. GENERAL: BEGIN COMPACTION AS SOON AS PLACED HOT-MIX PAVING WILL BEAR ROLLER

ROLLING FOR INDICATED CROWN, GRADE, AND SMOOTHNESS. CORRECT LAYDOWN AND

ROLLING WHILE HOT-MIX ASPHALT IS STILL HOT ENOUGH TO ACHIEVE SPECIFIED DENSITY.

ASTM D6927 OR AASHTO T 245, BUT NOT LESS THAN 94 PERCENT NOR GREATER THAN

D. FINISH ROLLING: FINISH ROLL PAVED SURFACES TO REMOVE ROLLER MARKS WHILE

E. EDGE SHAPING: WHILE SURFACE IS BEING COMPACTED AND FINISHED, TRIM EDGES OF

F. PLACE ASPHALT SO THAT FINAL COMPACTED ASPHALT IS EVEN WITH LIP OF GUTTER ON

AND GUTTER). PLACE ASPHALT SO THAT FINAL COMPACTED ASPHALT IS 1/4-INCH ABOVE

LIP OF GUTTER ON CURBS THAT CARRY WATER (SLOPE OF PARKING LOT IS TOWARDS THE

CURB). IN TRANSITION AREAS, USE EXTRA CARE TO MAKE SURE THAT NO PONDS, BIRD

MATERIALS AND REPLACE WITH FRESH, HOT-MIX ASPHALT. COMPACT BY ROLLING TO

H. PROTECTION: AFTER FINAL ROLLING, DO NOT PERMIT VEHICULAR TRAFFIC ON PAVEMENT

I. ERECT BARRICADES TO PROTECT PAVING FROM TRAFFIC UNTIL MIXTURE HAS COOLED

A. FOG SEALS: APPLY FOG SEAL AT A RATE OF 0.10 TO 0.15 GAL/SQ. YD. TO EXISTING

ASPHALT PAVEMENT AND ALLOW TO CURE. WITH FINE SAND, LIGHTLY DUST AREAS

B. SLURRY SEALS: APPLY SLURRY COAT IN A UNIFORM THICKNESS ACCORDING TO ASTM

1. ROLL SLURRY SEAL TO REMOVE RIDGES AND PROVIDE A UNIFORM, SMOOTH SURFACE.

B. PAVEMENT SURFACE SMOOTHNESS: COMPACT EACH COURSE TO PRODUCE A SURFACE

C. AFTER PAVING IS COMPLETE, POUR WATER ON PAVED AREAS AND IDENTIFY PONDS, BIRD

STRAIGHTEDGE APPLIED TRANSVERSELY OR LONGITUDINALLY TO PAVED AREAS:

A. SEE SECTION 01 4000 - QUALITY REQUIREMENTS, FOR GENERAL REQUIREMENTS FOR

1. PROVIDE FIELD INSPECTION AND TESTING. TAKE SAMPLES AND PERFORM TESTS IN

C. THICKNESS: IN-PLACE COMPACTED THICKNESS OF HOT-MIX ASPHALT COURSES WILL BE

D. SURFACE SMOOTHNESS: FINISHED SURFACE OF EACH HOT-MIX ASPHALT COURSE WILL BE

MIXTURES AND COMPACTED PAVEMENT ACCORDING TO ASTM D979 OR AASHTO T 168.

RESULTS FROM FOUR SAMPLES OF HOT-MIX ASPHALT-PAVING MIXTURE DELIVERED

DAILY TO SITE, PREPARED ACCORDING TO ASTM D2041/D2041M, AND COMPACTED

2. IN-PLACE DENSITY OF COMPACTED PAVEMENT WILL BE DETERMINED BY TESTING CORE

MEASURED FOR COMPACTED THICKNESS. THE OWNER AND ARCHITECT MAY ALSO

SAMPLES ACCORDING TO ASTM D1188 OR ASTM D2726/2726M. CORES WILL ALSO BE

DIRECT ADDITIONAL CORES TO BE TAKEN AT LOCATIONS OF THEIR CHOOSING TO VERIFY

a. ONE CORE SAMPLE WILL BE TAKEN FOR EVERY 1000 SQ. YD. OR LESS OF INSTALLED

b. FIELD DENSITY OF IN-PLACE COMPACTED PAVEMENT MAY ALSO BE DETERMINED BY

NUCLEAR METHOD ACCORDING TO ASTM D2950/D2950M AND CORRELATED WITH

c. COORDINATE THE TIME AND LOCATIONS OF ALL HOLES SO THAT CORES MAY BE

F. THE CONTRACTOR WILL REPLACE AND COMPACT HOT-MIX ASPHALT WHERE CORE TESTS

G. REMOVE AND REPLACE OR INSTALL ADDITIONAL HOT-MIX ASPHALT WHERE TEST RESULTS

END OF SECTION

PROJECT SITE AND LEGALLY DISPOSE OF THEM IN AN EPA-APPROVED LANDFILL.

1. DO NOT ALLOW MILLED MATERIALS TO ACCUMULATE ON-SITE.

1. REFERENCE MAXIMUM THEORETICAL DENSITY WILL BE DETERMINED BY AVERAGING

E. IN-PLACE DENSITY: TESTING AGENCY WILL TAKE SAMPLES OF UNCOMPACTED PAVING

SMOOTHNESS WITHIN THE FOLLOWING TOLERANCES AS DETERMINED BY USING A 10-FOOT

OF CURB AND GUTTER. REMOVE AND REPLACE ASPHALT, CURB AND GUTTER, ROAD BASE,

AND OR SUB-BASE AS NECESSARY TO FIX PONDS, BIRD BATHS, OR DEPRESSIONS AT NO

1. COMPLETE COMPACTION BEFORE MIX TEMPERATURE COOLS TO 185 DEG F.

ROLLING OPERATIONS TO COMPLY WITH REQUIREMENTS.

AND RESUMES WORK AT A SUBSEQUENT TIME. CONSTRUCT THESE JOINTS USING

A. CONSTRUCT JOINTS TO ENSURE A CONTINUOUS BOND BETWEEN ADJOINING PAVING

DEPRESSIONS WITH HOT-MIX ASPHALT TO PREVENT SEGREGATION OF MIX; USE SUITABLE

EXTEND ROLLING TO OVERLAP PREVIOUS STRIPS. COMPLETE A SECTION OF ASPHALT

3.06 PLACING ASPHALT PAVEMENT

THICKNESS OF 4-INCHES.

FQUIPMENT.

- E. PRE-INSTALLATION CONFERENCE: CONDUCT CONFERENCE AT PROJECT SITE. 1. REVIEW METHODS AND PROCEDURES RELATED TO HOT-MIX ASPHALT PAVING INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: a. REVIEW PROPOSED SOURCES OF PAVING MATERIALS, INCLUDING CAPABILITIES AND
- LOCATION OF PLANT THAT WILL MANUFACTURE HOT-MIX ASPHALT. b. REVIEW CONDITION OF SUBGRADE AND PREPARATORY WORK. c. REVIEW REQUIREMENTS FOR PROTECTING PAVING WORK, INCLUDING RESTRICTION OF
- TRAFFIC DURING INSTALLATION PERIOD AND FOR REMAINDER OF CONSTRUCTION PFRIOD d. REVIEW AND FINALIZE CONSTRUCTION SCHEDULE AND VERIFY AVAILABILITY OF MATERIALS, INSTALLER'S PERSONNEL, EQUIPMENT, AND FACILITIES NEEDED TO MAKE
- PROGRESS AND AVOID DELAYS. F. PERFORM WORK IN ACCORDANCE WITH STATE OF UTAH HIGHWAYS STANDARD. G. MIXING PLANT: CONFORM TO STATE OF UTAH HIGHWAYS STANDARD. H. OBTAIN MATERIALS FROM SAME SOURCE THROUGHOUT.
- 1.05 PROJECT CONDITIONS A. ENVIRONMENTAL LIMITATIONS: DO NOT APPLY ASPHALT MATERIALS IF SUBGRADE IS WET
- OR EXCESSIVELY DAMP, IF RAIN IS IMMINENT OR EXPECTED BEFORE TIME REQUIRED FOR ADEQUATE CURE, OR IF THE FOLLOWING CONDITIONS ARE NOT MET: 1. PRIME COAT: MINIMUM SURFACE TEMPERATURE OF 60 DEG F. NOT USED IF PAVING TAKES PLACE WITHIN 48 HOURS OF FINAL GRADING AND FINAL COMPACTION OF ROAD
- 2. TACK COAT: MINIMUM SURFACE TEMPERATURE OF 60 DEG F.
- 3. SLURRY COAT: COMPLY WITH WEATHER LIMITATIONS IN ASTM D 3910. 4. ASPHALT BASE COURSE: MINIMUM SURFACE TEMPERATURE OF 40 DEG F AND RISING AT TIME OF PLACEMENT. 5. ASPHALT SURFACE COURSE: MINIMUM SURFACE TEMPERATURE OF 60 DEG F AT TIME OF PLACEMENT.

### ART 2 PRODUCTS 2.01 MATERIALS

- A. GENERAL: USE MATERIALS AND GRADATIONS THAT HAVE PERFORMED SATISFACTORILY IN PREVIOUS INSTALLATIONS. B. AGGREGATE FOR BASE COURSE- GRAVEL : ASTM D692/D692M, SOUND, ANGULAR
- CRUSHED WASHED STONE, CRUSHED GRAVEL, OR CURED, CRUSHED BLAST-FURNACE SLAG, FREE OF SHALE, CLAY, FRIABLE MATERIAL AND DEBRIS. C. FINE AGGREGATE: ASTM D1073 OR AASHTO M 29, SHARP-EDGED NATURAL SAND OR SAND
- PREPARED FROM STONE, GRAVEL, CURED BLAST-FURNACE SLAG, OR COMBINATIONS THFRFOF 1. FOR HOT-MIX ASPHALT, LIMIT NATURAL SAND TO A MAXIMUM OF 20 PERCENT BY WEIGHT OF THE TOTAL AGGREGATE MASS.
- D. MINERAL FILLER: ASTM D242/D242M OR AASHTO M 17, ROCK OR SLAG DUST, HYDRAULIC CEMENT, OR OTHER INERT MATERIAL. E. ASPHALT CEMENT: AC 20 PER ASTM D3381/D3381M FOR VISCOSITY-GRADED MATERIAL
- EXCEPT USE DUCTILITY AT 39.2 DEG. F., >5 FOR AC 20 AND DELETE THE LOSS ON HEATING REQUIREMENT ON RESIDUE FROM "THIN-FILM OVEN TEST" F. PRIMER COAT: NOT REQUIRED IF PAVING IS DONE WITHIN 48 HOURS OF FINAL COMPACTION. G. TACK COAT: ASTM D977 OR AASHTO M 140 EMULSIFIED ASPHALT, OR ASTM D2397/D2397M OR AASHTO M 208 CATIONIC EMULSIFIED ASPHALT, SLOW SETTING, DILUTED IN WATER, OF
- SUITABLE GRADE AND CONSISTENCY FOR APPLICATION. H. FOG SEAL: ASTM D977 OR AASHTO M 140 EMULSIFIED ASPHALT, OR ASTM D2397/D2397M OR AASHTO M 208 CATIONIC EMULSIFIED ASPHALT, SLOW SETTING, FACTORY DILUTED IN
- WATER, OF SUITABLE GRADE AND CONSISTENCY FOR APPLICATION. I. WATER: POTABLE J. UNDERSEALING ASPHALT: ASTM D3141/D3141M. PUMPING CONSISTENCY. K. HERBICIDE: COMMERCIAL CHEMICAL FOR WEED CONTROL, REGISTERED BY THE EPA.
- PROVIDE IN GRANULAR, LIQUID, OR WETTABLE POWDER FORM. L. SAND: ASTM D1073 OR AASHTO M 29, GRADE NOS, 2 OR 3, M. PAVING GEOTEXTILE: AASHTO M 288. NONWOVEN POLYPROPYLENE: RESISTANT TO CHEMICAL ATTACK, ROT, AND MILDEW; AND SPECIFICALLY DESIGNED FOR PAVING
- APPI ICATIONS. N. JOINT SEALANT: ASTM D6690 OR AASHTO M 324, TYPE I TYPE II OR III TYPE IV, HOT-APPLIED, SINGLE-COMPONENT, POLYMER-MODIFIED BITUMINOUS SEALANT.
- 2.02 ASPHALT PAVING MIXES AND MIX DESIGN A. HOT-MIX ASPHALT: DENSE, HOT-LAID, HOT-MIX ASPHALT PLANT MIXES APPROVED BY AUTHORITIES HAVING JURISDICTION; DESIGNED ACCORDING TO PROCEDURES IN AI MS-2, "MIX DESIGN METHODS FOR ASPHALT CONCRETE AND OTHER HOT-MIX TYPES"; AND COMPLYING WITH THE FOLLOWING REQUIREMENTS:
- 1. PROVIDE MIXES WITH A HISTORY OF SATISFACTORY PERFORMANCE IN GEOGRAPHICAL AREA WHERE PROJECT IS LOCATED. PROVIDE MIX WITH THE FOLLOWING CHARACTERISTICS
- b. SATIABILITY BASED ON ASTM D5581: 1200 MINIMUM.
- d. VOIDS IN MINERAL AGGREGATE VMA: 14. BE BETWEEN 4% AND 7% OF THE WEIGHT OF THE BITUMINOUS MIXTURE.
- DRAWINGS WITH AGGREGATE MEETING A ½" GRADATION APWA 2012 UTAH CHAPTER SPECIFICATION.

### PART 3 EXECUTION 3.01 EXAMINATION

- A. VERIFY THAT COMPACTED SUBGRADE IS DRY AND READY TO SUPPORT PAVING AND IMPOSED
- B. VERIFY THAT THE ROAD BASE HAS BEEN PROPERLY COMPACTED AND IS AT THE CORRECT LINE, GRADE, AND SLOPE.
- C. VERIFY THAT THE ROAD BASE THICKNESS IS AS INDICATED ON THE PROJECT PLANS.
- E. PROCEED WITH PAVING ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. F. VERIFY THAT SUFFICIENT DEPTH AT CURBS, WALKS, LIPS AND OTHER VERTICAL EDGES IS AVAILABLE TO PLACE THE REQUIRED THICKNESS OF COMPACTED ASPHALT.
- 3.02 PATCHING A. HOT-MIX ASPHALT PAVEMENT: SAW CUT PERIMETER OF PATCH AND EXCAVATE EXISTING PAVEMENT SECTION TO SOUND BASE. EXCAVATE RECTANGULAR OR TRAPEZOIDAL PATCHES, EXTENDING 12 INCHES INTO ADJACENT SOUND PAVEMENT, UNLESS OTHERWISE
- INDICATED. CUT EXCAVATION FACES VERTICALLY. REMOVE EXCAVATED MATERIAL. RECOMPACT EXISTING UNBOUND-AGGREGATE BASE COURSE TO FORM NEW SUBGRADE. B. TACK COAT: APPLY UNIFORMLY TO VERTICAL SURFACES ABUTTING OR PROJECTING INTO NEW, HOT-MIX ASPHALT PAVING AT A RATE OF 0.05 TO 0.15 GAL./SQ. YD.
- PAVING 2. AVOID SMEARING OR STAINING ADJOINING SURFACES, APPURTENANCES, AND SURROUNDINGS. REMOVE SPILLAGES AND CLEAN AFFECTED SURFACES.
- C. PATCHING: FILL EXCAVATED PAVEMENTS WITH HOT-MIX ASPHALT BASE MIX FOR FULL 3.03 BASE COURSE
- A. PROOF-ROLL SUBGRADE BELOW PAVEMENTS WITH HEAVY PNEUMATIC-TIRED EQUIPMENT TO IDENTIFY SOFT POCKETS AND AREAS OF EXCESS YIELDING. DO NOT PROOF-ROLL WET OR SATURATED SUBGRADES.
- 2. PROOF ROLL WITH A LOADED 10-WHEEL, TANDEM-AXLE DUMP TRUCK WEIGHING NOT LESS THAN 15 TONS OR OTHER VEHICLE WITH SIMILAR AXEL WEIGHT. 3. EXCAVATE SOFT SPOTS, UNSATISFACTORY SOILS, AND AREAS OF EXCESSIVE PUMPING OR RUTTING, AS DETERMINED BY ARCHITECT, AND REPLACE WITH COMPACTED BACKFILL
- OR FILL AS DIRECTED. . GENERAL: IMMEDIATELY BEFORE PLACING ASPHALT MATERIALS, REMOVE LOOSE AND DELETERIOUS MATERIAL FROM SUBSTRATE SURFACES. ENSURE THAT PREPARED
- SUBGRADE IS READY TO RECEIVE PAVING. C. HERBICIDE TREATMENT: NOT USED.
- 3.04 PREPARATION PRIMER A. DO NOT USE IF PAVING TAKES PLACE NOT MORE THAN 48 HOURS AFTER FINAL COMPACTION AND GRADING OF ROAD BASES. IF PAVING MUST BE DELAYED SIGNIFICANTLY, RE-GRADE AND RE-COMPACT ROAD BASE OR APPLY PRIME COAT. APPLY UNIFORMLY OVER SURFACE OF COMPACTED UNBOUND-AGGREGATE BASE COURSE AT A RATE OF 0.15 TO 0.50 GAL./SQ. YD. APPLY ENOUGH MATERIAL TO PENETRATE AND SEAL BUT NOT FLOOD SURFACE.
- ALLOW PRIME COAT TO CURE. 1. IF PRIME COAT IS NOT ENTIRELY ABSORBED WITHIN 24 HOURS AFTER APPLICATION, SPREAD SAND OVER SURFACE TO BLOT EXCESS ASPHALT. USE ENOUGH SAND TO PREVENT PICKUP UNDER TRAFFIC. REMOVE LOOSE SAND BY SWEEPING BEFORE
- PAVEMENT IS PLACED AND AFTER VOLATILES HAVE EVAPORATED. 2. PROTECT PRIMED SUBSTRATE FROM DAMAGE UNTIL READY TO RECEIVE PAVING. B. USE CLEAN SAND TO BLOT EXCESS PRIMER.
- 3.05 PREPARATION TACK COAT A. APPLY TACK COAT ON ASPHALT OR CONCRETE SURFACES OVER SUBGRADE SURFACE AT UNIFORM RATE OF 0.05 TO 0.15 GAL/SQ YD (0.19 TO 0.57 L/SQ M).
- B. ALLOW TACK COAT TO CURE UNDISTURBED BEFORE APPLYING HOT-MIX ASPHALT PAVING. C. AVOID SMEARING OR STAINING ADJOINING SURFACES, APPURTENANCES, AND SURROUNDINGS.

- a. NUMBER OF COMPACTION BLOWS EACH END OF SPECIMEN: 50.
- c. FLOW IN 0.01-INCH UNITS PER ASTM D5581: 10-18.
- e. THE PERCENTAGE OF BITUMINOUS MATERIAL BY WEIGHT ADDED TO AGGREGATE WILL 2. SURFACE COURSE: 4-INCH MINIMUM COMPACTED THICKNESS AND AS INDICATED ON THE
- B. EMULSIFIED-ASPHALT SLURRY: ASTM D3910, TYPE 1.

- D. VERIFY GRADIENTS AND ELEVATIONS OF BASE ARE CORRECT.

- 1. ALLOW TACK COAT TO CURE UNDISTURBED BEFORE APPLYING HOT-MIX ASPHALT
- THICKNESS OF PATCH AND, WHILE STILL HOT, COMPACT FLUSH WITH ADJACENT SURFACE.
- 1. COMPLETELY PROOF-ROLL SUBGRADE IN ONE DIRECTION. LIMIT VEHICLE SPEED TO 3





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### **SECTION 32 1313** CONCRETE PAVING PART 1 - GENERAL **1.01 RELATED DOCUMENTS** A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 01 SPECIFICATION SECTIONS, APPLY TO THIS SECTION. 1.02 SUMMARY A. SECTION INCLUDES: CURBS AND GUTTERS. WALKS. **1.03 DEFINITIONS** A. CEMENTITIOUS MATERIALS: PORTLAND CEMENT ALONE OR IN COMBINATION WITH ONE OR MORE OF BLENDED HYDRAULIC CEMENT, FLY ASH AND OTHER POZZOLANS, AND GROUND GRANULATED BLAST-FURNACE SLAG. 1.04 ACTION SUBMITTALS A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED. B. OTHER ACTION SUBMITTALS: 1. DESIGN MIXTURES: FOR EACH CONCRETE PAVING MIXTURE. INCLUDE ALTERNATE DESIGN MIXTURES WHEN CHARACTERISTICS OF MATERIALS, PROJECT CONDITIONS, WEATHER, TEST RESULTS, OR OTHER CIRCUMSTANCES WARRANT ADJUSTMENTS. 1.05 INFORMATIONAL SUBMITTALS A. FOR QUALIFIED INSTALLER OF DETECTABLE WARNINGS, READY-MIX CONCRETE MANUFACTURER, AND TESTING AGENCY. B. MATERIAL CERTIFICATES: FOR THE FOLLOWING, FROM MANUFACTURER: 1. CEMENTITIOUS MATERIALS. 2. STEEL REINFORCEMENT AND REINFORCEMENT ACCESSORIES. 3. FIBER REINFORCEMENT. 4. ADMIXTURES. 5. CURING COMPOUNDS. 6. APPLIED FINISH MATERIALS. 7. BONDING AGENT OR EPOXY ADHESIVE. JOINT FILLERS. C. MATERIAL TEST REPORTS: FOR EACH OF THE FOLLOWING: 1. AGGREGATES: INCLUDE SERVICE-RECORD DATA INDICATING ABSENCE OF DELETERIOUS EXPANSION OF CONCRETE DUE TO ALKALI-AGGREGATE REACTIVITY. D. FIELD QUALITY-CONTROL REPORTS. **1.06 QUALITY ASSURANCE** A. DETECTABLE WARNING INSTALLER QUALIFICATIONS: AN EMPLOYER OF WORKERS TRAINED AND APPROVED BY MANUFACTURER OF STAMPED CONCRETE PAVING SYSTEMS. B. READY-MIX-CONCRETE MANUFACTURER QUALIFICATIONS: A FIRM EXPERIENCED IN MANUFACTURING READY- MIXED CONCRETE PRODUCTS AND THAT COMPLIES WITH ASTM C 94/C 94M REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT. 1. MANUFACTURER CERTIFIED ACCORDING TO NRMCA'S "CERTIFICATION OF READY MIXED CONCRETE PRODUCTION FACILITIES" (QUALITY CONTROL MANUAL - SECTION 3, "PLANT CERTIFICATION CHECKLIST"). C. QUALIFIED ACCORDING TO ASTM C 1077 AND ASTM E 329 FOR TESTING INDICATED. 1. PERSONNEL CONDUCTING FIELD TESTS SHALL BE QUALIFIED AS ACI CONCRETE FIELD TESTING TECHNICIAN, GRADE 1, ACCORDING TO ACI CP-1 OR AN EQUIVALENT CERTIFICATION PROGRAM. D. CONCRETE TESTING SERVICE: ENGAGE A QUALIFIED TESTING AGENCY TO PERFORM MATERIAL EVALUATION TESTS AND TO DESIGN CONCRETE MIXTURES. E. ACI PUBLICATIONS: COMPLY WITH ACI 301 UNLESS OTHERWISE INDICATED. F. PREINSTALLATION CONFERENCE: CONDUCT CONFERENCE AT SITE. 1. REVIEW METHODS AND PROCEDURES RELATED TO CONCRETE PAVING, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: a. CONCRETE MIXTURE DESIGN. b. QUALITY CONTROL OF CONCRETE MATERIALS AND CONCRETE PAVING CONSTRUCTION PRACTICES. **1.07 PROJECT CONDITIONS** A. MAINTAIN ACCESS FOR VEHICULAR AND PEDESTRIAN TRAFFIC AS REQUIRED FOR OTHER CONSTRUCTION ACTIVITIES. PART 2 - PRODUCTS 2.01 FORMS A. FORM MATERIALS: PLYWOOD, METAL, METAL-FRAMED PLYWOOD, OR OTHER APPROVED PANEL-TYPE MATERIALS TO PROVIDE FULL-DEPTH, CONTINUOUS, STRAIGHT, AND SMOOTH FXPOSED SURFACES 1. USE FLEXIBLE OR UNIFORMLY CURVED FORMS FOR CURVES WITH A RADIUS OF 100 FEET OR LESS.[ DO NOT USE NOTCHED AND BENT FORMS.] B. FORM-RELEASE AGENT: COMMERCIALLY FORMULATED FORM-RELEASE AGENT THAT WILL NOT BOND WITH, STAIN, OR ADVERSELY AFFECT CONCRETE SURFACES AND THAT WILL NOT IMPAIR SUBSEQUENT TREATMENTS OF CONCRETE SURFACES. 2.02 CONCRETE MATERIALS A. CEMENTITIOUS MATERIAL: USE THE FOLLOWING CEMENTITIOUS MATERIALS, OF SAME TYPE, BRAND, AND SOURCE THROUGHOUT PROJECT: 1. ASTM C 150, GRAY PORTLAND CEMENT a. FLY ASH: ASTM C 618 b. GROUND GRANULATED BLAST-FURNACE SLAG: ASTM C 989, GRADE 100 OR 120. 2. ASTM C 595, [TYPE IS, PORTLAND BLAST-FURNACE SLAG] [TYPE IP, PORTLAND-POZZOLAN] CEMENT. B. NORMAL-WEIGHT AGGREGATES: ASTM C 33, UNIFORMLY GRADED. PROVIDE AGGREGATES FROM A SINGLE SOURCE. 1. MAXIMUM COARSE-AGGREGATE SIZE: [3/4 INCH] NOMINAL. 2. FINE AGGREGATE: FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT C. WATER: POTABLE AND COMPLYING WITH ASTM C 94/C 94M. D. AIR-ENTRAINING ADMIXTURE: ASTM C 260. E. CHEMICAL ADMIXTURES: ADMIXTURES CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES AND TO CONTAIN NOT MORE THAN 0.1 PERCENT WATER-SOLUBLE CHLORIDE IONS BY MASS OF CEMENTITIOUS MATERIAL WATER-REDUCING ADMIXTURE: ASTM C 494/C 494M, TYPE A RETARDING ADMIXTURE: ASTM C 494/C 494M, TYPE B. 3. WATER-REDUCING AND RETARDING ADMIXTURE: ASTM C 494/C 494M, TYPE D. 4. HIGH-RANGE, WATER-REDUCING ADMIXTURE: ASTM C 494/C 494M, TYPE F. 5. HIGH-RANGE, WATER-REDUCING AND RETARDING ADMIXTURE: ASTM C 494/C 494M, TYPF G. PLASTICIZING AND RETARDING ADMIXTURE: ASTM C 1017/C 1017M, TYPE II. 2.03 RELATED MATERIALS A. JOINT FILLERS: ASTM D 1752, CORK OR SELF-EXPANDING CORK IN PREFORMED STRIPS. B. BONDING AGENT: ASTM C 1059, TYPE II, NON-REDISPERSIBLE, ACRYLIC EMULSION OR STYRENE BUTADIENE. C. ROCK SALT: SODIUM CHLORIDE CRYSTALS, KILN DRIED, COARSE GRADATION WITH 100 PERCENT PASSING 3/8- INCH SIEVE AND 85 PERCENT RETAINED ON A NO. 8 SIEVE. 2.04 CONCRETE MIXTURES A. PREPARE DESIGN MIXTURES, PROPORTIONED ACCORDING TO ACI 301, FOR EACH TYPE AND STRENGTH OF NORMAL-WEIGHT CONCRETE, AND AS DETERMINED BY EITHER LABORATORY TRIAL MIXTURES OR FIELD EXPERIENCE. 1. USE A QUALIFIED INDEPENDENT TESTING AGENCY FOR PREPARING AND REPORTING PROPOSED CONCRETE DESIGN MIXTURES FOR THE TRIAL BATCH METHOD. 2. WHEN AUTOMATIC MACHINE PLACEMENT IS USED, DETERMINE DESIGN MIXTURES AND OBTAIN LABORATORY TEST RESULTS THAT MEET OR EXCEED REQUIREMENTS. B. PROPORTION MIXTURES TO PROVIDE NORMAL-WEIGHT CONCRETE WITH THE FOLLOWING PROPERTIES 1. COMPRESSIVE STRENGTH (28 DAYS): 4000 PSI 2. MAXIMUM WATER-CEMENTITIOUS MATERIALS RATIO AT POINT OF PLACEMENT: 0.44 . 3. SLUMP LIMIT: 5 INCHES, PLUS OR MINUS 1 INCH. C. LIMIT WATER-SOLUBLE, CHLORIDE-ION CONTENT IN HARDENED CONCRETE TO [0.15] PERCENT BY WEIGHT OF CEMENT. 2.05 CONCRETE MIXING A. READY-MIXED CONCRETE: MEASURE, BATCH, AND MIX CONCRETE MATERIALS AND CONCRETE ACCORDING TO ASTM C 94/C 94M. FURNISH BATCH CERTIFICATES FOR EACH BATCH DISCHARGED AND USED IN THE WORK. 1. WHEN AIR TEMPERATURE IS BETWEEN 85 AND 90 DEG F, REDUCE MIXING AND DELIVERY TIME FROM 1-1/2 HOURS TO 75 MINUTES; WHEN AIR TEMPERATURE IS ABOVE 90 DEG F, REDUCE MIXING AND DELIVERY TIME TO 60 MINUTES. PART 3 - EXECUTION 3.01 EXAMINATION A. EXAMINE EXPOSED SUBGRADES AND SUBBASE SURFACES FOR COMPLIANCE WITH REQUIREMENTS FOR DIMENSIONAL, GRADING, AND ELEVATION TOLERANCES. B. PROOF-ROLL PREPARED SUBBASE SURFACE BELOW CONCRETE PAVING TO IDENTIFY SOFT POCKETS AND AREAS OF EXCESS YIELDING. 1. COMPLETELY PROOF-ROLL SUBBASE IN ONE DIRECTION [ AND REPEAT IN PERPENDICULAR DIRECTION]. LIMIT VEHICLE SPEED TO 3 MPH. 2. PROOF-ROLL WITH A PNEUMATIC-TIRED AND LOADED, 10-WHEEL, TANDEM-AXLE DUMP TRUCK WEIGHING NOT LESS THAN 15 TONS. 3. CORRECT SUBBASE WITH SOFT SPOTS AND AREAS OF PUMPING OR RUTTING EXCEEDING DEPTH OF 1/2 INCH ACCORDING TO REQUIREMENTS IN SECTION 312000 "EARTH MOVING." C. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. 3.02 PREPARATION A. REMOVE LOOSE MATERIAL FROM COMPACTED SUBBASE SURFACE IMMEDIATELY BEFORE PLACING CONCRETE. 3.03 EDGE FORMS AND SCREED CONSTRUCTION A. SET, BRACE, AND SECURE EDGE FORMS, BULKHEADS, AND INTERMEDIATE SCREED GUIDES

- TO REQUIRED LINES, GRADES, AND ELEVATIONS. INSTALL FORMS TO ALLOW CONTINUOUS PROGRESS OF WORK AND SO FORMS CAN REMAIN IN PLACE AT LEAST 24 HOURS AFTER CONCRETE PLACEMENT.
- B. CLEAN FORMS AFTER EACH USE AND COAT WITH FORM-RELEASE AGENT TO ENSURE SEPARATION FROM CONCRETE WITHOUT DAMAGE. 3.04 JOINTS
- A. GENERAL: FORM CONSTRUCTION, ISOLATION, AND CONTRACTION JOINTS AND TOOL EDGES TRUE TO LINE, WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE, CONSTRUCT TRANSVERSE JOINTS AT RIGHT ANGLES TO CENTERLINE UNLESS OTHERWISE INDICATED.

### 1. WHEN JOINING EXISTING PAVING, PLACE TRANSVERSE JOINTS TO ALIGN WITH PREVIOUSLY PLACED JOINTS UNLESS OTHERWISE INDICATED. B. ISOLATION JOINTS: FORM ISOLATION JOINTS OF PREFORMED JOINT-FILLER STRIPS ABUTTING CONCRETE CURBS, CATCH BASINS, MANHOLES, INLETS, STRUCTURES, OTHER FIXED

- OBJECTS, AND WHERE INDICATED. 1. LOCATE EXPANSION JOINTS AT INTERVALS OF 50 FEET UNLESS OTHERWISE INDICATED. EXTEND JOINT FILLERS FULL WIDTH AND DEPTH OF JOINT. 3. TERMINATE JOINT FILLER NOT LESS THAN 1/2 INCH OR MORE THAN 1 INCH BELOW
- FINISHED SURFACE IF JOINT SEALANT IS INDICATED. 4. PLACE TOP OF JOINT FILLER FLUSH WITH FINISHED CONCRETE SURFACE IF JOINT SEALANT IS NOT INDICATED. 5. FURNISH JOINT FILLERS IN ONE-PIECE LENGTHS. WHERE MORE THAN ONE LENGTH IS
- REQUIRED, LACE OR CLIP JOINT-FILLER SECTIONS TOGETHER. 6. DURING CONCRETE PLACEMENT, PROTECT TOP EDGE OF JOINT FILLER WITH METAL, PLASTIC, OR OTHER TEMPORARY PREFORMED CAP. REMOVE PROTECTIVE CAP AFTER CONCRETE HAS BEEN PLACED ON BOTH SIDES OF JOINT.
- C. CONTRACTION JOINTS: FORM WEAKENED-PLANE CONTRACTION JOINTS, SECTIONING CONCRETE INTO AREAS AS INDICATED. CONSTRUCT CONTRACTION JOINTS FOR A DEPTH EQUAL TO AT LEAST ONE-FOURTH OF THE CONCRETE THICKNESS, AS FOLLOWS [, TO MATCH JOINTING OF EXISTING ADJACENT CONCRETE PAVING]: 1. GROOVED JOINTS: FORM CONTRACTION JOINTS AFTER INITIAL FLOATING BY GROOVING
- AND FINISHING EACH EDGE OF JOINT WITH GROOVING TOOL TO A 1/4-INCH RADIUS. REPEAT GROOVING OF CONTRACTION JOINTS AFTER APPLYING SURFACE FINISHES. ELIMINATE GROOVING-TOOL MARKS ON CONCRETE SURFACES. a. ENSURE THAT GROOVED JOINTS ARE WITHIN [3 INCHES] EITHER WAY FROM CENTERS OF DOWFLS.
- D. EDGING: AFTER INITIAL FLOATING, TOOL EDGES OF PAVING, GUTTERS, CURBS, AND JOINTS IN CONCRETE WITH AN EDGING TOOL TO A 1/4-INCH RADIUS. REPEAT TOOLING OF EDGES AFTER APPLYING SURFACE FINISHES. ELIMINATE EDGING-TOOL MARKS ON CONCRETE SURFACES. 3.05 CONCRETE PLACEMENT
- A. BEFORE PLACING CONCRETE, INSPECT AND COMPLETE FORMWORK INSTALLATION AND ITEMS TO BE EMBEDDED OR CAST-IN. B. REMOVE SNOW, ICE, OR FROST FROM SUBBASE SURFACE BEFORE PLACING CONCRETE. DO
- NOT PLACE CONCRETE ON FROZEN SURFACES. C. MOISTEN SUBBASE TO PROVIDE A UNIFORM DAMPENED CONDITION AT TIME CONCRETE IS PLACED. DO NOT PLACE CONCRETE AROUND MANHOLES OR OTHER STRUCTURES UNTIL
- THEY ARE AT REQUIRED FINISH ELEVATION AND ALIGNMENT. D. COMPLY WITH ACI 301 REQUIREMENTS FOR MEASURING, MIXING, TRANSPORTING, AND
- PLACING CONCRETE. E. DO NOT ADD WATER TO CONCRETE DURING DELIVERY OR AT PROJECT SITE. DO NOT ADD
- WATER TO FRESH CONCRETE AFTER TESTING. F. DEPOSIT AND SPREAD CONCRETE IN A CONTINUOUS OPERATION BETWEEN TRANSVERSE JOINTS. DO NOT PUSH OR DRAG CONCRETE INTO PLACE OR USE VIBRATORS TO MOVE CONCRETE INTO PLACE.
- G. CONSOLIDATE CONCRETE ACCORDING TO ACI 301 BY MECHANICAL VIBRATING EQUIPMENT SUPPLEMENTED BY HAND SPADING, RODDING, OR TAMPING. 1. CONSOLIDATE CONCRETE ALONG FACE OF FORMS AND ADJACENT TO TRANSVERSE JOINTS WITH AN INTERNAL VIBRATOR. KEEP VIBRATOR AWAY FROM JOINT ASSEMBLIES OR SIDE FORMS. USE ONLY SQUARE-FACED SHOVELS FOR HAND SPREADING AND CONSOLIDATION. CONSOLIDATE WITH CARE TO PREVENT DISLOCATING JOINT DEVICES.
- H. SCREED PAVING SURFACE WITH A STRAIGHTEDGE AND STRIKE OFF. I. COMMENCE INITIAL FLOATING USING BULL FLOATS OR DARBIES TO IMPART AN OPEN-TEXTURED AND UNIFORM SURFACE PLANE BEFORE EXCESS MOISTURE OR BLEED WATER APPEARS ON THE SURFACE. DO NOT FURTHER DISTURB CONCRETE SURFACES BEFORE BEGINNING FINISHING OPERATIONS OR SPREADING SURFACE TREATMENTS.
- J. CURBS AND GUTTERS: USE DESIGN MIXTURE FOR AUTOMATIC MACHINE PLACEMENT. PRODUCE CURBS AND GUTTERS TO REQUIRED CROSS SECTION, LINES, GRADES, FINISH, AND JOINTING. K. SLIP-FORM PAVING: USE DESIGN MIXTURE FOR AUTOMATIC MACHINE PLACEMENT. PRODUCE
- PAVING TO REQUIRED THICKNESS, LINES, GRADES, FINISH, AND JOINTING. 1. COMPACT SUBBASE AND PREPARE SUBGRADE OF SUFFICIENT WIDTH TO PREVENT DISPLACEMENT OF SLIP-FORM PAVING MACHINE DURING OPERATIONS.
- L. COLD-WEATHER PLACEMENT: PROTECT CONCRETE WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH THAT COULD BE CAUSED BY FROST, FREEZING, OR LOW TEMPERATURES. COMPLY WITH ACI 306.1 AND THE FOLLOWING: 1. WHEN AIR TEMPERATURE HAS FALLEN TO OR IS EXPECTED TO FALL BELOW 40 DEG F
- UNIFORMLY HEAT WATER AND AGGREGATES BEFORE MIXING TO OBTAIN A CONCRETE MIXTURE TEMPERATURE OF NOT LESS THAN 50 DEG F AND NOT MORE THAN 80 DEG F AT POINT OF PLACEMENT. 2. DO NOT USE FROZEN MATERIALS OR MATERIALS CONTAINING ICE OR SNOW. 3. DO NOT USE CALCIUM CHLORIDE, SALT, OR OTHER MATERIALS CONTAINING ANTIFREEZE
- AGENTS OR CHEMICAL ACCELERATORS UNLESS OTHERWISE SPECIFIED AND APPROVED IN DESIGN MIXTURES. M. HOT-WEATHER PLACEMENT: COMPLY WITH ACI 301 AND AS FOLLOWS WHEN HOT-WEATHER
- CONDITIONS EXIST: 1. COOL INGREDIENTS BEFORE MIXING TO MAINTAIN CONCRETE TEMPERATURE BELOW 90 DEG F AT TIME OF PLACEMENT. CHILLED MIXING WATER OR CHOPPED ICE MAY BE USED TO CONTROL TEMPERATURE, PROVIDED WATER EQUIVALENT OF ICE IS CALCULATED IN TOTAL AMOUNT OF MIXING WATER. USING LIQUID NITROGEN TO COOL CONCRETE IS CONTRACTOR'S OPTION.
- 2. COVER STEEL REINFORCEMENT WITH WATER-SOAKED BURLAP SO STEEL TEMPERATURE WILL NOT EXCEED AMBIENT AIR TEMPERATURE IMMEDIATELY BEFORE EMBEDDING IN CONCRETE 3. FOG-SPRAY FORMS[, STEEL REINFORCEMENT,] AND SUBGRADE JUST BEFORE PLACING
- CONCRETE. KEEP SUBGRADE MOISTURE UNIFORM WITHOUT STANDING WATER, SOFT SPOTS, OR DRY AREAS 3.06 FLOAT FINISHING
- A. GENERAL: DO NOT ADD WATER TO CONCRETE SURFACES DURING FINISHING OPERATIONS. B. FLOAT FINISH: BEGIN THE SECOND FLOATING OPERATION WHEN BLEED-WATER SHEEN HAS DISAPPEARED AND CONCRETE SURFACE HAS STIFFENED SUFFICIENTLY TO PERMIT OPERATIONS. FLOAT SURFACE WITH POWER-DRIVEN FLOATS OR BY HAND FLOATING IF AREA IS SMALL OR INACCESSIBLE TO POWER UNITS. FINISH SURFACES TO TRUE PLANES. CUT DOWN HIGH SPOTS AND FILL LOW SPOTS. REFLOAT SURFACE IMMEDIATELY TO UNIFORM
- GRANULAR TEXTURE. 1. BURLAP FINISH: DRAG A SEAMLESS STRIP OF DAMP BURLAP ACROSS FLOAT-FINISHED CONCRETE, PERPENDICULAR TO LINE OF TRAFFIC, TO PROVIDE A UNIFORM, GRITTY
- TFXTURF 2. MEDIUM-TO-FINE-TEXTURED BROOM FINISH: DRAW A SOFT-BRISTLE BROOM ACROSS FLOAT-FINISHED CONCRETE SURFACE PERPENDICULAR TO LINE OF TRAFFIC TO PROVIDE
- A UNIFORM, FINE-LINE TEXTURE 3. MEDIUM-TO-COARSE-TEXTURED BROOM FINISH: PROVIDE A COARSE FINISH BY STRIATING FLOAT- FINISHED CONCRETE SURFACE 1/16 TO 1/8 INCH DEEP WITH A STIFF-BRISTLED BROOM, PERPENDICULAR TO LINE OF TRAFFIC.
- 3.07 CONCRETE PROTECTION AND CURING A. GENERAL: PROTECT FRESHLY PLACED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE COLD OR HOT TEMPERATURES.
- B. COMPLY WITH ACI 306.1 FOR COLD-WEATHER PROTECTION. C. EVAPORATION RETARDER: APPLY EVAPORATION RETARDER TO CONCRETE SURFACES IF HOT, DRY, OR WINDY CONDITIONS CAUSE MOISTURE LOSS APPROACHING 0.2 LB/SQ. FT. X H BEFORE AND DURING FINISHING OPERATIONS. APPLY ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AFTER PLACING, SCREEDING, AND BULL FLOATING OR DARBYING
- CONCRETE BUT BEFORE FLOAT FINISHING. D. BEGIN CURING AFTER FINISHING CONCRETE BUT NOT BEFORE FREE WATER HAS DISAPPEARED FROM CONCRETE SURFACE. 3.08 PAVING TOLERANCES
- A. COMPLY WITH TOLERANCES IN ACI 117 AND AS FOLLOWS:
- 1. ELEVATION: 3/4 INCH. 2. THICKNESS: PLUS 3/8 INCH, MINUS 1/4 INCH.
- 3. SURFACE: GAP BELOW 10-FOOT- LONG, UNLEVELED STRAIGHTEDGE NOT TO EXCEED 1/2 4. ALIGNMENT OF TIE-BAR END RELATIVE TO LINE PERPENDICULAR TO PAVING EDGE: 1/2
- INCH PER 12 INCHES OF TIE BAR 5. LATERAL ALIGNMENT AND SPACING OF DOWELS: 1 INCH.
- 6. VERTICAL ALIGNMENT OF DOWELS: 1/4 INCH 7. ALIGNMENT OF DOWEL-BAR END RELATIVE TO LINE PERPENDICULAR TO PAVING EDGE: 1/4 INCH PER 12 INCHES OF DOWEL
- 8. JOINT SPACING: 3 INCHES. 9. CONTRACTION JOINT DEPTH: PLUS 1/4 INCH, NO MINUS.

### 10. JOINT WIDTH: PLUS 1/8 INCH, NO MINUS. 3.09 FIELD QUALITY CONTROL

- A. TESTING AGENCY: OWNER WILL ENGAGE A QUALIFIED TESTING AGENCY TO PERFORM TESTS AND INSPECTIONS. B. TESTING SERVICES: TESTING OF COMPOSITE SAMPLES OF FRESH CONCRETE OBTAINED ACCORDING TO ASTM C 172 SHALL BE PERFORMED ACCORDING TO THE FOLLOWING
- REQUIREMENTS: 1. TESTING FREQUENCY: OBTAIN AT LEAST ONE COMPOSITE SAMPLE FOR EACH 100 CU. YD. OR 5000 SQ. FT. OR FRACTION THEREOF OF EACH CONCRETE MIXTURE PLACED EACH
- a. WHEN FREQUENCY OF TESTING WILL PROVIDE FEWER THAN FIVE COMPRESSIVE-STRENGTH TESTS FOR EACH CONCRETE MIXTURE, TESTING SHALL BE CONDUCTED FROM AT LEAST FIVE RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF FEWER THAN FIVE ARE USED. SLUMP: ASTM C 143/C 143M; ONE TEST AT POINT OF PLACEMENT FOR EACH COMPOSITE SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE
- MIXTURE. PERFORM ADDITIONAL TESTS WHEN CONCRETE CONSISTENCY APPEARS TO CHANGE 3. AIR CONTENT: ASTM C 231, PRESSURE METHOD; ONE TEST FOR EACH COMPOSITE
- SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE MIXTURE. 4. CONCRETE TEMPERATURE: ASTM C 1064/C 1064M; ONE TEST HOURLY WHEN AIR
- TEMPERATURE IS 40 DEG F AND BELOW AND WHEN IT IS 80 DEG F AND ABOVE, AND ONE TEST FOR EACH COMPOSITE SAMPLE.
- 5. COMPRESSION TEST SPECIMENS: ASTM C 31/C 31M; CAST AND LABORATORY CURE ONE SET OF THREE STANDARD CYLINDER SPECIMENS FOR EACH COMPOSITE SAMPLE.

- 6. COMPRESSIVE-STRENGTH TESTS: ASTM C 39/C 39M; TEST ONE SPECIMEN AT SEVEN DAYS AND TWO SPECIMENS AT 28 DAYS. a. A COMPRESSIVE-STRENGTH TEST SHALL BE THE AVERAGE COMPRESSIVE STRENGTH FROM TWO SPECIMENS OBTAINED FROM SAME COMPOSITE SAMPLE AND TESTED AT 28 DAYS.
- C. STRENGTH OF EACH CONCRETE MIXTURE WILL BE SATISFACTORY IF AVERAGE OF ANY THREE CONSECUTIVE COMPRESSIVE-STRENGTH TESTS EQUALS OR EXCEEDS SPECIFIED COMPRESSIVE STRENGTH AND NO COMPRESSIVE-STRENGTH TEST VALUE FALLS BELOW SPECIFIED COMPRESSIVE STRENGTH BY MORE THAN 500 PSI.
- D. TEST RESULTS SHALL BE REPORTED IN WRITING TO ARCHITECT, CONCRETE MANUFACTURER, AND CONTRACTOR WITHIN 48 HOURS OF TESTING. REPORTS OF COMPRESSIVE-STRENGTH TESTS SHALL CONTAIN PROJECT IDENTIFICATION NAME AND NUMBER, DATE OF CONCRETE PLACEMENT, NAME OF CONCRETE TESTING AND INSPECTING AGENCY, LOCATION OF CONCRETE BATCH IN WORK, DESIGN COMPRESSIVE STRENGTH AT 28 DAYS, CONCRETE MIXTURE PROPORTIONS AND MATERIALS, COMPRESSIVE BREAKING STRENGTH, AND TYPE OF BREAK FOR BOTH 7- AND 28-DAY TESTS.
- E. NONDESTRUCTIVE TESTING: IMPACT HAMMER, SONOSCOPE, OR OTHER NONDESTRUCTIVE DEVICE MAY BE PERMITTED BY ARCHITECT BUT WILL NOT BE USED AS SOLE BASIS FOR APPROVAL OR REJECTION OF CONCRETE. F. ADDITIONAL TESTS: TESTING AND INSPECTING AGENCY SHALL MAKE ADDITIONAL TESTS OF
- CONCRETE WHEN TEST RESULTS INDICATE THAT SLUMP, AIR ENTRAINMENT, COMPRESSIVE STRENGTHS, OR OTHER REQUIREMENTS HAVE NOT BEEN MET, AS DIRECTED BY ARCHITECT. G. CONCRETE PAVING WILL BE CONSIDERED DEFECTIVE IF IT DOES NOT PASS TESTS AND
- INSPECTIONS. H. ADDITIONAL TESTING AND INSPECTING, AT CONTRACTOR'S EXPENSE, WILL BE PERFORMED TO DETERMINE COMPLIANCE OF REPLACED OR ADDITIONAL WORK WITH SPECIFIED

### REQUIREMENTS. I. PREPARE TEST AND INSPECTION REPORTS.

- **3.10 REPAIRS AND PROTECTION** A. REMOVE AND REPLACE CONCRETE PAVING THAT IS BROKEN, DAMAGED, OR DEFECTIVE OR THAT DOES NOT COMPLY WITH REQUIREMENTS IN THIS SECTION. REMOVE WORK IN COMPLETE SECTIONS FROM JOINT TO JOINT UNLESS OTHERWISE APPROVED BY ARCHITECT.
- B. DRILL TEST CORES, WHERE DIRECTED BY ARCHITECT, WHEN NECESSARY TO DETERMINE MAGNITUDE OF CRACKS OR DEFECTIVE AREAS. FILL DRILLED CORE HOLES IN SATISFACTORY PAVING AREAS WITH PORTLAND CEMENT CONCRETE BONDED TO PAVING WITH EPOXY ADHFSIVF.
- C. PROTECT CONCRETE PAVING FROM DAMAGE. EXCLUDE TRAFFIC FROM PAVING FOR AT LEAST 14 DAYS AFTER PLACEMENT. WHEN CONSTRUCTION TRAFFIC IS PERMITTED, MAINTAIN PAVING AS CLEAN AS POSSIBLE BY REMOVING SURFACE STAINS AND SPILLAGE OF MATERIALS AS THEY OCCUR.
- D. MAINTAIN CONCRETE PAVING FREE OF STAINS, DISCOLORATION, DIRT, AND OTHER FOREIGN MATERIAL. SWEEP PAVING NOT MORE THAN TWO DAYS BEFORE DATE SCHEDULED FOR SUBSTANTIAL COMPLETION INSPECTIONS. END OF SECTION

### SECTION 32 1813 SYNTHETIC GRASS SURFACING (ADD ALTERNATE 2)

- PART 1 GENERAL 1.01 SUMMARY A. THE OWNER RESERVES THE RIGHT TO SERVE AS THE SOLE AUTHORITY IN SELECTING THE SYSTEM TO BE INSTALLED AND IN SELECTING THE INSTALLATION SUBCONTRACTOR. THE OWNER MAY WAIVE SPECIFICATION REQUIREMENTS UPON REVIEW OF THE SUBMITTAL PACKAGES, BID COST, REFERENCE INFORMATION AND PROPOSED SCHEDULE. 1.02 SECTION INCLUDES
- A. FURNISHING ALL REQUIRED LABOR, MATERIALS, EQUIPMENT, AND SUPPLIES NECESSARY FOR INSTALLING SYNTHETIC TURF AS SHOWN ON THE PLANS. B. SYNTHETIC GRASS SURFACING AND INFILL.
- C. EDGE ANCHORING AND BORDERS. D. DRAINAGE LAYER BENEATH SYNTHETIC SURFACE.
- 1.03 SUBMITTALS A. SEE SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS, FOR SUBMITTAL PROCEDURES. B. SUBMIT WITH BID A LIST OF TEN (10) INSTALLATIONS COMPLETED OVER THE PAST FIVE (5) YEARS. THE LIST SHALL INCLUDE THE NAME AND PHONE NUMBER OF A CONTACT FOR EACH
- PROJECT. CONTACTS CANNOT BE CURRENT OR FORMER EMPLOYEES OF THE BIDDER. C. SUBMIT WITH BID DETAILED SPECIFICATIONS AND OTHER DESCRIPTIVE LITERATURE AS WELL AS A PRODUCT SAMPLE (MINIMUM 10 IN. BY 10 IN.) SHOWING THE TURF AND INFILL. D. SUBMIT WITH BID PROPOSAL THE SOURCE OF THE FIBER USED FOR THE TURF. PROVIDE
- FIBER SUPPLIER'S COMPANY NAME, LOCATION AND CONTACT NAME FOR FOLLOW-UP VERIFICATION ON FIBER SUPPLIERS COMPANY LETTER HEAD. FAILURE TO DO SO WILL BE GROUNDS FOR DISMISSAL AND WILL BE CONSIDERED A NON-RESPONSIVE BID.
- E. UPON COMPLETION, BIDDER SHALL SUBMIT COPIES OF ALL PRODUCT INFORMATION, TEST RESULTS, WARRANTY DOCUMENTS AND MAINTENANCE INFORMATION. F. SUBMIT WITH BID A WARRANTY THAT SHALL BE PROVIDED BY A SINGLE SOURCE, FOR A MINIMUM PERIOD OF EIGHT (8) YEARS. A COPY OF THE WARRANTY SHALL BE SUBMITTED WITH THE BID. SPECIFY WHAT PORTION OF THE WARRANTY IS BONDED. WARRANTIES SHALL INCLUDE THE FOLLOWING:
- 1. COMPLETE REPLACEMENT COVERAGE (NOT PRORATED). 2. COVERAGE SHALL INCLUDE MATERIALS AND WORKMANSHIP.
- REMOVAL AND DISPOSAL OF FAILED SYSTEM. 4. REPLACEMENT OF FAILED SYSTEM WILL BE OF EQUAL QUALITY, VALUE AND

END AT FORTY-FIVE (45) DAYS AFTER THE WALKTHROUGH DATE.

3. INSTALLER SHALL BE CERTIFIED BY THE MANUFACTURER AND LICENSED.

OWNER SHALL HAVE THE RIGHT TO REJECT, OR REQUIRE THE CORRECTION OF, MATERIALS

INFILL AS WELL AS SPECIFIC MAINTENANCE REQUIREMENTS.

MATERIALS, LABOR, AND RELATED COSTS

B. THE BIDDER SHALL MEET THE FOLLOWING CRITERIA.

SELLING AND INSTALLING SYNTHETIC TURF.

SYNTHETIC GRASS INSTALLATION.

INSTALLATION OF THE INFILL MIXTURE.

C. THE INSTALLER SHALL MEET THE FOLLOWING CRITERIA:

5. REPAIR OR REPLACE PORTIONS THAT ARE NO LONGER SERVICEABLE INCLUDING

PERFORMANCE

1.04 QUALITY ASSURANCE

PROJECT SITE.

INSTALLATIONS

REMOVED FROM THE SITE.

SUBMITTAL FROM THE BIDDER.

1.05 DELIVERY, STORAGE, AND HANDLING

WARRANTY REQUIREMENTS.

2. FIBER TENSILE STRENGTH.

2.01 SYNTHETIC GRASS SURFACING

a. FIBERS: MONOFILAMENT.

3. YARN DENIER: 8,000 - 11,000

b. MATERIAL: POLYETHYLENE.

a. PROVIDE DIMENSIONAL STABILITY.

3. DETERIORATION OR FADING FROM UV LIGHT.

INSTALLATION COVERING:

. EXCESSIVE WEAR.

1.06 WARBANTY

PART 2 PRODUCTS

FIBER BACKING.

2. BACKING:

1. PRIMARY BLADES:

d. HEIGHT: 1-1/8"

ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS

c. WEIGHT: 60 OUNCES PER SQUARE YARD (2.1 L/SM).

b. BACKING WEIGHT: 15 OUNCES PER SQUARE YARD.

d. SECOND: HIGH FLOW K9 BACKING MATRIX.

NO DEDUCTIBLES OR ADDITIONAL COST SHALL APPLY TO OWNER DUE TO FAILURE. THE OWNER RESERVES THE RIGHT TO REQUEST A CHANGE TO UPGRADE AT ADDITIONAL COST FOR ANY CHANGES IN DESIGN, NEW TECHNOLOGY OR SYSTEM COMPONENTS. 8. A COPY OF ANY FIBER OR TURF COMPONENT MANUFACTURES WARRANTY SHALL BE PROVIDED THAT LISTS ALL CONDITIONS, EXCLUSIONS AND LIMITATIONS OF THE FINISHED

PRODUCT AND CIRCUMSTANCES THAT CAN VOID THE SYSTEM WARRANTY. AT A MINIMUM OF FORTY-FIVE (45) DAYS PRIOR TO THE EXPIRATION OF THE WARRANTY, THE WARRANTY PROVIDER IS REQUIRED TO SCHEDULE A WALKTHROUGH OF THE FIELD. IF THIS MEETING DOES NOT OCCUR AS STATED, THE WARRANTY PERIOD WILL BE EXTENDED AND NOT EXPIRE UNTIL THE SAID WALKTHROUGH TAKES PLACE AND THEN

10. THIS WARRANTY SHALL INCLUDE IN WRITING THE PERFORMANCE OF ANY ALTERNATIVE A. MAINTAIN ONE COPY OF THE LATEST EDITION OF ASTM F1487 AND CPSC PUB. NO. 325 AT

1. THE BIDDER MUST HAVE BEEN IN BUSINESS FOR AT LEAST FIVE (5) YEARS ACTIVELY

1. COMPANY SHALL SPECIALIZE IN PERFORMING THE WORK OF THIS SECTION. THE CONTRACTOR SHALL PROVIDE COMPETENT WORKMEN SKILLED IN THE SPECIFIC TYPE OF

2. THE DESIGNATED SUPERVISORY PERSONNEL ON THE PROJECT SHALL BE CERTIFIED, IN WRITING BY THE TURF MANUFACTURER, AS COMPETENT IN THE INSTALLATION OF SPECIFIED MONOFILAMENT MATERIAL, INCLUDING GLUING SEAMS AND PROPER

4. THE INSTALLER SUPERVISOR SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE AS EITHER A CONSTRUCTION MANAGER OR A SUPERVISOR OF SYNTHETIC TURF 5. INSTALLER MUST BE LOCATED WITHIN 100 MILE RADIUS OF PROJECT SITE. D. THE OWNER OR OWNER'S REPRESENTATIVE SHALL HAVE ACCESS TO THE PROJECT AT ALL TIMES AND HAVE THE OPPORTUNITY TO INSPECT WORKMANSHIP AND MATERIALS. THE

OR WORKMANSHIP WHICH FAILS TO MEET SPECIFICATIONS. REJECTED OR FAULTY WORK SHALL BE REPAIRED AT NO COST TO THE OWNER, AND REJECTED MATERIALS SHALL BE E. SYNTHETIC MATERIALS SHALL BE VERIFIED / COMPARE BY THE OWNER/ARCHITECT USING AN ONSITE SUBMITTED SAMPLE AT THE TIME OF INSTALLATION TO DETERMINE CONFORMANCE

WITH THE BIDDER'S SUBMITTAL. COMPARISON RESULTS WILL BE COMPARED TO THE A. DELIVER, HANDLE, AND STORE SYNTHETIC GRASS SURFACING TO PROJECT SITE IN

B. STORE MATERIALS IN A DRY, COVERED AREA, ELEVATED ABOVE GRADE. A. SEE SECTION 01 7800 - CLOSEOUT SUBMITTALS - CLOSEOUT SUBMITTALS, FOR ADDITIONAL B. PROVIDE WARRANTY FROM THE DATE OF SUBSTANTIAL COMPLETION FOR MATERIALS AND

A. SYNTHETIC GRASS CARPET: YARN FIBERS TUFTED THROUGH AND ADHERED TO A POROUS

c. FIRST: DUAL LAYER OF WOVEN POLYPROPYLENE TREATED WITH UV INHIBITORS.

4. FACE WEIGHT: MINIMUM 60 OUNCES PER SQUARE YARD. 5. ROLL: 15 FEET (4.6 M) FEET WIDE, MINIMUM.

- 6. NONCOMBUSTIBLE: PASS ASTM D2859 FOR FLAMMABILITY. B. SYNTHETIC GRASS INFILL: 8.4 POUNDS PER SQUARE FOOT TO BE VERIFIED BY ARCHITECT WITH INFORMATION PROVIDED BY INSTALLER. 1. THE SAND INFILL SHALL COMPLY WITHIN THE FOLLOWING CHARACTERISTICS:
- a. AVERAGE PARTICLE SIZE BETWEEN 20 AND 30 MESH [CALCULATED BASED ON SUMMING THE MIDPOINT OF SIEVE PAN FRACTIONS TIMES THE % RETAINED ON GIVEN SCREEN FRACTIONS]
- b. AVERAGE PARTICLE SHAPE > 0.4 ON THE KRUMBEIN SCALE c. PARTICLE STRUCTURE PREDOMINANTLY SINGLE GRAIN d. PRODUCE < 0.4%, -50M IN API CRUSH TEST AT 80PSIG
- 2.02 MATERIALS
- A. EDGE ANCHORING: WOOD-POLYMER COMPOSITE LUMBER COMPLYING WITH ASTM D6662; FACTORY FINISHED, FREE OF SHARP VERTICAL EDGES, PROTRUDING ELEMENTS, AND TRIP HAZARDS, CAPABLE OF BEING SECURED TO THE BORDER. 1. MINIMUM EDGE RADIUS: 1/2 INCH (13 MM).
- B. BORDER: PERMANENT ELEMENT SURROUNDING EDGE ANCHORING, CONSISTING OF SIDEWALKS AND CURB WITH CHAIN LINK FENCE: 1. SIDEWALKS: AS INDICATED ON DRAWINGS.
- 2. CONCRETE CURB: AS INDICATED ON DRAWINGS. CHAIN LINK FENCE: AS INDICATED ON DRAWINGS.
- C. DRAINAGE (LOOSE SURFACING) COURSE: FRACTURED, NON-ROUNDED GRAVEL; WASHED; FREE OF DUST, CLAY, DIRT, ORGANIC MATERIAL, HAZARDOUS SUBSTANCES, OR FOREIGN OBJECTS; ROUNDED PARTICLES, EITHER NATURALLY OR MECHANICALLY; SIEVED IN COMPLIANCE WITH ASTM C136/C136M IN THE SPECIFIED GRADATION RANGE. PERCENT PASSING SIEVE SIZE 1/2 INCH (13 MM): 100 PERCENT.
- 2. PERCENT PASSING SIEVE SIZE 3/8 INCH (10 MM): 75 TO 85 PERCENT. 3. PERCENT PASSING SIEVE SIZE NO. 4 (5 MM): 0 PERCENT.
- 2.03 FURNISHED MATERIALS/EQUIPMENT
- A. UPON COMPLETION OF THE TURF INSTALLATION, FURNISH 200 LBS. OF INFILL MATERIAL AND ALL PIECES OF SCRAP TURF SELECTED BY THE OWNER. 2.04 ACCESSORIES
- A. FASTENERS, SYNTHETIC GRASS TO EDGING: 1/2 INCH (13 MM) STAINLESS STEEL STAPLES, IN COMPLIANCE WITH ASTM F1667. B. FASTENERS, EDGING TO BORDER: SELF DRILLING, STAINLESS STEEL SCREWS, IN COMPLIANCE WITH ASTM F1667.

## 3.01 PREPARATION

- A. LAY OUT ENTIRE PROJECT PERIMETER AS INDICATED ON DRAWINGS PRIOR TO STARTING WORK
- B. MEASURE THE LOCATION OF ALL SYNTHETIC GRASS ELEMENTS, INCLUDING ACCESS AND EGRESS POINTS, HARD SURFACES AND FENCES.
- C. VERIFY LOCATION OF UNDERGROUND UTILITIES AND FACILITIES IN THE PROJECT AREA. DAMAGE TO UNDERGROUND UTILITIES AND FACILITIES WILL BE REPAIRED AT CONTRACTOR'S FXPFNSF
- 3.02 SUBGRADE A. THE SYNTHETIC TURF INSTALLER SHALL INSPECT THE AGGREGATE BASE PRIOR TO START OF INSTALLATION AND INDICATE ACCEPTANCE IN WRITING. PLANARITY SHALL NOT VARY MORE THAN 1/4 IN. IN 10 FT. INSTALLATION OF TURF OVER THE BASE SHALL NOT COMMENCE WITHOUT WRITTEN ACCEPTANCE. STARTING INSTALLATION OF THE TURF OVER THE BASE SHALL INDICATE ACCEPTANCE OF THE BASE AND CONSTITUTES FULL ACCEPTANCE OF LIABILITY OF BASE FAILURE.
- 3.03 GEOTEXTILE FABRIC A. VERIFY THAT SUBGRADE IS FREE OF RUTS OR PROTRUDING OBJECTS. B. INSTALL GEOTEXTILE FABRIC OVER SUBGRADE IN IN DRAINAGE TRENCHES FIRST, PRIOR TO PET AREA INSTALLATION.
- C. LAP MINIMUM 36 INCHES (915 MM) WIDTH AT SEAMS. ADHERE SEAMS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- D. INSTALL FABRIC SMOOTH, AND FREE OF TENSILE STRESSES, FOLDS, OR WRINKLES. E. PROTECT FABRIC FROM CLOGGING, TEARS, OR OTHER DAMAGE DURING SURFACING
- INSTALLATION. F. REPAIR OR REPLACE DAMAGED FABRIC IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 3.04 EDGE ANCHORING
- A. THE PERIMETER SHALL BE ANCHORED TO A NAILER ATTACHED TO THE CONCRETE CURB. THE NAILER SHALL BE INSTALLED BY THE TURF CONTRACTOR SO THAT THE HEIGHT OF THE INFILL MATCHES THE TOP OF CURB.
- 3.05 BORDER A. VERIFY THAT SITE FURNISHINGS AND COMPOSITE NAILER BOARDS LOCATED WITHIN PROJECT AREA ARE COMPLETE.
- 3.06 SYNTHETIC GRASS A. CARPET ROLLS:
- 1. TURF ROLLS SHALL BE INSTALLED DIRECTLY OVER THE GRADED AND COMPACTED STONE BASE. CARE SHALL BE TAKEN TO AVOID DISTURBING THE BASE. EQUIPMENT SHALL BE AVAILABLE DURING INSTALLATION TO CORRECT THE BASE AHEAD OF THE PLACEMENT OF EACH ROLL
- 2. UNROLL ALL CARPET IN THE SAME DIRECTION. 3. ALLOW CARPET TO REST FOR AT LEAST 4 HOURS AFTER UNROLLING AND PRIOR TO SFAMING
- 4. SMOOTH SEAMS AND EDGES, ELIMINATE OVERLAPS AND GAPS. B. SFAMING:
- CUT: STRAIGHT, WITH A CLEAN AND SMOOTH EDGE. METHOD: a. BONDING: FOR MINOR SEAMS, ADHESIVE-BACKED, APPLIED UNIFORMLY WITH COMPLETE COVERAGE.
- C. SECURING: STAPLE CARPET TO EDGING 1 INCH (25 MM) ON CENTER.
- 3.07 INFILL A. INSTALLATION OF INFILL MATERIAL SHALL BEGIN IMMEDIATELY FOLLOWING TURF INSTALLATION. INFILL MATERIAL SHALL BE SPREAD IN LIFTS AND PROPERLY GROOMED TO ENSURE UNIFORMITY OF DEPTH. FINAL SURFACE TEXTURE AND APPEARANCE SHALL BE UNIFORM AND SHALL REPLICATE NATURAL TURF AS CLOSELY AS POSSIBLE. THE INFILL MATERIAL SHALL ONLY BE APPLIED WHEN THE SYNTHETIC TURF FABRIC IS DRY. B. APPLY DURING DRY WEATHER WITHOUT SIGNS OF MOISTURE ON SYNTHETIC GRASS. C. THOROUGHLY BRUSH SYNTHETIC GRASS PRIOR TO INFILL INSTALLATION.
- D. APPLY INFILL UNIFORMLY IN MULTIPLE LIFTS, BRUSH FIBERS BETWEEN EACH APPLICATION. E. MEASURE DEPTH TO CONFIRM ACCORDANCE WITH PLANS. 3.08 CLEANING & COMPLETION
- A. PROTECT ALL INSTALLED WORK FROM OTHER CONSTRUCTION ACTIVITIES AS INSTALLATION PROGRESSES
- B. THE CONTRACTOR SHALL KEEP THE AREA CLEAN THROUGHOUT THE CONSTRUCTION PERIOD AND FREE FROM THE INSTALLATION PROCESS. C. CLEAN SURROUNDING AREAS OF EXCESS CONSTRUCTION MATERIALS, DEBRIS, AND WASTE. D. REMOVE EXCESS AND WASTE MATERIAL AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH
- REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. E. ANY DAMAGE TO EXISTING FIXTURES OR FACILITIES RESULTING FROM THE INSTALLATION OF THE SYNTHETIC TURF SYSTEM SHALL BE REPAIRED TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE PRIOR TO SUBSTANTIAL COMPLETION AND COMMENCEMENT OF THE WARRANTY PERIOD.
- F. A DEFICIENCY PUNCH LIST WILL BE PRODUCED BY THE ARCHITECT / OWNER AND INSTALLER AT THE CONCLUSION OF THE PROJECT. ALL INSTALLATION PROJECT DEFICIENCIES SHALL BE REMEDIED BY THE CONTRACTOR PRIOR TO THE ISSUANCE OF A CERTIFICATE OF SUBSTANTIAL COMPLETION.
- G. UPON COMPLETION OF THE FIELD INSTALLATION, THE CONTRACTOR SHALL HAVE AN APPROVED TURF PROVIDER REPRESENTATIVE PERFORM AN ON-FIELD TRAINING MAINTENANCE SEMINAR WITH THE OWNER. THE SEMINAR SHALL INCLUDE A DEMONSTRATION OF HOW TO USE AND CARE FOR THE PET TURF. THE ASSEMBLY OF THE EQUIPMENT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. SEMINAR TO ADDRESS THE REVIEW OF ENTIRE PROVIDED MAINTENANCE MANUAL (INCLUDING THE PROPER PROCEDURE FOR REMOVAL OF GUM AND OTHER DEBRIS), WARRANTY REQUIREMENTS AND ANSWER ANY QUESTIONS. 3.09 PROTECTION
- A. PROTECT INSTALLED PRODUCTS UNTIL DATE OF SUBSTANTIAL COMPLETION. B. RESTORE ADJACENT EXISTING AREAS THAT HAVE BEEN DAMAGED BY WORK OF THIS SECTION. END OF SECTION

SECTION 32 3113 CHAIN LINK FENCES AND GATES

### PART 1 GENERAL 1.01 SECTION INCLUDES A. POSTS, RAILS, AND FRAMES.

- B. WIRE FABRIC. C. CONCRETE.
- D. MANUAL GATES WITH RELATED HARDWARE. E. ACCESSORIES.
- 1.02 SUBMITTALS A. PRODUCT DATA: PROVIDE DATA ON FABRIC, POSTS, ACCESSORIES, FITTINGS AND
- HARDWARF. B. SHOP DRAWINGS: SHOW LOCATIONS, DETAILS, MATERIALS, DIMENSIONS, SIZES, WEIGHTS. FINISHES. OPERATIONAL CLEARANCES. AND INSTALLATION OF COMPONENTS. SEE CLFMI CLF-SFR0111 FOR PLANNING AND DESIGN RECOMMENDATIONS.
- PART 2 PRODUCTS 2.01 MATERIALS
- A. BASE BID: GALVANIZED STEEL B. ADD ALTERNATE #3: BLACK VINYL-COATED

- C. POSTS, RAILS, AND FRAMES: COMPLY WITH THE FOLLOWING: 1. LINE, TERMINAL, CORNER, RAIL, BRACE, AND GATE POSTS: TYPE I ROUND. a. TYPE I ROUND: LG 40 OR SCHEDULE 40 GALVANIZED STEEL PIPE COMPLYING WITH
- ASTM F1083. COMPLY WITH ASTM F1043, MATERIAL DESIGN GROUP IA, EXTERNAL AND INTERNAL COATING TYPE A, CONSISTING OF NOT LESS THAN 1.8-OZ./SQ. FT. ZINC; AND LINE, END, CORNER, AND PULL POSTS AND TOP RAIL PER REQUIREMENTS.
- b. POST BRACE RAILS: MATCH TOP RAIL FOR COATING AND STRENGTH AND STIFFNESS REQUIREMENTS. PROVIDE BRACE RAIL WITH TRUSS ROD ASSEMBLY FOR EACH GATE, END, AND PULL POST. PROVIDE TWO BRACE RAILS EXTENDING IN OPPOSING DIRECTIONS, EACH WITH TRUSS ROD ASSEMBLY FOR EACH CORNER POST AND FOR PULL POSTS. PROVIDE RAIL ENDS AND CLAMPS FOR ATTACHING RAILS TO POSTS. 2. COMPLY WITH CLFMI CLF-PM0610.
- B. WIRE FABRIC: COMPLY WITH CLFMI'S "PRODUCT MANUAL" : 1. BASE BID: GALVANIZED STEEL
- 2. ADD ALTERNATE #3: BLACK VINYL-COATED
- a. FENCE FABRIC SHALL BE VINYL-COATED TO MEET REQUIREMENTS OF ASTM F668 FOR CLASS 2B CHAIN LINK FABRIC. THICKNESS OF THE FUSION BONDED COATING SHALL BE 7-10 MILS, COLOR TO BE BLACK. b. THE VINYL COATING SHALL BE EVENLY APPLIED AND FREE OF BLISTERS. THE BOND
- BETWEEN THE VINYL COATING AND THE STEEL FABRIC TO BE EQUAL OR GREATER THAN THE COHESIVE STRENGTH OF THE VINYL.
- 3. NINE GAUGE CORE, MINIMUM WALL THICKNESS OF .015 INCHES OVER A GALVANIZED SUBSTRATE. THE BASE METAL SHALL HAVE A MINIMUM BREAKING STRENGTH OF FIVE HUNDRED FIFTY POUNDS (550 LBS.) AND A ZINC COAT WEIGHT OF .1503 POUNDS PER SQUARE FOOT OF UN-COATED WIRE SURFACE. TOP AND BOTTOM SELVAGE OF THE FABRIC SHALL BE KNUCKLED.
- 4. ASTM A392 ZINC COATED APPLIED TO STEEL WIRE MESH FABRIC AFTER WEAVING WITH CLASS 1. 1.2-0Z./SQ. FT. MINIMUM COATING WEIGHT.
- 5. THE TENSIONING STRANDS SHALL CONSIST OF ONE-HALF INCH (1/2") DIAMETER, 7-WIRE, STRESS RELIEVED STRANDS, HAVING A GUARANTEED ULTIMATE TENSILE STRENGTH OF 270,000 PSI (270 KIPS). STRANDS SHALL CONFORM TO ASTM-416. CABLES SHALL BE FABRICATED TO PROPER LENGTH FOR EACH SLAB, COATED WITH A PERMANENT RUST PREVENTATIVE LUBRICANT AND ENCASED IN SLIP-AGE SHEATHING AND SHALL BE REPAIRED WITH TAPE PRIOR TO CONCRETE PLACEMENT AS NECESSARY. A MAXIMUM OF
- SIX INCHES (6") EXPOSED STRANDS IS PERMITTED AT THE DEAD-END ANCHOR. 6. COMPLY WITH CLFMI CLF-PM0610. C. CAST-IN-PLACE CONCRETE: NORMAL-WEIGHT CONCRETE AIR ENTRAINED WITH NOT LESS THAN 3,000-PSI COMPRESSIVE STRENGTH (28 DAYS), 3-INCH SLUMP, AND 1-INCH MAXIMUM SIZE AGGREGATE:
- 1. CAST-IN-PLACE CONCRETE COMPLYING WITH ACI 301. 2. MATERIALS CONSISTING OF PORTLAND CEMENT COMPLYING WITH ASTM C150/C150M. AGGREGATES COMPLYING WITH ASTM C33/C33M. 4. POTABLE WATER.
- 2.02 COMPONENTS A. LINE POSTS: 1-7/8" DIAMETER SPACED AT 8 FEET.
- B. CORNER AND TERMINAL POSTS: 2-7/8" DIAMETER. C. GATE POSTS: 2-7/8" DIAMETER
- D. TOP AND BRACE RAIL: 1-5/8" DIAMETER, PLAIN END, SLEEVE COUPLED. SWEDGED-END OR FABRICATED FOR EXPANSION-TYPE COUPLING.
- E. GATE FRAME: 1-5/8" DIAMETER FOR WELDED FABRICATION. F. FABRIC: 2 INCH (51 MM) DIAMOND MESH INTERWOVEN WIRE, 7 GUAGE THICK, TOP SELVAGE KNUCKLE END CLOSED, BOTTOM SELVAGE KNUCKLE END CLOSED.
- G. TENSION WIRE: 7 GUAGE THICK STEEL, SINGLE STRAND, METALLIC-COATED. MATCH COATING AND COLOR ON CHAIN LINK FENCE FABRIC.
- H. TIE WIRE: ALUMINUM ALLOY STEEL WIRE. 2.03 MANUAL GATES AND RELATED HARDWARE
- A. COMPLY WITH ASTM F900 FOR SINGLE GATES, MADE FROM GALVANIZED STEEL PIPE AND TUBING COMPLYING WITH ASTM F1043, COMPLETE WITH HARDWARE. 1. HARDWARE FOR SINGLE SWINGING GATES: 180 DEGREE HINGES, 2 FOR GATES UP TO 60 INCHES (1,525 MM) HIGH, 3 FOR TALLER GATES; FORK LATCH WITH GRAVITY DROP AND PADI OCK HASP.
- 2. FRAMES AND BRACING: FOR GATE FABRIC HEIGHT 6 FEET OR LESS WITH WELDED CORNERS.
- 3. GATE POSTS: FABRICATE MEMBERS FROM ROUND GALVANIZED STEEL PIPE FOR THE FOLLOWING GATE FABRIC HEIGHTS BY LEAF WIDTHS: 6 FEET OR LESS BY 4 FEET OR LESS. B. HINGES: FINISHED TO MATCH FENCE COMPONENTS.
- 1. BRACKETS: ROUND 2. MOUNTING: CENTER
- 3. CLOSING: MANUAL. C. LATCHES: FINISHED TO MATCH FENCE COMPONENTS.
- BRACKETS: ROUND. 2.04 ACCESSORIES
- A. CAPS: CAST STEEL GALVANIZED; SIZED TO POST DIAMETER, SET SCREW RETAINER. 2.05 FINISHES A. COMPONENTS (OTHER THAN FABRIC): GALVANIZED IN ACCORDANCE WITH ASTM A123/A123M, AT 1.7 OUNCES PER SQUARE FOOT (530 G/SQ M).
- B. HARDWARE: HOT-DIP GALVANIZED TO WEIGHT REQUIRED BY ASTM A153/A153M. C. ACCESSORIES: SAME FINISH AS FRAMING.

COMPLETED, UNLESS OTHERWISE PERMITTED BY ARCHITECT.

CONCRETE IS SUFFICIENTLY CURED.

F. LINE POSTS: SPACE LINE POSTS UNIFORMLY AT 8 FEET 0.0

1. POSITION BOTTOM OF FABRIC 1 INCH ABOVE CONCRETE.

(MINIMUM OF 8 BANDS FOR 10 FT., 3 BANDS FOR 42").

A. MAXIMUM VARIATION FROM PLUMB: 1/4 INCH (6 MM).

THAT APPEAR OUT OF COMPLIANCE WITH DESIGN.

C. GATES: INSPECT FOR LEVEL, PLUMB, AND ALIGNMENT.

B. MAXIMUM OFFSET FROM TRUE POSITION: 1 INCH (25 MM).

ATTENTION TO GATE LOCATIONS AND UNDERGROUND UTILITIES.

A. DEMONSTRATE PROPER OPERATION OF EQUIPMENT TO OWNER'S DESIGNATED

END OF SECTION

L. LINE POST FOOTING DEPTH BELOW FINISH GRADE: ASTM F567.

H. CHAIN-LINK FABRIC: PLACE FABRIC ON OUTSIDE OF POSTS AND RAILS.

TIE WIRE AT MAXIMUM 15 INCHES (380 MM) ON CENTERS.

GALVANIZED HOG RINGS AT SIX (6) PER TEN FEET (10') OF TENSION WIRE.

BRACE RAIL. INSTALL BRACE RAIL ONE BAY FROM END AND GATE POSTS

SPACINGS INDICATED, IN FIRM, UNDISTURBED OR COMPACTED SOIL

TERMINAL PULL POSTS AT CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENT.

### PART 3 EXECUTION 3.01 INSTALLATION

CLIPS

3.02 TOLERANCES

3.04 CLEANING

3.03 FIELD QUALITY CONTROL

CI FAN WATER.

3.05 CLOSEOUT ACTIVITIES

REPRESENTATIVE.

A. GENERAL INSTALLATION: INSTALL FRAMEWORK, FABRIC, ACCESSORIES AND GATES IN ACCORDANCE WITH ASTM F567. DO NOT BEGIN INSTALLATION BEFORE FINAL GRADING IS B. CORNER, GATE AND TERMINAL POST FOOTING DEPTH BELOW FINISH GRADE: ASTM F567. C. POST EXCAVATION: DRILL OR HAND-EXCAVATE HOLES FOR POSTS TO DIAMETERS AND D. POST SETTING: HAND-EXCAVATE HOLES FOR POST FOUNDATIONS IN FIRM, UNDISTURBED OR COMPACTED SOIL. SET TERMINAL AND GATE POSTS PLUMB, IN CONCRETE FOOTINGS WITH TOP OF FOOTING 2 INCHES ABOVE FINISH GRADE. SLOPE TOP OF CONCRETE FOR WATER RUNOFF TOWARD GRASS OR SYNTHETIC TURF. PROTECT PORTION OF POSTS ABOVE GROUND FROM CONCRETE SPLATTER. PLACE CONCRETE AROUND POSTS AND VIBRATE OR TAMP FOR CONSOLIDATION. USING MECHANICAL DEVICES TO SET POSTS PER ASTM F567 IS NOT PREMITTED. VERIFY THAT POSTS ARE SET PLUMB, ALIGNED, AND AT CORRECT HEIGHT AND SPACING, AND HOLD IN POSITION DURING PLACEMENT AND FINISHING OPERATIONS UNTIL

E. TERMINAL POSTS: LOCATE TERMINAL END, CORNER, AND GATE POSTS PER ASTM F567 AND

G. INTERMEDIATE RAILS: INSTALL IN ONE PIECE AT POST-HEIGHT CENTER SPAN, SPANNING BETWEEN POSTS, USING FITTINGS, SPECIAL OFFSET FITTINGS, AND ACCESSORIES.

2. FASTEN FABRIC TO TOP RAIL, LINE POSTS, BRACES, AND BOTTOM TENSION WIRE WITH

3. DO NOT STRETCH FABRIC UNTIL CONCRETE FOUNDATION HAS CURED 28 DAYS 4. INSTALL BOTTOM TENSION WIRE STRETCHED TAUT BETWEEN TERMINAL POSTS. I. PROVIDE A MINIMUM OF FIVE (5) TIES FOR EACH EIGHT (8) FEET OF RAIL AND ONE (1) TIE TO EACH FOOT OF POST HEIGHT. TIES TO TENSION WIRE SHALL BE MADE WITH HEAVY

J. TENSION BANDS: PROVIDE ONE (1) FASTENER FOR EACH ONE FOOT (1) OF FABRIC HEIGHT K. SET TERMINAL AND GATE POSTS PLUMB. SLOPE TOP OF CONCRETE FOR WATER RUNOFF.

M. CORNER, GATE AND TERMINAL POST FOOTING DEPTH BELOW FINISH GRADE: ASTM F567. N. BRACE EACH GATE AND CORNER POST TO ADJACENT LINE POST WITH HORIZONTAL CENTER 0. ATTACH FABRIC TO END, CORNER, AND GATE POSTS WITH TENSION BARS AND TENSION BAR

A. LAYOUT: VERIFY THAT FENCE INSTALLATION MARKINGS ARE ACCURATE TO DESIGN. PAYING B. FENCE HEIGHT: RANDOMLY MEASURE FENCE HEIGHT AT THREE LOCATIONS OR AT AREAS

A. CLEAN JOBSITE OF EXCESS MATERIALS; SCATTER EXCESS MATERIAL FROM POST HOLE EXCAVATIONS UNIFORMLY AWAY FROM POSTS. REMOVE EXCESS MATERIAL IF REQUIRED. B. CLEAN FENCE WITH MILD HOUSEHOLD DETERGENT AND CLEAN WATER RINSE WELL. C. REMOVE MORTAR FROM EXPOSED POSTS AND OTHER FENCING MATERIAL USING A 10 PERCENT SOLUTION OF MURIATIC ACID FOLLOWED IMMEDIATELY BY SEVERAL RINSES WITH











DESCRIPTION	<u>QTY</u>	DETAIL
4' TALL CHAINLINK FENCE - base bid: galvanized, add alternate 3: black vinyl coated		A2/C-501
4' WIDE X 4' TALL CHAINLINK SINGLE GATE - base bid: galvanized, add alternate 3: black vinyl coated		A4/C-501
6' BENCH - Summit Supply Co. Hi-Back Bench PR6HBB Brown, install per manufacturer's recommendations		A5/C-501
6" x 6" CONCRETE CURB WITH GUTTER		B5/C-501
6" x 6" CONCRETE CURB		B4/C-501
8" x 6" CONCRETE CURB		
HANDRAIL		A1/C-501
24" WIDE DETECTABLE WARNING SURFACE		
6" x 12" CONCRETE EDGING AROUND TREE		C5/C-501
RELOCATED TRASH RECEPTACLE		
STORM DRAIN BOX		D4/C-501
DOG PARK SIGN - secure to fence		A6/C-501
DOG WATERING STATION - gravel sump underneath		
RELOCATED ELECTRICAL BOX		
RELOCATED LIGHT POLE		
PET WASTE STATION		
DESCRIPTION	<u>QTY</u>	DETAIL
SYNTHETIC TURF GRASS FOR PETS	2,944 sf	C4/C-501
ASPHALT	10,477 sf	B6/C-501
4" CONCRETE, ROUGH BROOM FINISH	711 sf	B1/C-501
6" CONCRETE AROUND UTAH SIGN - add alternate 4	65 sf	D5/C-501

-	
1.	THE CONTRACTOR SHALL INSPECT THE SITE TO BE FULLY AWARE OF ALL PERTINENT EXISTING CON PRIOR TO SUBMITTING BID OR PROPOSAL
2.	PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL MEET WITH THE OWNER'S REPRESENTA
	SHALL DROVIDE ALL TEMPORARY RAMPS, RADDIERS, ETC. AS DECUMPED TO MAINTAIN DURU C SAFE
n	STALL PROVIDE ALL TEIVIPORARY RAIVIPS, DARRIERS, ETC. AS REQUIRED TO IVIAINTAIN PUBLIC SAFE
ა.	PRIOR TO THE CONTINUENCEMENT OF ANY WORK, THE CONTRACTOR SHALL VERIFY THE LOCATION OF
1	
4.	
5	
0.	AND SHALL REPAIR ANY DAMAGE THAT MAY RESULT FROM THE WORK
6	THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL MEASURES AND PERMITS AS REQUIRED BY U
0.	NECESSARY FOR THE CONSTRUCTION OF THE PROJECT
7	THE LANDSCAPE AND IRRIGATION CONTRACTORS SHALL COORDINATE THEIR WORK WITH ANY OTH
	CONTRACTORS AND TRADES WORKING ON THIS PROJECT. PROVIDE SI FEVES AS REQUIRED FOR DE
	IRRIGATION AND FLECTRICAL LINES, FTC, PRIOR TO PAVING AND LANDSCAPE WORK.
8.	THE CONTRACTOR HAS THE RESPONSIBILITY OF VERIFYING ALL GRADES. ELEVATIONS. DIMENSIONS
	MEASUREMENTS, CORNERS, CURBS AND ANGLES FOR WORK TO BE PERFORMED WITHIN THIS CONT
	REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITION TO THE OWNER'S REPRESE
	IMMEDIATELY.
9.	THE CONTRACTOR IS RESPONSIBLE FOR ANY UNAUTHORIZED DAMAGE INSIDE AND OUTSIDE THE LIN
	LINE DUE TO CONSTRUCTION OPERATIONS AND SHALL RESTORE DAMAGED AREAS TO ORIGINAL CO
	NO COST.
10.	CONTRACTOR SHALL BE RESPONSIBLE FOR YARD AND BUILDING CLEANUP AT THE COMPLETION OF





EVIEWED FC DE COMPLIA





DEFINITION
EDGE OF ASPHALT
EDGE OF CONCRETE
MATCH EXISTING
TOP OF BACK OF CURB
TOP OF GRATE







DESIGN

NEST

LOGAN, UTAH (435) 752-7031

SALT LAKE CITY, UTAH (801) 539-8221







SITE DETAILS

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C-501



### SECTION 32 8423 UNDERGROUND SPRINKLERS

### PART 1 GENERA 1.01 SUMMAR

- A. THE WORK COVERED BY THESE SPECIFICATIONS CONSISTS OF FURNISHING ALL LABOR, MATERIAL, EQUIPMENT AND SUPPLIES IN PERFORMING ALL OPERATIONS IN CONNECTION WITH PROVIDING AN IRRIGATION SYSTEM AND ALL SITE WORK IN STRICT ACCORDANCE WITH PROVIDED SPECIFICATIONS, DETAILS, AND DRAWINGS. B. ANY MINOR ITEMS OF LABOR AND/OR MATERIALS NOT SPECIFICALLY NOTED ON THE
- DRAWINGS OR SPECIFICATIONS; BUT OBVIOUSLY NECESSARY FOR THE PROPER COMPLETION OF THE WORK, ARE TO BE CONSIDERED AS INCIDENTAL TO AND ARE TO BE INCLUDED IN THE CONTRACT. CONTRACTOR SHALL NOTE SUCH ITEMS AND PRESENT THEM TO OWNER BEFORE BID OPENING.
- C. CONTRACTOR SHOULD SUBMIT CONSTRUCTION SCHEDULE OF ANTICIPATED WORK TIME TO FACILITATE TIMELY VISITS FOR REVIEW OF WORK. SUCH PROPOSAL SHALL INCLUDE A PROJECTED TIME FRAME FOR INSTALLING THE SYSTEM. IT SHOULD REFLECT, IN CALENDAR DAYS, THE ANTICIPATED TIME REQUIRED FROM THE DAY OF THE AWARD TO COMPLETION OF THE SYSTEM IN A FULLY OPERATIONAL MODE. THIS SCHEDULE SHOULD REFLECT ANTICIPATED TIME FOR ORDERING AND RECEIVING ALL COMPONENTS, STARTING AND ENDING TIMES FOR INSTALLATION, SYSTEM START-UP, ETC.
- 1.02 SECTION INCLUDES
- A. PIPE AND FITTINGS, VALVES, SPRINKLER HEADS, EMITTERS, AND ACCESSORIES. 1.03 DEFINITION
- A. CIRCUIT PIPING: DOWNSTREAM FROM CONTROL VALVES TO SPRINKLERS, SPECIALTIES, AND DRAIN VALVES. PIPING IS UNDER PRESSURE DURING FLOW. B. DRAIN PIPING: DOWNSTREAM FROM CIRCUIT-PIPING DRAIN VALVES. PIPING IS NOT UNDER PRESSURE.
- C. MAINLINE PIPING: DOWNSTREAM FROM POINT OF CONNECTION TO WATER DISTRIBUTION PIPING TO AND INCLUDING CONTROL VALVES. PIPING IS UNDER WATER DISTRIBUTION SYSTEM PRESSURE.
- 1.04 PROJECT CONDITIONS
- A. IRRIGATION WATER SHALL BE PROVIDED BY THE FOLLOWING: 1. WATER SYSTEM TO BE CONNECTED TO EXISTING MAINLINE.
- 2. DESIGN PRESSURE OF THE IRRIGATION DESIGN IS 65 PSI. 3. STATIC PRESSURE IN MAINLINE SHALL BE VERIFIED BY THE CONTRACTOR. IF PRESSURE IS 5 PSI HIGHER OR LOWER AS SPECIFIED, THE INSTALLER SHALL NOTIFY THE PROJECT REPRESENTATIVE.
- 1.05 SYSTEM PERFORMANCE REQUIREMENTS A. MINIMUM WATER COVERAGE:
- 1. IRRIGATION HEADS IN LAWN AREAS SHALL BE SPACED 85% OF THE RADIUS FOR ROTORS AND 90% OF THE RADIUS FOR SPRAY HEADS. 2. SHRUBS, AND PERENNIALS SHALL HAVE ADEQUATE WATER APPLIED TO THE ROOT ZONES TO ENSURE PLANT HEALTH AND DEVELOPMENT.
- B. THE IRRIGATION SYSTEM SHALL PROVIDE THE MANUFACTURER'S RECOMMENDED MINIMUM OPERATION PRESSURE TO EVERY IRRIGATION HEAD.
- C. MINIMUM WORKING PRESSURES: THE FOLLOWING ARE MINIMUM PRESSURE REQUIREMENTS FOR PIPING, VALVES, AND SPECIALTIES, UNLESS OTHERWISE INDICATED: 1. PRESSURE PIPING: 200 PSIG. 2. CIRCUIT PIPING: 150 PSIG.
- 3. DRAIN PIPING: 100 PSIG. 1.06 SUBMITTALS
- A. SEE SECTION 01 3000 ADMINISTRATIVE REQUIREMENTS, FOR SUBMITTAL PROCEDURES. B. PRODUCT DATA: SUBMIT TECHNICAL PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR
- IRRIGATION SYSTEM MATERIALS AND PRODUCTS. C. SHOP DRAWINGS: SUBMIT SHOP DRAWINGS OR "AS BUILT" DRAWINGS FOR IRRIGATION
- SYSTEMS SHOWING PIPING MATERIALS, SIZES, LOCATIONS, AND ELEVATIONS. INCLUDE DETAILS OF UNDERGROUND STRUCTURES, CONNECTIONS, THRUST BLOCKS, AND ANCHORING. SHOW INTERFACE AND SPATIAL RELATIONSHIP BETWEEN PIPING AND
- PROXIMATE STRUCTURES. D. OPERATION AND MAINTENANCE DATA: INCLUDE IN MAINTANENCE MANUALS SPECIFIED IN DIVISION 1. INCLUDE DATA FOR THE FOLLOWING: 1. PROVIDE TYPEWRITTEN INSTRUCTIONS FOR OPERATION AND MAINTENANCE OF SYSTEM AND CONTROLS, SEASONAL ACTIVATION AND SHUTDOWN, AND MANUFACTURER'S PARTS CATALOG.
- 2. PROVIDE SCHEDULE INDICATING LENGTH OF TIME EACH VALVE IS REQUIRED TO BE OPEN TO PROVIDE A DETERMINED AMOUNT OF WATER.
- 3. SUBMIT MANUALS WITH RECORD DRAWINGS. THE MANUAL SHALL ALSO CONTAIN: a. IDENTIFICATION READABLE FROM THE OUTSIDE OF THE COVER STATING BY WHOM THE
- INFORMATION WAS COMPILED. b. NEATLY TYPE-WRITTEN INDEX NEAR THE FRONT OF THE MANUAL, FURNISHING IMMEDIATE INFORMATION AS TO THE LOCATION IN THE MANUAL OF ALL EMERGENCY
- DATA REGARDING THE INSTALLATION. c. COMPLETE NOMENCLATURE OF ALL REPLACEABLE PARTS, THEIR PART NUMBERS, CURRENT COST, AND NAME AND ADDRESS OF THE NEAREST VENDOR OF REPLACEMENT PARTS.
- d. COMPLETE OUTLINE OF FUTURE WATERING SCHEDULES AND WHEN THEY SHOULD BE CHANGED FROM THE INITIAL INSTALLATION SCHEDULE. THE INITIAL SCHEDULE IS CALCULATED FOR A WATERING RATE TO ESTABLISH LAWN. e. COPY OF ALL GUARANTEES AND WARRANTIES ISSUED ON THE INSTALLATION
- SHOWING ALL DATES OF EXPIRATION. E. RECORD DRAWINGS: AS INSTALLATION OCCURS, PREPARE ACCURATE RECORD DRAWINGS OF PIPING SYSTEM TO BE SUBMITTED PRIOR TO FINAL INSPECTION THAT ALSO INCLUDES: 1. DETAIL AND DIMENSION CHANGES MADE DURING CONSTRUCTION
- 2. SIGNIFICANT DETAILS AND DIMENSIONS NOT SHOWN IN THE APPROVED CONTRACT DOCUMENTS
- 3. FIELD DIMENSIONED LOCATIONS OF VALVE BOXES, MANUAL DRAINS, CONTROL WIRE RUNS NOT IN MAINLINE DITCH, AND BOTH ENDS OF SLEEVES. 4. TAKE DIMENSIONS FROM PERMANENT CONSTRUCTED SURFACES OR EDGES LOCATED AT
- OR ABOVE FINISH GRADE. 5. TAKE AND RECORD DIMENSIONS AT TIME OF INSTALLATION. F. MAINTENANCE MATERIALS: PROVIDE THE FOLLOWING FOR OWNER'S USE IN MAINTENANCE
- OF PROJECT. 1. EXTRA SPRINKLER HEADS: ONE OF EACH TYPE AND SIZE.
- 2. EXTRA VALVE BOX KEYS: ONE. 3. WRENCHES: ONE FOR EACH TYPE HEAD CORE AND FOR REMOVING AND INSTALLING EACH TYPE HEAD. G. WARRANTY DOCUMENTS: WARRANTY DOCUMENTS SHALL BE SUBMITTED TO OWNER AT THE
- TIME OF FINAL INSPECTION. 1.07 QUALITY ASSURANCE A. MANUFACTURER QUALIFICATIONS: LICENSED FIRMS REGULARLY ENGAGED IN MANUFACTURE
- OF IRRIGATION SYSTEM PRODUCTS OF TYPES, MATERIALS AND SIZES SPECIFIED, WHOSE PRODUCTS HAVE BEEN IN USE IN SIMILAR SERVICE. B. WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH LATEST RULES AND REGULATIONS,
- AND OTHER APPLICABLE STATE OR LOCAL LAWS. NOTHING IN APPROVED CONTRACT DOCUMENTS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES. C. PRE-INSTALLATION MEETING: SCHEDULE MEETING AFTER EXCAVATION OF TRENCHES AND
- INSTALLATION OF SLEEVES, BUT PRIOR TO INSTALLATION OF PIPE. D. INSTALLER QUALIFICATIONS: LICENSED CONTRACTING FIRM REGULARLY ENGAGED IN
- SUCCESSFUL INSTALLATION OF IRRIGATION SYSTEMS SIMILAR IN SIZE AND SCOPE OF THIS CONTRACT. OWNER RESERVES THE RIGHT TO ASK FOR AND VERIFY REFERENCES FROM CONTRACTORS PAST PORTFOLIO OF WORK BEFORE AWARD OF CONTRACT. 1.08 CODES AND STANDARDS
- A. PLUMBING CODE COMPLIANCE: COMPLY WITH ANY APPLICABLE PORTIONS OF THE UTAH STATE PLUMBING CODE PERTAINING TO THE SELECTION OF MATERIALS AND THE INSTALLATION OF IRRIGATION SYSTEMS.
- B. WATER PURVEYOR COMPLIANCE: COMPLY WITH REQUIREMENTS OF PURVEYOR SUPPLYING WATER TO THE PROJECT. C. ANY PERMITS THAT ARE NEEDED FOR THE INSTALLATION OF CONSTRUCTION OF ANY WORK INCLUDED UNDER THIS CONTRACT. WHICH ARE REQUIRED BY THE AUTHORITIES OF JURISDICTION. SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR FOLLOWING
- WHATEVER ORDINANCES, REGULATIONS AND CODES REQUIRING THE PERMITS. IF THE AUTHORITIES OF THE JURISDICTION REQUIRE INSPECTION AT SAID POINTS OF THE INSTALLATION, THE CONTRACTOR SHALL ARRANGE FOR, AND BE PRESENT AT, ANY SUCH INSPECTIONS. D. ADDITIONAL WORK OR FURNISHING OF MATERIALS REQUIRED DUE TO INSPECTION BY THE
- AUTHORITIES OF JURISDICTION SHALL BE FURNISHED AT NO COST TO THE OWNER. IN THE EVENT THAT THE SPECIFICATIONS FOR THIS PROJECT AND EXISTING ORDINANCES, REGULATIONS OR CODES ARE IN CONFLICT. THE CONFLICT SHALL BE NOTED IN WRITING BY THE CONTRACTOR TO THE OWNER'S AUTHORIZED REPRESENTATIVE, AND ANY NECESSARY CHANGES IN WORK SHALL FOLLOW AN ESTABLISHED PROCEDURE FOR CLAIMS FOR EXTRA COMPENSATION.
- 1.09 CONTRACTORS USE OF PREMISES A. CONTRACTOR IS RESPONSIBLE FOR DAMAGES AND INTERRUPTION OF ALL EXISTING UTII ITIFS
- B. CONTRACTOR SHALL NOT UNREASONABLY ENCUMBER SITE WITH MATERIALS AND FQUIPMENT
- C. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR PROTECTION AND SECURITY OF
- MATERIALS AND EQUIPMENT STORED ON JOB SITE. D. CONTRACTOR SHALL CONFINE OPERATIONS TO AREAS WITHIN HIS CONTRACT LIMITS. E. ANY DAMAGES TO EXISTING STRUCTURES, SURFACES, OR UTILITIES CAUSED BY CONTRACTOR OR CONTRACTOR'S EMPLOYEES SHALL BE CONSIDERED CONTRACTOR'S RESPONSIBILITY AND WILL BE PART OF THIS CONTRACT TO BE CORRECTED TO SATISFACTION
- OF OWNER. F. CONTRACTOR IS RESPONSIBLE FOR CONTACTING UTILITY LOCATING SERVICES AND KEEPING UTILITIES CLEARLY MARKED ON THE JOB SITE. ANY UTILITIES, WIRING, OR PIPING DAMAGED BY CONTRACTOR WITHOUT FOLLOWING THESE GUIDELINES WILL BE THE SOLE
- RESPONSIBILITY OF THE CONTRACTOR TO REPAIR. G. CONTRACTOR IS RESPONSIBLE FOR SAFETY ON JOB SITE. BARRICADING OR COVERING OPEN TRENCHES, ELIMINATING TRIP HAZARDS, AND OTHER SAFETY ISSUES ARE A PRIORITY. RENTAL OR SUPPLYING OF BARRICADES IS CONTRACTOR'S RESPONSIBILITY.
- 1.10 PERFORMANCE BOND/BID BOND/INSURANCE A. THE OWNER SHALL HAVE THE RIGHT TO REQUIRE THE CONTRACTOR TO FURNISH BONDS COVERING FAITHFUL PERFORMANCE OF THE CONTRACT AND PAYMENT OF OBLIGATIONS ARISING THEREUNDER AS STIPULATED IN BIDDING REQUIREMENTS. A BID BOND, CERTIFIED CHECK, OR CASHIERS CHECK EXECUTED IN FAVOR OF DFCM IN THE AMOUNT OF FIVE PERCENT (5%) OF THE TOTAL BID PRICE MUST BE SUBMITTED WITH THE PROPOSAL AS GUARANTEE THAT BIDDER IS WILLING TO ENTER INTO A CONTRACT. BIDDER MUST ALSO BE ABLE TO PROVIDE A ONE HUNDRED PERCENT (100%) PERFORMANCE AND PAYMENT BOND AT TIME OF AWARD OF CONTRACT.

- B. SUCCESSFUL CONTRACTOR MUST MEET FEDERAL, STATE, COUNTY AND CITY CODES AND REGULATIONS. PROOF OF LIABILITY INSURANCE AND WORKMEN'S COMPENSATION MUST BE SUBMITTED WITH BID. 1.11 SUPERVISION
- A. THE CONTRACTOR SHALL PROVIDE A COMPETENT SUPERINTENDENT AND ANY NECESSARY ASSISTANTS ON THE PROJECT WHEN WORK IS IN PROGRESS. THE SUPERINTENDENT SHALL NOT BE CHANGED DURING THE PROJECT WITHOUT THE CONSENT OF THE OWNER'S REPRESENTATIVE UNLESS THE SUPERINTENDENT CEASES HIS STATUS AS AN EMPLOYEE OF THE CONTRACTOR. THE SUPERINTENDENT SHALL REPRESENT THE CONTRACTOR IN THE CONTRACTOR'S ABSENCE, AND ALL DIRECTIONS GIVEN TO HIM BY THE OWNER'S
- REPRESENTATIVE SHALL BE BINDING AS IF THEY WERE GIVEN TO THE CONTRACTOR. B. THE CONTRACTOR'S SUPERINTENDENT SHALL SUPERVISE THE CONTRACTOR'S EMPLOYEES ON THE JOB SITE AND BE RESPONSIBLE FOR THEIR ACTIONS AND CONDUCT ON THE JOB SITE. 1.12 GUARANTEE
- A. SUBMIT ONE-YEAR WRITTEN GUARANTEE SIGNED BY UNDERGROUND SPRINKLER CONTRACTOR, AGREEING TO REPAIR OR REPLACE ALL DEFECTS IN MATERIAL, EQUIPMENT,
- AND WORKMANSHIP. B. GUARANTEE SHALL ALSO COVER REPAIR OF DAMAGE TO ANY PART OF THE PREMISES RESULTING FROM LEAKS OR OTHER DEFECTS IN MATERIAL, EQUIPMENT, AND WORKMANSHIP TO THE SATISFACTION OF THE OWNER. REPAIRS IF REQUIRED, SHALL BE
- DONE PROMPTLY AT NO COST TO THE OWNER. 1.13 SEQUENCING AND SCHEDULING A. MAINTAIN UNINTERRUPTED WATER SERVICE TO BUILDING DURING NORMAL WORKING
- HOURS. ARRANGE FOR TEMPORARY WATER SHUTOFF WITH OWNER. B. COORDINATE LAWN IRRIGATION PIPING WITH WORK SPECIFIED IN DIVISION 32 9223 "SODDING" AND 32 9300 "PLANTS". C. COORDINATE LAWN IRRIGATION PIPING WITH UTILITY WORK.
- PART 2 PRODUCTS
- 2.01 IRRIGATION SYSTEM A. MANUFACTURERS:
- RAIN BIRD SALES, INC; N/A: WWW.RAINBIRD.COM/#SLE. 2.02 FILL MATERIAL A. BACKFILL MATERIAL
- 1. BACKFILL MATERIAL FOR IRRIGATION PIPE SHALL CONSIST OF SAND, NATIVE MATERIAL OR TOPSOIL WITH NO ROCKS LARGER THAN 1/4 INCH IN ANY DIMENSION FOR PIPE BEDDING HAUNCHES AND INITIAL BACKFILL ABOVE THE PIPE. ABOVE THE INITIAL BACKFILL, THE TRENCH SHALL BE FILLED WITH SOIL WITH NO DEBRIS OR ROCKS GREATER THAN 1-1/2 INCH IN ANY DIRECTION. LANDSCAPE ARCHITECT SHALL APPROVE ON-SITE MATERIAL FOR BACKFILL OPERATION.
- 2. BACKFILL FOR IRRIGATION SLEEVES UNDER PAVEMENT SHALL CONSIST OF GRANULAR MATERIAL WITH NO ROCK SIZE LARGER THAN 1/4 INCH IN ANY DIMENSION UP TO THE BASE FOR THE PAVING ABOVE THE PIPE.
- 3. IMPORTED BACKFILL MATERIAL SHALL BE CLEAN SOIL, FREE FROM ORGANIC MATERIAL, TRASH, DEBRIS, RUBBISH, BROKEN CEMENT, ASPHALT MATERIAL, OR OTHER OBJECTIONABLE SUBSTANCES AND APPROVED BY THE LANDSCAPE ARCHITECT.
- B. DRAINAGE FILL MATERIAL 1. WASHED, EVENLY GRADED MIXTURE OF CRUSHED STONE, OR CRUSHED OR UNCRUSHED GRAVEL, WITH 100% PASSING A 1-1/2 INCH SIEVE AND NOT MORE THAN 5% PASSING A NO. 4 SIEVE.
- 2.03 PIPE MATERIALS A. PVC PIPE: ASTM D2241; 200 PSI (1.38 MPA) PRESSURE RATED UPSTREAM FROM
- CONTROLS, 160 PSI (1.10 MPA) DOWNSTREAM; SOLVENT WELDED SOCKETS.
- 1. ALL LATERAL PIPING SMALLER THAN 3", SHALL BE SCHEDULE 40 PRESSURE RATED PVC GLUE JOINT PIPE WITH RATINGS PRINTED ON OUTSIDE OF PIPE.
- 2. ALL LATERAL PIPE AND FITTINGS SHALL BE SCHEDULE 40 PRESSURE RATED PVC UNLESS SPECIFICALLY NOTED ON DRAWINGS. 3. ALL MAIN PRESSURE SIDE VALVE MANIFOLD PIPING SHALL BE DOMESTIC GALVANIZED IRON PIPE AND FITTINGS. ALL GALVANIZED IRON PIPE AND FITTING CONFIGURATIONS
- SHALL MATCH DETAIL DRAWINGS EXACTLY. B. FITTINGS:
- 1. MAINLINES SHALL HAVE PVC SCH. 40 FITTINGS FOR PIPE SIZES 3/4 INCH THROUGH 1-1/2 INCH, PVC SCH. 80 FOR PIPE SIZES 2 INCH THROUGH 3 INCH AND PUSH ON DUCTILE OR MECHANICAL CAST IRON FITTINGS ON PVC MAINLINE 4 INCH AND LARGER. 2. MAIN LINE PRESSURE FITTINGS SHALL BE CAST IRON MANUFACTURED BY HARCO OR
- APPROVED FQUAL 3. ALL POLYETHELENE PIPE FITTINGS SHALL BE COMPRESSION FITTINGS OR INSERT BARBED
- FITTINGS SECURED WITH STAINLESS STEEL CLAMPS. 4. REMOTE CONTROL VALVE CONNECTION TO MAINLINE SHALL BE PVC SST TEE, EPOXY
- COATED DOUBLE STRAP SADDLE, M.J. TEE, OR HARCO DUCTILE IBONS SERVICE TEES. 5. JOINT RESTRAINT SHALL BE LEEMCO OR APPROVED EQUAL. C. SLEEVE MATERIAL:
- 1. SLEEVE DIAMETER SHALL BE TWO TIMES LARGER THAN PIPE THAT IS TO BE INSTALLED IN SLEEVE. SLEEVES 4" AND SMALLER DIAMETER SHALL BE PVC SCHEDULE 40. SLEEVES 4 INCH AND LARGER SHALL BE CLASS 200 PVC OR PVC SEWER PIPE. 2. PIPING AND CONTROL WIRES UNDER WALKS, ROADS, OR OTHER HARD SURFACES SHALL
- BE INSTALLED IN CLASS 200 PVC SLEEVES OF ADEQUATE SIZE OR AS NOTED ON DRAWINGS 3. SLEEVES FOR ELECTRICAL CONDUIT SHALL BE ADEQUATE TO ACCOMMODATE MINIMUM
- CONDUIT SIZES AS REQUIRED BY UNIFORM ELECTRICAL CODE 4. WIRE SLEEVES SHALL BE PVC PIPE OR ELECTRICAL TUBING. MAZIMUM NUMBER OF 14-GAUGE WIRE IN SLEEVE SHALL BE AS FOLLOWS:
- a. 1-10 WIRES IN A 1 INCH SLEEVE b. 11-18 WIRES IN A 1-1/4 INCH SLEEVE
- D. PIPE CONNECTION MATERIAL 1. P-70 PRIMER
- 711 SOLVENT/GLUE TEFLON TAPE

### 2.04 OUTLETS A. MANUFACTURERS:

- 1. RAIN BIRD B. ALL SPRINKLER HEADS SHALL BE THE BRAND, MODEL, SIZE, AND TYPE SHOWN ON DRAWINGS.
- C. ALL SPRINKLER HEADS SHALL BE INSTALLED ON A "SWING JOINT" ASSEMBLY. LAWN SPRAY HEADS AND SMALL ROTORS WITH AN INLET SIZE 3/41" AND SMALLER SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS WITH "FUNNY PIPE" AND "SWING ELLS" AS
- MANUFACTURED BY HUNTER OR APPROVED EQUAL. ALL LARGE STREAM ROTOR AND IMPACT HEADS SHALL BE INSTALLED WITH THREE 1" SCHEDULE 40 MARLEX STREET ELLS AND ONE SCHEDULE 80 1"X12" NIPPLE. PREFABRICATED SWING JOINT ASSEMBLIES BY SPEARS MANUFACTURING OR OTHER APPROVED EQUAL CAN BE SUBSTITUTED IF DESIRED. ALL "SWING JOINT" CONFIGURATIONS SHALL MATCH DETAIL DRAWINGS EXACTLY. D. ROTARY TYPE SPRINKLER HEAD: POP-UP TYPE WITH SCREENS; FULLY ADJUSTABLE FOR
- FLOW AND PRESSURE; SIZE AS INDICATED; WITH LETTER OR SYMBOL DESIGNATING DEGREE OF ARC AND ARROW INDICATING CENTER OF SPRAY PATTERN. 1. RAIN BIRD ROTORS: 3500, 5000, 6504, AND 8005. E. DRIP TUBING:
- RAIN BIRD XT 700 DISTRIBUTION TUBING OR APPROVED EQUAL F. DRIP TUBING FITTINGS: 1. RAIN BIRD BARBED INSERT FITTING OR RAIN BIRD COMPRESSION FITTING.
- 2. RAIN BIRD REMOVABLE FLUSH CAP. 3. RAIN BIRD DIFFUSER BUG CAP.
- RAIN BIRD 1/4 INCH TUBING STAKE. G. DRIP EMITTER: ADJUSTABLE OUTLET, NON-CLOGGING, WITH TWO TRICKLE TUBES. 1. RAIN BIRD XERIBUG XB-PC. H. DRIP BUBBLER: ADJUSTABLE OUTLET AND RAIN BIRD ROOT WATERING SOCK.
- I. QUICK COUPLER & HOSE BIBS RAIN BIRD 44-NP J. RISERS: STATIONARY SPRAY POP-UP SPRINKLER HEADS, SHRUB SPRAY HEADS, STATIONARY
- SPRAY SPRINKLER HEADS AND ROTOR HEADS SHALL HAVE RISERS MADE UP OF ONE OF THE FOLLOWING WAYS: 1. RISERS FOR IRRIGATION HEADS WITH INLET SIZE OF 1/2 INCH SHALL BE SWING PIPE 14
- INCHES LONG MINIMUM AND 24 INCHES MAXIMUM. SWING PIPE WITH SPIRAL BARB FITTINGS AND STREET "L" SHALL BE ASSEMBLED ACCORDING TO PLAN DETAILS. EQUAL AS APPROVED BY LANDSCAPE ARCHITECT BEFORE BIDDING.
- 2. RISER FOR IRRIGATION HEADS WITH 3/4 INCH TO 1 INCH INLETS SHALL HAVE A SWING JOINT ASSEMBLY ACCORDING TO DETAILS ON DRAWING 2.05 VALVES
- A. MANUFACTURERS: 1. RAIN BIRD.
- 2 CARSON 3. SUBSTITUTIONS: SEE SECTION 01 6000 - PRODUCT REQUIREMENTS.
- B. ALL CONTROL/MASTER VALVE/QUICK COUPLER VALVES C. REMOTE CONTROL VALVES:
- ALL CONTROL VALVES USED SHALL BE SCRUBBER VALVES. 2. RAIN BIRD PEB-PRS-D WITH PRESSURE REGULATION.
- D. DRIP IRRIGATION VALVES:

2.06 CONTROLS

B. WIRE CONDUCTORS:

- 1. RAIN BIRD LFV-100 E. VALVE BOX AND COVER: ALL BOXES TO HAVE LOCKING LIDS. 1. CONTROL VALVE BOXES SHALL BE APPROPRIATE SIZE, MADE OF HDPE PLASTIC, GREEN
- OR TAN IN COLOR DEPENDING ON SURROUNDING SURFACE MATERIAL. WITH BOLT DOWN LID. VALVE BOXES SHALL BE MADE BY CARSON INDUSTRIES OR APPROVED EQUAL. NO MORE THAN ONE VALVE SHALL BE LOCATED IN EACH PLASTIC BOX. 2. CIRCUIT OR ISOLATION VALVE: CARSON 1220 JUMBO BOX OR APPROVED EQUAL 3. VALVE BOX SUPPORTS: STANDARD SIZE FIRED CLAY PAVING BRICKS WITHOUT HOLES.
- F. ISOLATION VALVES: 1. VALVE BANK ISOLATION VALVE SHALL BE A DOMESTIC BRASS BALL VALVE WITH AT LEAST A 200-PSI RATING. VALVE SHALL BE SAME SIZE AS THE LINE IT IS INSTALLED ON AND BE LOCATED AS SHOWN ON DRAWINGS OR DETAILS. VALVE SHALL BE AN APOLLO MODEL 70 SERIES BALL VALVE OR AN APPROVED EQUAL.
- 2. ALL ISOLATION VALVES WILL BE INSTALLED IN AN APPROPRIATE VALVE BOX AS SPECIFIED IN SECTION
- 3. 2" OR LESS WITH CROSS HANDLES MATCO-NORCA 513T BRONZE GATE VALVE.
- G. DRAIN VALVES: 1. NIBCO BRASS BALL GAS COCK WITH TEFLON SEAT OR APPROVED EQUAL. BRASS BALL VALVE SHALL HAVE "T" HANDLE ON MAIN LINES AND SHALL BE IN VALVE BOXES ON LATERAL LINES.

A. CONTROLLER: CONNECT INTO EXISTING CONTROLLER.

- 1. ELECTRICAL WIRE: a. ALL WIRING SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE.
- 2. TRADITIONAL WIRING: a. CONTROL WIRE SHALL BE UL LISTED DIRECT BURIAL CABLE NOT SMALLER THAN 14 GAUGE. IN SOME CASES 18-GAUGE MULTI-STRAND WIRE IS USED IN SPECIAL SITUATIONS AS SHOWN ON DRAWINGS AND APPROVED BY OWNER.
- b. COLORS OF WIRE SHALL BE AS FOLLOWS: 1) CONTROL WIRE FOR TURF AREAS: RED YELLOW 2) CONTROL WIRE FOR SHRUB AREAS: 3) CONTROL WIRE TO MASTER VALVE: BLUE 4) CONTROL WIRE TO FILTER BLOWOUT VALVE:
- BROWN 5) COMMON WIRE: WHITE 6) EXTRA WIRES ORANGE 3. SINGLE WIRE: a. SHALL BE UF-UL LISTED, COLOR CODED COPPER CONDUCTOR DIRECT BURIAL SIZE 14.
- DO NOT USE GREEN COLOR-CODED WIRE. b. USE DBY-6 OR DBR-6 BY 3M OR EQUAL AS APPROVED BY LANDSCAPE ARCHITECT BEFORE INSTALLATION.
- 4. EXPANSION CURLS: SHALL BE PROVIDED WITHIN THREE (3) FEET OF EACH WIRE CONNECTION TO SOLENOID AND AT LEAST EVERY THREE HUNDRED (300) FEET IN LENGTH. (EXPANSION CURLS ARE FORMED BY WRAPPING 36" OF WIRE AROUND A ROD OR PIPE 1" OR MORE IN DIAMETER, THEN WITHDRAWING THE ROD FOR SINGLE STRAND WIRE AND LOOSELY COILED FOR TWO WIRE CABLE).
- 2.07 OTHER COMPONENTS A. MIXES: CONCRETE FOR THRUST BLOCKS ON IRRIGATION PIPE 3" OR LARGER. 1. ONE CU. FT. CEMENT, 2 CU. FT. SAND, 4 CU. FT. GRAVEL, AND 5 GALLONS MINIMUM TO 6 GALLONS MAXIMUM WATER.
- 2. MIX THOROUGHLY BEFORE PLACING. B. SUBMIT OTHER COMPONENTS RECOMMENDED BY MANUFACTURER FOR ARCHITECT'S
- REVIEW AND ACCEPTANCE PRIOR TO INSTALLATION. C. PROVIDE COMPONENTS NECESSARY TO COMPLETE AND MAKE SYSTEM OPERATIONAL. D. FURNISH EXTRA MATERIALS DESCRIBED BELOW THAT MATCH PRODUCTS INSTALLED AND
- THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS. DELIVER EXTRA MATERIALS TO OWNER. 1. TWO VALVE BOX COVER KEYS. 2. TWO QUICK COUPLER KEYS WITH BRASS HOSE SWIVEL
- TWO MANUAL DRAIN VALVE KEYS.
- 4. TWO SETS OF SPRINKLER WRENCHES FOR ADJUSTING, CLEANING OR DISASSEMBLY OF EACH TYPE OF SPRINKLER. 5. TWO EACH OF ANY OTHER TOOLS REQUIRED FOR ANY OTHER EQUIPMENT.

### PART 3 EXECUTION 3.01 OWNERS SALVAGE RIGHTS

- A. ANY ITEMS REMOVED AND NOT REUSED IN CONTRACT WILL REMAIN OWNER'S PROPERTY AND WILL BE RETURNED TO OWNER AT HIS DISCRETION. 3.02 EXAMINATION
- A. VERIFY LOCATION OF EXISTING UTILITIES. B. VERIFY THAT REQUIRED UTILITIES ARE AVAILABLE, IN PROPER LOCATION, AND READY FOR
- C. PRIOR TO INSTALLATION OF IRRIGATION SYSTEM, THE CONTRACTOR MUST VERIFY THE SUPPLY PRESSURE AT THE WORK SITE. IF THERE IS A FAILURE TO OBTAIN THE NEEDED PRESSURE OR IF AN EXCESS PRESSURE SITUATION EXISTS FOR NORMAL OPERATION, THE CONTRACTOR MUST CONTACT THE OWNER FOR ANY ADJUSTMENTS TO THE SUPPLY OR IRRIGATION SYSTEM DESIGN. FAILURE TO REPORT ANY DISCREPANCIES IN PRESSURE DUE TO ANY REASON, AND ANY INSTALLATION DONE PRIOR TO NOTIFICATION OF OWNER SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.
- 3.03 PREPARATION A. DURING CONSTRUCTION AND STORAGE, PROTECT MATERIALS FROM DAMAGE AND PROLONGED EXPOSURE TO SUNLIGHT.
- B. WORK DAMAGED DURING COURSE OF WORK IN THIS SECTION SHALL BE REPLACED OR REPAIRED AT NO ADDITIONAL COST TO OWNER. IF DAMAGED WORK IS NEW, REPAIR OR REPLACEMENT SHALL BE PERFORMED BY INSTALLER OF ORIGINAL WORK. C. LAYOUT AND STAKE LOCATIONS OF SYSTEM COMPONENTS.
- D. REVIEW LAYOUT REQUIREMENTS WITH OTHER AFFECTED WORK. COORDINATE LOCATIONS OF SLEEVES UNDER PAVING TO ACCOMMODATE SYSTEM. E. ALL LATERAL LINES SHALL RUN PARALLEL WITH PLANTING AREAS AND AVOID CONFLICT WITH THE LOCATION OF PLANT MATERIALS. WHERE TRENCHING IS REQUIRED IN PROXIMITY TO PLANT MATERIALS CARE SHALL BE TAKEN TO AVOID DAMAGE TO ROOTS. DO NOT CUT EXISTING TREE ROOTS MEASURING OVER 2 INCHES IN DIAMETER.
- 3.04 TRENCHING A. TRENCH SIZE:
- 1. MINIMUM COVER OVER INSTALLED SUPPLY PIPING: 18 INCHES (457 MM). 2. MINIMUM COVER OVER INSTALLED BRANCH PIPING: 12 INCHES (305 MM). B. TRENCH TO ACCOMMODATE GRADE CHANGES AND SLOPE TO DRAINS C. MAINTAIN TRENCHES FREE OF DEBRIS, MATERIAL, OR OBSTRUCTIONS THAT MAY DAMAGE
- PIPF D. PULLING OF PIPE IS NOT PERMITTED.
- E. WHEN DIGGING ON PROJECT SITE, THE AREA SHALL BE STAKED TO IDENTIFY THE APPROXIMATE LCOATION OF ALL KNOWN UNDERGROUND UTILITIES AND STRUCTURES. F. EXCAVATION WORK SHALL BE AS DEEP AND AS WIDE AS REQUIRED TO SAFELY PERFORM THE WORK, SUCH AS MAKING MAINLINE CONNECTIONS OR FORMING VAULTS. WHERE
- TRENCHING IS DONE IN ESTABLISHED LAWN. CARE MUST BE TAKEN TO KEEP THE TRENCHES ONLY AS WIDE AS IS NECESSARY TO ACCOMPLISH THE WORK. G. IF MORE THAN ONE LINE IS REQUIRED IN A SINGLE TRENCH, THAT TRENCH SHALL BE DEEP AND WIDE ENOUGH TO ALLOW FOR AT LEAST 3 INCHES OF SEPERATION BETWEEN PIPES.
- INSTALL THE PIPING IN A MANNER FOR EASY REPAIR IN THE FUTURE. H. OVER-EXCAVATE TRENCHES 2 INCHES AND BRING BACK TO INDICATED DEPTH BY FILLING WITH BACKFILL MATERIAL AS SPECIFIED UNDER PART 2 - PRODUCTS. SEPARATE OUT ROCKS LARGER THAN 1-1/2 INCH IN ANY DIRECTION UNCOVERED IN TRENCHING OPERATION FROM
- EXCAVATED MATERIAL AND REMOVE FROM AREAS TO RECEIVE LANDSCAPING. I. WHERE IS BECOMES NECESSARY TO EXCAVATE BEYOND THE LIMITS OF NORMAL EXCAVATION LINES TO REMOVE ROCK OR OTHER INTERFERING OBJECTS, THE VOID REMAINING AFTER THE REMOVAL OF THE OBJECT SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED AS PER THE "EARTHWORK" SECTION. THE REMOVAL OF ALL ROCK OR OTHER
- INTERFERING OBJECTS AND THE BACKFILLING OF VOIDS LEFT BY SUCH REMOVALS SHALL BE AT THE EXPENSE OF THE CONTRACTOR. J. ANY EXISTING UTILITY LINES DAMAGED DURING EXCAVATING OR TRENCHING SHALL BE REPAIRED IMMEDIATELY AFTER NOTIFICATION OF THE UTILITY OWNER AND TO HIS/HER SATISFACTION. SHOULD UTILITY LINES BE ENCOUNTERED, WHICH ARE NOT INDICATED ON PLANS, THE PROJECT REPRESENTATIVE SHALL BE NOTIFIED. THE REPAIR OF ANY DAMAGE
- SHALL BE DONE AS SOON AS POSSIBLE BY THE CONTRACTOR OR THE UTILITY OWNER AND PROPER COMPENSATION WILL BE NEGOTIATED BY THE OWNER. SUCH UTILITY LOCATIONS SHALL BE NOTED ON THE "AS-BUILT" DRAWINGS.
- 3.05 INSTALLATION A. GENERAL: 1. INSTALL PIPE, VALVES, CONTROLS, AND OUTLETS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 2. CONNECT TO UTILITIES. 3. SET OUTLETS AND BOX COVERS AT FINISH GRADE ELEVATIONS AND SLOPED WITH SURROUNDING GRADE.
- 4. PROVIDE FOR THERMAL MOVEMENT OF COMPONENTS IN SYSTEM. B. PIPES:
- 1. INSTALL PIPE IN MANNER TO PROVIDE FOR EXPANSION AND CONTRACTIONS AS RECOMMENDED BY MANUFACTURER.
- 2. UNLESS OTHERWISE INDICATED ON APPROVED DRAWINGS, INSTALL MAIN LINES AND LATERAL LINES CONNECTING ROTOR POP-UP SPRINKLERS WITH MINIMUM COVER OF 18 INCHES BASED ON FINISHED GRADE. INSTALL REMAINING LATERAL LINES WITH MINIMUM
- OF 12 INCHES OF COVER BASED ON FINISH GRADE. 3. INSTALL PIPE AND WIRES UNDER DRIVEWAYS OR PARKING AREAS IN SPECIFIED SLEEVES 18 INCHES MINIMUM BELOW FINISH GRADE OR AS SHOWN ON APPROVED DRAWINGS. SLOPE PIPES UNDER PARKING AREAS OR DRIVEWAYS TO DRAIN OUTSIDE THESE AREAS.
- 5. LOCATE SPRINKLER HEADS NO CLOSER THAN 12 INCHES FROM BUILDING FOUNDATION. HEADS IMMEDIATELY ADJACENT TO MOW STRIPS, WALKS, OR CURBS SHALL BE ONE INCH BELOW TOP OF MOW STRIP. WALK. OR CURB AND HAVE 1 TO 3 INCHES CLEARANCE BETWEEN HEAD AND MOW STRIP. WALK. OR CURB.
- 6. SLOPE PIPING FOR SELF DRAINAGE TO CONTROL BOX WHERE POSSIBLE. 7. WHERE THIS IS NOT POSSIBLE, SLOPE PIPE TO A MINIMUM NUMBER OF LOW POINTS. INSTALL AT THESE LOW POINTS:
- a. 3/4 INCH MANUAL DRAIN b. INSTALL 2 INCH CLASS 200 PVC PIPE OVER TOP OF MANUAL DRAIN AND CUT AT FINISH GRADE.
- c. INSTALL RUBBER VALVE CAP MARKER FLUSH WITH FINISHED GRADE. d. DO NOT USE AUTOMATIC DRAIN VALVES. 8. CUT PLASTIC PIPE SQUARE. REMOVE BURRS AT CUT ENDS PRIOR TO INSTALLATION SO
- UNOBSTRUCTED FLOW WILL RESULT. 9. MAKE SOLVENT WELD JOINTS AS FOLLOWS:
- a. DO NOT MAKE SOLVENT WELD JOINTS IF AMBIENT TEMPERATURE IS BELOW 40
- b. CLEAN MATING PIPE AND FITTING WITH CLEAN, DRY CLOTH AND APPLY ONE COAT OF P-70 PRIMER TO EACH.
- c. APPLY UNIFORM COAT OF 711 SOLVENT TO OUTSIDE OF PIPE. d. APPLY SOLVENT TO FITTING IN A SIMILAR MANNER.
- e. RE-APPLY LIGHT COAT OF SOLVENT TO PIPE AND QUICKLY INSERT INTO FITTING. f. GIVE PIPE OR FITTING A QUARTER TURN TO ENSURE EVEN DISTRIBUTION OF SOLVENT
- AND MAKE SURE PIPE IS INSTERTED TO FULL DEPTH OF FITTING SOCKET. a. HOLD IN POSITION FOR 15 SECONDS MINIMUM OR LONG ENOUGH TO SECURE JOINT.
- h. WIPE OFF SOLVENT APPEARNING AT OUTER SHOULDER OF FITTING. i. DO NOT USE EXCESSIVE AMOUNT OF SOLVENT THEREBY CAUSING OBSTRUCTION TO FORM ON INSIDE OF PIPE.
- i. ALLOW JOINTS TO SET AT LEAST 24 HOURS BEFORE APPLYING PRESSURE TO PVC
- 10. THREADED CONNECTIONS SHALL BE MADE WITH TEFLON TAPE. C SI FEVING<sup>1</sup>
- 1. CONTRACTOR IS REPONSIBLE TO COORDINATE THE INSTALLATION OF SLEEVING WITH THE WORK OF OTHER TRADES (I.E. CONCRETE, ASPHALT PAVING, ETC.) 2. SLEEVE IRRIGATION WATER LINES AND CONTROL WIRES UNDER WALKS AND PAVING. EXTEND SLEEVES 6 INCHES MINIMUM BEYOND WALK OR PAVEMENT EDGE. CAP SLEEVES UNTIL PIPES AND WIRES ARE INSTALLED TO KEEP SLEEVE CLEAN AND FREE OF DIRT AND

- 3. USE ONE WATER PIPE MAXIMUM PER SLEEVE. SLEEVE CONTROL WIRING IN SEPERATE SI FFVF 4. POSITION SLEEVES WITH RESPECT TO BUILDINGS AND OTHER OBSTRUCTIONS SO PIPE
- CAN BE EASILY REMOVED.
- D. OUTLETS: 1. USE THREADED NIPPLES FOR RISERS TO EACH OUTLET.
- 2. SPRINKLER HEADS: a. PRIOR TO INSTALLATION OF SPRINKLER HEADS, OPEN CONTROL VALVES AND USE
- FULL HEAD OF WATER TO FLUSH OUT SYSTEM. b. SET SPRINKLER HEADS AND QUICK-COUPLING VALVES PERPENDICULAR TO FINISH
- c. DO NOT INSTALL SPRINKLERS USING SIDE INLETS. INSTALL USING BASE INLETS ONLY. d. SET SPRINKLERS AT A CONSISTENT DISTANCE FROM EXISTING WALKS, CURBS, AND OTHER PAVED AREAS AND TO GRADE.
- 3. TREE BUBBLERS: INSTALL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND PROJECT DETAILS. POINT SOURCE DRIP LINE EMITTERS INSTALLATION SHALL CONFORM TO THE FOLLOWING: a. ALL DRIP TUBING SHALL HAVE BUG CAP AT END OF 1/4 INCH DISTRIBUTION TUBING. b. ALL DRIP TUBING SHALL BE HELD ABOVE MULCH BY 1/4 INCH TUBING STAKE.
- c. SPACE THE POINT OF WATER APPLICATION EVENLY AROUND THE PLANTS. d. FOR TREES REQUIRING EMITTER FLOWS GREATER THAN 2 GPH INSTALL A WATER WELL TO HOLD THE WATER SO IT CAN ADEQUATELY SOAK IN. E. VALVES & VALVE BOXES:
- 1. INSTALL CONTROL WIRES, AND VALVES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PER ELECTRICAL CODE. 2. INSTALL VALVES, IN PLASTIC BOXES WITH LOCKING REINFORCED HEAVY-DUTY PLASTIC COVERS. LOCATE VALVE BOX TOPS AT FINISH GRADE. DO NOT INSTALL MORE THAN
- ONE VALVES IN A SINGLE BOX. PLACE PEA GRAVEL A MINIMUM OF 6 INCHES DEEP BELOW VALVE FOR DRAINAGE. EXTEND WASHED GRAVEL 3 INCH MINIMUM BEYOND LIMITS OF VALVE BOX. MAINTAIN 4 INCH MINIMUM BETWEEN BOTTOM OF VALVE AND TOP OF GRAVEL AND 3 INCHES MINIMUM CLEARANCE BETWEEN THE TOP OF THE VALVE TO THE BOTTOM OF VALVE COVER. SET VALVE BOXES OVER VALVE SO ALL PARTS OF VALVE CAN BE REACHED FOR SERVICE. SET COVER OF VALVE BOX EVEN WITH FINISH GRADE. VALVE BOX SHALL BE
- REASONABLY FREE FROM DIRT AND DEBRIS. 4. INSTALL 3/4 INCH BRASS BALL VALVE IN VALVE BOX ON DOWNSTREAM SIDE OF
- AUTOMATIC VALVES IF LATERAL LINE SLOPES TOWARD VALVE BOX. 5. INSTALL QUICK COUPLING VALVES IN APPROPRIATE LOCATIONS IN VALVE BOXES. 6. ISOLATION VALVES, AND ANY OTHER EQUIPMENT REQUIRED BY LOCAL AUTHORITIES SHALL BE INSTALLED ACCORDING TO LOCAL CODES AND REQUIREMENTS IN ORDER TO
- MAKE THIS SYSTEM COMPLETE. 7. INSTALL ANY OTHER EQUIPMENT REQUIRED BY LOCAL AUTHORITIES ACCORDING TO LOCAL CODES AND REQUIREMENTS IN ORDER TO MAKE THIS SYSTEM COMPLETE. F. WIRING:
- 1. STANDARD WIRE: a. TAPE CONTROL WIRE TO SIDE OF MAIN LINE EVERY 10 FEET. WHERE CONTROL WIRE LEAVES MAIN OR LATERAL LINE, ENCLOSE IT IN CLASS 200 PVC CONDUIT.
- b. PLACE ALL WATERPROOF WIRE SPLICE CONNECTORS INSIDE VALVE BOXES. c. USE WHITE OR GRAY COLOR FOR COMMON WIRE AND OTHER COLORS FOR ALL OTHER WIRE. EACH COMMON WIRE MAY SERVE ONLY ONE CONTROLLER. PROVIDE 12
- INCHES OF EXPANSION LOOP SLACK WIRE AT ALL CONNECTIONS INSIDE VALVE BOX. d. RUN ONE EXTRA CONTROL WIRE FROM PANEL CONTINUOUSLY FROM VALVE TO VALVE THROUGHOUT SYSTEM LIKE THE COMMON WIRE FOR USE IF THE COMMON WIRE
- FAILS. WIRE SHALL BE A DIFFERENT COLOR THAN ALL OTHER WIRES AND SHALL BE MARKED IN CONTROL BOX AS AN EXTRA WIRE. EXTEND EXTRA CONTROL WIRES 24 INCHES AND LEAVE COILED IN EACH VALVE BOX. G. AFTER PIPING IS INSTALLED, BUT BEFORE OUTLETS ARE INSTALLED AND BACKFILLING

C. PRIOR TO BACKFILLING, TEST SYSTEM FOR LEAKAGE AT MAIN PIPING TO MAINTAIN 100 PSI

A. COVER BOTH TOP AND SIDES OF PIPE WITH 3 INCH (75 MM) OF BACKFILL MATERIAL AS

B. BACKFILL TRENCH AND COMPACT TO WITHIN 5 INCHES (127 MM) OF FINISH GRADE AS

(127 MM) OF BACKFILL SHALL BE TOPSOIL AS SPECIFIED IN RELATED SECTION.

BEEN COMPLETED AND ARCHITECT HAS INSPECTED AND APPROVED THE SYSTEM

D. AFTER BACKFILLING, PERFORM AN OPERATING TEST OF THE ENTIRE SYSTEM. OPERATE THE

COVERAGE AND ASSURING THE ABSENCE OF LEAKS. REPAIR WATER LINES, VALVES, OR

THE SATISFACTION OF THE LANDSCAPE ARCHITECT AND OWNER OR BE REPLACED. AFTER

ALL REPAIRS OR REPLACEMENTS HAVE BEEN MADE AND APPROVED BY THE LANDSCAPE

A. PREPARE AND START SYSTEM IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. ADJUST CONTROL SYSTEM TO ACHIEVE TIME CYCLES REQUIRED TO PROVIDE PROPER

SHALL BE PART OF ORIGINAL CONTRACT WITH NO ADDITIONAL COST TO OWNER.

A. AT THE POINT OF SUBSTANTIAL COMPLETION OF WORK OUTLINED IN THESE PLANS, THE

OF OWNER'S REPRESENTATIVE. IT MUST BE FULLY OPERATIONAL IN A SATISFACTORY

ALL HEADS SHALL BE ADJUSTED TO PATTERN, RADIUS, AND GRADE LEVEL

FOR A WALK THROUGH TO VERIFY THE INSTALLATION OF THE SYSTEM. A COVERAGE TEST

WILL BE COMPLETED AND THE SYSTEM INSTALLATION INSPECTED AND A PUNCH LIST OF

CONDITION, WITH FULL UNIFORM COVERAGE OF THE AREAS INDICATED TO BE IRRIGATED.

C. BEFORE THE INSPECTION IS COMPLETE, THE CONTRACTOR MUST FURNISH THE "AS BUILT"

DRAWINGS. THESE DRAWINGS SHOULD BE UPDATED ON A DAILY BASIS TO ENSURE

WIRE SPLICES AND OTHER PERTINENT INFORMATION. THESE DRAWINGS AND ALL

MAINTENANCE MANUALS MUST BE SUBMITTED AT THE TIME OF FINAL INSPECTION IN

D. IF AT THE TIME OF THE FINAL INSPECTION THERE IS ANY ADDITIONAL WORK TO SATISFY

10 DAYS IN ORDER TO SATISFY, OR MAKE SUITABLE ARRANGEMENTS WITH OWNER TO

SATISFY ITEMS ON THE "PUNCH LIST". AT OWNER'S DISCRETION FINAL PAYMENT OR A

INCLUDING ADJUSTING OF SPRINKLER HEADS. USE OPERATION AND MAINTENANCE DATA

PORTION THEREOF, COULD BE HELD PENDING COMPLETION OF "PUNCH LIST" ITEMS.

E. INSTRUCT OWNER'S PERSONNEL IN OPERATION AND MAINTENANCE OF THE SYSTEM,

B. SEE SECTION 01 7000 - EXECUTION AND CLOSEOUT REQUIREMENTS. FOR ADDITIONAL

INCLUDING REPLACEMENT, FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL

COMPLETION. IF AN UNSATISFACTORY CONDITION DEVELOPS DURING THE WARRANTY

SHALL IMMEDIATELY REPLACE SUCH ITEMS IN A SATISFACTORY CONDITION. ALL

1. FILL AND REPAIR LOW AREAS AND REPLACE PLANTINGS DUE TO SETTLEMENT OF

2. AT THE END OF THE FIRST WATERING SEASON, CONTRACTOR SHALL SHUT OFF AND

END OF SECTION

3. AT THE BEGINNING OF THE NEXT SEASON, CONTRACTOR SHALL RESTART SYSTEM AND

A. REMOVE FROM SITE ALL DEBRIS RESULTING FROM WORK OF THIS SECTION.

REQUIREMENTS RELATING TO MAINTENANCE SERVICE.

OWNER AT THE TIME OF FINAL INSPECTION.

C. ADJUST HEADS TO PROPER GRADE WHEN TURF IS SUFFICIENTLY ESTABLISHED TO ALLOW

WALKING ON IT WITHOUT APPRECIABLE HARM. SUCH LOWERING OR RAISING OF HEADS

SPECIFIED IN RELATED SECTIONS. PROTECT PIPING FROM DISPLACEMENT. TOP 5 INCHES

COMMENCES, OPEN VALVES AND FLUSH SYSTEM WITH FULL HEAD OF WATER. 3.06 FIELD QUALITY CONTROL A. NOTIFY LANDSCAPE ARCHITECT TWO WORKING DAYS MINIMUM PRIOR TO TESTING. B. FIELD INSPECTION AND TESTING WILL BE PERFORMED UNDER PROVISIONS OF SECTION 01

4000 - QUALITY REQUIREMENTS.

DRAINS DURING TEST PERIOD.

SPEFICIED UNDER PART 2 - PRODUCTS.

AMOUNTS OF WATER TO ALL PLANTS.

FINAL ITEMS NEEDING COMPLETION MADE.

ACCORDANCE WITH THESE SPECIFICATIONS.

AS BASIS FOR DEMONSTRATION.

3.10 CLEAN-UP AND MAINTENANCE

EXTRA COST TO OWNER.

FXCAVATED AREAS

WINTERIZE THE SYSTEM.

3.11 WARRANTY

3.07 BACKFILLING

3.08 SYSTEM STARTUP

BUII DING.

3.09 CLOSEOUT ACTIVITIES

(690 KPA) PRESSURE FOR SIX HOURS MINIMUM.

CONNECTIONS WHICH SHOW EVIDENCE OF LEAKAGE.

ENSURE NO SETTLING OF THE SURFACE AFTER LAWN IN PLANTED.

ARCHITECT, THE ABOVE REQUIRED TEST SHALL BE MADE AGAIN.



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### SECTION 32 9113 **SOIL PREPARATION**

- PART 1 GENERA 1.01 SECTION INCLUDES
- A. PERFORM SOIL PREPARATION WORK. B. FURNISH AND APPLY SOIL AMENDMENTS.

ACCOUNT OF RECENT USE.

- C. PERFORM FINE GRADING WORK REQUIRED TO PREPARE SITE FOR PAVING FINISH GRADING AND FOR LANDSCAPE FINISH GRADING. 1.02 SUBMITTALS
- A. PRODUCT DATA: PRODUCT LITERATURE AND CHEMICAL /NUTRIENT ANALYSIS OF SOIL AMENDMENTS AND FERTILIZERS.
- B. INFORMATIONAL SUBMITTALS: 1. FIELD QUALITY CONTROL SUBMITTALS:
- a. SUBMIT TESTS ON IMPORTED AND SITE TOPSOIL BY LICENSED LABORATORY BEFORE
- 1) BEFORE USE, TOPSOIL SHALL MEET MINIMUM SPECIFIED REQUIREMENTS AND BE APPROVED BY ARCHITECT.
- 2) IF NECESSARY, SUBMIT PROPOSED AMENDMENTS AND APPLICATION RATES
- NECESSARY TO BRING TOPSOIL UP TO MINIMUM SPECIFIED REQUIREMENTS. b. SUBMIT REPORT STATING LOCATION OF SOURCE OF IMPORTED TOPSOIL AND
- PART 2 PRODUCT 2.01 MATERIALS
- A. TOPSOII 1. TOPSOIL USED IN LANDSCAPED AREAS, WHETHER IMPORTED, STOCKPILED, OR IN PLACE, SHALL BE FERTILE, LOOSE, FRIABLE SOIL MEETING THE FOLLOWING CRITERIA: a. CHEMICAL CHARACTERISTICS:
  - 1) ACIDITY / ALKALINITY RANGE: PH 5.5 TO 8.0.
  - SOLUBLE SALTS: LESS THAN 3.0 MMHOS/CM. 3) SODIUM ABSORPTION RATIO (SAR): LESS THAN 6.0.
- ORGANIC MATTER: GREATER THAN ONE PERCENT. b. PHYSICAL CHARACTERISTICS: 1) GRADATION AS DEFINED BY USDA TRIANGLE OF PHYSICAL CHARACTERISTICS AS MEASURED BY HYDROMETER. (a) SAND: 15 TO 60 PERCENT
- (b) SILT: 10 TO 60 PERCENT
- (c) CLAY: 5 TO 30 PERCENT 2) CLEAN AND FREE FROM TOXIC MINERALS AND CHEMICALS, NOXIOUS WEEDS, ROCKS LARGER THAN 1-1/2 INCH IN ANY DIMENSION, AND OTHER OBJECTIONABLE MATERIALS.
- 3) SOIL SHALL NOT CONTAIN MORE THAN 2 PERCENT BY VOLUME OF ROCKS MEASURING OVER 3/32 INCH IN LARGEST SIZE. c. FERTILITY REQUIREMENTS:
- 1) NITRATE-NITROGEN PPM > 20
- 2) PHOSPHOROUS PPM > 153) POTASSIUM PPM > 150
- 4) IRON PPM > 10 TOPSOIL DEPTHS FOR THE PLANTING AREAS ARE AS FOLLOWS:
- a. SOD/SEED AREAS: 4 INCHES
- b. PLANTER BEDS: 12 INCHES B. SOIL AMENDMENTS:
- 1. AMEND TOPSOIL, EITHER IMPORTED OR STOCKPILED, TO BRING IT IN COMPLIANCE WITH SOILS TEST.
- a. ACCEPTABLE FERTILIZERS AND APPLICATION RATES: 1) LAWNS: PHOSPHORUS 1-2 LBS PER 1000 SQ. FT., POTASSIUM 2 LBS. PER 1000 SQ.FT., AND NITROGEN 2-4 LBS. PER 1000 SQ. FT. 2) SHRUBS: PHOSPHORUS 1-2 LBS PER 1000 SQ. FT., POTASSIUM 2 LBS. PER 1000
- SQ.FT., AND NITROGEN 1-2 LBS. PER 1000 SQ. FT. 3) EQUAL AS APPROVED BY ARCHITECT BEFORE INSTALLATION.
- b. ACCEPTABLE SOIL CONDITIONERS AND APPLICATION RATES: 1) TYPE ONE ACCEPTABLE PRODUCTS.
- (a) SOIL CONDITIONER THAT MEETS THE REQUIRED FERTILIZER AND SOIL AMENDMENTS STATED ABOVE CAN BE USED AT THE DISCRETION OF THE CONTRACTOR.
- PART 3 EXECUTION 3.01 PERFORMANCE
- A. PROTECTION OF IN-PLACE CONDITIONS: PROTECT UTILITIES AND SITE ELEMENTS FROM DAMAGE B. SOIL AMENDMENTS:
- 1. ADD SPECIFIED SOIL AMENDMENTS AT SPECIFIED RATES TO LAWN AREAS. 2. ROTO-TILL OR OTHERWISE MIX AMENDMENTS EVENLY INTO TOP 4 INCHES OF TOPSOIL
- 3. INCORPORATE AND LEACH SOIL AMENDMENTS WHICH REQUIRE LEACHING, SUCH AS GYPSUM, WITHIN SUCH TIME LIMITS THAT SOIL IS SUFFICIENTLY DRY TO ALLOW PROPER APPLICATION OF FERTILIZER AND SOIL CONDITIONERS. C. SURFACE PREPARATION
- LANDSCAPING AND PLANTING AREAS:
- a. BEFORE GRADING, DIG OUT WEEDS FROM PLANTING AREAS BY THEIR ROOTS AND REMOVE FROM SITE, REMOVE ROCKS LARGER THAN 1-1/2 INCHES IN SIZE AND FOREIGN MATTER SUCH AS BUILDING RUBBLE, WIRE, CANS, STICKS, CONCRETE, ETC. b. BEFORE BEGINNING MAINTENANCE PERIOD. PLANTS SHALL BE IN AT LEAST AS SOUND.
- HEALTHY, VIGOROUS, AND IN APPROVED CONDITION AS WHEN DELIVERED TO SITE. UNLESS ACCEPTED BY ARCHITECT IN WRITING AT FINAL LANDSCAPE INSPECTION. c. REMOVE IMPORTED PAVING BASE MATERIAL PRESENT IN PLANTING AREAS DOWN TO NATURAL SUBGRADE OR OTHER MATERIAL ACCEPTABLE TO ARCHITECT.
- D. PERFORMANCE: 1. DO NOT EXPOSE OR DAMAGE EXISTING SHRUB OR TREE ROOTS.
- 2. TOLERANCES:
- a. LANDSCAPING AND PLANTING TOLERANCES: MAXIMUM VARIATION FROM REQUIRED GRADES SHALL BE 1/10 OF ONE FOOT. 2) TO ALLOW FOR FINAL FINISH GRADES OF PLANTING AREAS, FINE GRADE ELEVATIONS BEFORE PLACING TOPSOIL AND MULCH ARE:
- (a) SOD AREAS: 5.5 INCHES BELOW TOP OF WALK OR CURB.
- (b) PLANTER BED AREAS: 16 INCHES BELOW TOP OF WALK OR CURB. 3. DO NOT EXPOSE OR DAMAGE EXISTING SHRUB OR TREE ROOTS. REDISTRIBUTE
- APPROVED EXISTING TOPSOIL STORED ON SITE. REMOVE ORGANIC MATERIAL, ROCKS AND CLODS GREATER THAN 1-1/2 INCH IN ANY DIMENSION, AND OTHER OBJECTIONABLE MATERIALS.
- 4. SLOPE GRADE AWAY FROM BUILDING AS SPECIFIED. DIRECT SURFACE DRAINAGE IN MANNER INDICATED ON DRAWINGS BY MOLDING SURFACE TO FACILITATE NATURAL RUN-OFF. FILL LOW SPOTS AND POCKETS WITH SPECIFIED FILL MATERIAL AND GRADE TO DRAIN PROPERLY.

### END OF SECTION

### **SECTION 32 9223** SODDING

- PART 1 GENERAL 1.01 SECTION INCLUDES
- A. PLACING TOPSOIL.
- B. FERTILIZING. C. SOD INSTALLATION.
- D. MAINTENANCE. 1.02 RELATED REQUIREMENTS
- A. SECTION 31 2200 GRADING: PREPARATION OF SUBSOIL AND PLACEMENT OF TOPSOIL IN PREPARATION FOR THE WORK OF THIS SECTION. 1.03 DEFINITIONS
- A. WEEDS: INCLUDES DANDELION, JIMSONWEED, QUACKGRASS, HORSETAIL, MORNING GLORY, RUSH GRASS, MUSTARD, LAMBSQUARTER, CHICKWEED, CRESS, CRABGRASS, CANADIAN THISTLE, NUTGRASS, POISON OAK, BLACKBERRY, TANSY RAGWORT, BERMUDA GRASS, JOHNSON GRASS, POISON IVY, NUT SEDGE, NIMBLE WILL, BINDWEED, BENT GRASS, WILD GARLIC, PERENNIAL SORREL, AND BROME GRASS.
- 1.04 QUALITY ASSURANCE A. SOD PRODUCER: COMPANY SPECIALIZING IN SOD PRODUCTION AND HARVESTING WITH MINIMUM FIVE YEARS EXPERIENCE, AND CERTIFIED BY THE STATE OF UTAH.
- B. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO HAS COMPLETED LANDSCAPING WORK SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THAT INDICATED FOR THIS PROJECT AND WITH A RECORD OF SUCCESSFUL LANDSCAPE ESTABLISHMENT. 1.05 DELIVERY. STORAGE. AND HANDLING
- A. DELIVER SOD IN ROLLS. PROTECT EXPOSED ROOTS FROM DEHYDRATION. B. DO NOT DELIVER MORE SOD THAN CAN BE LAID WITHIN 24 HOURS.
- C. HARVEST, DELIVER, STORE, AND HANDLE SOD ACCORDING TO THE REQUIREMENTS OF THE AMERICAN SOD PRODUCER'S ASSOCIATION (ASPA) "SPECIFICATIONS FOR TURFGRASS SOD MATERIALS AND TRANSPLANTING/INSTALLING". .06 PROJECT CONDITIONS
- A. UTILITIES: DETERMINE LOCATION OF ABOVE GRADE AND UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNERS WHICH WILL AVOILD DAMAGE. HAND EXCAVATE AS REQUIRED. MAINTAIN GRADE STAKES UNTIL REMOVAL IS MUTUALLY AGREED UPON BY PARTIES CONCERNED.
- B. EXCAVATION: WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, NOTIFY LANDSCAPE ARCHITECT BEFORE PLANTING. 1.07 COORDINATION AND SCHEDULING
- A. COODINATE INSTALLATION OF PLANTING MATERIALS DURING NORMAL PLANTING SEASONS FOR EACH TYPE OF PLANT MATERIAL REQUIRED. 1.08 WARRANTY
- A. GENERAL WARRANTY: THE SPECIAL WARRANTY SPECIFIED IN THIS ARTICLE SHALL NOT DEPRIVE THE OWNER OF OTHER RIGHTS THE OWNER MAY HAVE UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS AND SHALL BE IN ADDITION TO AND RUN CONCURRENT WITH OTHER WARRANTIES MADE BY THE CONTRACTOR UDNER REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. SPECIAL WARRANTY: WARRANT ALL LAWN AREAS FOR A PERIOD OF ONE YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AGAINST DEFECTS INCLUDING DEATH AND UNSATISFACTORY GROWTH, EXCEPT FOR DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE, NEGLECT, OR ABUSE BY OWNER, ABNORMAL WEATHER CONDITIONS UNUSUAL FOR WARRANTY PERIOD. OR INCIDENTS THAT ARE BEYOND CONTRACTOR'S CONTROL.
- C. REMOVE AND REPLACE DEAD MATERIALS IMMEDIATLEY UNLESS REQUIRED TO PLANT IN THE SUCCEEDING PLANTING SEASON.

- D. A LIMIT OF ONE REPLACEMENT OF EACH PLANT MATERIAL WILL BE REQUIRED, EXCEPT FOR LOSSES OR REPLACEMENTS DUE TO FAILURE TO COMPLY WITH REQUIREMENTS. PART 2 PRODUCTS
- 2.01 MATERIALS
- A. SOD: TPI (SPEC), CERTIFIED TURFGRASS SOD QUALITY; CULTIVATED GRASS SOD; TYPE INDICATED IN PLANT SCHEDULE ON DRAWINGS: WITH STRONG FIBROUS ROOT SYSTEM. FREE OF STONES, BURNED OR BARE SPOTS; CONTAINING NO MORE THAN 5 WEEDS PER 1000 SQ FT (100 SQ M). MINIMUM AGE OF 18 MONTHS, WITH ROOT DEVELOPMENT THAT WILL SUPPORT ITS OWN WEIGHT WITHOUT TEARING, WHEN SUSPENDED VERTICALLY BY HOLDING THE UPPER TWO CORNERS. 1. KENTUCKY BLUE GRASS TYPE: 3 CULTIVAR MINIMUM.
- 2. THICKNESS: MINIMUM 1 INCH (25 MM) AND MAXIMUM 1-3/8 INCH (35 MM) TOPSOIL BASE. 3. CUT SOD IN AREA NOT EXCEEDING 1 SQ YD (1 SQ M). 4. MACHINE CUT SOD AND LOAD ON PALLETS IN ACCORDANCE WITH TPI (SPEC)
- GUIDELINES. B. TOPSOIL: FERTILE, AGRICULTURAL SOIL, TYPICAL FOR LOCALITY, CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH, TAKEN FROM DRAINED SITE; FREE OF SUBSOIL, CLAY, OR IMPURITIES, PLANTS, WEEDS AND ROOTS; PH VALUE OF MINIMUM 5.4 AND MAXIMUM 7.0. BRING SURFACE TO SPECIFIED ELEVATION RELATIVE TO WALK OR CURB.
- C. COMMERCIAL FERTILIZER: COMPLETE FERTILIZER OF NEUTRAL CHARACTER; RECOMMENDED FOR GRASS, WITH FIFTY PERCENT OF THE ELEMENTS DERIVED FROM ORGANIC SOURCES; OF PROPORTION NECESSARY TO ELIMINATE ANY DEFICIENCIES OF TOPSOIL. TO THE FOLLOWING PROPORTIONS: 1. NITROGEN: >16% (OF WHICH 50% WILL BE ORGANIC). PROVIDE NITROGEN IN A FORM
- THAT WILL BE AVAILABLE TO LAWN DURING INITIAL PERIOD OF GROWTH. 2. PHOSPHORIC ACID: 16% 3. SOLUBLE POTASH: 8%

### PART 3 EXECUTION 3.01 EXAMINATION

- A. VERIFY THAT PREPARED SOIL BASE IS READY TO RECEIVE THE WORK OF THIS SECTION. EXAMINE AREAS TO RECEIVE LANDSCAPING FOR COMPLIANCE WITH REQUIREMENTS AND FOR CONDITIONS AFFECTING PERFORMANCE OF WORK IF THIS SECTION. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. 3.02 PREPARATION
- A. PLACE TOPSOIL IN ACCORDANCE WITH SECTION 31 2200. B. LOOSEN SUB-GRADE TO A MINIMUM DEPTH OF 4 INCHES. REMOVE STONES LARGER THAN
- 1-1/2 INCHES IN ANY DIMENSION, STICKS, ROOTS, RUBBISH, AND OTHER EXTRANEOUS MATERIALS C. SPREAD PLANTING SOIL MIXTURE TO DEPTH REQUIRED TO MEET THICKNESS, GRADES, AND
- ELEVATIONS SHOWN, AFTER LIGHT ROLLING AND NATURAL SETTLEMENT. DO NOT SPREAD IF PLANTING SOIL OR SUB-GRADE IS FROZEN. 1. PLACE APPROXIMATELY 1/2 THE THICKNESS OF PLANTING SOIL MIXTURE REQUIRED. WORK INTO TOP OF LOOSENED SUB-GRADE TO CREATE TRANSITION LAYER AND THEN PLACE REMAINDER OF PLANTING SOIL MIXTURE.
- ALLOW FOR SOD THICKNESS IN AREAS TO BE SODDED. D. PREPARATION OF UNCHANGED GRADES: WHERE LAWNS ARE TO BE PLANTED IN AREAS UNALTERED OR UNDISTURBED BY EXCAVATING, GRADING, OR SURFACE SOIL STRIPPING OPERATIONS, PREPARE SOIL AS FOLLOWS:
- 1. TILL SURFACE SOIL TO A DEPTH OF AT LEAST 6 INCHES. APPLY REQUIRED SOIL AMENDMENTS AND INITIAL FERTILIZERS AND MIX THOROUGHLY INTO TOP 4 INCHES OF SOIL. TRIM HIGH AREAS AND FILL IN DEPRESSIONS. TILL SOIL TO A HOMOGENOUS MIXTURE OF FINE TEXTURE.
- 2. CLEAN SURFACE SOIL OF ROOTS, PLANTS, SOD, STONES, CLAY LUMPS, AND OTHER EXTRANEOUS MATERIALS HARMFUL TO PLANT GROWTH. E. GRADE LAWN AND GRASS AREAS TO A SMOOTH, EVEN SURFACE WITH LOOSE, UNIFORMLY FINE TEXTURE. ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS TO MEET FINISH GRADES. LIMIT FINE GRADING TO AREAS THAT CAN BE PLANTED IN THE IMMEDIATE FUTURE.
- REMOVE TRASH, DEBRIS, STONES LARGER THAN 1-1/2 INCHES IN ANY DIMENSION, AND OTHER OBJECTS THAT MAY INTERFERE WITH PLANTING OR MAINTENANCE OPERATIONS F. MOISTEN PREPARED LAWN AREAS BEFORE PLANTING WHEN SOIL IS DRY. WATER THOROUGHLY AND ALLOW SURFACE TO DRY BEFORE PLANTING. DO NOT CREATE MUDDY
- G. RESTORE PREPARED AREAS IF ERODED OR OTHERWISE DISTURBED AFTER FINE GRADING AND BEFORE PLANTING.
- H. TOPSOIL DEPTH SHALL BE A MINIMUM OF 4 INCHES.
- 3.03 FERTILIZING A. APPLY FERTILIZER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. B. APPLY AFTER SMOOTH RAKING OF TOPSOIL AND PRIOR TO INSTALLATION OF SOD. C. APPLY FERTILIZER NO MORE THAN 48 HOURS BEFORE LAYING SOD. D. MIX THOROUGHLY INTO UPPER 2 INCHES (50 MM) OF TOPSOIL.
- E. LIGHTLY WATER TO AID THE DISSIPATION OF FERTILIZER. 3.04 LAYING SOD A. MOISTEN PREPARED SURFACE IMMEDIATELY PRIOR TO LAYING SOD. B. LAY SOD WITHIN 24 HOURS AFTER HARVESTING TO PREVENT DETERIORATION. DO NOT LAY
- SOD IF DORMANT OR IF GROUND IS FROZEN C. LAY SOD SMOOTH AND TIGHT WITH NO OPEN JOINTS VISIBLE, AND NO OVERLAPPING; STAGGER END JOINTS 12 INCHES (300 MM) MINIMUM. DO NOT STRETCH OR OVERLAP SOD
- D. WHERE NEW SOD ADJOINS EXISTING GRASS AREAS, ALIGN TOP SURFACES. E. WHERE SOD IS PLACED ADJACENT TO HARD SURFACES, SUCH AS CURBS, PAVEMENTS, ETC., PLACE TOP ELEVATION OF SOD 1/2 INCH (13 MM) BELOW TOP OF HARD SURFACE.
- F. LAY SOD ACCROSS ANGLE OF SLOPES EXEEDING 1:3. G. ON SLOPES 6 INCHES PER FOOT (500 MM PER M) AND STEEPER, LAY SOD PERPENDICULAR TO SLOPE AND SECURE EVERY ROW WITH WOODEN PEGS AT MAXIMUM 2 FEET (600 MM) ON
- CENTER. DRIVE PEGS FLUSH WITH SOIL PORTION OF SOD. H. WATER SODDED AREAS IMMEDIATELY AFTER INSTALLATION. SATURATE SOD TO 4 INCHES (100 MM) OF SOIL. DURING FIRST WEEK, WATER DAILY OR MORE FREQUENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A MINIMUM DEPTH OF 1-1/2 INCHES BELOW THE
- I. AFTER SOD AND SOIL HAVE DRIED, ROLL SODDED AREAS TO ENSURE GOOD BOND BETWEEN SOD AND SOIL AND TO REMOVE MINOR DEPRESSIONS AND IRREGULARITIES. 3.05 CLEAN-UP AND PROTECTION
- A. DURING LANDSDCAPING, KEEP PAVEMENT CLEAN AND WORK AREA IN AN ORDERLY CONDITION B. PROTECT LANDSCAPING FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES, AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR, OR REPLACE DAMAGED
- LANDSCAPE WORK AS DIRECTED. 3.06 DISPOSAL OF SURPLUS AND WASTE MATERIALS
- A. REMOVE SURPLUS SOIL AND WASTE MATERIAL, INCLUDING EXCESS SUBSOIL, UNSUITABLE SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF THE OWNER'S PROPERTY. 3.07 MAINTENANCE
- A. PROVIDE MAINTENANCE AT NO EXTRA COST TO OWNER; OWNER WILL PAY FOR WATER. B. MAINTAIN SODDED AREAS IMMEDIATELY AFTER PLACEMENT UNTIL GRASS IS WELL ESTABLISHED AND EXHIBITS A VIGOROUS GROWING CONDITION, BUT NOT LESS THAN 30 DAYS AFTER DATE OF SUBSTANTIAL COMPLETION AND SECOND FULL MOWING HAS BEEN PFRFORMED
- C. MOW GRASS AT REGULAR INTERVALS TO MAINTAIN AT A MAXIMUM HEIGHT OF 2-1/2 INCHES (65 MM). DO NOT CUT MORE THAN 1/3 OF GRASS BLADE AT ANY ONE MOWING. DO NOT DELAY MOWING UNTIL GRASS BLADES BEND OVER AND BECOME MATTED. DO NOT MOW GRASS WHEN WET.
- D. APPLY FERTILIZER TO LAWN AFTER FIRST MOWING AND WHEN GRASS IS DRY. USE FERTILZER THAT WILL PROVIDE ACTUAL NITROGEN OF AT LEAST 1 LB. PER 1000 SQ. FT. OF LAWN AREA.
- E. NEATLY TRIM EDGES AND HAND CLIP WHERE NECESSARY. F. IMMEDIATELY REMOVE CLIPPINGS AFTER MOWING AND TRIMMING.
- G. WATER TO PREVENT GRASS AND SOIL FROM DRYING OUT TO A UNIFORM DEPTH OF 4 INCHES. WATER LAWN AT THE MINIMUM RATE OF 1 INCH PER WEEK.
- H. ROLL SURFACE TO REMOVE IRREGULARITIES.
- I. CONTROL GROWTH OF WEEDS. APPLY HERBICIDES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMEDY DAMAGE RESULTING FROM IMPROPER USE OF HFRBICIDFS J. IMMEDIATELY REPLACE SOD TO AREAS THAT SHOW DETERIORATION OR BARE SPOTS.
- K. PROTECT SODDED AREAS WITH WARNING SIGNS DURING MAINTENANCE PERIOD. END OF SECTION

A. WEEDS: ANY PLANT LIFE NOT SPECIFIED OR SCHEDULED.

D. TREE PRUNING: COMPLY WITH ANSI A300 PART 1.

### **SECTION 32 9300** EXTERIOR PLANTS

- PART 1 GENERAL 1.01 SECTION INCLUDES
- A. PREPARATION OF SUBSOIL.

D. FERTILIZER.

1.02 DEFINITIONS

E. MAINTENANCE

1.03 QUALITY ASSURANCE

B. TOPSOIL BEDDING. C. NEW TREES AND PLANTS.

F. TREE AND SHRUB PRUNING.

DESCRIBED IN ANSI Z60.1.

LANDSCAPE ESTABLISHMENT.

## B. PLANTS: LIVING TREES, PLANTS, AND GROUND COVER SPECIFIED IN THIS SECTION, AND

### A. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO HAS COMPLETED LANDSCAPING WORK SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THAT INDICATED FOR THIS PROJECT WITH AT LEAST 3 YEARS EXPERIENCE AND A RECORD OF SUCCESSFUL

B. PROVIDE QUALITY, SIZE, GENUS, SPECIES, AND VARIETY OF TREES, SHRUBS, AND PLANTS INDICATED COMPLYING WITH THE APPLICABLE REQUIREMENTS OF ANSI/AHIA Z60.1. C. MEASURE TREES AND SHRUBS ACCORDING TO ANSI/AHIA Z60.1 WITH BRANCHES AND TRUNKS OR CANES IN THEIR NORNAL POSITION. DO NOT PRUNE TO OBTAIN REQUIRED SIZES. TAKE CALIPER MEASUREMENTS 6 INCHES ABOVE GROUND FOR TREES UP TO 4 INCH CALIPER SIZE AND 12 INCHES ABOVE GROUND FOR LARGER SIZES. MEASURE MAIN BODY OF TREE OR SHRUB FOR HEIGHT AND SPREAD; DO NOT MEASURE BRANCHES OR ROOTS TIP-TO-TIP.

## 1.04 DELIVERY, STORAGE, AND HANDLING

- A. TREES AND SHRUBS: DELIVER FRESHLY DUG TREES AND SHRUBS. DO NOT PRUNE BEFORE DELIVERY, EXCEPT AS APPROVED BY LANDSCAPE ARCHITECT. PROTECT BARK, BRANCHES, AND ROOT SYSTEMS FROM SUN SCALD, DRYING, SWEATING, WHIPPING, AND OTHER HANDLING AND TYING DAMAGE. DO NOT BEND OR BIND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DESTROY NATURAL SHAPE. PROVIDE PROTECTIVE COVERING DURING DELIVERY. DO NOT DROP TREES AND SHRUBS DURING DELIVERY. B. HANDLE BALLED AND BURLAPPED STOCK BY THE ROOT BALL.
- C. DELIVER FERTILIZER IN WATERPROOF BAGS SHOWING WEIGHT, CHEMICAL ANALYSIS, AND NAME OF MANUFACTURER. D. DELIVER TREES, SHRUBS, AND PLANTS AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND INSTALL IMMEDIATELY. IF PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY, SET PLANTING MATERIALS IN SHADE, PROTECT FROM WEATHER AND MECHANICAL DAMAGE, AND KEEP ROOTS MOIST.
- 1. SET BALLED STOCK ON GROUND AND COVER BALL WITH SOIL, PEAT MOSS, SAWDUST, OR OTHER ACCEPTABLE MATERIAL. 2. DO NOT REMOVE CONTAINER-GROWN STOCK FROM CONTAINERS BEFORE TIME OF PI ANTING
- 3. WATER ROOT SYSTEMS OF TREES AND SHRUBS STORED ON SITE WITH A FINE-MIST SPRAY. WATER AS OFTEN AS NECESSARY TO MAINTAIN ROOT SYSTEMS IN A MOIST
- CONDITION. E. PROTECT AND MAINTAIN PLANT LIFE UNTIL PLANTED. F. DELIVER PLANT LIFE MATERIALS IMMEDIATELY PRIOR TO PLACEMENT. KEEP PLANTS MOIST. 1.05 FIELD CONDITIONS
- A. DO NOT INSTALL PLANT LIFE WHEN AMBIENT TEMPERATURES MAY DROP BELOW 35 DEGREES F (2 DEGREES C) OR RISE ABOVE 90 DEGREES F (32 DEGREES C). B. DO NOT INSTALL PLANT LIFE WHEN WIND VELOCITY EXCEEDS 30 MPH (48 K/HR). C. UTILITIES: DETERMINE LOCATION OF ABOVE GRADE AND UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER WHICH WILL AVOID DAMAGE. HAND EXCAVATE AS REQUIRED.
- MAINTAIN GRADE STAKES UNTIL REMOVAL IS MUTUALLY AGREED UPON BY PARTIES CONCERNED. D. EXCAVATION: WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, NOTIFY
- LANDSCAPE ARCHITECT BEFORE PLANTING. 1.06 COORDINATION AND SCHEDULING A. COORDINATE INSTALLATION OF PLANTING MATERIALS DURING NORMAL PLANTING SEASONS
- FOR EACH TYPE OF PLANT MATERIAL REQUIRED. 1.07 WARRANTY
- A. GENERAL WARRANTY: THE SPECIAL WARRANTY SPECIFIED IN THIS ARTICLE SHALL NOT DEPRIVE THE OWNER OF OTHER RIGHTS THE OWNER MAY HAVE UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS AND SHALL BE IN ADDITION TO AND RUN CONCURRENT WITH OTHER WARRANTIES MADE BY THE CONTRACTOR UDNER REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- B. SPECIAL WARRANTY: WARRANT TREES, SHRUBS, AND PLANTS FOR A PERIOD OF ONE YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AGAINST DEFECTS INCLUDING DEATH AND UNSATISFACTORY GROWTH, EXCEPT FOR DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE, NEGLECT, OR ABUSE BY OWNER, ABNORMAL WEATHER CONDITIONS UNUSUAL FOR WARRANTY PERIOD, OR INCIDENTS THAT ARE BEYOND CONTRACTOR'S CONTROL.
- C. REPLACEMENTS: PLANTS OF SAME SIZE AND SPECIES AS SPECIFIED, PLANTED IN THE NEXT GROWING SEASON, WITH A NEW WARRANTY COMMENCING ON DATE OF REPLACEMENT. 1. REMOVE AND REPLACE DEAD PLANTING MATERIALS IMMEDIATELY UNLESS REQUIRED TO PLANT IN THE SUCCEEDING PLANTING SEASON.
- 2. REPLACE PLANTING MATERIALS THAT ARE MORE THAN 25% DEAD OR IN AN UNHEALTHY CONDITION AT END OF WARRANTY PERIOD. 3. A LIMIT OF ONE REPLACEMENT OF EACH PLANT MATERIAL WILL BE REQUIRED, EXCEPT FOR LOSSES OR REPLACEMENTS DUE TO FAILURE TO COMPLY WITH REQUIREMENTS.

### PART 2 PRODUCTS 2.01 TREE AND SHRUB MATERIAL

- A. PLANTS: SPECIES AND SIZE IDENTIFIED IN PLANT SCHEDULE, GROWN IN CLIMATIC CONDITIONS SIMILAR TO THOSE IN LOCALITY OF THE WORK. B. GENERAL: FURNISH NURSERY-GROWN TREES AND SHRUBS CONFORMING TO ANSI/AHIA Z60.1, WITH HEALTHY ROOT SYSTEMS. DEVELOPED BY TRANSPLANTING OR ROOT PRUNING. PROVIDE WELL SHAPED, FULLY-BRANCHED, HEALTHY, VIGOROUS STOCK FREE OF DISEASE,
- INSECTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT C. GRADE: PROVIDE TREES AND SHRUBS OF SIZES AND GRADES CONFORMING TO ANSI/AHIA Z60.1 FOR TYPE OF TREES AND SHRUBS REQUIRED. TREES AND SHRUBS OF A LARGER SIZE MAY BE USED IF ACCEPTABLE TO LANDSCAPE ARCHITECT WITH PROPORTIONATE INCREASE
- IN SIZE OF ROOTS AND BALL. D. LABEL AT LEAST 1 TREE AND 1 SHRUB OF EACH VARIETY AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF BOTANNICAL AND COMMON NAME.
- 2.02 SHADE AND FLOWERING TREES A. SHADE TREES: SINGLE-STEM TREES WITH STRAIGHT TRUNK, WELL-BALANCED CROWN, AND INTACT LEADER. OF HEIGHT AND CALIPER INDICATED. CONFORMING TO ANSI/AHIA Z60.1 FOR TYPE OF TREES REQUIRED. B. PROVIDE BALLED AND BURLAPPED TREES WHEN SPECIFIED ON APPROVED PLANS.
- 2.03 SHRUBS AND PERENNIALS A. FORM AND SIZE: SHRUBS WITH NOT LESS THAN THE MINIMUM NUMBER OF CANES REQUIRED BY AND MEASURED ACCORDING TO ANSI/AHIA Z60.1 FOR TYPE, SHAPE, AND HEIGHT OF
- B. PROVIDE BALLED AND BURLAPPED OR CONTAINER SHRUBS AND PERENNIALS. 2.04 SOIL MATERIALS
- A. PROVIDE APPROVED IMPORTED TOPSOIL REQUIRED TO BRING SURFACE TO SPECIFIED ELEVATION RELATIVE TO WALK OR CURB. B. TOPSOIL: FERTILE, AGRICULTURAL SOIL, TYPICAL FOR LOCALITY, CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH, TAKEN FROM DRAINED SITE; FREE OF SUBSOIL, CLAY OR IMPURITIES, PLANTS, WEEDS AND ROOTS; SEE SECTION 32 9113: SOIL PREPARATION FOR
- REQUIRED CHEMICAL AND PHYSICAL CHARACTERISTICS. 2.05 SOIL AMENDMENT MATERIALS A. FERTILIZER FOR TREES AND SHRUBS: CONTAINING FIFTY PERCENT OF THE ELEMENTS DERIVED FROM ORGANIC SOURCES; OF PROPORTION NECESSARY TO ELIMINATE ANY DEFICIENCIES OF TOPSOIL, TO THE FOLLOWING PROPORTIONS: 1. NITROGEN: >20% (OF WHICH 50% WILL BE ORGANIC).
- 2. PHOSPHORIC ACID: 10%. 3. SOLUBLE POTASH: 5%.
- B. WATER: CLEAN, FRESH, AND FREE OF SUBSTANCES OR MATTER THAT COULD INHIBIT VIGOROUS GROWTH OF PLANTS. 2.06 ACCESSORIES
- A. STAKES: SOFTWOOD LUMBER, POINTED END.

### PART 3 EXECUTION 3.01 EXAMINATION

- A. EXAMINE AREAS TO RECEIVE LANDSCAPING FOR COMPLIANCE WITH REQUIREMENTS AND FOR CONDITIONS AFFECTING PERFORMANCE OF WORK OF THIS SECTION. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. B. VERIFY THAT PREPARED SUBSOIL AND PLANTERS ARE READY TO RECEIVE WORK.
- C. SATURATE SOIL WITH WATER TO TEST DRAINAGE. 3.02 PREPARATION OF SUBSOIL A. PREPARE SUBSOIL TO ELIMINATE UNEVEN AREAS. MAINTAIN PROFILES AND CONTOURS.
- MAKE CHANGES IN GRADE GRADUAL. BLEND SLOPES INTO LEVEL AREAS. B. REMOVE STONES LARGER THAN 1 INCH IN ANY DIMENSION, FOREIGN MATERIALS, STICKS, RUBBISH, WEEDS AND UNDESIRABLE PLANTS AND THEIR ROOTS. REMOVE CONTAMINATED
- SUBSOIL C. SCARIFY SUBSOIL TO A DEPTH OF 6 INCHES (150 MM) WHERE PLANTS ARE TO BE PLACED. REPEAT CULTIVATION IN AREAS WHERE EQUIPMENT, USED FOR HAULING AND SPREADING TOPSOIL, HAS COMPACTED SUBSOIL.
- 3.03 PLACING TOPSOIL A. TOPSOIL DEPTH SHALL BE A MINIMUM OF 12 INCHES. B. SPREAD TOPSOIL TO A MINIMUM DEPTH OF 6 INCHES (150 MM) OVER AREA TO BE PLANTED. WORK INTO TOP OF LOOSENED SUB GRADE TO CREATE A TRANSITION LAYER AND THEN PLACE REMAINDER OF PLANTING SOIL MIXTURE.
- C. TILL SOIL IN BEDS TO A MINIMUM DEPTH OF 8 INCHES AND MIX WITH SPECIFIED SOIL
- AMENDMENTS AND FERTILIZERS. D. PLACE TOPSOIL DURING DRY WEATHER AND ON DRY UNFROZEN SUBGRADE.
- E. REMOVE VEGETABLE MATTER AND FOREIGN NON-ORGANIC MATERIAL FROM TOPSOIL WHILE SPREADING F. GRADE TOPSOIL TO ELIMINATE ROUGH, LOW OR SOFT AREAS, AND TO ENSURE POSITIVE
- DRAINAGE 3.04 FERTILIZING A. APPLY FERTILIZER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS
- B. APPLY AFTER INITIAL RAKING OF TOPSOIL AND TILL IN TO BEDS. C. MIX THOROUGHLY INTO UPPER 8 INCHES (203 MM) OF TOPSOIL
- D. LIGHTLY WATER TO AID THE DISSIPATION OF FERTILIZER. 3.05 EXCAVATION FOR TREES AND SHRUBS
- A. PITS AND TRENCHES: EXCAVATE WITH BOTTOM OF EXCAVATION SLIGHTLY RAISED AT CENTER TO ASSIST DRAINAGE. LOOSEN HARD SUBSOIL IN BOTTOM OF EXCAVATION. 1. BALLED AND BURLAPPED TREES AND SHRUBS: EXCAVATE APPROXIMATELY 3 TIMES AS WIDE AS BALL DIAMETER AND EQUAL TO BALL DEPTH.
- 2. CONTAINER-GROWN TREES AND SHRUBS: EXCAVATE APPROXIMATELY 3 TIMES AS WIDE AS CONTAINER DIAMTER AND EQUAL TO ROOT MASS DEPTH. B. DISPOSE OF SUBSOIL REMOVED FROM LANDSDCAPE EXCAVATIONS. DO NOT MIX WITH
- PLANTING SOIL OR USE AS BACKFILL. C. OBSTRUCTIONS: NOTIFY LANDSCAPE ARCHITECT IF UNEXPECTED ROCK OR OBSTRUCTIONS
- DETRIMENTAL TO TREES OR SHRUBS ARE ENCOUNTERED IN EXCAVATIONS. D. DRAINAGE: NOTIFY LANDSCAPE ARCHITECT IF SUBSOIL CONDITIONS EVIDENCE UNEXPECTED
- WATER SEEPAGE OR RETENTION IN TREE OR SHRUB PITS. E. FILL EXCAVATION WITH WATER AND ALLOW TO PERCOLATE OUT BEFORE PLACING SETTING LAYER AND POSITIONING TREES AND SHRUBS.
- 3.06 PLANTING A. LAYOUT INDIVIDUAL TREE AND SHRUB LOCATIONS AND AREAS FOR MULTIPLE PLANTINGS. STAKE LOCATIONS. OUTLINE AREAS, AND SECURE LANDSCAPE ARCHITECTS ACCEPTANCE BEFORE THE START OF PLANTING WORK. MAKE MINOR ADJUSTMENTS AS NEEDED. B. SET BALLED AND BURLAPPED STOCK PLUMB AND IN CENTER OF PIT OR TRENCH WITH TOP OF BALL RAISED ABOVE ADJACENT FINISH GRADES AS INDICATED. 1. PLACE STOCK ON UNDISTURBED OR COMPACTED TOPSOIL.

- 2. REMOVE BURLAP AND WIRE BASKETS FROM TOPS AND AT LEAST UPPER HALF OF ROOT BALL (MORE IF THE ROOT BALL IS STABLE), BUT DO NOT REMOVE FROM UNDER ROOT BALL. REMOVE PALLETS, IF ANY, BEFORE SETTING. DO NOT USE PLANTING STOCK IF BALL
- IS CRACKED OR BROKEN BEFORE OR DURING PLANTING OPERATION. 3. PLACE BACKFILL AROUND BALL IN LAYERS, TAMPING TO SETTLE BACKFILL AND
- ELIMINATE VOIDS AND AIR POCKETS. 4. BACKFILL TO CONSIST OF ONE (1) PART TOPSOIL AND ONE (1) PART NATIVE SOIL CLEAN
- AND FREE FROM TOXIC MINERAL AND CHEMICALS, NOXIOUS WEEDS, ROCKS LARGER THAN 1-1/2 INCH IN ANY DIMENSION, AND OTHER OBJECTIONABLE MATERIALS. 5. WHEN PIT IS APPROXIMATELY 1/2 BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE IS ABSORBED. WATER
- AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF BACKFILL. C. SET CONTAINER-GROWN STOCK PLUMB IN CENTER OF PIT OR TRENCH WITH TOP OF BALL RAISED ABOVE ADJACENT FINISH GRADES AS INDICATED.
- 1. CAREFULLY REMOVE CONTAINERS SO AS NOT TO DAMAGE ROOT BALLS. 2. PLACE STOCK ON UNDISTURBED OR COMPACTED TOPSOIL.
- 3. PLACE BACKFILL AROUND BALL IN LAYERS, TAMPING TO SETTLE BACKFILL AND ELIMINATE VOIDS AND AIR POCKETS. 4. BACKFILL TO CONSIST OF ONE (1) PART TOPSOIL AND ONE (1) PART NATIVE SOIL CLEAN
- AND FREE FROM TOXIC MINERAL AND CHEMICALS, NOXIOUS WEEDS, ROCKS LARGER THAN 1-1/2 INCH IN ANY DIMENSION, AND OTHER OBJECTIONABLE MATERIALS. 5. WHEN PIT IS APPROXIMATELY 1/2 BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE IS ABSORBED. WATER
- AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF BACKFILL. D. DISH AND TAMP TOP OF BACKFILL TO FORM A 3 INCH HIGH MOUND AROUND THE RIM OF THE PIT. DO NOT COVER TOP OF ROOT BALL WITH BACKFILL.
- 3.07 PLANT SUPPORT A. BRACE PLANTS VERTICALLY WITH PLANT PROTECTOR WRAPPED GUY WIRES AND STAKES TO THE FOLLOWING: 1. TREE CALIPER: 1 TO 2 INCHES (25 TO 50 MM); TREE SUPPORT METHOD: 2 STAKES WITH TWO TIFS
- 3.08 TREE PRUNING A. PRUNE TREES AS RECOMMENDED IN ANSI A300 PART 1.
- B. UNLESS OTHERWISE DIRECTED BY LANDSCAPE ARCHITECT, DO NOT CUT TREE LEADERS, REMOVE ONLY DEAD, BROKEN, AND SPLIT BRANCHES. C. PRUNE SHRUBS TO RETAIN NATURAL CHARACTER. SHRUB SIZES INDICATED ARE SIZE AFTER
- PRUNING 3.09 FIELD QUALITY CONTROL A. PLANTS WILL BE REJECTED IF A BALL OF EARTH SURROUNDING ROOTS HAS BEEN DISTURBED OR DAMAGED PRIOR TO OR DURING PLANTING.
- 3.10 CLEAN-UP AND PROTECTION A. DURING LANDSCAPING, KEEP PAVEMENT CLEAN AND WORK AREA IN ORDERLY CONDITION. B. PROTECT LANDSCAPING FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES, AND TRESPASSERS. MAINTAIN PROTECTION DURING
- INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR, OR REPLACE DAMAGED LANDSCAPE WORK AS DIRECTED. 3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS
- A. REMOVE SURPLUS SOIL AND WASTE MATERIAL, INCLUDING EXCESS SUBSOIL, UNSUITABLE SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF THE OWNER'S PROPERTY.
- 3.12 MAINTENANCE A. PROVIDE MAINTENANCE AT NO EXTRA COST TO OWNER; OWNER WILL PAY FOR WATER. B. MAINTAIN PLANT LIFE FOR 60 DAYS AFTER DATE OF SUBSTANTIAL COMPLETION. C. IRRIGATE SUFFICIENTLY TO SATURATE ROOT SYSTEM AND PREVENT SOIL FROM DRYING OUT.
- D. REMOVE DEAD OR BROKEN BRANCHES AND TREAT PRUNED AREAS OR OTHER WOUNDS. E. NEATLY TRIM PLANTS WHERE NECESSARY
- F. IMMEDIATELY REMOVE CLIPPINGS AFTER TRIMMING. G. CONTROL GROWTH OF WEEDS. APPLY HERBICIDES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- H. CONTROL INSECT DAMAGE AND DISEASE. APPLY PESTICIDES IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

A. DO NOT INSTALL MULCH WHEN WIND VELOCITY EXCEEDS 30 MPH (48 K/HR).

A. CRUSHED ROCK: COLOR AND SIZE NOTED ON APPROVED DRAWINGS

TO BE MULCHED, LAPPING EDGES A MINIMUM OF 6 INCHES.

WITH WEED CONTROL BARRIER BENEATH.

WEED CONTROL BARRIER BENEATH.

WEEKS AFTER PLANTING.

LANDSCAPE WORK AS DIRECTED.

3.05 DISPOSAL OF SURPLUS AND WASTE MATERIALS

**END OF SECTION** 

3.04 CLEAN-UP AND PROTECTION

DEWITT PRO 5 WEED BARRIER OR LANDSCAPE ARCHITECT'S APPROVED EQUAL.

CONTAINERS AND MIX ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

I. REMEDY DAMAGE FROM USE OF HERBICIDES AND PESTICIDES. J. MAINTAIN STAKES. REPAIR OR REPLACE ACCESSORIES WHEN REQUIRED. END OF SECTION

### **SECTION 32 9419** LANDSCAPE SURFACING

### PART 1 GENERAL 1.01 SECTION INCLUDES

- A. MULCH. B. WEED BARRIER C. MAINTENANCE
- 1.02 SUBMITTALS A. SEE SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS, FOR SUBMITTAL PROCEDURES.

1.04 FIELD CONDITIONS

1.05 WARRANTY

PART 2 PRODUCTS 2.01 MULCH MATERIALS

2.02 ACCESSORIES

PART 3 EXECUTION

3.02 MULCHING

INDICATED.

3.03 ACCESSORIES

3.01 EXAMINATION

1.03 QUALITY ASSURANCE

LANDSCAPE ESTABLISHMENT.

CONTRACT DOCUMENTS.

A. INSTALLER QUALIFICATIONS: ENGAGE AN EXPERIENCED INSTALLER WHO HAS COMPLETED LANDSCAPING WORK SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THAT INDICATED FOR THIS PROJECT WITH AT LEAST 3 YEARS EXPERIENCE AND A RECORD OF SUCCESSFUL

A. GENERAL WARRANTY: THE SPECIAL WARRANTY SPECIFIED IN THIS ARTICLE SHALL NOT DEPRIVE THE OWNER OF OTHER RIGHTS THE OWNER MAY HAVE UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS AND SHALL BE IN ADDITION TO AND RUN CONCURRENT WITH OTHER WARRANTIES MADE BY THE CONTRACTOR UNDER REQUIREMENTS OF THE

A. WEED CONTROL BARRIER: 5 OZ. WOVEN, NEEDLE-PUNCHED POLYPROPYLENE FABRIC. B. ANTIDESICCANT: WATER-INSOLUBLE EMULSION, PERMEABLE MOISTURE RETARDER, FILM FORMING, FOR TREES AND SHRUBS. DELIVER IN ORIGINAL, SEALED, AND FULLY LABELED

A. EXAMINE AREAS TO RECEIVE LANDSCAPING FOR COMPLIANCE WITH REQUIREMENTS AND FOR CONDITIONS AFFECTING PERFORMANCE OF WORK OF THIS SECTION. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. B. VERIFY THAT PREPARED SUBSOIL AND PLANTERS ARE READY TO RECEIVE WORK. A. MULCH BACKFILLED SURFACES OF PITS, TRENCHES, PLANTED AREAS, AND OTHER AREAS

B. WEED CONTROL BARRIERS: INSTALL WEED CONTROL BARRIERS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND BEFORE MULCHING. COMPLETELY COVER AREA C. CRUSHED ROCK: GRAY IN COLOR; PLACE 6 INCH DEPTH IN AREAS AS SHOWN ON PLANS D. CRUSHED ROCK: TAN IN COLOR; PLACE 3 INCH DEPTH IN AREAS AS SHOWN ON PLANS WITH

A. APPLY ANTIDESICCANT USING POWER SPRAY TO PROVIDE AN ADEQUATE FILM OR TRUNKS. BRANCHES, STEMS, TWIGS, AND FOLIAGE. WHEN DECIDUOUS TREES OR SHRUBS ARE MOVED IN FULL-LEAF, SPRAY WITH ANTIDESICCANT AT NURSERY BEFORE MOVING AND AGAIN 2

A. DURING LANDSCAPING, KEEP PAVEMENT CLEAN AND WORK AREA IN ORDERLY CONDITION. B. PROTECT LANDSCAPING FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES. AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR, OR REPLACE DAMAGED

A. REMOVE SURPLUS SOIL AND WASTE MATERIAL, INCLUDING EXCESS SUBSOIL, UNSUITABLE SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF THE OWNER'S PROPERTY.

![](_page_9_Picture_215.jpeg)

![](_page_9_Picture_216.jpeg)

![](_page_9_Picture_217.jpeg)

![](_page_9_Picture_219.jpeg)

![](_page_10_Figure_0.jpeg)

SYMBOL	CODE	<u>QTY</u>	BOTANICAL / COMMON NAME	CONT
TREES				
$(\cdot)$	EXT	48	Existing Tree / to Remain	Existin
	GH	1	Gleditsia triacanthos 'Imperial' / Imperial Honeylocust	B & B
SYMBOL	<u>CODE</u>	<u>QTY</u>	BOTANICAL / COMMON NAME	<u>CONT</u>
SHRUBS				
$\odot$	BY	15	Berberis thunbergii 'Red Torch' / Red Torch Japanese Barberry	5 gal
$\left( \begin{array}{c} \overline{} \\ \overline{} \end{array} \right)$	EE	19	Ericameria nauseosa `Baby Blue` / Rubber Rabbitbrush	5 gal
$\check{\odot}$	JB	14	Juniperus horizontalis `Broadmoor` / Broadmoor Juniper	5 gal
$\overline{\tilde{\cdot}}$	PA	16	Perovskia atriplicifolia 'Prime Time' / Prime Time Russian Sage	5 gal
$\check{\bigcirc}$	PO	13	Potentilla fruticosa `Abbotswood` / Abbotswood Bush Cinquefoil	5 gal
GRASSES				
	PH	24	Panicum virgatum 'Heavy Metal' / Heavy Metal Switch Grass	1 gal
$\overline{\bigcirc}$	PU	24	Pennisetum alopecuroides 'Tift PA5' / Hush Puppy™ Fountain Grass	1 gal
PERENNIALS				
<b>(</b> • <b>)</b>	AC	15	Agastache cana `Sinning` / Sonoran Sunset® Hummingbird Mint	1 gal
( · · · · · · · · · · · · · · · · · · ·	GA	18	Gaillardia aristata 'Arizona Sun' / Arizona Sun Blanket Flower	1 gal

SYMBOL	DESCRIPTI
L-01	METAL ED
SYMBOL	LANDSCAF DESCRIPTI
	2" MINUS 1
· · · · · ·	TURF GRA
	4-6" GRAY

DESCRIPTION	QTY
METAL EDGING	1,401 lf
LANDSCAPE	
DESCRIPTION	QTY
2" MINUS TAN CRUSHED ROCK MULCH - 3" depth, weed barrier beneath	15,325 sf
TURF GRASS TO REMAIN - preserve and protect, patch and repair as needed	16,910 sf
4-6" GRAY CRUSHED ROCK MULCH - 6" depth, weed barrier beneath	7,600 sf

![](_page_10_Picture_17.jpeg)

![](_page_10_Picture_18.jpeg)

![](_page_10_Picture_25.jpeg)

![](_page_10_Picture_27.jpeg)

![](_page_10_Picture_28.jpeg)

![](_page_11_Figure_0.jpeg)

<u>SYMBOL</u>	MANUFACTURER/MODEL/DESCRIPTION	<u>QTY</u>	<u>PSI</u>				1. C	CONTRACTOR TO VERIFY ALL CONDITIONS PERTAINING TO THIS PLAN AND REPORT ANY DISCREPANCIES IMMEDIATELY TO
→         →           1401         1402	Rain Bird RWS-M-B-C 1400 Series Mini Root Watering System with 4in. diameter x 18in. long with locking grate, semi-rigid mesh tube and Rain Bird 1401 0.25 GPM or 1402 0.5 GPM bubbler as indicated. With Check Valve	48	30				2. CI 0' CI	LANDSCAPE ARCHITECT. CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY REQUIRED FEES TO ANY GOVERNMENTAL AGENCY HAVING JURISDICT OVER THE WORK. INSPECTIONS REQUIRED BY LOCAL ORDINANCES DURING CONSTRUCTION SHALL BE ARRANGED AND CONDUCTED BY THE CONTRACTOR.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	<u>QTY</u>	<u>PSI</u> <u>GPN</u>	<u>И <u>R</u>АС</u>	DIUS		3. BI SI	BEFORE ANY TRENCHING, EXCAVATION OR DIGGING BELOW THE SURFACE FOR ANY REASON IS BEGUN, THE CONTRACTOR SHALL HAVE THE AREA "BLUE STAKED" IN ORDER TO DETERMINE AS CLOSE AS POSSIBLE THE LOCATIONS OF ALL
(30)	Rain Bird 5004-PC-MPR 30 Turf Poter (in Pop Up Plactic Picer Matched Precipitation Poter (MPP pozzlo) Arc	8	35	27'			UI SI	UNDERGROUND UTILITIES. SHOULD UTILITIES NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS THE CONTRAC SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
U	and Radius as per Symbol. 25 ft=red, 30 ft=green, $35$ ft=beige.						4. TI S	THE DESIGN PRESSURE FOR THE IRRIGATION SYSTEM IS 35 PSI AT THE FARTHEST ROTOR HEAD. REPORTED AVAILABLE STATIC PRESSURE IS 140 PSI. CONTRACTOR SHALL VERIFY THE AVAILABLE STATIC PRESSURE AND REPORT ANY
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY					5. IR	DISCREPANCIES TO THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT. IRRIGATION DESIGN IS DIAGRAMMATIC. PIPING, IRRIGATION VALVES AND OTHER IRRIGATION EQUIPMENT ARE OFTEN SHO
	Rain Bird LFV-100 1in. Low Flow DV Valve	2					FC BI	FOR CLARITY IN AREAS ADJACENT TO LOCATIONS WHERE THEY WILL BE INSTALLED. IRRIGATION LINES AND EQUIPMENT I BE SHOWN ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT, INSIDE BUILDINGS OR ACROSS PROPERTY LINES. THE CONTRACTOR SHALL PLACE ALL IRRIGATION ON PAVEMENT.
۲	Pipe Transition Point in Drip Box Pipe transition point from PVC lateral to drip tubing with riser in 6in. drip box.	10					6. IN	LINES, VALVES, ETC. IN PLANTING AREAS AND ON THE PROPERTY WHEN POSSIBLE. INSTALL A PRESSURE REGULATOR IF STATIC PRESSURE IN THE SERVICE LINE EXCEEDS THE IRRIGATION SYSTEM OPERATI DESIGN DRESSURE - SIZE AND INSTALL DRESSURE RECULATOR ACCORDING TO MANUFACTURED'S DECOMMENDATIONS
¢	Rain Bird MDCFPCAP Dripline Flush Valve purple cap in compression fitting coupler. For non-potable water use.	5					7. PI 01 8 TI	DESIGN PRESSURE. SIZE AND INSTALL PRESSURE REGULATOR ACCORDING TO MANUFACTORER'S RECOMMENDATIONS. PROTECT EXISTING TREES AND THEIR ROOT SYSTEMS. ROUTE IRRIGATION LINES AS NECESSARY TO MINIMIZE THE CUTTIN OF TREE ROOTS. THE CONTRACTOR SHALL CONDUCT WORK IN SUCH A MANNER TO PROTECT ALL SITE CONDITIONS AND UTILITIES TO BEM
Ø	Rain Bird ARV050 1/2in. Air Relief Valve, made of quality rust-proof materials, with a 6in. drip valve box (SEB 7XB emitter box). Use with installation below soil. The valve will allow air to escape the pipeline, thus preventing water hammer or blockage.	2					9. Ci 2. Ci 5. Ci 5. Ci	FROM DAMAGE. WHEN OCCURS, THE CONTRACTOR SHALL REPAIR THE DAMAGE AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUED WATERING OF ALL AREAS AFFECTED BY CONSTRUCTION. THIS CAN BE COMPLETED BY HAND WATERING, THE USE OF TEMPORARY IRRIGATION SYSTEMS, OR THE CONTINUED OPERATION EXISTING SYSTEMS NOT DISTURBED BY CONSTRUCTION.
+ + + + +	Area to Receive Drip Emitters	0.005 (					10. A	ALL LINE SIZES SHOWN ARE FOR IRRIGATION PIPE. SEE SPECIFICATIONS AND DETAILS FOR SLEEVE SIZES.
+ + + + + + + + + + + + + + + + + + + +	Rain Bird XB-PC Single Outlet, Pressure Compensating Drip Emitters. Flow rates of 0.5 GPH=blue, 1.0	9,835 s.t.					11. SI W	WIRES NOT SLEEVED SHALL FOLLOW MAINLINE AND BE BUNDLED EVERY 10 FEET.
+ + + + -	GPH=black, and 2.0 GPH=red. Comes with a self-piercing barb inlet x barb outlet.	160					12. IN 13. A	INSTALL MANUAL DRAINS AT ALL LOW POINTS ON THE MAINLINE. ADJUST ALL RADII ON SPRINKLERS TO NOT SPRAY ONTO BUILDINGS, WALLS, WALKS, SIGNS, OR FENCES,
	our o emiliers (2 assigned to each i gai plant)	102					14. L/	LANDSCAPE CONTRACTOR TO COORDINATE PLANT PLACEMENT WITH SPRINKLERS.
	05PC emitters (2 assigned to each 5 gal plant)	154					15. U 16. U	CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING PROPER COVERAGE OF ALL IRRIGATED AREAS. CONSOLIDATE TWO EXISTING CONTROLLERS INTO ONE AND USE EXISTING CONTROLLER. DEFINITION DECONFICURE AND ADJUST THE INDICATION SYSTEM TO PROVIDE 100% COVERACE IN THRE AREAS. THE INSTAL
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY					II. RI S'	SYSTEM SHALL NOT SPRAY ONTO BUILDINGS, WALLS, WALKS, SIGNS, OR FENCES.
$\bullet$	Existing Valve	5					18. TI C	THE IRRIGATION PIPING SHALL BE SIZED TO HAVE WATER SPEEDS UNDER FIVE FEET PER SECOND. NEW PIPING SHALL NO CAUSE WATER SPEEDS IN THE EXISTING PIPE SYSTEM TO EXCEED FIVE FEET PER SECOND. PIPING SHALL BE PLACED SO T
•	Rain Bird PEB 1in., 1-1/2in., 2in., 3in. Plastic Industrial Remote Control Valve. Low Flow Operating Capability, Globe Configuration.	4					TI LI 19. RI	THERE IS 12 INCHES OF COVER ON LATERAL LINES AND 18 INCHES OF COVER ON MAINLINES AND ROTOR CIRCUIT LATERA LINES. RECONNECT THE IRRIGATION CONTROL WIRES AS REQUIRED TO CREATE AN OPERATIONAL SYSTEM. PUT ALL WIRE SPLICE SPLICE BOXES OF IN REMOTE CONTROL BOXES.
	Rain Bird 44-NP 1in. Brass Quick-Coupling Valve, with Corrosion-Resistant Stainless Steel Spring, Locking Non-Potable Purple Rubber Cover, and 2-Piece Body.	1					20. RI 21. A	REUSE EXISTING WIRE AND ZONES WHERE POSSIBLE. CONTRACTOR TO PROVIDE RECORD DRAWINGS AND VALVE SCHEDU AVOID CUTTING ACROSS ROOTS WHEN INSTALLING ROOT WATERING SYSTEM FOR TREES. USE AIR TRENCHING WHEN
	Watts 2580B Pressure Reducing Valve Pressure required downstream is 40.3 PSI	1					22. SI	POSSIBLE. SEE SHEET L-501 FOR LANDSCAPE DETAILS.
С	Controller Combine existing controllers onto one system. Remove unused controller and return to owner.	1					VAL	_VE SCHEDULE
POC	Install meter before the backflow preventer - meter provided by owner						NUMBER	<u>A MODEL SIZE TYPE GPM WIRE PSI PSI@POC PRECIP</u>
Η̈́	Point of Connection 3"	1					1	Rain Bird PEB         1"         Bubbler         3         157.5         31.5         31.9         1.05 in/h           Dain Bird LEV 100         1"         Area for Drip Emitters         0.6         152.6         12.1         12.1         0.2 in/h
	Irrigation Lateral Line: PVC Schedule 40	1,666 l.f.					2 3 4	Rain Bird PEB         1"         Bubbler         6         33.9         33.1         33.1         1.05 in/h           Rain Bird LFV-100         1"         Area for Drip Emitters         2.03         36.8         13.4         13.4         0.23 in/h
	Irrigation Mainline: PVC Schedule 40	231.3 l.f.					5 6	Rain Bird PEB         1"         Turf Rotor         17.81         103.2         39.0         40.0         0.74 in/h           Rain Bird PEB         1"         Bubbler         3         106.9         31.5         31.6         1.06 in/h
	Pipe Sleeve: PVC Schedule 40	93.4 l.f.						
	Valve Callout							
# •	Valve Number							
│ #" │ # ● │ ──	Valve Flow							0 10 20 30 feet
	Valve Size							
PRES	SERVE AND PROTECT EXISTING HEADS, REPLACE PIPE WITH PVC 14,017 sf							SCALE: 1" = 10'
	4					5		6

![](_page_11_Picture_23.jpeg)

PROJECT # CHECKED BY

823291 J. CLEMENTS B. WRIGHT 08.09.2024

![](_page_11_Picture_26.jpeg)

![](_page_11_Picture_27.jpeg)

![](_page_12_Figure_0.jpeg)

![](_page_12_Figure_1.jpeg)

![](_page_12_Figure_4.jpeg)

—(10)

### 1 PAVING BRICK (TYP.) (2) VALVE BOX EXTENSION AS

- REQUIRED (3) SCH. 80 PVC SS T.O.E. NIPPLE (TYP.)
- (4) SCH. 80 TT90 (TYP.)
- 5 FINISH GRADE
- 6 RECTANGULAR HEAVY DUTY PLASTIC VALVE BOX
- (7) 24" COILED WIRE
- (8) REMOTE CONTROL VALVE
- (9) SCH. 80 PVC THREADED NIPPLE

(10) SCH. 80 PVC UNION

- 1 FINISH GRADE
- (2) 12" DIA. ROUND VALVE BOX
- 3 2" CLASS 200 PVC SLEEVE
- 4 10 MIL. BLACK PLASTIC
- 5 MARLEX STREET ELL
- 6 1 CU. FT. GRAVEL SUMP
- (7) 3/4" SCH. 80 PVC THREADED
- NIPPLE
- (8) MAINLINE
- 9 TEE IN MAINLINE
- (10) CAP
- (12) 3/4" ELBOW
- (1) 3/4" BRASS BALL VALVE

P-8-DFC-BRIG-19

P-8-DFC-BRIG-18

![](_page_12_Figure_34.jpeg)

**B**3

## 1) 10" DIA. ROUND VALVE BOX 2 FINISH GRADE AS REQUIRED 4) BRICK PAVERS (TYP.) 5 TOE NIPPLE (TYP.) 6) 3/4" ROCK 7) PVC SCH. 80 UNION. SIZE AS REQUIRED (TYP.)

- (8) CLOSE NIPPLE (TYP.) (9) THREADED GATE VALVE 10 PVC MAINLINE

![](_page_12_Figure_40.jpeg)

![](_page_12_Figure_41.jpeg)

A3

(3)—

5

GEAR ROTOR

(2)----

4

-6

4

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