

**RESOLUTION NO. 2000-18**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY  
OF BRISBANE ESTABLISHING MINIMUM STANDARDS  
FOR DOWNHILL ROADWAY RETAINING WALLS**

WHEREAS, construction activity within the hillside areas of the City, particularly the widening or relocation of public streets, often requires the installation of retaining walls on the downhill slope to maintain the stability of the roadway surface; and

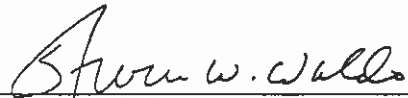
WHEREAS, in order to assure that such retaining walls, when located within the public right-of-way, are properly constructed and maintain a consistency of design and attractive appearance, it is necessary to establish minimum standards for downhill roadway retaining walls,

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of Brisbane as follows:

1. The written specifications entitled "Minimum Standards For Downhill Roadway Retaining Wall" attached hereto as Exhibit "A" and incorporated herein by reference, and the drawing entitled "Minimum Standards For Downhill Roadway Retaining Wall Systems" dated February, 2000, attached hereto as Exhibit "B" and incorporated herein by reference, are hereby approved and adopted, and shall be applied to all downhill roadway retaining walls for which building or encroachment permits are required to be obtained.

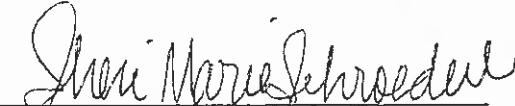
2. The City Engineer shall have authority to impose more stringent standards than adopted by this Resolution if the City Engineer finds and determines that such modification is reasonably necessary to accommodate the physical conditions of the site or the intended function of the retaining wall, or is reasonably necessary to improve the appearance of the retaining wall without impairing its structural integrity, and further finds that the appearance of the retaining wall, as modified, will generally be consistent with the design standards.

3. This Resolution will become effective immediately upon its passage and adoption.

  
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Steven W. Waldo, Mayor

**PASSED AND ADOPTED** at a regular meeting of the City Council of the City of Brisbane held on the 27<sup>th</sup> day of March, 2000, by the following vote:

AYES: Councilmembers Bologoff, Conway, Johnson, Panza, Mayor Waldo  
NOES: None  
ABSENT: None  
ABSTAIN: None

ATTEST:  
  
\_\_\_\_\_  
Sheri Marie Schroeder, City Clerk

**MINIMUM STANDARDS FOR  
DOWNHILL ROADWAY RETAINING WALL**

Standard Specifications as referred to elsewhere in these special provisions are defined as the Standard Specifications of the State of California Department of Transportation dated July 1992. The specifications set forth below are intended to be minimum standards and more stringent requirements may be imposed when deemed necessary by the City Engineer.

**1. CLEARING AND GRUBBING**

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions and as directed by the Engineer.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines. All existing vegetation, outside the areas to be cleared and grubbed, shall be protected from injury or damage resulting from the Contractor's operations.

Nothing herein shall be construed as relieving the Contractor of his responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

**2. EARTHWORK**

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions. A soils report to supplement the structural design and calculations shall be required unless a report satisfactory to the City Engineer already is available..

**2a. ROADWAY EXCAVATION AND EMBANKMENT**

Roadway excavation and embankment shall conform to the provisions in Section 19-2, "Roadway Excavation," and Section 19-6, "Embankment," of the Standard Specifications and these special provisions.

The quantities of roadway excavation which have been used in embankment will be adjusted by multiplying by a specific grading factor of 1.0. No further adjustment will be made in the event that the specified grading factor does not equal the actual grading factor.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right-of-way in conformance to Section 7-1.13, "Disposal of Material Outside the Highway right-of-way."

Full compensation for roadway excavation and embankment shall be considered as included in the contract price paid for the various items involved and no separate payment will be made therefor.

**2b. STRUCTURE EXCAVATION AND BACKFILL**

Structure excavation and backfill shall conform to Section 19-3 "Structure Excavation and Backfill" of the Standard Specifications and these special provisions, as shown on the plans and as directed by the Engineer. Structure excavation shall consist of furnishing all labor, materials, tools, equipment and incidentals involved in the removal of all material, including asphalt

concrete, concrete pavement, subbase, aggregate base and base, necessary for the construction of foundations of retaining walls, structures, inlets, manholes, and other project facilities.

Structure backfill shall consist of furnishing, placing and compacting backfill material, bedding, structure backfill, sand, imported topsoil, aggregate base, permeable material, pervious material, filter fabric, and asphalt concrete conforming to the existing pavement.

Once concrete is placed at the "H" pile retaining wall, structural backfill or pervious material shall not be placed behind the wall until the concrete has attained a compressive strength of not less than 2500 pounds per square inch.

Full compensation for structure excavation and backfill shall be considered as included in the contract price paid for the various items involved and no separate payment will be made therefor.

**2c. PERVIOUS BACKFILL MATERIAL**

Pervious backfill material shall conform to the provisions in Section 19-3.065, "Pervious Backfill Material," of the Standard Specifications and these special provisions.

The pervious backfill material shall be wrapped with filter fabric and placed as shown in the drawings and as directed by the Engineer.

Filter fabric shall conform to the provisions for fabric for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications, and shall be Mirafi 500x or approved equal.

The contract price paid per cubic yard for pervious backfill material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in pervious backfill material, complete in place, including filter fabric material and installation, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**2d. IMPORTED BORROW**

Imported Borrow (Embankment) shall conform to the provisions in Section 19-7, "Borrow Excavation," of the Standard Specifications, these special provisions and as directed by the Engineer.

The liquid limit shall be  $\geq 50$ . The permeability coefficient shall be  $\leq 1 \times 10^{-5}$ .

Testing certification of any and all Imported Borrow material is required before placement of material on site.

**2e. DRILLED HOLES**

Holes for the steel "H" piles shall be drilled into natural foundation materials at the location shown on the plans in accordance with these special provisions, and as directed by the Engineer.

Drilled holes shall be accurately located and shall be straight and true. When the piles are plumbed and aligned, the steel piles shall be at least one-inch clear of the sides of the hole for the full length of the hole to be filled with minor concrete as shown on the plans. Holes which do not provide the clearance around the steel piles shall be reamed or enlarged at the Contractor's expense.

Suitable temporary casings shall be furnished and placed when necessary to control water or to prevent caving of the hole.

All loose materials existing at the bottom of the hole, after drilling operations have been completed, shall be removed before placing the pile.

Hard rock conditions shall be anticipated. A rock barrel or other appropriate cutting head shall be available on site for advancing drill holes through hard rock material.

Surplus material shall become the property of the Contractor and shall be disposed of outside the highway right-of-way in accordance with Section 7.1.13 of the Standard Specifications.

Drilling mud or chemical stabilizers shall not be used except when permitted by the Engineer. Surface water shall not be permitted to enter the hole and all water in the hole shall be removed before placing concrete therein.

If piles with larger diagonal dimensions are substituted for the piles shown on the plans, the Contractor shall, at his expense, ream or enlarge the drilled holes to provide a hole diameter at least 4 inches larger than the diagonal dimension of the pile.

### 3. "H" PILE RETAINING WALL

Retaining wall construction shall conform to sections entitled "Roadway Excavation and Backfill," "Structural Excavation and Backfill," "Pervious Backfill Material," and "Imported Borrow," specified elsewhere in these special provisions and to the plans as directed by the Engineer.

#### 3a. PILING

Piling shall conform to the provisions in Section 49, "Piling," of the Standard Specifications, and these special provisions.

Attention is directed to the provisions of Section 7-1.09, "Public Safety," of the Standard Specifications. Before performing any pile handling or pile installation operation at any location that is closer than the length of the pile being handled or installed to the edge of any traveled way open to public use, the Contractor shall submit to the Engineer, as provided in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, a detailed plan of the measures that will be employed to provide for the safety of traffic and the public.

Section 49-5.01, "Description," of the Standard Specifications, is amended to read:

Steel piles shall be structural shape piles. Structural shape piles shall be of rolled section shown on the plans or of the section specified in the special provisions and shall be structural steel conforming to the specifications of the ASTM Designation: A36, or at the option of the Contractor, structural steel conforming to the specifications of ASTM Designation: A572.

Structural shape piles shall not be lap spliced welded. Structural shape piles shall be full penetration welded. Partial welds may be restored to full penetration welds in the field in conformance with AWS D1.1.

Steel "H" piles shall be of the size shown on the plans or shall be rolled sections. Rolled sections substituted for the members shown on the plans shall have a section modulus about the major axis at least equal to the section modulus about its major axis for the pile shown. Rolled sections shall have a nominal depth of 10.5 inches. Pile webs and flanges shall be at least 5/16 inch thick.

Steel "H" piles shall not be driven. Pervious material shall be placed prior to placing the pile. Steel "H" piles shall be plumbed and aligned before placing concrete. Alignment shall be maintained while placing backfill concrete material in the drilled holes and behind the retaining wall.

Protective coatings shall be removed from affected areas before splicing steel piles or cutting piles.

### **3b. CLEAN AND PAINT STEEL PILING**

Steel "H" piling surfaces shall be cleaned and painted in accordance with the provisions in Section 59-2, "Painting Structural Steel," and 91, "Paint," of the Standard Specifications and these special provisions.

**Cleaning.** All piling and channel surfaces shall be dry blast cleaned in accordance with the provisions of Surface Preparation Specification No. 10, "Near White Blast Cleaning," of the Steel Structures Painting Council. Blast cleaning shall leave all surfaces with a dense, uniform, angular, anchor pattern of no less than 1-1/2 mils as measured in accordance with ASTM Designation: D4417.

**Painting.** All blast cleaned surfaces shall receive a single undercoat consisting of a waterborne inorganic zinc primer conforming to the provisions of AASHTO Designation M 300, Type II, and the following:

The first three sentences of Section 4.7, "Primer Field Performance Requirement," of the AASHTO Specifications, shall not apply. The inorganic zinc primer shall be listed on the qualified product list which may be obtained from the Transportation Laboratory, (916) 227-7000.

Section 4.7.1 of the AASHTO Specification shall not apply.

When no finish coats are specified, the color of the inorganic zinc primer shall essentially match Federal Standard 595B No. 36373.

Inorganic zinc primer shall be used within 12 hours of initial mixing.

Application of inorganic zinc primer shall conform to provisions of Section 59-2.13, "Application of Zinc-Rich Primer," of the Standard Specifications.

Inorganic zinc primer shall not be applied when the atmosphere or surface temperature is less than 45°F or more than 100°F or when the relative humidity exceeds 85 percent.

The single undercoat of inorganic zinc primer shall be applied to the required dry film thickness in 2 or more applications within 4 hours after blast cleaning.

The total dry film thickness of all applications of inorganic zinc primer shall not be less than 4 mils or more than 8 mils.

All areas where mudcracking occurs in the inorganic zinc primer shall be blast cleaned and repainted with primer to the specified thickness.

Inorganic zinc primer shall have a minimum adhesion to steel of 600 psi when measured at no more than 6 locations per pile in accordance with ASTM Designation: D4541. The locations of adhesion tests will be determined by the Engineer. The Contractor at his expense shall: (1) verify compliance with the adhesion requirements, (2) furnish test results to the Engineer, and (3) repair the coating after testing.

Finish coats shall be required and meet the requirements of the section entitled "Aesthetics", elsewhere in these special provisions. The color of the finish coat must be approved before the drilling of holes for the pilings begins.

### **3c. TIMBER LAGGING**

Timber lagging shall be AAA grade and conform to the details shown on the plans and the provisions in Section 57, "Timber Structures," and 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications, and these special provisions.

Preservative treatment shall be creosote, creosote-coal tar solution, creosote-petroleum solution (50-50), or pentachlorophenol (heavy oil borne) preservative. Preservative treatment shall be for below ground use.

Timbers shall be installed with a ¼-inch gap between lagging members.

The size of timber lagging members required shall be as determined by the structural calculations, but in no instance shall they be smaller than 4" x 4".

### **3d. PILE CONCRETE BACKFILL**

Pile concrete backfill shall conform to the provisions in Section 51-1.02, "Minor Structures," and Section 90-10, "Minor Concrete," of the Standard Specifications, these special provisions and as directed by the Engineer.

Dewater holes: no water will be permitted in the holes at the time of placing concrete backfill.

Sufficient concrete to complete the pour of each pier prior shall be delivered to the job site prior to beginning the backfill operation.

### **3f. FILTER FABRIC**

Filter fabric shall be Mirafi 500x or approved equal and shall conform to the requirements for underdrains in Section 88, "Engineering Fabrics," of the Standard Specifications and these special provisions.

The following is added after the fourth paragraph of Section 88-1.01, "Description," of the Standard Specifications:

If the specifications require UV (ultraviolet ray) protection for one of the types of fabric, all fabric of that type shall be treated to provide a minimum of 70 percent breaking strength retention after 500 hours exposure when tested in accordance with ASTM Designation: D 4355.

Filter fabric for this project shall be UV-protected, as provided for in Section 88-1.01, "Description," of the Standard Specifications, as amended herein. The Contractor shall notify the Engineer, in writing, of the source filter fabric at least 45 days prior to use.

Filter fabric shall be handled and placed in accordance with the manufacturer's recommendations.

The fabric shall be aligned and placed in a wrinkle-free manner.

Adjacent borders of the fabric shall be overlapped from 12 to 18 inches or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number 5 to 7 per inch of seam.

### 3g. TIERED WALLS

Tiered retaining walls shall be considered where a single wall will exceed six (6) feet in height, if the City Engineer determines that such design will not impair the structural requirements of the retaining wall and if sufficient space within the public right-of-way is available.

### 4. FENCE

Ornamental metal fence shall conform to the provisions in Section 80, "Fences," of the Standard Specifications, and these special provisions.

Shop drawings or catalog cut sheets for the railing to be used must be submitted to the City for approval together with plans for the wall construction. Finishes shall be subject to the approval of the Planning Director.

### 5. METAL BEAM GUARD RAIL

Metal beam guard rail shall conform to the provisions in Section 83, "Railings and Barriers," of the Standard Specifications and these special provisions. Finish coats of paint shall conform to the section entitled "Aesthetics" elsewhere in these special provisions.

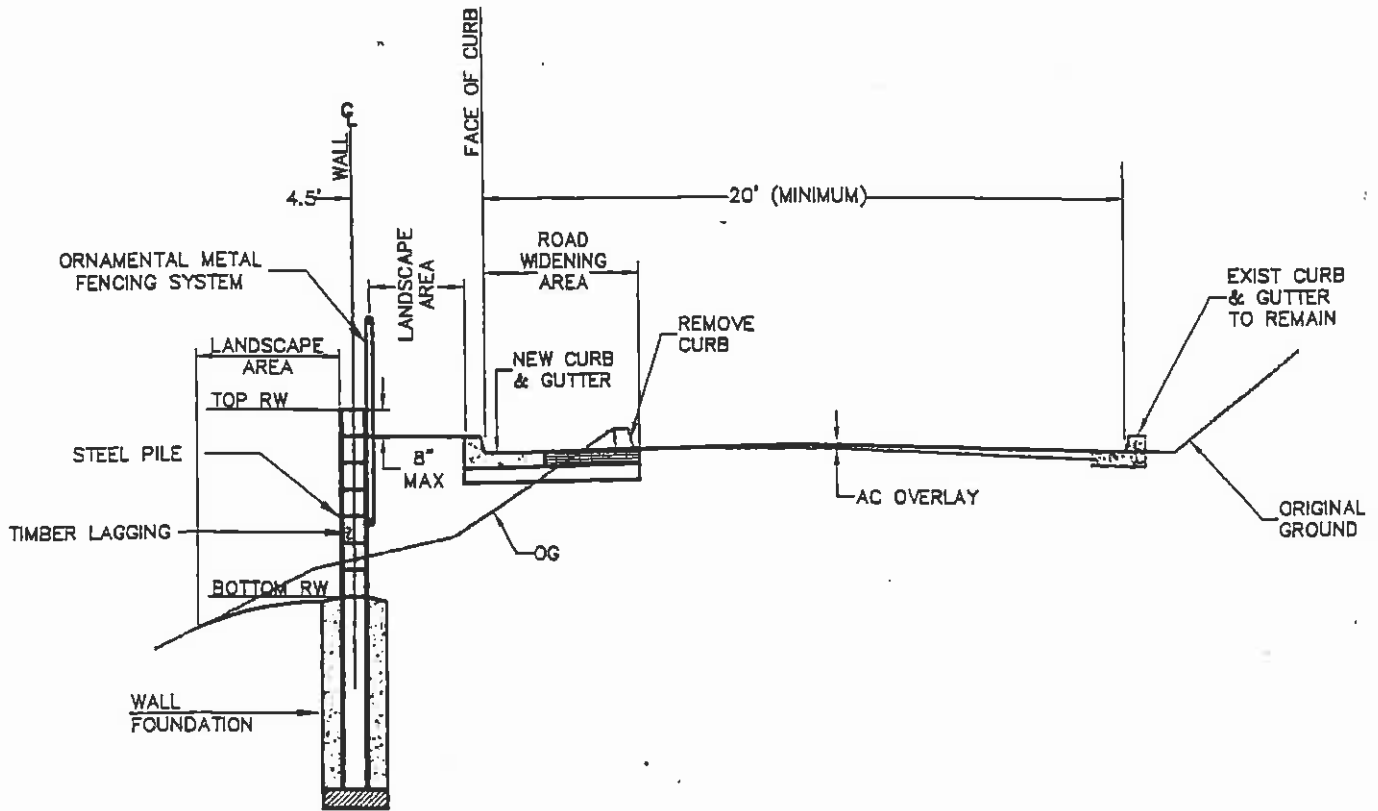
### 6. AESTHETICS

The aesthetic design of the proposed retaining wall shall be subject to approval by the Planning Director. The decision of the Planning Director, with regard to aesthetics and not the engineering requirements for the retaining wall, may be appealed to the Planning Commission in the same manner as appeals under the Zoning Ordinance.

Finish coats shall match the expected color of the aged wood beams. When railroad ties are used, pilings shall be painted a deep brown color. When pressure treated wood or redwood is used, the pilings shall be painted a deep steel gray color. A color sample or paint chip shall be submitted with the plans for approval by the Planning Director.



Screening with landscape materials or other measures, such as the use of a different type of wall material, may be required at the discretion of the Planning Director, to mitigate any adverse visual impacts created by the proposed retaining wall. Subject to approval by the Planning Director and the City Engineer, the owners of adjacent properties may be permitted to install landscaping within the public right-of-way to screen the wall.



**TYPICAL SECTION  
RETAINING WALL WITHOUT GUARD RAIL  
ORNAMENTAL METAL FENCE**

**MINIMUM STANDARDS FOR  
DOWNHILL ROADWAY  
RETAINING WALL SYSTEMS**  
BRISBANE CALIFORNIA

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