# R PARK PHASE 1 ROELAND PARK, KANSAS PAVILION AND **RESTROOM IMPROVEMENTS** CONSTRUCTION DOCUMENTS

# **INDEX OF SHEETS** <u>SHEET</u> <u>TITLE</u> CO COVER SHEET C1 CIVIL SITE PLAN C2 EXISTING CONDITIONS / DEMOLITION PLAN C3 EROSION CONTROL PLAN C4 LAYOUT PLAN C5GRADING PLAN C6 UTILITY PLAN C7 SANITARY SEWER SERVICE CONNECTION PLAN C8 SITE DETAILS C9 EROSION CONTROL DETAILS C10 CIVIL SPECIFICATIONS C11 CIVIL SPECIFICATIONS C12 CIVIL SPECIFICATIONS G1 ALTERNATES PLAN Α1 FLOOR PLAN (PAVILION) Α2 REFLECTED CEILING PLAN (PAVILION) FLOOR PLAN (RESTROOMS) ROOF PLANS A5 EXTERIOR ELEVATIONS BUILDING SECTIONS SECTIONS, INTERIOR ELEVATIONS AND DETAILS STRUCTURAL DETAILS STRUCTURAL DETAILS STRUCTURAL DETAILS STRUCTURAL DETAILS STRUCTURAL NOTES STRUCTURAL SPECIFICATIONS STRUCTURAL SPECIFICATIONS STRUCTURAL SPECIFICATIONS RENDERINGS (PAVILION) RENDERINGS (PAVILION) RENDERINGS (PAVILION) RENDERINGS (RESTROOMS) RENDERINGS (PAVILION) (NO ALTERATIONS) SYMBOLS AND ABBREVIATIONS - MECH./ELEC. SITE PLAN - MECH./ELEC. SCHEDULES & DETAILS – MECH./ELEC. SPECIFICATIONS - MECHANICAL/ELECTRICAL SPECIFICATIONS – MECHANICAL/ELECTRICAL SPECIFICATIONS – MECHANICAL/ELECTRICAL FLOOR PLAN (RESTROOM) - PLUMBING FLOOR PLAN (PAVILION) - ELECTRICAL FLOOR PLAN (RESTROOM) — ELECTRICAL E3 SCHEDULES & DETAILS - ELECTRICAL L1 PAVILION AND RESTROOM PLANTING PLAN



# UTILITY CONTACTS

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BENCHMARK A "X" CUT IN TOP CENTER OF CURB INLET AT EAST END OF W. 55TH TERRACE. ELEV.=973.77

BENCHMARK B SQUARE CUT IN TOP OF WEST CURB OF JUNIPER STREET DUE EAST OF 5522 JUNIPER STREET. ELEV.=972.69



<u>LEGEND</u>

ASPHALT REMOVAL

GRAVEL REMOVAL

TEMPORARY TOILET REMOVAL

CURB REMOVAL





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SANITARY SEWER NOTES:

- 1. SANITARY SEWER SERVICE LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT JCW SERVICE LINE DESIGN AND CONSTRUCTION STANDARDS.
- 2. ROOF DRAINS AND FOUNDATION DRAINS SHALL NOT BE CONNECTED TO SANITARY SEWER.
- 3. BMP'S ARE NOT REQUIRED BY THE CITY OF ROELAND PARK AND WILL NOT BE PROVIDED FOR THIS PROJECT.
- CONTRACTOR TO RECORD SEWER CLEAN OUT LOCATIONS FROM 2 FIXED POINTS FOR FUTURE LOCATING.

RESTROOM FINISHED FLOOR EL.=973.50 SERVICE LINE OUT OF BUILDING = 969.50

INSTALL SERVICE LINE AT 3% SLOPE

- **S1** CONNECT TO SANITARY SERVICE STUB EL.= 966.64
- \$2 EL.= 966.90
- \$3 EL.= 969.14

CLEAN OUT TOP ELEVATIONS

- (C1) EL.= 973.60
- C2 EL.= 973.40

KANSAS ONE-CALL

![](_page_7_Picture_16.jpeg)

KNOW WHAT'S BELOW CALL BEFORE YOU DIG.

ALL UTILITIES ARE SHOWN BASED ON THE INFORMATION AVAILABLE TO THE ENGINEER. THERE IS NO GUARANTEE ALL FACILITIES ARE SHOWN OR THAT THE LOCATION, DEPTH, AND SIZE OF EACH FACILITY IS CORRECT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES AND SERVICE LINES PRIOR TO CONSTRUCTION. COORDINATE NECESSARY RELOCATIONS WITH UTILITY COMPANIES.

# UTILITY CONTACTS

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![](_page_7_Figure_26.jpeg)

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![](_page_7_Figure_36.jpeg)

![](_page_8_Figure_0.jpeg)

PRECAST CONCRETE WHEEL STOP

![](_page_8_Figure_5.jpeg)

![](_page_8_Figure_6.jpeg)

![](_page_8_Figure_7.jpeg)

VARIES SEE PLANS

STANDARD SIDEWALK

VARIES SEE PLANS

- NOTES: 1. TYPE "A" JOINT SPACING 4'-0" CENTER TO CENTER ON WIDTH ALONG SIDEWALK. 5'-0" ON 5' WIDE SIDEWALKS.
- 2. TYPE "B" JOINTS WHERE WALK ABUTS JUNCTION OF EXISTING WALK, CONCRETE CURBS. DRIVEWAYS, AND SIMILAR STRUCTURES, AND 250' CENTERS MAXIMUM.

![](_page_8_Figure_12.jpeg)

NEW SIDEWALK EXISTING SIDEWALK OR EXISTING DRIVE APRON

NEW TO EXISTING SIDEWALK

![](_page_9_Figure_0.jpeg)

# <u>DEMOLITION</u>

- 1. DEMOLISH ABOVE-GRADE STRUCTURES AND IMPROVEMENTS, GRADE-LEVEL SITE IMPROVEMENTS, AND BELOW-GRADE FOUNDATIONS, IMPROVEMENTS AND OBSTRUCTIONS TO DEPTH TO AVOID CONFLICT WITH NEW CONSTRUCTION OR SITEWORK. REMOVE HOLLOW ITEMS WHICH COULD COLLAPSE.
- 2. REMOVE AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS OFF-SITE PROTECT SITEWORK AND ADJACENT STRUCTURES.
- 4. COORDINATE DISCONNECTION, CAPPING AND REMOVAL OF UTILITIES.
- 5. ERECT BARRIERS, FENCES, GUARD RAILS, ENCLOSURES, CHUTES, AND SHORING TO PROTECT PERSONNEL, STRUCTURES, AND UTILITIES REMAINING INTACT.
- 6. PROTECT DESIGNATED TREES AND PLANTS FROM DAMAGE.
- 7. ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, DRIVEWAYS, SIDEWALKS, AND ADJACENT FACILITIES.
- 8. DO NOT CLOSE OR OBSTRUCT STREETS, SIDEWALKS, ALLEYS OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION.
- 9. IF REQUIRED BY GOVERNING AUTHORITIES, PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC
- 10. PLACE FILL IN LIFTS NOT EXCEEDING 12-INCHES AND COMPACT TO DENSITY NOT LESS THAN ADJACENT SOIL.
- 11. GRADE SURFACE TO ADJACENT CONTOURS AND SLOPE TO DRAIN. 12. REMOVE DEMOLITION DEBRIS DAILY.
- 13. DO NOT STORE OR BURN MATERIALS ONSITE. 14. TRANSPORT DEMOLITION DEBRIS TO AN OFFSITE DISPOSAL AREA.

# CLEARING AND GRUBBING

- 1. CLEAR AND GRUB TREES, STUMPS, VEGETATION, DEBRIS, RUBBISH, AND DESIGNATED IMPROVEMENTS FROM SITE. 2. PROTECT TREES, LANDSCAPING, SITE IMPROVEMENTS, AND OTHER ITEMS NOT SCHEDULED FOR CLEARING, OR THAT MIGHT BE DAMAGED BY CONSTRUCTION ACTIVITIES.
- 3. STRIP TOPSOIL AND STOCKPILE AT APPROVED LOCATION ONSITE.
- 4. PROVIDE TEMPORARY EROSION AND DUST CONTROL. 5. DO NOT DISTURB BENCHMARKS OR MONUMENTS.
- 6. INVESTIGATE THE SITE AND LOCATE ALL OBJECTS TO BE REMOVED OR PROTECTED
- 7. LOCATE ALL EXISTING UTILITY AND PIPE LINES AND DETERMINE THE STATUS OF EACH.
- 8. RELOCATE ALL EXISTING PIPING THAT MUST REMAIN IN SERVICE BUT CONFLICTS WITH NEW CONSTRUCTION. 9. THE ENGINEER WILL DESIGNATE ALL TREES, SHRUBS AND PLANTS WITHIN THE CONSTRUCTION LIMITS THAT ARE TO REMAIN. ALL OTHER VEGETATION WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED AND DISPOSED OF PROPERLY.
- 10. PREVENT DAMAGE TO EXISTING IMPROVEMENTS INDICATED TO REMAIN, INCLUDING IMPROVEMENTS ON AND OFF SITE. PROTECT EXISTING TREES AND VEGETATION INDICATED TO REMAIN. DO NOT STOCKPILE MATERIALS WITHIN DRIP LINE OF TREES. PROVIDE AND MAINTAIN TEMPORARY GUARDS TO ENCIRCLE TREES OR GROUPS OF TREES; OBTAIN APPROVAL BEFORE BEGINNING WORK.
- 11. COMPLETE REMOVE ALL IMPROVEMENTS INCLUDING STUMPS AND DEBRIS EXCEPT FOR THOSE INDICATED TO REMAIN. REMOVE BELOW GRADE IMPROVEMENTS AT LEAST 12 INCHES BELOW FINISH GRADE AND TO THE EXTENT NECESSARY TO NOT INTERFERE WITH NEW CONSTRUCTION. REMOVE ABANDONED MECHANICAL AND ELECTRICAL WORK AS REQUIRED.
- 12. BLASTING WILL NOT BE ALLOWED.
- 13. GRUBBING SHALL CONSIST OF THE REMOVAL OF ALL STUMPS, ROOTS, BURIED LOGS, FOUNDATIONS, DRAINAGE STRUCTURES, ABANDONED WATER WELLS AND OTHER OBJECTIONABLE MATERIALS BELOW THE GROUND SURFACE. ALL TAP ROOTS, LATERAL ROOTS OR OTHER PROJECTS OVER 2 INCHES IN DIAMETER SHALL BE REMOVED TO A DEPTH
- OF 2 FEET BELOW THE NATURAL GROUND SURFACE. 14. ALL HOLES CAUSED BY GRUBBING OPERATIONS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH THE APPLICABLE PROVISION OF SECTION 02200 AND TO THE LEVEL OF THE SURROUNDING GROUND SURFACE. 15. BURNING WILL NOT BE ALLOWED.
- 16. PAVEMENTS, ABANDONED SEWERS, PIPE LINES, OR OTHER OBSTRUCTIONS TO THE PROJECT CONSTRUCTION WITHIN THE CONSTRUCTION LIMITS OR STREET RIGHT-OF-WAY NOT DESIGNATED OR PERMITTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AWAY FROM THE SITE OF THE WORK.
- 17. IN REMOVING PAVEMENT, CURB, CURB AND GUTTER, GUTTERS, SIDEWALK, AND OTHER SIMILAR IMPROVEMENTS, AND WHERE A PORTION OF SUCH IMPROVEMENTS ARE TO BE LEFT IN PLACE, THEY SHALL BE REMOVED TO AN EXISTING JOINT OR TO A JOINT SAWED TO A MINIMUM DEPTH OF 1 INCH WITH A TRUE LINE AND VERTICAL FACE. SUFFICIENT REMOVAL SHALL BE MADE TO PROVIDE FOR PROPER GRADE AND CONNECTIONS IN THE NEW WORK REGARDLESS OF ANY LIMITS WHICH MAY BE INDICATED ON THE PLANS.

# UTILITY LINE ADJUSTMENTS

- 1. WHERE THE LOCATIONS OR GRADES OF ITEMS DESCRIBED ARE SHOWN ON THE PLANS, THE INFORMATION IS CONSIDERED APPROXIMATE ONLY, AND NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS THEREOF. IT IS ANTICIPATED THAT UNKNOWN ITEMS NOT SHOWN ON THE PLANS WILL ALSO BE UNCOVERED DURING EXCAVATION AND SHALL REQUIRE ADJUSTMENT AS SPECIFIED HEREIN.
- 2. RELOCATIONS OR ADJUSTMENTS TO FACILITIES OWNED BY PRIVATE UTILITIES LOCATED WITHIN CITY RIGHT-OF-WAY WILL BE ACCOMPLISHED BY THE UTILITY COMPANY AT NO COST TO THE CONTRACTOR. 3. THE CONTRACTOR WILL ENDEAVOR TO HAVE ALL NECESSARY ADJUSTMENTS OR RELOCATIONS OF PUBLIC OR PRIVATE
- UTILITY FACILITIES IN DIRECT CONFLICT WITH THE PROPOSED IMPROVEMENTS, AS SOON AS PRACTICABLE. SUCH ADJUSTMENTS OR RELOCATIONS WILL BE MADE AT NO COST TO THE CONTRACTOR. SOME ADJUSTMENTS OR RELOCATIONS MAY BE COMPLETED BEFORE THE CONTRACTOR PROGRESSES TO THE POINT AFFECTED. UNDER SOME CIRCUMSTANCES, HOWEVER, SUCH ADJUSTMENTS OR RELOCATIONS MAY HAVE TO BE PERFORMED DURING THE CONTRACTOR'S CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THAT OF THE UTILITY OWNERS OR THEIR CONTRACTORS SO AS TO CAUSE THE LEAST POSSIBLE DELAY IN WORK.

# EXCAVATION, BACKFILL, AND SITE GRADING

- EXCAVATIONS AND EMBANKMENTS SHALL BE CONSTRUCTED TO THE LINES AND GRADES INDICATED UNLESS OTHERWISE
- DIRECTED. 2. FINAL GRADES SHALL BE WITHIN ONE-HALF (1/2") INCH OF INDICATED ELEVATIONS. HORIZONTAL ALIGNMENTS SHALL
- BE WITHIN 3 INCHES OF THEORETICAL LOCATION. 3. FINISHED SURFACES SHALL BE BLADED AND ALIGNED TO PRESENT A NEAT AND UNIFORM APPEARANCE.

# FILL MATERIALS

- 4. FILL MATERIALS SHALL BE OBTAINED FROM APPROVED BORROW SOURCES.
- 5. FILL MATERIAL SHALL BE FREE OF TRASH, DEBRIS, CINDERS, ORGANIC MATTER OR OTHER DELETERIOUS MATERIALS. 6. CONTROLLED STRUCTURAL FILL MATERIAL: SOIL: SOIL FILL MATERIAL SHALL BE CLAY SOILS OF MEDIUM TO LOW PLASTICITY (CL) NON-FROST SUSCEPTIBLE. WITH A LIQUID LIMIT LESS THAN 45 PERCENT. A PLASTICITY INDEX LESS THAN 20 AND CONTAINING LESS THAN 10 PERCENT SHALE, OR ROCK PARTICLES LARGER THAN 3 INCHES IN GREATEST DIMENSION. CRUSHED STONE: CRUSHED STONE SHALL BE WASHED CLEAN, FREE-DRAINING, DURABLE CRUSHED ROCK WITH THE FOLLOWING GRADATION LIMITS:

<u>VE SIZE</u>	PERCENT PASSING
I INCH	100%
¾ INCH	90%
12 INCH	60-70%
⅔ INCH	15-25%
#4	0-5%

7. NON-STRUCTURAL FILL MATERIAL:

<u>SIE</u>

SOIL: NON-STRUCTURAL FILL MATERIAL MAY BE CLAY SOILS OF MEDIUM TO LOW PLASTICITY (CL OR ML) NON-FROST SUSCEPTIBLE EXCAVATED FROM SITE OR BORROW AREA.

<u>TOPSOIL</u>

8. TOPSOIL SHALL CONSIST OF FERTILE, FRIABLE LOAMY SOIL OF UNIFORM QUALITY, FREE FROM SUBSOIL, HARD CLODS, STIFF CLAY, HARD PAN, STONES, CRUSHED ROCK AND OTHER SIMILAR IMPURITIES. TOPSOIL SHALL BE FREE FROM GRASS, ROOTS, WEEDS AND OTHER MATERIALS HARMFUL TO PLANT LIFE OR WHICH WILL PREVENT FORMATION OF SUITABLE SEED BED. TOPSOIL DEPTH SHALL BE MINIMUM OF SIX (6) INCHES.

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MANNER

<u>GENERAL</u>

- EMBANKMENTS.

- SITE GRADING

- EXCESSIVE VIBRATION

# BORROW MATERIAL

- BE APPROVED.

9. EXCAVATION IS UNCLASSIFIED AND INCLUDES EXCAVATION TO SUBGRADE REGARDLESS OF MATERIALS ENCOUNTERED. REPAIR EXCAVATIONS BEYOND ELEVATIONS AND DIMENSIONS INDICATED. 10. DO NOT PERFORM WORK WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER IF SUBGRADE MATERIAL IS UNSUITABLE FOR INTENDED USE.

11. MAINTAIN STABILITY OF EXCAVATIONS; COORDINATE SHORING AND BRACING AS REQUIRED BY AUTHORITIES HAVING JURISDICTION. PREVENT SURFACE AND SUBSURFACE WATER FROM ACCUMULATING IN EXCAVATIONS. STOCKPILE SATISFACTORY MATERIALS FOR REUSE, ALLOW FOR PROPER DRAINAGE AND DO NOT STOCKPILE MATERIALS WITHIN DRIP LINE OF REMAINING TREES.

12. COMPACT MATERIALS AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 BY AERATION OR WETTING. 13. PLACE ACCEPTABLE MATERIALS IN LAYERS NOT MORE THAN 8 INCHES LOOSE DEPTH FOR MATERIALS COMPACTED BY HEAVY EQUIPMENT AND NOT MORE THAN 4 INCHES LOOSE DEPTH FOR MATERIALS COMPACTED BY HAND EQUIPMENT. 14. GRADE TO WITHIN ONE-HALF INCH (1/2") INCH ABOVE OR BELOW REQUIRED SUBGRADE AND WITHIN A TOLERANCE OF ONE-HALF INCH (1/2") INCH IN TEN (10) FEET.

15. PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. RE-COMPACT AND RE-GRADE SETTLED, DISTURBED AND DAMAGED AREAS AS NECESSARY TO RESTORE QUALITY, APPEARANCE, AND CONDITION OF WORK. 16. CONTROL EROSION AND WIND-BLOWN DUST. DISPOSE OF WASTE AND UNSUITABLE MATERIALS OFF SITE IN A LEGAL

17. THE SOILS AT THE SITE WILL BE SUSCEPTIBLE TO DISTURBANCE DUE TO CONSTRUCTION ACTIVITY AND WATER SEEPAGE. CARE SHALL BE TAKEN DURING EXCAVATION AND CONSTRUCTION OF THE STRUCTURES TO MINIMIZE DISTURBANCE TO THE BEARING SOILS. THE BASE OF ALL EXCAVATIONS SHALL BE FREE OF WATER AND LOOSE SOIL PRIOR TO PLACING CONCRETE. CONCRETE SHALL BE PLACED AS SOON AS POSSIBLE AFTER EXCAVATION. 18. REMOVE ALL RUBBISH, TRASH, DEBRIS, STONES, CONCRETE WASTE, CRUSHED ROCK AND SAND POCKETS FROM SITE.

# <u>ARATION</u>

RIPPING IN THE BUILDING AND FILL EMBANKMENT AREAS AND PAVED AREAS SHALL INCLUDE THE REMOVAL OF TION, TOPSOIL, AND ANY OTHER SOFT, LOOSE OR UNSUITABLE MATERIALS. STRIPPING DEPTHS OF SIX-INCHES TO 12 INCHES MINIMUM SHOULD BE EXPECTED OVER THE SITE. STRIPPED TOPSOIL SHALL BE STOCKPILED FOR JSE AS SURFACE DRESSING IN LANDSCAPED AREAS.

ROOT SYSTEMS OF TREES SHALL BE THOROUGHLY REMOVED FROM THE BUILDING AREAS AND TO A MINIMUM OF TWO (2) FEET BELOW PAVEMENT SUBGRADES.

# EXCAVATION FOR STRUCTURES

21. PERFORM ALL EXCAVATION TO THE DIMENSIONS AND ELEVATIONS INDICATED. ALL EXCAVATION SHALL BE UNCLASSIFIED AND INCLUDES THE REMOVAL AND SUBSEQUENT HANDLING AND DISPOSAL OF ALL MATERIALS EXCAVATED REGARDLESS OF THE COMPOSITION OR CONDITION THEREOF.

22. DO NOT EXCAVATE BELOW ELEVATIONS OR DEPTH INDICATED UNLESS DIRECTED BY THE ENGINEER. WHERE EXCAVATIONS ARE MADE BELOW INDICATED DEPTHS OR ELEVATIONS WITHOUT AUTHORIZATION, THE EXCAVATION SHALL BE RESTORED TO THE PROPER GRADE WITH LEAN CONCRETE AT NO ADDITIONAL COST TO THE OWNER. 23. EXCAVATIONS SHALL EXTEND A SUFFICIENT DISTANCE FROM WALLS AND FOOTINGS TO PROVIDE ROOM FOR FORMS, INSTALLATION OF SERVICES, AND INSPECTION. FOOTINGS OR WALLS SHALL NOT BE POURED DIRECTLY AGAINST

EXCAVATED SURFACES UNLESS AUTHORIZED BY THE ENGINEER. 24. ALL EXISTING STRUCTURES, FOUNDATIONS AND RELATED ITEMS OR OTHER SUBSURFACE STRUCTURES ALONG WITH ANY POORLY COMPACTED FILL SHALL BE REMOVED WITHIN THE BUILDING CONSTRUCTION LIMITS TO A DISTANCE OF 5'-O" MINIMUM OUTSIDE THE BUILDING LIMITS.

25. THE OVER-EXCAVATION SHALL EXTEND DOWN TO THE UNDERLYING NATURAL LEAN CLAY SOILS. ANY LOW DENSITY, SOFT OR UNSUITABLE MATERIAL SHALL BE REMOVED. 26. THE SIDE SLOPES OF EXCAVATIONS WILL NEED TO BE BRACED OR SLOPED BACK AS REQUIRED FOR STABILITY AND IN

ACCORDANCE WITH APPLICABLE SAFETY REGULATIONS. EXCAVATION EQUIPMENT AND EXCAVATED MATERIALS SHALL BE KEPT AWAY FROM THE EXCAVATION SIDE SLOPES. AREAS AROUND EXCAVATION SHALL BE GRADED TO KEEP SURFACE WATER FROM ENTERING THE EXCAVATION.

27. BACKFILLING SHALL NOT BE PERFORMED UNTIL THE WORK IS INSPECTED AND ALL TESTING IS COMPLETED AND THE ENGINEER'S APPROVAL OBTAINED.

# SUBGRADE PREPARATION AND STABILIZATION

28. SUBGRADES FOR CONCRETE STRUCTURES, FLOOR SLABS, AND PAVEMENTS, SHALL BE FIRM, DENSE, AND PROPERLY COMPACTED IN ACCORDANCE WITH APPLICABLE SPECIFICATION REQUIREMENTS. ALL SUBGRADES SHALL BE SUFFICIENTLY STABLE TO REMAIN FIRM AND INTACT UNDER CONSTRUCTION TRAFFIC.

29. EXCESSIVELY DRY SUBGRADES SHALL BE SCARIFIED AND MOISTENED TO WITHIN SPECIFICATION LIMITS AND RE-COMPACTED PRIOR TO PLACEMENT OF FOOTINGS, SLABS OR PAVEMENTS.

30. SUBGRADE SOILS WHICH HAVE BECOME EXCESSIVELY WET AND MUCKY SHALL BE REMOVED. FREE DRAINING CRUSHED STONE OR GRAVEL SHALL BE USED TO BRING GRADE UP TO THE BOTTOM OF SLABS. THIS MATERIAL SHALL BE

COMPACTED AS IT IS PLACED. 31. PRIOR TO PLACEMENT OF FILL MATERIAL, THE SUBGRADE SHALL BE SCARIFIED TO A DEPTH OF 8 INCHES AND RE-COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698. AREAS WHICH CANNOT BE RE-COMPACTED TO THIS DEGREE SHALL BE UNDERCUT AND REPLACED WITH STABLE MATERIAL. CARE SHALL BE TAKEN TO MAINTAIN THE PREPARED CONDITION OF THE SUBGRADES PRIOR TO CONSTRUCTION. IF THE SUBGRADES BECOME SATURATED, FROZEN, OR DISTURBED, THEY SHALL BE REWORKED PRIOR TO CONSTRUCTION.

# BACKFILL FOR STRUCTURES

32. BACKFILL STRUCTURES ONLY AFTER CONCRETE HAS ATTAINED SUFFICIENT STRENGTH BASED ON LABORATORY RESULTS FROM CONCRETE CYLINDER BREAKS.

33. REMOVE ALL FORMS, TRASH, DEBRIS AND OTHER UNSUITABLE MATERIALS BEFORE BACKFILLING. 34. SUIL BACKFILL SHALL BE PLACED IN LOOSE LAYERS NOT EXCEEDING 8 INCHES IN DEPTH AND COMPACTED BY MECHANICAL TAMPERS OR ROLLERS.

35. COMPACTION MOISTURE CONTENT SHALL BE SUITABLE FOR GOOD COMPACTION, BUT NOT LESS THAN 3 PERCENT BELOW OR MORE THAN 3 PERCENT ABOVE OPTIMUM MOISTURE AS DETERMINED BY ASTM D698. 36. PERVIOUS BACKFILL SHALL BE PLACED IN LEVEL LAYERS WITH A LOOSE DEPTH NOT EXCEEDING 8 INCHES. COMPACT WITH VIBRATORY ROLLERS OR VIBRATING PLATE COMPACTING EQUIPMENT ADEQUATE TO REACH SPECIFIED DENSITY WITH

A REASONABLE NUMBER OF PASSES. FLOODING OR JETTING TO COMPACT PERVIOUS BACKFILL IS PROHIBITED. PROTECT STRUCTURES FROM DAMAGE DUE TO EXCESSIVE VIBRATION. 37. COMPACT BACKFILL UNDER STRUCTURES, FLOORS, CONCRETE SLABS ON GRADE, AND PAVEMENTS TO A MINIMUM OF

95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698. ALL OTHER BACKFILL SHALL BE COMPACTED TO 90 PERCENT OF MAXIMUM DENSITY. 38. BACKFILLING AND CONSTRUCTION OF FILLS AND EMBANKMENTS DURING FREEZING WEATHER SHALL NOT BE PERMITTED

EXCEPT BY PERMISSION OF THE ENGINEER. NO BACKFILL, FILL OR EMBANKMENT MATERIALS SHALL BE INSTALLED ON FROZEN SURFACES NOR SHALL FROZEN MATERIALS, SNOW OR ICE BE PLACED IN ANY BACKFILL, FILL OR

# EMBANKMENTS AND AREA FILL

39. STRIP ALL AREAS TO RECEIVE COMPACTED FILL, OF TOPSOIL, ORGANIC OR EXCESSIVELY WET SOIL OR OTHER UNSUITABLE SOILS PRIOR TO PLACING FILL. STOCKPILE TOPSOIL AND OTHER USABLE MATERIALS FOR REUSE IN FINAL

40. PLACE APPROVED FILL MATERIALS IN UNIFORM LAYERS NOT EXCEEDING EIGHT (8 ") INCHES IN LOOSE THICKNESS. COMPACT WITH SUITABLE EQUIPMENT TO A MINIMUM OF 90 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698. MOISTURE CONTENT SHALL BE SUITABLE FOR GOOD COMPACTION BUT NOT LESS THAN 3 PERCENT BELOW OR MORE THAN 3 PERCENT ABOVE OPTIMUM MOISTURE AS DETERMINED BY ASTM D698. 41. AFTER FINAL FINISH ROLLING AND BLADING, THE SURFACE SHALL BE SMOOTH AND EVEN AND WILL CONFORM TO THE INDICATED LINES AND GRADES WITHIN SPECIFIED TOLERANCES.

# FILL UNDER STRUCTURES, FLOORS AND SLABS

42. STRIP ALL AREAS TO RECEIVE COMPACTED FILL, OF TOPSOIL, ORGANIC OR EXCESSIVELY WET SOIL OR OTHER

UNSUITABLE SOILS PRIOR TO PLACING FILL. 43. SOIL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING EIGHT (8) INCHES IN DEPTH AND COMPACTED BY MECHANICAL TAMPERS OR ROLLERS.

44. PERVIOUS MATERIAL SHALL BE PLACED IN LEVEL LAYERS WITH A LOOSE DEPTH NOT EXCEEDING 8 INCHES. COMPACT WITH VIBRATORY ROLLERS OR VIBRATING PLATE COMPACTING EQUIPMENT ADEQUATE TO REACH SPECIFIED DENSITY. FLOODING OR JETTING TO COMPACT PERVIOUS FILL IS PROHIBITED. PROTECT STRUCTURES FROM DAMAGE DUE TO

45. COMPACT FILLED AREAS UNDER FOOTINGS, BASE SLAB, FLOOR SLABS AND PAVEMENT TO A MINIMUM DENSITY OF 95 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698. MOISTURE CONTENT AT TIME OF COMPACTION SHALL NOT BE LESS THAN 3 PERCENT BELOW OR 3 PERCENT ABOVE OPTIMUM MOISTURE AS DETERMINED BY ASTM D698.

46. IF BORROW MATERIAL IS REQUIRED, THE CONTRACTOR SHALL SUPPLY THIS MATERIAL FROM A BORROW AREA OFF THE SITE. THE BORROW AREA SHALL BE OBTAINED BY THE CONTRACTOR AT HIS SOLE EXPENSE. BORROW MATERIALS SHALL BE APPROVED BY THE ENGINEER BEFORE THEY ARE TRANSPORTED TO THE SITE OF THE PROJECT. ONE BORROW SITE WILL BE INSPECTED FOR APPROVAL AT NO COST TO THE CONTRACTOR. IF HE WISHES OR NEEDS TO USE ADDITIONAL SITES, TESTING OF SUCH SITES SHALL BE AT HIS SOLE COST. 47. MATERIALS SHALL BE SIMILAR TO SOILS FOUND ON THE PROJECT. SOILS SHOWING HIGH SWELL POTENTIALS WILL NOT

48. CONTROL GRADING IN VICINITY OF EXCAVATIONS TO PREVENT EXCESS SURFACE DRAINAGE FROM RUNNING INTO EXCAVATIONS. REMOVE WATER PROMPTLY TO AVOID SOFTENING OF SUBGRADE SOILS. 49. PROVIDE FOR REMOVAL OF SEEPAGE OR GROUND WATER FROM EXCAVATIONS BY PUMPING FROM SUMPS OR OTHER APPROPRIATE MEANS.

50. EXCAVATIONS SHALL BE KEPT DRY DURING SUBGRADE PREPARATION AND CONTINUALLY THEREAFTER UNTIL CONSTRUCTION IS COMPLETE. TO THE EXTENT THAT NO DAMAGE FROM HYDROSTATIC PRESSURE, FLOTATION OR OTHER CAUSES WILL RESULT.

## SHORING AND BRACING

51. ADEQUATE SHORING AND BRACING SHALL BE PROVIDED TO PROTECT AND MAINTAIN THE STABILITY OF EXISTING STRUCTURES AND FACILITIES AND PREVENT SLIDING OF THE SIDES OF EXCAVATIONS, UNTIL THEY ARE BACKFILLED 52. SHEETING, BRACING AND SHORING SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND ALL EARTH AND EQUIPMENT LOADS AND SHALL REMAIN RIGID AND MAINTAIN SHAPE AND POSITION UNDER ALL CIRCUMSTANCES. 53. AVOID HAZARDOUS AND DANGEROUS CONDITIONS. MAINTAIN SAFETY OF PERSONNEL AND EXISTING WORK AT ALL TIMES.

# WASTE FILL

54. ANY EXTRA FILL MATERIAL PRODUCED BY THE EARTHWORK FOR THIS PROJECT AND NOT REQUIRED FOR THE CONSTRUCTION OF THE PROJECT SHALL BE DISPOSED OF OFF THE SITE OF THE WORK BY AND AT THE EXPENSE OF THE CONTRACTOR. ARRANGEMENTS FOR WASTE FILL SITES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

# <u>GRADING</u>

55. ROUGH GRADE: GRADE ENTIRE AREA AS INDICATED BY FINISH CONTOURS. GRADING SHALL BE PERFORMED TO PROVIDE UNIFORM APPEARING SURFACE THAT WILL DRAIN ALL SURFACE WATER. OBTAIN APPROVAL BY ENGINEER. 56. TOPSOIL: SUBSOIL SHALL BE SCARIFIED TO A TWO (2) INCH DEPTH FOR BONDING OF TOPSOIL WITH SUBSOIL. SPREAD TOPSOIL OVER ALL GRADED AREA TO A DEPTH OF SIX (6) INCHES. EXISTING TOPSOIL MAY HAVE TO BE SUPPLEMENTED BY HAULED-IN MATERIAL AS REQUIRED. 57. FINE GRADE: FINE GRADE SITE USING LIGHT ROLLER AND DRAG TO LEAVE SURFACE IN CONDITION FOR SODDING. FINISH

GRADE SHALL BE ONE (1) INCH BELOW ALL PAVEMENT UNLESS OTHERWISE SPECIFIED. REPAIR ERODED AREAS AT TIME OF PROJECT ACCEPTANCE BY THE OWNER.

# ROCK EXCAVATION

58. GENERAL: SHOULD ROCK BE ENCOUNTERED IN TWO OR MORE LEDGES, EACH LEDGE BEING MORE THAN 6 INCHES THICK AND WITH INTERLYING STRATA OF EARTH CLAY, SHALE, OR GRAVEL NOT MORE THAN 12 INCHES THICK IN EACH STRATUM, THE ENTIRE VOLUME BETWEEN THE TOP LEDGE AND BOTTOM OF THE BOTTOM LEDGE WILL BE CLASSIFIED AS ROCK. 59. DEFINITION: ROCK IS DEFINED AS BEING SANDSTONE, LIMESTONE, CHERT, GRANITE, SILL STONE, QUARTZITE, SLATE OR SHALE, OCCURRING IN ITS NATURAL UNDISTURBED STATE, HARD AND UN-WEATHERED OR SIMILAR MATERIAL IN MASSES MORE THAN 11/2 CUBIC YARDS IN VOLUME, IN LEDGES SIX (6) INCHES MORE IN THICKNESS.

# EROSION CONTROL

- NECESSARY THROUGHOUT CONSTRUCTION TO CONTROL SEDIMENT.
- COMPLETE. SEEDING SHALL INCLUDE STRAW AND MULCH.
- STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

# SEDIMENT FENCE MATERIALS

- MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120F.
- FARRIC MESH SPACING OF 6 INCHES.
- 8. FABRIC SPECIFICATIONS:

PHYSICAL PROPERTY FILTER EFFICIENCY

# MAINTENANCE:

- IMMEDIATELY.
- OF THE FENCE HEIGHT.
- BEEN PROPERTY STABILIZED.

# AGGREGATE FOR BASE

- WITH THE ABOVE MATERIAL SPECIFICATION.
- FOR HIGHWAY CONSTRUCTION. EXCEPT AS OTHERWISE MODIFIED HEREIN.

- THE MOISTURE CONTENT AS DIRECTED BY THE ENGINEER.

# COMPACTED SUBGRADE

- TO ACCOMPLISH THE COMPACTION.
- 3. FILLING AND COMPACTING OPERATIONS SHALL CONTINUE ALTERNATELY UNTIL THE FILL CONFORMS WITH THE LINES, GRADES, AND TYPICAL CROSS-SECTIONS SHOWN ON THE APPROVED DRAWINGS.

# COMPACTION IN FILL SECTIONS

- GIVEN MATERIAL
- PNEUMATIC-TIRED ROLLER. EACH LIFT SHALL BE ROLLED UNTIL NO FURTHER CONSOLIDATION IS EVIDENT.

# COMPACTION IN CUT SECTIONS

- A MINIMUM OF SIX INCHES.
- SUBGRADE AND SUITABLE SOIL REPLACED AND COMPACTED AS SPECIFIED.

1. LOCATE EROSION CONTROL MEASURES PER THE EROSION CONTROL PLAN. ADDITIONAL MEASURES AND TYPES MAY BE 2. PROVIDE TEMPORARY OR PERMANENT SEEDING IF WORK IN AN AREA HAS CEASED FOR 14 DAYS OR MORE OR GRADING IS 3. CONTRACTOR IS RESPONSIBLE FOR ADHERING TO KDHE LAND DISTURBANCE PERMIT REQUIREMENTS AND SITE SPECIFIC

4. USE A SYNTHETIC FILTER FABRIC OR A PERVIOUS SHEET OF POLYPROPYLENE, NYLON, POLYESTER, OR POLYETHYLENE YARD, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE REQUIREMENTS SHOWN IN TABLE BELOW. 5. SYNTHETIC FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 6. POSTS FOR SEDIMENT FENCES SHALL BE EITHER 4-INCH DIAMETER PINE, 2-INCH DIAMETER OAK, OR 1.33 LB/LINEAR FT. STEEL WITH A MINIMUM LENGTH OF 4 FT. MAKE SURE THAT STEEL POSTS HAVE PROJECTIONS TO FACILITATE FASTENING THE 7. FOR REINFORCEMENT OF STANDARD STRENGTH FILTER FABRIC, USE WIRE FENCE WITH A MINIMUM 14 GAUGE AND A MAXIMUM

> MINIMUM REQUIREMENTS 85% TENSILE STRENGTH AT 200%STANDARD STRENGTH @ (MAX) ELONGATION 30 PSI EXTRA STRENGTH @ 50 PSI SLURRY FLOW RATE 0.3 GAL/SQ FT/MIN.

9. INSPECT EROSION CONTROLS AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS 10. SEDIMENT DEPOSITS AT SEDIMENT FENCES SHALL BE REMOVED AFTER EACH RAINFALL OR BEFORE THEY ACCUMULATE TO 1/3 11. REMOVE EROSION CONTROLS AND BRING AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS

1. THE CONTRACTOR SHALL SUBMIT, PRIOR TO DELIVERY OF THE MATERIAL TO THE PROJECT, A CERTIFICATE INDICATING THE GRADATION, PLASTICITY INDEX, AND THE MOISTURE-DENSITY RELATIONSHIPS OF THE MATERIAL, USING ASTM D698, COMPLIES 2. AGGREGATE FOR BASE SHALL BE SUPPLIED IN ACCORDANCE WITH SECTION 305 OF THE KANSAS STANDARD SPECIFICATIONS 3. MATERIAL SHALL MEET SECTION 1100 AB3 AGGREGATE EXCEPT THAT THE COMPOSITION SHALL BE MODIFIED SO THAT THE MATERIAL SHALL CONSIST OF 100% LIMESTONE OR DOLOMITE PRODUCED BY MECHANICAL CRUSHING. 4. THE MATERIAL SHALL BE MIXED WITH WATER IN A STATIONARY PLANT, BEFORE DELIVERY TO THE PROJECT SITE, TO OBTAIN

1. THE EMBANKMENT FILL AREA SHALL BE CLEARED AND GRUBBED PRIOR TO PLACING THE FILL LAYERS. SUITABLE MATERIALS. AS SPECIFIED IN EXCAVATION, BACKFILL AND GRADING, SHALL BE USED WITHIN THE TOP THREE FEET OF SUBGRADE. WHERE THE FILL IS LESS THAN FOUR FEET BELOW THE SUBGRADE, ALL SOD AND VEGETABLE MATTER SHALL BE REMOVED FROM THE SURFACE UPON WHICH THE FILL IS TO BE PLACED. THE CLEARED SURFACE SHALL BE COMPLETELY BROKEN UP BY PLOWING, SCARIFYING OR STEPPING TO A MINIMUM DEPTH OF SIX INCHES. THE MATERIAL SHALL BE RECOMPACTED. THE FILL SHALL BE SPREAD IN LAYERS NOT TO EXCEED EIGHT INCHES LOOSE, FREE FROM CLODS, BLADED OR DISKED TO AN EVEN SURFACE, AND COMPACTED. IN NO CASE SHALL ROCKS, LARGER THAN THREE INCHES IN ANY DIMENSION BE DEPOSITED WITHIN ONE FOOT OF SUBGRADE ELEVATION. IN NO INSTANCE SHALL ANY LIFT OR LAYER EXCEED SIX INCHES OF COMPACTED THICKNESS. THE ENTIRE EMBANKMENT FILL SHALL BE SPREAD IN LAYERS AND COMPACTED AS HEREINAFTER SPECIFIED. 2. AFTER EACH FILL LAYER HAS BEEN SPREAD AS OUTLINED ABOVE. THE ENTIRE AREA SHALL BE COMPACTED AS SET FORTH IN THESE SPECIFICATIONS. THE CONTRACTOR SHALL HAVE AVAILABLE ADEQUATE HAND OR MECHANICAL COMPACTION EQUIPMENT

4. COMPACTED DENSITY OF SOIL IN FILL AREAS IN THE TOP 18 INCHES SHALL BE EQUAL TO OR GREATER THAN 95% OF STANDARD PROCTOR DENSITY, TYPE AA COMPACTION WITH A MOISTURE RANGE OF MR-3-3 EXCEPT AS RECOMMENDED BY A QUALIFIED LABORATORY AND APPROVED BY THE ENGINEER. THE FILL AREA BELOW THE TOP 18 INCHES SHALL BE TYPE B COMPACTION WITH A MOISTURE RANGE OF MR-90 UNLESS MORE STRINGENT COMPACTION IS REQUIRED BY THE ENGINEER. THE MAXIMUM DENSITY FOR THE MATERIAL USED SHALL BE AS DETERMINED BY ASTM D-698 AND WITHIN THE TOLERANCES OF THE OPTIMUM MOISTURE AT MAXIMUM DENSITY AS DETERMINED BY THE MOISTURE DENSITY CURVE OBTAINED FOR THE

5. SAND AND GRAVEL WHICH CANNOT BE COMPACTED SATISFACTORILY WITH A SHEEPS-FOOT ROLLER SHALL BE ROLLED WITH A

6. THE SOIL SIX INCHES BELOW THE FINISH SUBGRADE LINE IN CUT SECTIONS SHALL BE SCARIFIED. BROKEN UP. AND THEN COMPACTED AS SPECIFIED IN EXCAVATION, BACKFILL, AND GRADING. THE DEPTH OF COMPACTION IN CUT SECTIONS SHALL BE 7. HIGHLY PLASTIC AND NONPLASTIC FINE-GRAINED MATERIAL AND ALL UNSTABLE AND UNSUITABLE MATERIAL AS DEFINED IN SECTION 02200 - EXCAVATION, BACKFILL, AND SITE GRADING SHALL BE REMOVED WITHIN THE TOP THREE FEET OF THE 8. IF ADDITIONAL FILL IS REQUIRED FOR SUBGRADE, AGGREGATE DESIGNATED AS AB3 SHALL BE USED IN ACCORDANCE WITH DIVISION 900 OF THE KANSAS STANDARD SPECIFICATIONS, OR AS APPROVED BY THE ENGINEER.

9001 STATE LINE RD KANSAS CITY, MO 64 816.361.0440 LampRynearson.com	<b>A R S</b> ., STE. 200 114	<u>ON</u>	
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CONSTRUCTION DOCUMENTS	CIVIL SPECIFICATIONS	R PARK – PHASE 1 ROELAND PARK, KANSAS	
REVISIONS DESIGNER / DRAFTER MDM/AJM DATE 01-28-2020 PROJECT NUMBER 0319001.04 BOOK AND PAGE SHEET			

TRENCHING, BACKFILLING, AND COMPACTION	REMOVAL OF V
<ol> <li>EMBEDMENT MATERIAL: MATERIAL SHALL BE CLEAN RIVER GRAVEL OR SOUND CRUSHED LIMESTONE, FREE OF CEMENTITIOUS, SHALY OR FLAT AND FLAKY PARTICLES IN AN AMOUNT WHICH WOULD CAUSE THE MATERIAL TO CAKE OR PACK OR OTHERWISE FORM AN UNYIELDING SUPPORT FOR THE PIPE. GRADATION SHALL BE: 3/4" SQUARE MESH SIEVE – 100% PASSING 1/2" SQUARE MESH SIEVE – 90–100% PASSING NO. 4 SQUARE MESH SIEVE – 0–15% PASSING NO. 8 SQUARE MESH SIEVE – 0–5% PASSING</li> </ol>	33. THE CONT SURFACE / SHALL BE BUILT, OR HYDROSTAT
<ol> <li>WHERE BEDDING ROCK IS NOT REQUIRED, BEDDING MATERIAL SHALL BE SAME AS FILL MATERIAL.</li> <li>FILL MATERIAL: BACKFILL MATERIAL SHALL BE SELECTED EARTH OR GRANULAR FILL MATERIAL, FREE FROM SOD, STICKS AND ROOTS OVER 1/2 INCH IN DIAMETER, AND FREE FROM HARD LUMPS, CLODS OR ROCK IN SUCH QUANTITY OR CONCENTRATION AS TO INTERFERE WITH THE SPECIFIED COMPACTION. MATERIAL SHALL BE OF PROPER MOISTURE CONTENT FOR SPECIFIED COMPACTION.</li> </ol>	34. PLACE PIP BRING UP EARTH INT SUCH MAN UNDER TH
GENERAL	TRENCH BACK
4. TRENCHING WORK SHALL BE PERFORMED IN A SAFE AND PROPER MANNER, WITH SUITABLE PRECAUTIONS BEING TAKEN AGAINST HAZARDS OF EVERY KIND. TRENCHING SHALL PROVIDE ADEQUATE WORKING SPACE AND CLEARANCES FOR THE WORK TO BE PERFORMED THEREIN.	35. NINETY PE GRAVEL, C HIGHWAY, OF BACK
<ol> <li>TRENCHING AND BACKFILLING DURING FREEZING WEATHER SHALL NOT BE DONE EXCEPT BY PERMISSION OF THE ENGINEER. NO BACKFILL MATERIALS SHALL BE INSTALLED ON FROZEN SURFACES NOR SHALL FROZEN MATERIALS, SNOW OR ICE BE PLACED IN ANY BACKFILL.</li> <li>WHEN OPERATING ON PAVEMENTS OR WALKS ALL EQUIPMENT SHALL BE RUBBER TIRED, EXCEPT FOR EXCAVATION</li> </ol>	STREET SH 36. NINETY-FIN OR OTHER OF STREET
THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT THE EXISTING PAVEMENTS AND WALKS. 7. NO CLASSIFICATION OF EXCAVATED MATERIALS WILL BE MADE. TRENCHING AND TRENCHING WORK SHALL INCLUDE THE REMOVAL AND SUBSEQUENT HANDLING OF ALL MATERIALS EXCAVATED OR OTHERWISE REMOVED IN PERFORMANCE OF THE CONTRACT, WORK, RECARDLESS, OF THE TYPE, CHARACTER, COMPOSITION, OR CONDITION, THEREOF.	SHALL BE 37. IN AREAS 38. SIX INCHE
<ul> <li>8. PIPE LINES AND OTHER EXISTING UNDERGROUND INSTALLATIONS AND STRUCTURES IN THE VICINITY OF THE WORK TO BE DONE HEREUNDER ARE INDICATED ON THE PLANS ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE OWNER. THE OWNER DOES NOT GUARANTEE THE ACCURACY OF SUCH INFORMATION. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO</li> </ul>	39. IF SPECIFI GRANULAR CONTRACTO
<ul> <li>LOCATE ALL UNDERGROUND PIPE LINES, CONDUITS AND STRUCTURES BY CONTACTING OWNERS OF UNDERGROUND UTILITIES AND BY PROSPECTING IN ADVANCE OF TRENCH EXCAVATION. DAMAGE TO ANY EXISTING UNDERGROUND INSTALLATION CAUSED BY THE CONTRACTOR'S OPERATION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.</li> <li>9. ANY DELAYS OR EXTRA COST TO THE CONTRACTOR CAUSED BY PIPE LINES OR OTHER UNDERGROUND STRUCTURES OR OBSTRUCTIONS NOT SHOWN BY THE PLANS, OR FOUND IN LOCATIONS DIFFERENT THAN THOSE INDICATED, SHALL NOT</li> </ul>	40. THE ENGIN WILL BE T 41. THICKNESS PERFORMA EXCEPT WI
CONSTITUTE A CLAIM FOR EXTRA WORK, ADDITIONAL PAYMENT OR DAMAGES. 10. EROSION CONTROL OF DISTURBED AREAS WILL BE REQUIRED DURING THE CONSTRUCTION PERIOD THROUGH THE USE OF CHECK DAMS, SILTATION POOLS, MULCHING, ETC. 11. USE ALL MEANS NECESSARY TO CONTROL DUST OR MUD THAT MAY INTERFERE WITH OPERATION. MAINTAIN ALL STREETS AND DDIVEWANCE FREE OF DIDT. AND MATERIAL FROM CONTRACTOR'S OPERATION.	EXCAVATIO EXCAVATIO 42. ALL COMP ORIGINAL 43. FOLUPMENT
AND DRIVEWAYS FREE OF DIRT AND MATERIAL FROM CONTRACTOR'S OPERATION. 12. USE ALL MEANS NECESSARY TO PROTECT MATERIAL AND PRESERVE SPECIFICATION REQUIREMENTS. 13. REPLACE ALL DAMAGED MATERIAL OR MATERIAL THAT HAS LOST SPECIFICATION REQUIREMENTS.	43. EQUIFMEN NOT BE U PARKING L 44. PERMITTED PLATE CON
14. THE CONTRACTOR SHALL NOT OPEN MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO EXPEDITE THE	DRAINAGE MAI
WORK. ONE BLOCK OR 400 FEET (WHICHEVER IS THE SHORTER) SHALL BE THE MAXIMUM LENGTH OF OPEN TRENCH PERMITTED ON ANY LINE UNDER CONSTRUCTION. 15. EXCEPT WHERE TUNNELING IS PERMITTED BY THE ENGINEER OR CALLED FOR ON THE PLANS, ALL TRENCH EXCAVATION SHALL BE OPEN CUT FROM THE SURFACE.	45. TRENCHES WATER CO SIDE OF T
<ol> <li>16. TRENCH WALLS SHALL BE VERTICAL, AND BRACED WHERE NECESSARY, IN STREETS OR IMPROVED AREA UNLESS OTHERWISE AUTHORIZED BY ENGINEER.</li> <li>17. ALIGNMENT AND GRADE, SEWER AND STORM SEWER LINES: THE ALIGNMENT AND GRADE OR ELEVATION OF EACH PIPE LINE SHALL BE FIXED AND DETERMINED BY MEANS OF OFFSET STAKES. VERTICAL AND HORIZONTAL ALIGNMENT OF PIPES AND THE MAXIMUM JOINT DEFLECTION. USED IN CONNECTION THEREWITH SHALL BE IN CONFORMUTY WITH THE DECHIPEMENTS.</li> </ol>	AND MAINT UNFILLED CROSSED SECTION
OF THE SPECIFICATION COVERING THE INSTALLATION OF THE PIPE BEING LAID IN EACH CASE. 18. ALIGNMENT AND GRADE, WATER LINES: TRENCHES BE CAREFULLY EXCAVATED SO THAT THE MINIMUM COVER OVER TOP OF PIPE WILL BE 42 INCHES TO EXISTING STREET OR GROUND SURFACE, OR TO FUTURE SURFACE WHEN INDICATED. GREATER COVER AT SOME LOCATIONS ALONG THE LINE MAY BE REQUIRED DUE TO STREET OR GROUND PROFILE AND	CONDITION
CLEARANCE OF CULVERTS, STRUCTURES, UTILITY LINES, ETC. 19. MINIMUM TRENCH WIDTHS AND PIPE CLEARANCES: TRENCHES SHALL BE EXCAVATED TO A WIDTH WHICH WILL PROVIDE ADEQUATE WORKING SPACE AND PIPE CLEARANCES FOR PROPER PIPE INSTALLATION, JOINTING AND EMBEDMENT. BELOW AN ELEVATION OF 12 INCHES FROM GROUND LEVEL TO THE TOP OF THE INSTALLED PIPE. THE TRENCH WIDTH SHALL BE	46. EXCEPT AS AWAY FRO 47. PAVEMENT ACTUALLY
MAINTAINED AS NARROW AS POSSIBLE. WHERE NECESSARY TO REDUCE THE EARTH LOAD ON TRENCH BANKS TO PREVENT SLIDING AND CAVING, THE BANKS MAY BE CUT BACK ON SLOPES WHICH SHALL NOT EXTEND LOWER THAN 1 FOOT ABOVE THE TOP OF THE PIPE. 20. MECHANICAL EXCAVATION: THE USE OF MECHANICAL EQUIPMENT WILL NOT BE PERMITTED IN LOCATIONS WHERE ITS	SIMILAR W 48. THE DISPO SURFACING 49. UN-COMP
OPERATION WOULD CAUSE DAMAGE TO BUILDINGS, CULVERTS, OR OTHER EXISTING PROPERTY, UTILITIES, OR STRUCTURES ABOVE OR BELOW GROUND; IN ALL SUCH LOCATIONS, HAND EXCAVATING TOOLS AND METHODS SHALL BE USED. 21. MECHANICAL EQUIPMENT USED FOR TRENCH EXCAVATION SHALL BE OF A TYPE, DESIGN AND CONSTRUCTION AND SHALL BE SO OPERATED, THAT THE ROUGH TRENCH EXCAVATION BOTTOM ELEVATION CAN BE CONTROLLED, THAT UNIFORM TRENCH WIDTHS AND VERTICAL SIDE WALLS ARE OBTAINED AT LEAST FROM AN ELEVATION 1 FOOT ABOVE THE TOP OF	AND ABOV THAT THE DRAINAGE PORTION C TRENCH.
THE INSTALLED PIPE TO THE BOTTOM OF THE TRENCH, AND THAT THE TRENCH ALIGNMENT IS SUCH THAT THE PIPE WHEN ACCURATELY LAID TO SPECIFIED ALIGNMENT WILL BE CENTERED IN THE TRENCH WITH ADEQUATE CLEARANCE BETWEEN THE PIPE AND SIDE WALLS OF THE TRENCH. UNDERCUTTING OF THE TRENCH SIDEWALL TO OBTAIN CLEARANCE WILL NOT BE PERMITTED.	50. OTHER TYF DISPOSE C ETC., UNLE EXCESS E/
<ol> <li>22. EXCAVATION BELOW PIPE SUBGRADE: EXCEPT WHERE OTHERWISE REQUIRED, PIPE TRENCHES SHALL BE EXCAVATED BELOW PIPE SUBGRADE ELEVATIONS TO PROVIDE FOR THE INSTALLATION OF GRANULAR FILL PIPE FOUNDATION MATERIAL.</li> <li>23. UNAUTHORIZED TRENCH WIDTHS: WHERE THE WIDTH OF THE LOWER PORTION OF THE TRENCH AS EXCAVATED AT ANY POINT EXCEEDS THE MAXIMUM PERMITTED, EITHER PIPE OF ADEQUATE STRENGTH, CLASSIFICATION OR GAGE, SPECIAL PIPE</li> </ol>	ENGINEER. DRAIN. 51. FINAL GRA GRADE OVI
EMBEDMENT, OR CLASS A CONCRETE ARCH ENCASEMENT (FOR CONCRETE PIPE ONLY), AS REQUIRED BY LOADING CONDITIONS AND AS DETERMINED BY THE ENGINEER, SHALL BE FURNISHED AND INSTALLED BY AND AT THE EXPENSE OF THE CONTRACTOR. 24. GRUBBING: GRUB OUT LIVE ROOTS FOR A DISTANCE OF AT LEAST 6 INCHES BELOW AND 8 INCHES ON SIDES OF	FINISHED S 52. FINAL GRA OFF GRASS
25. BELL HOLES: BELL HOLES SHALL PROVIDE ADEQUATE CLEARANCE FOR THE TOOLS AND METHODS USED IN INSTALLING THE PIPE. NO PART OF ANY BELL OR COUPLING SHALL BE IN CONTACT WITH THE TRENCH BOTTOM, TRENCH WALLS, OR THE GRANULAR FILL WHEN THE PIPE IS JOINTED.	SURFACE ( EXPENSE. 54. RESTORATIO
26. CUTTING CONCRETE PAVEMENT AND WALKS: CUTS IN CONCRETE AND ASPHALT PAVEMENTS SHALL BE NO LARGER THAN NECESSARY TO PROVIDE ADEQUATE WORKING SPACE FOR PROPER INSTALLATION OF PIPE AND PIPE LINE APPURTENANCES. CUTTING SHALL BE STARTED WITH A CONCRETE SAW (OR BY OTHER CUTTING METHOD APPROVED BY THE ENGINEER) AND IN A MANNER WHICH WILL PROVIDE A CLEAN GROOVE AT LEAST 1–1/2 INCHES DEEP ALONG EACH SIDE OF THE TRENCH	APPROPRIA
<ul> <li>27. PAVEMENT AND BASE PAVEMENT OVER TRENCHES EXCAVATED FOR PIPE LINES SHALL BE REMOVED SO THAT A SHOULDER NOT LESS THAN 6 INCHES IN WIDTH AT ANY POINT IS LEFT BETWEEN THE CUT EDGE OF THE PAVEMENT AND THE TOP EDGE OF THE TRENCH. THE TRENCH WIDTH AT THE BOTTOM SHALL NOT BE GREATER THAN AT THE TOP AND NO UNDERCUTTING WILL BE PERMITTED. PAVEMENT CUTS SHALL BE MADE TO AND BETWEEN STRAIGHT OR ACCURATELY MARKED CURVED LINES WHICH, UNLESS OTHERWISE REQUIRED, SHALL BE PARALLEL TO THE CENTER LINE OF THE TRENCH.</li> </ul>	
SHEETING AND SHORING	
28. EXCEPT WHERE BANKS MAY BE CUT BACK ON A STABLE SLOPE, EXCAVATION FOR TRENCHES SHALL BE PROPERLY AND SUBSTANTIALLY SHEETED, BRACED AND SHORED, AS NECESSARY, TO PREVENT CAVING OR SLIDING, TO PROVIDE PROTECTION FOR THE WORKMEN AND THE WORK, AND TO PROVIDE PROTECTION FOR EXISTING STRUCTURES AND FACILITIES. SHEETING, BRACING AND SHORING SHALL BE DESIGNED AND BUILT TO WITHSTAND ALL LOADS THAT MIGHT BE CAUSED BY EARTH MOVEMENT OR PRESSURE, AND SHALL BE RIGID, MAINTAINING ITS SHAPE AND POSITION UNDER ALL CIRCUMSTANCES.	
STABILIZATION	
<ul> <li>29. TRENCH BOTTOMS SHALL BE FIRM, DENSE AND THOROUGHLY COMPACTED AND CONSOLIDATED; SHALL BE FREE FROM MUD AND MUCK; AND SHALL BE SUFFICIENTLY STABLE TO REMAIN FIRM AND INTACT UNDER THE FEET OF THE WORKMEN.</li> <li>30. TRENCH BOTTOMS WHICH ARE OTHERWISE SOLID, BUT WHICH BECOME MUCKY ON TOP DUE TO CONSTRUCTION OPERATIONS, SHALL BE REINFORCED WITH ONE OR MORE LAYERS OF GRANULAR FILL MATERIAL OR OTHER CRUSHED STONE OR GRAVEL EMBEDDED THEREIN. NOT MORE THAN 1/2 INCH DEDTH OF MUCK SHALL DE ALLOWED TO</li> </ul>	
REMAIN ON STABILIZED TRENCH BOTTOMS WHEN THE PIPE BEDDING MATERIAL IS PLACED THEREON. THE FINISHED ELEVATION OF STABILIZED SUBGRADES FOR CONCRETE STRUCTURES SHALL NOT BE ABOVE THE SUBGRADE ELEVATIONS. 31. ALL STABILIZATION WORK HEREUNDER SHALL BE PERFORMED BY AND AT THE EXPENSE OF THE CONTRACTOR. 32. IF THE SUBGRADE FOR PIPE CAN BE STABILIZED WITH A THICKNESS OF GRANULAR FILL OF L2 INCHES OR LESS BELOW BOTTOM OF PIPE, OR SUBGRADE OF STRUCTURE, SUCH STABILIZATION WILL BE AT THE CONTRACTOR'S EXPENSE.	

# <u>NATER</u>

RACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE DEWATERING EQUIPMENT TO REMOVE AND DISPOSE OF ALL AND GROUND WATER ENTERING EXCAVATIONS, TRENCHES, OR OTHER PART OF THE WORK. EACH EXCAVATION KEPT DRY DURING SUBGRADE PREPARATION AND CONTINUALLY THEREAFTER UNTIL THE STRUCTURE TO BE THE PIPE LINE TO BE INSTALLED, THEREIN IS COMPLETED TO THE EXTENT THAT NO DAMAGE FROM ATIC PRESSURE, FLOTATION, OR OTHER CAUSES WILL RESULT.

PE EMBEDMENT MATERIAL ON A SUITABLY PREPARED SUBGRADE IN LIFTS NOT EXCEEDING 6 INCHES AND EVENLY ON BOTH SIDES OF PIPE. DO NOT DUMP OVER SIDE OF TRENCH IN ANY MANNER THAT WILL BRING TO THE EMBEDMENT MATERIAL OR DISPLACE THE PIPE. COMPACT, VIBRATE, OR SLICE WITH A SHOVEL, IN NNER THAT MATERIAL FILL WILL TAKE ITS FINAL COMPACTION AND PROVIDE UNIFORM AND SOLID BEARING HE PIPE AND ITS HAUNCHES.

# FILL COMPACTION

RCENT COMPACTED BACKFILL. UNDER STREETS, DRIVES OR STATE OR COUNTY HIGHWAYS SURFACED WITH CRUSHED STONE, "BLACKTOP" OR OTHER LOW OR INTERMEDIATE TYPE SURFACING. IN STREET, ROAD, RAILWAY OR ALLEY RIGHTS-OF-WAY. IN TRAVELED WAYS. IN ESTABLISHED LAWNS. ANY LINE WITHIN 5 FEET OF CURB OR 5 FEET OF STREET SURFACING IF NO CURB, EITHER PERPENDICULAR TO OR PARALLEL TO THE IALL BE CONSIDERED AS UNDER THE STREET SURFACING, AND 90 PERCENT COMPACTION SHALL APPLY. /E PERCENT COMPACTED BACKFILL. UNDER CONCRETE, ASPHALTIC CONCRETE, BRICK, CONCRETE STRUCTURES HIGH TYPE PAVEMENTS. UNDER CONCRETE WALKS, CURBS, GUTTERS AND CULVERTS. UNDER ALL TYPES SURFACING WHERE TRENCH CUT IS APPROXIMATELY AT RIGHT ANGLE TO ROADWAY. BACKFILL MATERIAL AS DESIGNATED ON THE PLANS OR ELSEWHERE IN THESE SPECIFICATIONS. NOT LISTED ABOVE, BACKFILL SHALL BE COMPACTED TO A DENSITY EQUAL TO THE SURROUNDING GROUND.

S OF TOPSOIL SHALL BE PLACED IN THE TOP OF TRENCHES THAT ARE TO BE COVERED WITH SOD OR TO ED DENSITY CANNOT BE OBTAINED WITH AVAILABLE EARTH, THE CONTRACTOR SHALL FURNISH AND HAUL

FILL MATERIAL OR SUITABLE EARTH AT HIS EXPENSE. UNSUITABLE EARTH SHALL BE DISPOSED OF AT THE DR'S EXPENSE NEER WILL CALL FOR DENSITY TESTS TO BE MADE WHENEVER DEEMED NECESSARY. THE SPECIFIED DENSITY

HE MINIMUM ALLOWED AND THE OBTAINMENT THEREOF WILL BE ENTIRELY THE CONTRACTOR'S RESPONSIBILITY. OF BACKFILL LAYERS WILL BE DETERMINED BY THE COORDINATION OF TEST RESULTS WITH FIELD NCE AND EQUIPMENT USED. THE CONTRACTOR WILL BE EXPECTED TO MAINTAIN ESTABLISHED PROCEDURES HERE UNUSUAL CONDITIONS ARISE. IF GREATER THAN 12 INCH THICK COMPACTED LAYERS ARE USED, THE OR SHALL HAND EXCAVATE TO THE TEST LEVEL AS DIRECTED BY THE ENGINEER AND THEN REFILL THE TEST ON WITH COMPACTED BACKFILL TO THE SPECIFIED DENSITY. LETED LINES SHALL BE RETURNED, IN THE OPINION OF THE ENGINEER, AS NEARLY AS POSSIBLE TO

CONDITION, INCLUDING RESEEDING, RE-SODDING OR REPAVING. THE BUCKET ON AN EXCAVATOR OR BACKHOE IS NOT A PIECE OF COMPACTION EQUIPMENT AND SHALL

SED AS THE METHOD FOR COMPACTING SOIL OR BASE ROCK UNDER A FUTURE OR CURRENT: STREET, OT, SIDEWALK, CURB AND GUTTER, OR DRIVEWAY.

COMPACTION EQUIPMENT ARE AS FOLLOWS: SHEEPSFOOT ROLLER, VIBRATORY ROLLER, TAMPER, VIBRATORY MPACTOR, PNEUMATIC TYRED ROLLERS, GRID ROLLERS, AND PAD FOOT TAMPING ROLLERS.

# <u>NTENANCE</u>

ACROSS ROADWAYS, DRIVEWAYS, WALKS, OR OTHER TRAFFIC-WAY'S ADJACENT TO DRAINAGE DITCHES OR URSES SHALL NOT BE BACKFILLED PRIOR TO COMPLETION OF BACKFILLING THE TRENCH ON THE UPSTREAM HE TRAFFIC—WAY, TO PREVENT IMPOUNDING WATER AFTER THE PIPE HAS BEEN LAID. BRIDGES AND OTHER RY STRUCTURES REQUIRED TO MAINTAIN TRAFFIC ACROSS SUCH UNFILLED TRENCHES SHALL BE CONSTRUCTED AINED BY THE CONTRACTOR. BACKFILLING SHALL BE DONE SO THAT WATER WILL NOT ACCUMULATE IN OR PARTIALLY FILLED TRENCHES. ALL MATERIAL DEPOSITED IN ROADWAY DITCHES OR OTHER WATER COURSES BY THE LINE OF TRENCH SHALL BE REMOVED IMMEDIATELY AFTER BACKFILLING IS COMPLETED AND THE GRADES, AND CONTOURS OF DITCHES OR WATER COURSES SHALL BE RESTORED TO THEIR ORIGINAL SURFACE DRAINAGE SHALL NOT BE OBSTRUCTED LONGER THAN NECESSARY.

# AND DISPOSAL OF EXCESS EXCAVATED MATERIALS

OTHERWISE INDICATED, ALL EXCESS EXCAVATED MATERIALS SHALL BE DISPOSED OF BY THE CONTRACTOR OM THE SITE OF THE WORK.

AND PAVEMENT BASE MATERIAL, EXCAVATED ROCK IN EXCESS OF THE AMOUNT PERMITTED TO BE AND INSTALLED IN TRENCH BACKFILL, JUNK AND DEBRIS ENCOUNTERED IN EXCAVATION WORK, AND OTHER

ASTE MATERIALS SHALL BE DISPOSED OF AWAY FROM THE SITE OF THE WORK. ISAL OF WASTE AND EXCESS EXCAVATED MATERIALS, INCLUDING HAULING, HANDLING, LEVELING AND SHALL BE AT THE CONTRACTOR'S EXPENSE.

ACTED BACKFILL: WHERE UN-COMPACTED BACKFILL IS SPECIFIED, EXCESS EARTH FROM EXCAVATIONS, OVER THAT DISPLACED BY THE PIPE, SHALL BE MOUNDED DIRECTLY OVER THE PIPE TRENCH, IN SUCH MANNER EARTH WILL SETTLE INTO THE TRENCH AS NATURAL CONSOLIDATION OCCURS. OPENINGS FOR NATURAL SHALL BE PROVIDED. THE MOUNDED EARTH SHALL BE GRADED TO A SMOOTH, UNIFORM SURFACE. THAT OF THE EARTH DISPLACED BY THE PIPE SHALL BE UNIFORMLY AND SMOOTHLY GRADED ADJACENT TO THE

PES OF BACKFILL: FOR ALL TYPES OF BACKFILL OTHER THAN UN-COMPACTED. THE CONTRACTOR SHALL OF EXCESS EXCAVATED MATERIAL ABOVE THE SURFACE OF THE GROUND OR SUBGRADE OF PAVEMENT WALKS. ISS OTHERWISE DIRECTED. WHERE DIRECTED, THE CONTRACTOR SHALL LEAVE ALL OR A PORTION OF THE RTH AND GRADE SMOOTHLY ALONG AND ADJACENT TO THE TRENCH IN THE IF DIRECTED, HE SHALL GRADE EXCESS EARTH INTO ADJACENT LOW AREAS, FINE GRADING AND SLOPING TO

DING: JUST PRIOR TO COMPLETION AND ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL FINAL ER ALL PIPE TRENCHES AND AROUND STRUCTURES, FILLING IN ANY PLACES THAT MAY HAVE SETTLED HE PERIOD BETWEEN CONSTRUCTION OF EACH LINE AND THE COMPLETION OF THE ENTIRE CONTRACT. SURFACE SHALL BE BLADED AND ALIGNED TO A NEAT AND UNIFORM APPEARANCE.

DING, IMPROVED YARDS AND LAWNS: FINE GRADE, SUITABLE FOR SEEDING OR SODDING. HAND RAKE EARTH SS IN ESTABLISHED LAWN AREAS, UNLESS DIRECTED TO LEAVE EXCESS EARTH AS OUTLINED ABOVE. OF BACKFILL: WHEREVER THERE IS A DEFICIENCY OF MATERIAL REQUIRED TO BACKFILL TO THE SPECIFIED OR SUBGRADE, THE CONTRACTOR SHALL FURNISH THE NECESSARY AMOUNT OF SUITABLE EARTH AT HIS

ION OF DISTURBED EARTH: THE CONTRACTOR SHALL RESTORE ALL EARTH AREAS DISTURBED FROM THE CONDITION BY HIS OPERATIONS. RESTORATION WILL BE BY SEEDING, FERTILIZING AND MULCHING OR BY ATE PAVEMENT AND STREET REPAIR.

# CONCRETE SIDEWALK

1. ALL SIDEWALKS SHALL BE CONSTRUCTED IN COMPLIANCE WITH THE AMERICAN WITH DISABILITIES ACT OF 1990, 42 U.S.C. 12101 ET SEQ. 2. ALL SIDEWALKS SHALL BE CONSTRUCTED USING KCMMB 4K PORTLAND CEMENT CONCRETE UNLESS OTHERWISE

- DESIGNATED ON THE DRAWINGS
- SPECIFICATIONS.
- ESTABLISHED BY THE ENGINEER.
- TO THE DESIGN DIMENSIONS.
- ENGINEER.
- PLACING CONCRETE.
- SIDEWALK REPLACEMENT.

# PLACING AND FINISHING CONCRETE

- EQUAL TO THE WIDTH OF THE SIDEWALK WITH A MAXIMUM DISTANCE BETWEEN JOINTS OF SEVEN FEET.
- ONE-QUARTER INCH SHALL BE USED IN FORMING THE JOINTS.
- TIME OR WEATHER.
- FILLER AND SHALL EXTEND THE FULL DEPTH OF THE SLAB.
- WHEN THE CONCRETE HAS SET SUFFICIENTLY SO THAT IT WILL NOT BE DAMAGED IN THE PROCESS.
- ON BARE SOIL.
- DIRECTED BY THE ENGINEER.

# CONCRETE SIDEWALK RAMPS

- BE REMOVED AND REPLACED.
- SECTION OF THE CURB AND RECONSTRUCT AS REQUIRED.

3. RAMPS SHALL BE CONSTRUCTED WITH OR WITHOUT A DETECTABLE WARNING SURFACE AS SPECIFIED ON THE PLANS.

3. REINFORCING STEEL, IF DESIGNATED TO BE USED, SHALL BE GRADE 40 SUPPLIED IN ACCORDANCE WITH THESE

4. WHEN AN EXISTING SIDEWALK ENTRANCE IS TO BE REMOVED, AND REPLACED, THE CONTRACTOR SHALL NOTIFY THE AFFECTED PROPERTY OWNER OR TENANT TWENTY-FOUR (24) HOURS PRIOR TO THIS WORK. SCHEDULING OF THE CONSTRUCTION OF SIDEWALK ENTRANCES SHALL BE SUCH THAT, WHEREVER POSSIBLE, PLACING OF CONCRETE SHALL BE ACCOMPLISHED WITHIN TWENTY-FOUR (24) HOURS AFTER THE EXISTING MATERIALS HAVE BEEN REMOVED. 5. ALL SIDEWALK CONSTRUCTION SHALL BE CONSTRUCTED TO THE LINES AND GRADES SHOWN ON THE DRAWINGS OR

6. THE WIDTH OF ANY SIDEWALK REPAIR SHALL BE THE SAME AS THAT BEING REPLACED. BUT NOT LESS THAN FOUR FOOT IN WIDTH, EXCEPT FOR A MINIMUM DISTANCE TO MATCH THE EXISTING SIDEWALK IF LESS THAN FOUR FOOT IN WIDTH. THE WIDTH OF NEW SIDEWALK CONSTRUCTION SHALL BE AS INDICATED ON THE PLANS. THE MINIMUM WIDTH OF PUBLIC SIDEWALKS SHALL BE FOUR FEET WITH A FIVE-FOOT SQUARE PASSING SPACE EVERY 200 FEET. THE MINIMUM ALLOWABLE THICKNESS SHALL BE FOUR INCHES, EXCEPT WITHIN A DRIVEWAY APPROACH AREA, WHERE THE MINIMUM ALLOWABLE THICKNESS SHALL BE SIX INCHES. SIDEWALKS CONSTRUCTED WITH CONCRETE PAVER BRICK SHALL MEET THE FOLLOWING SPECIFICATIONS: FOUR INCHES OF CONCRETE SHALL BE USED AS A BASE PLUS ONE INCH OF BEDDING SAND FOR THE PAVERS. EDGE RESTRAINT MUST BE PROVIDED IN ANY CASE TO CONFINE THE PAVED SECTION

7. THE GRADE OR SLOPE ALONG THE LENGTH OF THE WALK SHALL BE AS NEAR PARALLEL TO THE STREET GRADIENT AS PRACTICAL. THE MAXIMUM LONGITUDINAL SLOPE SHALL BE ONE INCH PER FOOT, EXCEPT WHERE A VARIANCE FROM STREET GRADE HAS BEEN APPROVED BY THE ENGINEER. THE CROSS SLOPE IS ONE FOOT PER 100 FEET OR 1%; WITH THE INTENTION OF ENFORCING A 2% MAXIMUM WITH ABSOLUTELY NO TOLERANCE FOR EXCEEDING 2%, DUE TO FEDERAL REQUIREMENTS. THIS MAXIMUM CROSS SLOPE STANDARD ALSO APPLIES WHEN THE WALK CROSSES DRIVES AND SHALL SLOPE TOWARD THE STREET, EXCEPT AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. THE FINISH GRADE OF THE SIDEWALK SHALL BE SUCH THAT THE SLOPE OF THE FINISH GRADE BETWEEN THE CURB AND THE SIDEWALK WILL NOT EXCEED ONE-HALF INCH PER FOOT AND WILL NOT BE LESS THAN ONE-QUARTER INCH PER FOOT AND SHALL SLOPE TOWARD THE STREET, EXCEPT AS SHOWN ON THE DRAWINGS OR APPROVED BY THE

8. THE SUBGRADE SHALL BE UNIFORMLY COMPACTED AS DESIGNATED ON THE DRAWINGS OR IN THESE SPECIFICATIONS. THE SUBGRADE SHALL BE EVENLY GRADED TO THE REQUIRED SUBGRADE ELEVATION. ALL LOOSE OR EXTRANEOUS MATERIAL SHALL BE REMOVED FROM THE SUBGRADE AND SOFT SPOTS SHALL BE UNIFORMLY RE-COMPACTED PRIOR TO PLACEMENT OF CONCRETE. SIDEWALK CONCRETE MATERIAL SHALL NOT BE PLACED ON FROZEN SUBGRADE. THE CONTRACTOR SHALL HAVE AVAILABLE ADEQUATE HAND OR MECHANICAL COMPACTION EQUIPMENT TO ACCOMPLISH THE COMPACTION AS SET FORTH IN THESE SPECIFICATIONS. THE SUBGRADE SHALL BE PROPERLY MOISTENED PRIOR TO

9. ALL FORMS SHALL BE SUFFICIENTLY STRONG AND RIGID AND SECURELY STAKED AND BRACED TO OBTAIN A FINISHED PRODUCT CORRECT TO THE DIMENSIONS, LINES AND GRADES REQUIRED. FORMS MAY BE OF STEEL OR WOOD AT THE OPTION OF THE CONTRACTOR. EACH FORM SHALL NOT VARY MORE THAN ONE-QUARTER INCH IN LONGITUDINAL AND VERTICAL ALIGNMENT FOR EACH TEN FEET IN LENGTH. ALL FORMS MUST BE CLEANED AND OILED BEFORE EACH USE. A SLIP-FORM MACHINE, EQUIPPED WITH ELECTRONICS, MAY BE USED IN LIEU OF FORMS. THE MACHINE SHALL BE EQUIPPED WITH MECHANICAL INTERNAL VIBRATORS AND SHALL BE CAPABLE OF PLACING THE FINISHED SIDEWALK TO THE CORRECT CROSS SECTION, LINE AND GRADE AS REQUIRED IN THIS SECTION. ADJUSTMENTS OF THE STRING LINE AND/OR SLIP-FORM MACHINE SHALL BE MADE TO GIVE A SMOOTH AND ACCURATE LINE AND GRADE. 10. REINFORCING OF SIDEWALKS WILL NOT BE REQUIRED EXCEPT IN UNUSUAL CONDITIONS WHERE THE ENGINEER MAY REQUIRE REINFORCING OR WELDED WIRE FABRIC. WHEN WELDED WIRE FABRIC IS USED IT SHALL BE PLACED TWO

INCHES (2") FROM THE FINISHED SURFACE OF THE SIDEWALK. THE REINFORCEMENT SHALL BE SUPPORTED USING SET SPACING SUCH THAT BETWEEN THE SUPPORTS, THE REINFORCEMENT DOES NOT DEFLECT OR SAG EXCESSIVELY. THERE WILL BE NO DIRECT PAYMENT FOR THIS ITEM, AND IT SHALL BE SUBSIDIARY TO THE UNIT PRICE BID FOR

11. THE CONTRACTOR SHALL PROVIDE ADEQUATE TOOLS AND EQUIPMENT TO PRODUCE QUALITY WORKMANSHIP IN PLACING AND FINISHING CONCRETE. THE SIDEWALK AND RAMPS SHALL BE FINISHED TO THE TOP OF THE FORMS AND THE SURFACE FINISHED WITH A WOOD OR STEEL FLOAT AND SURFACE TEXTURE SHALL BE A COURSE BROOM FINISH TRANSVERSE TO THE SLOPE OF THE SIDEWALK OR RAMP. NO "PLASTERING" OF THE SURFACE SHALL BE PERMITTED. 12. CONTRACTION JOINTS: THE SIDEWALK SURFACE SHALL BE MARKED OFF INTO NOMINAL SQUARES OF DIMENSIONS 13. CONTRACTION JOINTS: ALL JOINTS IN FORMED CONCRETE SIDEWALKS SHALL BE TOOLED. A STANDARD JOINT TOOL HAVING A WIDTH OF ONE-EIGHTH INCH AND ONE-INCH-DEEP HAVING A LIP RADIUS OF ONE-EIGHTH INCH TO

14. CONTRACTION JOINTS: ALL JOINTS IN SLIP-FORMED CONCRETE SIDEWALKS SHALL BE SAWED. IF SAWING JOINTS, THE CONTRACTOR SHALL BEGIN AS SOON AS THE CONCRETE HARDENS SUFFICIENTLY TO PREVENT EXCESSIVE RAVELING ALONG THE SAW CUT AND SHALL FINISH BEFORE CONDITIONS INDUCE UNCONTROLLED CRACKS, REGARDLESS OF THE

15. EXPANSION JOINTS: EXPANSION JOINTS SHALL BE CONSTRUCTED AT LOCATIONS WHERE THE SIDEWALK ABUTS EXISTING CONCRETE CURBS, DRIVEWAYS, AND SIMILAR STRUCTURES, AND EVERY TWO HUNDRED FIFTY FEET AND AS SHOWN ON APPROVED PLANS. EXPANSION JOINTS SHALL BE FORMED WITH ONE-HALF INCH PREFABRICATED NON-EXTRUDING

16. CURING CONCRETE: SIDEWALK SLABS SHALL BE CURED EITHER BY WET COVERING, WATERPROOF COVERING, OR LIQUID MEMBRANE-FORMING COMPOUND IN ACCORDANCE WITH "CONCRETE CONSTRUCTION". THE CURING PERIOD SHALL BE A MINIMUM OF FIVE DAYS. CURING SHALL BE COMMENCED AS SOON AS POSSIBLE AFTER THE FINISHING OPERATION AND 17 BACKEILLING CONCRETE: BACKEILLING OPERATIONS SHALL NOT COMMENCE PRIOR TO THE COMPLETION OF THE

FIVE-DAY CURING PERIOD, OR UNTIL THE CONCRETE ATTAINS 75% OF DESIGN STRENGTH. ALL BACKFILL MATERIAL SHALL CONSIST OF SOIL SUITABLE FOR VEGETATION. THE AREA SHALL BE PREPARED SUCH THAT SOD CAN BE PLACED

18. SIDEWALK CURB: SIDEWALK CURB SHALL BE PLACED ON THE BACK OF SIDEWALK AS SHOWN ON THE PLANS OR AS

1. AFTER THE CONSTRUCTION OF THE ADJACENT CURB AND GUTTER SECTION, AND NOT LESS THAN ONE WEEK PRIOR TO THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS. THE CONTRACTOR SHALL VERIFY THAT THE CURB RETURN ELEVATIONS AND THE LOCATION OF THE DEPRESSED SECTION IS CONSTRUCTED IN CONFORMANCE WITH THE DESIGN DRAWINGS. IF THE ABSOLUTE ELEVATION OF ANY OF THE CONTROL POINTS SHOWN IN SIDEWALK RAMP DRAWINGS IS NOT WITHIN .5 INCHES, OR IF THE RELATIVE DIFFERENCE BETWEEN ANY TWO CONTROL POINTS IS NOT WITHIN .125 INCHES, OR IF THE DEPRESSION LOCATION IS NOT WITHIN 1" OF THE DESIGN DRAWINGS, THE CONTRACTOR SHALL EITHER 1) REMOVE AND REPLACE THE NON-COMPLIANT CURB, OR 2) SUBMIT A SHOP DRAWING SHOWING HOW THE RAMP CAN BE CONSTRUCTED TO BE ADA COMPLIANT. IN THE EVENT THAT THE ORIGINAL DESIGN DRAWINGS SHOWED A RAMP WITH ELEMENTS THAT WERE NOT ADA COMPLIANT, THE SHOP DRAWING SHALL SHOW THAT THE PROPOSED ELEMENT IS AS OR MORE ADA COMPLAINT THAN THE ORIGINAL DESIGN DRAWING. IF THIS CANNOT BE ACCOMPLISHED, THE CURB SHALL

2. WHEELCHAIR ACCESSIBLE CURB RAMPS SHALL BE CONSTRUCTED AT ALL STREET CROSSINGS. MAXIMUM DESIRABLE SLOPE OF RAMPS SHALL BE ONE INCH PER FOOT. MINIMUM WIDTH SHALL BE FOUR FEET. EXCEPT ALONG THOROUGHFARE CORRIDORS WHERE THE WIDTH SHALL BE FIVE FEET. THE MINIMUM ALLOWABLE THICKNESS FOR WHEELCHAIR ACCESSIBLE CURB RAMPS SHALL BE SIX INCHES. CURBS AT RAMP LOCATIONS MUST PROVIDE A GRADUAL TRANSITION FROM GUTTER LINE TO BACK OF CURB, NOT EXCEEDING ONE INCH IN HEIGHT OR SLOPES OF GREATER THAN ONE INCH PER FOOT. SIDE SLOPES OF RAMPS SHALL NOT EXCEED ONE INCH PER FOOT WHERE SUCH SIDE SLOPES ARE IN THE NORMAL PATH OF PEDESTRIANS ON ADJACENT PORTIONS OF SIDEWALK. IF THE STREET CURB HAS NOT BEEN CONSTRUCTED TO RECEIVE THE SIDEWALK RAMP, THE SIDEWALK CONSTRUCTOR SHALL REMOVE A

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DELTA SOLUTION	NIEL MCG CENSCO 20173 ANSAS O'ONAL ENG 1-28-2020 DANIEL MCGHEE KS PE 20773	JR.
CONSTRUCTION DOCUMENTS	CIVIL SPECIFICATIONS	r Park – Phase 1 roeland Park, kansas
REVISIONS		

CONCRETE CURB AND GUTTER

- SECTION 2209 OF THE APWA STANDARD SPECIFICATIONS SHALL GOVERN THE CONSTRUCTION OF CONCRETE CURB AND GUTTER.
- REINFORCEMENT FOR CURB AND GUTTER SHALL BE THREE NO. 4 BARS IN ACCORDANCE WITH "CONCRETE REINFORCEMENT." 3. CONCRETE FOR CURB AND GUTTER SHALL BE IN ACCORDANCE WITH "CONCRETE CONSTRUCTION".

# CONSTRUCTION REQUIREMENTS CONCRETE PLACEMENT

- 4. A SLIP FORM CURB MACHINE, WITH ELECTRONIC CONTROL, SHALL BE REQUIRED ON ALL CONTINUOUS CURB CONSTRUCTION OF LENGTHS GREATER THAN 100 FEET. 5. THE CONCRETE SHALL NOT BE PLACED UNTIL THE SUBGRADE HAS BEEN INSPECTED FOR COMPACTION AND MOISTURE. THE CONCRETE SHALL BE CONSOLIDATED WITH AN APPROVED INTERNAL TYPE VIBRATOR. THE SURFACE SHALL BE SHAPED BY USE OF A STEEL TOOL TO PRODUCE THE SECTIONS SHOWN ON THE DRAWINGS. THE EDGES SHALL BE ROUNDED WITH EDGERS TO
- FORM THE RADII INDICATED ON THE DRAWINGS. THE SURFACES SHALL BE FINISHED WITH A WOODEN OR METALLIC FLOAT AND BRUSHED. 6. ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH THE "CONCRETE CONSTRUCTION" SPECIFICATION.

**REINFORCEMENT** 

7. NO REINFORCEMENT SHALL BE REQUIRED WHEN CURB AND GUTTER IS LAID ON FOUR INCHES OR MORE OF ASPHALTIC CONCRETE BASE

<u>JOINTS</u>

- 8. ALL JOINTS SHALL BE FORMED AT RIGHT ANGLES TO THE ALIGNMENT OF THE CURBING.
- 9. EXPANSION JOINTS SHALL BE PLACED AT POINTS OF CURVATURE, CURB RETURNS, CURB INLET TRANSITIONS, AND AT INTERVALS NOT TO EXCEED 250 FEET. THE EXPANSION JOINTS SHALL CONSIST OF ONE-HALF INCH PRE-MOLDED BITUMINOUS, NON-EXTRUDING AND RESILIENT EXPANSION JOINT MATERIAL CUT TO THE CONFIGURATION OF THE CURB SECTION. THE MATERIAL SHALL EXTEND THROUGH THE FULL CURB SECTION. THE EDGES OF THE JOINTS SHALL BE ROUNDED WITH AN EDGING TOOL OF ONE-QUARTER INCH RADIUS.
- 10. CURBING SHALL HAVE CONTRACTION JOINTS FORMED AT 15 FEET INTERVALS. THEY SHALL EXTEND ACROSS THE ENTIRE CURB SECTION THE CUT SHALL BE APPROXIMATELY 1/4-INCH-WIDE, AND THE DEPTH SHALL BE ONE-THIRD THE THICKNESS OF THE CURB (MINIMUM) OR AS SHOWN IN THE PLANS. THE CONTRACTION JOINTS MAY BE FORMED BY ANY APPROVED METHOD. IF SAWING JOINTS, THE CONTRACTOR SHALL BEGIN AS SOON AS THE CONCRETE HARDENS SUFFICIENTLY TO PREVENT EXCESSIVE RAVELING ALONG THE SAW CUT AND SHALL FINISH BEFORE CONDITIONS INDUCE UNCONTROLLED CRACKS, REGARDLESS OF THE TIME OR WEATHER.

# <u>LINE AND GRADE</u>

- 11. THE NEW CONCRETE CURB AND GUTTER SHALL BE ACCURATELY PLACED IN ACCORDANCE WITH THE LINE AND GRADE AS ESTABLISHED BY THE ENGINEER. CURBS SHALL BE FORMED TO THE CROSS SECTION AS SHOWN ON THE DRAWINGS WITH A MULE; OR TEMPLATES SUPPORTED ON THE SIDE FORMS AND WITH A FLOAT NOT LESS THAN 4 FEET IN LENGTH, FOR HAND PLACED CURB
- 12. THE FINISHED SURFACE OF THE CURB AND GUTTER SHALL BE CHECKED FOR NO MORE THAN 1/4-INCH DEVIATION, BY THE USE OF A 10-FOOT STRAIGHTEDGE, AND CORRECTED IF NECESSARY. WHERE GRADES ARE FLAT AND WHILE THE CONCRETE IS STILL PLASTIC, THE DRAINAGE OF THE GUTTER SHOULD BE CHECKED WITH A 4-FOOT CARPENTER'S LEVEL.

<u>FINISH</u>

13. THE SURFACES OF CURB AND GUTTER SHALL BE FINISHED WITH A WOODEN OR STEEL FLOAT AND BROOMED. BROOMING SHALL BE PERPENDICULAR TO THE CURB LINE. THE BROOMING OPERATION SHALL BE SO EXECUTED THAT THE MARKS WILL BE UNIFORM IN APPEARANCE AND NOT MORE THAN ONE-SIXTEENTH INCH IN DEPTH. BROOMING SHALL BE COMPLETED BEFORE THE CONCRETE IS IN SUCH CONDITION THAT IT WILL BE TORN OR UNDULY ROUGHENED AND BEFORE THE CONCRETE HAS ATTAINED ITS INITIAL SET.

CURING AND BACKFILLING

- 14. CONCRETE CURBS SHALL BE CURED IN ACCORDANCE WITH "CONCRETE CONSTRUCTION."
- 15. BACKFILLING OPERATIONS SHALL NOT COMMENCE PRIOR TO THE COMPLETION OF THE CURING PERIOD, OR UNTIL THE CONCRETE ATTAINS 75% DESIGN STRENGTH, AS SHOWN BY COMPRESSIVE TESTS OF FIELD CURED CYLINDERS. ALL BACKFILL MATERIAL SHALL CONSIST OF SOIL SUITABLE FOR VEGETATION. THE AREA SHALL BE PREPARED SUCH THAT SOD CAN BE PLACED ON BARE SOIL.

# **DRIVEWAYS**

- CONCRETE SHALL BE CLASSIFIED AS KCMMB 4K IN ACCORDANCE WITH "CONCRETE CONSTRUCTION."
- 2. ALL CONCRETE DRIVEWAYS SHALL BE CONSTRUCTED ON A PREPARED SUBGRADE, COMPACTED TO 95% FOR A DEPTH OF 6 INCHES IN CUT SECTIONS, AND TO A DEPTH OF 18 INCHES IN FILL SECTIONS.
- 3. WHERE CONSTRUCTION REQUIRES THE REMOVAL AND REPLACEMENT OF EXISTING CONCRETE DRIVEWAYS, SUCH REMOVAL SHALL BE ACCOMPLISHED BY FIRST SAWING THE EXISTING DRIVEWAY AS SHOWN ON THE PLANS, AND REMOVING ALL MATERIAL TO BE REPLACED. A ONE\_HALF INCH (1/2") PRE-MOLDED EXPANSION JOINT SHALL BE INSTALLED AT THE SAWED JOINT, AND THE DRIVEWAY AND DRIVE APRON REPLACED WITH CONCRETE. CONCRETE DRIVEWAYS SHALL BE REPLACED TO A MINIMUM THICKNESS OF 6 INCHES, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN THE SECTION BEING REPLACED, AND IT SHALL INCLUDE WIRE MESH IF THE EXISTING DRIVEWAY IS SO REINFORCED. IF WIRE MESH IS USED, IT SHALL BE 6 INCH X 6 INCH #6 WWF PROVIDED IN SHEET FORM. ROLLED WIRE MESH SHALL NOT BE ALLOWED. ALL CONCRETE SHALL CONFORM TO KCMMB 4K CONCRETE AS DEFINED IN THESE SPECIFICATIONS. DRIVEWAYS SHALL RECEIVE A NONSLIP FINISH OBTAINED BY A WOOD FLOAT AND HAIR BRUSH OR BROOM APPLIED TRANSVERSE TO THE CENTERLINE OF THE DRIVEWAY.
- 4. ALL JOINTS IN CONCRETE DRIVEWAYS SHALL BE TOOLED, OR AS APPROVED BY THE ENGINEER. JOINTS SHALL BE TOOLED AFTER BROOMING TO PROVIDE A "PICTURE FRAME" APPEARANCE

# STORM SEWER PIPE

1. ALL STORM SEWER MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH APWA SECTION 2600.

# DRAINAGE STRUCTURES

1. THIS SECTION COVERS STRUCTURES APPURTENANT TO THE STORM SEWER SYSTEM. THESE STRUCTURES INCLUDE INLETS, MANHOLES, AND JUNCTION BOXES.

# CONCRETE CONSTRUCTION

- 2. ALL NEW INLETS AND JUNCTION BOXES SHALL BE CONSTRUCTED OF CONCRETE IN ACCORDANCE WITH CONCRETE
- REINFORCEMENT AND CONCRETE SECTION.
- 3. INLET TOPS SHALL HAVE LIGHT BROOM FINISH. 4. CURB TRANSITIONS SHALL HAVE BROOM FINISH. CONTRACTION JOINTS SHALL BE CUT WHERE SHOWN. CUT EACH A MINIMUM OF 1/4 OF THE CONCRETE DEPTH AND FINISH WITH JOINT TOOL
- 5. CONCRETE STRUCTURES MAY BE CAST IN PLACE, OR PRECAST, IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION. 6. CONNECTIONS TO EXISTING PIPES SHALL BE MADE WITH A CONCRETE COLLAR WITH KCMMB 4K CONCRETE AND ANY EXISTING PIPE THAT REQUIRES REPLACING SHALL BE DONE SO SUBSIDIARY TO THE PIPE INLET CONNECTION.

# PRECAST INLETS AND JUNCTION BOXES

- 7. PRECAST CONCRETE INLETS AND JUNCTION BOXES SHALL BE CONSTRUCTED IN ALL RESPECTS, IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, EXCEPT AS PROVIDED IN THE FOLLOWING ITEMS OF THIS SUBPARAGRAPH. THE USE OF PRECAST STRUCTURES WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MAKE ANY ADJUSTMENTS TO THE STRUCTURES FOUND TO BE NECESSARY BECAUSE OF FIELD UTILITY CONFLICTS OR OTHER FIELD CONDITIONS. MODIFICATION OF PRECAST STRUCTURES, IF ALLOWED BY THE ENGINEER OR SUBSTITUTION OF AN APPROVED STRUCTURE TO MEET FIELD CONDITIONS SHALL BE ENTIRELY AT THE CONTRACTOR'S EXPENSE.
- 8. ALL APPLICABLE REQUIREMENTS OF ASTM C-478 SHALL APPLY TO THE MANUFACTURE OF PRECAST CONCRETE MANHOLES. 9. THE MANUFACTURER OF PRECAST CONCRETE INLETS AND JUNCTION BOXES SHALL SUBMIT DETAILED DRAWINGS AND SPECIFICATIONS, FOR THE CONSTRUCTION OF THE BASIC PRECAST UNITS AND APPURTENANCES TO THE ENGINEER, FOR PRIOR APPROVAL. A SHOP DRAWING FOR EACH STRUCTURE SHOWING DIMENSIONS, ELEVATIONS AND OPENINGS, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO MANUFACTURING OF THE UNITS. THE CONTRACTOR SHALL VERIFY ALL TOP OF INLET AND MANHOLE ELEVATIONS PRIOR TO CONSTRUCTION OF THE STRUCTURES.
- 10. MULTIPLE PRECAST UNITS MAY ONLY BE USED AS SPECIFIED ON THE PLANS, OR WITH APPROVAL OF THE ENGINEER. WHERE DIVIDING WALLS ARE USED OR WHERE MULTIPLE PRECAST UNITS ARE USED, THE TOTAL NET LENGTH OF OPENING SHALL EQUAL THE LENGTH OF INLET SPECIFIED ON THE PROJECT PLANS. INTERMEDIATE WALL OPENINGS SHALL BE LARGE ENOUGH SO AS TO NOT CAUSE HYDRAULIC HEAD LOSS. LOCATION AND NUMBER OF MANHOLE OPENINGS, AS WELL AS OPENINGS IN WALLS BETWEEN MULTIPLE UNITS OR IN DIVIDING WALLS, SHALL BE AS REQUIRED TO PROMOTE EASY ACCESS TO ALL PARTS OF THE INLET, SUBJECT TO THE ENGINEER'S APPROVAL
- 11. UNLESS OTHERWISE NOTED ON THE PLANS, CONCRETE BASE SLABS FOR PRECAST STRUCTURES SHALL BE CONSTRUCTED MONOLITHIC WITH THE WALLS. THE BASE SLAB SHALL BE REINFORCED IN ACCORDANCE WITH THE PROJECT PLANS, AND THE BOTTOM OF THE BASE SLAB SHALL BE LOCATED TO PROVIDE AT LEAST 4" OF CLEARANCE BETWEEN THE BOTTOM OF THE LOWEST PIPE AND THE TOP OF THE BASE SLAB. 12. MASTIC PIPE JOINT COMPOUND, OR APPROVED PREFORMED MASTIC, SHALL BE USED IN HORIZONTAL JOINTS AND WHERE WALLS
- OF MULTIPLE SECTIONS JOIN, IN ORDER TO FORM A REASONABLY WATERTIGHT STRUCTURE. 13. ALL CURB INLET, AREA INLET, AND SHALLOW MANHOLE TOP SLABS SHALL BE CAST IN PLACE. WALL STEEL SHALL BE EXTENDED
- A MINIMUM OF 4.5" INTO THE TOP SLAB FOR 6" THICK CURB INLET TOPS, AND 6.5" FOR 8" THICK MANHOLE TOP SLABS.

# MATERIALS FOR MORTAR

- 14. PORTLAND CEMENT TYPE 1
- 15. HYDRATED LIME ASTM DESIGNATION C 207, TYPE N.
- 16. MASONRY CEMENT AASHTO DESIGNATION M 150, TYPE II.

17. SAND. PER KCMMB SPECIFICATIONS.

4. THE GENERAL CONTRACTOR SHALL SUPPLY ADEQUATE WATER TO THE SITE. FIRST WEEK: THE CONTRACTOR SHALL PROVIDE ALL LABOR AND ARRANGE FOR ALL WATERING NECESSARY FOR ROOTING OF THE TURFGRASS SOD. SOIL ON SOD PADS SHALL BE KEPT MOIST AT ALL TIMES. IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHALL BE PERFORMED DAILY OR AS OFTEN AS NECESSARY DURING THE FIRST WEEK AND IN SUFFICIENT QUANTITIES TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST FOUR INCHES. WATERING SHOULD BE DONE DURING THE HEAT OF THE DAY TO PREVENT WILTING. 5. SECOND AND SUBSEQUENT WEEKS: THE CONTRACTOR SHALL WATER THE TURFGRASS SOD AS REQUIRED TO MAINTAIN

TIME LIMITATION

<u>WATERING</u>

<u>SODDING</u>

8. ANY PORTION OF THE SOD THAT IS NOT IN GOOD GROWING CONDITION SHALL BE REPLACED WITH FRESH. LIVE SOD IN ACCORDANCE WITH THESE SPECIFICATIONS AND SHALL BE MAINTAINED IN GOOD, LIVE CONDITION UNTIL FINAL ACCEPTANCE OF THE WORK AND AT LEAST 30 DAYS FROM INSTALLATION.

# <u>PLACING</u>

- <u>GUARANTEE</u>

1. ALL CONCRETE FORM WORK SHALL BE IN ACCORDANCE WITH APWA SECTION 2200. CONCRETE REINFORCEMENT

1. REINFORCEMENT PLACEMENT AND DETAILING SHALL COMPLY WITH PRACTICE SPECIFIED IN THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" PUBLICATION ACI 3L5-80 OF THE AMERICAN CONCRETE INSTITUTE OR ITS LATEST REVISION, UNLESS OTHERWISE SPECIFIED HEREIN.

SITUATIONS.

# 18. WATER. POTABLE, PER KCMMB SPECIFICATIONS. 19. IRON OXIDE FOR EXPANDING GROUT. EMBECO BY MASTER BUILDERS CO., OR EQUAL

20. THE INGREDIENTS SHALL BE PROPORTIONED AS FOLLOWS:

	<u>WEIGHTS</u>	VOLUN
CEMENT	94#	1
LIME	10 <sup>#</sup>	0.15
	200#	3

21. MASONRY CEMENT MAY BE SUBSTITUTED FOR PORTLAND CEMENT AND HYDRATED LIME, PROVIDING SATISFACTORY RESULTS ARE OBTAINED. PROPORTION BY VOLUME SHALL BE ONE (L) PART MASONRY CEMENT TO THREE (3) PARTS SAND. 22. ALL THE MATERIALS EXCEPT WATER SHALL BE MIXED, EITHER IN A TIGHT BOX OR IN AN APPROVED MORTAR MIXER, UNTIL THE MIXTURE ASSUMES A UNIFORM COLOR, AFTER WHICH THE WATER SHALL BE ADDED AND THE MIXING CONTINUED. SUFFICIENT WATER SHALL BE ADDED TO PRODUCE A MORTAR OF SUCH CONSISTENCY THAT IT CAN BE HANDLED EASILY AND SPREAD WITH A TROWEL. MORTAR SHALL BE MIXED ONLY IN THOSE QUANTITIES REQUIRED FOR IMMEDIATE USE. MORTAR THAT IS NOT USED WITHIN 45 MINUTES AFTER WATER HAS BEEN ADDED SHALL BE DISCARDED. RETEMPERING OF MORTAR WILL NOT BE PERMITTED. 23. WORK INVOLVING MORTAR OR PLASTER SHALL NOT BE DONE IN FREEZING WEATHER AND SHALL BE PROTECTED FROM FREEZING FOR THREE DAYS AFTER CONSTRUCTION.

24. EXPANDING MORTAR OR GROUT PROPORTION, MIX AND USE SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

# WATER TIGHTNESS

MORTAR OR PLASTER

PORTLAND

HYDRATED

SAND

25. ALL STRUCTURES SHALL BE CONSTRUCTED SUBSTANTIALLY WATER TIGHT. ALL OBVIOUS LEAKS SHALL BE REPAIRED. 26. CURING SEAL, MOIST CURE OR SHADE SHALL BE USED, WHEN REQUIRED, TO ACCOMPLISH THESE RESULTS AND TO PROVIDE A WATERTIGHT STRUCTURE. 27. MASONRY AND MORTAR AROUND PIPE SHALL BE CAREFULLY CONSTRUCTED TO PROVIDE WATERTIGHT CONNECTIONS.

# SETTING TOP CASTINGS

28. TOP CASTINGS FOR ALL STRUCTURES WITH A CONCRETE TOP SLAB SHALL BE CAST IN THE SLAB AT THE TIME OF POURING 29. TOP CASTINGS FOR MANHOLES SHALL BE SET IN FULL MORTAR BED AND TO REQUIRED ELEVATION AND SLOPE.

30. TOP SHALL BE SHALL BE SET FLUSH, AND ON SAME SLOPE, WITH FINISHED PAVEMENTS OR WALKS. IN NEWLY DEVELOPED AREAS, SET TOP TO DESIGNED STREET SURFACE.

31. IN ESTABLISHED LAWNS, SET TOPS APPROXIMATELY 1 INCH ABOVE NORMAL GRADE AND SLOPE AWAY FROM MANHOLE AT 1 ON 10 SLOPE.

# **MISCELLANEOUS**

32. STEEL ITEMS: ASTM A7 OR A36. PAINTING OR GALVANIZING, AS REQUIRED BY THE PLANS. 33. CAST IRON ITEMS: ASTM A48, CLASS 35, GRAY IRON. EXCEPT FOR THE BURIED PORTION OF MANHOLE STEPS, COAT WITH COAL TAR PITCH, 2 COATS, AT FOUNDRY. CASTINGS SHALL FIT TOGETHER PROPERLY, MATING SURFACES SHALL BE MACHINED, AND BE NON-ROCKING UNDER MOVING LOADS.

1. ALL SEEDING AND SODDING INCLUDING MATERIALS, EQUIPMENT, AND MAINTENANCE SHALL BE IN ACCORDANCE WITH APWA SECTION 2400.

2. ACCEPTANCE: INITIAL ACCEPTANCE SHALL BE GIVEN TO THE GENERAL CONTRACTOR BY THE OWNER OR THEIR REPRESENTATIVE UPON SATISFACTORY COMPLETION OF EACH SECTION OR AREA AS INDICATED ON THE DRAWINGS OR AS OTHERWISE SPECIFIED. FINAL ACCEPTANCE WILL BE MADE BY THE OWNER OR THEIR REPRESENTATIVE AT LEAST 30 DAYS AFTER INSTALLATION.

3. SOD PLACED OUT OF SEASON: PAYMENT FOR SOD PLACED OUT OF SEASON WILL BE DEFERRED UNTIL THE SOD HAS BEEN ACCEPTED AFTER AN INSPECTION AT THE APPROPRIATE TIME DURING THE NEXT GROWING SEASON. THE INSPECTION AND ACCEPTANCE WILL CONFORM TO THIS SECTION.

ADEQUATE MOISTURE IN THE UPPER FOUR INCHES OF SOIL, NECESSARY FOR THE PROMOTION OF DEEP ROOT GROWTH. FLOODING WILL NOT BE PERMITTED.

7. DURATION OF MAINTENANCE RESPONSIBILITIES SHALL BE FOR 20 DAYS UNLESS OTHERWISE SPECIFIED.

# CONCRETE FORM WORK

2. ALL REINFORCEMENT SHALL BE FREE FROM RUST, LOOSE MILL SCALE, DIRT COATING, OIL, PAINT, ANY OTHER CONTAMINANTS, OR ANY FOREIGN SUBSTANCE.

3. ALL BARS SHALL BE BILLET STEEL BARS FOR CONCRETE REINFORCEMENT ASTM A615 GRADE 60. ALL REINFORCEMENTS SHALL BE EPOXY COATED. 4. WELDED STEEL WIRE SHALL MEET ASTM A185.

5. ACCESSORIES SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

6. ACCURATELY PLACE ALL BARS AND TIE IN PLACE BEFORE PLACING CONCRETE, INCLUDE DOWELS. TIE AT ALL INTERSECTIONS WITH 18 GAUGE STEEL WIRE. 7. CORNER BARS REQUIRED FOR HORIZONTAL REINFORCING. UNLESS OTHERWISE NOTED ON PLANS CORNER BARS SHALL BE SAME SIZE AS HORIZONTAL BAR.

8. PRESERVE CLEARANCE BETWEEN BARS OF 1 INCH MINIMUM, NOT LESS THAN ONE BAR DIAMETER OR 1-1/3 TIMES LARGE AGGREGATE, WHICHEVER IS LARGER.

9. PROVIDE FOLLOWING CONCRETE COVERAGE OVER REINFORCING STEEL UNLESS OTHERWISE INDICATED ON PLANS: THREE INCHES ABOVE SUBGRADE - IN EXCAVATION TWO INCHES ABOVE SUBGRADE - SLAB ON FILL TWO INCHES FROM FORM - WALL EXPOSED TO WATER OR EARTH ONE AND ONE-HALF INCHES FROM FORM - NORMAL COVER INTERIOR WALLS, BEAMS, COLUMNS, ETC. ONE AND ONE-HALF INCH ON TOP STEEL - INTERIOR SLABS ONE AND ONE-HALF INCHES ON TOP AND BOTTOM - EXTERIOR SLAB OR SLAB OVER OR UNDER WATER

10. LAP ALL REINFORCING BARS AS REQUIRED BY ACI 318-77 CLASS B LAP WITH A MINIMUM OF 36 DIAMETERS EXCEPT WHERE OTHERWISE SHOWN OR REQUIRED BY ACI. 11. STAGGER SPLICES EXCEPT WHERE OTHERWISE SHOWN.

12. LAP WELDED WIRE TWO SPACES.

13. ALL DOWELS SHALL BE PLACED AND SECURELY ANCHORED BEFORE PLACING CONCRETE.

14. SECURE ALL REINFORCEMENT IN PLACE USING STEEL CHAIRS, SUPPORTS, Z BARS AND OTHER PRODUCTS FABRICATED FOR THE PURPOSE. SUPPORTS SHALL BE SPACED ADEQUATELY TO SUPPORT THE STEEL FIRMLY IN PLACE. USE SAND PLATES OR OTHER APPROVED PRODUCTS WHEN REINFORCEMENT IS PLACED ON SAND OR EARTH SUBGRADE. CHAIRS WILL NOT BE ACCEPTED TO HOLD REINFORCING CLEARANCE ON WALLS.

15. OPENINGS AND OBSTRUCTIONS: PLACE ONE EXTRA NO. 5 BAR, 4 FEET LONG, DIAGONALLY IN EACH FACE AT CORNERS OF OPENINGS. PLACE NO. 4 HOOP AROUND ALL ROUND OPENINGS. 16. OPENINGS AND OBSTRUCTIONS: BEND REINFORCING AROUND OBSTRUCTIONS. PLACE EXTRA REINFORCING WHERE CUTTING

IS AUTHORIZED. ENGINEER'S APPROVAL REQUIRED BEFORE CUTTING STEEL. CONSULT ENGINEER ON SPECIAL 17. CERTIFY MATERIAL AND TYPE OF DEFORMATION.

# <u>CONCRETE</u>

1. ALL PRODUCING AND PLACING OF CONCRETE SHAL FOR STATE ROAD AND BRIDGE CONSTRUCTION.

<u>MATERIALS</u>

- 2. CEMENT: CEMENTITIOUS MATERIALS SHALL MEET
- 3. FINE AGGREGATE: AGGREGATE FOR CONCRETE SHAL 4. COARSE AGGREGATE: AGGREGATE FOR CONCRETE
- 5. MIXING WATER: MIXING WATER FOR CONCRETE SHA
- 6. AIR-ENTRAINING AGENT: AIR-ENTRAINING AGENTS U THE REQUIREMENTS OF THE KCMMB.
- 7. ADMIXTURES: ADMIXTURES LISTED IN THE KCMMB OF THE ENGINEER. 8. REINFORCING STEEL: GENERAL: ALL REINFORCING
- DESIGNATION A615, GRADE 40 OR 60. BAR SUPP STANDARD 513, AND THOSE USED IN THE UNDERS SUPPORT ON CONTINUOUS CHAIRS. FABRICATION: ACI STANDARD 315. REQUIREMENTS FOR LAPS, SP. THE PLANS. REINFORCING STEEL SHALL BE PROT THE ALTERNATE CROSSINGS, OR CLOSER. THE STE DISPLACEMENT, AND INSPECTED BEFORE ANY CON CLEARANCE BETWEEN THE FORMS AND THE REINFO CORRECT POSITION BY MEANS OF APPROVED META MORTAR, LOOSE RUST OR MUD SHALL BE CLEANE 9. WELDED WIRE FABRIC: ASTM DESIGNATION A-185 10. EXPANSION JOINT FILLER: AASHTO M213

# READY MIXED CONCRETE

11. READY MIXED CONCRETE, IN ACCORDANCE WITH AS BY THE ENGINEER. ANY CONCRETE WHICH IS NOT FORMS SHALL BE REJECTED.

# CONCRETE MIX

12. KCMMB 4K CONCRETE CONSTRUCTION: ALL CONCR CULVERT APRONS, INLETS, JUNCTION BOXES, YARD RETAINING WALLS SHALL BE CLASSIFIED AS CLASS

# CURING CONCRETE

- 13. MAINTAIN CONTINUOUSLY FOR 5 DAYS AFTER PLAC 14. CONCRETE TEMPERATURE AT LEAST 50° F AND NO 15. CONCRETE MOISTURE:
- WALLS AND STRUCTURES: COVER WITH 6 M REQUIRED FOR RUBBING. SLABS: POLYETH L X 4 AT LAPS AND AT 6 FOOT CENTERS. IN COLD WEATHER. PAVEMENT, WALKS, CHA MEMBRANE -ONE (1) GALLON TO 200 SQUA

SPECIAL WEATHER CONDITIONS - COLD WEATHER

- 16. AVERAGE DAILY TEMPERATURES AS DEFINED IN ACI 17. CONCRETE TEMPERATURES WILL BE DETERMINED BY THE CONTRACTOR BELOW INSULATED BLANKETS TEMPERATURES. UNCOVERED CONCRETE, WHICH HA
- DURING THE FIRST 24 HOURS WILL BE CONSIDERE 18. THE MONTHS OF DECEMBER, JANUARY AND FEBRU
- PROTECTION, REGARDLESS OF TEMPERATURE. 19. CONCRETE SHALL REACH 75% OF ITS DESIGN STR THROUGH THE USE OF FIELD-CURED CYLINDERS, DAYS WHERE THE AVERAGE DAILY TEMPERATURE IS
- CYLINDERS ARE TAKEN. THESE DAYS DO NOT NEE 20. ALL COVERINGS AND HEATING EQUIPMENT SHALL

# SPECIAL WEATHER CONDITIONS - HOT WEATHER

21. PLACE CONCRETE WITHIN THE TIME AND TEMPERAT

AMBIENT AIR TEMPER	ATURE AND AGITATED CONCR	RETE F
	SPECIMEN ANGE TIME	
AT= AMBIENT AIR	LIMITED AGITATED	
TEMPRATURE AT TIME OF	CONCRETE MUST BE PLACED	
BATCHING (F)	WITHIN, AFTER ADDITION	
T < 75	1 1/2	
75 <u>&lt;</u>	1	
75 <u>&lt;</u> T < 90	1 1/2	

22. IN ALL CASES, IF THE CONCRETE TEMPERATURE AT CONTRIBUTING TO QUICK STIFFENING OF THE CONC CEMENT TO THE WATER. DO NOT USE CONCRETE DELIVERY AD PLACEMENT, THE ENGINEER WILL SUS TAKEN IF THERE IS EVIDENCE THAT THE CONCRETE

# <u>FORMS – WALL</u>

- 23. FORMS SHALL BE CONSTRUCTED FROM SURFACE F FORMING SYSTEM. ALL FORM MATERIAL SHALL BE
- CLEANOUTS AT BOTTOM AND REMOVE DEBRIS. 24. FORMS SHALL BE ERECTED TRUE AND RIGID WITH EXPOSED CORNERS.

# CONCRETE FINISH

25. ALL CONCRETE SHALL BE FINISHED MONOLITHICALL

- RUBBED TO PRODUCE UNIFORM SANDY TEXTURE V WALLS SHALL BE HARD TROWEL FINISH WITH CHAM
- 26. PAVEMENT SLAB, SLOPE PAVING, INLET TOPS, SIDE BROOM FINISH.

# <u>JOINTS</u>

- 27. JOINTS SHALL BE CONSTRUCTED AS SHOWN ON T CONSTRUCTED UNLESS APPROVED BY THE ENGINE
- 28. ALL CONSTRUCTION JOINTS SHALL BE MADE WITH
- CONSTRUCTION JOINT CONTACT SURFACES SHALL 29. NORMAL GROUT: FURNISH AND INSTALL NORMAL
- PART SAND TO 2 PARTS CEMENT BY VOLUME. U
- 30. EXPANDING GROUT: PROPORTION BY WEIGHT L PA COMPOUND SIMILAR AND EQUAL TO EMBECO (MAST WATER TO A STIFF CONSISTENCY AS LIMITED BY PL MOIST CURE FOR THREE DAYS.

# CONCRETE EQUIPMENT AND PLACING

- 31. THE CONTRACTOR'S ATTENTION IS CALLED TO THE CREWS, VIBRATORS AND OTHER EQUIPMENT TO PRO THAT CONCRETE SURFACES WILL BE KEPT "ALIVE". BE USED.
- 32. BEFORE DELIVERY OF CONCRETE THE CONTRACTOR NECESSARY ITEMS ON HAND NOT ONLY FOR PROP AND/OR AS REQUIRED TO PERFORM IN ACCORDAN PREPARED MAY RESULT IN INABILITY TO PERFORM
- 33. ANY CONCRETE DAMAGED BY THE CONTRACTOR'S REPLACED AT THE CONTRACTOR'S EXPENSE

L CONFORM TO SECTION 400 OF THE KANSAS STANDARD SPECIFICATIONS	L A M I R Y N E	A R	5 <b>O N</b>
THE REQUIREMENTS OF THE KCMMB. LL MEET THE REQUIREMENTS OF THE KCMMB. SHALL MEET THE REQUIREMENTS OF THE KCMMB. JLL BE POTABLE AND SHALL MEET THE REQUIREMENTS OF THE KCMMB. JSED TO PRODUCE SPECIFIED AMOUNTS OF AIR ENTRAINMENT SHALL MEET MIX DESIGN AS "OPTIONAL" WILL BE USED ONLY WITH PRIOR APPROVAL	9001 STATE LINI KANSAS CITY, M 816.361.0440 LampRynearson.c	E RD., STE. 200 IO 64114 com	
STEEL SHALL BE DEFORMED BARS AND SHALL COMPLY WITH ASTM PORTS: ALL BOLSTERS AND CHAIRS SHALL BE IN ACCORDANCE WITH ACI SIDE OF THE TOP SLABS SHALL BE PRE-GALVANIZED. ON SUB-GRADE, FABRICATION OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH PACING, EDGE DISTANCE, LENGTH AND BENDING OF BARS ARE GIVEN ON TECTED FROM DAMAGE AT ALL TIMES. THE BARS SHALL BE FIRMLY TIED AT TEL SHALL BE TIED IN CORRECT POSITION, POSITIVELY SECURED AGAINST CRETE IS PLACED. CARE SHALL BE EXERCISED TO MAINTAIN PROPER ORCEMENT. BARS AT THE TOP OF LIFTS SHALL BE HELD SECURELY IN AL BAR SUPPORTS. BEFORE ANY CONCRETE IS PLACED, ANY DRIED D FROM THE REINFORCING STEEL.			
STM DESIGNATION C-94, SHALL BE USED UNLESS OTHERWISE AUTHORIZED T PLASTIC AND WORKABLE WHEN PLACED ON THE SUBGRADE OR IN THE	Line Contraction of the second	NIEL MCGA	JR JR
ETE USED IN CONSTRUCTION OF CURB AND GUTTERS, RETAINING WALLS, D INLETS, MANHOLES, DITCH LINERS, SIDEWALKS, AND INTEGRAL SIDEWALK KCMMB 4K UNLESS OTHERWISE STATED IN THE PLANS.		TANSAS SYONAL ENGIN	
DING. DT OVER 100° F	MARKI	DANIEL MCGHEE J KS PE 20773	К.
MIL POLYETHYLENE FILM AND LEAVE FORMS ON 5 DAYS, EXCEPT AS HYLENE MEMBRANE 4 MIL THICK; LAP JOINTS 6". HOLD DOWN WITH MEMBRANE TO BE TRANSLUCENT OR WHITE IN HOT WEATHER; BLACK ANNELS, AND OTHER APPROVED STRUCTURES: SPRAY APPROVED ARE FEET.			
I 306.1–90 WILL BE DETERMINED AND RECORDED BY THE CITY. HROUGH THE USE OF HIGH–LOW THERMOMETERS PLACED AND OPERATED G, OR WHERE THE CONCRETE IS UNCOVERED, BY CHECKING AIR AS BEEN SUBJECTED TO FREEZING TEMPERATURES OF ANY DURATION ED "FROZEN," AND SHALL BE REJECTED. JARY WILL BE CONSIDERED "COLD WEATHER" AND WILL REQUIRE CONCRETE			
ENGTH PRIOR TO BACKFILLING. THIS STRENGTH CAN BE DETERMINED MADE AND TESTED AT CONTRACTOR'S EXPENSE. CONCRETE MUST HAVE 5 ABOVE 50 DEGREES F PRIOR TO BACKFILLING UNLESS FIELD CURED D TO BE CONSECUTIVE. BE ON HAND PRIOR TO BEGINNING PLACEMENT OF THE CONCRETE.	JMENTS	(0	
TURE CONDITIONS SHOWN IN TABLE BELOW.	DOCI	NOL	
TE PLACEMENT TIME	Z	ICAT	
	CTIO	ECIF	
ADMIXTURES NONE	RUG	SPE	
NONE SET RETARDER	ISN		AS
T TIME OF PLACEMENT IS 90°F OR ABOVE, OR UNDER CONDITIONS CRETE, PLACE THE CONCRETE WITHIN 45 MINUTES OF ADDING THE THAT HAS DEVELOPED ITS INITIAL SET. REGARDLESS OF THE SPEED OF SPEND THE CONCRETING OPERATIONS UNTIL CORRECTIVE MEASURES ARE E CANNOT BE ADEQUATELY CONSOLIDATED.	CO		PHASE 1 ARK, KANS
FINISHED PLYWOOD AND 2 X 4 STUDS OR APPROVED MANUFACTURED IN FIRST CLASS CONDITION AND WITH MORTAR TIGHT JOINTS. PROVIDE ADEQUATE BRACING TO INSURE ALIGNMENT. PROVIDE CHAMFER FOR ALL			PARK – Eland P/
LY. NO "TOPPING" OR "PLASTERING". WALLS EXPOSED TO VIEW SHALL BE WITHOUT AIR VOIDS, FINS, FORM MARKS OR OFFSETS. TOPS OF ALL MFERED CORNERS. EWALK, AND EXPOSED SLABS OF STRUCTURES SHALL RECEIVE A LIGHT			8 8 9 8 9 8
HE PLANS. UNLESS SHOWN ON THE PLANS, JOINTS SHALL NOT BE ER. CANTED 2 X 4 AT LEAST 2 INCHES FROM WALL FACE. ALL BE FINISHED WITH WOOD FLOAT FINISH.	REVISIONS		
CEMENT GROUT WHERE CALLED FOR ON THE PLANS. MIX TO BE ONE SE MINIMUM WATER REQUIRED FOR WORKABILITY. ART NORMAL PORTLAND CEMENT. L PART SAND AND L PART IRONITF			
TER BUILDERS CO.). THOROUGHLY DRY MIX AND ADD A MINIMUM OF PLACING CONDITIONS. FIRMLY PACK MORTAR INTO THE HOLE OR JOINT AND			
SIZE OF CONCRETE POURS REQUIRED. HE SHALL HAVE SUFFICIENT COPERLY HANDLE SAME SO THAT NO COLD JOINTS WILL BE CREATED AND . THE ENGINEER SHALL BE ADVISED IN ADVANCE OF THE EQUIPMENT TO	MDM/AJM DATE 01-28-2020	۱ 	
K SHALL HAVE MADE ALL NECESSARY PREPARATIONS AND SHALL HAVE ALL PER PLACING BUT FOR COVERING, CURING, HEATING, FINISHING, RUBBING ICE WITH THE PLANS AND SPECIFICATIONS. FAILURE TO BE PROPERLY	0319001.04 BOOK AND PAGE		
PROPERLY AND CONSEQUENT REJECTION OF THE WORK. EQUIPMENT, OR BY OTHER MEANS DURING CONSTRUCTION SHALL BE			
	SHEET		
		C12	
	l	- · <b>-</b>	

![](_page_13_Figure_1.jpeg)

![](_page_14_Figure_0.jpeg)

![](_page_15_Figure_0.jpeg)

# 1 REFLECTED CEILING PLAN - PAVILION 1/4" = 1'-0"

![](_page_16_Picture_0.jpeg)

![](_page_17_Figure_0.jpeg)

![](_page_17_Figure_1.jpeg)

![](_page_17_Figure_2.jpeg)

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	3488 3488 SIONAL APO	TI TI ECT
OF EACH SLOPED ROOF	CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS
	REVISIONS  DESIGNER / DRAFTER DATE DATE DATE BOOK AND PAGE MISSOURI AUTHORIZATION NUMBER	ANS

![](_page_18_Figure_0.jpeg)

![](_page_18_Figure_2.jpeg)

		<ul> <li>FIBERON RAINSCREEN CLADDING</li> <li>METAL TRIM</li> <li>ELEC. PANEL</li> <li>STONE CLADDING</li> <li>HOLLOW METAL WINDOW WITH FROSTED INSULATED GLASS</li> </ul>	N	A R S O N STE. 200 14 architects miller ., STE. 922 0 64108
	<ul> <li>SNOW GU/</li> <li>METAL RO</li> <li>STONE FIF</li> <li>WOOD T&amp;O</li> <li>(4) 1/4" STE</li> <li>BRACES WOUT, POW</li> <li>DIFFERENT</li> <li>TBD LATEF</li> <li>PERGOLA</li> <li>STEEL CO</li> <li>STONE WA</li> </ul>	ARDS OFING REPLACE G DECKING EL PLATE LATERAL /ITH CNC PATTER CUT DER COAT 4 T COLORS, COLORS ALL/SEAT	CONSTRUCTION DOCUMENTS	PARK - PHASE 1 DELAND PARK, KANSAS
	<ul> <li>STONE FIF</li> <li>TIMBER TF</li> <li>JOIST</li> <li>PERGOLA</li> <li>STEEL CO</li> <li>BEAMS</li> </ul>	REPLACE RUSSES AND LUMNS AND	REVISIONS DESIGNER / DRAFTER DATE DATE DATE BOOK AND PAGE MISSOURI AUTHORIZATION	RIOR TIONS

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# **BATHROOM ACCESSORIES**

- A TOILET PARTITIONS BRADLEY, SERIES 400 , STAINLESS STEEL, SENTIEL OVERHEAD BREACED
- B GRAB BARS BRADLEY, SERIES 812, 1-1/2" DIA. STAINLESS STEEL, WITH CONCEALED MOUNTING
- С TOILET PAPER BRADLEY, SERIES 5A10, STAINLESS STEEL, SURFACE DISPENSER MOUNTED
- D NAPKIN DISPOSAL BRADLEY, SERIES 4791-11, STAINLESS STEEL, SURFACE MOUNTED WITH SHELF
  - FOUNDATIONS, MODEL 100-SSC-SM, STAINLESS BABY CHANGE STEEL, SURFACE MOUNT
  - ADULT CHANGE FOUNDATIONS, MODEL 100-SSE-SM, STAINLESS STATION STEEL, SURFACE MOUNT
  - MIRROR BRADLEY, SERIES 740 FIXED TILT

Е

F

G

STATION

- SOAP DISPENSER BRADLEY, SERIES 6A01, STAINLESS STEEL, FOAM Н SOAP DISPENSER
- HAND DRYER BRADLEY, SERIES 2923 STAINLESS STEEL, HIGH J SPEED DUFACE MOUNT
- BRADLEY, SERIES 3565 STAINLESS STEEL, 12 GALLON K TRASH CAN WASTE RECEPTACLE

![](_page_20_Figure_11.jpeg)

CUSTOM CAST STONE CHIMNEY CAP

L1 BOND BEAM AT PERIMETER OF CHIMNEY

CHIMNEY/HEARTH

2" STONE VENEER OVER 8" CMU, 8" CMU W/ (1) #6 @ 16" OC IN FULLY GROUTED CELLS AT FULL HEIGHT CELLS. GROUT ALL CELLS AT END WALLS

L2 BOND BEAM FIREPLACE OPENING

CAST STONE LINTEL

FIREPLACE: FIREROCK BUILDING MATERIALS, MODULARE SEE-THROUGH FIREPLACE AND FLUE, 48" MODEL. INSTALL PER FIREROCK INSTRUCTIONS. FIREBRICK NOT BUT BY FIREROCK BUT SHALL BE INSTALLED PER INSTRUCTIONS.

CAST STONE HEARTH

8" CMU SUPPORT FOR FIREPLACE HEARTH

CONCRETE FOOTING W/ #8 REINF. @ 12" OC EA. WAY TOP AND BOTTOM. HOOK TOP BARS DOWN SIDES AS SHOWN.

![](_page_20_Figure_25.jpeg)

![](_page_20_Figure_26.jpeg)

![](_page_20_Figure_27.jpeg)

![](_page_21_Figure_0.jpeg)

![](_page_21_Figure_3.jpeg)

![](_page_21_Figure_4.jpeg)

![](_page_21_Figure_5.jpeg)

3 Typical Slab on Grade Details 3/4" = 1'-0"

![](_page_21_Figure_8.jpeg)

2 Typical Lintel Section 3/4" = 1'-0"

![](_page_21_Figure_10.jpeg)

![](_page_22_Figure_0.jpeg)

![](_page_23_Figure_0.jpeg)

![](_page_24_Figure_0.jpeg)

# A. Building Code

1. The design and construction shall conform to the 2012 International Building Code (IBC) as amended by the City of Roeland Park, Kansas,

# B. Design Loads

1. This project is designed to resist the most critical loads resulting from the basic load combinations outlined in section 1605 of the code.

2.	Dead Loads	
	a. Total service roof dead load:	15 psf. (Pavilion) 20 psf (Restrooms)
1.	Live Loads a. Code Loads 1. Roof b. Live load reduction has not been utilized.	20 psf
2.	<ul> <li>Wind - The wind load is in accordance with ASCE 7-10</li> <li>a. Basic wind speed</li> <li>b. Risk Category</li> <li>c. Exposure Catergory</li> <li>d. Internal Pressure Coefficient</li> <li>e. Components &amp; Cladding Force</li> </ul>	0 with the following criteria: V3S=115 mph II C ±.18 per code
3.	<ul> <li>Snow - The snow load is in accordance with ASCE 7-7</li> <li>a. Ground snow load</li> <li>b. Exposure Factor</li> <li>c. Importance Factor</li> <li>d. Thermal Factor</li> <li>e. Gable Roof Snow Load</li> </ul>	10 with the following criteria: pg=20 psf, Ce=0.9 IS=1.10 Ct=1.0 pf=16.8 psf

- Gable Rool Show Load Minimum Snow Load
- 4. Seismic The seismic design is in accordance with the general building code with the following criteria: IE=1.25

pm=20 psf

Ss=9.5%

S1=6.9%

Sd1=11.1%

3 kips

Cs=0.082

Equivalent Lateral Force

R=1.25

- a. Importance Factor b. Risk Category
- c. 0.2 sec Spectral Response Acceleration d. 1.0 sec Spectral Response Acceleration
- Soil Site Class
- Sds=10.2% Design 0.2sec Spectral Response Acceleration
- Design 1.0sec Spectral Response Acceleration
- Seismic Design Category
- Basic Seismic Force Resisting System Steel Ordinary Cantilever Column System
- Design Base Shear
- Seismic Response Coefficient
- Response Modification Coefficient
- **m.** Analysis Procedure

# C. Foundations

- 1. Geotechnical Report. a. Read and be familiar with all aspects of the Geotechnical Engineering Report prepared by Kaw Valley Engineering, Inc., October 18, 2019, Report #C19G03060.
- b. If existing field conditions vary from the geotechnical report, it is the responsibility of the contractor to notify the Geotechnical Engineer, Architect and Engineer of Record. 2. Spread Footings, Trench Footing and Grade Beams
- a. All shallow foundations have been designed to bear on undisturbed soil or engineered fill per geotechnical report for a net allowable bearing pressure of 2500 psf.
- 3. Side forms for trenched foundations are not required.

# D. Concrete

2

1. All concrete and reinforcing details shall conform to ACI 318-14 and CRSI "Manual of Standard Practice"

Stre	ength - The following areas shall hav	ve a minimum 28 day compressive strengtl			
a.	Interior flatwork concrete:	4000 psi			
<b>L</b>	Estavian flatural, comparates	4000			

b.	Exterior flatwork concrete:	4000 psi
C.	Footing and grade beams:	4000 psi
No	water may be added to the concrete mix on the job	aita unloga ar

3. No water may be added to the concrete mix on the job site unless specifically withheld at the batch plant. The workability should be attained through the use of water-reducing agents and/or super-plasticizing chemical admixtures.

# 4. Reinforcing

- a. Grade
  - ASTM A615, Grade 60 1. Typical reinforcing
- b. Lap splices and development lengths in reinforcement shall be 48 bar diameters unless indicated elsewhere in the drawings and specifications. Lap welded wire reinforcing one full mesh space plus 2 inches. ASTM A185 c. Welded Wire Reinforcing
- 1. All welded wire reinforcing for slab on grade shall be supported on metal chairs specifically designed for soil bearing conditions. Pulling reinforcing up during concrete placement is not allowed.
- d. All concrete shall be reinforced unless specifically identified on the drawings as unreinforced. Reinforce sections with similar conditions located elsewhere on the project.
- 5. Concrete cover shall be the following.
- a. Concrete cast against and exposed to earth 3" 1 1⁄2" b. Concrete exposed to weather #5 and smaller
- c. Concrete exposed to weather #6 and larger 2"
- d. Concrete not exposed to weather or earth 3/,"
- 1. Slabs
- 6. All openings in slabs, walls, foundations, etc. shall have an additional 2-#5's on each side, in each corner of the opening and each face of the member. Extend reinforcing 2'-6" beyond edge of opening.
- 7. Aluminum items shall not be embedded in concrete.

# E. Masonry

- 1. All masonry design and detailing shall be in accordance with the recommendations of TMS 402/ACI 530-14.
- 2. Materials f'm = 2000 psi a. Design strength
- 3. Minimum reinforcing for 8" non-load bearing masonry shall be (1)#4 at 48" on center minimum.
- 4. Control joints in all masonry shall be at 20 feet maximum on center unless indicated elsewhere in the drawings and specifications. All horizontal joint reinforcement shall be discontinuous at vertical control joints. All horizontal reinforcement in bond beams shall be continuous through vertical control joints.
- 5. All CMU shall be running bond unless otherwise noted in the contract documents
- 6. Reinforcement Details
- a. Rebar positioners shall be used for all reinforcing and all vertical cells should be free of debris and excess mortar such that a minimum space of 3" by 3" is maintained to ease the placement of grout.
- b. Lap splices shall be 48 bar diameters minimum unless indicated elsewhere in the drawings and specifications. c. Locate wall reinforcing at jambs, ends of walls and each side of control joints. Reference typical details for additional reinforcing information
- d. Reinforcing shall be placed prior to grouting.
- 7. Grout shall be consolidated by means of mechanical vibration unless self-consolidating grout is used.
- 8. Grout solid all units below grade and below finish floor.

# F. Structural Steel

- 1. All steel fabrication and erection shall be in accordance with the requirements and recommendations of the American Institute of Steel Construction (AISC) Manual of Steel Construction, 14th edition a. Steel design shall be per Allowable Stress Design or Load and Resistance Factor Design as outlined by AISC.
- 2. Grade
- a. Channels, angles and plates ASTM A36
- b. Square hollow structural shapes ASTM A500, Grade C (50 ksi)
- c. Connection material ASTM A36.
- d. All exterior steel shall be galvanized G60.
- 3. Anchor Rods
- a. Anchor rods shall conform to ASTM F1554, Grade 55.
- b. Steel or plywood templates shall be used for all anchor rod placement in concrete and masonry.
- 4. Thermal cutting is not allowed in the field.
- 5. The contractor shall supply all miscellaneous steel as required by the contract documents. Miscellaneous steel shall include, but is not limited to, shelf angle, glass support, lintels, catwalks and other steel required for stabilization of architectural elements.

# G. Wood

- 1. All wood framing shall be designed and erected in accordance with the recommendations of the latest edition of the National Design Specification (NDS) For Wood Construction Manuals.
- All wood framing shall be Western Cedar #2 or better with 19% maximum moisture content at the time of manufacture. 3. Plywood
- a. Stagger panel ends of roof sheathing.
- b. H-Clips shall be used for all roof sheathing. 4. Any wood member that rests on or is in contact with concrete, earth or masonry shall be exterior preservative pressure
- All metal wood connectors shall perform to a minimum load capacity of the Simpson Strong Tie products. All connectors shall be capable of resisting the corrosive effects of the exterior preservative pressure treatment and shall be completely installed prior to loading the connections.
- H. Wood Trusses and Purlins
- 1. All wood trusses shall be designed, fabricated and erected in accordance with the recommendations of the latest edition of the National Design Specification (NDS) For Wood Construction Manuals.
- 2. Design calculations shall be prepared by a registered, professional licensed engineer in the State of the project.
- 3. Loads
- a. Top chord roof dead load 10 psf (in addition to wood member self weight)
- b. Top chord roof live load 20 psf
- c. Bottom chord roof dead load 2 psf
- Bottom chord roof live load10 psf (non-concurrent)
- 4. Shop drawings shall be prepared under the supervision of a licensed professional engineer. Submit layout plans, connection design, typical details, bracing requirements and truss design details for the entire project. Design calculations shall be submitted and signed and sealed by a professional engineer in the State of the project.
- 5. All wood trusses shall be securely braced during construction through final construction. The contractor is responsible for all temporary construction bracing.

# J. Miscellaneous

- relieves the Contractor of any requirements of the contract documents.

- on plans
- Engineer of Record regarding any discrepancy with existing building dimensions.
- 7. Submittals
- drawing that is not original will be rejected and returned without review.
- review stamp will be returned without review.
- project. Provide the following design calculations for review: Structural Steel connections
- Submittals Provide the following submittals for review: Concrete Mix Design and Materials Concrete Reinforcing
- Embedded Items (plates, angles, etc.)
- 4. Masonry Products and Materials
- Masonry Reinforcing
- 6. Structural Steel
- Miscellaneous Steel

# K. Special Inspections (based on 2012 IBC, Chapter 1705)

- and any other pertinent entity in a timely manner.

- as required to assist with special inspections.
- 5. Foundations
- a. Bearing capacity
- b. Bearing elevation
- 6. Concrete
- a. Reinforcing steel placement
- b. Embedded items in concrete
- c. Concrete placement technique
- d. Sampling of fresh concrete
- 7. Masonry
- a. Reinforcing steel placement
- b. Sampling of fresh grout and mortar
- c. Grout placement technique d. Level B special inspection required
- a. Periodic
  - Single-pass fillet welds not exceeding 5/16 inch in size.
  - 2. Floor and roof deck attachment 3. Headed stud anchors
  - Welding of stairs and railing systems
  - 5. High strength bolts
- b. Continuous
- 1. Partial and full penetration welds.
- 9. Wood
- a. Nail / screw installation.
- b. General framing
- 10. Post installed Anchors

1. Site visits will be made by representatives of Hollis and Miller Architects in order to establish the general conformance of the construction to the contract documents. Observations by the Engineer shall not be considered inspections and in no way

2. Stability of the structure during construction, including load bearing and non-load bearing masonry walls, is the responsibility of the Contractor. The Engineer is responsible for the stability of the completed structure only.

3. Conflict between the Architectural and Structural Drawings shall be brought to the attention of the Architect and Engineer immediately. When conflicts occur between the drawings and the specifications, the strictest interpretation shall govern.

4. The Engineer shall not be in control of, have charge of, or be responsible for the construction means and methods. The contractor is solely responsible for all construction means, methods, procedures, techniques and job sequence.

5. Typical details are intended to represent typical conditions for the entire project. Typical details may or may not be indicated

6. All existing field and building conditions shall be verified by the Contractor before any other work shall begin. Coordinate with

a. Submittals are to be based upon the latest submitted contract documents. This includes all addendums, Architectural Supplemental Instructions (ASIs) and Structural Supplemental Drawings (SSD's) and Requests for Information (RFI's). b. Submittals shall be original documents. Shop drawings shall not be a duplication, in any way, of the contract documents. This includes, but is not limited to, photocopies, electronic drawing copying or electronic scanning. Any submitted shop

c. Prior to submission of the submittals to the Architect, the Contractor shall review the shop drawings for conformance to the means, methods, techniques, sequences and operations of construction. The Contractor's review stamp shall be affixed to all shop drawings prior to Architect or Structural Engineer review. Shop drawings not bearing the Contractor's

d. Design Calculations - All calculations shall be signed and sealed by a professional engineer licensed in the State of the

2. Prefabricated wood trusses, wood purlines and all wood roof framing connections.

8. Prefabricated Wood Trusses, wood purlines and all wood roof framing connections. All truss, purlin, and connection drawings shall be signed and sealed by a professional engineer licensed in the state of the project. Substitutions are allowed prior to bid only. Reference the specifications for timing of submission

1. Special inspection reports shall be submitted to the Building Official, Owner, Architect, Engineer, Contractor, Sub-Contractor

2. All discrepancies found by the special inspector shall immediately be brought to the attention of the general contractor and corrected. If the contractor is unable to correct the discrepancy, the special inspector shall notify the Architect and Engineer.

3. Upon completion of the project, the special inspector shall submit a final report delineating that the work was, to the best of the inspector's knowledge, completed in conformance with the approved contract documents and applicable building code.

4. The Owner shall retain special inspection services for the items listed below. The Contractor shall provide light general labor

Steel (includes structural steel, joist, deck and anchor rod placement)

c. All other welding not covered in periodic inspections.

L A M P R Y N E A R	SON
9001 STATE LINE RD., STE. 200 KANSAS CITY, MO 64114 816.361.0440 LampRynearson.com	)
hollis <sup>ar</sup>	chitects <b>ler</b>
1828 WALNUT ST., STE. KANSAS CITY, MO 64108 816.442.7700	922
TT204	1.15.2020
-	
CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS
STRUCTU NOTES	RAL S
REVISIONS	
DESIGNER / DRAFTER	
 DATE 1-15-2020	
MISSOURI AUTHORIZATION NUMBE	R
A20	)

1.	edition for "reinforced concrete" and Concrete Reinforcing Steel Institute "Manual of Standard Practice" shall govern the performance of work required under this division.	12.	C
<b>റ</b>			p
۷.	a. Cement used for general construction shall conform to ASTM C-150, Type I.		
	b. Fine and coarse aggregate shall be normal weight aggregates complying with ASTM C33, free of spalling - causing deleterious material. Fine and coarse aggregate shall be regarded as separate	DIVI	SIC
	ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall conform to the appropriate grading requirements of the applicable ASTM specifications. Maximum size of the aggregate shall be as follows:	1.	C C
	<ol> <li>Footings and grade beams max. 3/4"</li> <li>Slabs max. 1"</li> <li>Bond beam fill max. 3/8"</li> </ol>	2.	S a
	<ul> <li>Use only water which is clean and free of oil, acids, alkalis, salts, and organic matter.</li> <li>Reinforcing Bars: Refer to Drawings.</li> </ul>		
	e. Welded Wire Reinforcement: All wire reinforcement shall be electrostatically welded wire conforming to ASTM A-185 and A-82. Welded wire reinforcement in slabs on grade shall be laid with a side and end lap of 6".		b
	f. All spacers, chairs, ties, and other devices necessary for properly placing, spacing, supporting and fastening reinforcement in place shall be used according to the latest edition of the Concrete Reinforcing Steel Institute.		С
	g. Granular Drainage Fill: Provide 4" thick, clean gravel, particle size ½" to 3/4" per ASTM D 448, grading size 57.		
3.	CONCRETE:		
	<ul> <li>All concrete shall have a water/cement ratio of 0.45 maximum and shall be of a mix which will produce a minimum compressive strength of 4,000 p.s.i., measured at 28 days when tested in accordance with ASTM standard test C-39, current edition.</li> </ul>	3.	N P N
	<ul> <li>All concrete shall be batched as per ASTM-C94 and as per ACI-301 and ACI-318.</li> <li>No additives containing chloride will be permitted in any concrete mix</li> </ul>		а
	<ul> <li>d. No additional admixtures of any kind are permitted without written approval of Architect.</li> <li>e. Air-entrainment shall be 6 - 8% and conform to ASTM C 260.</li> </ul>		
4.	HANDLING AND PLACEMENT OF REINFORCEMENT:		
	and splices shall be in strict accordance with the requirements of the Concrete Reinforcing Steel	4.	A
	<ul> <li>All bars must be fabricated as shown or called for in the drawings and must be accurately placed,</li> </ul>		a
	thoroughly wired at the intersections, and fastened in the forms in such a manner as to hold them firmly in place, while the concrete is being placed. Reinforcing bars and welded wire fabric shall be placed within 1" to 1-1/2" of top of slab. Extreme care shall be used to set reinforcement accurately		
	and to hold firmly in place. Approved chairs and spacers shall be provided, as required.		
	called for, the Contractor must consult the Architect and secure from him, in writing, the method of installation before placing any concrete. The bending of bars around openings for sleeves will not be		
	permitted unless authorized by the Architect. d. Unless noted otherwise, lap splices shall be 48 bar diameters.		
	e. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process. Apply to concrete surfaces exposed to		
	public view on vertical surfaces of sides and of stairs and stair risers.		
	indicated. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber- bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.		
5.	PLACING CONCRETE:		
	a. Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete" and as specified. All concrete shall be deposited in the form as nearly as practicable in its		
	final position to avoid segregation. Spouting directly into forms will not be permitted from more than	F	
	eight feet in height. Each layer placed shall be thoroughly incorporated with layers previously laid. Concrete shall not be transported by vibrating.	5.	a a
	b. During and after depositing, thoroughly compact concrete by mechanical vibration to achieve a solid homogeneous mass. Where it is impractical to vibrate, the concrete shall be thoroughly spaded so as		b C
	to secure a solid homogeneous mass. Deposit and consolidate slabs in continuous operation within limits of construction lovers proviously laid. Deposit and consolidate slabs in continuous operation		
	within limits of construction joints.		e
6.	CONTROL TESTS:		f.
	<ul> <li>A slump test shall be made from each concrete delivery truck before concrete is deposited. The maximum slump permitted shall be 4" for both regular concrete and air-entrained concrete.</li> </ul>		ģ
	b. Laboratory test cylinders shall be taken for each 50 cubic yards of concrete and/or for each separate pour exceeding 20 cubic yards. Not less than three cylinders shall be taken for each required test and		-
	shall be in accordance with ASTM specifications C-31 and C-172. Compression tests shall be made in accordance with ASTM specification $C_{-39}$ . Samples and tests shall be made by testing laboratory		٢
	personnel only.		
	c. One (1) copy each of all concrete test reports shall be submitted to the Architect, Engineer, and Contractor for their review and record.		I. j
1.	SLABS: a. Concrete slabs on grade shall be poured over prepared and level granular base course.		k I.
	b. Slabs shall have doweled construction joints where shown in the drawings. There shall be isolation joints around all columns. In addition to the construction joints all slabs will be marked off in areas not		
	to exceed 15' square, or as noted in plans, with 1/8" sawed contraction joints, 1/3 the depth of slab. All saw cuts shall be made as soon as possible without dislodging aggregate. Construction joints will have fluch edges	6.	 a
	c. Reinforcing mesh shall be continuous through joints. All reinforcing shall be supported well up into the upper 1/2 to 1/4 of eleb. just below contraction initial of the contracts shall.		,
	d. Monolithic Steel Troweled Finish: For floor slabs, the finish shall be produced by tamping the concrete		D
	to force aggregate away from surface and then screeding at proper level. Surfaces shall then be floated and lightly troweled. When concrete has set sufficiently, it shall again be troweled to produce a smooth, dense surface, which shall not exceed a 1/8" variation in any 10' radius.		с
8.	ISOLATION JOINT MATERIAL: For all isolation joints between floor slabs and vertical walls or structures,	7.	C
	install 30# non-perforated asphalt-saturated building felt complying with ASTM D 226, Type II terminate ½" below top of slab.		(l n
0			C
9.	CURING AND SEALING: Cure all floor slabs using a clear, waterborne, membrane-forming curing and sealing compound. Start initial curing as soon as free water has disappeared from concrete surface after		ra ir
	placing and finishing. Cure for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.	8.	S d
10.	SLAB PROTECTION: All slabs and walks shall be protected from damage due to paints, stains, or chipping		ir
	during the construction process. No concrete which has been so damaged will be accepted		

WEATHER PLACEMENT: Temperature of concrete shall not exceed 80 deg F. If this cannot be met, Contractor shall follow A.C.I. 305 and inform Architect of procedures he intends to use.

D WEATHER PLACEMENT: Temperature of concrete shall not drop below 50 deg F. Cold weather ement shall follow A.C.I. 306. Calcium chloride or other accelerating admixtures shall not be used.

# <u>4: MASONRY</u>

ICRETE BLOCK: All concrete block shall be normal weight, load bearing complying with ASTM C-90 and . Blocks shall have a minimum average net area compressive strength of 4350 psi.

NE: Refer to Drawings for stone types, face textures and colors. Lay stone in patterns indicated. Mortar for Adhered Stone: Provide pre-manufactured and pre-packaged polymer-fortified and Kevlar reinforced, non-sag, high bond strength mortar specifically manufactured for installation of adhered stone. Basis of design product: Laticrete International. Inc., "Masonry Veneer Mortar".

Mortar, pointing mortar and waterproofing shall be from same manufacturer. Pointing Mortar for Adhered Stone: Provide pre-manufactured and pre-packaged polymer-fortified and Kevlar reinforced, non-sag, high bond strength mortar specifically manufactured for installation of adhered stone. Basis of design product: Laticrete International. Inc., "Pointing Mortar". Color selected by Architect.

Waterproofing for Adhered Stone: Provide pre-manufactured and pre-packaged, load bearing, singlecomponent, self-curing liquid rubber polymer waterproofing. Waterproofing shall be flexible, seamless and have crack-isolating capability. Waterproofing shall exceed ANSI A118.10 and A118.12 performance criteria. Basis of design product: Laticrete International, Inc., "Air & Water Barrier"

RTAR: Mortar for full-bed-depth stone shall conform to ASTM C -270, proportion specifications for and cement lime mortar. Use Type N mortar for all masonry, except below grade which shall use Type ortar. Mortar shall be natural grey color.

Grout: Comply with ASTM C 476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.

Use fine grout in grout spaces less than 2 " in horizontal dimension, unless otherwise indicated 2. Use coarse grout in grout spaces 2 " or more in least horizontal dimension, unless otherwise indicated.

Grout shall attain a compressive strength of 3000 psi at 28 days, 3/8" maximum aggregate. 3. ESSORIES:

- Block Masonry
- Reinforcing Steel: Provide Plain reinforcing steel, ASTM 615 grade 60. All bars shall be billet
- Horizontal Joint Reinforcement: Provide 9 gauge galvanized truss type reinforcing at every other 2. course and at each course at corners and intersections. Galvanized per ASTM A 153, Class B-2.
- 3.
- Adjustable Veneer Anchors: For full bed depth stone, veneer anchors shall be models "D/A 213" or "D/A 210" by Dur-O-Wall (Dayton Superior) with "Textro-Seal" self-adhering gasketing. Anchors shall be Class B-2, and ties shall be 9 gauge diameter, trapezoidal shaped. Provide "Textro-Seal" at each veneer anchor where backup is metal studs with plywood sheathing.
- Metal Drip Edges: Provide drip edges fabricated from ASTM A 240, Type 304 stainless steel not 5. less than 0.016" thick. Flanges on drip edges shall be at least 2-1/2" long. All exposed outside corners shall be welded and the edge rounded.
- Embedded Flexible Through-Wall Flashing: Provide "Hyload S/A" self-adhering flashing system with a stainless steel drip edge
- Termination Bars: Provide 1/8" thick aluminum or stainless steel with 1" minimum face and 3/8" bent top leg to receive sealant. Bars shall be pre-drilled and in maximum lengths practicable. Weeps: Provide "Mortar Net Weep Vents" in color shall be grey. Install at a maximum of 24
- inches on center
- Cavity Drainage Material: Provide "Mortar Net" in thickness to fill width of cavity.
- Cavity Insulation: Provide rigid, cellular, extruded polystyrene thermal insulation with closed cells and integral high-density skin, complying with ASTM C 578, Type X; in manufacturer's standard lengths and widths; and in thicknesses indicated.
- **TALLATION OF MASONRY:**
- All masonry units shall be laid plumb, level and true to line. All vertical joints to be plumb. All head joints shall be full.
- All concrete masonry units shall be laid in running bond, unless otherwise noted. All stone shall be laid in pattern indicated. Fill cores of masonry units below through-wall flashing and units below grade.
- All joints are to be carefully tooled, concave, unless otherwise noted. Provide vertical reinforcing in block walls as called for, and grout block cores with, 3,000 p.s.i. grout. Cells shall have a minimum 3"x3" clear area.
- For concrete masonry units, prefabricated corner sections to be used. All reinforcing shall be lapped a minimum 8".
- Veneer anchors shall be installed 16" o.c. vertically and horizontally; providing embedment at tie to within 1" from exterior face of unit. Install additional veneer anchors within 12" of openings at intervals not exceeding 8" around perimeter of opening. Install additional veneer anchors within 12" above horizontal leg of through-wall flashing and lintel flashing at intervals not to exceed 32" on center. All required anchors, frames, doors, windows, weeps, counter flashings, etc., shall be built into walls as walls are laid up. All masonry lintels shall rest on solid masonry units.
- Where bond beam and lintel blocks occur, embed a #5 bar.
- After installation carefully clean all masonry walls as recommended, by the trade industry. Set masonry in full beds of mortar, do not furrow mortar.
- Grouting: Units shall be placed the full-height of the grout pour, reinforcing placed, and the cells grouted. A horizontal control joint shall be formed by stopping grout 1 1/2" below mortar joint . Grout pour shall not exceed 4'-8".
- FALLATION OF ADHERED STONE MASONRY VENEER:
- General: Install manufactured stone veneer in accordance with stone veneer manufacturer's and mortar manufacturer's written instructions in addition to the "Installation Guidelines for Adhered Concrete Masonry Veneer" published by the Masonry Veneer Manufacturers Association. Prior to installation of masonry, apply waterproofing to all surfaces indicated to receive stone veneer. Apply waterproofing in strict accordance with waterproofing manufacturer's written instructions. Coordinate waterproofing installation with sequencing and installation of all integral sheet metal flashing.
- All stone masonry units shall be laid true to line in a random ashlar pattern. Clean all excess mortar from faces of stone to achieve a "mortarless" appearance.
- ST STONE: Provide cast stone shapes in configuration indicated as manufactured by Rockcast, Flax is of design). Cast stone shall be highly refined architectural precast concrete building stone ufactured from a mixture of portland cement, coarse, and fine aggregate, to simulate natural stone. t stone shall have a compression strength of not less than 4000 psi at 28 days and air content ing between 4 to 6 percent. Wet Cast as required. Color, face texture and configurations shall be as ated.
- ECIAL INSPECTIONS: Owner will engage an inspector to conduct "Level B" special inspection as cribed in Table 1704.5.3 of the 2012 International Building Code. Submit to Architect two (2) copies of all ection reports and tests.

# **DIVISION 5: METALS**

- non-headed. For additional requirements refer to Drawings. Steel Channels (051200.A03): Refer to Drawings for sizes. а.
  - Steel Angles (051200.A04): Refer to Drawings for sizes.
  - Steel Plate (051200.A05): Refer to Drawings for sizes. C.
- 2. moment connection locations.
- 3. incidental to other work described.
- 4. be spliced unless shown on drawings or approved by the Engineer of Record.
- 5
- Steel Construction. 6.
- complying with ASTM C 1107 of grade to suit application.
- within a tolerance of 1/16 inch in 3 feet. Α.
  - exterior applications.
- copies of all inspection reports and tests.
- the HVAC Contractor.
- applied to a dry film thickness of 2.5 to 3.5 mils.
- 13. Furnish gate hinges and latch.

STRUCTURAL STEEL - MATERIALS: All other structural steel shall conform to the latest edition of ASTM specifications for A-36 grade steel. All structural pipe columns shall conform to ASTM A-501. All structural tube shall conform to ASTM A-500, Grade C. Anchor rods/bolts shall conform to ASTM F 1554, Grade 55,

FABRICATION shall be in accordance with the detailed drawings and the latest edition of AISC specifications. All members shall be punched or drilled where required for the attachment of other materials. Provide templates for the setting on cast-in-place anchor bolts for columns and other structural members. All connections not specifically detailed on drawings shall be designed by steel fabricator. Reference plans for

MISCELLANEOUS METAL AND ACCESSORIES: Provide all miscellaneous metal angles, frames, clips, bolts, screws, anchors, sleeves, lintels and all other items required to properly install all the steel work described in the drawings. Provide all miscellaneous accessories, including but not limited to; anchor bolts, angles, clips, rails, brackets, guard posts, and other items as shown in the drawings or as may be reasonably

WORKMANSHIP shall be in accordance with the AISC manual of steel construction. No steel members shall

ERECTION shall be in accordance with the latest of the code of standard practice of the American Institute of

FIELD CONNECTIONS: All field connection shall be bolted and/or welded, unless specifically noted. All bolted connections shall be with high strength bearing type bolts (A325-N) and hardened washers unless noted otherwise. Bolts shall be set by "the turn-of-the-nut-method" to the proper torque.

COLUMN ERECTIONS: All column base plates shall be welded to the columns with 1/4" minimum fillet welds. Base plates shall be set with double nut anchor bolts, securely set in footings. After columns have been set and leveled (plumbed), they shall be throughly grouted under with non-metallic, non-shrink grout

METAL RAILINGS AND HANDRAILS: Provide metal railings and handrails fabricated from 1-1/2" square steel tube meeting ASTM A500 (cold formed), galvanize after fabrication. Interconnect railing and handrail members by butt-welding. Form changes in direction of railing members by mitered bends as indicated. Welds shall be completely sanded with minimal undercutting and pinholes, comply with NOMMA "Finish #2" guidelines. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout. Slope grout away from post to shed water. Set posts plumb

Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for

INSPECTIONS: Inspections for bolted connections and welded connections shall be made by an approved testing agency and shall be the "arbitration" inspection methods. The testing agency shall inspect 10% of all welded connections and 10% of all bolted connections (with a minimum of 2-bolts per connection). If any joints fail the inspection, corrections shall be made promptly to all bolted and welded connectors and retested until tests are satisfactory. Cost for re-testing shall be borne by this Contractor. Submit to Architect two (2)

10. WELDING: Where structural joints are made by welding, the details of all joints, the technique of welding employed, the appearance and quality of welds made, and the methods used in correcting defective work shall conform to requirements of the "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings of the American Institute of Steel Construction" and the "Structural Welding Code" (latest edition of the American Welding Society). Welds shall be made only by certified welders using E70xx electrodes. Submit a copy of certification for each welder working on the project of the Architect.

11. MISCELLANEOUS SUPPORTS: Provide steel supports as required for air conditioning, roof hatches or other equipment located on the roof or elsewhere. Exact dimensions of roof-top equipment shall be obtained from

12. PRIMER: All iron and steel, except for factory-finished items and surface of steel embedded in concrete, shall be thoroughly cleaned of rust, scale and dirt in accordance with Preparation Procedures of Steel Structures Painting Council (SSPC). These include the removal of grease and oil by solvent cleaning (SSPC-SP1) and the removal of mill scale, rust, weld flux and slag by hand tool cleaning (SSPC-SP2). All iron and steel shall be given one shop coat of rust inhibitive paint, similar to "IronClad Retardo Rust Inhibitive Paint 163" (Benjamin Moore), except as specified otherwise. Inaccessible surfaces shall be steel members need not be touched up. Any scarred areas shall be touched up with the same paint after erection. Exposed steel framing shall be blast cleaned to SSPC-SP6 requirement then primed with Tnemec 90-97 Tnemec-Zinc

MISCELLANEOUS METAL FABRICATIONS: Provide miscellaneous metal fabrications fabricated from hotdip galvanized steel of sizes and shaped indicated. [Fabricated roof access gate] to configuration indicated.

![](_page_26_Picture_71.jpeg)

THIS SEAL APPLIES TO DIVISIONS 3, 4, 5, AND 6. TYPICAL ALL SHEETS

![](_page_26_Picture_73.jpeg)

DIV	ISION 6: CARPENTRY	DIVI	SION 7
1.	GENERAL: Lumber shall comply with DOC PS 20 "American Softwood Lumber Standard". All dimension and board framing lumber shall as noted on Drawings. All lumber shall be kiln dried to 19% maximum moisture content and each piece shall be factory marked with grade stamp. Wood shall be free from loose or unsound knots, shakes or other damaging imperfections.	1.	SEL Wraj man
	<ul> <li>a. Exposed exterior wood shall comply with "Appearance" grade requirements of ALSC National Grading Rule and shall be same species and grade as indicated for Timber Framing.</li> <li>b. Beams and stringers (2" to 4" thick, 5" and wider): S4S, No. 2 or better.</li> <li>c. All other lumber except as noted (2" to 4" thick, 2" and wider): S4S, No. 2 or better.</li> </ul>		adhe be w less a.
2.	e. Wood decking shall be 2 x 6 nominal, T&G Western Red Cedar decking. TIMBER FRAMING (061000.A02): Provide heavy timber construction, including connectors, capable of	2.	AIR   air/w
	withstanding structural loads shown on Drawings. Comply with AITC 108 "Standard for Heavy Timber Construction". Timber species and grade shall be Western Red Cedar; No. 1, NLGA, WCLIB OR WWPA. Moisture content shall be 19 percent maximum at time of dressing and timbers shall be dressed S4S. For additional requirements refer to Drawings.		plyw AC 1 flash a.
	a. Erect heavy timber construction true and plumb. Provide temporary bracing. Install horizontal and sloping members with crown edge up and provide not less than 4" of bearing on supports. Handle timbers to prevent surface damage and other effects that may impair indicated finish. Predrill for fasteners and assembly of units.		1) 2) 3) b.
	WOOD PANEL PRODUCTS: All wood panel products shall be appropriately graded to comply with DOC PS 1 "US Product Standard for construction and industrial plywood; products not manufactured under DOC PS-1 provisions shall comply with APA PRP-108. Factory mark each panel with the APA "The Engineered Wood Association" trademark indicating compliance with panel grade requirements specified.		(2-pa c. instru man
-	<ul> <li>a. Fire-Retardant Treated Plywood Sheathing: Plywood wall sheathing shall be 5/8" thick, fire-retardant treated plywood and roof sheathing shall be 5/8" thick, per Drawings. All plywood shall be engineered grade APA rated, with exterior glue as designated. Fire retardant treated plywood shall comply with AWPA C27 requirements and shall receive appropriate classification marking from Underwriter's Laboratory (UL). Provide ACX fire treated plywood as backing papels for telephone and electrical.</li> </ul>	3.	SIDI venti clado
	<ul> <li>b. Miscellaneous plywood shall be 19/32" thick, minimum CDX APA rated.</li> <li>c. Cement Board Sheathing for "Adhered Stone Veneer": Comply with ANSI A118.9 and ASTM C 1325.</li> </ul>		clado a. b.
	<ul> <li>Cement board shall be mold and mildew resistant with a score of 10 per ASTM D 3273. Provide ½ thick "PermaBase" as manufactured by National Gypsum Company.</li> <li>WOOD TRUSSES: Comply with requirements set forth in the Structural General Notes and in this Division.</li> <li>Erect and brace trusses to comply with applicable requirements of referenced TPI standards. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacings</li> </ul>		c. d. e. f.
	indicated. Anchor trusses securely at all bearing points to comply with methods and details indicated. Install permanent bracing and related components to enable trusses to maintain design spacing and to withstand live and dead loads including lateral loads and other requirements.		g.
	Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction". All work shall be accurately laid out, cut and fitted, level and true. Work shall be adequately braced and shall be secured with sufficient [framing anchors, ]nails, screws, bolts and adhesives to assure its structural integrity. For further reference, see table II "recommended nailing schedule" of the 2012 International Building Code for recommended nailing schedule. For further reference, refer to Structural Drawings for stud sizes, stud	4.	MET unde All m the " be U
	<ul> <li>spacing and recommended nailing schedule.</li> <li>a. Termite Shields: Install termite shields between top of foundation and wood sill plate.</li> <li>b. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.</li> <li>c. Install joists with crown edge up and support ends of each member with not less than 1-1/2 inches of</li> </ul>		resis Macł spac deck reco
	bearing on wood or metal, or 3 inches on masonry. Where supported on wood members, by toe nailing or by using metal framing anchors.	5.	SHE
	construction. Provide blocking for support of toilet accessories, cabinets, etc., do indicated of required bound necessary bolts, hangers, nails, screws, and other items classed as rough hardware as required for the complete anchoring or wood members.		the S follov a.
	Blocking and Nailers: All wood nailers, cants, blocking, framing members, etc., in connections with roofing, flashing, vapor barriers and waterproofing, wood sills, sleepers blocking, furring, stripping on similar concealed members in contact with masonry or concrete, shall be treated under pressure to resist termites decay and dry rot. Provide ACQ treated lumber and plywood with at least 0.25 retention and kiln dry after treatment to KDAT 19. Treated lumber and plywood shall be separated from adjacent metal with a #30		b.
0	asphalt felt isolation strip and shall be fastened with stainless steel or double-dipped, hot-dip galvanized fasteners. EXTERIOR AND INTERIOR WOOD TRIM: Provide western red cedar trim. C and better grade. S4S		c. d.
0.	<ul> <li>Fasteners: Provide stainless steel nails, screws and other anchoring devices of type, size, material and finish required for application indicated to provide secure attachment, concealed where possible.</li> <li>Back out or kerf backs of standing and running trim, except those with ends exposed in finished work</li> </ul>		e.
	<ul> <li>c. Install finished carpentry level, plumb, true and aligned with adjacent materials. Use concealed shims where necessary for alignment. Scribe and cut to fit adjoining work. Any exposed fasteners shall be countersunk, filled and sanded flush. Standing and running trim shall be installed using full length pieces from maximum lengths to minimize number of joints. Predrill pilot holes to avoid splitting.</li> </ul>	6.	SEA seala a.
			D. C.
			d.
			e.
			f. Insta

# : MOISTURE CONTROL AND INSULATION

F-ADHERING WEATHER RESISTIVE BARRIER: Behind rainscreen cladding provide "VaproShield pShield SA" as manufactured by VaproShield LLC or approved comparable product from other ufacturer. Provide weather resistive barrier as a complete system, including but not limited to: selfering weather resistive barrier, self-adhering flashing tape and sealants. Weather resistive barrier shall ater vapor permeable, with a perm rating of 40 to 50 per ASTM E 96, Method B. Thickness shall not be than 0.026". Install in strict accordance with manufacturer's written instructions.

Weather resistive barrier shall meet ICC-ES AC38 "Acceptance Criteria for Water-Resistive Barriers".

BARRIER COATING: Provide one-component, fluid-applied, vapor permeable, synthetic polymer vater resisitve barrier coating membrane over exterior faces of concrete masonry units, gypsum and ood sheathing and at other locations indicated. Air barrier coating shall meet ICC-ES AC 212, ICC-ES 148, ASTM d 1970 for nail sealability and ASTM E 2357 for an air barrier assembly. Provide primer, ning, transition membrane and other related accessories for a complete system.

- Air Barrier Coating Performance Criteria. Air barrier coating system shall meet or exceed the following: Air leakage per ASTM E 2357: Not more than 0.0001 cfm/sg ft at 1.57 psf.
- Air permeance per ASTM E 2178: Not more than 0.00098 cfm/sg ft at 1.57 psf.
- Water vapor transmission per ASTM E 96, Method B: 18 perms @ 10 mils wet thickness.
- Basis of Design Product: ProSoCo, Inc.; R-Guard (2-component) System II or Sto Corp.; Gold Coat art) or DuPont Tyvek Fluid-Applied WB.
- Install air barrier coating and accessories in strict accordance with coating manufacturer's written uctions to achieve performance criteria specified. Apply to a wet mil thickness as recommended by ufacturer; not less than 10 mils over plywood sheathing and not less than 20 mils over plywood and

NG: Provide wood plastic composite board cladding with polyethylene capping material for a rearilated open-joint rainscreen façade system. Provide all necessary flashing, fasteners, composite board ding, trim and accessories for a complete system. Board cladding system shall be "Fiberon" as ufactured by Fiber Composites, LLC. Installation shall be as indicated and in strict accordance with ling manufacturer's written instructions and recommendations.

- Cladding board thickness shall be 0.935" total thickness with 0.015" thick capping material.
- Cladding board width shall be 5.4".
- Cladding board lengths shall be continuous. Color as indicated.
- Fasteners shall be Type 304 stainless steel of gage and length recommended by cladding manufacturer.
- For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
- Battens and vent screens for rain screen shall be VaproShield; VaproBatten and VaproVent Strip.

AL ROOFING SYSTEMS: Provide all necessary metal closures, flashing, fasteners, sealants, 30# felt erlayment or waterproofing underlayment, metal roofing and accessories for a complete roofing system. netal for the roofing system shall be 24 gauge Kynar coated galvanized steel. Roofing System shall be of Snap-Seam" design with at least 1-1/2" high seams spaced at not more than 16". Roofing system shall IL listed for a wind uplift rating of 90 per UL 580 test procedure and shall pass ASTM E 331 for water stance and ASTM E 1592 for structural performance. Roofing systems shall be similar to New Tech hinery Corp.; "RR3 with SS675 panel profile. Pans of panels shall have two "large V" striations, equally ed in the pan. Metal color shall match Firestone "Medium Bronze." Installation shall be over 2x wood king and underlayment to meet specified performance criteria and metal roofing system manufacturer's mmendations.

ET METAL FLASHING AND TRIM: Provide all materials, accessories, detailing, and installation for each which conforms to the recommendations shown in the "Architectural Sheet Metal Manual" published by Sheet Metal and Air Conditioning Contractors National Association, Inc., (SMACNA), latest edition and as

- Pre-finished Metal Materials: Fabricate sheet metal flashing and trim from coil coated galvanized steel sheet complying with the following: Zinc coated, commercial quality steel sheet conforming to ASTM A 755, G 90 (ASTM A 755M, Z 275) coating designation, coil coated with 70 percent high-performance fluoropolymer coating. Metal shall not be less than 0.0239" thick (24 ga), unless otherwise indicated. Fabricate to configurations indicated.
- Metal Finish: Provide a full strength (70%), factory-applied baked fluoropolymer (Kynar). Color will be selected by the Architect from the manufacturer's full line of standard colors.
- Cleats: Provide 20 gauge galvanized steel. Fabricate as recommended by SMACNA manual.
- Termite Shields: Provide 24 gauge galvanized steel fabricated to configurations indicated and recommended by SMACNA manual, 6<sup>th</sup> edition, as shown in Figure 4-24. Fabricate with 3/4" flat-locked joints.
- Accessories: Provide all prefinished sheet metal trim, fasteners, sealants, etc., for a complete watertight installation.
- ANTS: Prior to installation of sealants, field-test their adhesion to joint substrates for each type of int as recommended by sealant manufacturer. General: All sealants applied against glazing/window framing systems shall be the responsibility of the
- Glazing Contractor. Exterior sealant shall be Tremco "Spectrem 4-TS", GE Silicone Silpruf or Dow Corning Silicone.
- Sealant in contact with exterior masonry shall be non-staining type.
- Interior sealant shall be multi-part non-sag urethane sealant; Type M, Grade NS, Class 25; uses NT (nontraffic), M, G, A, and as applicable to nonporous joint substrates indicated O. Provide Dynatrol II" by Pecora Corporation, Dymeric 240/240FC" by Tremco, Inc. or equivalent.
- Interior sealant at toilet accessories shall be a one-part, mildew-resistant silicone sealant; complying with National Sanitation Foundation for rating of C2 for Type S; Grade NS; Class 25; Uses NT (nontraffic), G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide; intended for sealing interior joints with nonporous substrates and subject to in-service
- exposure to conditions of high humidity and temperature extremes. Exterior Sealant in Concrete Paving/Sidewalks/Patio shall be multi-part pourable urethane sealant for Use T (traffic): Type M, Grade NS, Class 25. Uses T (traffic), M, A, and O. Provide NR-200 Urexpan"
- by Pecora Corp. or equivalent. Backer rod shall be closed cell polyethylene foam.
- all sealants and backers as recommended by sealant manufacturer to meet conditions involved.

# **DIVISION 8: DOORS, WINDOWS, GLASS, HARDWARE**

- a. b.
- 2. HOLLOW METAL FRAMES:
  - prime paint.
  - b.
    - exterior frames Α.
    - interior frames (maximum 48 masonry anchors
    - stud anchors D.
    - hinge reinforcement F.
    - all other hardware reinforcer
    - floor knees G.
  - C. surfaces
- but not limited to:
  - Butts. а.
  - b.
  - Stops wall and/or floor. d.
  - Closers at all labeled doors and exterior doors.
  - Silencers and gaskets. Provide listed smoke gasketing at all labeled doors.
  - q.
- 4. HARDWARE INSTALLATION
  - b.
  - until unsatisfactory conditions are corrected.
  - recommendations.
  - d.
- GLASS
- Glass and Glazing Requirements General: a.

  - Part 1201 for Category II materials.
- acceptable to authorities having jurisdiction. b.
- testing agency. Monolithic Fully Tempered Float Glass: Provide 1/4" thick clear glass. C.
- d. Patterned Glass: As indicated.
- е. shall not exceed 0.40.
- f.
- g. fully tempered safety glass.

HOLLOW METAL DOORS: All hollow metal doors shall be of size as shown on drawings. Interior doors shall be ANSI/SDI-A250.8, grade II, heavy duty, Model 1 with 18 gauge faces and flush top and bottom closures. Exterior doors shall be ANSI/SDI-A250.8 grade III extra heavy duty, Model 2 (seamless) with 16 gauge faces and flush top and bottom closures. All doors and frames shall be galvanized prior to shop priming. Door shall be internally factory reinforced with 12-gauge steel at all door closer locations. Doors shall be mortised and reinforced in the factory for all hardware and shall be in accordance with templates furnished by the hardware supplier.

a. Hollow Metal Frames: Hollow metal frames shall be of type and size as shown in the drawings. All frames shall have mitered joints, welded and ground smooth. Frames shall be furnished with 3-rubber mutes on each lock jamb and shall have 3-anchors per jamb up to 7'-0" high and 4 anchors per jamb up to 8'-0" high in masonry walls. All frames are to be galvanized and shall have on coat of baked on

The following is a list of gauges to be used in frame construction

	14 gauge, galvanized
8" wide)	16 gauge
	16 gauge
	18 gauge
	7 gauge x 10" long
ment	12 gauge
	14 gauge

Place frames in compliance with SDI-105 "Recommended Erection Instructions for Steel Frames". Fit doors accurately in frames within tolerances specified in ANSI/SDI-A250.8. Touch-up paint marred

3. HARDWARE: Contractor shall provide all necessary hardware for a complete operation. Hardware to include

Lock/latch sets-lever handles and exit devices as required by code.

Weatherstripping as required, including drip heads on exterior doors.

Note: All hardware to be medium grade-commercial in brushed stainless steel finish.

a. All keying shall be accomplished at hardware manufacturer's plant where adequate records are maintained in order to avoid duplication of changes. Keying system shall match Owner's existing

system. Key locks as directed by Owner. Provide 2 change keys per lock.

Carefully inspect doors, frames, and conditions under which hardware will be installed. Do not proceed Mount Hardware units at heights indicated in respective DHI Standards, except as specifically

indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect. Install each hardware item in compliance with the manufacturer's instructions and written

Cut and fit thresholds to door frame profiles. Prepare thresholds for the attachment of strikes and clearance for spindles as required. Set thresholds in a continuously laid bed of polyisobutylene mastic sealant to completely fill voids and exclude moisture from every source.

Primary glass of each (ASTM C 1036), Type 1, Class 1, Quality q<sup>3</sup>.

Heat-treated glass of each (ASTM C 1048) condition indicated. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR

1) Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency

Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and

Clear low-E Insulated Fully Tempered Glass (088000.A20): Provide 1 inch thick unit constructed of 1/4" clear fully tempered exterior lite conforming to ASTM C 1048, Condition A, Kind FT, Type 1, Class 1, Quality q<sup>3</sup>, <sup>1</sup>/<sub>2</sub>" air space and 1/4" clear fully tempered interior lite conforming to ASTM C 1048, Condition A, Kind FT, Type 1, Class 1 and Quality q<sup>3</sup>. Winter U-value shall not exceed 0.31 and SHGC

Provide safety glass where required by code, as specified and where indicated.

Door and window glass to be fully tempered safety glass. Glass panels on each side of doors to be

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PP 3488 3488 BOOMAL AR	
CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS
SPECIFICAT	IONS
REVISIONS	
DESIGNER / DRAFTER	
1-15-2020	

# **DIVISION 9: FINISHES**

1.	GYPSUM BOA Construction F govern. Fire ra a. Mold an resistan
	ASTM E b. All acce
	joints w
	d. Provide
	e. There s interior i board si
	f. Finish d GA-214
	fi
	g. Patching transitio
2.	RESILIENT W with ASTM F 1 preformed or r
	matte finish. a. Resilien color to
	wide. b. Color: A
3	
5.	manufacturers
	a. Paint sh
	D. Paint sr recomm
	thicknes
	c. All surfa
	d Accepta
	Profess
	e. Colors:
	1. Paint sc
	1. Stained varnish
	2. Epoxy F
	topcoate
	3. Galvani 4 Expose
	(glass) (

ARD - General: Gypsum board partitions, soffits and ceilings shall comply with USG "Gypsum" Handbook", latest edition and the, Gypsum Association most stringent requirements shall rated gypsum drywall systems shall comply with U.L. design indicated.

nd Moisture Resistant Gypsum Board (092900.A06): Provide 5/8" thick mold and moisture t gypsum board. Board shall have a mold and mildew resistance average panel score of 8 per O 3273. Install board in wet areas and in restrooms unless indicated otherwise.

essories as required for a complete installation per U.S.G., recommended guidelines. Board Trim (092900.A11): Provide zinc-coated steel corner beads, edge trim and control hich comply with ASTM C 1047.

tape, self tapping screws, adhesive, sealant, joint compounds, etc.

hall be no installation of gypsum board until the building is closed in, weather tight and the relative humidity within the last 24 hours period ranges from 40 to 60 percent. All gypsum hall be dry and shall be cleaned of dirt and debris before it is installed. All boards shall be vertically.

Irywall to a Level 4 finish. Finish levels shall be in accordance with Gypsum Associates

Contractor whose work will be applied to drywall shall inspect the drywall finish to confirm the nish is acceptable to receive his/her work.

g and repair shall be flush with adjacent surfaces and feathered to create a non-visible

ALL BASE: Provide Roppe, thermoset vulcanized 100 percent resilient rubber base complying 1861, Type TS. Provide rubber base shall be in rolls, not strips with matching end stops and molded corner units. Provide base in heights indicated, 1/8" gauge, topset cove profile and

nt Edge Strips: 1/8" thick, homogeneous vinyl or rubber composition, tapered or bullnose edge, match flooring, or as selected by Architect from standard colors available; not less than 1"

As indicated on Drawings.

aint shall be delivered, stored and handled in sealed containers from one of the approved paint Care should be taken to prevent danger of fire or noxious odors.

nall be applied when weather, temperature and humidity are acceptable to the manufacturer. nall be applied in the minimum number of coats required, and in the minimum square footage nended by manufacturer in order to achieve complete and even coverage, and proper mil

aces shall be properly prepared, dirt removed, holes filled, surfaces sanded, in order to achieve lass look.

able manufacturers: PPG, Benjamin-Moore, Sherwin-Williams, Tnemec or Glidden ional.

Refer to Drawings. Colors not specifically indicated will be selected by Architect. chedule

Wood: Sanding sealer first coat, second coat semi-transparent stain, third & fourth coat

Paint: In restrooms and other locations indicated to be painted, provide one coat primer and two s of waterbased precatalyzed epoxy. Eggshell sheen.

ized Metal: Galvanized steel touchup primer first coat alkyd enamel second and third coats. d steel: Tnemec 90-97 intermediate coat with 2 coats of Tnemec, "Endura-shield" series 74 3 to 5 mils per coat.

# **DIVISION 10: SPECIALTIES**

# 1. SIGNAGE:

- stand-off type.
- 2. TOILET COMPARTMENTS
  - floor shall be 12 inches. Door and panel height shall be 58 inches.
    - material. Doors and pilasters shall be  $\frac{3}{4}$ -inch thick.
    - Panels shall be  $\frac{1}{2}$ -inch thick. 2.

  - satin finish.
  - stainless steel, No. 4 satin finish.
  - е. accessories fabricated from stainless steel.
    - 2.

    - compartments designated as accessible.
  - profile and in manufacturer's standard finish.
  - dip galvanized steel, or other rust-resistant, protective-coated steel.
  - of toilet accessories.
  - Buildings and Facilities and ICC A117.1.

    - 2.
    - Align brackets at pilasters with brackets at walls. 3.
    - 4.
- Accessories are to be installed according to manufacturer's written instructions.

- 3.

- 4. ASTM E 814 for fire-resistance rating of walls where they are installed.
  - and tub finish shall be finished with white baked enamel.
  - cabinets. Extinguishers shall be filled and posted with service labels.

a. Pin-Mounted Letters: Provide letters of heights and font type indicated. Letters shall be cast bronze,

a. Toilet-Enclosure Style: Floor-mounted overhead braced. Configurations as indicated. Height above

Door, Panel, Screen, and Pilaster Construction: Solid, color through phenolic panel material on both faces, seamless, with eased edges and with homogenous color and pattern throughout thickness of

Color and Pattern: One color, pattern and texture in each room, as selected by Architect. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design. Type 304 stainless steel, No. 4

Brackets (Fittings): Full-Height (Continuous) Type: Manufacturer's continuous design. Type 304

Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and

Hinges: Provide manufacturer's continuous stainless-steel hinge.

Latch and Keeper: Manufacturer's standard stainless steel surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.

Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.

Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at

Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip

Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chromeplated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-

Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment

Installation – General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices. For toilet compartments designated as accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for

1. Each pilaster over 3 inches wide shall be anchored to floor with a minimum of two (2) anchors to prevent twisting.

Clearances: Panels, pilasters and walls shall be 1-inch.

Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

RESTROOM ACCESSORIES: Refer to Drawings. Furnish and install restroom accessories as shown on the Drawings. All accessories to be mounted to meet ADA requirements. Accessories shall be fabricated from stainless steel meeting AISI Type 302/304, with polished No. 4 finish, 22 ga (.034") minimum thickness.

FIRE EXTINGUISHERS AND CABINETS: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers." Cabinets shall be listed and labeled to comply with requirements of

a. Cabinets: Provide Larsen's Manufacturing Co.; Architectural Series cabinets, Model 2409-6R nonrated cabinet. Cabinets shall be semi-recessed, vertical duo style, 2-1/2" rolled edge, clear acrylic glazing and vertical red lettering. Provide each cabinet with "LarsenLoc". Cabinet door and trim, box

Fire Extinguishers: Provide multi-purpose dry chemical type; UL-Rated 4A:60B:C, 10 lb nominal capacity, in enameled steel container, for Class A, Class B and Class C fires for installation in

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PRO 3488 BOT SOUTH CENSED 3488 BOT SOUTH CENSED							
CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS						
SPECIFICAT	ONS						
REVISIONS							
DESIGNER / DRAFTER DATE DATE 1-15-2020 PROJECT NUMBER BOOK AND PAGE MISSOURI AUTHORIZATION NUMBE	R						

![](_page_29_Picture_0.jpeg)

ma-isc/ka-projects/19000/19018.00 - R Park - Phase 1/CAD/FAMULES/LR 22x34 titleblock.dwg. 5/13/2019 2:05:02 PM, GEORGE KNIPP, LAMP Arconn

# PAVILION from the SOUTH

9001 STATE LINE RD., STE. 200 KANSAS CITY, MO 64114 816.361.0440 LampRynearson.com	<u>5 O N</u>				
hollis architects miller 1828 WALNUT ST., STE. 922 KANSAS CITY, MO 64108 816.442.7700					
PROTOSIONAL ARC					
CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS				
RENDERII SHELTE	NGS R				
REVISIONS					
DESIGNER / DRAFTER					
DATE 1-15-2020 PROJECT NUMBER 	R				
A40	)				

![](_page_30_Picture_0.jpeg)

# **PAVILION from the SOUTH-WEST**

![](_page_30_Picture_3.jpeg)

![](_page_30_Picture_5.jpeg)

L A M P R Y N E A R S O N

9001 STATE LINE RD., STE. 200 KANSAS CITY, MO 64114 816.361.0440 LampRynearson.com

# 1-15-2020 PROJECT NUMBER

BOOK AND PAGE

MISSOURI AUTHORIZATION NUMBER

A41

# **PAVILION** from the SOUTH-EAST

![](_page_31_Picture_0.jpeg)

# PAVILION from the NORTH-EAST

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

![](_page_31_Picture_5.jpeg)

# **PAVILION from the NORTH-WEST**

![](_page_31_Picture_7.jpeg)

![](_page_32_Picture_0.jpeg)

# **RESTROOMS** from the NORTH-EAST

![](_page_32_Picture_4.jpeg)

![](_page_32_Picture_5.jpeg)

# **RESTROOMS** from the NORTH-WEST

![](_page_33_Picture_0.jpeg)

# PAVILION from the NORTH-EAST (NO ALTERNATES)

![](_page_33_Picture_3.jpeg)

![](_page_33_Picture_5.jpeg)

# (NO ALTERNATES) PAVILION from the SOUTH-WEST

Control of Contro		CONDUIT AND WIRE		C	<b>OMMUNICATION</b>	<u>S</u>		E		<u>l</u>	н	VAC
	$\frown$	ARROWS INDICATE CONDUIT AND W TO PANEL WITH 2-#12 AWG COND	VIRE HOME RU DUCTORS UNLE	N(S)	TELEPHONE OUTLET			F	MANUAL PULL	STATION	CWS	CHILLED WATER SUPPLY
		NOTED OR OTHERWISE REQUIRED.		<b>■</b>	DATA OUTLET	DICATES AN	OVE COUNTER	PE	PHOTOELECTRIC	: DETECTOR ('D' DENOTES DENOTES BEAM-TYPE)	— — CWR — — ——CHWS ——	CHILLED WATER RETURN CHILLED/HOT WATER SUPPLY
	$\frown$	CEILING.	L OK ADOVE	▼	TELEPHONE/DATA OUT	LET			('R' DENOTES	N RETURN AIR PLENUM)	– – CHWR – –	CHILLED/HOT WATER RETURN
	~ - ~	CONDUIT RUN UNDERGROUND OR	CONCEALED IN	0	FLOOR BOX WITH COM	IMUNICATIO	NS OUTLET		IONIZATION DET	ECTOR ('D' DENOTES	—— HWS ——	HEATING HOT WATER SUPPLY
	T			$\mathbf{O}$	TELEVISION ANTENNA (	DUTLET			INFRARED DETE	CTOR ('D' DENOTES IN DUCT)	— — HWR — —	HEATING HOT WATER RETURN
	LV	LOW VOLTAGE CONDUIT AND WIRING	G					D 190	THERMODETECT	OR ('D' DENOTES IN DUCT)	— — CTS — — —	COOLING TOWER RETURN
				_				Ш <sub>D</sub>	FIXED TEMPERA	TURE AS NOTED	STM	LOW PRESSURE STEAM
				<u>S</u>	ECURITY			DH	DOOR HOLDER		— — RTN — —	LOW PRESSURE CONDENSATE RETURN
		LIGHTING BATTERY OPERATED EMERGENCY LIC	GHT (WALL MO		CLOSED CIRCUIT TV C	AMERA			CHIME		— STM-50—	HIGH PRESSURE STEAM – NO'S GIVE GAUGE PRESSURE IN P.S.I.
					DOOR LOCK			Ē	FIRE ALARM ST	ROBE LIGHT		HIGH PRESSURE RETURN – NO'S GIVE GAUGE
	N_N	BATTERY OPERATED EMERGENCY LIC	GHI (CEILING		SECURITY MONITOR			<del>→</del> Ê→	FIRE ALARM SE	PEAKER – ARROWS DENOTE	RIN-50	PRESSURE IN P.S.I.
	0	SURFACE/RECESSED LIGHT FIXTURE	E		WATCH TOUR			~	COMBINATION S	PEAKER AND VISUAL FIRE LIGHT)	RD	REFRIGERANT DISCHARGE
	•	FLUORESCENT LIGHT FIXTURE			ELECTRIC DOOR LOCK	CURITY			FIRE HORN. ( HORN AND VIS	'L' DENOTES COMBINATION UAL FIRE LIGHT)	RL	REFRIGERANT LIQUID
	•	FLUORESCENT STRIP FIXTURE		¢s	MOTION SENSOR (WAL	L MOUNTEI	)) – SECURITY	RL	REMOTE ALARM	LAMP	—FOS—	FUEL OIL SUPPLY
Here is a set of a many s	0 🗖 📼	Shading denotes emergency fix	TURE	<u> </u>				PI	POST INDICATO	R SWITCH	FOR	FUEL OIL RETURN
						c		FS	FLOW SWITCH		— A —	COMPRESSED AIR
		POLE MOUNTED LIGHT FIXTORE		<b>丘</b> 网	MICROPHONE OUTLET	2		GS CS	FIREMAN'S PHO	NE JACK	—_ U — H∏s	DRAIN (CONDENSATE) THERMOSTAT – ('S' DENOTES SENSOR)
Sec.         Control matrix register (Control Mark 1996)         Sec.         File PROFICE(No.         Sec.		EXIT LIGHT - DOUBLE FACE - AR	ROWS AS SHO	OWN (Sh	SPEAKER. ('H' DENO	tes horn	TYPE)	1			⊦®s	HUMIDISTAT - ('S' DENOTES SENSOR)
	<b>ک</b> ۲ ۱. ۲۰ ۲۰ ۲۰ ۲۰	EXIT LIGHT - SINGLE FACE - ARK	TUWS AS SHU		SPEAKER VOLUME CON	NTROL		E	IRE PROTE	CTION	⊢⊞	THERMOSTAT/HUMIDITY SENSOR
	<u>\$ \$`\$<u></u>\$` \$<u></u>\$` \$<u></u>*</u>	KEY, LOW VOLTAGE, PILOT LIGHT	5-wat, 4-w		SPEAKER CONDUIT ANI	D WIRING			FIRE PROTEC			CARBON DIOXIDE SENSOR
	\$ <sup>D</sup>	DIMMER WITH SINGLE POLE SWITCH	4		BUZZER	LIFIER ANU	CABINET	FDV	FIRE HUSE C	ABINET MENT VALVE		THERMOSTAT/HUMIDITY SENSOR/CO2 SENSOR
August and a second secon	\$ <sup>D3</sup>	DIMMER WITH THREE WAY SWITCH	(WATTAGE NOT	ED) EO	BELL				UPRIGHT SPR	INKLER HEAD	$\sim \sim $	HUMIDIFIER
Open (2016) English (2016)     Constraint	\$ <sup></sup>	WALL MOUNTED MOTION SENSOR		Ξ	INTERCOM OUTLET				PENDENT SPF	RINKLER	-	SUPPLY AIR FLOW INDICATOR
	<b>Φ</b> <sub>(A)</sub>	(LETTER DENOTES TYPE)	ζ.		INTERCOM OUTLET -	MASTER		<u> </u>	RECESSED SP	RINKLER	<u>-</u> ≁- ⊠	RETURN AND EXHAUST AIR FLOW INDICATOR
	Ó.	SWITCH AND DUPLEX RECEPTACLE		© <sub>D</sub>	CLOCK SYSTEM RECEP FACE ('D' DENOTES D	PTACLE WIT	H SINGLE E)	—	RECESSED SF	PRINKLER WITH CLOSURE PLATE		
NEWLY LOWING       PART DIAL AND CONTROL       ISSUE NUMBER	КÙ	DENOTES A WALL MOUNTED FIXTUR	RE					<b>—</b>	SIDEWALL SPR	RINKLER.		RETURN GRILLE OR EXHAUST REGISTER
THENCE DEVICES         THE LARK LAW LAW INCOME.         THE HANGE CONTROL OF ALL AND				_			A	<u>_</u>	DOUBLE CHEC	K DETECTOR BACKFLOW PREVENTER		
A MART REPORT ALL PROVIDE THE ALL PROVIDED THE ALL P	~	WIRING DEVICES		<u>۳</u>	OWER DEVICE	<u>and C</u>	<u>ON IROLS</u>	$\sim$				
	 €	LINE THRU DEVICE INDICATES ABOV	VE COUNTER	$\bigcirc$		304 – 3P	NON-FUSED	I	FIRE PROTECT	TUN SIAMESE CONNECTION	н	OSPITAL
Image: Control of the contro	<u>~</u>	DUPLEX RECEPTACLE WITH ISOLATE	ED GROUND		EXCEPT AS NOTED	50A 51,		$\mathbf{x}$	FIRE PROTECT	ION SIDEWALK SIAMESE CONNECTION	N	NURSE CALL CONDUIT AND WIRING
Product Regiment         Particle Regiment	<u>a</u>	(SINGLE AND FOURPLEX SIMILAR)		<b>H</b>	MANUAL MOTOR START	ER		<del>_</del>	POST INDICAT	OR VALVE	— M —	MONITOR CONDUIT AND WIRING
Import Not Not Not Not Not Not Not Not Not No	<del>o,</del>	DUPLEX RECEPTACLE – TOP HALF BOTTOM HALF TO HAVE POWER AT	SWITCHED -	$\boxtimes$	MAGNETIC MOTOR STAF	RTER		_			NMS	NURSE CALL MASTER STATION
				Ц	COMBINATION MOTOR SWITCH	STARTER A	ND DISCONNECT					NURSE CALL BEDSIDE STATION - SINGLE PATIENT
B         RUME IN RESTRUCT         PACLONG DULL OF LOW         Pactor	<del>©_</del> EM	(SINGLE AND FOURPLEX SIMILAR)		D	MOTOR			N	IEDICAL GA	<u>IS</u>		EMERGENCY PUSHBUTTON STATION
Column Sector         Description         Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>	₽	FOURPLEX RECEPTACLE			PANELBOARD (SEE ON	E-LINE)		VAC	MEDICAL VAC	UUM	<u></u> шр	('P' DENOTES PULL CORD)
Control	↔ ⊑	SINGLE RECEPTACLE		<b>P</b>		/		ox	OXYGEN	_	DS	DUTY STATION
		CEILING MOUNTED RECEPTACLE MULTI-SERVICE FLOOR BOX			DISTRIBUTION PANELBO	ARD		—— NO ——	NITROUS OXIE	DE PRESSED AIR	53	
•         1.000         0.00000000000000000000000000000000000		DIVIDED POWER POLE			CONTACTOR			N	NITROGEN		€	('B' DENOTES WITH BUZZER)
o         STOLE         I/O         WALCHAR DURL         W	\$	FLOOR BOX W/DUPLEX RECEPTACL	E	ß	AUTOMATIC TRANSFER	SWITCH		ΗØ	OXYGEN OUTL	ET	HD	
Disc construction         Differentiation         Page         Mode Config         Webbork and Duff	0	SPECIAL RECEPTACLE W/NEMA CON	NFIGURATION	P	PHOTOCELL			н©	VACUUM OUTI	LET	● ● B	( B DENOIES WITH BUZZER)
A MPS, APP. (DAMPESSED)     DC     DECT EXPANSION     L     DECT      DECT     DECT      DECT     DECT      DECT     DECT      D	©	CLOCK RECEPTACLE			PUSHBUTTON			⊢(A) ⊢®©	MEDICAL AIR	OUTLET	€Z B	CODE BLUE PUSHBUTTON
A.       MARS. MR (DUMPRESSED)       DV       MECH DEC NOME       F15       F2 AND       MARS. MR (DUMPRESSED)       DV       MECH DEC NOME       SDC       SD	<b>≖_≡_</b> #/	MULTI-OUTLET ASSEMBLY			TRANSFORMER			⊦⊛ ⊢®	NITROGEN OU	TLET	_	
A       APPS, AP, CONPRESSION       D. DIRCT DAPARSION       HTM       HCTR       Winki WALL       SUM       PATO       ARC       ARC CONTROLLING       D. DIRCT DAPARSION       DIRCT DAPARSION       D. DIRCT DAPARSION       DIRCT DAPARSION       DIRCT DAPA												
A/A       ARE CONSIDED BARKA, ACCESS DOOR       FA       Enhand, ACCESS DOOR       Enhand       Enhand       HW       DAMEMAND, DOOR       Enhand       Enhand       HW       DAMEMAND, DOOR       Enhand       Enhand       HW       Enhand       HW       Enhand       HW       Enhand       HW       Enhand       HW       HW       MODE ALS DONE       SP       STATE       SP       <	А	AMPS, AIR (COMPRESSED)	DX	DIRECT EXPANSION		HTG	HEATING		MUAF	MAKE UP AIR FAN	SD	SUPPLY DIFFUSER, SMOKE DAMPER
AD ARA DAMA, ACAUSS LOCK FAIL FAILURATED AN ILLMINATOR, MET VOID IT HOUSEN FOR SPECIAL COUNT IN A MITCHESS SPECIAL	A/C	AIR CONDITIONING	EA	EXHAUST AIR		HTR	HEATER		MV	MIXING VALVE	SDCW	SOFT DOMESTIC COLD WATER
ABOVE THISIS FORME       EF       EXAMPLE TAIL       HOW AND TABLE TO THE TAIL TO AND AND TABLE SUPPLY       N/C       NORMALLY CLOED       Set       SUPPLY TESTER       SUPP	AD AFC	AREA DRAIN, ACCESS DOOR	EAT FC	ENTERING AIR TEMPERA	URE R EMPTY CONDUIT	HVU нw	HEATING AND VEN	TFR	N N /A		SDHW	SOFT DOMESTIC HOT WATER
APP HANDLING WIT       EA       MOUNTES ELECTRON DREADT       INVERT ELECTRON       NO       NORMALLY OPEN       SP       STATLE PRESSURE       SP         BD       ARACHART MANER, RLUXDOW       EX       DANCAT STATLE SUPPLY       N/O       NORMALLY OPEN       SP       SUPPLY       SP       SUPPLY       STATLE PRESSURE       SP       SUPPLY       SUPPLY <td>AFG</td> <td>ABOVE FINISH GRADE</td> <td>EF</td> <td>EXHAUST FAN</td> <td></td> <td>HWR</td> <td>HOT WATER RETUR</td> <td>RN</td> <td>N/C</td> <td>NORMALLY CLOSED</td> <td>SE</td> <td>SQUARE FEET</td>	AFG	ABOVE FINISH GRADE	EF	EXHAUST FAN		HWR	HOT WATER RETUR	RN	N/C	NORMALLY CLOSED	SE	SQUARE FEET
AF       ABOVE FINANCE OF LOOR       EP0       DERCENCY POWER OFF       IE       IN EVALUATE LEGANTION       N°       INDICATES NONUSED DEVECES       SR       SUPPLY RESIDER         BP       BACKRUD MARCHART DAMPER, ELKONSON       EXALATE CREGIBER       EVALUAT RESIDER       ST       STORM CONTRUCTOR       ST       STORM CONTRUCTOR         BPR       BACKRUD MARCHART DAMPER, ELKONSON       EXALATE CREGIBER       EVALUAT RESIDER       KV       KLONOLT       N       NIGHT LEAFT       ST       STORM CONTRUCTOR         BRR       BERKARF       ENTEN KORT BLUE       ELECTRIC MATER ACLER, KVA       KLONOLT       N       NIGHT LEAFT       SNBD       SNBTCH HOARNALL, NT         BOD       BOTTOM OF DUCT       EVAN       ELECTRIC MATER ACLER, KVA       KLONOLT AMPS       QA       OUTSEL, AR       SNBD       SNBTCH MONALL, NT       THERMALANIL         BOD       BOTTOM OF STRUCTURE       ENA       ELECTRIC MATER ALLER, ELEC, MALL HTR, KVA       KLONOLT ALLER, ARA       KVA       KLONOLT ALLER, KVA       NUT       THERMALANIL       THERMALANIL </td <td>AHU</td> <td>AIR HANDLING UNIT</td> <td>EM</td> <td>INDICATES EMERGENCY</td> <td>CIRCUIT</td> <td>HWS</td> <td>HOT WATER SUPP</td> <td>LY</td> <td>N/0</td> <td>NORMALLY OPEN</td> <td>SP</td> <td>STATIC PRESSURE</td>	AHU	AIR HANDLING UNIT	EM	INDICATES EMERGENCY	CIRCUIT	HWS	HOT WATER SUPP	LY	N/0	NORMALLY OPEN	SP	STATIC PRESSURE
BD     BACKRIGAF RELOTION     LH     EARLING RELEASE     IC     MOL AND COUNT     NC     NC <td>AFF</td> <td>ABOVE FINISHED FLOOR</td> <td>EPO</td> <td>EMERGENCY POWER OFF</td> <td></td> <td>IE</td> <td>INVERT ELEVATION</td> <td></td> <td>NF</td> <td>INDICATES NON-FUSED DEVICE</td> <td>SR</td> <td>SUPPLY REGISTER</td>	AFF	ABOVE FINISHED FLOOR	EPO	EMERGENCY POWER OFF		IE	INVERT ELEVATION		NF	INDICATES NON-FUSED DEVICE	SR	SUPPLY REGISTER
BY BREAKER END DECIMANT ALLONG AND	BD	BACKDRAFT DAMPER, BLOWDOWN	ER	EXHAUST REGISTER		IG	ISOLATED GROUND	)    S	NIC	NOT IN CONTRACT	ST ST /O	STORM
BOD       BOT MO OF PUCT       ENC       ELECTRIC WATER LOCACER       KVA       KUOWCIT MAPS       DA       OUTSDE AIR       SWB       SWITCHEDARD         BOD       BOT MO OF PIPE       ENM       ELECTRIC WATER HEATER, ELEC. WALL HITR.       KVA       KUOWCIT       ORD       OVERLOW ROOF DRAIN       TSTAT       THEMBOLITUAL UNIT         BOT       BOTTM OF PIPE       ENM       ELECTRIC WATER HEATER, ELEC. WALL HITR.       KVA       KUOWCIT       AUROR       CO       OVERLOW ROOF DRAIN       TSTAT       THEMBOLITUAL UNIT         BOT       BOTTM OF SPECUTRE       ELECTRIC WATER HEATER, ELEC. WALL HITR.       KVA       KUOWCIT       AUROR       CO       OVERLOW ROOF DRAIN       TSTAT       THEMBOLITUAL UNIT         BOT       CONDUT       F/A       COMBINATION FIRE AND SWICE DAMPER, LEC. WALL HITR.       KVA       KUOWCIT       AUROR       DO       OVERLow ROOF DRAIN       THE       ELAWING AND SWICE DAMPER, LEAWING AND ROOF DRAIN       LID       LOWING PEPED       PILE       PILE PARAMENT       LID       UNIT       LID       UNIT       VIEW ELAWING AND SWICE DAMPER, LABORATION FIRE AND SWICE DAMPER, LABORATION FIRE UNIT       LID       UNIT       LID       UNIT       VIEW ELAWING AND SWICE DAMPER, LABORATION FIRE AND SWICE DAMPER, LABORATION FIRE UNIT       LID       LID UNITER ELAWING WATER HEREIN WALL WIT       VIEW	BKR	BREAKER	EWB	ENTERING WET BULB		KV	KILOVOLT		NO	NITROUS OXIDE	STM	LOW PRESSURE STEAM
BOP       BOTTOM OF PIPE       EM       ELECTRIC MATTER FLEATER, ELEC, WALL HIT,       KW       KLOWATT       OUR CONCERTLOW ROOF DEAIN       TAT       THERMOSTAT         BOS       BOTTOM OF STRUCTURE       EXH       EXHAUST       KWH       KLOWATT HOUR       OX       OXYCEN       TU       TERMINAL LUNT       FLAP       FLANDA LANST       KWH       KLOWATT HOUR       OX       OXYCEN       TU       TERMINAL LUNT       TERMINAL LUNT       FLAP       FLANDA LON SNOKE DAMPER       LA       LEANING DAY RULE       DE       LEANING DAY RULE       PL       LONGERD PETERDE PETERLIADOR NALVE       UL       UNINTERRUTER LADORATORIES INC.         CATIV       CASED CIRCUIT TELEMISON       FCO       FLAO FRUE       LANINA NANALOATORIO CONTROL PANEL       LA       LOCKED ROTOR AMPS       PN       PAREL       UNIN<	BOD	BOTTOM OF DUCT	EWC	ELECTRIC WATER COOLE	२	KVA	KILOVOLT AMPS		OA	OUTSIDE AIR	SWBD	SWITCHBOARD
BOD       BOTTOM OF STRUCTURE       EXHAUST       KMH       KLOWATI HOUR       OX       OXYCEN       TU       TEXMINAL LINIT         BTU       BTUSTISH INFERNAL LUNIT       FASO       PRE ALARM CONTROL PANEL       LAT       LAT LEAVING AIR TEMPERATURE       PD       PUMP DISCHARGE       UH       UNIT EXMINAL LUNIT       IEAMERA CONTROL PANEL       LDB       LEAVING AIR TEMPERATURE       PD       POST INDICATOR VALVE       UL       UNIT EXMINAL LUNIT       IEAMERA CONTROL PANEL       LDB       LEAVING OR TEMPERATURE       PD       PANEL       UNIT       UNIT EXMINAL LUNIT       IEAMERA CONTROL PANEL       LDB       LEAVING OR TEMPERATURE       PD       PANEL       UNIT       UNIT EXMIPACINES LABORATORIES INC.         CATV       CABLE TELEVISION SYSTEM       FAACP       FRC OR ELOGO CLEANOLT       LAR       LOGKED ROTAR AMPS       PN       PANEL       UNIT       UNIT EXMIPACINES       UNIT       UNIT EXMIPACINES INC.       UNIT EXMIPACINES INC. </td <td>BOP</td> <td>BOTTOM OF PIPE</td> <td>EWH</td> <td>ELECTRIC WATER HEATER</td> <td>R, ELEC. WALL HTR.</td> <td>KW</td> <td>KILOWATT</td> <td></td> <td>ORD</td> <td>OVERFLOW ROOF DRAIN</td> <td>TSTAT</td> <td>THERMOSTAT</td>	BOP	BOTTOM OF PIPE	EWH	ELECTRIC WATER HEATER	R, ELEC. WALL HTR.	KW	KILOWATT		ORD	OVERFLOW ROOF DRAIN	TSTAT	THERMOSTAT
C CONDUIT FACAP FIRE ALARM CANNER PARE LOB LEAVING OR BULL ON ULTAR AN FUNCTION. LOW CONTROL CAN CONTR	BOS	BOTTOM OF STRUCTURE	EXH E /S	EXHAUST	SMOKE DANDER	KWH	KILOWATT HOUR		0X DD		TU	TERMINAL UNIT
CATV       CABLE TELEVISION SYSTEM       FAACP       FIRE ALARM ANNUNCIATOR CONTROL PANEL       LP       LUQUIFIED PETROLEUM       PIV       POST INDICATOR VALVE       UL       UNDERWRITERS LABORATORIES INC.         CB       CIRCUIT BREAKER       FOO       FLOOR CLEANOUT       LR       LOCKED FOTOR AMPS       PNL       PANEL       UNO       UNINTERRUPTIBLE POWER SUPPLY         CFM       CUBIC FEET PER MINUTE       FOO       FAN COLUMIT       LW       LOW VOLTAGE       PRV       PRESSURE REDUCING VALVE       US       UNINTERRUPTIBLE POWER SUPPLY         CFM       CUBIC FEET PER MINUTE       FD       FIRE DAMPER, FLOOR DRAIN       LWB       LEAVING WATER FUELPEN       RA       RETURN AR       VAC       MEDICAL VACUUMA       MARE         CHW       CHILED/HOT WATER SUPPLY       FIR       FLOOR CRAIN       LW       LEAVING WATER TEMPERATURE       RA       RETURN AR       VAC       MEDICAL VACUUMA       DAME         CW       CHILED/HOT WATER SUPPLY       FIR       FLOOR DRAIN       LW       LEAVING WATER TEMPERATURE       RA       RETURN AR       VAC       MEDICAL VACUUMA       DAME         CW       CRUIT       FOR       FUEL OIL RETURN       MANU       MARE UP AIR UNIT       REV       RETURN GRIEL AVE UNUMARY VARIABE LAPVE WAULUMA       GRIE ALVINANCIALORIT </td <td>С</td> <td>CONDUIT</td> <td>FACP</td> <td>FIRE ALARM CONTROL P</td> <td>ANEL</td> <td>LDB</td> <td>LEAVING AIR TEMP</td> <td>B</td> <td>PH</td> <td>PHASE</td> <td>UH</td> <td>UNIT HEATER</td>	С	CONDUIT	FACP	FIRE ALARM CONTROL P	ANEL	LDB	LEAVING AIR TEMP	B	PH	PHASE	UH	UNIT HEATER
CRCIRCUITECOFLORLOCKED ROTOR AMPSPALPANELUNDUNLESS NOTED OTHERMSECTVOLOSED CIRCUIT TLEWISIONFOUFAN COLU UNTLVLOW VOLTAGEPROPRESSURE REDUCING VALVEUPSUNINTERRUPTIBLE POWER SUPPLYCFMCUBIC FEET PER MINUTEFDFAN COLU NATLWLEAVING WATER TEMPERATURERARETURN AIRVACMEDICAL VACUUMHEMECHWCHILED/HOT WATER RETURNFLAFULL CAD AMPSLWLEAVING WATER TEMPERATURERARETURN AIRVACMEDICAL VACUUM49= LEMECHWCHILED/HOT WATER SUPPLYFLRFLORFLUENAMEDICAL AIRRDROO DRAINVACVACUALE AR VOLUME49= LEMECMCIRCUITFORFUEL OL RETURNMAMAC UP AIR UNITREVRCMISTORVACVACUALABLE AIR VOLUME49= LEMECMCIRCUITFORFUEL OL RETURNMBH1000 BTU PER HOURRGRETURN GRILLEVTRVEICH THROUCH ROOF50-2= TCMCARBON DIOXODEFOSFUEL OL RETURNMBH1000 BTU PER HOURRGRETURN GRILLEVTRVEICH THROUCH ROOF50-2= TCMCOULING TOWER RETURNFPBFAN POWERD TERMINAL UNITMCCMECHANCAL CONTRACT CONTRACT CANTRACTORRHRELUNIN CALAD AMPSWWITHVEICE HOURCMCOULING TOWER RETURNFPBFAN POWERD TERMINAL UNITMCCMOTOR CONTRACT CANTRACT CANTRACT CANTRACTORRHRELUN	CATV	CABLE TELEVISION SYSTEM	FAACP	FIRE ALARM ANNUNCIAT	OR CONTROL PANEL	LP	LIQUIFIED PETROLE	EUM	PIV	POST INDICATOR VALVE	UL	UNDERWRITERS LABORATORIES INC.
CTV       CLOSED CIRCUIT TELEVISION       FU       FAN COLL UNIT       LV       LOW VOLTAGE       PRV       PRESSURE REDUCING VALVE       UNINTERRUPTIBLE POWER SUPPLY         CFM       COBIG FEET PRE MINUTE       FD       FRE DARGER, FLOOR DRAIN       LWB       LEAVING WET BULB       QTV       QUANTITY       V       VX       VAIT PIPE       HIGH         CHW       CHILLED/HOT WATER RETURN       FLA       FULL LOAD AMPS       LWT       LEAVING WET BULB       QTV       QUANTITY       V       VAIT PIPE       HIGH         CHW       CHILLED/HOT WATER RETURN       FLA       FULL LOAD AMPS       LWT       LEAVING WET BULB       QTV       QUANTITY       V       VAIT PIPE       HIGH       TAKE         CHW       CHILLED/HOT WATER SUPPLY       FLR       FLOOR       MA       MEDICAL AIR       RD       ROOF DRAIN       VAI       VAIT ABEL AR VOLUME       ABE       LEAVING WET ENDIT       MA       MEDICAL AIR       RD       ROOF DRAIN       VAI       VAIT ABEL AR VOLUME       MEDICAL ACUUM       MAIT       MAIT       MAIT       RETURN AIR       RD       ROOF DRAIN       VAI       VAIT ABEL AR VOLUME       MAIT       MAIT       RD       ROOF DRAIN       VAIT       WENT HOULDE       MAIT       MAIT       MAIT       MAIT	СВ	CIRCUIT BREAKER	FCO	FLOOR CLEANOUT		LRA	LOCKED ROTOR A	MPS	PNL	PANEL	UNO	UNLESS NOTED OTHERWISE
CHW       CHURD HELT FELV MILTOL       FD       FILE DAMPER, FLON EXAM       LEW       LEAVING WEI BOLDS       CHUR       CHURT       VAC       MEDICAL VACUUM       DAMPER         CHWS       CHILLED/HOT WATER SUPPLY       FLR       FLOOR       MA       MEDICAL AIR       RD       ROOF DRAIN       VAC       MEDICAL VACUUM       DAMPER       CM       CM       CM       CM       MEDICAL AIR       RD       ROOF DRAIN       VAC       MEDICAL VACUUM       DAMPER       CM       CM<	CCTV	CLOSED CIRCUIT TELEVISION	FCU	FAN COIL UNIT			LOW VOLTAGE	D	PRV	PRESSURE REDUCING VALVE	UPS	
CHWS       CHILLED/HOT WATER SUPPLY       FLR       FLOR       MA       MEDICAL AIR       RD       ROOF DRAIN       VAV       VARIABLE AIR VOLUME       48 = HALEI         CKT       CIRCUIT       FOR       FUEL OIL RETURN       MAU       MAKE UP AIR UNIT       REV       REVISION       VD       VOLUME DAMPER       08 = INLEI         CO       CLEANOUT, CARBON MONOXIDE       FOS       FUEL OIL SUPPLY       MBH       1000 BTU PER HOUR       RG       RETURN GRILLE       VTR       VENT THROUGH ROOF       SD-2 = T         C02       CARBON DIOXIDE       FP       FIRE PROTECTION       MC       MECHANICAL CONTRACTOR       RH       RELATIVE HUMIDITY       W       WRE, WATT(S)         CTR       COOLING TOWER RETURN       FP       FINE PROTECTION       MC       MCCHANICAL CONTRACTOR       RH       RELATIVE HUMIDITY       W       WRE, WATT(S)         CTR       COOLING TOWER RETURN       FP       FAN POWERED TERMINAL UNIT       MC       MOTORIZED DAMPER       RL       REFRICERANT LIQUID       W/O       WITH         CTS       COOLING TOWER RETURN       FP AN POWERED TERMINAL UNIT       MC       MOTORIZED DAMPER       RL       RUNNING LOAD AMPS       WB       WET BULB         CU       COOPER, CONDENSING UNIT       FS	CHWR	CHILLED/HOT WATER RETURN	FLA	FULL LOAD AMPS	AIN	LWD	LEAVING WET BOL		RA	RETURN AIR	V VAC	MEDICAL VACUUM DAME
CKT       CIRCUIT       FOR       FUEL OIL RETURN       MAU       MAKE UP AIR UNIT       REV       REVISION       VD       VOLUME DAMPER       NO         C0       CLEANOUT, CARBON MONOXIDE       FOS       FUEL OIL SUPPLY       MEH       1000 BTU PER HOUR       RG       RETURN GRILLE       VTR       VENT THROUGH ROOF       SD-2       T         C02       CARBON DIXIDE       FP       FIRE PROTECTION       MC       MCHANICAL CONTRACTOR       RH       RELATIVE HUMIDITY       W       WRE, WAIT(S)         CTR       COOLING TOWER RETURN       FPB       FAN POWERED TERMINAL UNIT       MCA       MINIMUM CIRCUIT AMPACITY       RHW       DOMESTIC CRULATION HOT WATE       W/       WTH         CTS       COOLING TOWER SUPPLY       FPVAV       FAN POWERED TERMINAL UNIT       MCA       MOTORIZED DAMPER       RL       RUNNING LOAD AMPS       W       WET BULB         CU       COPPER, CONDENSING UNIT       FS       FLOOR SINK       MD       MOTORIZED DAMPER       RL       RUNNING LOAD AMPS       WB       WET BULB         CUH       CABINET UNIT HEATER       G       GAS (NATURAL), GROUND       MP       MAIN DISTRIBUTION PANEL       RPM       RECOLUTIONS PER MINUTE       WO       WAIL LEANOUT         CW       DOBESTIC COLD WATER RETU	CHWS	CHILLED/HOT WATER SUPPLY	FLR	FLOOR		MA	MEDICAL AIR		RD	ROOF DRAIN	VAV	VARIABLE AIR VOLUME
C0       CLEANOUT, CARBON MONOXIDE       FOS       FUEL OIL SUPPLY       MBH       1000 BTU PER HOUR       RG       RETURN GRILLE       VTR       VENT THROUGH ROOF       SU-2 = 10         C02       CARBON DIOXIDE       FP       FIRE PROTECTION       MC       MECHANICAL CONTRACTOR       RH       RELATIVE HUMIDITY       W       WIRE, WATT(S)         C1R       COOLING TOWER RETURN       FPB       FAN POWERED TERMINAL UNIT       MCA       MINIMUM CIRCUIT AMPACITY       RHW       DOMESTIC RECIRCULATION HOT WATER       W/       WITH-       C       MOTO         C1S       COOLING TOWER SUPPLY       FPV AV       FAN POWERED TERMINAL UNIT       MCA       MINIMUM CIRCUIT AMPACITY       RHW       DOMESTIC RECIRCULATION HOT WATER       W/       WITH-       C       WITHOUT       VITH       VIT	CKT	CIRCUIT	FOR	FUEL OIL RETURN		MAU	MAKE UP AIR UNI	Т	REV	REVISION	VD	VOLUME DAMPER 08 = INLET
CO2CARBON DIVADEFFFREE FRUIECTIONMCMCCMECHANICAL CONTRACTORRHKELATARE HUME/HUMIDITYWWIRE, WATI(S)CTRCOOLING TOWER RETURNFPBFAN POWERED TERMINAL UNITMCAMINIMUM CIRCUIT AMPACITYRHWDOMESTIC RECIRCULATION HOT WATERW/WTHCTSCOOLING TOWER SUPPLYFPVAVFAN POWERED TERMINAL UNITMCAMINIMUM CIRCUIT AMPACITYRHWDOMESTIC RECIRCULATION HOT WATERW/WTHOUTCUCOPFER, CONDENSING UNITFSFLOGE SINKMDMOTORIZED DAMPERRLARUNNING LOAD AMPSWBWET BULBCUHCABINET UNIT HEATERGGAS (NATURAL), GROUNDMDPMAIN DISTRIBUTION PANELRPMREVOLUTIONS PER MINUTEWCOWALL CLEANOUTCWDOMESTIC COLD WATERGCOGRADE CLEANOUTMFRMANUFACTURERRSREFRIGERANT SUCTIONWHWALL HYDRANTCWRCHILLED WATER RETURNGFI/GFCIGROUND FAULT CIRCUIT INTERRUPTERMHMANHOLERTNLOW PRESSURE CONDENSATE RETURNWPWEATHERPROOFCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMTRANSFORMERDDCDIRECT DIGITAL CONTROLGPMGALLONS PER MINUTEMDMOUNTEDSASUPPLY AIRXPEXPLOSION PROOFDDDECK DRAINHBHOSE BIBBMUMAKE UPSANSANITARYNDEXPLOSION PROOFDNDOWNHOAHAND OFF AUTOMATICHM </td <td>CO</td> <td>CLEANOUT, CARBON MONOXIDE</td> <td>FOS</td> <td>FUEL OIL SUPPLY</td> <td></td> <td>MBH</td> <td>1000 BTU PER HO</td> <td></td> <td>RG</td> <td>RETURN GRILLE</td> <td>VTR</td> <td>VENT THROUGH ROOF <math>SD-2 = Th</math></td>	CO	CLEANOUT, CARBON MONOXIDE	FOS	FUEL OIL SUPPLY		MBH	1000 BTU PER HO		RG	RETURN GRILLE	VTR	VENT THROUGH ROOF $SD-2 = Th$
CTSCOOLING TOWER SUPPLYFPVAVFAN POWERED TERMINAL UNITMCCMOTOR CONTROL CENTERRLREFRIGERANT LIQUIDW/OWITHOUTCUCOPPER, CONDENSING UNITFSFLOOR SINKMDMOTOR/ZED DAMPERRLARUNNING LOAD AMPSWBWET BULBCUHCABINET UNIT HEATERGGAS (NATURAL), GROUNDMDPMAIN DISTRIBUTION PANELRPMREVOLUTIONS PER MINUTEWCOWALL CLEANOUTCWDOMESTIC COLD WATERGCOGRADE CLEANOUTMFRMANUFACTURERRSREFRIGERANT SUCTIONWHWALL HYDRANTCWRCHILLED WATER RETURNGFI/GFCIGROUND FAULT CIRCUIT INTERRUPTERMHMANHOLERTNLOW PRESSURE CONDENSATE RETURNWPWEATHERPOOFCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMRTRANSFORMERCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMRTRANSFORMERDDCDIGECT DIGITAL CONTROLGPMGALLONS PER MINUTEMTDMOUNTEDSASUPPLY AIRXPEXPLOSION PROOFDDDECK DRAINHBHOSE BIBBMUMAKE UPSANSANITARYMECHAND ELECTRICAL SYMBOLS AND ABBREVIATIONDNDOWNHOAHAND OFF AUTOMATICWITHMAKE UPSANSANITARYMECHAND ELECTRICAL SYMBOLS AND ABBREVIATION	CU2 CTR	CARDON DIOXIDE	۲۲ FPR	FIRE PRUIECTION	L UNIT	MCA	MECHANICAL CON		RH RHW	RELATIVE HUMIDITY	W TER W /	WIKE, WATI(S) WITH
CUCOPPER, CONDENSING UNITFSFLOOR SINKMDMOTORIZED DAMPERRLARUNNING LOAD AMPSWBWET BULBCUHCABINET UNIT HEATERGGAS (NATURAL), GROUNDMDPMAIN DISTRIBUTION PANELRPMREVOLUTIONS PER MINUTEWCOWALL CLEANOUTCWDOMESTIC COLD WATERGCOGRADE CLEANOUTMFRMANUFACTURERRSREFRIGERANT SUCTIONWHWALL HYDRANTCWRCHILLED WATER RETURNGFI/GFCIGROUND FAULT CIRCUIT INTERRUPTERMHMANUFACTURERRTNLOW PRESSURE CONDENSATE RETURNWPWEATHERPROOFCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMRTRANSFORMERDDCDIRECT DIGITAL CONTROLGPMGALLONS PER MINUTEMLOMAINE UPSASUPPLY AIRXFMRTRANSFORMERDDDECK DRAINHBHOSE BIBBMUMAKE UPSANSANITARYXFMRXFMD ABBBREVIATIONDNDWNHAN OFF AUTOMATICWFHAND OFF AUTOMATICWFWEATHERPROFMECHAND ELECTRICAL SYMBOLS AND ABBBREVIATION	CTS	COOLING TOWER SUPPLY	FPVAV	FAN POWERED TERMINA	L UNIT	MCC	MOTOR CONTROL	CENTER	RL	REFRIGERANT LIQUID	W/O	WITHOUT
CUHCABINET UNIT HEATERGGAS (NATURAL), GROUNDMDPMAIN DISTRIBUTION PANELRPMREVOLUTIONS PER MINUTEWCOWALL CLEANOUTCWDOMESTIC COLD WATERGCOGRADE CLEANOUTMFRMANUFACTURERRSREFRIGERANT SUCTIONWHWALL HYDRANTCWRCHILLED WATER RETURNGFI/GFCIGROUND FAULT CIRCUIT INTERRUPTERMHMANHOLERTNLOW PRESSURE CONDENSATE RETURNWPWEATHERPROOFCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMRTRANSFORMERDDCDIRECT DIGITAL CONTROLGPMGALLONS PER MINUTEMUMOUNTEDSASUPPLY AIRXPEXPLOSION PROOFDDDECK DRAINHBHOSE BIBBMUMAKE UPSANSANITARYXPEXPLOSION PROOFDNDOWNHOAHAND OFF AUTOMATICWUWAKE UPSANSANITARYSANITARY	CU	COPPER, CONDENSING UNIT	FS	FLOOR SINK		MD	MOTORIZED DAMPE	ER	RLA	RUNNING LOAD AMPS	WB	WET BULB
CWDOMESTIC COLD WATERGCOGRADE CLEANOUTMFRMANUFACTURERRSREFRIGERANT SUCTIONWHWALL HYDRANTCWRCHILLED WATER RETURNGFI/GFCIGROUND FAULT CIRCUIT INTERRUPTERMHMANHOLERTNLOW PRESSURE CONDENSATE RETURNWPWEATHERPROOFCWSCHILLED WATER SUPPLYGNDGROUNDMLOMAIN LUGS ONLYRTUROOF TOP UNITXFMRTRANSFORMERDCDIRECT DIGITAL CONTROLGPMGALLONS PER MINUTEMIDMOUNTEDSASUPPLY AIRXPEXPLOSION PROOFDDDECK DRAINHBHOSE BIBBMUMAKE UPSANSANITARYVECTORICAL SYMBOLS AND ABBREVIATIONDNHOAHAND OFF AUTOMATICVECTORIATICVECTORIAL AND ELECTRICAL SYMBOLS AND ABBREVIATION	CUH	CABINET UNIT HEATER	G	GAS (NATURAL), GROU	ND	MDP	MAIN DISTRIBUTION	N PANEL	RPM	REVOLUTIONS PER MINUTE	WCO	WALL CLEANOUT
CWS     CHILLED WATER SUPPLY     GND     GROUND     MED     MAIN LUGS ONLY     RTU     ROOF TOP UNIT     XFMR     TRANSFORMER       DDC     DIRECT DIGITAL CONTROL     GPM     GALLONS PER MINUTE     MTD     MOUNTED     SA     SUPPLY AIR     XP     EXPLOSION PROOF       DD     DECK DRAIN     HB     HOSE BIBB     MU     MAKE UP     SAN     SANITARY       DN     DOWN     HOA     HAND OFF AUTOMATIC     KEE UP     KEE UP     KEE UP     KEE UP	CW	DOMESTIC COLD WATER		GRADE CLEANOUT		MFR			RS	REFRIGERANT SUCTION	WH IRN WD	WALL HYDRANT
DDC       DIRECT DIGITAL CONTROL       GPM       GALLONS PER MINUTE       MTD       MOUNTED       SA       SUPPLY AIR       XP       EXPLOSION PROOF         DD       DECK DRAIN       HB       HOSE BIBB       MU       MAKE UP       SAN       SANITARY         DN       DOWN       HOA       HAND OFF AUTOMATIC       V       V       MECHANICAL AND ELECTRICAL SYMBOLS AND ABBREVIATION	CWS	CHILLED WATER SUPPLY	GND	GROUND		MLO	MAIN LUGS ONLY		RTU	ROOF TOP UNIT	XFMR	TRANSFORMER
DD DECK DRAIN HB HOSE BIBB MU MAKE UP SAN SANITARY DN DOWN HOA HAND OFF AUTOMATIC MECHANICAL AND ELECTRICAL SYMBOLS AND ABBREVIATION	DDC	DIRECT DIGITAL CONTROL	GPM	GALLONS PER MINUTE		MTD	MOUNTED		SA	SUPPLY AIR	XP	EXPLOSION PROOF
DOWN HOA HAND OFF AUTOMATIC MECHANICAL AND ELECTRICAL SYMBOLS AND ABBREVIATION	DD		HB	HOSE BIBB		MU	MAKE UP		SAN	SANITARY		
	DN	DOMN	НОА	HAND OFF AUTOMATIC				<u>MECH</u>	ANICAL	AND ELECTRICAL	<u>SYMBO</u>	LS AND ABBREVIATION

Roeland Park Park Structures X:\19\19192\1919200\Drawings\01-1919200\_ME1.dwg PPatro Thursday, August 1, 2019 10:00:20 AM Charles Booty Monday, January 13, 2020 2:56:02 PM

PROJECT NAME: AUTOCAD FILE LOCATION \ NAME LAST CORRECTION BY& DATE\* T PLOTTED BY\* DATE TIME:

# PLUMBING

	DOMESTIC COLD WATER
	DOMESTIC HOT WATER
	RECIRCULATING DOMESTIC HOT WATER
TW	DOMESTIC TEMPERED WATER
	SOFT DOMESTIC COLD WATER
++	SOFT DOMESTIC HOT WATER
+++	SOFT RECIRCULATING HOT WATER
	SOIL OR WASTE ABOVE GRADE OR FLOOR
— — SAN — —	SOIL OR WASTE BELOW GRADE OR FLOOR
ST	STORM ABOVE GRADE OR FLOOR
— — ST — —	STORM BELOW GRADE OR FLOOR
ST/0	STORM OVERFLOW ABOVE GRADE OR FLOOR
<b>_</b> _ST/0 <b>_</b> _	STORM OVERFLOW BELOW GRADE OR FLOOR
v	PLUMBING VENT
G	GAS (NATURAL)
LP	LIQUIFIED PETROLEUM
—— PD ——	PUMP DISCHARGE
———— <del> +</del> НВ	HOSE BIBB
	WALL HYDRANI
— <u>⊣</u> ⊪ wco	WALL CLEAN OUT
‡CO	CLEAN OUT
© FCO	FLOOR CLEAN OUT
	FLOOR DRAIN, AREA DRAIN, FLOOR SINK
	ROOF DRAIN, OVERFLOW ROOF DRAIN
A	SHOWER HEAD.
<b>⊣</b> ŧ₫₫ŧ+	REDUCED PRESSURE BACKFLOW PREVENTER
(P) #	PLUMBING VENT RISER CALL-OUT NUMBER
GE	NERAL
1	MECHANICAL NOTE REFERENCE
2	ELECTRICAL NOTE REFERENCE
3	DEMOLITION NOTE REFERENCE
$\Delta$	REVISION NOTE REFERENCE
$\bullet$	CONNECT TO EXISTING WORK
	DETAIL REFERENCE - NO./SHEET NO.
A M1	SECTION CUT - SECTION/SHEET NO.

![](_page_34_Figure_15.jpeg)

![](_page_34_Figure_16.jpeg)

# <u>IS</u>

"SOME SYMBOLS AND ABBREVIATIONS ON THIS LEGEND MAY NOT BE USED. REFER TO FLOOR PLANS FOR ALL SYMBOLS AND ABBREVIATIONS."

PI	PING
—;) ;	ELBOW DOWN
	ELBOW UP
+0+	TEE UP
	TEE DOWN
7	
	REDUCER (OR INCREASER)
, ,	
<u>_</u>	DROP IN PIPING
	GUIDE
——————————————————————————————————————	ANCHOR
	PRESSURE GAUGE WITH GAUGE COCK
<u>,</u>	TEMPERATURE GAUGE
	FLOW INDICATOR
D T	THERMOMETER.
—i⊗i	SITE GLASS
	EXPANSION JOINT
	FILTER-DRIER
	DRIP ASSEMBLY
+[]	BASKET STRAINER
+₩	SHUTOFF VALVE
<b>_</b>	SHUTOFF VALVE IN RISER
	BALANCING VALVE
	CALIBRATED BALANCING VALVE
	RELIEF VALVE
.I.	TEST PLUG
	CHECK VALVE.
——————————————————————————————————————	AUTOMATIC CONTROL VALVE (2-WAT)
	AUTOMATIC CONTROL VALVE (3-WAY)
	AUTO FLOW CONTROL VALVE
; ;⊖;	SOLENOID VALVE
回 	PRESSURE REDUCING VALVE

# <u>DUCTWORK</u>

![](_page_34_Picture_21.jpeg)

![](_page_35_Figure_0.jpeg)

PLAN NOTES:

- 1 APPROXIMATE LOCATION OF PAD MOUNTED UTILITY TRANSFORMER. INSTALL CONCRETE PAD PER UTILITY (KCPL) SPECIFICATIONS. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
- 2 SECONDARY ELECTRICAL UTILITY FEEDER. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
- 3 PRIMARY ELECTRICAL UTILITY FEEDER. PROVIDE (1) 4" CONDUIT WITH PULL STRING FROM UTILITY POLE, COORDINATE ROUTING WITH CIVIL CONTRACTOR AND UTILITY.
- 4 APPROXIMATE LOCATION OF EXISTING ELECTRICAL UTILITY POLE. PROVIDE (1) 4" SWEEP AND STUD UP ONTO POLE AND CAP. COORDINATE WITH UTILITY.
- 5 BRANCH CIRCUIT FEEDERS FROM PAVILION TO RESTROOM TO BE RUN UNDER GROUND. COORDINATE ROUTING AND INSTALLATION REQUIREMENTS WITH CONTRACTOR. BORE BELOW GRADE AS NEEDED FOR ROUTING TO BE COMPLETED BY ELECTRICAL CONTRACTOR.

![](_page_35_Picture_8.jpeg)

UN	NIT HEATER SCHED	ULE - ELECTRI	С		PLUM
DES	IGNATION	ECH-1	ECH-2	ECH-3	
HEA	TER TYPE	FAN-FORCED	FAN-FORCED	FAN-FORCED	MARK
LOC	ATION	FAMILY	STORAGE	FAMILY	
ΜΟι	INTING	WALL	WALL	WALL	WC-1
MAN	UFACTURER	RAYWALL	RAYWALL	RAYWALL	
мос	EL	AFA115D	AFA115D	AFA115D	
WEI	GHT (LBS)				
A	AIRFLOW (CFM)	175	175	175	
DAT	FAN DRIVE	DIRECT	DIRECT	DIRECT	
NIT	HEATER KW	1.5	1.5	1.5	
n	VOLTAGE/PHASE	120/1	120/1	120/1	
	AMPS	12.5	12.5	12.5	L-1
ΑΤΑ	PANEL & CIRCUIT	RP-12	RP-14	RP-16	
RL. D	WIRE & CONDUIT	(2) #12, #12 G.,1/2" C.	(2) #12, #12 G.,1/2" C.	(2) #12, #12 G.,1/2" C.	EWC-1
c./CT	OVERCURRENT DEVICE	20A/1P CB	20A/1P CB	20A/1P CB	
ELEC	DISCONNECT	INTEGRAL	INTEGRAL	INTEGRAL	HB-1
	CONTROL	NOTE 1	NOTE 1	NOTE 1	
REF	ERENCE DRAWING/DETAIL	M1	M1	M1	NOTES:
REM	ARKS	-	-	-	1. PROVIDE W 2. PROVIDE W
NOT	ES:				3. PROVIDE S

1: PROVIDE WITH UNIT-MOUNTED DISCONNECT, TRANSFORMER / RELAY AND REMOTE WALL THERMOSTAT.

**DOMESTIC WATER HEATER - INSTANTANEOUS** DESIGNATION MANUFACTURER MODEL INPUT (KW) LOCATION WATER FLOW (GPM) TEMPERATURE RISE (°F) OUTLET TEMP. (°F) VOLTS/PHASE PANEL & CIRCUIT WIRE & CONDUIT OVERCURRENT DEVICE DISCONNECT REFERENCE DRAWING/DETAIL REMARKS

NOTE 1: PROVIDE A 40A RATED TOGGLE SWITCH FOR DISCONNECT AS REQUIRED

![](_page_36_Figure_4.jpeg)

Roeland Park Park Structures X:\19\19192\1919200\Drawings\01-1919200\_ME3.dwg JCampbell Friday, December 20, 2019 2:11:34 Charles Booty Monday, January 13, 2020 2:56:54

5 🔶 É 6 щ'о 🔶 PRC PLO

<b>BING FIXTURE</b>	SCHEDULE							
MANUFACTURER			FITTINGS					
/ MODEL	DESCRIPTION	MANUFACTURER/ MODEL	DESCRIPTION	NOTES	CW	HW	SAN	VENT
AMERICAN STANDARD	WATER CLOSET: WHITE VITREOUS CHINA, ELONGATED BOWL,	SLOAN	SENSOR ACTIVATED, CONCEALD WATER CLOSET SINGLE FLUSH VALVE,	1,3,4	1-1/4"		4"	2"
AF WALL	WALL MOUNTED FLUSH VALVE BOWL WITH BACK SPUD AND FLAT BOLT COVERS,	OPTIMA	1.28 GPF, CHROME PLATED, FLUSH OVERRIDE BUTTON, HARD-WIRED, TRANSFORMER					
3353.101	1.28 GALLON SIPHON JET FLUSHING ACTION.	152-1.28 ES-S	AS REQUIRED, VACUUM BREAKER FLUSH CONNECTION AND SPUD COUPLING					ľ
			FOR 1-1/2" BACK SPUD					ľ
WADE	PROVIDE CARRIER AS REQUIRED TO SUIT APPLICATION FOR							ľ
330-HD	MOUNTING IN CHASE		PROVIDE WALL AND SPUD FLANGES.					
CHURCH	SEAT: SOLID PLASTIC, OPEN FRONT, WHITE, ELONGATED BOWL, INTEGRATED							ľ
9500C	BUMPERS, EXTERNAL CHECK HINGES WITH STAINLESS STEEL POSTS.							ľ
AMERICAN STANDARD	WALL-HUNG LAVATORY: WHITE VITREOUS CHINA,	SLOAN	HANDSFREE SENSOR OPERATED FAUCET, .5 GPM VANDAL RESISTANT SPRAY,	1,2,3,4,5	1/2"	1/2"	2"	1-1/2"
COMRADE	REAR OVERFLOW, 20"x18-1/4".	SOLIS	POLISHED CHROME, SINGLE SUPPLY, SOLAR-POWERED, BATTERY BACKUP					
		EAF-275						ľ
ELKAY	MECHANICALLY ACTIVATED, OUTDOOR, WALL MOUNTED,				1/2"	1/2"	2"	1-1/2"
LK4405	NON-FILTERED, NON-REFRIGERATED, FOUNTAIN. VANDAL RESISTANT,							ľ
	FRONT MOUNTED BUBBLER. COORDINATE FINISHWITH ARCHITECT.							
JAY R. SMITH	SILLCOCK, INTEGREL VACUUM BREAKER, STAINLESS				3/4"			
5572	STEEL VANDAL RESISTANT BOX, 3/4" HOSE THREAD SPOUT, "T" HANDLE KEY,							

PROVIDE WITH ALL MOUNTING HARDWARE AS REQUIRED.

PROVIDE WITH CHROME PLATED DRAIN, GRID STAINER, TAILPIECE, AND TRAP.

3. PROVIDE STAINLESS STEEL BRAIDED HOSE WITH KEYED STOP 4. PROVIDE CAULK AROUND FIXTURE CONNECTION TO FLOOR/WALL. COLOR BY ARCHITECT.

5. PROVIDE TRUEBRO LAV GUARD 2 INSULATION KIT. COLOR BY ARCHITECT.

	IWH-1	IWH-2
	EEMAX	EEMAX
	EX3012	EX3012
	3.0	3.0
	FAMILY	FAMILY
	0.5	0.5
	41	41
	90	90
	120/1	120/1
	RP-13	RP-15
	(2) #8, #10 G, 3/4" C.	(2) #8, #10 G, 3/4" C.
	40A/1P CB	40A/1P CB
	NOTE 1	NOTE 1
	M1	M1
١Λ		

DES	SIGNATION	EF-1	EF-2	
SERVICE		EXHAUST	EXHAUST	
LOC	CATION	FAMILY	FAMILY	
	MANUFACTURER	СООК	COOK	
	MODEL NO.	CBF	CBF	
	FAN TYPE	CENTRIFIGAL	CENTRIFIGAL	
	CFM	75	75	
ব	STATIC PRESSURE	0.15	0.15	
1 PA L	FAN RPM	1763	1763	
VIT I	BRAKE HORSEPOWER	40.5W	40.5W	
5	MOTOR HORSEPOWER	N/A	N/A	
	VOLTAGE/PHASE	120/1	120/1	
	DRIVE	DIRECT	DIRECT	
	WEIGHT (LBS)	21	21	
	SONES	3.3	3.3	
TA	PANEL & CIRCUIT	LIGHTING CIRCUIT	LIGHTING CIRCUIT	
DA	WIRE & CONDUIT	(2) #12, #12 G., 1/2" C.	(2) #12, #12 G., 1/2" C	
<b>TROI</b>	OVERCURRENT DEVICE	NOTE 1	NOTE 1	
NOC	DISCONNECT	TOGGLE SWITCH	TOGGLE SWITCH	
EC./C	CONTROL	NOTE 1	NOTE 1	
ELE	DAMPER TYPE	NOTE 2	NOTE 2	
REI	FERENCE DRAWING/DETAIL	M1	M1	

1  $\,$  INSTALL A LIGHTING POWER PACK FOR FAN THAT OPERATES WTH THE RESTROOM

2 FURNISH AND INSTALL WITH INTEGRAL BACKDRAFT DAMPER.

LIGHTS.

![](_page_36_Figure_18.jpeg)

DRAIN	SCHEDULE	
MARK	MANUFACTURER/ MODEL	
FD-1	WADE	CAST IRON DRAIN WITH
	1100A	VANDAL RESISTANT SC
FD-2	WADE	CAST IRON DRAIN WITH
	2370	PROVIDE WITH TRAP SE

NOTES:

1: COORDINATEL ALL DRAIN LOCATIONS WITH (BUT NOT EXCLUDING) 2: REFER TO PLANS FOR FLOOR DRAIN OUTLET SIZE.

![](_page_36_Figure_22.jpeg)

NO SCALE

**DOMESTIC WATER SERVICE DETAIL** 

NOT TO SCALE

STANT SPRAY,	1,2,3,4,5	1/2"	1/2"	2"	1-1/2"	smith&k	
TDAOROF		1/2"	1/2"	2"	1-1/2"	25501 west valley parkway, su phone 913.34	ite 200 olathe, ks 66061 5.2127 fax 913.345.0617 project number 1919200
		3/4"					
						DE SUMAN	46 5/20 (5) 15/20 (5) 15/20 (5) 15/20 (5) 15/20 (5)
				REN	IARKS		
REWS. PROVIDE WITH TRAP SEAL D	EVICE.	AINER	WIIH		1,2		
12" SQUARE, NICKEL BRONZE FIXED AL DEVICE.	TOP, SLO	ITED G	RATE.		1,2		
) EQUIPMENT, HOUSE-KEEPING PAI	DS, MILLWO	ORK, A	ND STI	RUCTL	JRAL.		
						S	
DO NOT PLACE SMOKE DETECTOR IN THIS AREA 4" 4" 4" 4" 4" 4" 4" 4" 4" 4" 4" 4" 4"	4" 12 TOP O DETEC ACCEP HERE <u>NOTES</u> 1. MOUN THIS I SHOW PLANS 2. SEE AI FOR SI NOTIF OF AN	F TOR TABLE 5: TING H DETAIL N OTH · RCHITE PECIAL Y ARCH Y CONI	EIGHT ARE T ERWIS COND HITECT FLICTS	S SHC YPICA E ON <sup></sup> AL ELE ITION IMME	OWN IN L UNLES THE VATIONS S. DIATELY	CONSTRUCTION DOCUMEN	R PARK - PHASE 1 ROELAND PARK, KANSAS
MOUNTED OPERABLE DEVICES BLE DEVICES SHALL BE LOCATED 48 ON OF DEVICE. WALL MOUNTED TELE E MOUNTED UP TO 54" AFF. WALL M DE, BUT ARE NOT LIMITED TO THE FO JSTABLE THERMOSTATS, TEMPERATU ENSORS	3" AFF. TO <sup>-</sup> EPHONES V OUNTED O OLLOWING JRE SENSC	THE TC VITH S PERAB : RS, HU	)P OF C IDE AC LE DEV JMIDIT	)PERA CESSI /ICES Y SEN	BLE BILITY SORS,	SCHEDU DETAILS MECH./E	LES & - LEC.
H BUTTONS ER CONTROL OR "CALL" DEVICES							
R/COMMUNICATION DEVICES:							
TS SHALL BE LOCATED 16" AFF TO T ABOVE COUNTER DEVICES (PLAN DE ED AT 48" TO THE TOP OF THE BOX, CASEWORK. WHEN ABOVE CASEWO BACKSPLASH OF COUNTER TOP ME WARCHITECTURAL DETAILS.	HE BOTTOI ESIGNATIO MOUNTED DRK LOCAT ASURED TC	M OF T N 👎 VERTI E THES O THE E	HE BO) Table CALLY SE DEV: BOTTON	X. HALL E UNLES ICES A M OF E	BE SS AT 2" DEVICE.	DESIGNER / DRAFTER DATE 01-15-2020 PROJECT NUMBER BOOK AND PAGE	

LAMP

RYNEARSON

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# WALL MOUNTED DEVICES: MOUNTING HEIGHTS

![](_page_36_Picture_27.jpeg)

MISSOURI AUTHORIZATION NUMBER

# PART 1 - GENERAL REQUIREMENTS - HVAC, PLUMBING, AND FIRE PROTECTION

# 1.1 SUMMARY OF WORK

- A. THE CONTRACT DOCUMENTS REQUIRE THE FURNISHING AND INSTALLING OF COMPLETE FUNCTIONING MECHANICAL SYSTEMS, AND EACH ELEMENT THEREOF, AS SPECIFIED OR INDICATED IN THE CONTRACT DOCUMENTS OR REASONABLY INFERRED, TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION THE SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY, WHETHER OR NOT SPECIFICALLY CALLED FOR BY ITEM. ELEMENTS OF THE WORK INCLUDE MATERIALS, LABOR, SUPERVISION, SUPPLIES, EQUIPMENT, TRANSPORTATION, AND UTILITIES.
- B. SPECIFICATIONS AND DRAWINGS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN ONE SHALL BE AS BINDING AS IF CALLED FOR BY BOTH.
- C. ALL WORK PERFORMED UNDER THIS SECTION SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER BY EXPERIENCED MECHANICS OF THE PROPER TRADE.

# 1.2 COORDINATION, MEASUREMENTS AND LAYOUTS

- A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.
- B. THE CONTRACTOR SHALL EMPLOY A COMPETENT FOREMAN ON THE JOB TO SEE THAT WORK IS DONE IN ACCORDANCE WITH THE BEST PRACTICES AND IN A SATISFACTORY AND WORKMANLIKE MANNER. THE FOREMAN SHALL KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND SHALL EXECUTE HIS WORK IN SUCH A MANNER AS NOT TO INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.
- C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. WHERE LOCAL CONDITIONS NECESSITATE A REARRANGEMENT, THE CONTRACTOR SHALL PREPARE, AND SUBMIT FOR APPROVAL, DRAWINGS OF THE PROPOSED REARRANGEMENT. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH OFFSETS, FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSION.

# 1.3 PERMITS AND FEES

A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION, OTHER THAN THOSE DEPOSITS OR FEES WHICH ARE FULLY REFUNDABLE TO THE OWNER.

# 1.4 SUBMITTALS, MATERIALS AND EQUIPMENT

- A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE SPECIFIED HEREIN, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.
- B. AS SOON AS POSSIBLE AFTER THE AWARD OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT FOR REVIEW SIX COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT TO BE FURNISHED FOR THIS PROJECT. SUBMITTALS SHALL INCLUDE MANUFACTURER'S NAME, MODEL NUMBER, DESCRIPTIVE ENGINEERING DATA AND ALL NECESSARY INFORMATION AS TO FINISH, MATERIAL GAUGES AND ACCESSORIES. AFTER SUCH SHOP DRAWINGS ARE PROCESSED, THREE COPIES WILL BE RETURNED TO THE CONTRACTOR. THE CONTRACTOR SHALL, UPON RECEIPT OF REVIEWED SHOP DRAWINGS PROCEED WITH THE PROCUREMENT AND INSTALLATION OF SUCH EQUIPMENT.

# 1.5 CODES, LAWS, AND STANDARDS

A. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH ALL GOVERNING CODES, APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES OR STATUTES OF REGULATORY BODIES HAVING JURISDICTION. THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH SAID LAWS, REGULATIONS, ORDINANCES, STATUES OR CODES, WITHOUT INCREASED COST TO THE OWNER. ANY POINT IN QUESTION SHALL BE REFERRED TO THE ENGINEER FOR APPROVAL. WORK INDICATED ON THE DOCUMENTS THAT IS IN EXCESS OF CODE REQUIREMKNTS SHALL NOT BE REDUCED IN QUALITY AND/OR QUANTITY.

B. COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMETNS AFFECTED BY CONNECTIONS OF SERVICES.

# 1.6 RECORD DOCUMENTS

- A. THIS CONTRACTOR SHALL PREPARE A COMPLETE "AS-BUILT" SET OF DRAWINGS INCORPORATING ALL CHANGES MADE DURING CONSTRUCTION. LOCATION OF UNDERGROUND PIPING SHALL BE LOCATED BY DIMENSION FROM COLUMN LINES.
- B. THIS CONTRACTOR SHALL PREPARE AND SUBMIT TO THE OWNER'S REPRESENTATIVE FIVE BOUND SETS OF OPERATING AND MAINTENANCE MANUALS INCLUDING FINAL COPIES OF EQUIPMENT SHOP DRAWINGS, MANUFACTURER'S LITERATURE FOR ALL EQUIPMENT INSTALLED ON THE PROJECT SHOWING ALL DETAILS OF EQUIPMENT, REPLACEMENT PART DATA AND MAINTENANCE AND OPERATING INSTRUCTIONS. MANUALS SHALL INCLUDE COPIES OF ALL EQUIPMENT WARRANTIES.

# 1.7 GUARANTEES AND WARRANTIES

- A. THE CONTRACTOR SHALL GUARANTEE COMPLETE SYSTEM OPERATION AND THAT THE MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED WILL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS AND WILL GIVE SATISFACTORY SERVICE UNDER THE SPECIFIED OPERATING CONDITIONS. THE CONTRACTOR AGREES TO REPLACE, WITHOUT EXPENSE TO THE OWNER, ANY PART OF THE APPARATUS WHICH PROVES OR BECOMES DEFECTIVE WITHIN ONE YEAR AFTER THE SYSTEM IS ACCEPTED. NO EQUIPMENT WARRANTY OR GUARANTEE SHALL START UNTIL THE TIME OF BUILDING ACCEPTANCE.
- B. ALL WARRANTIES ISSUED BY EQUIPMENT MANUFACTURERS SHALL BE FILLED OUT IN THE OWNER'S NAME AND GIVEN TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF WORK PERFORMED UNDER THIS SECTION.

# 1.8 FINAL INSPECTION

A. AFTER COMPLETION OF THE ENTIRE PROJECT THE CONTRACTOR SHALL REQUEST FINAL INSPECTION OF THIS PROJECT IN WRITTEN FORM ADDRESSED TO THE ARCHITECT ALONG WITH A STATEMENT TO THE EFFECT THAT ALL INSTALLATIONS HAVE BEEN COMPLETED, CHECKED, ADJUSTED AND BALANCED IN ACCORDANCE WITH REQUIREMENTS OF THIS PROJECT. UPON RECEIPT OF WRITTEN NOTIFICATION OF COMPLETION AND REQUEST FOR FINAL INSPECTION THE ENGINEER WILL PERFORM A FINAL INSPECTION OF THIS WORK AND, IF ALL INSTALLATIONS ARE AS REPRESENTED BY THE CONTRACTOR, THE ENGINEER WILL SUBMIT WRITTEN RECOMMENDATION OF ACCEPTANCE.

# 1.9 CLEANING

- A. DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE WORK SHALL BE REMOVED TO KEEP THE PREMISES REASONABLE CLEAN AT ALL TIMES.
- B. AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED SURFACES AND EQUIPMENT, REMOVE ALL DIRT, DEBRIS, CRATING, CARTONS, ETC., AND LEAVE ALL INSTALLATIONS FINISHED AND READY FOR OPERATION.

# 1.10 OPENINGS AND SLEEVES

- A. ALL PIPING THROUGH EXTERIOR OR FOUNDATION WALLS SHALL PASS THROUGH SCHEDULE 40 GALVANIZED STEEL SLEEVES WHICH SHALL BE LARGE ENOUGH TO ALLOW FOR PIPE SEAL MATERIAL. SLEEVES IN NEW CONSTRUCTION SHALL HAVE A MINIMUM 2 INCH WATERSTOP IN THE CENTER OF THE SLEEVE. NO SLEEVES ARE PERMITTED THROUGH CONCRETE STRUCTURAL MEMBERS.
- 1. SPACE BETWEEN PIPE AND SLEEVE IN EXTERIOR UNDERGROOUND WALLS SHALL BE SEALED WITH LINK-SEAL, FLEXICRAFT OR METRAFLEX LINK STYLE PIPE SEALS.
- 2. IN ABOVE GRADE EXTERIOR WALLS PACK THE SPACE BETWEEN PIPE AND SLEEVE WITH MINERAL WOOL AND THEN COMPLETE SEAL WITH APPROVED CAULKING COMPOUND FLUSH WITH FINISHED SURFACE. PROVIDE PIPE COLLAR ON INTERIOR SIDE OF WALL.
- B. ALL PIPING THROUGH FLOORS SHALL BE PROVIDED WITH SCHEDULE 40 GALVANIZED STEEL PIPE SLEEVES, EXTENDING 1 INCH ABOVE THE FLOOR.
- C. FOR OPENINGS IN FLOORS, THE CAULKING SHALL BE APPLIED FROM THE UPPER SIDE TO A MINIMUM OF 3 INCH TOTAL DEPTH RECESSED 1/2 INCH BELOW THE FINISHED FLOOR. THIS 1/2 INCH RECESS SHALL THEN BE FILLED WITH SEALANT TO FLUSH WITH FINISHED FLOOR.

# 1.11 CUTTING AND PATCHING

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OF WALLS, FLOORS, CEILINGS AND ROOFS REQUIRED FOR PERFORMANCE OF HIS WORK.
- B. NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ARCHITECT.
- C. PATCH ALL OPENINGS TO MATCH ADJACENT CONSTRUCTION IN BOTH MATERIAL AND FINISH.

# 1.12 EXCAVATION AND BACKFILL

- A. ALL EXCAVATION AND BACKFILL REQUIRED FOR THE INSTALLATION OF THE WORK SHALL BE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR.
- B. NO EXCAVATION AND BACKFILL SHALL BE DONE WITHIN DRIP LINE OF TREES TO REMAIN. NO TREE SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE.
- C. CONTRACTOR SHALL PROVIDE PROTECTION FOR TREES WITHIN 15 FEET OF UTILITY EXCAVATION.
- D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL TRENCH AREAS AND MAINTAINING A DRY EXCAVATION. ANY DEWATERING OF TRENCHES/EXCAVATION SHALL BE PROVIDED PRIOR TO INSTALLING ANY MATERIAL.
- E. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ALL NECESSARY BARRICADES, FENCING, BRACING, SHEET PILING, SHORING, WARNING SIGNS, PUMPS, ETC., FOR THE PROTECTION OF WORKERS, GENERAL PUBLIC, AND PROPERTIES. EXCAVATION WORK SHALL COMPLY WITH ASA STANDARD A10.2 "SAFETY CODE FOR BUILDING CONSTRUCTION" AND AGC STANDARD "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" AND THE DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH (OSHA) STANDARDS.
- F. LOCATE EXISTING UNDERGROUND UTILITIES IN AREAS OF EXCAVATION WORK. SHOULD UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS.
- G. ALL TRENCHES SHALL BE UNIFORMLY GRADED AND BE FREE OF SOFT SPOTS AND STONE. PROVIDE A 4 INCH SAND BED.
- H. BACKFILL SHALL NOT BEGIN UNTIL INSTALLATION HAS BEEN TESTED AND INSPECTED. CONTRACTOR SHALL CONSULT WITH THE AUTHORITY HAVING JURISDICTION AND THE ARCHITECT/ENGINEER PRIOR TO BACKFILLING.
- 1. INITIAL BACKFILL SHALL BE SAND TO A POINT 6 INCHES ABOVE TOP OF INSTALLED WORK.
- 2. FINAL BACKFILL SHALL BE INSTALLED IN LAYERS NOT EXCEEDING 12 INCHES. FILL SHALL BE WELL TAMPED BEFORE ADDITIONAL BACKFILL MATERIAL IS PLACED. BACKFILL SHALL CONSIST OF EARTH OR SAND FREE OF STONE, BRICKS, OR FOREIGN MATTER.
- I. ALL EXCESS EARTH AND OTHER MATERIAL RESULTING FROM THE EXCAVATION SHALL BE REMOVED FROM SITE BY THE CONTRACTOR OR MAY BE PILED AT A LOCATION DESIGNATED AND APPROVED BY THE OWNER. ALL DEBRIS, ROCK AND TRASH SHALL NOT BE ALLOWED TO ACCUMULATE AND SHALL BE REMOVED FROM THE SITE. STREETS, ROADWAYS AND PRIVATE PROPERTY SHALL BE KEPT IN A CLEAN CONDITION.
- J. WHEN THE EXCAVATION IS WITHIN THE AREA WHERE FINISHED SITE WORK IS TO BE DONE UNDER THE GENERAL CONTRACT WORK, BACKFILL TO THE HEIGHT OF ROUGH GRADE. FINAL SURFACING WILL BE UNDER GENERAL CONTRACT WORK.
- K. WHEN THE EXCAVATION IS BEYOND THE AREA OF GENERAL CONSTRUCTION WORK, FINAL SURFACE AND ADJACENT DISTURBED AREAS SHALL BE RESTORED TO MATCH THE ORIGINAL CONDITION BY SODDING, SEEDING, ASPHALT PAVING, CONCRETE, ETC., AS REQUIRED. WORK SHALL CONFORM TO APPLICABLE SECTIONS OF THESE SPECIFICATIONS.
- L. WHEN THE EXCAVATION IS ON PUBLIC PROPERTY, RESTORATION OF SURFACE CONDITIONS SHALL MEET THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- M. WHEN SERVICES ARE TO BE RUN SIDE-BY-SIDE, A COMMON TRENCH MAY BE USED PROVIDING THE REQUIRED VERTICAL AND HORIZONTAL SEPARATION BETWEEN THE VARIOUS SERVICES ARE MAINTAINED AND PROVIDING THE METHODS OF BEDDING AND BACKFILL MEET THE APPROVAL OF THE ENGINEER. CONTRACTORS INVOLVED SHALL MAKE THEIR OWN AGREEMENT AS TO THE SHARING OF THE COST OF THE COMMON TRENCHING AND BACKFILL WORK.

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# PART 2 - HEATING, VENTILATING AND AIR CONDITIONING

# 2.1 GENERAL REQUIREMENTS

A. SEE PART 1 FOR GENERAL REQUIREMENTS.

# 2.2 BELT DRIVES AND GUARDS

- A. ALL BELT DRIVES SHALL BE OF THE MULTIPLE "V" TYPE, DAYTON, GATES OR EQUAL. STANDARD SLIDE RAILS OR OTHER MEANS OF BELT ADJUSTMENT SHALL BE PROVIDED FOR EACH MOTOR USED WITH A BELT DRIVE.
- B. REMOVABLE STEEL GUARDS WITH EXPANDED METAL SCREENS OF ACCEPTABLE DESIGN SHALL BE PROVIDED OVER ALL EXPOSED BELT DRIVES AND COUPLINGS.

# 2.3 FILTERS

A. FILTERS SHALL BE AS MANUFACTURED BY AMERICAN AIR FILTER, CAMFIL FARR OR CAMBRIDGE.

# 2.4 FLEXIBLE CONNECTORS

- A. THE CONTRACTOR SHALL INSTALL FLEXIBLE DUCT CONNECTIONS BETWEEN EACH PIECE OF EQUIPMENT HAVING A FAN, AND ITS SHEET METAL SUPPLY AND RETURN DUCTWORK CONNECTIONS, WHICH, WHEN COMPLETED SHALL BE AIRTIGHT.
- B. CONNECTORS SHALL PROVIDE A MINIMUM OF 2 INCHES BETWEEN METAL TO INSURE AGAINST TRANSMISSION OF VIBRATION FROM THE FAN UNIT TO THE DUCTWORK.

## 2.5 MOTORS AND STARTERS

- A. ALL ELECTRIC MOTORS SHALL BE FURNISHED FOR OPERATION ON ELECTRICAL SERVICES AS DESIGNATED AND SHALL HAVE STARTING TORQUE CHARACTERISTICS SUITABLE FOR THE EQUIPMENT SERVED. ANY CHANGES TO THE ELECTRICAL WIRING DUE TO EQUIPMENT BEING FURNISHED, OTHER THAN THAT SPECIFIED, IS THE RESPONSIBILITY OF THE CONTRACTOR.
- B. ACROSS-THE-LINE MANUAL STARTERS AND MAGNETIC STARTERS SHALL BE CUTLER-HAMMER PRODUCTS OR APPROVED EQUAL, UNLESS OTHERWISE SPECIFIED, OF SIZES REQUIRED FOR THE MOTOR HORSEPOWER AND PHASE SERVED. STARTERS LOCATED IN EQUIPMENT AREAS AND UNFINISHED SPACES MAY BE SURFACE MOUNTED TYPES WITH FUNCTIONS IDENTIFIED BY ENGRAVED PLASTIC PLATES.
- C. THE MECHANICAL CONTRACTOR SHALL FURNISH TO THE ELECTRICAL CONTRACTOR ALL STARTERS AND STARTER OVERLOADS, ALL NECESSARY WIRING DIAGRAMS AND INSTRUCTIONS TO FACILITATE THE INSTALLATION OF POWER AND CONTROL WIRING TO ALL EQUIPMENT.

## 2.6 SHEET METAL DUCTWORK

- A. SHEET METAL DUCTS AND CONNECTIONS SHALL BE CONSTRUCTED OF G90 GALVANIZED SHEETS OF MILD STEEL. THE DUCTS SHALL BE CONSTRUCTED TO THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) 2" W.G. PRESSURE CLASS STANDARDS. NO DUCT SHALL BE CONSTRUCTED WITH LESS THAN 24 GUAGE METAL. LOCAL CODES REQUIRING HEAVIER GAUGES SHALL GOVERN. ALL DUCTS SHALL BE SEALED TO SMACNA "B" CLASSIFICATION.
- B. DUCT SECTIONS SHALL BE JOINED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION AND REQUIREMENTS OF THE BUILDING CODE HAVING JURISDICTION.
- C. DUCT DIMENSIONS SHOWN ARE SHEET METAL DIMENSIONS AND DO NOT NEED TO BE ADJUSTED FOR INSULATION/LINING.
- D. CURVED ELBOWS SHALL BE CONSTRUCTED WITH INSIDE RADIUS NOT LESS THAN THE DUCT WIDTH IN THE SAME PLANE. SQUARE ELBOWS SHALL HAVE TURNING VANES. TURNING VANES SHALL BE DESIGNED IN ACCORDANCE WITH ASHRAE RECOMMENDATIONS. MANUFACTURED VANES SHALL BE BY TITUS OR APPROVED EQUAL.
- E. CROSSBREAK ALL DUCTWORK SURFACES OVER 18 INCHES IN WIDTH.
- F. FULL AREAS SHALL BE MAINTAINED IN TRANSITIONS WHERE A CHANGE IN THE CONFIGURATION OF THE DUCT OCCURS. ALL TAPERING JOINTS SHALL BE REDUCED GRADUALLY.
- G. JOINTS IN DUCTS SHALL BE MADE PRACTICALLY AIRTIGHT AND ANY OPEN CORNER SHALL BE NEATLY PATCHED AND SOLDERED TIGHT. DUCT TAPE WILL NOT BE ACCEPTED AS A JOINT PATCH. LOW PRESSURE SYSTEM DUCT LEAKAGE SHALL NOT EXCEED 2%.
- H. CONCEALED ROUND DUCTS SHALL BE CONSTRUCTED TO SMACNA 2" W.G. STANDARDS WITH GROOVED LONGITUDINAL SEAMS AND SLEEVED TYPE TRANSVERSE JOINTS.
- I. EXPOSED ROUND DUCTS SHALL BE CONSTRUCTED TO SMACNA 10" W.G. STANDARDS, SPIRAL LOCK SEAM DUCT AND FITTINGS.

# 2.7 FLEXIBLE DUCT

A. FLEXIBLE DUCTS SHALL BE UL181 CLASS THERMAFLEX M-KE, OR APPROVED EQUAL, SHALL NOT BE LONGER THAN 8 FEET AND SHALL NOT HAVE ANY AIR FLOW OBSTRUCTION.

# 2.8 DUCTWORK SUPPORTS

A. ALL HORIZONTAL DUCTS SHALL BE SUPPORTED WITH HANGERS SPACED NOT MORE THAN 8'-0" APART. HANGERS FOR DUCTS SMALLER THAN 31 INCHES SHALL CONSIST OF 22 GUAGE GALVANIZED STEEL STRAPS SECURELY FASTENED TO THE DUCT AND THE BUILDING CONSTRUCTION. DUCTS OVER 31 INCHES IN WIDTH SHALL BE HUNG WITH 1/4 INCH STEEL ANGLE ON THE BOTTOM OF THE DUCT SUPPORTED WITH STEEL RODS OF APPROPRIATE SIZE SECURELY FASTENED TO THE BUILDING STRUCTURE. ALL SUPPORTS TO MEET SMACNA STANDARDS.

# 2.9 GRILLES, REGISTERS, DIFFUSERS AND LOUVERS

- A. FURNISH AND INSTALL ALL GRILLES, REGISTERS, DIFFUSERS AND LOUVERS AS SHOWN AND DESCRIBED ON THE DRAWINGS OR COMPARABLE PRODUCTS OF TITUS OR PRICE.
- B. THE CONTRACTOR SHALL INFORM THE GENERAL CONTRACTOR OF THE REQUIREMENTS FOR OPENING SIZES AND FRAMING FOR ALL EQUIPMENT AND SHALL COORDINATE THE INSTALLATION OF ALL SUCH EQUIPMENT WITH THE STRUCTURAL REQUIREMENTS OF THIS PROJECT.

# 2.10 OPERATING AND MAINTENANCE MANUALS

A. THE EQUIPMENT MANUFACTURER SHALL FURNISH THE OWNER TWO BOUND SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL SYSTEMS.

# 2.11 START-UP/TESTING, ADJUSTING, BALANCING

- A. THE CONTRACTOR SHALL COMPLETE ALL EQUIPMENT INSTALLATIONS, CHECK ALL CONTROL WIRING, START UP AND ADJUST ALL EQUIPMENT AND PLACE ALL SYSTEMS IN OPERATION.
- B. AFTER COMPLETION AND START-UP OF ALL SYSTEMS THE CONTRACTOR SHALL ARRANGE FOR TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS.
- C. TESTING, ADJUSTING AND BALANCING OF ALL AIR SYSTEMS SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH NEBB OR SMACNA STANDARDS.
- D. UPON COMPLETION OF TESTING, ADJUSTING AND BALANCING, A COMPLETE REPORT OF ALL FINDINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE OF THIS PROJECT. THREE COPIES OF THE REPORT SHALL BE PROVIDED.

# 2.12 CURBS

- A. CURBS FOR EXHAUSTERS AND DUCTWORK THROUGH ROOF SHALL BE PATE TYPE PC AS REQUIRED BY ROOF CONSTRUCTION, OR COMPARABLE THYCURB PRODUCTS OF THE THYBAR CORP. ALL CURBS AND SUPPORTS SHALL BE CONSTRUCTED AS REQUIRED TO COMPENSATE FOR SLOPES OF THE ROOF STRUCTURE TO PROVIDE LEVEL SUPPORT OF EQUIPMENT. CURB HEIGHTS AT THE HIGH POINTS OF THE BUILDING STRUCTURE SHALL NOT BE LESS THAN 14 INCHES.
- B. CURBS FOR ROOF MOUNTED HEATING, VENTILATING AND AIR CONDITIONING UNITS SHALL BE PROVIDED BY THE EQUIPMENT MANUFACTURER AND SHALL BE DESIGNED TO COMPENSATE FOR SLOPES OF STRUCTURAL STEEL TO PROVIDE LEVEL SUPPORT OF EQUIPMENT. CURBS SHALL BE INSULATED TYPE WITH 1-1/2 INCH THICK INSULATION AND A MINIMUM DENSITY OF 3 POUNDS.

# 2.13 EXHAUST FANS

- A. EXHAUST FANS SHALL BE AS SHOWN ON THE DRAWINGS OR COMPARABLE PRODUCTS OF GREENHECK, COOK, OR CARNES.
- B. EACH EXHAUSTER SHALL BE PROVIDED WITH A DISCONNECT SWITCH, BACKDRAFT DAMPER AND BIRDSCREEN.
- C. ROOF MOUNTED EXHAUST FANS SHALL BE PROVIDED WITH CURBS AS DESCRIBED ABOVE.
- D. REFER TO PARAGRAPH TITLED "CURBS" IN THIS SECTION OF THE SPECIFICATION.

# 2.14 PAINTING: (SEE ARCHITECTURAL SECTION "PAINTING")

- A. PAINTING, EXCEPT AS SPECIFIED HEREIN, SHALL BE DONE BY OTHERS.
- B. EQUIPMENT WHICH HAS DAMAGED FINISH SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY FINISH.
- C. ALL EXPOSED FERROUS METAL FURNISHED UNDER THIS CONTRACT, SUCH AS HANGERS, STRUTS, STRUCTURAL STEEL, ETC., SHALL BE GIVEN ONE COAT OF TNEMEC GRAY PRIMER.

<b>DAMP</b> <b>POOL STATE LINE RD., STE. 200</b> KANSAS CITY, MO 64114 816.361.0440 LampRynearson.com		
25501 west valley parkway, suite 200 olathe, ks 66061 phone 913.345.2127 fax 913.345.0617 project number 1919200		
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CONSTRUCTION DOCUMENTS	R PARK - PHASE 1 ROELAND PARK, KANSAS	
SPECIFICATIONS - MECH./ELEC.		
REVISIONS		
DESIGNER / DRAFTER		
 DATE 01-15-2020		
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# PART 3 - PLUMBING

- 3.1 GENERAL REQUIREMENTS
- A. SEE PART 1 FOR GENERAL REQUIREMENTS.

# 3.2 TRAPS

- A. ALL FLOOR DRAINS AND FIXTURES WITH WASTE CONNECTIONS SHALL BE SEPARATELY TRAPPED WITH A WATER SEALED TRAP PLACED AS CLOSE TO THE FIXTURE OR DRAIN AS POSSIBLE. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRAPS REQUIRED INCLUDING TRAPS NOT FURNISHED IN COMBINATION WITH FIXTURES AND EQUIPMENT. ALL EXPOSED TRAPS IN FINISHED SPACES SHALL BE CHROMIUM PLATED BRASS. PROVIDE DEEP SEAL TRAPS AND RUNNING TRAPS WHERE REQUIRED.
- B. IN LIEU OF DEEP SEAT TRAPS, FLOOR DRAINS CAN BE PROVIDED WITH PROSET SYSTEMS TRAP GUARD OR EQUAL.

# 3.3 PIPING INSTALLATION

- A. ENDS OF PIPE SHALL BE REAMED AND ALL BURRS REMOVED BEFORE INSTALLATION. PIPING SHALL BE CUT ACCURATELY TO MEASUREMENTS TAKEN ON THE JOB AND SHALL BE INSTALLED WITH AMPLE CLEARANCE FOR INSTALLATION OF COVERINGS.
- B. PIPING PASSING THROUGH WALLS OR FLOOR SHALL BE RUN FREE, USING PIPE SLEEVES AND SHALL NOT BE GROUTED IN PLACE. SLEEVES FOR PIPING TO BE INSULATED SHALL BE SIZED TO ALLOW FOR INSULATION THICKNESS. PIPING SHALL BE INSTALLED CONCEALED IN FINISHED ROOMS AND WHEREVER POSSIBLE. EXPOSED PIPES, WHERE PASSING THROUGH FLOORS, FINISHED WALL, OR FINISHED CEILINGS SHALL BE FITTED WITH CHROMIUM PLATED ESCUTCHEON PLATES. PLATES SHALL BE LARGE ENOUGH TO COMPLETELY CLOSE THE HOLES AROUND THE PIPES AND SHALL BE ROUND, NOT LESS THAN 1-1/2" LARGER THAN THE DIAMETER OF THE PIPE. PLATES SHALL BE SECURELY FASTENED IN PLACE.
- C. AT LEAST ONE PIPE UNION SHALL BE INSTALLED ADJACENT TO ALL VALVES THAT ARE SCREWED. HOT AND COLD SUPPLIES TO EACH FIXTURE AND WATER HEATER SHALL BE VALVED SEPARATELY AT THE FIXTURE. ALL SUPPLY PIPES TERMINATING AT VALVES OR FIXTURES SHALL BE PROVIDED WITH A WATER HAMMER ARRESTOR OF SUFFICIENT CAPACITY TO PREVENT WATER HAMMER.
- D. ALL HOT AND COLD WATER BRANCH LINES SHALL BE VALVED IN AN ACCESSIBLE LOCATION.
- E. ALL HOT AND COLD WATER PIPING SHALL BE ARRANGED TO DRAIN THE LOWEST POINT AND DRAIN VALVES WITH HOSE THREADS SHALL BE PROVIDED SO THAT THE ENTIRE SYSTEM CAN BE EMPTIED.

# 3.4 PIPING JOINTS

- A. THREADED JOINTS SHALL BE CUT FULL AND CLEAN, WITH NOT MORE THAN THREE THREADS EXPOSED BEYOND FITTINGS. JOINTS SHALL BE MADE UP TIGHT WITH GRAPHITE BASE PIPE JOINT COMPOUND APPLIED TO MALE THREADS ONLY. EXPOSED THREADS OF FERROUS PIPE SHALL BE PAINTED WITH ACID-RESISTING PAINT AFTER PIPING HAS BEEN TESTED AND PROVEN TIGHT. NO CAULKING, LAMP WICK OR OTHER MATERIAL WILL BE ALLOWED FOR CORRECTION OF DEFECTIVE JOINTS.
- B. SWEAT OR SOLDERED JOINTS IN COPPER WATER PIPING SHALL BE MADE BY THE APPROPRIATE USE OF APPROVED BRASS WATER FITTINGS PROPERLY SWEATED OR SOLDERED TOGETHER. FLARED JOINTS WHERE SPECIFIED FOR SOFT COPPER TUBING SHALL BE MADE WITH FITTINGS MEETING APPROVED STANDARDS. SURFACES TO BE SOLDERED OR SWEAT SHALL BE CLEANED BRIGHT, PROPERLY FLUXED WITH APPROVED NONCORROSIVE PASTE TYPE FLUX AND MADE WITH 95-5 OR 94-6 SOLDER. THE USE OF SELF-CLEANING FLUXES, 50-50 SOLDER OR PASTE TYPE SOLDER IS PROHIBITED. FLARED JOINTS SHALL BE MADE BY EXPANDING THE TUBE WITH A PROPER FLARING TOOL. ALL TUBES SHALL BE PROPERLY REAMED.
- C. JOINTS IN BELL AND SPIGOT CAST IRON SOIL PIPE SHALL BE OF SOFT PIG LEAD AND OAKUM WITH LEAD NOT LESS THAN 1" DEEP, AND INSTALLED IN ONE POUR OR TYLER TY-SEAL GASKETS UNDERGROUND ONLY.
- D. JOINTS FOR NO-HUB PIPE SHALL BE NEOPRENE WITH STAINLESS STEEL BANDS.
- E. JOINTS FOR PLASTIC PIPE, WHEN PERMITTED, SHALL BE SOLVENT WELDED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS.

# 3.5 DOMESTIC HOT AND COLD WATER PIPING

- A. ALL DOMESTIC HOT AND COLD WATER PIPING WITHIN THE BUILDING SHALL BE COPPER. UNDERGROUND WATER SERVICE OUTSIDE OF THE BUILDING MAY BE TYPE "K" SOFT TEMPER COPPER OR DUCTILE IRON OR CAST IRON PIPE WITH SUPER BELL-TITE, MECHANICAL OR FLANGED JOINTS.
- B. COPPER PIPING INSTALLED UNDERGROUND SHALL BE SOFT TEMPER TYPE "K" AND INSTALLED WITHOUT JOINTS.
- C. ALL OTHER COPPER PIPING SHALL BE HARD TEMPER TYPE "L". ALL COPPER PIPING SHALL CONFORM TO ASTM-B-88 REQUIREMENTS. SERVICE PIPING OF CAST IRON OF DUCTILE IRON PIPE SHALL CONFORM TO USASI, AWWA AND FEDERAL SPECIFICATIONS.
- D. FITTINGS FOR USE WITH TYPE "K" AND "L" COPPER PIPING SHALL BE WROUGHT COPPER SOLDER-JOINT. UNIONS SHALL BE GROUND JOINT TYPE AND SHALL BE INSTALLED WHERE NECESSARY TO PROVIDE EASE OF DISCONNECTION OF THE PIPING SYSTEM. PRESS FITTINGS FOR COPPER WATER PIPING ARE ACCEPTABLE WHERE PERMITTED BY GOVERNING CODES.
- E. WHEN A CONNECTION BETWEEN COPPER PIPE AND FERROUS PIPE IS NECESSARY, SAID CONNECTION SHALL BE MADE BY USING BRASS CONVERTER FITTING.
- F. DRAINS INDICATED ON THE DRAWINGS AND AT LOW POINTS IN CONNECTION WITH THE HOT AND COLD WATER DISTRIBUTION SYSTEM SHALL CONSIST OF 1/2" FAUCET WITH HOSE THREADS. DRAINS SHALL BE INSTALLED AT LOW POINTS IN THE HOT AND COLD WATER PIPING AND ALL PIPING SHALL GRADE TO DRAIN.

# 3.6 VALVES FOR DOMESTIC WATER

- A. FOR PIPING 1/2" 2": MILWAUKEE BA-150 BALL VALE, BRONZE, TEFLON SEATS AND PACKING, 400 LBS W.O.G., SOLDER END.
- B. FOR PIPING 2-1/2" AND LARGER: MILWAUKEE ML224E BUTTERFLY VALVE, FULL LUG BODY, EPDM SEATS, STAINLESS STEEL DISC, LEVER OPERATOR.

# 3.7 CROSS CONNECTIONS AND INTERCONNECTIONS

A. NO INSTALLATION SHALL BE MADE OF PLUMBING FIXTURE, DEVICE OR PIPING THAT WILL PROVIDE A CROSS CONNECTION OR INTERCONNECTION BETWEEN A DISTRIBUTING WATER SUPPLY FOR DRINKING OR DOMESTIC PURPOSES AND A POLLUTED SUPPLY SUCH AS A DRAINAGE SYSTEM OR A SOIL OR WASTE PIPE THAT WILL PERMIT OR MAKE POSSIBLE A BACKFLOW OF SEWAGE, POLLUTED WATER OR WASTE INTO THE WATER SUPPLY SYSTEM.

# 3.8 SOIL, WASTE, DRAIN AND VENT PIPING

- A. UNDERGROUND SOIL, WASTE, DRAIN AND VENT PIPE AND FITTINGS, THROUGHOUT THE BUILDING BELOW THE BASE SLAB TO THE LOCATIONS NOTED OUTSIDE OF THE BUILDING, SHALL BE COATED HUB-AND- SPIGOT SERVICE WEIGHT CAST IRON. SCHEDULE 40 PVC SOLID PLASTIC PIPE MAY BE USED WHERE PERMITTED BY GOVERNING CODES. NO-HUB PIPE WILL NOT BE PERMITTED UNDERGROUND.
- B. SOIL, WASTE, DRAIN, VENT PIPE, AND FITTINGS ABOVE GROUND INSIDE OF THE BUILDING SHALL BE SERVICE WEIGHT HUB-AND- SPIGOT OR NO-HUB CAST IRON PIPE. SCHEDULE 40 PVC SOLID PLASTIC PIPE MAY BE USED WHERE PERMITTED BY GOVERNING CODES. PVC PIPING RUN IN RETURN AIR PLENUM SPACE SHALL BE INSTALLED WITH A 1 HOUR RATED COVERING OVER ALL PIPE, FITTINGS AND VALVES.
- C. CHANGES IN PIPE SIZE ON SOIL, WASTE, AND DRAIN LINES SHALL BE MADE WITH REDUCING FITTINGS. CHANGES IN DIRECTION IN DRAINAGE PIPING SHALL BE MADE BY THE APPROPRIATE USE OF 45 DEGREE Y'S, LONG OR SHORT SWEEP QUARTER BENDS, SIXTH, EIGHTH, OR SIXTEENTH BENDS, OR BY A COMBINATION OF THESE OR EQUIVALENT FITTINGS. SINGLE AND DOUBLE SANITARY TEES AND SHORT QUARTER BENDS MAY BE USED IN DRAINAGE LINES ONLY WHERE THE DIRECTION OF FLOW IS FROM THE HORIZONTAL TO THE VERTICAL. QUARTER BENDS MAY BE USED IN SOIL AND WASTE LINES ON THE DISCHARGE FROM WATER CLOSETS IN SLAB ON GRADE AREAS.
- D. SEWER LINES SHALL BE LOCATED IN GENERAL AS SHOWN ON THE DRAWINGS. THE EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN SUCH A MANNER AS TO MAINTAIN PROPER CLEARANCES AND SUFFICIENT SLOPE TO INSURE DRAINAGE.
- E. HORIZONTAL SOIL, WASTE, AND DRAIN PIPES SHALL BE GIVEN A GRADE OF NOT LESS THAN 1/4" PER FOOT FOR SIZES UP TO 3" UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER. HORIZONTAL SOIL, WASTE, AND DRAIN PIPES SHALL BE GIVEN A GRADE OF NOT LESS THAN 1/8" PER FOOT FOR SIZES 4" AND LARGER WHEN FIRST APPROVED BY THE ADMINISTRATIVE AUTHORITY.
- F. VENT STACKS SHALL BE EXTENDED FULL SIZE THROUGH THE ROOF AND FLASHED WITH 4 POUND LEAD SHEETS TURNED DOWN INTO THE STACK AT LEAST 2" AND EXTENDED 12" IN ALL DIRECTIONS FROM THE PIPE AT THE ROOF LINE. VENTS THROUGH ROOF SHALL NOT BE LESS THAN 3". PVC PIPING SHALL NOT BE USED FOR VENT PIPING THROUGH THE ROOF.
- G. WHERE APPLICABLE FOR THE ROOFING SYSTEM USED, PROVIDE FLASHING VIA PLEATED EPDM CONE IN LIEU OF LEAD.
- H. VENTS SHALL BE AIR AND WATER TIGHT.
- I. VENT CONNECTIONS SHALL BE INSTALLED ON ALL FIXTURES AND EQUIPMENT CONNECTED TO SOIL AND WASTE SYSTEMS AND ALL FLOOR DRAINS SHALL BE VENTED OR CONNECTED TO A VENTED LINE AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY CODE.
- J. ALL VENT STACKS IN OR AT OUTSIDE WALLS SHALL BE OFFSET 1'-6" MINIMUM FROM OUTSIDE WALLS BEFORE GOING THROUGH THE ROOF, TO FACILITATE FLASHING.
- K. RISERS SHALL BE INSTALLED ABSOLUTELY PLUMB AND STRAIGHT. BRANCHES SHALL BE RUN IN STRAIGHT LINES AND PITCH UNIFORMLY TO MAINS.
- L. RISERS, BRANCHES AND MAINS SHALL BE CONCEALED IN THE CONSTRUCTION EXCEPT WHERE SHOWN OTHERWISE. BRANCHES FOR CLOSETS SHALL BE FINISHED AT THE WALL LINE WITH PROPER FLANGE TO RECEIVE THE FIXTURE WHEN SET, AND THEY SHALL BE TRUE AND LEVEL SO THAT CLOSET BASE WILL HAVE FULL BEARING ON THE WALL.
- M. ALL SOIL AND VENT STACKS SHALL OFFSET WHERE REQUIRED TO MISS OBSTRUCTIONS AND AS REQUIRED TO CLEAR FLOOR BEAMS AND SPANDREL BEAMS AT FLOOR LINES AND HUG WALL CONSTRUCTION ABOVE FLOOR.
- N. PROHIBITED FITTINGS. THE DRILLING AND TAPPING OF BUILDING DRAINS, SOIL, WASTE OR VENT PIPE AND THE USE OF SADDLE HUBS OR BANDS IS PROHIBITED. ANY FITTING OR CONNECTION WHICH HAS AN ENLARGEMENT CHAMBER OR RECESS WITH A LEDGE, SHOULDER OR REDUCTION OF THE PIPE AREA THAT OFFERS AN OBSTRUCTION TO THE FLOW IS PROHIBITED.
- O. PROHIBITED CONNECTIONS. NO FIXTURES, DEVICES OR CONSTRUCTION SHALL BE INSTALLED WHICH WOULD ALLOW A BACKFLOW CONNECTION BETWEEN A DISTRIBUTION SYSTEM OF WATER FOR DRINKING AND DOMESTIC PURPOSES TO THE DRAINAGE SYSTEM, SOIL OR WASTE PIPING SO AS TO PERMIT OR MAKE POSSIBLE THE BACKFLOW OF SEWAGE OR WASTE INTO THE WATER SYSTEM.

# 3.9 INSULATION

- A. ALL COLD WATER PIPING SHALL BE INSULATED WITH CERTAIN-TEED 1/2" THICK GLASS FIBER PIPE INSULATION IN MOLDED SECTIONS WITH FACTORY APPLIED ALL SERVICE VAPOR BARRIER JACKET OR APPROVED EQUAL. THE END JOINT STRIPS AND OVERLAP SEAMS SHALL BE SEALED WITH A VAPOR BARRIER MASTIC AND STAPLED WITH OUTWARD CLINCHING STAPLES SPACED NOT TO EXCEED 4" CENTERS. STAPLES AND SEAMS SHALL BE SEALED WITH A COAT OF VAPOR BARRIER MASTIC. JOINTS SHALL BE COVERED BY JOINT TAPE.
- B. ALL DOMESTIC HOT WATER PIPING SHALL BE INSULATED WITH 1" THICK CERTAIN-TEED GLASS FIBER PIPE INSULATION IN MOLDED SECTIONS WITH FACTORY APPLIED ALL SERVICE JACKET OR APPROVED EQUAL. THIS INSULATION SHALL BE CLOSELY BUTTED TOGETHER AND SECURED BY JOINT TAPE MATCHING THE INSULATION COVER.
- C. ALL PIPING SURFACES TO BE INSULATED SHALL BE CLEAN AND DRY AND PIPING SHALL HAVE BEEN TESTED AND APPROVED BEFORE THE INSULATION IS APPLIED.
- D. ALL VALVES, FITTINGS AND FLANGES SHALL BE INSULATED WITH CERTAIN-TEED GLASS FIBER PIPE INSULATION, OR APPROVED EQUAL. INSULATION SHALL BE SECURELY HELD IN PLACE AND COVERED WITH ZESTON PRE-MOLDED PVC FITTING COVERS. FITTING COVERS MAY BE PROVIDED WITH FIBERGLASS INSULATION INSERTS.
- E. HORIZONTAL ROOF DRAIN PIPING AND ROOF DRAIN BODIES SHALL BE INSULATED WITH 1" THICK CERTAIN-TEED GLASS FIBER PIPE INSULATION IN MOLDED SECTIONS WITH FACTORY APPLIED ALL SERVICE JACKET OR APPROVED EQUAL. THIS INSULATION SHALL BE CLOSELY BUTTED TOGETHER AND SECURED BY PASTING THE CANVAS LAP.
- F. ALL PIPE INSULATION SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER BY AN INSULATION CONTRACTOR REGULARLY ENGAGED IN INSULATION WORK.
- G. PROVIDE HEAVY DENSITY RIGID FOAM INSERTS AT ALL HANGER LOCATIONS ON LINES 2" AND LARGER TO BE INSULATED, UNLESS OTHERWISE NOTED OR SPECIFIED.

# 3.10 WATER HAMMER ARRESTORS

A. WATER HAMMER ARRESTORS SHALL BE PROVIDED FOR ALL QUICK CLOSING VALVES INCLUDING BUT NOT LIMITED TO DRINKING FOUNTAINS, DISHWASHERS, FAUCETS, FLUSHOMETER VALVES, ICE MAKERS, SELF-CLOSING VALVES, SPRING LOADED VALVES, AND WASHING MACHINES AND AS REQUIRED BY THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.

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- B. WATER HAMMER ARRESTORS SHALL BE INSTALLED PER MANUFACTURES SPECIFICATIONS AND SHALL CONFORM TO ASSE 1010 AND PER STANDARD PDI-WH-201.
- C. WATER HAMMER ARRESTOR SHALL BE SIOUX CHIEF MODEL OR APPROVED EQUAL. AIR CHAMBERS ARE NOT PERMITTED.

# 3.11 PIPE HANGERS AND SUPPORTS

- A. ALL NON-INSULATED COPPER PIPING SHALL BE SUPPORTED BY ANVIL FIGURE CT65 COPPER PLATED CARBON STEEL HANGERS.
- B. NON-INSULATED STEEL PIPING 2" AND SMALLER SHALL BE SUPPORTED BY ANVIL FIGURE 108 SPLIT PIPE RING HANGER WITH FIGURE 114 TURNBUCKLE ADJUSTER. NON-INSULATED STEEL PIPING 2-1/2" AND LARGER SHALL BE SUPPORTED BY ANVIL 260 HANGERS WITH TURNBUCKLE ADJUSTERS.
- C. ALL CAST IRON PIPE SHALL BE SUPPORTED WITH ANVIL FIGURE 260 CLEVIS HANGERS WITH TURNBUCKLE ADJUSTERS.
- D. ALL SCHEDULE 40 SOLID PLASTIC PVC PIPING SHALL BE SUPPORTED WITH ANVIL FIGURE 260 ADJUSTABLE CLEVIS HANGERS WITH #168 SHIELD.
- E. ALL INSULATED PIPING SHALL BE PROVIDED WITH ANVIL FIGURE 260 ADJUSTABLE CLEVIS HANGER WITH #168 SHIELD. HANGER SHALL BE INSTALLED EXTERIOR TO INSULATION UNLESS OTHERWISE NOTED OR SPECIFIED.
- F. ALL HANGERS SHALL UTILIZE THREADED RODS. NO PERFORATED STRAP IRON HANGERS OR WIRE HANGERS WILL BE ALLOWED.
- G. HANGERS AND SUPPORTS SHALL BE SPACES AS FOLLOWS:
- 1. COPPER PIPE: 1-1/4" AND SMALLER 6 FEET, 1-1/2" AND LARGER 10 FEET.
- 2. STEEL PIPE: 1" AND SMALLER 8 FEET, 1-1/4" AND LARGER 10 FEET.
- CAST IRON PIPE: ALL SIZES 5 FEET. (10 FEET WITH 10' LENGHTS OF PIPE. MINIMUM ONE HANGER AT EACH JOINT.)
   DUO DIDE: 1 FEET
- 4. PVC PIPE: 4 FEET.
- H. PROVIDE ANVIL FIGURE CT-121 RISER CLAMP FOR COPPER PIPING UP THROUGH 4". PROVIDE VERTICAL SUPPORT EVERY 10 FEET.
- I. STEEL AND CAST IRON PIPE PROVIDE ANVIL FIGURE 261 RISER CLAMP FOR PIPING 1-1/2" AND SMALLER AND FIGURE 40 RISER CLAMP FOR PIPING ABOVE 2". PROVIDE VERTICAL SUPPORT EVERY 15 FEET.

# 3.12 TESTING

- A. ALL PLUMBING SYSTEMS INSTALLED UNDER THIS SECTION OF THESE SPECIFICATIONS SHALL BE TESTED AND APPROVED AS HEREIN DESCRIBED AND AS REQUIRED BY THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.
- B. THE NEW DRAINAGE AND VENT SYSTEM SHALL BE TESTED BY PLUGGING ALL OPENINGS WITH TEST PLUGS, EXCEPT THOSE AT THE TOPS OF STACKS, AND FILLING THE SYSTEM WITH WATER. TEST RESULTS WILL BE SATISFACTORY IF THE WATER LEVEL REMAINS STATIONARY FOR NOT LESS THAN ONE HOUR WHEN ALL PARTS OF THE SYSTEM ARE SUBJECTED TO A PRESSURE OF AT LEAST 10 FEET OF WATER. IF LEAKS DEVELOP, THEY SHALL BE REMEDIED AND THE TEST REPEATED AFTER THE SYSTEM IS MADE TIGHT.
- C. THE WATER SYSTEM TEST PROCEDURE SHALL CONSIST OF CHARGING THE ENTIRE SYSTEM TO OPERATING PRESSURE AND THEN ISOLATING THE SYSTEM FROM ITS SOURCE. THE SYSTEM SHALL REMAIN CLOSED FOR A PERIOD OF 24 HOURS WITH NO FIXTURE BEING USED. THE PRESSURE DIFFERENTIAL FOR THIS 24-HOUR PERIOD SHALL NOT EXCEED 5 PSIG.
- D. THE INSPECTION AUTHORITY HAVING JURISDICTION AND THE ARCHITECT SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO PERFORMANCE OF ALL TESTS SO THAT THE TESTS MAY BE WITNESSED IF DEEMED NECESSARY.
- E. ALL PLUMBING FIXTURES AND ACCESSORIES SHALL BE TESTED, ADJUSTED AND MADE FREE OF LEAKS.
- F. NATURAL GAS SYSTEMS SHALL BE TESTED WITH COMPRESSED AIR PER THE LOCAL PLUMBING CODE REQUIREMENTS.

# 3.13 WATER SYSTEM FLUSHING AND STERILIZATION

- A. IMMEDIATELY UPON COMPLETION OF THE NEW WATER DISTRIBUTION SYSTEM AND PRIOR TO PLACING THIS SYSTEM IN SERVICE, THE ENTIRE NEW SYSTEM SHALL BE FLUSHED AND STERILIZED.
- B. THIS SYSTEM SHALL BE FILLED WITH WATER SLOWLY AND CAREFULLY SO THAT AIR MAY READILY ESCAPE THROUGH OPEN DRAINS AND FIXTURE VALVES. ALL DRAINS AND FIXTURE VALVES SHALL BE OPENED, STARTING WITH VALVES NEAREST THE WATER SERVICE ENTRY, AND WATER RUN UNTIL IT HAS RUN CLEAR FROM ALL OUTLETS FOR NOT LESS THAN 10 MINUTES.
- C. AFTER THIS ENTIRE WATER SYSTEM HAS BEEN THOROUGHLY FLUSHED, THE CONTRACTOR SHALL STERILIZE THE ENTIRE SYSTEM AS REQUIRED BY LOCAL CODES AND THE STATE BOARD OF HEALTH. IN THE EVENT THAT LOCAL CODES OR THE STATE BOARD OF HEALTH DO NOT HAVE SPECIFIC REQUIREMENTS FOR WATER SYSTEM STERILIZATION, THE FOLLOWING PROCEDURE SHALL BE EMPLOYED:
- 1. A CHLORINE WATER MIXTURE OF A CHLORINE BEARING COMPOUND SUCH AS HIGH TEST CALCIUM HYPOCHLORITE OR SODIUM HYPOCHLORITE SHALL BE INTRODUCED INTO THE SYSTEM AT THE BEGINNING OF THE BUILDING WATER SERVICE.
- 2. IF A CHLORINE GAS WATER MIXTURE IS USED, IT SHALL BE FED INTO THE SYSTEM BY MEANS OF A SOLUTION FEED CHLORINA TING DEVICE WHICH MUST BE EQUIPPED WITH MEANS FOR PREVENTING THE BACKFLOW OF WATER INTO THE CHLORINE CYLINDER.
- 3. IF CHLORINE BEARING COMPOUND SUCH AS A HIGH TEST CALCIUM HYPOCHLORITE OR SODIUM HYPOCHLORITE IS USED, THE POWDER SHALL FIRST BE MADE INTO A PASTE AND THEN THINNED TO APPROXIMATELY 1% CHLORINE SOLUTION (10,000 PPM).
- 4. THE RATE OF CHLORINE MIXTURES FLOW INTO THE SYSTEM SHALL BE PROPORTIONED TO THE RATE OF WATER ENTERING THE PIPE SO THAT A CHLORINE DOSE OF NOT LESS THAN 10 PPM WILL BE PRODUCED THROUGHOUT THE SYSTEM. THIS SOLUTION SHALL BE RETAINED IN THE SYSTEM FOR NOT LESS THAN 24 HOURS AND SHALL PRODUCE NOT LESS THAN 10 PPM OF CHLORINE AT THE END OF THE RETENTION PERIOD.
- 5. THE SYSTEM BEING STERILIZED SHALL BE ISOLATED FROM THE WATER SUPPLY SOURCE SO AS TO POSITIVELY ASSURE THAT TREATED WATER WILL NOT BACKFLOW INTO THE SUPPLY LINE. SYSTEM STERILIZATION SHALL BE PERFORMED IN COOPERATION WITH THE SERVING UTILITY AND SHALL COMPLY IN ALL RESPECTS WITH THEIR REQUIREMENTS.
- 6. AFTER STERILIZATION IS COMPLETED THE ENTIRE SYSTEM SHALL BE FLUSHED AND TESTED. TEST RESULTS SHALL BE SUBMITTED TO THE AUTHORITIES HAVING JURISDICTION FOR REVIEW PRIOR TO ACCEPTANCE OF THIS PROJECT.

# 3.14 ACCESS DOORS

- A. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE ARCHITECTURAL PLANS/ SPECIFICATIONS AND ADVISING THE GENERAL CONTRACTOR PRIOR TO BIDDING OF THE NEED FOR ACCESS DOORS IN SHEETROCK OR PLASTERED CEILINGS AND WALLS AND ALL OTHER LOCATIONS WHERE ACCESS IS REQUIRED FOR PLUMBING COMPONENTS.
- B. ACCESS DOORS SHALL BE FLUSH-MOUNTED OF A STYLE SPECIFICALLY SUITED FOR THE TYPE OF CONSTRUCTION IN WHICH THEY ARE TO BE USED, AND SIZES AND COLORS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. IN AREAS WHERE THERE ARE REMOVABLE CEILINGS, ACCESS DOORS MAY BE OMITTED, PROVIDED CEILING PANELS USED FOR ACCESS ARE CLEARLY MARKED. THE TYPE OF ACCESS DOOR USED SHALL BE MILCOR, OR AN APPROVED EQUAL.
- C. ACCESS DOORS SHALL BE FURNISHED BY THE PLUMBING CONTRACTOR FOR INSTALLATION BY THE GENERAL CONTRACTOR.
- D. IN THE EVENT THAT THE PLUMBING CONTRACTOR FAILS TO ADVISE THE GENERAL CONTRACTOR OF REQUIRED ACCESS DOORS PRIOR TO BIDDING, THE COST TO FURNISH AND INSTALL ACCESS DOORS SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR.

# 3.15 PLUMBING FIXTURES

- A. ALL FIXTURES SHOWN OR SCHEDULED ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED, SET FIRM AND TRUE, CONNECTED TO ALL REQUIRED PIPING SERVICES, THOROUGHLY CLEANED, AND LEFT READY FOR USE.
- B. ALL EXPOSED FITTINGS AND PIPING AT THE FIXTURES SHALL BE CHROME PLATED. SUPPLY PIPING SHALL BE VALVED AT EACH FIXTURE.
- C. ALL CHINA FIXTURES SHALL BE NEW, OF THE BEST GRADE VITREOUS WARE, WITHOUT PIT HOLES OR BLEMISHES, AND THE OUTLINES SHALL BE GENERALLY TRUE. ALL FIXTURES OF THE SAME TYPE SHALL BE OF ONE MANUFACTURER THROUGHOUT THE ENTIRE INSTALLATION. THE ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT WHICH, IN HIS OPINION, IS FAULTY. ALL FIXTURES AND FLANGES ON SOIL PIPE SHALL BE MADE ABSOLUTELY GASTIGHT AND WATERTIGHT. RUBBER GASKETS OR PUTTY WILL NOT BE PERMITTED FOR THIS CONNECTION. CLOSET BOLTS SHALL BE STAINLESS STEEL AND NOT LESS THAN 1/4" IN DIAMETER AND SHALL BE EQUIPPED WITH CHROMIUM PLATED NUTS AND WASHERS. FIXTURES WITH OUTLET FLANGES SHALL BE SET AT THE PROPER DISTANCE FROM FLOOR OR WALL TO MAKE A FIRST CLASS JOINT WITH THE CLOSET SETTING COMPOUND OR GASKET AND THE FIXTURES USED.
- D. PLUMBING FIXTURES SHALL BE AS SPECIFIED, OR EQUIVALENT PRODUCTS MANUFACTURED BY ELJER, CRANE, OR AMERICAN STANDARD. ALL WATER CLOSETS, LAVATORIES, URINALS AND SINKS SHALL BE PRODUCTS OF ONE MANUFACTURER. FIXTURES SHALL BE INSTALLED COMPLETE WITH ALL NECESSARY ACCESSORIES AND TRIM. INSTALLATION OF COUNTERTOP SINKS SHALL BE COORDINATED WITH THE COUNTERTOP SUPPLIER.
- E. DRAINS AND ACCESSORIES SHALL BE AS SPECIFIED OR EQUIVALENT PRODUCTS OF WADE, JAY R. SMITH, OR JOSAM.
- F. INSULATE EXPOSED LAVATORY "P" TRAP ON ADA LISTED FIXTURES WITH PLUMBEREX TRAP GEAR OR EQUAL.

# 3.16 PAINTING (SEE ARCHITECTURAL SECTION "PAINTING")

- A. PAINTING, EXCEPT AS SPECIFIED HEREIN, SHALL BE DONE BY OTHERS.
- B. EQUIPMENT WHICH HAS DAMAGED FINISH SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY FINISH.
- C. ALL EXPOSED FERROUS METAL FURNISHED UNDER THIS CONTRACT, SUCH AS HANGERS, STRUTS, STRUCTURAL STEEL, ETC. SHALL BE GIVEN ONE COAT OF TNEMEC GRAY PRIMER.

# 3.17 FIELD QUALITY CONTROL

- A. PERFORM THE FOLLOWING FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS:
- 1. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
- B. REPORT TEST RESULTS PROMPTLY AND IN WRITING TO ARCHITECT AND AUTHORITIES HAVING JURISDICTION.

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# PART 1 - GENERAL REQUIREMENTS - ELECTRICAL

# 1.1 SUMMARY OF WORK

- A. THE CONTRACT DOCUMENTS REQUIRE THE FURNISHING AND INSTALLING OF COMPLETE FUNCTIONING ELECTRICAL SYSTEMS. AND EACH ELEMENT THEREOF. AS SPECIFIED OR INDICATED IN THE CONTRACT DOCUMENTS OR REASONABLY INFERRED, TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION THE SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY, WHETHER OR NOT SPECIFICALLY CALLED FOR BY ITEM. ELEMENTS OF THE WORK INCLUDE MATERIALS, LABOR, SUPERVISION, SUPPLIES, EQUIPMENT, TRANSPORTATION, AND UTILITIES.
- B. SPECIFICATIONS AND DRAWINGS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN ONE SHALL BE AS BINDING AS IF CALLED FOR BY BOTH.
- C. ALL WORK PERFORMED UNDER THIS SECTION SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER BY EXPERIENCED MECHANICS OF THE PROPER TRADE.

# 1.2 COORDINATION, MEASUREMENTS AND LAYOUTS

- A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.
- B. THE CONTRACTOR SHALL EMPLOY A COMPETENT FOREMAN ON THE JOB TO SEE THAT WORK IS DONE IN ACCORDANCE WITH THE BEST PRACTICES AND IN A SATISFACTORY AND WORKMANLIKE MANNER. THE FOREMAN SHALL KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND SHALL EXECUTE HIS WORK IN SUCH A MANNER AS NOT TO INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.
- C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. WHERE LOCAL CONDITIONS NECESSITATE A REARRANGEMENT, THE CONTRACTOR SHALL PREPARE, AND SUBMIT FOR APPROVAL, DRAWINGS OF THE PROPOSED REARRANGEMENT. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH OFFSETS, FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSION.

# 1.3 PERMITS AND FEES

A. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION, OTHER THAN THOSE DEPOSITS OR FEES WHICH ARE FULLY REFUNDABLE TO THE OWNER.

# 1.4 SUBMITTALS, MATERIALS AND EQUIPMENT

- A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE SPECIFIED HEREIN, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.
- B. AS SOON AS POSSIBLE AFTER THE AWARD OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT FOR REVIEW ELECTRONIC COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT TO BE FURNISHED FOR THIS PROJECT. SUBMITTALS SHALL INCLUDE MANUFACTURER'S NAME, MODEL NUMBER, DESCRIPTIVE ENGINEERING DATA AND ALL NECESSARY INFORMATION AS TO FINISH, MATERIAL GAUGES AND ACCESSORIES. AFTER SUCH SHOP DRAWINGS ARE PROCESSED, ELECTRONIC COPIES WILL BE RETURNED TO THE CONTRACTOR. THE CONTRACTOR SHALL, UPON RECEIPT OF REVIEWED SHOP DRAWINGS PROCEED WITH THE PROCUREMENT AND INSTALLATION OF SUCH EQUIPMENT.

# 1.5 CODES, LAWS, AND STANDARDS

- A. ALL WORK SHALL BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, THE NATIONAL BOARD OF FIRE UNDERWRITERS, THE NATIONAL ELECTRICAL SAFETY CODE, AND ALL GOVERNING CODES, APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES OR STATUTES OF REGULATORY BODIES HAVING JURISDICTION. THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH SAID LAWS, REGULATIONS, ORDINANCES, STATUES OR CODES, WITHOUT INCREASED COST TO THE OWNER, ANY POINT IN QUESTION SHALL BE REFERRED TO THE ENGINEER FOR APPROVAL. WORK INDICATED ON THE DOCUMENTS THAT IS IN EXCESS OF CODE REQUIREMENTS SHALL NOT BE REDUCED IN QUALITY AND/OR QUANTITY.
- B. COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMETNS AFFECTED BY CONNECTIONS OF SERVICES.

# 1.6 RECORD DOCUMENTS

- A. THIS CONTRACTOR SHALL PREPARE A COMPLETE "AS-BUILT" SET OF DRAWINGS INCORPORATING ALL CHANGES MADE DURING CONSTRUCTION. LOCATION OF UNDERGROUND CONDUIT SHALL BE LOCATED BY DIMENSION FROM COLUMN LINES.
- B. THIS CONTRACTOR SHALL PREPARE AND SUBMIT TO THE OWNER'S REPRESENTATIVE FIVE BOUND SETS OF OPERATING AND MAINTENANCE MANUALS INCLUDING FINAL COPIES OF EQUIPMENT SHOP DRAWINGS, MANUFACTURER'S LITERATURE FOR ALL EQUIPMENT INSTALLED ON THE PROJECT SHOWING ALL DETAILS OF EQUIPMENT, REPLACEMENT PART DATA AND MAINTENANCE AND OPERATING INSTRUCTIONS. MANUALS SHALL INCLUDE COPIES OF ALL EQUIPMENT WARRANTIES.

# 1.7 GUARANTEES AND WARRANTIES

- A. THE CONTRACTOR SHALL GUARANTEE COMPLETE SYSTEM OPERATION AND THAT THE MATERIAL AND EQUIPMENT FURNISHED AND INSTALLED WILL BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS AND WILL GIVE SATISFACTORY SERVICE UNDER THE SPECIFIED OPERATING CONDITIONS. THE CONTRACTOR AGREES TO REPLACE. WITHOUT EXPENSE TO THE OWNER, ANY PART OF THE APPARATUS WHICH PROVES OR BECOMES DEFECTIVE WITHIN ONE YEAR AFTER THE SYSTEM IS ACCEPTED. NO EQUIPMENT WARRANTY OR GUARANTEE SHALL START UNTIL THE TIME OF BUILDING ACCEPTANCE.
- B. ALL WARRANTIES ISSUED BY EQUIPMENT MANUFACTURERS SHALL BE FILLED OUT IN THE OWNER'S NAME AND GIVEN TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF WORK PERFORMED UNDER THIS SECTION.

# 1.8 FINAL INSPECTION

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A. AFTER COMPLETION OF THE ENTIRE PROJECT THE CONTRACTOR SHALL REQUEST FINAL INSPECTION OF THIS PROJECT IN WRITTEN FORM ADDRESSED TO THE ARCHITECT ALONG WITH A STATEMENT TO THE EFFECT THAT ALL INSTALLATIONS HAVE BEEN COMPLETED, CHECKED, ADJUSTED AND BALANCED IN ACCORDANCE WITH REQUIREMENTS OF THIS PROJECT. UPON RECEIPT OF WRITTEN NOTIFICATION OF COMPLETION AND REQUEST FOR FINAL INSPECTION THE ENGINEER WILL PERFORM A FINAL INSPECTION OF THIS WORK AND, IF ALL INSTALLATIONS ARE AS REPRESENTED BY THE CONTRACTOR, THE ENGINEER WILL SUBMIT WRITTEN RECOMMENDATION OF ACCEPTANCE.

# 1.9 CLEANING

- A. DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE WORK SHALL BE REMOVED TO KEEP THE PREMISES REASONABLE CLEAN AT ALL TIMES.
- B. AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED SURFACES AND EQUIPMENT, REMOVE ALL DIRT, DEBRIS, CRATING, CARTONS, ETC., AND LEAVE ALL INSTALLATIONS FINISHED AND READY FOR OPERATION.

# 1.10 OPENINGS AND SLEEVES

- A. ALL PIPING THROUGH EXTERIOR OR FOUNDATION WALLS SHALL PASS THROUGH SCHEDULE 40 GALVANIZED STEEL SLEEVES WHICH SHALL BE LARGE ENOUGH TO ALLOW FOR PIPE SEAL MATERIAL. SLEEVES IN NEW CONSTRUCTION SHALL HAVE A MINIMUM 2 INCH WATERSTOP IN THE CENTER OF THE SLEEVE. NO SLEEVES ARE PERMITTED THROUGH CONCRETE STRUCTURAL MEMBERS.
- 1. SPACE BETWEEN PIPE AND SLEEVE IN EXTERIOR UNDERGROOUND WALLS SHALL BE SEALED WITH LINK-SEAL, FLEXICRAFT OR METRAFLEX LINK STYLE PIPE SEALS.
- 2. IN ABOVE GRADE EXTERIOR WALLS PACK THE SPACE BETWEEN PIPE AND SLEEVE WITH MINERAL WOOL AND THEN COMPLETE SEAL WITH APPROVED CAULKING COMPOUND FLUSH WITH FINISHED SURFACE. PROVIDE PIPE COLLAR ON INTERIOR SIDE OF WALL

- B. ALL PIPING THROUGH FLOORS SHALL BE PROVIDED WITH SCHEDULE 40 GALVANIZED STEEL PIPE SLEEVES, EXTENDING 1 INCH ABOVE THE FLOOR.
- C. IN FIRE RATED WALLS: CAULKING SHALL BE A PURE CERAMIC FIBER MADE OF ALUMINA-SILICA "CERAFIBER-FS" BY JOHNS-MANVILLE. SEALANT SHALL BE GUN GRADE. AN ACRYLIC 2-PART GUN APPLIED, FIRE RETARDANT ELASTIC SEALANT, "DYMERIC" BY TREMCO OR EQUAL BY PERMATITE NO. 1113FR.
- 1. LIMIT THE SIZE OF THE SPACE BETWEEN THE WALL OR FLOOR AND THE OUTSIDE OF THE PIPE THE PIPES OR DUCT WITHOUT CRACKING THE CAULKING OR SEALANT.
- 2. FOR OPENINGS IN WALLS, THE CAULKING SHALL BE APPLIED TO A MINIMUM OF 3 INCH TOTAL OF 1/2 INCH IN DEPTH, FINISHED FLUSH WITH THE WALL. D.
- D. FOR OPENINGS IN FLOORS, THE CAULKING SHALL BE APPLIED FROM THE UPPER SIDE TO A INCH RECESS SHALL THEN BE FILLED WITH SEALANT TO FLUSH WITH FINISHED FLOOR.

# 1.11 CUTTING AND PATCHING

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING OF WALLS, FLOORS, CEILINGS
- AND ROOFS REQUIRED FOR PERFORMANCE OF HIS WORK.

- D. ALL CUTTING OF EXISTING CONCRETE FLOORS/SLABS ON GRADE IN THE INTERIOR OF THE BUILDING SHALL BE PERFORMED BY "SAW CUTTING" AND SHALL BE PERFORMED BY THIS CONTRACTOR.

# 1.12 EXCAVATION AND BACKFILL

- A. ALL EXCAVATION AND BACKFILL REQUIRED FOR THE INSTALLATION OF THE WORK SHALL BE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR.
- B. NO EXCAVATION AND BACKFILL SHALL BE DONE WITHIN DRIP LINE OF TREES TO REMAIN. NO TREE SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE OWNER'S REPRESENTATIVE.
- C. CONTRACTOR SHALL PROVIDE PROTECTION FOR TREES WITHIN 15 FEET OF UTILITY EXCAVATION.
- D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL TRENCH AREAS AND MAINTAINING A DRY EXCAVATION. ANY DEWATERING OF TRENCHES/EXCAVATION SHALL BE PROVIDED PRIOR TO INSTALLING ANY MATERIAL.
- E. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ALL NECESSARY BARRICADES, FENCING, OCCUPATIONAL SAFETY AND HEALTH (OSHA) STANDARDS.
- F. LOCATE EXISTING UNDERGROUND UTILITIES IN AREAS OF EXCAVATION WORK. SHOULD DURING EXCAVATION, CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS.
- G. ALL TRENCHES SHALL BE UNIFORMLY GRADED AND BE FREE OF SOFT SPOTS AND STONE. PROVIDE A 4 INCH SAND BED.
- H. BACKFILL SHALL NOT BEGIN UNTIL INSTALLATION HAS BEEN TESTED AND INSPECTED. ARCHITECT/ENGINEER PRIOR TO BACKFILLING.
- 1. INITIAL BACKFILL SHALL BE SAND TO A POINT 6 INCHES ABOVE TOP OF INSTALLED WORK.
- CONSIST OF EARTH OR SAND FREE OF STONE, BRICKS, OR FOREIGN MATTER.
- ALL EXCESS EARTH AND OTHER MATERIAL RESULTING FROM THE EXCAVATION SHALL BE PROPERTY SHALL BE KEPT IN A CLEAN CONDITION.
- J. WHEN THE EXCAVATION IS WITHIN THE AREA WHERE FINISHED SITE WORK IS TO BE DONE UNDER THE GENERAL CONTRACT WORK, BACKFILL TO THE HEIGHT OF ROUGH GRADE. FINAL SURFACING WILL BE UNDER GENERAL CONTRACT WORK.
- K. WHEN THE EXCAVATION IS BEYOND THE AREA OF GENERAL CONSTRUCTION WORK, FINAL SURFACE AND ADJACENT DISTURBED AREAS SHALL BE RESTORED TO MATCH THE ORIGINA CONDITION BY SODDING, SEEDING, ASPHALT PAVING, CONCRETE, ETC., AS REQUIRED. WORK SHALL CONFORM TO APPLICABLE SECTIONS OF THESE SPECIFICATIONS.
- L. WHEN THE EXCAVATION IS ON PUBLIC PROPERTY, RESTORATION OF SURFACE CONDITIONS SHALL MEET THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- M. WHEN SERVICES ARE TO BE RUN SIDE-BY-SIDE. A COMMON TRENCH MAY BE USED PROVIDING SHARING OF THE COST OF THE COMMON TRENCHING AND BACKFILL WORK.

# 1.13 TEMPORARY HEAT

A. THE CONTRACTOR SHALL COOPERATE WITH THE GENERAL CONTRACTOR TO PROVIDE EQUIPMENT USED.

# 1.14 DEMOLITION AND NEW WORK

- A. THE CONTRACTOR SHALL DO ALL DEMOLITION, ALTERATIONS AND REWORK INDICATED AND/OR REQUIRED TO MAINTAIN THE OPERATION OF ALL EXISTING ELECTRICAL SYSTEMS AND TO INTEGRATE THE NEW SYSTEMS IN THE RENOVATED BUILDING AS REQUIRED. THE CONTRACTOR SHALL INCLUDE ALL WORK WHICH MAY BE REQUIRED TO ALTERATIONS AND DEMOLITION WORK. THIS SHALL INCLUDE ALL REMOVAL, RELOCATION AND REWORKING OF WIRE AND CONDUIT, OUTLET BOXES, JUNCTION BOXES, ETC. EXISTING SYSTEMS AND NEW SYSTEMS SHALL BE COMPLETELY INTEGRATED AS INTENDED AND AS INDICATED ON THE PLANS AND IN THE SPECIFICATIONS.
- B. THE CONTRACTOR SHALL REMOVE FROM THE PREMISES AND DISPOSE OF PROPERLY ALL EXISTING MATERIAL AND EQUIPMENT WHICH NO LONGER SERVES A PURPOSE IN ALTERED JUNCTION BOX. MAINTIAN CIRCUIT CONNECTIVITY. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL MAINTAIN SERVICES TO ALL EXISTING AREAS REQUIRING SUCH SERVICES. THE CONTRACTOR SHALL REROUTE AS REQUIRED SUCH SERVICES WHERE ARE DISRUPTED DUE THE CONTRACTOR WITH NEW EQUIPMENT OF LIKE KIND AT NO COST TO THE OWNER.

# 1.15 INTERRUPTION OF SERVICES

A. THE CONTRACTOR SHALL SCHEDULE ANY SERVICE INTERRUPTIONS TO THE EXISTING BUILDING SCHEDULE.

OR DUCT TO 1 INCH MAXIMUM. THIS SPACE IS SUFFICIENT TO ALLOW SOME MOVEMENT OF

DEPTH. SEALANT SHALL THEN BE APPLIED ON BOTH SIDES OF THE WALL OPENING A MINIMUM

MINIMUM OF 3 INCH TOTAL DEPTH RECESSED 1/2 INCH BELOW THE FINISHED FLOOR. THIS 1/2

B. NO STRUCTURAL MEMBER SHALL BE CUT WITHOUT PERMISSION FROM THE ARCHITECT.

C. PATCH ALL OPENINGS TO MATCH ADJACENT CONSTRUCTION IN BOTH MATERIAL AND FINISH.

BRACING, SHEET PILING, SHORING, WARNING SIGNS, PUMPS, ETC., FOR THE PROTECTION OF WORKERS, GENERAL PUBLIC, AND PROPERTIES. EXCAVATION WORK SHALL COMPLY WITH ASA STANDARD A10.2 "SAFETY CODE FOR BUILDING CONSTRUCTION" AND AGC STANDARD "MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" AND THE DEPARTMENT OF LABOR

UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE ENCOUNTERED

CONTRACTOR SHALL CONSULT WITH THE AUTHORITY HAVING JURISDICTION AND THE

2. FINAL BACKFILL SHALL BE INSTALLED IN LAYERS NOT EXCEEDING 12 INCHES. FILL SHALL BE WELL TAMPED BEFORE ADDITIONAL BACKFILL MATERIAL IS PLACED. BACKFILL SHALL

REMOVED FROM SITE BY THE CONTRACTOR OR MAY BE PILED AT A LOCATION DESIGNATED AND APPROVED BY THE OWNER. ALL DEBRIS, ROCK AND TRASH SHALL NOT BE ALLOWED TO ACCUMULATE AND SHALL BE REMOVED FROM THE SITE. STREETS, ROADWAYS AND PRIVATE

THE REQUIRED VERTICAL AND HORIZONTAL SEPARATION BETWEEN THE VARIOUS SERVICES ARE MAINTAINED AND PROVIDING THE METHODS OF BEDDING AND BACKFILL MEET THE APPROVAL OF THE ENGINEER. CONTRACTORS INVOLVED SHALL MAKE THEIR OWN AGREEMENT AS TO THE

TEMPORARY HEAT AS SOON AS POSSIBLE FOR USE DURING CONSTRUCTION IF TEMPORARY HEAT IS REQUIRED. AIR HANDLING EQUIPMENT SHALL NOT BE OPERATED AT ANY TIME WITHOUT FILTERS IN PLACE AND ALL EQUIPMENT SHALL BE PROTECTED FROM DAMAGE. OPERATING THE EQUIPMENT FOR TEMPORARY HEAT SHALL NOT START THE WARRANTY PERIOD OF THE

AREAS. THE CONTRACTOR SHALL REMOVE CONNECTIONS TO EQUIPMENT BACK TO PANEL OR TO ARCHITECTURAL CHANGES IN THE EXISTING STRUCTURE. ANY EQUIPMENT WHICH IS DESIGNATED TO BE REUSED AND WHICH IS DAMAGED IN THE PROCESS SHALL BE REPLACED BY

WITH THE OWNER'S REPRESENTATIVE. SUCH INTERRUPTIONS SHALL BE PLANNED SO AS TO BE AT TIMES TO CAUSE THE LEAST INCONVENIENCE AND INTERRUPTION TO THE FACILITY'S

# 1.16 EXISTING CONDITIONS

# PART 2 - ELECTRICAL

2.1 GENERAL REQUIREMENTS

A. SEE PART 1 FOR GENERAL REQUIREMENTS

- 2.2 IDENTIFICATION OF SWITCHES AND APPARATUS
- A. ALL CABINETS, SAFETY SWITCHES, AND OTHER APPARATUS USED FOR OPERATION AND CONTROL OF CIRCUITS, APPLIANCES, AND EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY IDENTIFIED BY MEANS OF ENGRAVED PLASTIC PLATES EITHER BLACK WITH WHITE LETTERS OR WHITE WITH BLACK LETTERS.

# 2.3 GROUNDING

A. ALL CONDUCTORS, MOTOR FRAMES, RACEWAYS, CABINETS, ETC., THAT REQUIRE GROUNDING SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, THOSE OF THE SERVING UTILITY AND LOCAL AUTHORITIES HAVING JURISDICTION.

# 2.4 SAFETY SWITCHES

- A. SAFETY SWITCHES, AS MANUFACTURED BY GENERAL ELECTRIC, CROUSE-HINDS, CUTLER-HAMMER, SQUARE D, SIEMENS, OR APPROVED EQUAL, SHALL BE FURNISHED AND INSTALLED (WHERE NOT FURNISHED BY OTHERS) WHEREVER SHOWN ON THE DRAWINGS SPECIFIED, OR REQUIRED BY THE NATIONAL ELECTRICAL CODE.
- B. SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE, UNDERWRITERS' LABORATORIES SHORT CIRCUIT LABELED FOR AT LEAST 100,000 AMPERES WITH CLASS R REJECTION FUSEHOLDERS SO AS TO COMPLY WITH NEC 100-9. SWITCHES INSIDE OF BUILDING SHALL BE FURNISHED IN NEMA 1 GENERAL PURPOSE ENCLOSURES. SWITCHES OUTSIDE OF BUILDING SHALL BE FURNISHED IN NEMA 3R ENCLOSURES UNLESS OTHERWISE SPECIFIED.
- C. EACH MOTOR SHALL BE PROVIDED WITH A DISCONNECTING MEANS IN ACCORDANCE WITH REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

# 2.5 CONDUIT

- A. ALL ELECTRICAL WIRING, INCLUDING LOW VOLTAGE WIRING, SHALL BE INSTALLED IN CONDUIT AS HEREIN SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH NOMINAL SIZE SHALL BE USED BELOW GRADE; NO LESS THAN 1/2 INCH NOMINAL SIZE SHALL BE USED ABOVE GRADE.
- B. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 EPC-40-PVC. ALL CONDUITS SHALL BE INSTALLED WITH MINIMUM 24 INCH COVER.
- C. CONDUIT INSTALLED IN CONCRETE SLABS OR ABOVE GROUND SHALL BE GALVANIZED RIGID STEEL OR EPC-40-PVC.
- D. WHEN PVC CONDUITS PENETRATE CONCRETE FLOOR CONSTRUCTION, CONTRACTOR SHALL USE RIGID STEEL OR IMC ELBOWS AND EXTENSION. PVC CONDUIT/FITTINGS SHALL NOT BE PERMITTED TO BE EXPOSED ABOVE THE FLOOR.
- E. THINWALL TUBING SHALL BE E.M.T.
- F. ALL FITTINGS SHALL BE OF THE COMPRESSION TYPE AND WATERTIGHT FOR UNDERGROUND AND IN SLAB LOCATIONS. COMPRESSION OR SCREWED FITTINGS FOR INDOOR.
- G. CONDUIT FOR INTERIOR WIRING, IN GENERAL, SHALL BE THINWALL TUBING UNLESS OTHERWISE NOTED.
- H. RACEWAYS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FITTING TO FITTING. A RUN OF CONDUIT BETWEEN OUTLETS OR FITTINGS SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF FOUR QUARTER-BENDS INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE OUTLET OR FITTING. THE RADIUS OF BENDS SHALL NEVER BE SHORTER THAN THAT OF THE CORRESPONDING TRADE ELBOW. THE SYSTEM SHALL BE COMPLETE WITH OUTLETS, DISTRIBUTION BOXES, ETC., SMOOTH INSIDE AND MECHANICALLY SECURE IN PLACE. APPROVED STRAPS, HANGERS, OR SUPPORTS SHALL BE USED TO SECURE CONDUITS IN PLACE, CONDUITS SHALL, IN GENERAL, BE SUPPORTED AT INTERVALS NOT EXCEEDING 10'-0" AND WITHIN 3'-0" OF EACH OUTLET BOX, JUNCTION BOX, CABINET OR FITTING.
- CONDUITS SHALL BE PROTECTED DURING CONSTRUCTION; PLUG AND KEEP CLEAN AND DRY. CONDUIT ENDS SHALL BE BUTTED IN CENTERS OF COUPLINGS. NO CRACKS OR FLATTENED SECTIONS WILL BE PERMITTED AT BENDS OR ELSEWHERE. ALL ENDS OF CONDUIT SHALL BE REAMED TO REMOVE ROUGH EDGES. RUNNING THREADS WILL NOT BE PERMITTED.
- J. CONDUITS SHALL BE CONCEALED WITHIN THE WALLS, CEILINGS, AND FLOORS WHERE POSSIBLE AND UNLESS OTHERWISE NOTED. EXPOSED CONDUIT SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES WITH THE BUILDING LINES.

# 2.6 WIRE AND CABLE

- A. WIRE AND CABLE SHALL BE COPPER.
- B. ALL CONDUCTORS SHALL BE COPPER.
- C. NO. 10 AWG AND SMALLER CONDUCTORS SHALL BE SOLID WITH TYPE THHN INSULATION AND NO. 8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED WITH TYPE THHN INSULATION EXCEPT THAT CONDUCTORS WITHIN 3 INCHES OF LIGHT FIXTURE BALLASTS SHALL HAVE RHH, THHN, OR EQUAL INSULATION RATED FOR 90 DEGREES C. APPLICATION.

# 2.7 LOCATIONS OF OUTLETS AND EQUIPMENT

A. ELECTRICAL OUTLETS AND EQUIPMENT ARE SO LOCATED ON THE DRAWINGS TO SHOW INTENT OF DESIGN. MINOR VARIATIONS IN THESE LOCATIONS MAY BE MADE BY THIS CONTRACTOR TO COMPLY WITH STRUCTURAL AND OTHER REQUIREMENTS AS DETERMINED IN THE COURSE OF CONSTRUCTION. IT SHALL BE THE DUTY OF THIS CONTRACTOR TO TAKE HIS OWN MEASUREMENTS AND BE RESPONSIBLE FOR SAME. THIS CONTRACTOR SHALL ALSO REVIEW THE ARCHITECTURAL DRAWINGS AND THOSE DRAWINGS USED BY OTHER CONTRACTORS IN ORDER TO DETERMINE EXACT LOCATIONS FOR ELECTRICAL OUTLETS AND EQUIPMENT. DO NOT SCALE DRAWINGS FOR OUTLET LOCATIONS.

ITEM	EQUIPMENT MOUNTING HEIGHT FLOOR TO	MOUNTING
INTERIOR RECEPTACLES	воттом	16"
EXTERIOR RECEPTACLES	CENTERLINE	24"
TELEPHONE OUTLETS	воттом	16"
SWITCHES	ТОР	48"

RECEPTACLES ABOVE COUNTERS: CENTERLINE 10 INCHES ABOVE COUNTER AND HORIZONTAL

- 2.8 WALL PLATES
- UNDER ONE GANG-PLATE.
- SURFACES.
- DEVICES.

# 2.9 WIRING DEVICES

- SHALL MATCH EXISTING.

# 2.10 PANELBOARDS

- - FUNCTION OF EACH BREAKER.
- 2.11 LIGHTING FIXTURES

- LEAKAGE.
- THE DRAWINGS.

# 2.12 IDENTIFICATION OF EQUIPMENT

- LETTERS.

A. GROUPS OF SWITCHES, OUTLETS OR SWITCH AND OUTLET COMBINATIONS SHALL BE MOUNTED

B. WALL PLATES SHALL FIT AND COVER PROPERLY THE DEVICE AND WALL OPENING. NO OPEN OR UNFINISHED SURFACES SHALL SHOW AFTER INSTALLATION OF THE WALL PLATES. C. WALL PLATES SHALL BE SET VERTICAL AND SHALL FINISH FLUSH WITH ALL SURROUNDING

D. WALL PLATES FOR ALL DEVICES AND TELEPHONE OUTLETS SHALL MATCH THE EXISTING

A. SINGLE-POLE WALL TUMBLER SWITCHES FOR GENERAL USE SHALL BE SPECIFICATION GRADE HUBBELL NO. 1121, OR APPROVED EQUAL, MECHANICALLY SILENT TYPE WITH PLASTIC HANDLES, RATED 20 AMPERES AC, 120/277 VOLTS. GENERAL USE SWITCHES INDICATED ON PLANS AS DOUBLE POLE, 3-WAY, 4-WAY OR LOCK TYPE WITH KEY GUIDE SHALL BE THE SAME SERIES AS THE SINGLE-POLE SWITCHES. DEVICE COLOR SHALL MATCH EXISTING.

B. CONVENIENCE OUTLETS IN FINISHED SPACES SHALL BE SPECIFICATION GRADE HUBBELL NO. 5362, OR APPROVED EQUAL, DUPLEX GROUNDING TYPE RECEPTACLES RATED 20 AMPERES AC, 120 VOLT. DEVICE COLOR SHALL MATCH EXISTING.

C. RECEPTACLES DESIGNATED WITH GROUND FAULT PROTECTION SHALL BE HUBBELL NO. GF-5362, OR APPROVED EQUAL, 120 VOLT, 20 AMP GROUND FAULT INTERRUPTER TYPE. DEVICE COLOR

A. PANELBOARDS SHALL BE GENERAL ELECTRIC, SQUARE D, OR SIEMENS ITE CIRCUIT BREAKER TYPES, WITH CIRCUIT BREAKERS AS NOTED IN THE SCHEDULE ON THE DRAWINGS.

B. PANELBOARDS SHALL BE EQUIVALENT TO SQUARE D TYPE NOOD, 120/208 VOLT, WITH BOLTED BREAKERS, NEMA RATED FOR THE AVAILABLE FAULT CURRENT.

C. FURNISH AND INSTALL A TYPEWRITTEN DIRECTORY FOR EACH PANELBOARD, SHOWING THE

A. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL LIGHTING FIXTURES AND LAMPS AS INDICATED ON THE DRAWINGS AND HEREIN DESCRIBED. MATERIAL, EQUIPMENT, OR SERVICES NECESSARY TO COMPLETE THE INSTALLATION OF THESE FIXTURES, BUT NOT SPECIFICALLY MENTIONED, SHALL BE FURNISHED AS THOUGH SPECIFIED. ALL FIXTURES AND LAMPS SHALL BE PROPERLY CLEANED AND ADJUSTED AFTER INSTALLATION.

B. ALL ADJUSTABLE LIGHTING FIXTURES SHALL BE CAREFULLY POSITIONED BY THIS CONTRACTOR IN THE PRESENCE OF THE ARCHITECT OR HIS REPRESENTATIVE.

C. LAMPS SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, SYLVANIA OR PHILLIPS.

D. BALLASTS SHALL BE AS NOTED IN FIXTURE SCHEDULE. BALLASTS IN FIXTURES DESIGNATED FOR EMERGENCY LIGHTING MUST BE COMPATIBLE WITH THE EMERGENCY UNIT USED WITH MINIMUM

E. THIS CONTRACTOR SHALL FURNISH AND INSTALL FIXTURES HEREIN SPECIFIED OR AS SHOWN ON

F. LIGHT FIXTURES SHALL BE SUPPORTED FROM ROOF STRUCTURE PER UBC 47-18.

G. GENERAL CONTRACTOR SHALL PROVIDE ALL FIRE-RATED ENCLOSURES FOR LIGHT FIXTURES INSTALLED IN FIRE-RATED CEILINGS.

A. ALL SERVICE ENTRANCE EQUIPMENT, DISCONNECT SWITCHES, PANELBOARDS, RELAYS, MOTOR STARTERS, CONTACTORS, TELEPHONE TERMINAL CABINETS, TV EQUIPMENT AND RISER JUNCTION BOXES, AND OTHER ELECTRICAL EQUIPMENT UNDER THIS CONTRACT, SHALL BE PROVIDED WITH PROPER IDENTIFICATION. IDENTIFICATION SHALL BE BY THE USE OF ENGRAVED COLOR CODED PLASTIC NAMEPLATES WITH WHITE LETTERING SCREWED TO THE COVER OF THE EQUIPMENT. USE OF EMBOSSED PLASTIC "TAPE" LABELS AS PREPARED BY "TYPEWRITER" TYPE EQUIPMENT SHALL NOT BE USED. COLOR CODING SHALL BE AS FOLLOWS:

1. EQUIPMENT CONNECTED TO A NORMAL POWER SOURCE SHALL BE BLACK WITH WHITE

<b>DAMP</b> <b>RYNEARSON</b> 9001 STATE LINE RD., STE. 200 KANSAS CITY, MO 64114 816.361.0440 LampRynearson.com			
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2 FLOOR PLAN - RESTROOM - HVAC 1/4" = 1'-0"

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 $\textcircled{3} \frac{\mathsf{FLOOR} \ \mathsf{PLAN} - \mathsf{RESTROOM} - \mathsf{PLUMBING}}{1/4" = 1'-0"}$ 

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1 FLOOR PLAN - RESTROOM - PLUMBING - UNDERSLAB 1/4" = 1'-0" GENERAL NOTES:

- 1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO CONVEY SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE, CEILINGS, WALLS, AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
- 2. ALL DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT INCLUDE ALL OFFSETS, DROPS, AND RISES. CAREFULLY COORDINATE DUCT AND PIPE ROUTING WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES, EQUIPMENT ACCESSIBILITY, DESIRED CEILING HEIGHTS, AND AESTHETICS. THE CONTRACTOR SHALL INCLUDE ANY NEEDED OFFSETS AND CHANGES OF DIRECTION IN THE BID PRICING.
- 3. COORDINATE ALL PIPING AND DUCTWORK PENETRATIONS WITH STRUCTURAL PRIOR TO CORE DRILLING OR CUTTING BEARING WALLS.
- 4. PROVIDE SHUT OFF VALVES ABOVE ACCESSIBLE CEILING OR OTHER ACCESSIBLE LOCATION FOR ALL BRANCH PIPING AND INDIVIDUAL CONNECTIONS TO PLUMBING FIXTURES. WHERE STOPS ARE PROVIDED FOR INDIVIDUAL FIXTURES SHUT OFF VALVES ARE ALSO REQUIRED AT THE BRANCH CONNECTION. PLUMBING STOPS ARE NOT CONSIDERED A SUBSTITUTE FOR SHUT OFF VALVES.
- PROVIDE DRAIN DOWN VALVES AT ALL LOW POINTS IN THE DOMESTIC COLD WATER PIPING SYSTEM FOR WINTERIZATION OF THE BUILDING.

PLAN NOTES:

- (1) 4" SANITARY SEWER SERVICE ENTRANCE LOCATION. 15 DFU LOAD. APPROXIMATE FLOWLINE 36" BELOW FINISHED FLOOR. REFER TO CIVIL DRAWINGS FOR CONTINUATION. COORDINATE EXACT LOCATION AND DEPTH WITH SITE UTILITIES CONTRACTOR PRIOR TO INSTALLATION. ALL SANITARY SEWER PIPING OUTSIDE THE BUILDING FOUNDATION IS SHOWN ON SHEET C7 SANITARY SEWER SERVICE CONNECTION PLAN (THE JCW PERMIT PLAN). THIS PIPING SHALL MEET JOHNSON COUNTY WASTE WATER STANDARD AND SHALL BE INSPECTED BY JOHNSON COUNTY WASTE WATER.
- 1-1/2" DOMESTIC SERVICE ENTRANCE. REFER TO CIVIL DRAWINGS FOR CONTINUATION. COORDINATE EXACT LOCATION AND DEPTH WITH SITE UTILITIES CONTRACTOR PRIOR TO INSTALLATION.
- 3 DOMESTIC COLD WATER SERVICE ENTRANCE, REFER TO DETAILS FOR ADDITIONAL INFORMATION.
- 4 8"Ø EXHAUST DUCT UP THROUGH THE ROOF. FURNISH AND INSTALL ROOF CAP AND INSPECT SCREEN.
- 5 4" SAN UP TO CLEANOUT.
- 6 4" SAN UP TO WATER CLOSET.
- 7 3" SAN UP TO FLOOR DRAIN.
- 8 3" SAN UP TO 2" VENT.
- 9 2" SAN UP TO FLOOR DRAIN.
- (10) 2" SAN UP TO 1-1/2" VENT.
- 11 2" SAN UP TO SINK/LAV.

![](_page_40_Picture_25.jpeg)

![](_page_41_Figure_0.jpeg)

1 FLOOR PLAN - PAVILION - ELECTRICAL 1/4" = 1'-0"

Image: style styl	
(2)#4,#4 G., IN 1" C.     (2)#4,#4 G., IN 1" C.     (3) ROUTE CONDUITS CONCEALED     THROUGH MASONRY BEFORE     ROUTING BELOW GRADE BACK TO     PANEL.     (4) ROUTE CONDUITS DOWN THROUGH     COLUMNS TO GRADE FOR ROUTING     BELOW GRADE BACK TO PANEL.     (5) LIGHTING CIRCUIT HOME RUN SHALL     BE ROUTED THROUGH     ASTRONOMICAL TIME SWITCH FOR     LIGHTING CIRCUIT ON/OFF     CONTROL.	
GENERAL NOTES: 1. REFER TO ARCHITECTURAL FLOOR FOR EXACT MOUNTING LOCATIONS OF ALL WALL MOUNTED ELECTRICAL DEVICES. 2. REFER TO M/E SCHEDULES AND DETAILS FOR MECHANICAL EQUIPMENT CIRCUITING INFORMATION. 3. PROVIDE LOW VOLTAGE WIRING BETWEEN OCCUPANCY SENSORS AND TO CORRESPONDING POWRP PACKS WITHIN EACH ROOM UNLESS NOTED OTHERWISE. REFER TO WIRINS DIAGRAMS ON SHEET ME201 FOR MORE INFORMATION. 4. CONDUCTORS ARE #12, AND CONDUIT IS 1/2' UNLESS NOTED OTHERWISE. 5. ALL EXPOSED CONDUIT TO BE PAINTED. COORDINATE FINISH WITH ARCHITECT. 6. 120 V BRANCH CIRCUITING SHALL BE AS FOLLOWS: (UNLESS SPECIALLY NOTED OTHERWISE.) 0-100' = #12 AWG 101'-150' = #10 AWG 151'-250' = #8 AWG ELECTRICAL PLAN NOTES: 1. (2)#8,#8 G., IN 1" C.	ERS 66061 5.0617 19200

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![](_page_42_Picture_1.jpeg)

1 FLOOR PLAN - RESTROOM - ELECTRICAL 1/4" = 1'-0"

<u>GENERAL NOTES:</u> 1. REFER TO SHEET E1 FOR GENERAL NOTES.		ARSON
ELECTRICAL PLAN NOTES:	9001 STATE LINE RD., KANSAS CITY, MO 641 816.361.0440 LampRynearson.com	STE. 200 14
1 ELECTRIC CONNECTION TO HAND DRYER. PROVIDE AND INSTALL WORLD DRYER SLIMDRI HAND DRYER. VERIFY FINISH WITH ARCHITECT.		
<ul> <li>2 ELECTRICAL CONNECTION TO WATER COOLER.</li> <li>3 HARD WIRED ELECTRIC CONNECTION</li> </ul>	smith&	
TO HANDS FREE DEVICES. EXTEND LOW VOLTAGE CABLING TO EACH DEVICE IN RESTROOMS. COORDINATE REQUIRED LOCATION WITH PLUMBING FIXTURE SCHEDULE. PROVIDE STEP-DOWN CONTROL TRANSFORMERS AS REQUIRED. LOCATE ALL JUNCTION BOXES AND TRANSFORMERS WITHIN THE STORAGE/MECHANICAL ROOM.	25501 west valley parkway, s phone 913.34	suite 200 olathe, ks 66061 45.2127 fax 913.345.0617 project number 1919200
4 200A SELF CONTAINED ELECTRIC SERVICE METER AND 200A/F200 NEMA 3R FUSED SERVICE DISCONNECT. REFER TO ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.	PR 21	446 115 20 E
5 LIGHTING CIRCUIT HOME RUN SHALL BE ROUTED THROUGH ASTRONOMICAL TIME SWITCH FOR LIGHTING CIRCUIT ON/OFF CONTROL.		SAS
6 LOCATE POWER PACK FOR THE RESTROOM LIGHTING IN THE MECHANICAL/STORAGE ROOM. EXTEND LOW VOLTAGE CABLING TO THE SENSORS IN THE RESTROOMS.		- <u> </u>
7 VANSTY FIXTURE TO BE MOUNTED ON WALL CENTERED ABOVE MIRROR.		
8 FURNISH AND INSTALL ASTRONOMICAL TIME SWITCH AND ALL REQUIRED CONDUIT AND WIRING FOR EXTERIOR LIGHTING CIRCUIT CONTROL. ASTRONOMICAL TIME SWITCH SHALL BE PROGRAMMED TO TURN EXTERIOR LIGHT FIXTURES ON AT DUSK AND OFF AT DAWN. ASTRONOMICAL TIME SWITCH BASIS OF DESIGN IS AN INTERMATIC ET8415CR WITH (4) 30 AMP CONTROL CIRCUITS IN A TYPE 3R	MENTS	
STEEL ENCLOSURE OR APPROVED EQUAL.	CU	
	ncl	
	STR	
	Ň	ANSAS
	O	HASE 1 PARK, K
		PARK - PH OELAND F
	FLOOR	
	RESTR	OOM - RICAL
	REVISIONS	
	DESIGNER / DRAFTER	
	DATE 01-15-2020 PROJECT NUMBER	
	BOOK AND PAGE	
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OCCUPAN	ICY CONTROL DEVICE SCHEDULE					
SYMBOL	DESCRIPTION	DETECTION TYPE	MANUAL OVERRIDE	SETTINGS (TYPICAL)	MANUFACTURER/MODEL	NOTES
\$ <sub>T</sub>	WALL MOUNTED DIGITAL TIMER SWITCH LINE VOLTAGE - SINGLE RELAY	NONE	INTEGRAL	ON: MANUAL OFF: 2 HOUR DELAY SCROLL: UP WARNING FLASH: ON WARNING SOUND: ON	WATTSTOPPER TS-400	1,2
\$ <sub>K</sub>	WALL MOUNTED - KEYED SWITCH LINE VOLTAGE	NONE	(NOTE 4)	ON: MANUAL OFF: MANUAL	LEGRAND PS20 AC/WL	1,2
<b>•</b>	CEILING MOUNTED OCCUPANCY SENSOR LOW VOLTAGE - 1100 SF COVERAGE	ULTRASONIC	(NOTE 4)	ON: AUTOMATIC OFF: 30 MINUTE DELAY	WATTSTOPPER WT-1100	1,5,6,7
PP	OCCUPANCY SENSOR POWER PACK UNIVERSAL VOLTAGE - SINGLE RELAY	-	-	-	WATTSTOPPER BZ-50	1,3

NOTE 1: THE MANUFACTURERS AND MODELS LISTED ARE THE BASIS OF DESIGN, ALL PRODUCT SUBSTITUTIONS SUBMITTED MUST BE APPROVED AS EQUAL. REFER TO DRAWINGS FOR QUANTITIES. NOTE 2: ALL WALL MOUNTED LIGHTING CONTROLS MUST HAVE MATCHING FINISHES TO THOSE LISTED IN SPECIFICATION SECTION 262726 - WIRING DEVICES. NOTE 3: LOCATE DEVICE ABOVE ACCESSIBLE CEILING, LOCATIONS SHOWN ON DRAWINGS ARE SCHEMATIC.

NOTE 4: PROVIDE 8'-0" OF EXCESS CONTROL WIRING, COILED AND TIED, BETWEEN CEILING MOUNTED OCCUPANCY SENSORS AND CORRESPONDING POWER PACKS. NOTE 5: OCCUPANCY SENSOR LOCATIONS SHOWN ON FLOOR PLANS ARE GENERIC, CONTRACTOR TO MODIFY LOCATIONS AS REQUIRED BASED COVERAGE CAPABILITIES OF SUBMITTED PRODUCTS.

NOTE 6: MODIFY LOCATIONS OF CEILING MOUNTED OCCUPANCY SENSORS AS REQUIRED SO THAT NO OCCUPANCY SENSOR IS WITHIN 4'-0" OF AN HVAC SUPPLY DIFFUSER.

MAIN LUGS ONLY

EQUIPMENT GROUND BUS

# PANEL RP MAIN BUS AMPS: 200 A AIC: SECTIONS: MAIN BREAKER: 200 A 1 - 30 SPACE VOLTAGE MOUNTING 208/120 1/

VOLTAGE: PHASES/WIRES:	208/120 V 3 PH / 4 W	MC LC	OUNTIN CATION	G: I:	SURFA RE: PL	CE ANS	NEMA-3R ENCLOSURE			
CIRCUIT DES	CRIPTION	POLES	AMPS	CKTNO	CKTNO	AMPS	POLES	CIRCUIT DESCRIPTION		
REC - INTERIOR RR		1	20	1	2	20	1	LTG - EXTERIOR RR		
REC - EXTERIOR RR		1	20	3	4	20	1	LTG - INTERIOR RR		
JBOX - HAND DRYER		1	20	5	6	20	1	LTG - PAVILION		
JBOX - HAND DRYER		1	20	7	8	20	1	REC - PAVILION S		
REC- WATER COOLER		1	20GFI	9	10	20	1	REC - PAVILION N		
JBOX - HANDS FREE		1	20	11	12	20	1	ECH-1		
WH-1		1	40	13	14	20	1	ECH-2		
WH-2		1	40	15	16	20	1	ECH-3		
SPARE		1	20	17	18	20	1	SPARE		
SPARE		1	20	19	20	20	1	SPARE		
SPARE		1	20	21	22	20	1	SPARE		
SPARE		1	20	23	24	20	1	SPARE		
SPACE ONLY		1	20	25	26	20	1	SPACE ONLY		
SPACE ONLY		1	20	27	28	20	1	SPACE ONLY		
SPACE ONLY		1	20	29	30	20	20 1 SPACE ONLY			
	GFI - GROUND	FAU	LT BREA	KER						

22,000 A

LIG	HT FIXTURE SCHEDULE					
TYPE	DESCRIPTION	MOUNTING	LAMP	VOLTS	MANUFACTURER	V-A
А	8" WIDE X 4'-0" LONG VANDAL RESISTANT LED FIXTURE FOR	CEILING OR	LED	120	FAIL-SAFE SERIES FVS8	45.5
	EITHER CEILING OR WALL MOUNT125" THICK ACRYLIC LENS.	WALL	5675 LUMENS		OR PRE-BID APPROVED EQUAL	
	TAMPER RESISTANT SCREWS. INTEGRAL DRIVER. COORDINATE	MOUNT	(DELIVERED)			
	EXACT MOUNTING HEIGHT WITH ARCHITECT. 2 ROWS LED, LOW		4000K			
	ILLUMINATION LEVEL.					
В	4'-0" LED INDUSTRIAL STRIP FIXTURE. INTEGRAL DRIVER.	CHAIN HANG	LED	120	WILLIAMS SERIES 76-LED	48
		TO 8'-0" A.F.F.	4000 LUMENS		LITHONIA SERIES ZL1N	
		UNLESS NOTED	(MINIMUM)		DAYBRITE SERIES LF	
		OTHERWISE	4000K		COLUMBIA SERIES LCS	
					LSI SERIES S	
D	4" WALL MOUNTED SQUARE DIRECT/INDIRECT AREA LIGHT. MEDIUM	WALL	LED	120	LIGMAN UGI-31631	12
	DISTRIBUTION, DARK BRONZE FINISH PREFERRED, BLACK FINISH		2X444 LUMENS		OR PRE-BID APPROVED EQUAL	
	ACCEPTABLE. MOUNTED ON STRUCTURE COORDINATED WITH		(DELIVERED)			
	ARCHITECT.		4000K			
			90 CRI			
F	4'-0" FULLY ENCLOSED LED STRIP WITH ACRYLIC DIFFUSER AND	SURFACE	LED	120	WILLIAMS SERIES 96-LED	40
	FIBERGLASS HOUSING. INTEGRAL DRIVER.	TO BOTTOM	4,000 LUMENS		LITHONIA SERIES FEM-LED	
		OF BEAM	(DELIVERED)		DAYBRITE SERIES DW-LED	
			4000K		LAMAR SERIES DV-LED	
			85 CRI		COLUMBIA SERIES LXEM	

EL	ECTRONIC TIME
RELAY #	RELAY AREA DESCRI
1	RESTROOM EXTERIOR LIGHT
2	PAVILION LIGHTING
3	SPARE
4	SPARE
CABIN	IET REQUIREMENTS:
1. BA	SIS OF DESIGN IS AN INTERMATI
2. AL	L RELAYS TO BE RATED FOR 20A
3. EL	ECTRICAL CONTRACTOR TO PRO
4. SE	VEN DAY TIME CLOCK INCLUDIN
5. CA	PABLE OF RECEIVING LOW VOLT
NOTE	S:
1. CC	NTROLLED BY TIME CLOCK
2. AF	TER-HOURS OVERRIDE BY OCCU

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SWITCH - "ETC"											
PTION	WATTS	CIRCUIT	LOCAL OVERRIDE	SCHEDULED ON	SCHEDULED OFF	NOTES					
ſING	96	RP-2	NONE	DUSK	11:00 PM	1,2					
	160	RP-6	NONE	DUSK	11:00 PM	1,2					

IC ET8415CR. ALL PRODUCT SUBSTITUTIONS SUBMITTED MUST BE APPROVED AS EQUAL.

A (MINIMUM) - NORMALLY CLOSED.

OVIDE CABLING AS REQUIRED BETWEEN THE TIME CLOCK AND PANELBOARDS.

NG SKIP-A-DAY CAPABILITY.

FAGE OCCUPANCY SENSOR INPUT FOR OVERRIDE-ON DURING NON-SCHEDULED HOURS OF OPERATION.

UPANCY SENSORS CONNECTED TO TIME SWITCH. RELAY TO ONLY OVERRIDE-ON DURING HOURS OF DARKNESS.

![](_page_43_Figure_17.jpeg)

![](_page_44_Figure_0.jpeg)

	COMMON NAME	PLANTING SIZE	HEIGHT	WIDTH	RYNE	E A R	SON
	LITTLE RASCAL HOLLY	5 GAL.	2-3	1-2	9001 STATE LIN	E RD., STE. 20	0
DE'	CONCORDE BARBERRY	3 GAL.	1-2	1-2	KANSAS CITY, M 816.361.0440 LampRynearson.c	10 64114 com	
	RED DRIFT ROSE	3 GAL.	1–2	2-3			
	BUTTERFLY MILKWEED	1 GAL.	1–2	2-3			
'KARL	KARL FORESTER FEATHER REED GRASS	1 GAL.	4–5	2-3			
DY'	AUTUMN JOY STONECROP	1 GAL.	1-2	1–2			
	RED OCTOBER BIG BLUE STEM	1 GAL.	5-6	2-3			
	ELIJAH BLUE FESCUE	1 GAL.	.5–1	.5–1		NIFL Mag	<u> </u>
	LITTLE MISS DWARF MAINDEN GRASS	1 GAL.	2-3	2-3	NAC TO THE	CENSE	K JR
	PRAIRIE DROPSEED	1 GAL.	2-3	2-3		20173	EP 1
	TWILIGHT ZONE LITTLE BLUESTEM	1 GAL.	3–5	1-2	Neithers	SYONAL ENGL	
	STANDING OVATION LITTLE BLUESTEM	1 GAL.	3-4	1-2	C MARK	01-28-2020	JR.
	LILY TURF	1 GAL.	1-1.5	.5–1		KS PE 20773	
F ALL UCTUR INSTAL AND ES TO NG PLA S, SUE THE C COR AF COR AF CO	PROPOSED AND EXISTING VAULTS, ELE ES AND OTHER UTILITIES PRIOR TO CO L ANY PROPOSED LANDSCAPE IMPROVE EXISTING OR PROPOSED UTILITIES OR S REMAIN. ANS, SEE ENGINEER'S AND ARCHITECT'S BSURFACE AND ABOVE GRADE UTILITIES PRAWINGS. SEE PLANT LIST FOR KEY EDDED HARDWOOD MULCH ON ALL PLA 'PROVAL. TIC. DO NOT WILLFULLY LOCATE PLANTI IG AREAS SHALL BE FREE FROM CHEM ER THAN ONE INCH IN DIAMETER. JRBED AREAS SHALL BE SCARIFIED ANI M DEPTH OF 12", SEE CONDITIONED S ONTROL TO AREAS TO RECEIVE SHRUES NG SOIL AMENDMENTS. THE CONTRACT LANDS NOT RECEIVING SOD. ONVENIENCE TO THE CONTRACTOR. IF GOVERN. AN AGRICULTURAL/SOIL SUITABILITY TE SOIL AMENDMENT AT THE RATE OF 6 C MINIMUM DEPTH OF 6". RAKE TO A S	CTRICAL DUCT MMENCING WO MENTS WHEN SITE FEATURES ORAWINGS FO AND CLASSIFIC NTING AREAS H NGS WHERE CO ICALS, CONSTR D RECEIVE CON SOIL NOTES BE S, GROUNDCOV OR SHALL PLA THERE ARE DIS CUBIC YARDS F SMOOTH, EVEN	BANKS, MANHO RK. CONFLICTS EXI SUCH AS WAL DR BUILDING ATION. EXCEPT LAWN, ONFLICTS EXIST RUCTION DEBRIS NOITIONED SOIL LOW. (ERS, AND NON CE TRIPLE SHR SCREPANCIES E PURPOSES PER 1,000 SQU SURFACE PER	DLES, ST KS, SUBMIT WITH S AND S. -LAWN REDDED DETWEEN ARE THE	CONSTRUCTION DOCUMENTS	PAVILION PLANTING PLAN	r park – phase 1 roeland park, kansas
AREAS THE F POST S D THE	G TO RECEIVE LANDSCAPING. REQUIREMENTS SPECIFIED BELOW. SHALL BE PLACED ON TOP OF ALL LAN EXISTING SOIL TO A DEPTH OF SIX IN OF THIS SECTION. MATERIAL SHALL BE	NDSCAPE AREA: CHES. WELL COMPOS	S. Sted, free of	WEED			
OXYGE O VISIA AL MUS WFICH	EN CONSUMPTION AND CARBON DIOXIDE BLE FREE WATER OR DUST PRODUCED T PASS THROUGH A HALF INCH SCREE IT.	E GENERATION. WHEN HANDL EN. MANUFAC	COMPOST SH ING THE MATER TURED INERT	IALL RIAL.	REVISIONS		
	MAX. 65%						
	25:1 8.0 50						
IT MATI CTS IN OTHER NTY CC AND	ERIALS FOR A PERIOD OF TWO (2) YE/ CLUDING DEATH AND UNSATISFACTORY IS, OR UNUSUAL PHENOMENA OR INCIE IVERS A MAXIMUM OF ONE REPLACEME HAVE AT LEAST 3 YEARS OF LANDSCAF	ARS FROM THE GROWTH, EXCE DENTS WHICH A NT PER ITEM. PING EXPERIEN	DATE OF PT FOR DEFEC ARE BEYOND TH CE INSTALLING	TS <del>I</del> E	DESIGNER / DRAFTER SAM CHRISTENSEN DATE 01-28-2020 PROJECT NUMBER 0319001.04 BOOK AND PAGE	3	
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LAMP