

**UNIFORM STANDARD SPECIFICATIONS
CLARK COUNTY AREA, NEVADA**

YEAR 2014 REVISIONS

<u>SECTION</u>	<u>TITLE AND REVISIONS SUMMARY</u>	<u>EFFECTIVE DATE</u>
101	"Definitions and Terms" – Specification revised to add a definition for unsuitable material.	7/1/2014
203	"Excavation and Embankment" – Specification to clarify how caliche excavation is addressed.	7/1/2014
215	"Keyhole Pothole Excavation and Backfill" – Specification revised to allow for farmed core replacements.	7/1/2014
413	"Plantmix Bituminous Gap – Graded Surface" – Specification revised to add a requirement for testing and stockpiling material to be used on the project.	7/1/2014
501	"Portland Cement Concrete" – Specification revised to require submittal of testing reports.	7/1/2014
603	"Reinforced Concrete Pipe" – Specification revised to require rubber gaskets on elliptical pipe.	7/1/2014
609	"Catch Basins, Manholes, and Inlets" – Specifications revised to add a requirement to replace the lining material on concrete collars.	1/1/2014

SECTION 101**DEFINITIONS AND TERMS****101.01 BLANK****101.02 ADDENDUM**

- A. A supplemental addition or deletion to the contract documents prior to the advertised bid opening.

101.03 ADVERTISEMENT

- A. The public announcement, as required by law, inviting bids for work to be performed or materials to be furnished.

101.04 ASSESSMENT ACT CONTRACT

- A. A contract financed by special assessments authorized under, or implemented by, an act of the Legislature of the State or procedural ordinance of a City or the County.

101.05 AWARD

- A. The acceptance by the Contracting Agency of a bid. Refer to ***Subsection [103.02](#), "Award of Contract."***

101.06 BASE COURSE

- A. The layer or layers of specified or selected material of designated thickness on a sub-base or a subgrade to support a surface course.

101.07 BIDDER

- A. An individual, partnership, firm, corporation, or any acceptable combination thereof, or joint venture, submitting a bid for the advertised work.

101.08 BOARD

- A. The officer or body constituting the awarding authority for the Contracting Agency.

101.09 BRIDGE

- A. A structure, including supports, erected over a depression or an obstruction, as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads and having a length measured along the center of roadway of more than 20 feet between under copings of abutments or extreme ends of openings for multiple boxes.
- B. **Length:** The length of a bridge structure is the overall length measured along the line of survey stationing back to back of back walls of abutments, if present, otherwise end to end of the bridge floor; but in no case less than the total clear opening of the structure.
- C. **Roadway Width:** The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or guard timbers or in the case of multiple height of curbs, between the bottoms of the lower risers and in the case of no curbs or guard timbers, between the inner faces of parapet or railing at the bottom.

101.10 CALENDAR DAY

- A. Every day shown on the calendar.

101.11 CONTRACT CHANGE ORDER OR FIELD CHANGE ORDER

- A. A written order issued by the Engineer or Contracting Agency as provided in the contract documents, to the Contractor, covering changes in the plans, specifications or quantities or both, within the scope of the contract and establishing the basis of payment and time adjustments for the work affected by the change.

101.12 CHANNEL

- A. A natural or artificial water course.

101.13 CONTRACT

- A. The written agreement between the Contracting Agency and the Contractor setting forth the obligations of the parties thereunder, including, but not limited to the performance of the work, the furnishing of labor and materials, and the basis of payment.
- B. The contract includes the invitation for bids, proposal, contract form and contract bond, standard specifications, supplemental specifications, special provisions, general and detailed plans, notice to proceed, and any addenda, change orders, and supplemental agreements that are required to complete the construction of the work in an acceptable manner, including authorized extensions and basis of payment thereof, all of which constitute one instrument.

101.14 CONTRACTING AGENCY

- A. The party of the first part to a contract which may be any of the following entities: Boulder City, Nevada; City of Henderson, Nevada; City of Las Vegas, Nevada; City of North Las Vegas, Nevada; City of Mesquite, Nevada; Las Vegas Valley Water District, Las Vegas, Nevada; Clark County Water Reclamation District, Las Vegas, Nevada; Southern Nevada Water Authority, Las Vegas, Nevada; Clark County Regional Flood Control District, Las Vegas, Nevada; Regional Transportation Commission of Southern Nevada, Las Vegas, Nevada; and Clark County, Nevada.

101.15 CONTRACT ITEM (PAY ITEM)

- A. An item of work specifically described and for which a price, either Unit or Lump Sum, is provided. It includes the performance of all work and the furnishing of all labor, equipment, and materials described in the text of a specific item included in the contract or described in the Standard Specifications, Supplemental Specifications, or Special Provisions of the contract. Contract items are numbered so that the first three digits of the item number corresponds to the section of the same number. Thus, in Item No. 203.01, which is the item number for roadway excavation, the number 203 is the section number and corresponds to **Section 203, "Excavation and Embankment"** of the Standard Specifications, Supplemental Specifications and Special Provisions.
- B. Each contract item shall be constructed under the specifications contained in the section of the same number, i.e., the number preceding the aforementioned last two digits.

101.16 CONTRACTOR

- A. The person, firm, partnership, corporation, permittee, subdivider, or other entity who has entered into a contract or agreement with the Contracting Agency. Where work is done under permit issued by the Contracting Agency, the permittee shall be construed to be the Contractor. Also, a subdivider who does land development and other work under contract with the Contracting Agency.

101.17 CONTRACT TIME

- A. The number of days allowed for completion of the contract, including authorized time extensions.

101.18 CULVERT

- A. Any structure not classified as a bridge which provides an opening under the roadway.

101.19 DETOUR

- A. A temporary route for traffic around a closed portion of road.

101.20 DIVIDED HIGHWAY

- A. A highway with separated roadways for traffic in opposite directions.

101.21 DRAWINGS

- A. That part of the Contract Documents prepared or approved by the Contracting Agency which graphically shows the scope, intent, and character of the Work to be performed by the Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

101.22 EMPLOYEE

- A. Any person working on the project mentioned in the contract of which these specifications are a part, and who is under the direction and control, or received compensation from the Contractor or the Contractor's subcontractor.

101.23 ENGINEER

- A. The Chief Engineer of the Contracting Agency or other person designated by the Board acting directly and through the Chief Engineer's duly authorized representative.

101.24 EQUIPMENT

- A. All machinery and equipment, together with the necessary supplies for upkeep and maintenance, also tools and apparatus necessary for the proper construction and acceptable completion of the work.

101.25 EXTRA WORK

- A. An item of work not provided for in the contract as awarded, but found essential by the Contracting Agency to the satisfactory completion of the contract within its intended scope.

101.26 FRONTAGE ROAD OR FRONTAGE STREET

- A. A local street or road auxiliary to and located generally on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

101.27 GUARANTEE BOND

- A. The approved form of security executed by the Contractor and the Contractor's surety or sureties guaranteeing the work against defect and failures.

101.28 HIGHWAY

- A. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

101.29 HOLIDAYS

- A. Any day established by law or agreed as a holiday for employees of the Contracting Agency.

101.30 HYDRAULIC CEMENT

- A. An inorganic material or a mixture of inorganic materials that sets and hardens by chemical reaction with water by formation of hydrates, and is capable of doing so under water.

101.31 INSPECTOR

- A. The Engineer's or Contracting Agency's authorized representative assigned to make detailed inspections of contract performance.

101.32 INTERAGENCY QUALITY ASSURANCE COMMITTEE (IQAC)

- A. An ad hoc multi-jurisdictional and agency committee established for the purpose of simplifying the material approval process and promoting the consistent enforcement of the Uniform Standard Specifications and Drawings, Clark County Area, Nevada.

101.33 LABORATORY

- A. The testing laboratory of the Contracting Agency or of any other testing laboratory which may be designated by the Engineer.

101.34 MAJOR CONTRACT ITEM

- A. A "Major Item" shall be construed to be any individual bid item included in the proposal that has a total cost equal to or greater than \$50,000 or 5 percent of the total contract cost, whichever is the lesser amount. The total contract cost shall be computed on the basis of the proposal quantities and contract unit prices.

101.35 MATERIALS

- A. Any substances specified for use in the construction of the project and its appurtenances.

101.36 MEDIAN

- A. That portion of a divided highway separating the travel ways for traffic, generally in opposite directions.

101.37 NOTICE TO BIDDERS

- A. The official notice inviting bids for the proposed work or materials.

101.38 NOTICE TO PROCEED

- A. A written notice to the Contractor to proceed with the contract work including, when applicable, the date of beginning of contract time.

101.39 PAVEMENT STRUCTURE

- A. The combination of base course and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.

101.40 LABOR AND MATERIAL PAYMENT BOND

- A. The approved form of security executed by the Contractor and the Contractor's surety or sureties to guarantee the payment of persons furnishing materials or persons performing labor under the contract.

101.41 PERFORMANCE BOND

- A. The approved form of security executed by the Contractor and the Contractor's surety or sureties to guarantee the faithful performance of all work under said contract within the prescribed time limit and that materials and workmanship will be free from original or developed defects.

101.42 PLANS

- A. The approved project plans and Standard Drawings, profiles, typical cross sections, and supplemental drawings, or exact reproductions thereof, which show the location, character, dimensions, and details of the work to be performed. All such documents are to be considered as a part of the plans whether or not noted in the Special Provisions.
- B. In the above definition, the following terms are defined as follows:
1. Standard Drawings - The Standard Drawings of the Contracting Agency.
 2. Project Drawings - The Project Drawings are specific details and dimensions peculiar to the work and are supplemented by the Standard Drawings insofar as the same may apply.

101.43 PROFILE GRADE

- A. The trace of a vertical plane intersecting the top surface of the proposed structural section as shown on the plans. Profile grade means either elevation or gradient of such trace according to the context.

101.44 PROJECT

- A. The specific improvement to be constructed together with all appurtenances and construction to be performed thereon at the prices quoted.

101.45 PROPOSAL

- A. The offer of a bidder, on the prescribed form, to perform the work and to furnish the labor and materials at the prices quoted.

101.46 PROPOSAL FORM

- A. The approved form on which the Contracting Agency requires bids to be prepared and submitted for the work.

101.47 PROPOSAL GUARANTEE

- A. The security furnished with a bid to guarantee that the bidder will enter into the contract if bidder's bid is accepted.

101.48 QUALITY ASSURANCE (QA)

- A. Planned and systematic operations conducted to ensure that the operations and/or product meets specifications. QA encompasses the Engineer's review and oversight of the Contractor's "Quality Control"; verifying the results of "Quality Control"; and inspecting for conformance to plans and specifications. QA is the responsibility of the "Engineer."

101.49 QUALITY CONTROL (QC)

- A. Planned and specified operations necessary to construct items that will meet the requirements for quality and performance as specified. QC includes, but should not be limited to controlling the quality of raw materials, produced materials assemblies, components, finished product, and construction process. QC is the responsibility of the "Contractor."

101.50 RIGHT-OF-WAY OR EASEMENT

- A. A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a highway or other improvements.

101.51 ROAD

- A. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

101.52 ROADBED

- A. The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

101.53 ROADSIDE

- A. A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside.

101.54 ROADSIDE DEVELOPMENT

- A. Those items necessary to the complete improvement which provides for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching, and the placing of other ground covers; such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the improvement.

101.55 ROADWAY

- A. The portion of a highway within limits of construction.

101.56 SHOULDER

- A. The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

101.57 SIDEWALK

- A. That portion of the roadway primarily constructed for the use of pedestrians.

101.58 SPECIAL PROVISIONS

- A. Additions and revisions to the standard and supplemental specifications covering conditions peculiar to an individual project.

101.59 SPECIFICATIONS

- A. The directions, provisions, and requirements contained in the Standard Specifications and supplemental specifications as modified by the Special Provisions. Whenever the term "these specifications" is used in this book, it means the provisions set forth in this book.

101.60 STREET

- A. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

101.61 SUBCONTRACTOR

- A. Any individual, firm, or corporation to whom the Contractor, with the consent of the Contracting Agency, sublets any part of the contract.

101.62 SUBGRADE

- A. The top of a roadbed upon which the base courses and/or the pavement structure and shoulders are constructed.

101.63 SUBSTRUCTURE

- A. All of that part of the structure below the bearings of simple and continuous spans, skewbacks or arches, and tops of footings or rigid frames, together with backwall, wingwalls, and wing protection railings.

101.64 SUPERINTENDENT

- A. The Contractor's authorized representative in responsible charge of the work, present on the work at all times during the progress to supervise and direct the construction, to receive and fulfill instructions from the Engineer, and to accept orders for changed and extra work.

101.65 SUPERSTRUCTURE

- A. The entire structure except the substructure.

101.66 SUPPLEMENTAL AGREEMENT

- A. A written agreement within the scope of the project made and entered into by and between the Contractor and the Contracting Agency covering work not otherwise provided for, revisions in or amendments to the terms of the contract, or conditions specifically

prescribed in the specifications as requiring supplemental agreements. Such supplemental agreements become a part of the contract when approved and properly executed.

101.67 SUPPLEMENTAL SPECIFICATIONS

- A. Additions and revisions to the Standard Specifications that are approved subsequent to the issuance of the published specifications.

101.68 SURETY

- A. The corporation, partnership, or individual, other than the Contractor, executing a bond furnished by the Contractor.

101.69 SURFACE COURSE

- A. The top layer of an improvement.

101.70 TRAFFIC LANE

- A. The portion of a traveled way for the movement of a single line of vehicles.

101.71 TRAVELED WAY

- A. That portion of roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

101.72 UNSUITABLE MATERIAL

- A. Soils that fail to meet the AASHTO Soil Classification System (AASHTO M145) A-1 through A-7 classifications; are highly organic; or are determined to be contaminated.

~~101.72~~**101.73 UTILITY**

- A. Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, sewers, or storm drains owned, operated, or maintained in or across a public right-of-way or private easement.

~~101.73~~**101.74 WORK**

- A. Work will mean furnishing all labor, materials, equipment, and other incidentals necessary or convenient to the successful completion of the project and the carrying out of all of the duties and obligations as imposed by the contract.

~~101.74~~**101.75 WORKING DAY**

- A. A day on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed for the major part of the day (5 hours) with the normal working force engaged in performing the controlling item or items of work which would be in progress at that time, exclusive, however, of Saturdays, Sundays, holidays, and any day that is incumbent upon the Contractor, by means of a labor union, to observe as a holiday. However, if the Contractor elects to work on such days, those days will be considered as a working day.
- B. Attention is directed to **Subsections 108.04, "Limitation of Operations,"** and **108.08, "Determination and Extension of Contract Time."**

~~101.75~~101.76 WORKING DRAWINGS

- A. Stress sheets, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, or any other supplementary plans or similar data which the Contractor is required to submit to the Engineer for approval. Working Drawings are not part of the Contract Documents.
- B. In order to avoid cumbersome and confusing repetition of expressions in these specifications, it is provided that whenever anything is, or is to be, done, if, as, or, when, or where "contemplated, required, determined, directed, specified, authorized, ordered, given, designated, indicated, considered necessary, deemed necessary, permitted, reserved, suspended, established, approval, approved, disapproved, acceptable, unacceptable suitable, accepted, satisfactory, unsatisfactory, sufficient, insufficient, rejected, or condemned," it shall be understood as if the expression were followed by the words "by the Contracting Agency."

SECTION 203

EXCAVATION AND EMBANKMENT

DESCRIPTION

203.01.01 GENERAL

- A. This work shall consist of grading and excavating the roadway, excavating borrow pits, removing slide material, and excavating ditches and stream channels and satisfactorily disposing of all excavated material and all work necessary for the construction and completion of cuts, embankments, slopes, ditches, dikes, stream channels, approaches, parking areas, intersecting driveways and highways, and subsidiary work. Exceptions are slope rounding, structure excavation, or other separately designated pay items of work, which are made a part of the contract. All work shall be in conformity with the alignment, grades, and cross sections shown on the plans or established by the Engineer.

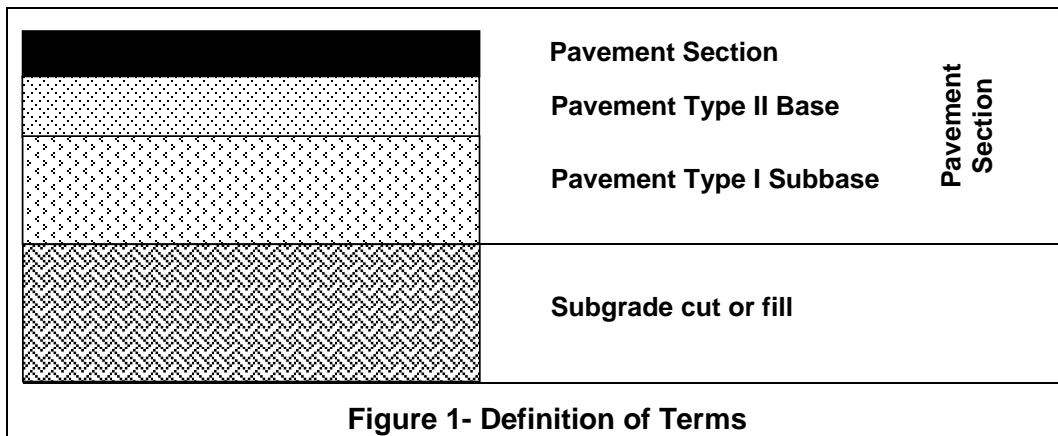


Figure 1- Definition of Terms

MATERIALS

203.02.01 ROADWAY EXCAVATION

- A. Roadway excavation shall consist of all excavation involved in grading and constructing the roadway and appurtenances, irrespective of the nature or type of material encountered; except excavation designated as structure excavation, drainage excavation, channel excavation, and borrow excavation when these items are provided as items of work under the contract. Dividing the project into construction stages shall not be construed as separate material classifications.
- A-B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.02 DRAINAGE EXCAVATION

- A. Drainage excavation shall include all excavation in the construction of open ditches less than 12 feet in bottom width, excepting ditches that are part of the roadway prism as shown in the plans. The nature or type of material encountered shall have no bearing on the classification of material.

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A-B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.03 CHANNEL EXCAVATION

A. Channel excavation shall include all excavation in the construction of open ditches or stream channels with a bottom width of 12 feet or more with the exception of ditches that are part of the roadway prism as shown in the plans. The nature or type of material encountered shall have no bearing on the classification of material.

A-B. When cementitious material is encountered within the excavation limits, the treatment, removal, trimming, and working of that material shall be considered as incidental to the excavation work.

203.02.04 BORROW

- A. Borrow shall consist of approved material excavated and used in the construction of fills, or for other construction purposes. Borrow shall be material that is excavated from sources specified in the Special Provisions or designated by the Engineer. The source of material to be excavated shall be approved in advance by the Engineer. Borrow shall be excavated to the lines and grades established by the Engineer.
- B. The Contractor shall notify the Engineer, sufficiently in advance, of opening any borrow site so that adequate time will be allowed for testing the material and establishing cross section elevations and measurements of the ground surface. The widening of roadway cuts shall be considered as roadway excavation and not as borrow, unless otherwise specified. Borrow excavation will not be classified according to type or character of material encountered in the borrow area unless otherwise required in the Special Provisions.

203.02.05 SELECTED BORROW

- A. Selected borrow shall consist of approved material required for the construction of embankments within the required limits shown on the plans or directed by the Engineer, and shall be obtained from approved sources.
- B. Selected borrow shall conform to the requirements set forth in the Special Provisions.

03CONSTRUCTION

203.03.01 ROADWAY

- A. All excavation shall be made true to lines and grades staked by parties under the supervision of a Nevada licensed professional land surveyor working for the Engineer or Contractor and shall be so conducted as to avoid removing or loosening any material outside the required slopes. If any material is so disturbed, it shall be replaced and thoroughly compacted to the required cross section, unless such replacement is impractical as determined by the Engineer.
- B. The work done under this section shall begin at some definite point or points on the project subject to the approval of the Engineer, and the work shall progress toward completion in an orderly manner. The roadway shall be graded to full cross section width before placing base or surfacing of any type, unless otherwise specified.

- C. Intersecting roads, service highways, ramps, approaches, and driveways shall be graded as shown on the plans or established by the Engineer.
- D. All suitable material removed from the excavation shall be used as far as practicable in the formation of embankments, subgrade, shoulders, slopes, dikes, and backfill for structures, unless otherwise indicated on the plans or specifications herein or disposed of in a manner satisfactory to the Engineer. Excavated material shall not be wasted without permission.

203.03.02 GRADE TOLERANCE

- A. Immediately prior to placing subsequent layers of material thereon, the grading layer shall conform to one of the following:
 - 1. The subgrade shall not vary more than 0.10 foot above or below the grade established by the Engineer or Contractor.
 - 2. The final subgrade layer prior to application of the structural base shall not vary more than zero foot above or 0.10 foot below the grade.

203.03.03 UNSUITABLE MATERIAL

- A. Unsuitable material ~~shall be as defined in Section 101 "Definitions", and as soil or organic matter not suitable for foundation material regardless of moisture content. Material~~ that is unsuitable for planned use, including material below the natural ground surface in embankment areas, shall be excavated and disposed of in a manner approved by the Engineer or as specified in the contract documents.
- B. When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable material shall be placed and compacted in layers as specified below under embankment.
- C. Disposal of material outside the right-of-way shall be in accordance with **Subsection 107.14, "Disposal of Material Outside Project Right-of-Way."**

203.03.04 BLASTING

- A. Any material outside the authorized cross section on the backslopes which may be shattered or loosened because of blasting shall be removed by the Contractor at no additional cost to the Contracting Agency. Shattered or loosened material below the bottom limits of required excavation shall be uniformly distributed and compacted or otherwise disposed of in a manner satisfactory to the Engineer. The Contractor shall discontinue any method of blasting which leads to overshooting or is dangerous to the public or destructive to property or to natural features.
- B. The use of coyote holes in blasting is prohibited. Attention is directed to **Subsection 107.10, "Explosives."**

203.03.05 ROCK CUTS

- A. In excavating side hill rock cuts and rock cliffs, the Contractor shall exercise care and use precautionary methods so as not to break down, loosen, or otherwise damage supporting rock below the bottom limits of required excavation. In general, such cuts shall be worked from the top of lifts of such height that will not damage the bench of rock below the bottom limits of required excavation. The Contractor shall be responsible for the methods used and for any damage to the roadbed resulting from Contractor's operations.

- B. The slope of all rock cuts shall be scaled and dressed to a safe, stable condition by removing all loose spalls and rock not firmly keyed to the rock slope. Overhanging rock shall be removed when, in the opinion of the Engineer, it may be a hazard to public use of the roadway.
- C. In solid rock excavation, slopes shall be constructed to the approximate neat lines staked by the Engineer. No rock shall project or overhang more than 12 inches from the true slope.

203.03.06 OVERBREAK

- A. Overbreak is that portion of material excavated, displaced or loosened outside and beyond the slopes or grade as staked or re-established, regardless of whether any such overbreak is due to blasting, the inherent character of any formation encountered, or to any other cause. Slides and slipouts as defined in **Subsection 203.03.11, "Slides and Slipouts,"** and that portion of rock subgrade as set forth below shall not be considered overbreak. All side slope overbreak as so defined shall be removed by the Contractor and shall be disposed of in the same manner as provided for the surplus under the heading of "Surplus Material," but at no additional cost to the Contracting Agency and without any allowance for overhaul.
- B. Rock removed to a maximum depth of 6 inches below subgrade will be measured for payment as described in **Subsection 203.04.01.C.2, "Overbreak."**

203.03.07 SLOPES

- A. All excavation and embankment slopes, except in solid rock, shall be trimmed to the lines staked by the Engineer. The degree of smoothness shall be that normally obtained by hand shovel operations or blade grader operations.

203.03.08 WIDENING CUTS

- A. If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section originally proposed and within the limits of the right-of-way, the Contractor shall do so and compensation therefor will be as set forth in **Subsection 203.04.01.C.3, "Widening Cuts."**

203.03.09 SURPLUS MATERIAL

- A. Unless otherwise specified in the contract documents, surplus excavated material shall be used to widen embankments uniformly, or to flatten slopes, or at other locations, all in a manner satisfactory to the Engineer. No surplus material shall be disposed of above the grade of the adjacent roadbed nor shall the Contractor waste any material unless approved in writing by the Engineer.
- B. If the quantity of surplus material is specified in the contract documents, such quantity shall be considered approximate only. The Contractor shall verify that there is sufficient material available for the completion of the embankments within the areas involved before disposing of any indicated surplus material inside or outside the right-of-way. Any shortage of material caused by premature disposal of the indicated surplus material by the Contractor shall be replaced by the Contractor and no compensation will be allowed the Contractor for such replacement.

203.03.10 SELECTED MATERIAL

- A. When specified in the contract documents, or when selected by the Engineer, suitable selected material encountered in excavating or widening the roadway prism or any other excavation within the right-of-way, or in the excavation or borrow, shall be used for finishing the top portion of the subgrade. The top portion of the subgrade shall be 2 feet in depth, or as determined by the Engineer.
- B. Selected material shall be defined as material that is excavated from one or more of the above sources and is used for selective purposes.
- C. When practical, selected material shall be hauled directly from excavation to its final position and compacted in place and such work shall be paid for at the contract unit price for the excavation item involved. Attention is directed to ***Subsection 104.05, "Rights In and Use of Materials Found on the Project."***
- D. When the transporting of selected material directly from excavation to its final position is impractical, the selected material shall be left in place until it can be placed in final position and no additional compensation will be made because of the delayed excavation. If, however, the conditions are such that the undisturbed selected material will hamper ordinary grading operations or cause unnecessary movements of equipment, the Engineer may order, in writing, the removal of sufficient selected materials and the stockpiling thereof to enable practical hauling operations. If the excavation and stockpiling of selected material is specified in the contract documents or is ordered by the Engineer, the excavation and stockpiling locations shall be designated by the Engineer. The selected material shall be removed from the stockpile and placed in final position when approved by the Engineer.
- E. Measurement for payment of selected material will be in accordance with ***Subsection 203.04.01.C.4, "Selected Material."***

203.03.11 SLIDES AND SLIPOUTS

- A. Material outside the planned roadway or ditch slopes that is unstable and constitutes potential slides in the opinion of the Engineer, material from slides that has come into the roadway or ditch, and material that has slipped out of new or old embankments shall be excavated and removed. The material shall be excavated to designated lines or slopes either by benching or in a manner approved by the Engineer. Such material shall be used in the construction of the embankments or disposed of as approved by the Engineer.
- B. The above provisions shall not be so construed as to relieve the Contractor from the duty of maintaining all slopes true and smooth. Erosion, regardless of amount or extent, caused by the action of the elements which results in damage to work or materials, shall in no case be considered a slide or slipout. Measurement for payment will be in accordance with ***Subsection 203.04.01.C.6, "Slides and Slipouts."***

203.03.12 DRAINAGE

- A. During construction of the roadway, the roadbed shall be maintained in such condition that it will be well drained at all times.
- B. V-type ditches shall be formed to the cross section and dimensions on the plans by means of suitable equipment, which will deposit all loose material on the downhill side. The bottom of the finished ditches shall not be less than 2 feet 6 inches below the crest of the loose material piled on the downhill side.

- C. In going from cut-to-fill, the roadway ditches shall be so cut as to avoid damage to embankments by erosion.
- D. The flat-bottom ditches indicated on the plans, or staked by the Engineer, shall be excavated to the required cross section and grade. Materials so obtained shall be used to construct roadway embankments or dikes or both, to form a continuous diversion channel as staked by the Engineer.

203.03.13 CHANNELS

- A. To avoid destruction of natural growth during construction of ditches, channels, or dikes, travel of equipment shall be confined to the construction limits. Where ditches, channels, and dikes are nearly parallel to the roadway, turn-around shall not be located closer than 200 feet apart. Attention is directed to **Subsection [107.12](#), "Protection and Restoration of Property and Landscape."**
- B. Fine grading of channel bottoms will not be required unless paving is specified.

203.03.14 BORROW

- A. A possible source of borrow material may be indicated in the contract documents. If the Contractor desires to use borrow materials from sources other than those described in the contract documents, the Contractor shall, at no additional cost to the Contracting Agency, acquire the necessary right to take materials and pay all costs involved. All costs of exploring such alternate sources shall be borne by the Contractor. Use of material from these sources will not be permitted until approved in writing by the Engineer.
- B. The Contractor shall, at the time of execution of the contract, execute an "Agreement" for all borrow deposits obtained under an "Option and Agreement for Sale of Materials" when said "Option" is contained in the Special Provisions. This agreement shall be executed whether the material is to be used or not.
- C. In case designated borrow deposits fail to contain the necessary quantity of acceptable material, the Contractor shall immediately notify the Engineer in writing. The Engineer shall thereupon investigate, and if the Engineer's investigation shows that there is not sufficient quantity of acceptable material, the Engineer shall designate an alternate deposit from which to obtain the deficit.
- D. In all borrow pits having undesirable material, including overburden, refuse, organic and deleterious substances, the material shall be removed and wasted or redistributed, in a manner satisfactory to the Engineer. All costs incurred therefor shall be considered as incidental and subsidiary to the borrow material.
- E. Borrow shall not be obtained until all other excavation items are complete to the extent necessary to determine the need for borrow.
- F. The Contractor shall notify the Engineer 30 days in advance of opening any borrow areas so that cross section elevations and measurements of the ground surface after stripping may be taken, and the borrow materials can be tested before being used. Sufficient time for testing of the borrow material shall be allowed.
- G. Borrow deposits shall be excavated to regular lines as staked to permit accurate measurement. The dimensions of the borrow deposit will be designated and the Contractor shall not excavate below the depth or outside limits given, except with prior approval. The depth of excavation throughout the area of the borrow pits shall be as uniform as practicable and the side slopes shall conform to the requirements of

Section 626, "Final Cleanup." Unless otherwise permitted, borrow pits shall be excavated so that the pits will drain to the nearest natural outlet.

- H. All materials that are not satisfactory for use for the purposes intended shall be rejected at the pit and disposed of in a manner satisfactory to the Engineer.
- I. If the Contractor excavates more material than is required, the excess will not be measured for payment.
- J. All work and materials required to build and maintain borrow haul roads and obliteration of haul roads in accordance with **Section 626, "Final Cleanup"** shall be considered subsidiary to the "borrow" item and no further compensation will be allowed.

203.03.15 FOUNDATION

- A. When embankment is to be placed and compacted on hillsides, or when new embankment is to be compacted against existing embankments, or when embankment is to be built one half width at a time, the slopes that are steeper than 4:1, when measured at right angles to the roadway, shall be continuously benched as the work is brought up in layers. Benching shall be of sufficient width to permit operations of placing and compacting equipment. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of the previous cuts. Material thus cut out shall be recompacted along with the new embankment material at no additional cost to the Contracting Agency, unless the width of excavation required by the Engineer exceeds 6 feet, in which case the excavated material in excess of 6 feet will be measured and paid for as roadway excavation.
- B. All foundations for embankment shall be cleared and grubbed in accordance with **Section 201, "Clearing and Grubbing."**
- C. In designated areas, unsuitable material shall be removed and disposed of as prescribed in **Subsection 203.03.03, "Unsuitable Material."**
- D. Where 12 inches or less of embankment is placed over existing bituminous surface, such surface shall be removed and incorporated in the embankment or otherwise disposed of as approved by the Engineer. Where more than 12 inches of embankment is placed over existing bituminous surface, such surface shall be left undisturbed. Measurement for removal of existing bituminous material will be measured and paid for as roadway excavation unless the contract documents specifically call for payment under **Section 202, "Removal of Structures and Obstructions."**

203.03.16 EMBANKMENT MATERIALS

- A. Embankments shall be constructed with suitable materials, excavated as prescribed and with any excess materials from other operations which are acceptable and suitable for use.
- B. All materials used in embankment shall be free from objectionable material such as leaves, grass, roots, logs, stumps, brush, or other perishable material.
- C. When there is a choice of material, the excavation shall be made so the best material will be placed on top of the embankment for at least 1 foot in depth. This paragraph shall not be interpreted as to require the Contractor to stockpile and subsequently rehandle embankment materials except as provided in **Subsection 203.03.10, "Selected Material."**

- D. Material shall not be placed in the embankment when either the material, foundation, or the embankment on which it would be placed is frozen.
- E. Where embankments are to be made of material from rock cuts or other material that is unsuitable for finishing the roadbed, the upper 6 inches of the roadbed shall be formed of approved material.

203.03.17 PLACING EMBANKMENT

- A. For embankment or backfill deposited against structures, attention is directed to ***Subsection 207.03.02, "Placing and Compacting at Abutments, Piers, Wingwalls and Retaining Walls."***
- B. Where structure abutments are placed on embankment, the embankment shall be constructed to subgrade elevation prior to excavating for the construction of the abutment. Where the abutment is supported on piles, the embankment shall be constructed to the elevation of the bottom of the footing.
- C. Where a structure is to be covered by a rockfill, it shall be covered with not less than 2 feet of satisfactory soil or granular materials before the rock embankment is placed over the structure.
- D. Embankments shall, except as specified herein, be constructed in layers. The construction of embankments shall begin at the lowest point of the fill below the grade or the bottom of ravines. Individual layers shall be spread evenly to uniform thickness throughout and parallel with the finished grade for the full width of the embankment, unless otherwise permitted. The thickness of the layer shall be as necessary to secure the required compaction with 12 inch maximum thickness after compaction. Excepted provisions for placing in marsh and placement of rock are outlined below. Hauling equipment shall be routed to obtain uniform compaction and channelization of haul routes and rutting of the fill shall be avoided.
- E. When embankments are constructed across wet or swampy ground that will not support the weight of heavy hauling and spreading equipment, the Contractor will be expected to choose such methods of embankment construction and to use such hauling and spreading equipment as will least disturb the soft foundation. When soft foundations are encountered, and when approved by the Engineer, the lower part of the fill may be constructed by dumping and spreading successive vehicle loads. This shall be in a uniformly distributed layer of a thickness not greater than that necessary to support the vehicle while placing subsequent layers, after which the remainder of the embankment shall be constructed in layers and compacted as specified.
- F. It is not the policy of the Contracting Agency to allow an increase in the planned depth of embankment material over soft, wet, or swampy ground for the sole purpose of providing support for heavy hauling and spreading equipment, unless the Contractor proves to the satisfaction of the Engineer that the planned depth is inadequate to support light hauling vehicles. If it proves necessary for the Contractor to use smaller hauling vehicles or different methods of embankment construction than the Contractor had originally contemplated in order to comply with the foregoing, such shall not be the basis for a claim for extra compensation against the Contracting Agency. The unit contract price for the various pay items involved shall be full compensation for all labor, materials, and equipment necessary to perform the work as outlined herein.
- G. Embankment which, in the opinion of the Engineer, contains enough rock larger than 4 inches to make it impractical to place and compact in 1-inch lifts shall be considered as

"Rock Embankment." The materials shall be spread in a uniform horizontal layer over the full width of the embankment. The layer thickness shall not exceed 1-1/3 times the vertical dimension of maximum size material larger than 8 inches. The largest size rock allowed in the embankment will be 3 feet measured in vertical direction and rocks larger than this shall be broken up before being placed in the embankment. Rock to be wasted may exceed 3 feet and be disposed of in an inconspicuous manner approved by the Engineer.

- H. In rock fills where end dumping is employed, direct end dumping upon the previously constructed layer of embankment will not be permitted. Rock shall be dumped on the layer of embankment being constructed and dozed ahead into place. Care shall be exercised to work the fines and smaller rock into the spaces between the larger rock. Compaction will be required as provided in **Subsection 203.03.19, "Compaction, Rock Embankment."**
- I. To the extent of project requirements for embankments, all rock from excavation shall be used for embankment. The Contractor shall plan the grading operation to use rock that may be encountered in excavation in accordance with the following provisions:
- J. Rock, in general, shall be placed to form the base of embankment for the full width of the cross section under the following condition:
 - 1. on the side slope or slopes of a new embankment being placed; or
 - 2. on the side slope or slopes of an embankment already in place requiring widening; or where excess rock may be wasted; or
 - 3. on the side slopes and top of rolled embankment made of embankment materials other than rock.
- K. The Contractor shall not place large rock in embankments where piles will be driven. The Contractor shall be responsible for penetrating the embankment with specified piles.
- L. When rock and other embankment materials are excavated at approximately the same time, the rock shall be distributed throughout the fill and not nested in one location.
- M. When there is insufficient material other than rock in the excavation to permit properly compacted layers, the rock shall be placed for the full cross section width with the larger rocks well distributed and the void spaces filled with the smaller rocks and fragments.
- N. When shown on the plans or considered necessary by the Engineer, embankments shall be built to such elevation above required grade to allow for settlement, or sufficient surcharge shall be placed above the required elevation of earth grade over deposits of unstable material to secure displacement or settlement. Surcharge shall be removed only after the fill has reached stability or the required settlement time has been reached.

203.03.18 COMPACTION, DIRT EMBANKMENT

- A. Optimum moisture content and material density of the various soils will be determined by a Geotechnical Engineer and acceptable ranges for optimum moisture and material density shall be approved by the Engineer. At the time of compaction, the moisture content of the various soils shall be within the approved ranges.
- B. The compacted subgrade shall be maintained at a minimum of optimum moisture content until placement of an aggregate base course or cement treated base.
- C. When necessary, each layer before being compacted shall be processed as required in order to bring its moisture content within the prescribed limits. The material shall be

wetted by the application of water or dried as necessary and either process may be carried out either on the embankment or at the source of the material or otherwise as approved by the Engineer. Full compensation of any work involved in wetting or drying embankment material to obtain the required moisture content shall be considered as included in the contract unit price bid for excavating or furnishing the material and no additional compensation will be allowed therefor.

- D. Hauling and leveling equipment shall be routed over each layer of the fill in such a manner as to uniformly distribute the compaction afforded by the wheel load. In addition to hauling and leveling equipment, the Contractor shall provide compaction equipment that is specifically designed and manufactured for compacting dirt embankments. The compaction equipment shall work continuously with the grading equipment.
- E. The top 8 inches of the base of cuts and natural ground having less than 5 feet of embankment, measured from the subgrade, and all embankment material, shall be compacted to not less than 90 percent relative compaction unless otherwise specified. When natural ground material is encountered that cannot be compacted to the required density, compaction requirements shall be determined by the Engineer.
- F. All selected borrow and structure backfill placed within the limits of embankment shown on the plans for approaches to bridges shall be compacted to not less than 95 percent relative compaction unless otherwise specified.
- G. It is to be expected that a loss of density in the upper portion of earth subgrade may occur due to the elements, or for lapse of time, or for other reasons. Recomposition to the specified density will be required prior to placement of any subsequent course and no additional compensation will be allowed.

203.03.19 COMPACTION, ROCK EMBANKMENT

- A. Field density tests will not be required on rock embankments. In lieu thereof, the required compaction shall be tested by proof rolling. Unless otherwise specified, compaction shall be attained and tested by using construction methods and equipment as follows:
 - 1. Methods:
 - a. The material for the embankment shall be deposited, spread, and leveled the full width of the embankment, and the layer of thickness may be 1-1/3 times the vertical dimension of maximum size material. The maximum size rock shall not exceed 3 feet.
 - b. Hauling and leveling equipment shall be routed and distributed over each layer of the fill in such a manner as to make use of the compaction afforded thereby. Rollers, vibrators, or compactors shall compact the embankment full width with a minimum of 3 complete passes for each layer of embankment. The compacting equipment shall not exceed a speed of 5 miles per hour and shall work continuously with the grading equipment.
 - c. Rolling shall be done in a longitudinal direction along the embankment and shall begin at the outer edges and progress toward the center. The travel paths of traffic and construction equipment shall be kept dispersed over the entire width of the embankment to aid in obtaining uniform compaction. Weights of equipment used in making embankments over soil having an excessive moisture content may be limited, if, in the judgment of the Engineer, such limitations are necessary in order to maintain the fill in a satisfactory condition.

- d. Water shall be applied to the embankment in the amount necessary to obtain the required compaction.
2. Equipment:
 - a. Compaction equipment shall be adequately designed to obtain compaction requirements without adverse shoving, rutting, displacement, or loosening and shall meet the requirements specified herein. Rollers shall have displayed thereon in permanent legible characters, the manufacturer's guaranteed net operating weights as distributed on each axle.
 - b. The proof roller shall be a pneumatic-tired roller or pneumatic-tired compactor weighing not less than 50 tons, and capable of applying to the ground loads of not less than 25,000 pounds per wheel. All tires shall be of equal size and diameter and shall be capable of operating at an air pressure of at least 90 psi. The tires shall be kept uniformly inflated so that the difference in pressure in any 2 tires shall never exceed 5 psi and means shall be provided by the Contractor for checking the tire pressure on the job at any time.
 3. Tests:
 - a. Subsequent layers shall not be placed until the previous layer of the embankment is compacted to the degree that no further appreciable deflection is evidenced under the action of proof rolling equipment, as determined by the Contractor with approval of the Engineer.
 - b. Rolling and proof rolling may be deleted on any layer or portion thereof when, in the judgment of the Engineer, accomplishment is physically impractical.
 - c. Payment for rolling and proof rolling or for the correction of any subgrade weakness or deficiencies disclosed by the proof rolling operation shall be considered subsidiary to the price bid for the "Excavation" item.
 4. The Contractor shall submit an inspection report to the Engineer that has been reviewed and stamped by a Nevada professional engineer.

203.03.20 MAINTENANCE

- A. Embankment material that may be lost or displaced as a result of natural settlement of the ground or foundation upon which the embankment is constructed shall be replaced by the Contractor with acceptable material from excavation or borrow, etc. The quantity of material required will be paid for at the regular contract price for the type of material used.
- B. The Contractor shall, at no additional cost to the Contracting Agency, remove and replace with acceptable material any embankment or portion thereof which has been constructed with unapproved material as well as remove and replace portions of the embankment which may become unstable or displaced as the result of carelessness or negligence on the Contractor's part.

203.03.21 SUBGRADE TOLERANCE

- A. Subgrade shall comply with **Subsection [203.03.02](#), "Grade Tolerance."**

04METHOD OF MEASUREMENT

203.04.01 MEASUREMENT

- A. Unless otherwise specified, excavation will be measured on a volume basis by cross sectioning the area to be excavated and computing neat lines for an end area. The average end area method will be used with no allowance made for curvature. If for any reason it is impossible or impractical to measure quantities by average end areas, the Engineer will compute the quantities by a method which, in the Engineer's opinion, is best suited to obtain an accurate determination.
- B. The quantity of excavation to be measured for payment shall be the number of cubic yards excavated and placed as shown on the plans and as directed by the Engineer. The estimated quantities shown on the plans, plus or minus authorized changes will be the quantity used for payment. Additional measurement of excavation quantities will not be made for methods or equipment chosen by the Contractor for the Contractor's convenience. The Contracting Agency or the Contractor may request a final measurement in which case final cross sections will be taken. When final cross sections are taken the determination of quantities derived therefrom will be the quantities used for payment. Furthermore, when the Contractor requests final measurement and the quantities thus determined are less than the planned quantities plus authorized changes, the Contractor shall reimburse the Contracting Agency for the Agency's expenses incurred by such final measurement and calculation.
- C. When changes are made during construction such as widening cuts, changing grades, disposing of unsuitable material, stockpiling selected material, and other changes resulting in increases or decreases in quantities, then additional measurements for payment will be made by the Engineer as outlined below:
1. **Unsuitable Material:**
 - a. When the removal and disposal of unsuitable material is shown in the contract documents, such material will be measured for payment as excavation for the related item. Removal and disposal of unsuitable material not shown on the plans will be measured and paid for as "Roadway Excavation." However, if removal and disposal of unsuitable material not shown on the plans required special equipment or unusual operations, it may be paid for as extra work according to the provisions of **Subsection 104.03, "Extra Work."**
 - b. No measurement will be made of suitable material temporarily removed and replaced to facilitate compaction of material.
 2. **Overbreak:**
 - a. All sideslope overbreaks as defined in **Subsection 203.03.06, "Overbreak,"** shall not be paid for. Rock removed to a maximum depth of 6 inches below subgrade will be measured for payment provided the rock has been removed sufficiently to permit accurate cross sectioning. Replacement to this depth shall be with material designated on the plans and approved by the Engineer and will be measured and paid for at the contract unit price for the material used.
 - b. Rock loosened or removed in excess of 6 inches below subgrade will not be measured nor paid for. When ordered by the Engineer, the loosened material will be removed and the resultant space refilled with approved material at the expense of the Contractor.

3. **Widening Cuts:** If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section and before the excavation is substantially completed, the material shall be classified as "Roadway Excavation" and shall be paid for at the contract bid price. However, if widening cuts requires special equipment, or unusual and extra expense, it may be paid for as extra work according to the provisions of **Subsection 104.03, "Extra Work."**
 4. **Selected Material:** Selected material stockpiled as provided in **Subsection 203.03.10, "Selected Material"** will be measured for payment as roadway excavation both in its original position and also from the stockpile. Measurement of the material taken from stockpile will be made of the volume actually removed.
 5. **Surplus Material:** Surplus excavated material will be measured for payment as roadway excavation and no further compensation will be allowed by virtue of the method of disposing, placing, or widening embankments caused from such surplus material.
 6. **Slides and Slipouts:** In the event of slides and slipouts, the Engineer and Contractor shall negotiate in each case and decide the relative difficulty of performing the work, and payment will be made either as "Roadway Excavation" or as "Extra Work" as provided in **Subsection 104.03, "Extra Work."**
- D. Where slopes have been previously completed by the Contractor, the cost of resloping required in areas where unstable material is removed will be paid for as extra work as provided in **Subsection 104.03, "Extra Work."**
- E. The cost of pioneering work necessary to make slide or slipout areas accessible to normal excavation equipment and the cost of necessary clearing and grubbing will be paid for as extra work as provided in **Subsection 104.03, "Extra Work."**
- F. Only those quantities of slide or slipout material that are authorized and actually removed will be measured for payment.
- G. Excavation in excess of the staked or authorized cross section will not be measured for payment, except as outlined above.
- H. Material used for surcharge, whether shown on the plans or called for by the Engineer, will be measured for payment as roadway excavation both in its original position and when removed from the surcharge position.
- I. Earthwork quantities within the limits of "Slope Rounding" will not be measured for payment.
- J. V-type ditches will be measured parallel to the ground and each 100 linear feet shall constitute a unit of measure. The volume of excavation for such ditches will not be measured for payment.
- K. The quantity of "Selected Borrow" or "Selected Borrow Excavation" to be measured for payment will be the number of cubic yards or tons measured as set forth in the Special Provisions.
- L. All measurements will be made in accordance with **Subsection 109.01, "Measurement of Quantities."**

05BASIS OF PAYMENT

203.05.01 PAYMENT

- A. The accepted quantities of excavation measured as specified in **Subsection 203.04.01, "Measurement,"** will be paid for at the contract unit price bid for each of the pay items listed in the bid schedule. Compensation for roadway excavation shall include excavating, loading, hauling, depositing, spreading, compacting, and maintaining the material complete and in place which includes all labor, tools, equipment for removal of existing asphalt paving, saw cutting of existing paving, scarifying the existing subgrade or subbase, all miscellaneous grading of shoulders, ditches, and transitions, and incidentals as necessary, as shown on the drawings, as specified herein, and as required by the Engineer.
- B. All costs for disposal of surplus materials is considered to be included in the contract price paid per cubic yard of roadway excavation and no additional payment will be made therefor.
- C. The accepted quantities of selected borrow or selected borrow excavation will be paid for at the contract unit price bid per cubic yard or ton for "Selected Borrow" or "Selected Borrow Excavation," which shall be full compensation for furnishing all materials, loading, hauling, depositing, spreading, watering, compacting, and maintaining the material complete and in place.
- D. The contract unit price bid per cubic yard for roadway excavation, borrow excavation, and channel excavation shall be considered as including payment for all haul.
- E. All payments will be made in accordance with **Subsection 109.02, "Scope of Payment."**
- F. Payment will be made under:

PAY ITEM	PAY UNIT
Roadway Excavation	Cubic Yard
Drainage Excavation.....	Cubic Yard
Channel Excavation.....	Cubic Yard
Borrow Excavation.....	Cubic Yard
V-type Ditches	Stations
Selected Borrow	Cubic Yard, Ton
Selected Borrow Excavation.....	Cubic Yard, Ton

TESTING

203.05.02 TESTING

SECTION	DESCRIPTION	TEST	REFERENCE SPECIFICATION AND/OR TEST PROCEDURE	RECOMMENDED FREQUENCY
203.02.01	Roadway Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.02	Drainage Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.03	Channel Excavation (Subgrade)	Field Density	AASHTO T 310	1/5000 SF
203.02.04	Borrow	Sieve Analysis	AASHTO T 11 & T 27	1/Type
		Plasticity Index	AASHTO T 89 & T 90	1/Type ¹
203.02.05	Selected Borrow	R-Value	AASHTO T 190	1/Type
		Proctor	AASHTO T 180	1/Project or Change
203.03.01	Roadway At Grade or Fill (Subgrade)	Field Density	AASHTO T 310	Residential = 1/5000 SF/Lift/Day Arterial and Collector = 1/5000 SF/Lift/Day
203.03.10	Selected Material	Sieve Analysis	AASHTO T 11 & T 27	1/1000 LF
		Plasticity Index	AASHTO T 89 & T 90	1/1000 LF
		R-Value	AASHTO T 190	1/Type
		Field Density	AASHTO T 310	1/5000 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.15	Foundation ² (Subgrade)	Field Density	AASHTO T 310	1/500 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.18	Embankment	Field Density Fill	AASHTO T 310	1/5000 SF/Lift/Day
		Field Density Native Below Embankment Fill Operations	AASHTO T 310	1/5000 SF/Lift/Day
		Proctor	AASHTO T 180	1/Project or Change
203.03.19	Rock Embankment	Visual	Issue Inspection Report	Full Time

¹ A maximum testable lift is defined as a 12-inch layer of compacted material.

² This is in reference to benched slope construction of embankment only.

SECTION 215

KEYHOLE POTHOLE EXCAVATION AND BACKFILL

01DESCRIPTION

215.01.01 GENERAL

- A. This specification covers the requirements for keyhole coring, vacuum excavation, backfilling, and reinstatement of the keyhole core in asphalt or concrete pavements to allow for underground utility repairs and underground exploratory potholing.
- B. Quality control field inspection and testing requirements including frequency shall be in accordance with Contracting Agency requirements.

215.01.02 DEFINITIONS

- A. **Keyhole Coring:** The operation of coring a circular hole through the roadway pavement using diamond core drilling equipment.

02MATERIALS

215.02.01 GENERAL

- A. The material and placement requirements in the pipe zone and final backfill area shall be in accordance with **Section 208, "Trench Excavation and Backfill."**
- B. Pavement keyhole cores removed shall either be removed from the work site or stored in a safe and secure on-site location. The cores shall be made readily available for restoring the pavement after backfilling is complete and approved.
- C. **Bonding Agent:** The bonding agent shall be a single component cementitious, rapid hardening, high strength, waterproof bonding agent conforming to the physical properties shown in Table 1.
 - 1. The bonding material shall be impervious to water penetration at the joint after application.
 - 2. The bonding material shall securely bond the undamaged keyhole core to the pavement and shall completely fill the annular space at the joint.
 - 3. The bonding material shall, within 30 minutes at an ambient temperature of 70 degrees Fahrenheit, allow the core to support an equivalent traffic load condition of at least three (3) times the AASHTO H-25 standard.
 - 4. The bonding material shall be Utilibond, manufactured by Utilicor Technologies, Inc., or an Engineer approved equal.

Table 1

Bonding Material Properties

Property	ASTM Test Method	Requirements
Bond Strength (Slant Shear), psi (70 degrees F., 30 minute cure)	C882	200 min.
Compressive Strength, psi (70 degrees F., 60 minute cure)	C109	1500 min.

03CONSTRUCTION

215.03.01 POTHOLE EXCAVATION, GENERAL

- A. The vertical alignment of the keyhole coring shall be perpendicular to the horizon, and the cutting shall extend to the full depth of the existing pavement section.
- B. Unless otherwise approved by the Engineer, keyhole cores shall not be greater than 24-inches in diameter. Adjacent cores shall not be closer than 3 feet from each other (edge to edge), shall not contain a joint or any pavement cracks greater than 1/8-inch wide, and shall not be performed in pavements where the section is less than 4-inches thick.
- C. Coring shall be performed with a keyhole coring saw.
- D. The Contractor shall place a temporary mark on the keyhole core prior to cutting to insure that the removed section is replaced in the same orientation as originally found in the pavement.
- E. Soils within potholes shall be removed by air/vacuum extraction methods to expose utilities. The zone of soil removal shall remain essentially within a vertical plane extending below the edges of the removed pavement.
- F. The Contractor shall remove all materials excavated from the site.

215.03.02 POTHOLE BACKFILL AND COMPACTION

- A. The backfilling of each zone shall be completed in accordance with **Section 208, "Trench Excavation and Backfill."** Unless otherwise approved by the Engineer, the backfill material shall be placed in maximum 10-inch loose lifts.
- B. Backfill compaction quality shall be determined by use of a compression wave amplitude monitoring device manufactured specifically for the purpose of measuring soil compaction. This device shall measure the compression wave amplitude as compaction progresses using below-grade disposable piezoelectric transducer wave sensors and an above-grade electronic monitor. The device shall signal the operator of successful compaction when

- the compaction wave amplitude becomes asymptotic to continued compaction effort for each lift.
- C. Backfill soil shall be placed with a moisture content within three percent of optimum moisture content. Moisture content shall be determined in accordance with AASHTO T217.
 - D. Place a disposable compaction sensor at the bottom of the first loose lift. A new sensor shall be placed for every 48-inches of compacted fill depth. Remove backfill soil and sensor if the disposable sensor fails during compaction and repeat repairs with a new sensor.
 - E. Mechanical compaction on each lift shall be continued until the electronic monitor signals that compaction is complete. A new lift shall not be placed until a positive signal has been received. Remove backfill soil and sensor if the monitor does not give a positive compaction signal after repeated compaction work.

215.03.03 PAVEMENT RESTORATION

- A. The surface cut by keyhole coring restored to its original condition with the reinstated core flush with and in the original orientation as the existing surface, matching existing pavement surface appearance.
- B. Excess bonding material shall be removed from the restored surface. A patched appearance shall be avoided in surface restoration wherever possible.
- C. Unless otherwise approved by the Engineer, the Contractor shall reinstate the bonded keyhole core within 24 hours of cutting the pavement. Openings allowed to be left open greater than 24 hours shall be covered with an approved steel road plate capable of supporting traffic loads, and in accordance with **Subsection [208.03.21](#), “Cutting and Restoring Street Surfacing.”**
- D. **Surface Tolerances:** The reinstated core shall be flush and level with the adjacent pavement. Gaps attributable to the positioning of the core shall be less than 1/16-inch between the bottom of a minimum 3-foot long straightedge and the surface of the pavement in any direction on the surface of the keyhole core.

215.03.04 DEFICIENCIES

- A. Where the keyhole core is found to be fractured or defective upon removal, or becomes damaged after removal and prior to reinstatement, the core shall not be used to restore the pavement. The pavement at damaged keyhole core locations shall be cut and a permanent patch shall be installed in accordance with **Subsection [208.03.21](#), “Cutting and Restoring Street Surfacing.”**
- B. A keyhole core shall be considered unacceptable when one of the following conditions exist:
 - 1. The keyhole core contains any vertical cracks wider than 1/8-inch extending full depth through the core; or
 - 2. Any deteriorated piece of the keyhole core is larger than ten percent of the overall area of the core; or

3. Two or more successive layers of pavement in the keyhole core become horizontally delaminated and cannot be re-bonded to each other with the bonding material.
- C. All keyhole cores that are damaged or do not meet the surface tolerances shall be removed, and the Contractor shall cut and install a permanent patch in accordance with **Subsection 208.03.21, "Cutting and Restoring Street Surfacing."**
- C.D. An alternative to the cut and patch repair may be used. A new core of the same circular dimension may be cut from a core "farm." A core farm is an existing pavement with different mix designs and thickness for the sole purpose of replacing damaged keyholes. The core must have the same circular dimension, a depth of one inch greater than the existing pavement, and the same type of IQAC mix design. The exact mix design number is not required. The inspection of the core farm pavement shall be as specified in Subsection 401.03.12 "Acceptance Sampling and Testing of Bituminous Mixture." The testing documents shall be submitted to the Engineer for approval.

04METHOD OF MEASUREMENT

215.04.01 MEASUREMENT

- A. Unless otherwise specified, the quantity of Keyhole Core repair will not be measured for payment, but shall be considered incidental to other items of work.

05BASIS OF PAYMENT

215.05.01 PAYMENT

- A. Payment for Keyhole Core Repair will be made only when required in the Special Provisions.

SECTION 413

PLANTMIX BITUMINOUS GAP-GRADED SURFACE

DESCRIPTION

413.01.01 GENERAL

- A. This work shall consist of placing a gap-graded wearing course, bonded to the surface, in accordance with these specifications and in conformity with the lines, grades, thickness, and the typical cross sections shown on the plans or established by the Engineer.
- B. The bonded wearing course shall consist of an application of a warm polymer modified asphalt emulsion to create a polymer modified membrane (PMM) followed immediately with a hot gap-graded ultra-thin asphalt concrete surface course (UTACS).
- C. This work shall not be started until the Contractor has completed all heavy equipment work or any other work that could scar or mar the finished gap-graded surface.
- D. The requirements of **Section 401, "Plantmix Bituminous Pavements – General,"** shall be applicable to this work, except as hereinafter specified.

413.01.02 REFERENCE CODES AND STANDARDS

- A. Related Interagency Quality Assurance Committee (IQAC) procedures at:
http://www.clarkcountynv.gov/Depts/public_works/construction_mgmt/Pages/Materials.aspx

413.01.03 REQUIREMENTS

- A. Persons involved with the placement of UTACS shall be trained by the manufacturer and/or the Nevada T2 Program.

MATERIALS

413.02.01 GENERAL MATERIALS

- A. The materials shall conform to **Subsection 401.02.01, "Composition of Mixtures,"** with the following exceptions:
 1. Prior to starting work, the Contractor shall submit a proposed job-mix formula in writing for review and approval by the Engineer.
 2. The proposed job-mix formula shall be determined by an AASHTO certified testing laboratory, using Nevada Alliance for Quality Transportation Construction (NAQTC) certified technicians, based on the tests required to determine the gradation and surface capacity for coarse aggregate.
 3. The gradation shall be Type S1, S2, or S3 in accordance with **Subsection 705.03.08, "Plantmix and Roadmix Asphalt Concrete Surface Course UTACS Type S1 through S3,"** and the contract Special Provisions.
 4. The bituminous materials shall be PG76-22CC in accordance with **Section 703.03.02, "Asphalt Cements."**
- 4-B. Prior to the production of the UTACS gap-graded mix material, all of the contract aggregate quantity shall be stockpiled and shall be tested by the Contractor. The tests

[are to be submitted to the Engineer no earlier than two weeks prior to placement and may be used only after the Engineer has taken no exception to the results.](#)

413.02.02 COMPOSITION OF GAP-GRADED (UTACS) MIXTURE

- A. The plantmix gap-graded Ultra-Thin Asphalt Concrete Surface (UTACS) mixture shall be composed of aggregates and bituminous materials as described in these specifications. The criteria for the design is based on **Subsection [413.02.01](#), "General Materials,"** above and the following:
1. Film Thickness (μm):
 - a. Gradation surface area factor using the film thickness calculation based on effective asphalt content and aggregate surface area according to Asphalt Institute MS-2 Table 6.1.
 - b. The minimum film thickness shall be 10 μm .
 2. Specimens for AASHTO T283 testing shall be compacted using the Superpave gyratory compactor applying 100 gyrations or using the Marshall compactor applying 50 blows on each side of the 4-inch diameter sample.
 - a. Use mix quantity necessary to obtain compacted samples 2.5 inches ± 0.05 inch in height.
 - b. Further test compacted samples regardless of air void levels achieved after 100 gyrations or 50 blows on each side.
 - c. Apply vacuum to samples to be conditioned for 20 seconds and proceed without calculating percent saturation.
 - d. Mixing and compaction temperatures are to be recommended by the binder supplier.
 - e. The minimum moisture susceptibility shall be 80 percent retained strength.
 3. The minimum air voids shall be 4 percent and the maximum aggregate surface shall be 26 square feet per pound.
 4. Marshall stabilities are not required.
 5. Gradation shall be in accordance with **Subsection [705.03.08](#), "Plantmix and Roadmix Asphalt Concrete Surface Course UTACS Type S1 through S3" of Section [705](#), "Aggregates for Bituminous Courses."**
 6. The binder type shall be PG76-22CC as described in **Section [703](#), "Bituminous Materials."**

413.02.03 POLYMER MODIFIED MEMBRANE

- A. The UTACS pavement shall consist of an application of a warm polymer modified membrane (PMM) asphalt emulsion, as specified under **Section [703](#), "Bituminous Materials,"** followed immediately with an ultra-thin surface course of quality hot mix asphalt concrete.
- B. The PMM emulsion shall be sprayed immediately prior to the application of the surface course so that no wheel or other part of the paving machine comes in contact with the PMM before the surface course is applied.

1. Should emulsion be spilled into the paver hopper, paving shall stop and all contaminated material shall be removed from the paver hopper.
 2. Under no circumstances shall the contaminated material be placed on the roadway.
- G. Overlapping or hot lapping of the bonded wearing course shall not be permitted when paving miscellaneous areas in order to achieve project layout requirements.
- H. Material that has been placed through the paving screed or over the polymer modified asphalt emulsion membrane shall not be reintroduced into the paving process.
- I. UTACS shall be applied at a thickness such that no aggregate is fractured.
1. The S3 mix shall be applied at a minimum 3/4-inch thickness.
 2. The S2 mix shall be applied at a minimum 5/8-inch thickness.
 3. The S1 mix shall be applied at a minimum of 9/16-inch thickness.

413.03.04 SURFACE PREPARATION FOR UTACS

- A. The following items shall be performed prior to the commencement of paving operations and paid for under the appropriate bid item numbers:
1. Manhole covers, drains, grates, catch basins, and similar utility structures shall be protected and covered with building felt prior to paving, and shall also be clearly referenced for location and adjustment after paving.
 2. Thermoplastic traffic markings shall be removed.
 3. Pavement cracks and joints greater than 0.25 inches wide shall be cleaned and filled using an approved material and method.
 - a. There shall be no over-banding of cracks which will be covered by UTACS.
 - b. Crack sealing shall be completed at least 7 days prior to paving.
 4. Surface irregularities greater than 1 inch deep shall be milled and/or filled with a material approved by the Engineer. All repairs shall be completed 1 week prior to paving or as recommended by the sealant manufacturer or the Engineer.
 5. The entire pavement surface to be overlaid shall be thoroughly cleaned, giving special attention to accumulated mud and debris. Pressurized water and/or vacuum systems may be required to ensure a clean surface.
 6. Cold planing shall be completed as specified herein.

413.03.05 JOINTS

- A. Longitudinal joints shall be constructed only on the shoulders or at the edge of the travel lanes.

413.03.06 QUALITY CONTROL ASPECTS

- A. PMM application rate shall be checked twice per day using random sample location techniques.
- B. Determination of the application rate of the PMM shall be as follows:
1. At the location to be sampled, immediately adjacent to the paving area, use 2 pads approximately ~~3.3 feet~~15-inches wide by ~~3.3 feet~~20 inches long, placed side by side, to determine the PMM application rate based on the average of 2 application rate measurements.

SECTION 501

PORTLAND CEMENT CONCRETE

DESCRIPTION

501.01.01 GENERAL

- A. This work shall consist of Portland cement, fine aggregate, coarse aggregate, water and when specified, an air entraining admixture, proportioned, mixed, placed, and cured as herein specified. All concrete shall meet the most current requirements of American Concrete Institute (ACI) with the following additions and/or exceptions indicated in this specification.
- B. As used in this section, the term Portland Cement shall be considered synonymous with the term Hydraulic Cement.

501.01.02 QUALITY CONTROL TESTING AND INSPECTION

- A. The testing and inspection of Portland cement concrete shall comply with this specification. The inspection of the mixing plant shall comply with the ACI 311, Chapter 2. In Clark County unincorporated areas and if required by other Contracting Agencies, all field and laboratory sampling and testing for project control shall be performed by NAQTC or ACI certified technicians in an AASHTO or A2LA accredited laboratory. The concrete designs shall comply with Tables 1 and 2 and the IQAC website http://www.clarkcountynv.gov/Depts/public_works/construction_mgmt/Pages/Materials.aspx or comply with Contracting Agency requirements.

- B. Testing reports shall be distributed to the owner, licensed design professional responsible for the design, Contractor, appropriate subcontractors, appropriate suppliers, and building official within seven calendar days to allow timely identification of either compliance or the need for corrective action.**

02MATERIALS

501.02.01 GENERAL

- A. Materials shall meet the requirements of the following sections and subsections:

Materials	Section
<i>Aggregate for Portland Cement Products</i>	<u>706</u>
<i>Concrete Curing Materials and Admixtures</i>	<u>702</u>
<i>Hydraulic Cement</i>	<u>701</u>
<i>Water</i>	<u>722</u>

501.02.02 GRADATION REQUIREMENTS

- A. Refer to ACI 304R Chapters 2.1 and 2.2, and comply with the gradation requirements specified in **Section [706](#), "Aggregates for Portland Cement Products,"** and the following:
1. The gradation requirements represent the extreme limits in determining the suitability of material. The gradation from any one source shall maintain a uniformity

SECTION 603

REINFORCED CONCRETE PIPE

DESCRIPTION

603.01.01 GENERAL

- A. This work shall consist of furnishing circular or elliptical, reinforced concrete pipe, siphons, and conduits of the size, classes, and dimensions and at locations shown on the plans or established by the Engineer and in accordance with ASTM C76, ASTM C655, or ASTM C507, with design basis in accordance with **Section 708, "Concrete and Clay Pipe and Drains,"** and where indicated in these specifications.
- B. The installation shall conform to the AASHTO LRFD Bridge Construction Specifications and these specifications.

MATERIAL

603.02.01 GENERAL

- A. Materials and their use shall conform to **Subsection 601.02.01, "General,"** and the requirements below.
- B. Prior to the use of these materials, the Contractor shall submit to the Engineer for approval a document certifying that the material meets these specifications and **Section 708, "Concrete and Clay Pipe and Drains,"** from an authorized source approved by the Interagency Quality Assurance Committee (IQAC).
- C. Flared end sections (precast) shall conform to the details and dimensions shown on the plans and, except for shape, shall conform to the material requirements of this section for reinforced concrete pipe.
- D. Rubber gaskets are required for all circular pipes and ~~mastic for~~ elliptical pipes. Rubber gaskets shall conform to **Subsection 707.03.06, "Rubber Gaskets."**
- E. If joint mortar is required, it shall be as specified in **Subsection 501.03.12, "Mortar," Class "C."**
 - 1. Sand shall conform to **Subsection 706.03.04, "Grout and Mortar Sand."**
 - 2. The materials shall be mixed to a consistency suitable for the purpose intended.
 - 3. All mortar shall be used within 30 minutes after the mixing water has been added.
 - 4. Admixtures of hydrated lime, fire clay, diatomaceous earth, or other approved inert material may be used in the mortar to facilitate workability if the Contractor elects.
 - 5. The amount of admixture to be added shall be the quantity determined by the Engineer.

03CONSTRUCTION

603.03.01 GENERAL

- A. Construction methods shall conform to **Subsection 601.03.01, "Earthwork,"** through **Subsection 601.03.06, "Extending Existing Culverts,"** and shall meet the requirements below. All pipe installations shall conform to the workmanship and inspection

SECTION 609

CATCH BASINS, MANHOLES, AND INLETS

DESCRIPTION

609.01.01 GENERAL

- A. This work shall consist of constructing or reconstructing catch basins, manholes, inlets, and similar structures, consisting of Portland cement concrete with necessary reinforcement, metal frames, grates, and lids, including required excavation and backfilling.

MATERIALS

609.02.01 GENERAL

- A. Materials shall conform to the following sections and subsections:

Materials	Section/Subsection
<i>Portland Cement Concrete</i>	<u>501</u>
<i>Reinforcing Steel</i>	<u>505</u>
<i>Miscellaneous Metal</i>	<u>712</u>
<i>Gray Iron Castings</i>	<u>712.03.02</u>

- B. Casting shall be true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow holes, and other defects in positions affecting strength and value for the service intended.
1. Casting shall be boldly filleted at angles and the arises shall be sharp and perfect.
 2. Casting shall be sand blasted or otherwise effectively cleaned of scale and sand so as to present a smooth, clean, and uniform surface.
- C. The Contractor shall obtain from the fabricator of the structural steel grates, frames, and gray iron castings a Certificate of Compliance stating that the fabrications meet these specifications, and giving certified shop weights for the fabrications.
- D. Mortar for setting grates shall be mixed in the proportions of 1 part cement to 3 parts of fine aggregate.
- E. Pipe crossbars for drop inlets shall be unpainted standard weight black pipe conforming to ASTM A53. Straps shall be unpainted ASTM A36 steel.

CONSTRUCTION

609.03.01 GENERAL

- A. Catch basins, inlets, and manholes shall be constructed in accordance with **Section [501](#), "Portland Cement Concrete."**
- B. Inlet and outlet pipes shall be placed prior to pouring concrete.
- C. Grates shall be set in full mortar beds or otherwise secured as shown on the plans. Grates shall be set accurately to the final elevations so that no subsequent adjustments will be necessary.

- D. Concrete covers, when indicated on the plans, shall be constructed to fit snugly and be readily removable.
- E. Structural steel grates shall be painted as specified in **Section 614, "Painting."**
- F. Pipe or tile placed in masonry for inlet or outlet connections shall extend through the walls and beyond the outside surfaces of the walls a sufficient distance to allow for connections with conduit, and the masonry shall be carefully constructed around the pipe or tile to prevent leakage around their outer surfaces.
- G. Commercially prefabricated frames and grates of equal or greater capacity and strength may be substituted for the design shown on the plans for drop inlets provided prior approval is obtained in writing from the Engineer.
- H. Frames and grates shall be matchmarked in pairs before delivery to the work and grates shall fit into the frames without rocking.

609.03.02 ADJUSTING CATCH BASIN, MANHOLE, AND INLET COVERS

- A. Unless otherwise provided on the plans or by the contract, existing covers including frames, grates, lining, and lids shall be adjusted to the required elevation.
- B. Remove the existing covers and adjust the top of the existing structures by removing or adding concrete, brick masonry, concrete block masonry, high density polyethylene adaptor rings, or steel or cast iron adaptor rings, as applicable.
- C. Reinstall the fixtures by supporting them on a satisfactory collar of concrete constructed to hold the fixtures firmly in place.
- ~~C.D.~~ Concrete collars for manholes shall be constructed in accordance with Uniform Standard Drawing No. 408.1 "Concrete Collar Around Manholes, 30 Inch Ring and Cover."

609.03.03 CLEAN OUT

- A. All catch basins, manholes, inlets, and similar structures shall be thoroughly cleaned of any accumulations of silt, debris, or foreign matter of any kind, and shall be clean of accumulations at the time of final inspection.

609.03.04 EARTHWORK

- A. Structure excavation and structure backfill shall conform to **Section 206, "Structure Excavation"** and **Section 207, "Structure Backfill."**

04METHOD OF MEASUREMENT

609.04.01 MEASUREMENT

- A. The quantities of castings and structural steel grates measured for payment will be the number of pounds complete and in place.
 1. The weight of castings shall be computed from the dimensions shown on the approved shop drawings, assuming the cast iron to weigh 450 pounds per cubic foot with an allowance of 10 percent for fillets and overrun.
 2. The weight of structural steel grates shall be computed from the dimensions shown on the approved shop drawings and in accordance with **Section 506, "Steel Structures."**
 3. Certified shop weights will be acceptable in lieu of computed weights.

- B. Adjusting covers for catch basins, manholes, and inlets will be measured per each complete and in place.
- C. All measurements will be made in accordance with **Subsection 109.01, "Measurement of Quantities."**
- D. Pipe crossbars and straps for drop inlets shall be included in the measurement for payment by the contract bid price per pound for Structural Steel Grates.

05BASIS OF PAYMENT

609.05.01 PAYMENT

- A. The accepted quantities of grates measured as provided in **Subsection 609.04.01, "Measurement,"** will be paid for at the contract unit price bid per pound for types and sizes specified.
- B. The work for adjusting covers measured as specified in **Subsection 609.04.01, "Measurement,"** will be paid for at the contract unit price bid per each for adjusting covers for catch basins, manholes, and inlets, which shall be full compensation for furnishing all materials, tools, incidentals, and labor required to adjust the covers.
- C. Portland cement concrete used in new structures of catch basins and inlets will be paid for as specified in **Section 502, "Concrete Structures."**
- D. Reinforcing steel in catch basins and inlets will be paid for as specified in **Section 505, "Reinforcing Steel."**
- E. The accepted quantity of precast manholes measured as provided in **Subsection 609.04.01, "Measurement,"** will be paid for at the contract unit price bid per each for types and sizes specified. This price shall be full compensation for furnishing all materials including structure excavation and structure backfill, Portland cement concrete, steel, castings, and incidentals necessary to complete the work.
- F. Structure excavation and structure backfill for catch basins and inlets will be paid for as specified in **Section 206, "Structure Excavation,"** and **Section 207, "Structure Backfill."**
- G. All payments will be made in accordance with **Subsection 109.02, "Scope of Payment."**
- H. Payment will be made under:

PAY ITEM	PAY UNIT
Castings.....	Pound
Structural Steel Grates	Pound
(Size) Precast Reinforced Concrete Manhole (type).....	Each
Adjusting Covers.....	Each