SECTION 9 CONTENTS

SPECIFICATIONS FOR SIDEWALKS AND BICYCLE PATHS

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9.01 DESCRIPTION OF WORK

The work shall consist of furnishing and installing sidewalks of the specified widths and thicknesses as shown on the drawings specified herein, and furnishing all labor, materials, tools, and equipment for receiving, unloading, transporting, laying, and testing of sidewalk and bicycle paths. Contractor shall furnish all necessary accessories to complete the sidewalk and or bicycle path work as shown on the drawings and specified herein.

The work shall be performed in accordance with the specifications and drawings of the most recent editions MDOT Standard Specifications for Construction and the following specifications.

9.02 RIGHT-OF-WAY/EASEMENTS

The Contractor shall confine his work to the public right-of-way or recorded easements as shown on the drawings. Any other area required for equipment or material storage or for construction operations shall be the Contractor's responsibility.

9.03 LIMITATION ON OPERATIONS

The Contractor shall at all times conduct his work so that there is a minimum of inconvenience to the residents of the streets in the project area. A traffic control plan must be submitted to, and approved by, the municipality and/or agency of jurisdiction prior to the start of construction.

9.04 PERMITS

The Owner shall obtain all necessary permits including but not limited to those from the Road Commission and Water Resources Commissioner. The Owner will receive plan approval from these agencies. The Owner shall pay for any charges or bonds for those permits and related inspection by those agencies.

The Owner will obtain the Soil Erosion and Sedimentation Control permit and provide a copy for the Contractor’s reference. The Owner is to provide a certified storm water operator and shall complete inspection reports as required by local, state, and federal requirements.

9.05 STAKING

Alignment and grade of the pathway/sidewalk must be staked by the design engineer. Contractors constructing without stakes accept liability for the placement of the pathway/sidewalk if found to be unacceptable.

9.06 GRADING

All streets, walks, and other improved surfaces disturbed by construction operations shall be replaced to uniform lines and grades established by the Engineer. The Contractor shall haul in approved fill material or haul out and properly dispose of excess material as necessary.

The Contractor shall perform all grading, compacting, shaping, and related work required to prepare the subgrade to the satisfaction of the Engineer.

Grade Tolerances:
Subgrade: +/- ¾"
Subbase:+/- ½"
Aggregate Depth +/- ½"

Pavement Depth:
In no instance shall the finished bituminous course or concrete thickness be more than ½" thinner than plan thickness.

9.07 TESTING

Testing Requirements:

Compaction (Based on the Michigan One Point Cone Test)
Aggregate Base: 98%
Aggregate Surface: 98%
Gravel Shoulder: 95%
Sand sub-base: 95%
Hot Mix Asphalt Pavement: 92%-96% of the Theoretical Maximum Density.

Pavement cores may be taken for density determination if it appears that there is not enough compactive effort being made during paving operations. Cost for testing and repair will be the responsibility of the owner if the tests indicate the pavement surface falls below the specifications listed in this section.

Sub-grade is to be proof rolled prior to placing sub-base material. Any areas indicating signs of yielding are to be undercut and filled and compacted with material meeting MDOT Class II requirements.

Aggregate performance and stability shall be verified prior to the first course of pavement as directed by the Engineer.

9.08 LONGITUDINAL AND TRANSVERSE GRADES

Sidewalk or pathway transverse grades shall be between 1.5% and 2.0%. In no circumstance may transverse grades exceed 2.0%. Longitudinal grades shall be 5.0% maximum unless directed by Engineer and must meet ADA requirements.

9.09 ASPHALT PATHWAY CONSTRUCTION

9.09.01 Width

Minimum pathway width must be 8 feet. Wider pathway may be required as indicated on the plan.

9.09.02 Sub-base Preparation

Existing vegetation shall be removed, and organic material excavated to provide a minimum of six (6") inches of MDOT Class II sand subbase. Deeper sand subbase depths may be required to properly undercut existing organic material. The sand subbase shall extend a minimum of one (1') foot beyond each edge of the surface course width and shall be compacted to ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures. Where fill sand is required it shall be compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

Where path is being constructed above recently disturbed soil due to grading, new utility installations or existing utility alterations, or any other activity that disturbs the existing soils, all fill and backfill material shall be MDOT Class II sand and compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

9.09.03 Aggregate Base

Aggregate base shall consist of a minimum of six (6") inches aggregate as specified below and extend a minimum of one (1') foot beyond each edge of the surface course width. Material must be MDOT 21AA or approved equal.

Aggregate surface course shall meet the requirements of Sections 306 and 902 of the MDOT 2012 Standard Specifications for Construction.

All material shall be taken from stockpiles that have recently been tested by the county road commission, MDOT, or an independent laboratory. Aggregate material that is removed from roadways and driveways shall not be reused but shall be replaced with an equivalent depth of newly compacted aggregate conforming to MDOT 21AA.

9.09.04 Herbicide

This treatment is to control vegetation before and after plant growth begins under asphalt.

The Contractor shall spray herbicide on all areas to be paved with HMA. Herbicide treatment shall be applied on the same day as paving and after compaction of the gravel base. The entire area is to be covered in a uniform application with a thickness and application rate determined by the contractor and as specified by the product label and manufacturer's recommendation. The rate will be sufficient to control/kill the vegetation but will not exceed the label rate limitations per square foot/year.

Herbicide shall be Pramitol 25 E manufactured by Agri Solutions, Sonra 4SC manufactured by Makhteshim Agan of North America, Inc., or an approved equal.

The Contractor shall hold the Township and its agents harmless for the effects the herbicide may have to persons or property on or off the pathway. Damage to the turf or landscape plant material caused by any action of the contractor, including but not limited to: drift, leaching or lateral movement of the herbicide from the target area. All landscape material damaged by the contractor will be replaced in kind according to Section 815 of the MDOT 2012 Standards Specifications for Construction.

The Contractor will furnish sufficiently trained personnel qualified as certified commercial pesticide applicators, in the required categories in the State of Michigan, to complete the work in the specified time frame under normal seasonal conditions. The contractor shall obtain any licenses or permits required by the federal, state or local government for the application of herbicide.

9.09.05 Hot Mix Asphalt

Base course shall be applied at a rate of 165 lbs./sq. yd. of MDOT 13A or approved equal in one lift. Maximum Air Voids must be 3% or less. Asphalt Binder must be minimum PG58-28. Recycled Content must not exceed 25% by weight. Mix designs must be submitted to the Engineer for approval.

Bond coat is to be applied between successive courses of asphalt and to all surfaces that the pavement will be in contact with, including existing pavement edges, edges of concrete curb, etc. Bond coast material shall be applied at a rate of 0.1 gal/syd.

Top Course shall be applied at a rate of 110 lbs./sq. yd. of MDOT 36A or approved equal in one lift over a bonding agent over the Base course. Maximum Air Voids must be 3% or less. Asphalt Binder must be minimum PG58-28. Recycled Content must not exceed 17% by weight. Mix designs must be submitted to the Engineer for approval.

Construction methods shall be in accordance with Sections 302, 501, 502 of the MDOT 2012 Standard Specifications for Construction.

The Contractor shall not place the aggregate base course until the subgrade has been approved by the Engineer. The Contractor shall not place the first course of HMA and each successive course of HMA until the underlying aggregate or HMA course has been approved by the Engineer. Proof rolling is required prior to placement of subbase and first course of HMA.

No live-bottom trucks may be used unless directed by the Engineer and after base has been proven to withstand comparable loads with turning.

A minimum of two rollers will be used for compacting and finishing HMA surface. There shall be no visible roller marks on the finished surface of all courses of HMA.

9.10 CONCRETE PATHWAY CONSTRUCTION

9.10.01 Width

Minimum pathway width must be 8 feet. Wider pathway may be required as indicated on the plan.

Where path is being constructed above recently disturbed soil due to grading, new utility installations or existing utility alterations, or any other activity that disturbs the existing soils, all fill and backfill material shall be MDOT Class II sand and compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

9.10.02 Sub-base Preparation

Existing vegetation shall be removed, and organic material excavated to provide a minimum of four (4”) inches of MDOT Class II sand subbase. Six (6”) inch minimum sand subbase is to be placed for proposed path that is specified to be six (6”) inch thick concrete. Deeper sand subbase depths may be required to properly undercut existing organic material. Sand shall be compacted to ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures. Where fill sand is required it shall be compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

9.10.03 Concrete

Concrete shall meet the requirements for Grade P1 or S2 Concrete as specified in Sections 601 and 701 of the MDOT 2012 Standard Specifications for Construction and shall have limestone aggregate. Other material shall meet the requirements of the applicable portions of the MDOT 2012 Standard Specifications for Construction. All concrete pathways shall be paved with a single course of concrete.

Concrete pathway and concrete driveways shall be placed in accordance with Sections 801 and 803 of the MDOT 2012 Standard Specifications for Construction.

Pathways through driveways shall be six (6") inches thick extending a minimum of 5’ on either side of the driveway. Other walks shall be four (4") inches thick. In some circumstances, such as industrial driveways, eight (8”) inch thick concrete shall be required.

9.10.04 Joints

Full depth transverse expansion joints shall be constructed perpendicular to the surface of the pathway at intervals not to exceed two hundred (200') feet. Transverse joints must be completed within a 12-hour window of when the concrete was poured.

One (1”) inch pre-molded expansion joints must be placed between the pathway and back-of-curb when pathway is constructed between the curb and building or other rigid structures. Sealed of joints will not be required.

Transverse plane of weakness joints shall be true to line and grade and shall be placed at eight (8') foot intervals and shall be cut with a wet saw. Planes of weakness joints shall be constructed to a depth of at least one (1") inch and a width of 1/8 inch to 1/4 inch. Sealing of joints will not be required.

Tooled joints are not permitted on pathway.

9.10.05 Surface

The surface of the concrete shall be floated to a level uniform surface and left with a slightly rounded surface. The surface shall be roughened with mechanic's brush to prevent smooth and slippery surfaces. No surface shall be troweled to a glassy finish. Edges at the forms shall be rounded with an edging tool.

9.11 CONCRETE SIDEWALK CONSTRUCTION

9.11.01 Width

Minimum sidewalk width must be 5 feet. Wider sidewalk may be required as indicated on the plan.

9.11.02 Sub-base Preparation

Existing vegetation shall be removed, and organic material excavated to provide a minimum of four (4") inches of MDOT Class II sand subbase. Six (6") inch minimum sand subbase is to be placed for proposed sidewalk that is specified to be six (6") inch thick concrete. Deeper sand subbase depths may be required to properly undercut existing organic material. Sand shall be compacted to ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures. Where fill sand is required it shall be compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

Where sidewalk is being constructed above recently disturbed soil due to grading, new utility installations or existing utility alterations, or any other activity that disturbs the existing soils, all fill and backfill material shall be MDOT Class II sand and compacted to achieve ninety-five (95%) percent maximum unit weight in accordance with MDOT procedures.

9.11.03 Concrete

Concrete shall meet the requirements for Grade P1 or S2 Concrete as specified in Sections 601 and 701 of the MDOT 2012 Standard Specifications for Construction and shall have limestone aggregate. Other material shall meet the requirements of the applicable portions of the MDOT 2012 Standard Specifications for Construction. All concrete sidewalks shall be paved with a single course of concrete.

Sidewalk and concrete driveways shall be placed in accordance with Sections 801 and 803 of the MDOT 2012 Standard Specifications for Construction.

Sidewalks through driveways shall be six (6") inches thick extending a minimum of 5' on either side of the driveway. All other walks shall be four (4") inches thick. In some circumstances, such as industrial driveways, eight (8") inch thick concrete shall be required.

9.11.04 Joints

Full depth transverse expansion joints shall be constructed perpendicular to the surface of the sidewalk at intervals not to exceed one hundred (100') feet. Expansion joint material shall be one-half (1/2") inch pre-molded expansion joints and shall be set 1/4' below the surface of the sidewalk. Sealing of joints will not be required.

One (1") inch pre-molded expansion joints must be placed between the sidewalk and back-of-curb when sidewalk is constructed between the curb and building or other rigid structures. Sealing of joints will not be required.

Transverse plane of weakness joints shall be true to line and grade and shall be placed at five (5') foot intervals and shall be formed with a grooving tool. Planes of weakness joints shall be constructed to a depth of at least one (1") inch and a width of 1/8 inch to ¼ inch. Sealing of joints will not be required.

9.11.05 Surface

The surface of the concrete shall be floated to a level uniform surface and left with a slightly rounded surface. The surface shall be roughened with mechanic's brush to prevent smooth and slippery surfaces. No surface shall be troweled to a glassy finish. Edges at the forms and joints shall be rounded with an edging tool.

9.12 UNDERDRAIN

A minimum four (4") inch diameter underdrain must be provided where sand subbase is not drained by existing pervious soils, by daylighting of subbase, or by adjacent sand subbase, such as a street equipped with underdrain. The top of the underdrain pipe must not be above the specified subgrade elevation.

9.13 CLEAR AREA

A one (1) foot clear area for sidewalk and two (2) foot clear area for pathway must be provided on both sides. There may be no obstruction within the clear area. Maximum slope of the clear area may be no greater than one vertical on six horizontal (1:6).

9.14 VERTICAL CLEARANCE

Vertical clearance for sidewalk and pathways must be a minimum of ten (10) feet.

9.15 GREENBELT

A minimum 5’ greenbelt must be provided between sidewalk/pathway and a public or private street or a driveway unless directed by the engineer.

9.16 ACCESSIBLE CONCRETE RAMPS

Concrete ramps are required to extend a minimum of five (5) beyond the intersections of a street for all pathways regardless of material used for the rest of the pathway.

At locations where sidewalks or bicycle paths are constructed to a concrete curb, the curb shall be constructed to match existing curb using MDOT Detail F4, Detail B2, or other as directed by the engineer with 1-foot dub downs to meet ADA requirements. A clear width equal to the pathway width must be maintained perpendicular to the pathway.

Sidewalk or concrete pathway thickness within curb ramps must be 6 inches thick.

9.17 DETECTIBLE WARNING PLATES

Detectible warning plates must be cast iron and manufactured by EJ or approved equal. Plates must extend the full width of the sidewalk or pathway. Placement must be according to ADA requirements and installed at all street crossings.

9.18 TREES

Trees noted for removal on the drawings shall be taken down and removed from the right-of-way in a manner that does not endanger the adjoining property, or persons or traffic using the right-of-way. Tree limbs (less than three (3”) inches in diameter) and tree stumps shall be completely removed and disposed of by the Contractor.

Firewood from the trees removed shall remain the property of the adjoining property owner. If the adjoining property owner does not want the remaining firewood, it shall be the property of the Contractor and disposed of by the Contractor.

Because of the concern for preservation of trees in the area, only those trees that have been indicated on the construction drawings are to be removed.

Trees six (6) inches and smaller that are removed will not be considered a pay item. If shown in the proposal, trees over six (6) inches that are removed shall be a pay item otherwise shall be considered part of the major items of work. All other trees are to be preserved unless written permission for removal is obtained from the adjoining property owner and the Engineer. Selective pruning of trees will be permitted to allow operation of the Contractor’s equipment and this will be required for the necessary clearances along the proposed sidewalk. Tree branches and roots shall be pruned neatly, and the scars shall be covered with an approved tree dressing.

9.19 STUMP REMOVAL

As noted on the drawings or as authorized by the Engineer, existing tree stumps as well as stumps remaining from trees which are removed shall be completely removed and disposed of by the Contractor. Grinding stumps down will not be permitted except as specifically authorized by the Engineer. All stumps and root material within two feet (2') of the sidewalk or pathway shall be completely removed.

9.20 TREE REPLACEMENT

Replacement trees shall be the size and type specified in the proposal. Transplanting replacement trees shall be performed in accordance with the 2012 MDOT Standard Specifications for Construction Section 815 "Landscaping". The Contractor shall replace transplanted trees that are not in a vigorous growing condition one year after transplanting. Unless otherwise specified, tree replacement shall be a pay item.

9.21 TREE TRIMMING

Adjacent trees shall be trimmed to allow for a minimum of ten (10) feet overhead clearance and one (1) foot side clearance to the edge of the sidewalk or two (2) feet clearance to the edge of the pathway. Unless otherwise specified, cost shall be considered part of the major items of work.

9.22 RELOCATIONS

9.22.01 Existing Utility Structures

Existing utility poles, guy anchors, hydrants (unless listed in the proposal), cable enclosure boxes, etc. shall be relocated by the utility company at no cost to the Contractor.

9.22.02 Fence Relocations

Existing fences shown or not shown on the construction drawings shall be relocated in accordance with MDOT 2012 Standard Specifications for Construction (or current edition) Section 808 "Fencing".

9.22.03 Landscape Relocations

Existing shrubs, seedlings, bushes, landscaped mounds, decorative stone, shredded bark, etc. at the proposed sidewalk or pathway location shown or not shown on the drawings shall be relocated and transplanted by the Contractor, unless specified otherwise by the adjoining property owner.

The Contractor shall take care to transplant shrubs and bushes to guarantee continued growth. If the transplanted material dies within the Contractor's warranty period, the Contractor shall replace the dead material with a similar type of nursery stock in vigorous

growing condition. Landscaping that cannot be transplanted shall be replaced with a similar type of nursery stock in a vigorous growing condition.

9.22.04 Irrigation System Preservation and Relocations

The Contractor shall take care to preserve the existing irrigation system and components. Replacement of all components damaged by construction is required. If necessary, sprinkler heads must be relocated so that they are not within the proposed sidewalk or pathway.

9.22.05 Mailboxes

The Contractor shall relocate and maintain mailboxes interfering with the sidewalk or pathway location so that mail service is not interrupted, both temporarily and permanently. Mailboxes shall be replaced in a condition and location equal to that prior to construction or as required by the U.S. Postal Service. All mailboxes shall be replaced with a turnout of six (6) inches of MDOT 23A gravel.

9.23 ADJUSTMENTS OF EXISTING UTILITY VALVES, ETC.

All existing valves for watermains, including valves for water services, gas company valves, manholes and catch basin castings, etc. shall be adjusted to meet the sidewalk elevations. Unless otherwise specified, cost shall be considered part of the major items of work.

9.24 DRIVEWAYS / HARD SURFACE PARKING AREAS

Unless otherwise noted on the construction drawings or as directed by the Engineer, all existing driveways/hard surface parking areas shall be saved. Where driveways/hard surface parking areas are to be removed, a clean sawcut smooth joint the full depth of the material shall be made. Bond coat or joint material shall be applied if necessary.

9.25 GRAVEL DRIVEWAYS

Gravel driveways that have been disturbed during construction shall be replaced with 6" of MDOT 22A gravel compacted in place.

9.26 DITCH / SWALE CONSTRUCTION

All ditch/swale construction, as required to maintain existing drainage patterns, shall be considered part of the major items of work.

9.27 EXCESS EXCAVATION

Excess excavation shall be the property of the Contractor and shall be disposed of by the Contractor.

9.28 TREATED LUMBER/CONCRETE RIP-RAP RETAINING WALL

Treated lumber/concrete rip-rap retaining walls shall be constructed in accordance with the details shown in the construction drawings.

9.29 TREATED LUMBER FENCE

Treated lumber fence shall be constructed in accordance with the details shown in the construction drawings.

9.30 BOARDWALK

Boardwalks are permitted where significant environmental impacts to wetlands will be avoided or where regulation prevents the construction of pathway with retaining walls. A minimum of two (2') feet of clearance must be provided in additional to the design width of the pathway. The surface elevation of Boardwalk must exceed the 100-yr flood plain elevation.

Boardwalk must be designed and certified by a Professional Engineer. Signed and sealed drawings must be submitted to the Township.

9.31 PEDESTRIAN STRIPING FOR CROSSINGS

Existing paved streets, driveways and parking areas shall be painted with "continental" style crosswalk designation. Paints must be approved by the Engineer prior to placement. The Contractor is responsible for placing temporary signage during the placement of pedestrian striping.

9.32 PEDESTRIAN CROSSING INTERNAL TO DEVELOPMENT

Where specified on the plan or directed by the engineer, raised concrete platform crosswalks must be used to alert traffic of a public pedestrian crossing.

9.33 PEDESTRIAN SIGNS

Where specified on the plan or directed by the engineer, pedestrian crossing signs shall be required where crossing internal drive.

9.34 EXISTING SIDEWALKS, CROSSINGS/REPLACEMENT/SAFETY

Where existing sidewalk or pathways are disturbed or removed, they shall be replaced as soon as possible. The Contractor shall place barricades and warning signs to alert the sidewalk or pathway users.

9.35 SIDEWALK OR PATHWAY THROUGH DRIVEWAYS

Sidewalk or Pathway must be constructed through driveways with material or construction joints delineating the sidewalk or pathway. Existing commercial driveways in good condition conforming to the required slope may be striped in lieu of reconstruction upon approval of the Engineer. Existing residential driveways in good condition conforming to the required slope and of the same material as the pathway or sidewalk may be maintained.

Driveway approaches shall be replaced from the sidewalk or pathway to the roadway edge only where noted on the plans or approved by the engineer. A clean sawcut smooth joint the full depth of the material shall be made in line with the edge of gravel shoulder if there is one or with the edge of the paved shoulder if no gravel shoulder exists. Bond coat or joint material shall be applied if necessary.

9.36 MATERIALS TESTING

The Owner reserves the right to sample and test any of the materials required for the proposed construction, either before or after delivery to the project and to reject any material represented by any sample which fails to comply with the minimum requirements specified.

The Contractor shall furnish all materials reasonably required for sampling testing and analysis necessary for the testing of materials as required by these specifications.

The cost of the above-described testing shall be paid by the Owner. If any material fails to meet the specified requirements, all material represented by the sample shall be rejected unless the Contractor can demonstrate through additional tests, at his own expense, that the remainder of the material is satisfactory.

As a minimum requirement, the following shall be submitted to the Engineer by the Contractor (at no additional cost to the Owner):

a. Pipe: certified test reports for strength from the manufacturer.
b. Hot Mix Asphalt (HMA) materials:
    1) Master mix design
    2) Slips from the plant indicating type and amount of mix
c. Concrete material slips from the plant indicating type and amount of mix.

9.37 SURFACE RESTORATION

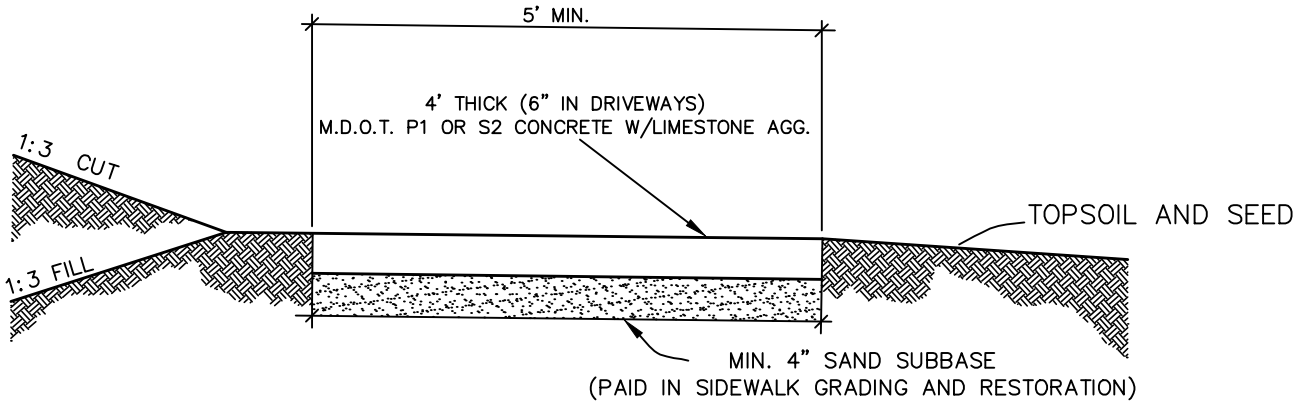
All areas disturbed by construction operations shall be restored to their original condition as determined by the Engineer. The Engineer will use information from drawings, photographs, or videotapes when available.

All streets, walks, and other improved surfaces disturbed by construction operations shall be replaced to uniform lines and grades established by the Engineer.

Restoration shall follow the construction in a timely fashion so as to minimize inconvenience to the adjacent property owners and the general public. The manner in which this restoration is done by the Contractor will be a determining factor in the approval by the Engineer of staking requests and partial payment requests.

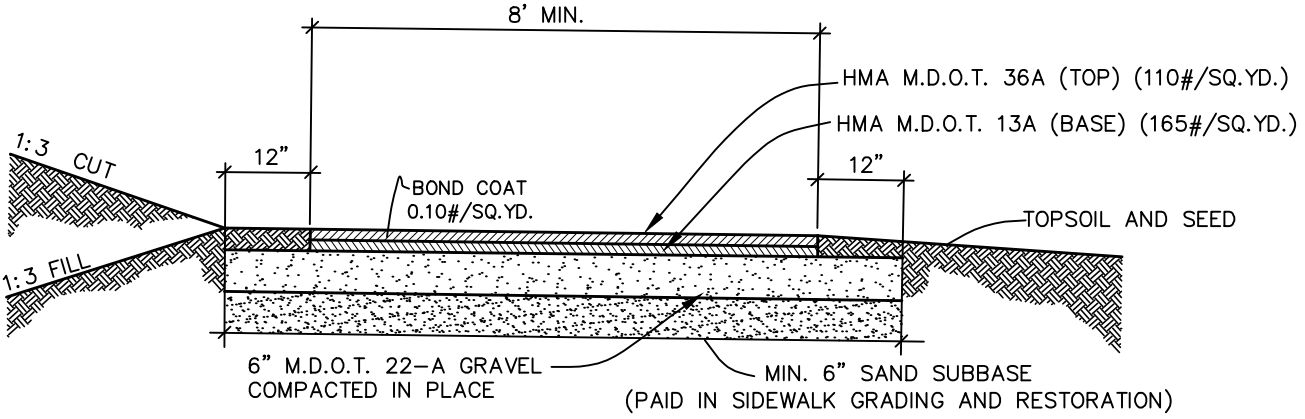
9.38 PROTECTION OF WORK

The Contractor shall protect the work until it is accepted by the Engineer. Any part of the completed work that is damaged prior to acceptance by the Owner shall be replaced at the Contractor's expense.



CONCRETE SIDEWALK DETAIL

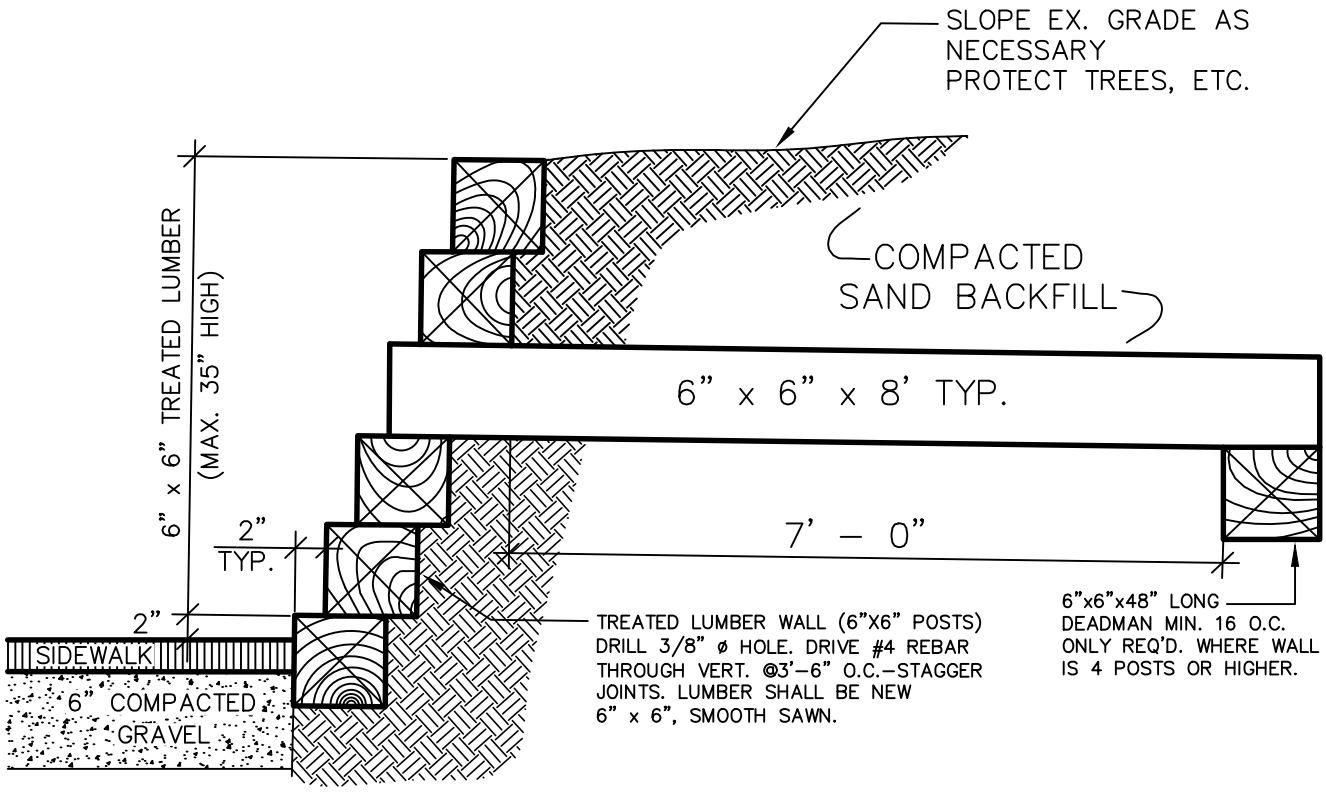
NO SCALE



BICYCLE PATH DETAIL

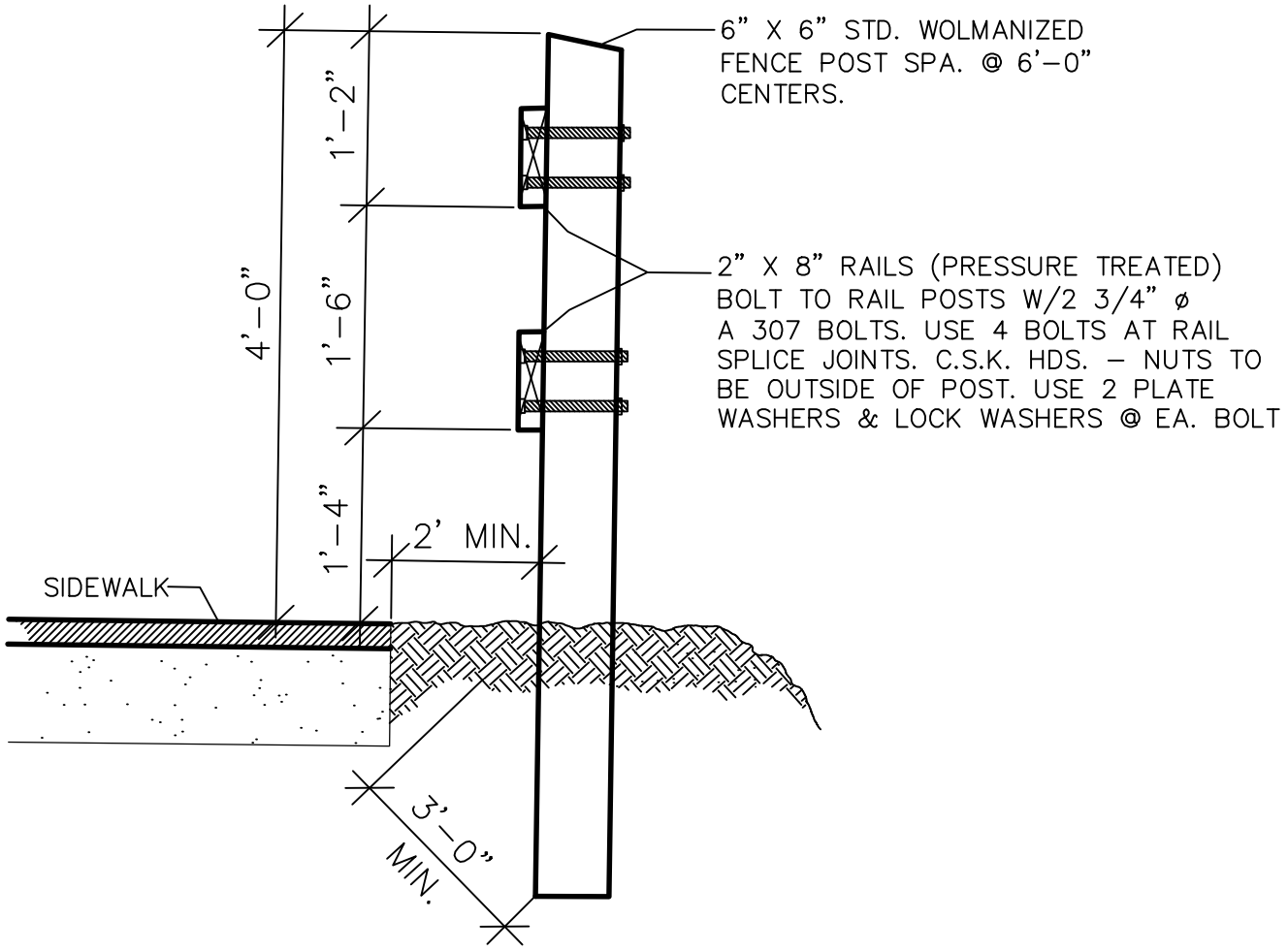
NO SCALE

SIDEWALK AND BICYCLE PATH DETAILS

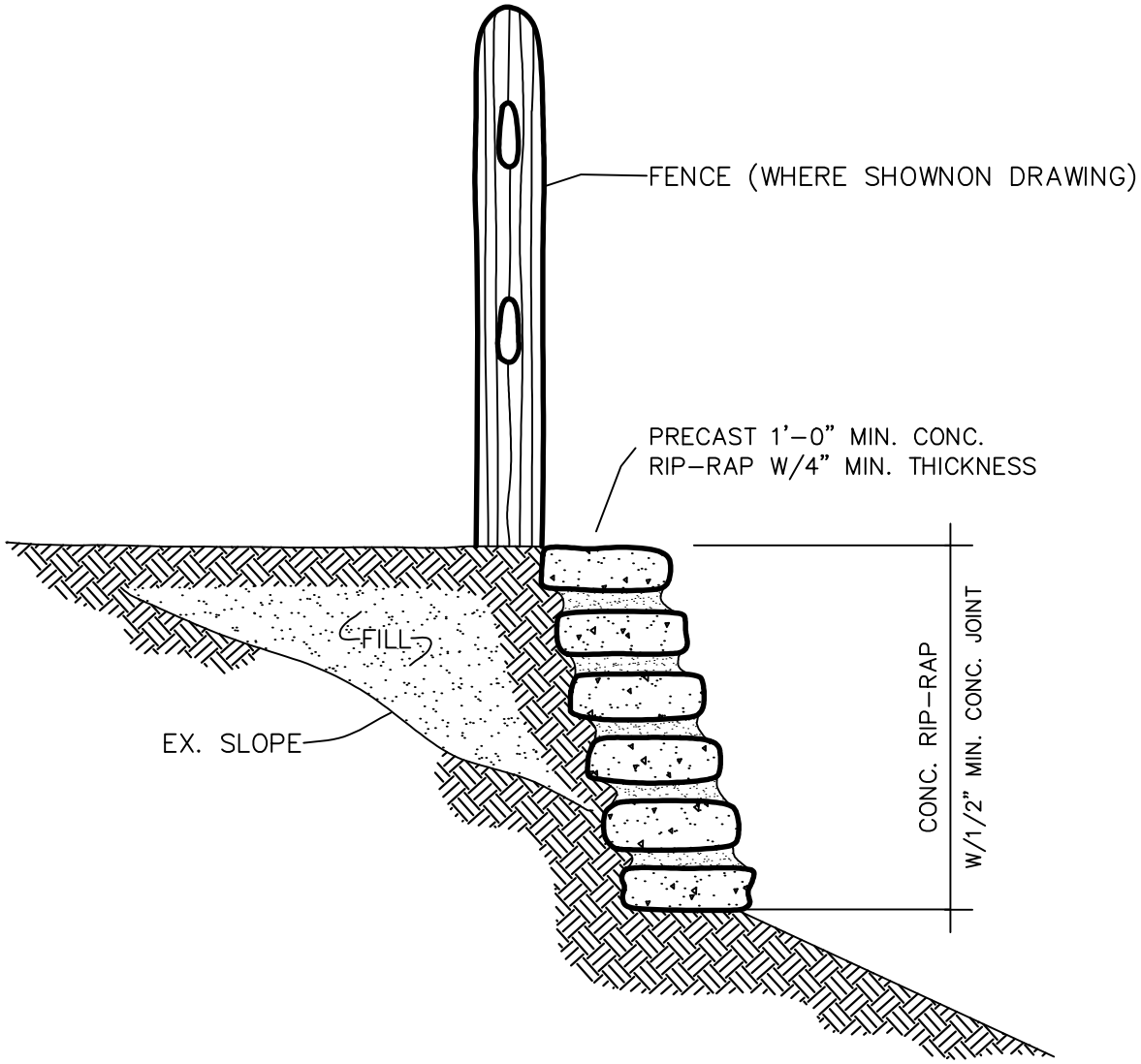


(6" x 6" TREATED LUMBER, 0.4 RETENTION,
EQUIVALENT TO WOOD FOUNDATION
SOUTHERN YELLOW OR RED PINE - SMOOTH SAWN)

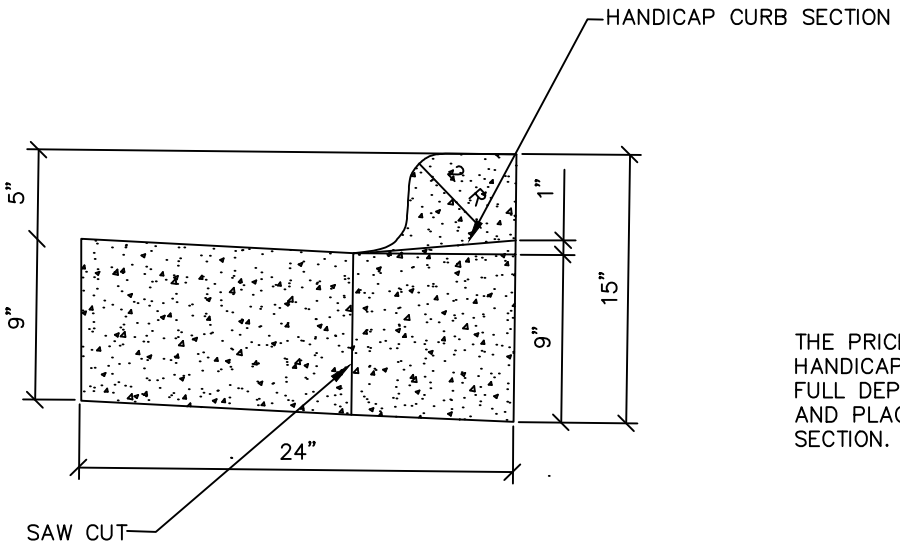
DETAIL TREATED LUMBER RETAINING WALL



TREATED LUMBER FENCE



CONCRETE RIP-RAP RETAINING WALL



THE PRICE PER LINEAL FOOT OF HANDICAP CURB SHALL INCLUDE FULL DEPTH SAWCUT, REMOVAL AND PLACING A HANDICAP CURB SECTION.

ACCESSIBLE CONCRETE CURB DETAIL