## **GENERAL NOTES**

- ALL UTILITIES SHOWN HAVE BEEN LOCATED FROM AVAILABLE RECORDS. THEIR LOCATION SHOULD BE CONSIDERED APPROXIMATE. THE CONTRACTOR HAS THE RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES, PRIOR TO CONSTRUCTION, TO HAVE EXISTING UTILITIES FIELD LOCATED. THE CONTRACTOR SHALL BE ON RECORD WITH THE MISSOURI ONE CALL SYSTEM. ALL PROPOSED UTILITIES TO BE UNDERGROUND.
- 2. A BOUNDARY AND TOPOGRAPHIC SURVEY WAS PERFORMED BY MARLER SURVEYING AT TWO SEPARATE TIMES. INITIAL SURVEY WAS PERFORMED IN AUGUST, 2018, FOR PREVIOUSLY COMPLETED OFFICE EXPANSION. ADDITIONAL SURVEYING WAS PROVIDED IN OCTOBER, 2019 FOR CURRENT
- 3. ALL ON-SITE MATERIALS AND METHODS OF CONSTRUCTION TO MEET THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF O'FALLON
- 4. ALL GRADED AREAS SHALL BE PROTECTED FROM EROSION BY EROSION CONTROL DEVICES AND/OR SEEDING AND MULCHING AS REQUIRED BY
- 5. PRIOR TO BEGINNING ANY WORK ON THE SITE, THE SUB-CONTRACTOR SHALL CONTACT THE GENERAL CONTRACTOR FOR SPECIFIC INSTRUCTIONS RELEVANT TO THE SEQUENCING OF WORK.
- 6. GRADING CONTRACTOR SHALL INSTALL SILTATION CONTROL PRIOR TO STARTING THE GRADING. ADDITIONAL SILTATION CONTROL DEVICES SHALL
- BE INSTALLED AS DIRECTED BY THE CITY OF O'FALLON. 7. ALL FILLS AND BACKFILLS SHALL BE MADE OF SELECTED EARTH MATERIALS, FREE FROM BROKEN MASONRY, ROCK, FROZEN EARTH, RUBBISH,
- 8. GRADING CONTRACTOR SHALL KEEP EXISTING ROADWAYS CLEAN OF MUD AND DEBRIS AT ALL TIMES.
- 9. ALL GRADING & DRAINAGE TO BE IN CONFORMANCE WITH THE CITY OF O'FALLON STANDARDS. 10. SEEDING, SODDING, MULCHING AND PLANTINGS FOR ALL DISTURBED AREAS SHALL BE SPECIFIED ON THE LANDSCAPE PLAN.
- SIDEWALKS ALONG THE ACCESSIBLE ROUTE SHALL NOT HAVE A SLOPE EXCEEDING 1'V: 20'H. SLOPES GREATER THAN 1'V: 20'H MUST BE
- DESIGNED AS A RAMP. SIDEWALKS TO BE CONSTRUCTED TO ADA STANDARDS. 12. SIDEWALKS, CURB RAMPS, RAMPS AND ACCESSIBLE PARKING SPACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT APPROVED "AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES" (ADAAG) ALONG WITH THE REQUIRED GRADES, CONSTRUCTION MATERIALS,
- SPECIFICATIONS AND SIGNAGE. IF ANY CONFLICT OCCURS BETWEEN THE ADAA GUIDELINES AND THE INFORMATION ON THE PLANS, THE ADAA CUIDELINES SHALL TAKE PRECEDENCE AND THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER PRIOR TO ANY CONSTRUCTION. 13. A DRAINLAYER PERMIT IS REQUIRED BY THE CITY DEPARTMENT OF PUBLIC WORKS FOR ALL PRIVATE STORM SEWERS.
- 14. BY GRAPHIC PLOTTING ONLY, THIS PROPERTY LIES WITHIN UNSHADED ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) ACCORDING TO THE FLOOD INSURANCE RATE MAP PANEL NUMBER 29183C0241G, 290316 (ST CHARLES COUNTY MISSOURI) WHICH BEARS AN ÉFFECTIVE OF JANUARY 20, 2016.
- 15. NO GRADE SHALL EXCEED 3 (HORIZONTAL) :1 (VERTICAL).
- 16. STORMWATER SHALL BE DISCHARGED AT AN ADEQUATE NATURAL DISCHARGE POINT. SINKHOLES ARE NOT ADEQUATE NATURAL DISCHARGE POINTS.
- 17. ALL LANDSCAPE AREAS TO BE FILLED WITH A MINIMUM OF 6" OF TOPSOIL.
- 18. ALL LANDSCAPED AREAS DISTURBED BY OFF-SITE WORK SHALL BE IMMEDIATELY SEEDED OR SODDED, AS DIRECTED BY CITY DEPARTMENT OF PUBLIC WORKS UPON COMPLETION OF WORK IN AREA AFFECTED
- ADEQUATE TEMPORARY OFF-STREET PARKING FOR CONSTRUCTION EMPLOYEES SHALL BE PROVIDED. PARKING ON NON-SURFACED AREAS SHALL BE PROHIBITED IN ORDER TO ELIMINATE THE CONDITION WHEREBY MUD FROM CONSTRUCTION AND EMPLOYEES' VEHICLES IS TRACKED ONTO THE PAVEMENT CAUSING HAZARDOUS ROADWAY AND DRIVEWAY CONDITIONS
- 20. ALL PUBLIC SEWER CONSTRUCTION MUST CONFORM TO THE REQUIREMENTS OF THE CITY OF O'FALLON.

SIDE =  $10^{\circ}$ 

= 14,180 s.f.

- 21, NO STEP ALLOWED AT ACCESSIBLE ENTRANCE DOORS.
- 22. ALL ROOF TOP UNITS SHALL BE SCREENED BY A PARAPET WALL THAT EXTENDS AROUND THE PERIMETER OF THE BUILDING. THE PARAPET SHALL HAVE A MINIMUM HEIGHT THAT IS AT LEAST AS TALL AS THE TALLEST UNIT MOUNTED ON THE ROOF, GROUND MOUNTED HVAC AND MECHANICAL UNITS SHALL BE SCREENED BY FENCING, VEGETATION, OR SOME OTHER MEANS (APPROVED BY THE PLANNING AND ZONING COMMISSION) THAT HAS A MINIMUM HEIGHT THAT IS AT LEAST AS TALL AS THE TALLEST UNIT BEING SCREENED.
- 23. STORM WATER DETENTION AND WATER QUALITY MEASURES ARE PROPOSED FOR THE NEW IMPROVEMENTS. NO MODIFICATIONS ARE PROPOSED FOR THE EXISTING IMPROVEMENTS OR STORMWATER CONTROL MEASURES.
- 24. ALL PAVING TO BE TO ST. LOUIS COUNTY STANDARDS EXCEPT AS MODIFIED BY THE CITY OF O'FALLON, CONCRETE SHALL BE 4.000 PSI
- 25. SETBACKS PER ZONING ("I-1", LIGHT INDUSTRIAL)  $\frac{PARKING}{FRONT} = 10'$ FRONT = 30'
- 26. PARKING REQUIREMENTS (OFFICE / WAREHOUSE / MANUFACTURING)
- EXISTING PARKING
- PROPOSED PARKING BUILDING AREAS:

SIDE = 20'

- WAREHOUSE = 40,000 s.f. + 49,812 s.f. (PROPOSED)MANUFACTURING = 50,000 s.f.
- WARFHOUSE
- MANUFACTURING 132 EMPLOYEES
- A. OFFICES One (1) space per 300 sq. ft. of floor area = <u>48 SPACES</u> OFFICE AREA = 14,180 s.f. / 300B. <u>WAREHOUSE AND STORAGE</u>
- One (1) space for every employee on the maximum work shift, plus one (1) for each vehicle utilized in the operation of the business, plus two (2) guest spaces. Any other uses within a warehouse building (office, retail, manufacturing, etc.) would also require parking based upon those separate calculations. EMPLOYEES = 7 (WAREHOUSE)
- = 40,000 s.f. + 49,812 s.f. (PROPOSED) = 89,812 s.f. WARFHOUSE AREA = 7 SPACES + 2 GUEST SPACES PARKING REQUIRED = 9 SPACES
- . MANUFACTURING FACILITIES One (1) space per employee, plus one (1) space per 1,000 sq. ft. of floor area EMPLOYEES = 9.3
- MANUFACTURING AREA = 50,000 s.f. / 1,000= 50 SPACES PARKING REQUIRED = 93 + 50= <u>143 SPACES</u>
- TOTAL PARKING REQUIRED = 48 + 9 + 143= 200 SPACES TOTAL PARKING PROVIDED = 160 SPACES (INCLUDES 7 ADA)
- NOTE: THE PROPOSED PARKING COUNT MATCHES THE EXISTING PARKING COUNT OF 160 STALLS, WHICH HISTORICALLY HAS BEEN NO CHANGES ARE ANTICIPATED TO THE NUMBER OF EMPLOYEES OR THE NUMBER OF VISITORS WITH THE PROPOSED WAREHOUSE EXPANSION, THEREFORE, NO INCREASE TO THE QUANTITY OF EXISTING STALLS IS PROPOSED.
- 27. BIKE PARKING (1) RACK SPACE PER FIFTEEN (15) REQUIRED AUTOMOBILE PARKING SPACES, WITH A MINIMUM OF FOUR (4) RACK SPACES PER INDIVIDUAL REQUIRED = 160 / 15 = 11 SPACESPROVIDED = 11 SPACES
  - NOTE: BIKE PARKING WAS PROVIDED DURING THE 2018 OFFICE EXPANSION
- 28. LOADING REQUIREMENTS: (PER SEC. 400.512)
- Number of loading spaces required. Uses having over five thousand (5,000) square feet of gross floor area shall provide at least one (1) off-street loading and unloading space. For every additional twenty thousand (20,000) square feet of gross floor space, one (1) additional loading and unloading space shall be provided (LOADING SPACE =  $12'W \times 35'L$ ) BUILDING AREA = 14,180(OFFICE) + 90,000(WAREHOUSE/MANUF) + 49,812(NEW WAREHOUSE)
- = 153,992 s.f.LOADING REQUIRED = 1 + 153,992 s.f. -5,000 = 9 LOADING SPACES
- LOADING PROVIDED = 10 SPACES

a. OFFICE

- 29. HEIGHT REQUIREMENTS: (PER SEC. 400.140 "I-1" LIGHT INDUSTRIAL) EXCEPT AS OTHERWISE PROVIDED IN ARTICLE VI OF THIS CHAPTER, NO BUILDING OR STRUCTURE SHOULD EXCEED FIFTY (50) FEET OR THREE (3) STORIES. BUILDING HEIGHTS = 18'-4"
- b. NEW WAREHOUSE = 29'-0" 30. ALL PROPOSED FENCING REQUIRES A SEPARATE PERMIT.
- 31. ALL SIGN LOCATIONS AND SIZES MUST BE APPROVED SEPARATELY THROUGH THE PLANNING DIVISION
- LIGHTING VALUES WILL BE REVIEWED ON SITE PRIOR TO THE FINAL OCCUPANCY INSPECTION. CORRECTIONS WILL NEED TO BE MADE IF NOT IN COMPLIANCE WITH CITY STANDARDS. LIGHTING ON SITE MUST BE AIMED AND SHIELDED SO THAT AMBIENT LIGHT LEVEL ON SITE DOES NOT EXCEED 0.5 FOOT CANDLES AT THE PROPERTY LINE.
- 33. ALL PROPOSED UTILITIES TO BE LOCATED UNDERGROUND.
- 34. ALL SILTATION CONTROL DEVICES (SILT FENCES AND SEDIMENTATION BASINS) SHALL FOLLOW ST. LOUIS COUNTY SOIL AND WATER CONSERVATION DISTRICT EROSION AND SEDIMENT CONTROL GUIDELINES.
- 35. CITY APPROVAL OF THE CONSTRUCTION SITE PLANS DOES NOT MEAN THAT ANY BUILDING CAN BE CONSTRUCTED ON THE LOTS WITHOUT MEETING THE BUILDING SETBACKS AS REQUIRED BY THE ZONING CODE.

FLOW = 15 GAL/PERSON/DAY

- 36. ALL PROPOSED UTILITIES AND/OR UTILITY RELOCATIONS SHALL BE LOCATED UNDERGROUND
  - **Determination of Sanitary Flows**
  - 1. USING MISSOURI DNR GUIDELINES FOR SANITARY WASTE AS LISTED IN CHAPTER 8 DESIGN GUIDES (10 CSR 20-8.020).
  - EMPLOYEES: 2. CONVERSION RATE: 1 GPM = 0.002228 C.F.S.
  - 3. TOTAL EMPLOYEES
  - A. AVERAGE DAILY FLOW (ADF) EMPLOYEES = 132 PEOPLE X 15 GALLONS/PERSON/SHIFT

(8-HR. SHIFT)

- $= (132 \times 15) / (24 \text{ HR. } \times 60 \text{ MIN./HR.}) = 1.38 \text{ GPM}$
- B. PEAK HOURLY FLOW (PHF) = ADF X 4  $= 1.38 \text{ GPM } \times 4$ 
  - = 5.52 GPM OR 0.01 C.F.S.

# **EARTHWORK NOTES**

BULK CUT 10,399 +/- CUBIC YARD
BULK FILL 10,399 +/- CUBIC YARD (INCLUDES 15% FOR SHRINKAGE)

THE CALCULATED EARTHWORK QUANTITIES SHOULD BE REGARDED AS AN ESTIMATE OF THE BULK MOVEMENT AND/OR REDISTRIBUTION OF SOILS FOR THE SUBJECT PROPERTY. THE CALCULATED QUANTITIES ARE INTENDED FOR GENERAL USE, AND SHOULD BE USED AS A COMPARISON WITH THE QUANTITIES CALCULATED BY THE EARTHWORK SUBCONTRACTOR. THE ENGINEER ASSUMES NO LIABILITY FOR COST OVERRUNS DUE TO EXCESS EXCAVATED MATERIALS OR FILL SHORTAGES. DISCREPANCIES BETWEEN THE ENGINEER'S CALCULATED QUANTITIES AND

THE EARTHWORK SUBCONTRACTOR'S ESTIMATE SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY. THE EARTHWORK QUANTITIES ESTIMATED FOR THE SUBJECT SITE ARE BASED UPON HORIZONTAL AND VERTICAL LOCATION OF THE IMPROVEMENTS AS PROPOSED ON THE SITE ENGINEERING PLANS PREPARED BY CIVIL ENGINEERING DESIGN CONSULTANTS, INC.

- THE ENGINEER'S ESTIMATE DOES NOT INCLUDE ANY OF THE FOLLOWING ITEMS PERTAINING TO EARTHWORK QUANTITIES THAT MAY BE NECESSARY FOR COMPLETION OF THE PROJECT: A.) MISCELLANEOUS UNDERGROUND CONDUITS AND MANHOLES
- B.) WATER MAINS LESS THAN TWENTY-FOUR INCHES IN DIAMETER.
- C.) BUILDING FOOTINGS AND FOUNDATIONS
- D,) UTILITY AND/OR LIGHT STANDARD BASES
- THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACTUAL SIZE OF THE FIELD EXCAVATIONS MADE FOR THE INSTALLATION OF UNDERGROUND STRUCTURES, AND THEREFORE, THE ACTUAL EARTHWORK QUANTITIES MAY VARY FROM THE THESE ESTIMATED QUANTITIES. THE ENGINEER ALSO ASSUMES NO RESPONSIBILITY FOR COSTS INCURRED DUE TO THE REMOVAL OF UNSUITABLE MATERIAL WHICH MUST BE REMOVED FROM THE SITE.
- 1.) IT IS ASSUMED THAT THE TOPSOIL, IF ANY, WILL BE REUSED ON-SITE WITHIN LANDSCAPING AREAS AND WILL NOT BE HAULED OFF. SUBGRADE FOR ASPHALT PAVEMENT SECTIONS - 11" SUBGRADE FOR BUILDING PAD - 10" 4.) ASSUMED 15% SHRINKAGE FACTOR

### CITY GENERAL NOTES

- Driveway locations shall not interfere with the sidewalk handicap ramps, or curb inlet sumps
- Sidewalks, curb ramps, ramps and accessible parking spaces shall be constructed in accordance with the current approved "American with Disabilities Act Accessibility Guidelines" (ADAAG) along with the required grades, construction materials, specifications and signage. If any conflict occurs between the above information and the plans, the ADAAG guidelines shall take precedence and the contractor prior to any construction shall notify the Project Engineer.
- Truncated domes for curb ramps located in public right of way shall meet PROWAG requirements and shall be constructed using red pre-cast truncated domes per pavement details.
- Any proposed pavilions or playground areas will need a separate permit from the Building Division.
  - The Contractor is responsible to call Missouri One Call and The City of O'Fallon for the location of utilities, Contact the City of O'Fallon (636) 379-3814 for the location of City maintained cable for street lights and traffic signals, all other utilities call Missouri One Call 1-800-DIG-RITE. 1-800-344-7483
- . All proposed utilities and/or utility relocations shall be located underground
- 5. All proposed fencing requires a separate permit through the Building Safety Division.
- All construction operations and work zone traffic control within the right of way will follow MoDOT or M.U.T.C.D. standards whichever
- 8, (INTENTIONALLY OMITTED)
- All subdivision identification or directional sign(s) must have the locations and sizes approved and permitted separately through the Planning and Development Division.
- Materials such as trees, organic debris, rubble, foundations, and other deleterious material shall be removed from the site and disposed of in compliance with all applicable laws and regulations. If the material listed previously are reused, a letter from a soil Engineer must clarify amount, location, depth, etc. and be approved with the construction plans. Landfill tickets for such disposal shall be maintained on file by the developer. Burning on site shall be allowed only by permit from the local fire district. If a burn pit is proposed the location and mitigation shall be shown on the grading plan and documented by the soils engineer.
- Twenty—four (24) hours prior to starting any of the work covered by the above plans and after approval thereof, the developer shall make arrangements with the Construction Inspection Office to provide for inspection of the Work, sufficient in the opinion of the City Engineer, to assure compliance with the plans and specifications as approved.
- 12. The City Engineer or their duly authorized representative shall make all necessary inspections of City infrastructure, escrow items or
- 3. All installations and construction shall conform to the approved engineering drawings. However, if the developer chooses to make minor modifications in design and/or specifications during construction, he/she shall make such changes at his/her own risk, without any assurance that the City Engineer will approve the completed installation or construction. It shall be the responsibility of the developer to notify the City Engineer of any changes from the approved drawings. The developer may be required to correct the installed improvements so as to confirm to the approved engineering drawings. The developer may request a letter from the Construction Inspection Division regarding any field changes approved by the City inspectors.
- 4. City approval of the construction site plans does not mean that any building can be constructed on the lots without meeting the building setbacks as required by the zoning code.

## **EROSION CONTROL NOTES**

- The Permittee shall assume complete responsibility for controlling all siltation and erosion of the project area. The Permittee shall use whatever means necessary to control erosion and siltation including, but not limited to, staked straw bales and/or siltation fabric fences (possible methods of control are detailed in the plan). Control shall commence with the clearing operations and be maintained throughout the project until acceptance of the work by City of O'Fallon and as needed by MoDOT. The Permittee's responsibilities include all design and implementation as required to prevent erosion and the depositing of silt. The City of O'Fallon and as required by MoDOT may at their option direct the Permittee in his methods as deemed fit to protect property and improvements. Any depositing of silt or mud on new or existing pavement shall be removed immediately. Any depositing of silts or mud in new or existing storm sewers and/or swales shall be removed after each rain and affected areas cleaned to the satisfaction of the City of O'Fallon and as required by MoDOT."
- All erosion control systems are to be inspected and corrected weekly, especially within 48 hours of any rain storm resulting in one—quarter inch of rain or more, Any silt or debris leaving the site and affecting public right of way or storm water drainage facilities shall be cleaned up within 24 hours after the end of the storm.
- Erosion control devices (silt fence, sediment basin, etc.) shall be in accordance with Missouri Department of Natural Resources Protecting Water Quality — a field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas.
- This development is required to provide long term post construction BMP's such as; low impact design, source control and treatment controls that protects water quality and controls run off to maximum extent practical in compliance with Phase II Illicit Storm Water Discharge Guidelines. (Ord. 5082, section 405.245)
- Graded areas shall be seeded and mulched (strawed) within 14 days of stopping land disturbance activities. Unless it can be shown to the City Engineer that weather conditions are not favorable, vegetative growth is to be established within 6 weeks of stopping grading work on the project. The vegetative growth established shall be sufficient to prevent erosion and the standard shall be as required by EPA and DNR. (70% coverage per square foot) Ord. 6496, Section 405.095

### **ROADWAY NOTES**

- . All paying (public and private) to be in accordance with St. Louis County Standards and Specifications except as modified by the City of O'Fallon ordinances.
- 2. If the intersecting road does not have a curb, then the curb on the new entrance shall begin 10' from the edge of the existing
- Provide 6" of concrete over 5" of aggregate base rock or asphalt equivalent for minor residential streets per City Code 405.370. 3.1. Rock to meet the all the requirements of MoDOT type 5 rock with a tighter restriction on the fines being that no more than ten percent (10%) fines shall pass a no. 200 sieve. (City Code 405.210.B.1) The gradation of this rock needs to be submitted to the City for approval. Any deliveries made without the proper delivery ticket, including signature, will not be accepted. The delivery ticket must list the project name or jobsite location. A separate certification sheet may be provided attached to the delivery ticket with a signature of the company's quality control manager. The quality control certification
- 4. Multi-use trail (when required) Shall have a minimum of 3" Type "C" Asphalt over 4" aggregate base per City requirements.
- 5. Type C (BP-1) Compaction requirements shall be 98% minimum density according to St. Louis Co. Standard Specifications.
- 6. Provide pavement striping at any point where the multi-use trail crosses existing or proposed pavement
- 7. All street stub-outs over 250' in length will require a temporary turnaround. 8. All sub grade in cut or fill will need to conform to the City of O'Fallon Compaction requirements

must be current and dated within 4 weeks of the delivery. (City Code 405.210.A.2.k)

- ). Material Testing And Frequency. Materials for construction shall be tested and inspected per the appropriate ASTM code or at the City Engineer's discretion. The developer's engineer shall perform quality control guidelines, in accordance with St. Louis County
- 10, Approval Of Sub grade And Base (Sub base). The City Engineer or representative shall approve the sub grade before any base is placed thereon and shall approve the base before concrete or surface course is placed. The sub grade and base shall be so constructed that it will be uniform in density throughout.
- 11. In all fill areas in the roadways, soil tests shall be submitted and approved by the City Engineer for each foot of fill and at least one (1) test and an average of one (1) test within every two hundred fifty (250) feet.
- 12. No traffic will be allowed on new concrete pavement until it has cured for seven (7) days and it reaches three thousand five hundred (3,500) psi within 28 days. 12.1. Concrete payements shall not be approyed unless it reaches a strength of four thousand (4,000) psi. Cylinders/compressive strength. One (1) set of four (5) cylinders within the first fifty (50) cubic yards and one (1) set per one hundred (100) cubic
- yards thereafter. One (1) cylinder must be tested at seven (7) days, three (3) at twenty-eight (28) days, and one (1) held in 3. Prior to placement of aggregate base material on sub grade and prior to placement of payement on base material, the sub grade and base must be proof-rolled with a fully loaded (ten (10) ton load) tandem truck or equivalent tire vehicle with one (1) pass down each driving lane no faster than three (3) miles per hour. If soft spots are detected, or pumping, rutting or heaving occurs greater than one (1) inch at the sub grade, the roadbed shall be considered unsatisfactory and the soil in these areas shall be
- remediated to the depth indicated by the contractor's testing firm and approved by a representative of the City Engineer. 4. Sub grade and base beneath pavements shall be compacted to St. Louis County Highway Department specifications. The moisture range shall be determined by the Standard or Modified Proctor Density Method AASHTO T-99 and within -2/+4 percentage points of the optimum moisture content.
- 15. The entire width and length will conform to line, grade and cross section shown on the plans or as established by the engineer. If any settling or washing occurs, or where hauling results in ruts or other objectionable irregularities, the contractor shall improve the sub grade or base to the satisfaction of the City before the payement is placed. Additional rolling or methods to verify compaction shall be at the discretion of the City Engineer. Tolerance allowed on all lines, grades and cross sections shall be plus or minus four-hundredths (+0.04) feet.
- 16. Utility Work Prior To Base Construction. No base course work may proceed on any street until all utility excavations (storm and sanitary sewers, water, gas, electric, etc.) have been properly back filled with granular material, crushed stone or gravel mechanically tamped in ten (10) inch lifts. Utilities installed after sub grade preparation shall be bored. Compaction requirements shall follow St. Louis County standards.
- 17. Equipment calibration. The developer's contractors and subcontractors must have their equipment calibrated by the following
- 17.1. Air meter--weekly.
- 17.2. Cylinder compression—annually by independent calibration service. 17.3. Batch scales——monthly.
- 17.4. Nuclear testing devices—every six (6) months. 17.5. Proctor equipment—every six (6) months. 17.6. Slump cone—monthly,
- 18, All permanent traffic control will be per M,U,T,C,D, or MoDot standards, S1-1 from the M,U,T,C,D, manual will be used at all
- crosswalk locations accompanied with ether w16-9p or w16-7p signs 19, All traffic signals, street signs, sign post, backs and bracket arms shall be painted black using Carboline Rust Bond Penetratina
- 20. If the excavations are made in the improved portion of the right-of-way, twelve inches of granular backfill will be placed over exposed facilities and controlled low strength material (CLSM) aka flowable fill will fill the hole with eight inches of the finished surface for concrete pavement. There will be a plastic membrane placed between the rock base and the CLSM to prevent the material from bleeding into the rock base. The remaining eight inches will be restored by placing a 28 day, 4,000 psi concrete mix.

Sealer SG and Carboline 133 HB paint (or equivalent as approved by City of O'Fallon and MoDOT)

### **GRADING NOTES**

- Developer must supply City Construction Inspectors with an Engineer's soil reports prior to and during site grading. The soil report will be required to contain the following information on soil test curves (Proctor reports) for projects within the City:
- Maximum dry density
- Curve must be plotted to show density from a minimum of 90% Compaction and above as determined by the "Modified AASHTO
- Optimum moisture content
- Maximum and minimum allowable moisture content

approved SWPPP.

- T-180 Compaction Test" (A.S.T.M.-D-1157) or from a minimum of 95% as determined by the "Standard Proctor Test ASSHTO

- T-99. Method C" (A.S.T.M.-D-698). Proctor type must be designated on document.
- Curve must have at least 5 density points with moisture content and sample locations listed on document Specific aravity Natural moisture content
- Liauid limit Plastic limit Be advised that if this information is not provided to the City's Construction Inspector the City will not allow grading or construction activities to proceed on any project site.
- All fill placed in greas other than proposed storm sewers, sanitary sewers, proposed roads, and payed greas shall be compacted from the bottom of the fill up in 8" lifts and compacted to 90% maximum density as determined by Modified AASHTO T-180 compaction test or 95% of maximum density as determined by the Standard Proctor Test AASHTO T-99. Ensure the moisture content of the soil in fill areas corresponds to the compactive effort as defined by the Standard or Modified Proctor Test. Optimum moisture content shall be determined using the same test that was used for compaction. Soil compaction curves shall be submitted to the City of O'Fallon prior to the placement of fill.
- The surface of the fill shall be finished so it will not impound water. If at the end of a days work it would appear that there may be rain prior to the next working day, the surface shall be finished smooth, If the surface has been finished smooth for any reason, it shall be scarified before proceeding with the placement of succeeding lifts. Fill shall not be placed on frozen ground, nor shall filling operations continue when the temperature is such as to permit the layer under placement to freeze,
- All sediment and detention basins are to be constructed during the initial phase of the grading operation or in accordance with the
- When grading operations are complete or suspended for more than 14 days, permanent grass must be established at sufficient density to provide erosion control on site. Between permanent grass seeding periods, temporary cover shall be provided according to Missouri Department of Natural Resources Protecting Water Quality — a field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas.All finished grades (areas not to be disturbed by improvements) in excess of 20% slopes (5:1) shall be mulched and tacked at a rate of 100 pounds per 1000 square feet when seeded.
- No slopes shall exceed 3 (horizontal): 1 (yertical) unless otherwise approved by the soils report and specifically located on the plans and approved by the City Engineer.
- All low places whether on site or off shall be graded to provide drainage with temporary ditches,
- Construction Inspection Department and following Missouri Department of Natural Resources standards and specifications. (INTENTIONALLY OMITTED)

Any existing wells and/or springs which may exist on the property must be sealed in a manner acceptable to the City of O'Fallon

material (free of large clods, or stones) and compacted using either mechanical tamping or water jetting, Granular material and earth material associated with new construction outside of pavements may be jetted, taking care to avoid damage to newly laid sewers. The jetting shall be performed with a probe route on not greater than 7.5 foot centers with the jetting probe centered over and parallel with the direction of the pipe. Trench widths greater than 10 feet will require multiple probes every 7.5 foot centers.

0. All trench back fills under paved areas shall be granular back fill, and compacted mechanically. All other trench back fills may be earth

- Depth, Trench back fills less than 8 feet deep shall be probed to a depth extending half the depth of the trench back fill, but not less than 3 feet. Trench back fill greater than 8 feet in depth shall be probed to half the depth of the trench back fill but not
- areater than 8 feet. Equipment, The jetting probe shall be a metal pipe with an interior diameter of 1.5 to 2 inches. Method, Jetting shall be performed from the lowest surface topographic point and proceed toward the highest point, and from the bottom of the trench back fill toward the surface. The flooding of each jetting probe shall be started slowly allowing slow saturation of the soil. Water is not allowed to flow away from the trench without first saturating the trench.
- 10.4. Surface Bridging, The contractor shall identify the locations of the surface bridging (the tendency for the upper surface to crust and arch over the trench rather than collapse and consolidate during the jetting process). The contractor shall break down the bridged areas using an appropriate method such as wheels or bucket of a backhoe. When surface crust is collapsed, the void shall be back filled with the same material used as trench back fill and re-jetted. Compaction of the materials within the sunken/jetted area shall be compacted such that no further surface subsidence occurs.
- . Site grading. 11.1. Within City right-of-way. Material is to be placed in eight (8) inch to twelve (12) inch loose lifts and compacted per the approved compaction requirements. One (1) compaction test will be performed every two hundred fifty (250) feet along the
- centerline for each lift. 11.2. Outside of City right—of—way. Material is to be placed in eight (8) inch to twelve (12) inch loose lifts and compacted per the approved compaction requirements. One (1) compaction test will be performed at two (2) foot vertical intervals and approximately every one thousand (1,000) cubic yards.
- 12. Access to the site from any other location other than the proposed construction entrance is strictly prohibited!

## SANITARY SEWER NOTES

- 1. All sanitary sewer installation is to be in accordance with M.S.D. standards and specifications except as modified by the City of
- Brick shall not be used in the construction of sanitary sewer structures. Pre cast concrete structures are to be used unless otherwise approved by the City of O'Fallon.
- 3. Connections at all sanitary structures are to be made with A-Lock joint or equal

4. All sanitary laterals shall be a minimum of 4" residential, 6" commercial diameter pipe.

- 5. All sanitary mains shall be a minimum of 8" diameter pipe.
- 6. All sanitary sewer line with a slope greater than 20% will require concrete cradle or concrete collar at each pipe joint. Sanitary line with a slope greater than 50% will require a special approved design as shown on detail sheet. 7. All manholes built within the 100 year flood plain must have lock type watertight manhole covers.
- 8. All sanitary sewer mains must have a minimum of 42" cover, 9. When sanitary mains cross over storm line the sanitary main must be ductile iron pipe for 10 feet on each side of the crossing.
- 10. Encase with concrete both sanitary and storm sewer at crossing when storm sewer is within 18 inches above sanitary sewer. Add concrete cradle to only RCP storm sewer and encase flexible storm sewer when it is more than 18 inches above sanitary line. Show on profile sheet.
- 11. The sanitary sewers should run diagonally through the side yards to minimize any additional utility easements required.
- 12. All sanitary sewer structures shall be waterproofed on the exterior in accordance to Missouri DNR specifications 10CSR-8.120 (7)(E). 13. All sanitary sewer pipe shall be SDR35 or equal. All sanitary sewer laterals shall be Schedule 40.

14. All sanitary sewer manholes and pipes will be tested to the following specifications. ASTM C1244, Standard testing method for Concrete

Sewer Manhole by Negative Air Pressure (Vacuum), Latest revision ASTM F1417, Standard testing method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low Pressure Air, Latest revision.

15. Add 1" minus rock back fill to all sanitary sewer and all other utilities that lie within the 1:1 shear plane of the road.

approved by the City of O'Fallon.

that will allow infiltration of storm water.

- STORM SEWER NOTES
- 1. All Storm Sewer installation is to be in accordance with M.S.D. standards and specifications except as modified by the City of O'Fallon ordinances.

Brick shall not be used in the construction of storm sewer structures. Pre cast concrete structures are to be used unless otherwise

(INTENTIONALLY OMITTED)

3. A 5/8" trash bar shall be installed horizontally in the center of the opening(s) in all curb inlets and area inlets.

- 5. Encase with concrete both sanitary and storm sewer at crossing when storm sewer is within 18 inches above sanitary sewer. Add concrete cradle to only RCP storm sewer and encase flexible storm sewer when it is more than 18 inches above sanitary line.
- Show on profile sheet,
- 6. The storm sewers should run diagonally through the side yards to minimize any additional utility easements required.

8. Connections at all storm structures are to be made with A-lock joint or equal.

- 7. All concrete pipes will be installed with 0-ring rubber type gaskets.
- 9. Pre cast concrete inlet covers are not to be used. 10. The swale in the detention basins shall have a minimum 2% longitudinal slope and be lined with a permanent erosion control blanket
- 11. All structures and flared end sections must be concrete. H.D.P.E. pipe will not be allowed for detention basin outflows, final pipe run to detention basins, creek discharge or other approved means.
- 12. (INTENTIONALLY OMITTED) 13. Rip rap shown at flared end sections will be evaluated in the field by the Engineer, Contractor, and City Inspectors after installation
- for effectiveness and field modified, if necessary to reduce erosion on and off site. 14. Add 1" minus rock back fill to all storm sewer that lie within the 1:1 shear plane of the road.

15. (INTENTIONALLY OMITTED)

### **WATER NOTES**

- Fire hydrants shall be a maximum of 600' apart. Local fire district approval is required
- Coordinate with the water company on the location of water meters. For meters in the City's district, meters shall be in the right-of-way, otherwise an access easement from the right-of-way shall be provided.
  - All water main must have a minimum of 42" of cover. (City water mains)
  - Provide water valves to isolate the system
- All water mains shall be class 200 SDR 21 or equal with locator/tracer wires

dechlorination will be performed by the contractor.

If the excavations are made in the improved portion of the right-of-way, twelve inches of argular backfill will be placed over exposed facilities and controlled low strength material (CLSM) aka flowable fill will fill the hole with eight inches of the finished surface for

concrete payement. There will be a plastic membrane placed between the rock base and the CLSM to prevent the material from

- bleeding into the rock base. The remaining eight inches will be restored by placing a 28 day, 4,000 psd concrete mix. DISINFECTING: Disinfecting shall be accomplished by placing sufficient hypo chlorite granule (HTH) in each section of pipe to achieve a chlorine residual in the pipeline, upon initial filling, of 50 mg/L (PPM). HT. tablets will not be allowed. Following completion of the pipeline, it shall be slowly filled with water and a sample will be taken immediately and the chlorine residual must be 50 mg/L or greater. The solution shall be allowed to stand for 24 hours and a sample shall then be taken. The chlorine residual after 24 hours shall be 30 mg/L or greater. If the piping shows insufficient chlorine residuals in either test, the piping shall be re-chlorinated by the injection of hypo chlorite solution until satisfactory results are achieved. All disinfecting shall be done by the contractor. Only the
- testing to determine the chlorine residual will be done by the City. PRESSURE TESTING: Immediately following disinfection, the piping shall be pumped to a pressure (at the HIGHEST point in the project) of 150 psi or higher where the working pressure is higher than 150 PSI as determined by the City. In such cases, the pressure shall be as specified by the City and two pressure tests shall be conducted. The first test shall be with the fire hydrant auxiliary valve open and be to 50 PSI. The second test shall be with the fire hydrant auxiliary valve closed and be to the higher pressure as directed by the City. All pumping equipment and pressure gauges shall be provided by the contractor. After achieving the test pressure, the piping shall be left closed for a period of two (2) hours. At the end of this time the pressure drop shall not exceed 2 psi. In addition, if the pressure appears, in judgment of the City's representative, to be continuing to drop, the test shall be continued for another two (2) hours and if any further drops occur, the test shall be considered a failure. If the pressure test fails, the contractor will be required to find and correct the source of the leakage. If this requires draining of the pipeline, when the leakage is corrected,
- All tops for valves, meters, and manholes are to be constructed to within 1 inch (0.08') of finish grade. Grading around structure tops on slopes need to be accounted for.

the pipeline must be re-disinfected and the pressure tested again until satisfactory result are achieved. Any MDNR required

BACTERIOLOGICAL TESTING: After satisfactory disinfection and pressure testing, a sample shall be taken by the contractor in the presence of a City representative and submitted to a laboratory approved by the Missouri Department of Natural Resources and the City for bacteriological analysis. After 24 hours, a second sample shall be taken in a like manner and submitted for analysis. The two samples taken on consecutive days ,a minimum of 24 hours apart, must be found to be "safe" by the testing laboratory, and copies of the test results must be supplied to the City. If the samples are not found to be "safe" further flushing and/or disinfection as directed by the City shall be conducted by the contractor until "safe" samples on two consecutive test days are achieved. Following successful bacteriological testing and a determination by the City that the samples are "safe", the mains may be placed into service.

## SECTION 31 00 00 -EARTHWORK

- Note: the geotechnical report prepared by SCI Engineering with a date of June, 2018, shall be considered part of these specifications. The contractor is responsible for obtaining a copy of the report which shall be used as the basis for construction means and
- 1.1 DEFINITIONS IN THIS SECTION INCLUDE THE FOLLOWING: A. Backfill: Soil materials used to fill an excavation.
- B. Base Course: Layer placed between the subbase course and asphalt paying.
- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe. D. <u>Borrow:</u> Satisfactory soil imported from off—site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

- F. Excayation: Removal of material encountered above subgrade elevations. 1. <u>Additional Excavation:</u> Excavation below subgrade elevations as directed by Construction Manager. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work. 2. <u>Unauthorized Excavation</u>: Excavation below subgrade elevations or beyond indicated dimensions without direction by Construction Manager. Unauthorized excavation, as well as remedial work directed by Construction Manager, shall be without
- additional compensation. G. Fill: Soil materials used to raise existing grades. H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade

and a concrete pavement or walk. J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials. K. Utilities include on—site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

L. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by

## Construction Manager and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 PRODUCTS 2.1 MATERIALS: A. Soil Materials: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. B. Satisfactory Soils: ASTM D 2487 soil classification groups CL, ML, CL-ML, and GW BY ASTM D 2487-11; free of rock or gravel

larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. The

E. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM

- contractor shall refer to the geotechnical report or directly with the geotechnical engineer to confirm satisfactory soils prior to construction. C. Backfill and Fill: Satisfactory soil materials. D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- D 2940: except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) F. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

### G. Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.

elsewhere, to allow for bedding course. Hand excayate for bell of pipe.

percent and is too wet to compact to specified dry unit weight.

of on-site at direction of Construction Manager.

PART 3 EXECUTION 3.1 PREPARATION: A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. B. Provide erosion and sedimentation control measures.

C. Prevent surface water and around water from entering excavations, from ponding on prepared subgrades, and from flooding

Project Site and surrounding area. D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation. E. Excayate to subgrade elevations regardless of the character of surface and subsurface conditions encountered including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory

- F. Excayate for structures, payements, and walks to indicated elevations and dimensions. Extend excayations for placing and removing concrete form work, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work. G. Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit.
- H. Proof roll subgrades, before filling or placing aggregate courses, with heavy pneumatic—tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities. J. Fill unauthorized excayation under foundations or Wall footings by extending bottom elevation of concrete foundation or footing to excayation bottom, without altering top elevation. Lean concrete fill may be used when approved by Construction Manager.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Construction Manager.

requirements of the geotechnical report, of satisfactory soil material to final subgrade.

1. Excayate trenches deeper than bottom of pipe elevations, 6 inches (150 mm) deeper in rock, 4 inches (100 mm) deeper

K. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees. L. Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations. 1. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch (25

mm), to a height of 12 inches (300 mm) over the utility pipe or conduit. Place and compact final backfill, according to the

- 2. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under payements and slabs. M. Fill: Place and compact fill material in layers to required elevations. N. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum
- O. Compaction: Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated P. Compact soil to not less than the following percentages of maximum dry density as determined by the Standard Proctor test, according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, compact and prepare subgrade and each layer of backfill or fill

1. Remove and replace, or scarify and air—dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2

2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent of standard Proctor (ASTM D 698) maximum dry density or as directed by the geotechnical engineer. 3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent of standard Proctor (ASTM D 698) maximum dry density or as directed by the geotechnical engineer.

Q. Grading: Uniformly grade areas to smooth surface, free from irregular surface changes. Comply with compaction requirements

R. Subbase and Base Courses: Under pavements and Walks, place subbase course on prepared subgrade. Place base course

material over subbase. Compact to required grades, lines, cross sections, and thickness to not less than 98 percent of

minus 1 inch (25 mm) and payements and areas within building lines to plus or minus 1/2 inch (13 mm).

and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpayed subgrades to tolerances of plus or

material at 95 percent of standard Proctor (ASTM D 698) maximum dry density or as directed by the geotechnical engineer,

maximum dry density as determined by the standard Proctor test, according to ASTM D 698. S. Under slabs—on—grade, place drainage course on prepared subgrade. Compact to required cross sections and thickness to not less than 98 percent of maximum dry density as determined by the standard Proctor test, according to ASTM D 698. T. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality control

1. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only

W. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose

after test results for previously completed work comply with requirements. 2. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained. U. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled or where they lose compaction. V. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

ARCHITECT

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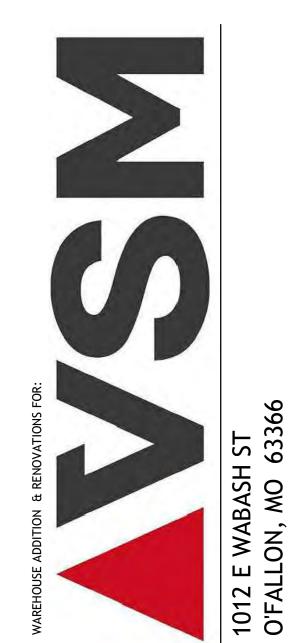
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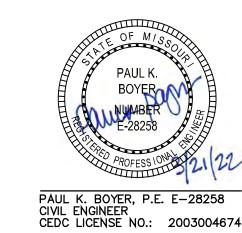
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01/05/22 | Construction Site Plan Submittal

**DESCRIPTION:** 

01/14/22 | Permit / Bid Set

02/24/22 | City comments

03/21/22 City comments

01/14/22 Issue Date: Job Number 1981.1 Drawn By: PKB

Specification

END OF SECTION 31 00 00

Checked By:

Drawing Title: