

Naples City Road Standards 2017

Naples City has adopted the Naples City Road Standards and UDOT standards for all roads, curb and gutter and sidewalk construction within all types of subdivisions, the construction of collector roads and bridges.

UDOT

UDOT website: www.udot.utah.gov

Go to Doing Business tab then to Standards & Specifications

ADA

Because Naples City is a Political Subdivision of the State of Utah, The American's with Disabilities Act (ADA) must be followed.

ADA Website: www.ada.gov

Go to ADA Standards Tab

Then to ADA Standards (HTML)

For technical answers to questions call: 1-800-949-4232 or 1-800-514-0301

If you have questions your contact at Naples City is:

Jim Harper

Office: 435-789-9090

Cell: 435-828-5554

Fax: 435-789-9458

Email: NaplesRoad1@gmail.com

Typical Cross Section for Naples Roads

Naples City Road Standards

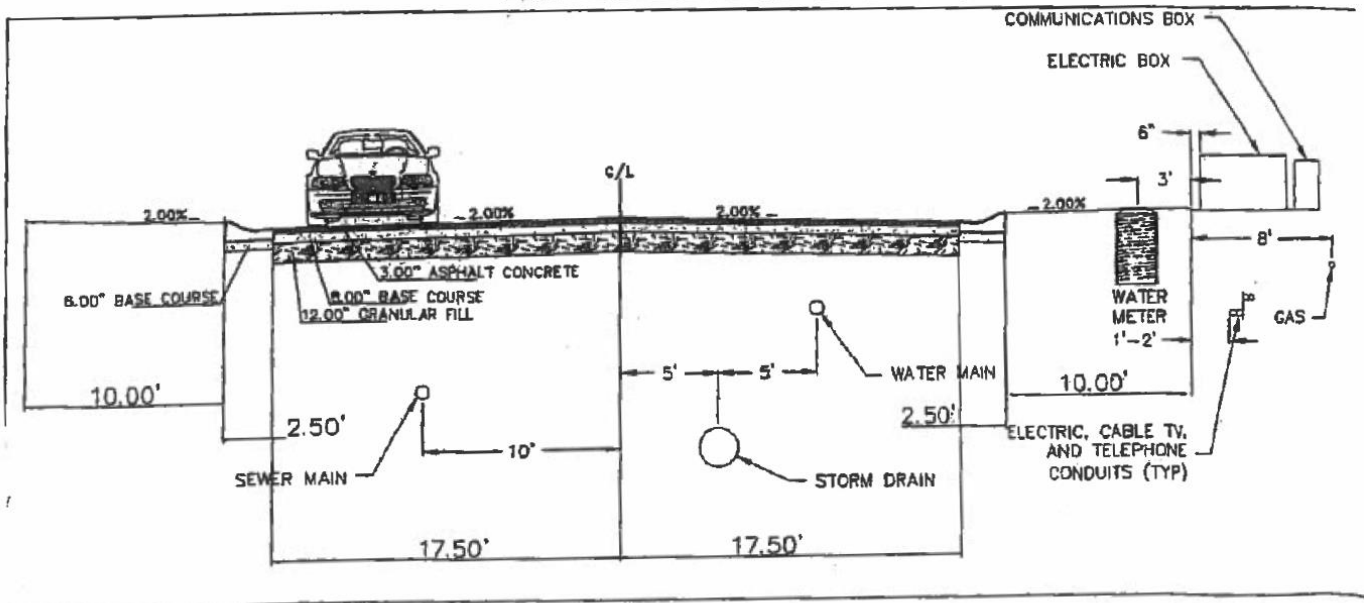
The City has adopted the UDOT Road Standards and Specs with a few exceptions:

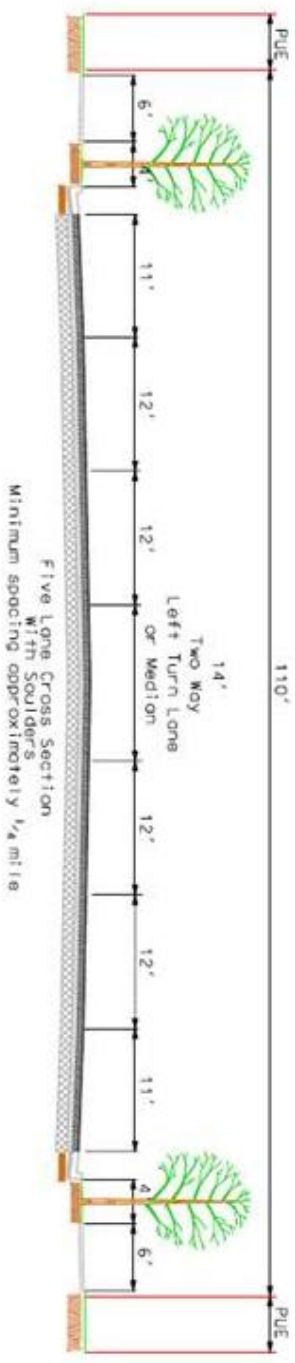
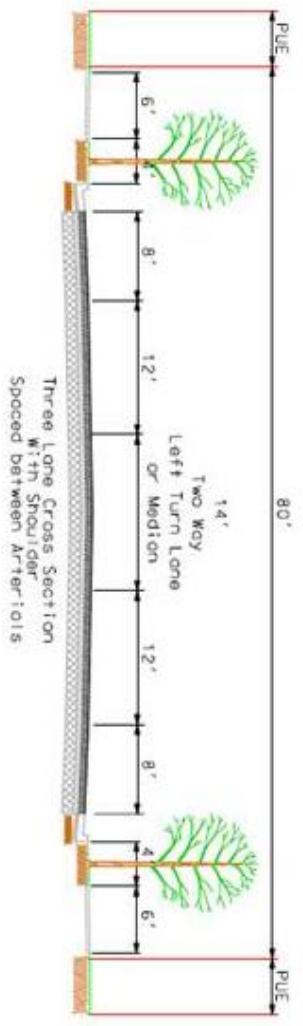
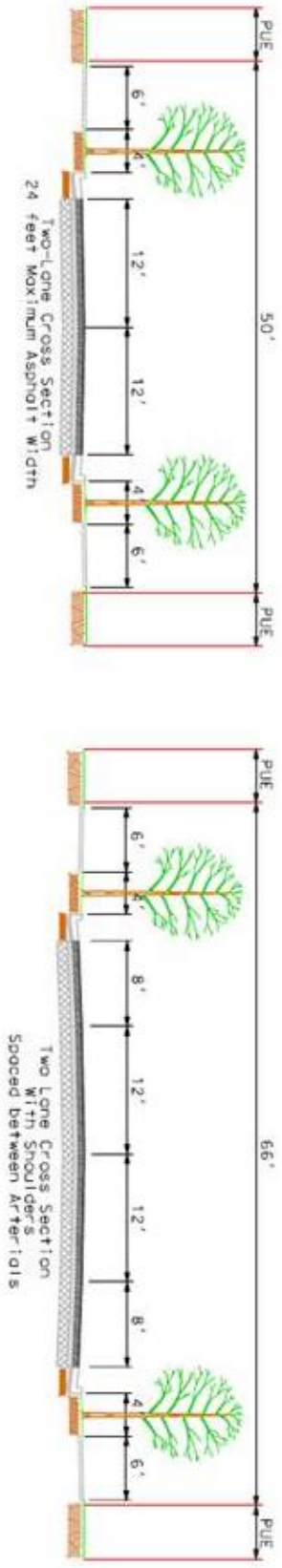
1. Asphalt Type; we use USSD mix
2. Modified High Back Curb and Gutter; we have our own design, which is used by Uintah County.
3. Compaction: ours is 97%
4. Minimum Road Structure (Must meet UDOT Standards): 3" inches of Asphalt, 8" inches of Road Base and 12" inches of Granular Barrow.
5. Trash baffle required on all storm water retention.

Justifications:

1. Quality and Longevity – 30 year life roads. The Developer pays for it now or the City will pay for it a short time later, the homeowner and the City expect a fair cost of return for their investment.
2. During the construction of the homes there is heavy construction loads for 2 to 3 years as the homes are built. The moving vans are next taking the life out of the asphalt and road structure.
3. The asphalt is only as good as the road structure. Like homes, they start with a strong foundation.
4. Short life means disruption and inconvenience and cost in a subdivision as the roads are overlaid or rebuilt before their time.
5. Proven Standards like UDOT's save money, time and inconvenience.

TYPICAL CROSS SECTION 60 FOOT ROW





- NOTES:
1. Sidewalk Dimension varies from 6' to 8' (See UDOT Std Dwg CW 11 Note 3)
 2. Public Utility Easement (PUE) dimension varies from 2.5' to 12' typical
 3. Shoulder Dimensions:
 - on 80' ROW - varies from 8' to 12';
 - on 110' ROW - varies from 10' to 12'
 See AASHTO A Policy on Geometric Design of Highways and Streets



Figure 4-1: Suggested Typical Cross Section
 Revised: September 16, 2004

SECTION #02776
Concrete Sidewalk, Median Filler, and Flatwork

PLANS AND SPECIFICATIONS

UDOT STANDARD SPECIFICATIONS

See UDOT Standards: Section 301 Finished Untreated Base Course.

The finished base course is composed of road base material or reject sand. Acceptance of material used; if finished base course meetings density/compaction 97%. The CONTRACTOR, at his expense shall provide testing results for compaction of finished base course.

UDOT Standards: Section 505.3.1 Composition of Concrete.

Required mix design strength	5210
Moving average strength	4550
Minimum strength	4000

Air content (using $\frac{3}{4}$ inch to size aggregate) 6+ 1%. If Portland Cement is used, the air content shall be 7+1%

Cementitious Range	5 gals max to 94 lbs of cement If Portland Cement is used, 5.5 gals max to 94 lbs of cement.
--------------------	---

Water to Cementitious ratios	3.5 inches
------------------------------	------------

UDOT Standards: Section 505.3.9 to 505.5.2 Sampling and Testing

The CONTRACTOR, at his expense, shall finish the sampling and testing of the concrete for strength, slump, and air.

**SECTION 02776
CONCRETE SIDEWALK, MEDIAN FILLER, AND FLATWORK**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for constructing concrete sidewalk, median filler, and flatwork.

1.2 RELATED SECTIONS

- A. Section 02324: Compaction
- B. Section 02330: Embankment
- C. Section 02721: Untreated Base Course
- D. Section 03055: Portland Cement Concrete
- E. Section 03152: Concrete Joint Control
- F. Section 03390: Concrete Curing

1.3 ACCEPTANCE

- A. Concrete Sidewalk, Median Filler, and Flatwork may be accepted at a reduced price when the concrete strength is below that specified.
 - 1. Price adjustment pay factor following Section 03055.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT CONCRETE

- A. Class AA (AE). Refer to Section 03055.
- B. Substitute higher class of concrete if desired.
- C. For flatwork: High purity, chemically inert, unfading, and alkali-fast synthetic pigment coloring material.

2.2 EXPANSION JOINT FILLER

- A. Preformed material. Refer to Section 03152.

2.3 UNTREATED BASE COURSE

- A. Untreated Base Course. Refer to Section 02721.

2.4 EMBANKMENT MATERIAL

- A. Refer to Section 02330.

PART 3 EXECUTION

3.1 PREPARATION

- A. Construct subgrade to plan elevations and following Section 02330.
- B. Place and compact fill material following Section 02324.
- C. Concrete flatwork coloring:
 - 1. Conform to the samples provided by the Engineer.
 - 2. Provide a matching sample, 1 ft² for the Engineer's approval before placing concrete.
 - 3. Thoroughly mix color pigment in the concrete before placing.
- D. Forms:
 - 1. Use approved concrete forms on all curves that transition smoothly from curves to straight section. Keep forms free of flat sections and sharp bends.
 - 2. Use wood, metal, reinforced fiberglass, or plastic forms free of warps or bends. Anchor securely in place.

3.2 PLACING AND FINISHING CONCRETE

- A. Dampen the subgrade just before concrete placement.
- B. Hand methods of strike-off and consolidation are permitted.
- C. Finish the surface with a moist wooden float.
- D. Round edges to a ½ inch radius.
- E. Brush to a traverse broom finish.

3.3 EXPANSION AND CONTRACTION JOINTS

- A. Place joints perpendicular to the subgrade and at right angles to the longitudinal axis of the sidewalk or median.
- B. Contraction Joints:
 - 1. 1/8 inch to 3/16 inch thick steel plates.
 - 2. Space the joints 10 feet apart.
 - 3. Remove the steel plates as soon as the concrete takes an initial set.
- C. Expansion Joints:
 - 1. ½ inch thick pre-molded expansion joint filler. Refer to Section 03152.
 - 2. Place expansion joint every 30 ft.

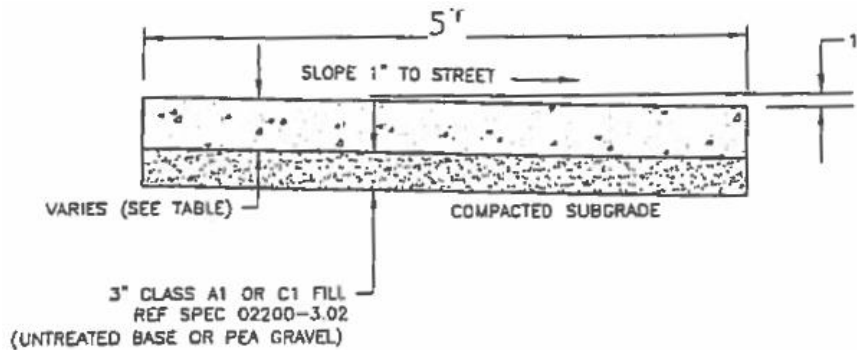
3. Place joint filler between the sidewalk or median filler and the curb or adjacent pavement, sidewalk, driveway, pavement, or structure.

3.4 CONCRETE CURING AND PROTECTION

- A. Refer to Section 03390.

MINIMUM SIDEWALK THICKNESS

<u>Condition</u>	<u>Minimum Sidewalk Thickness</u>
Residential Zone (Typical)	4"
Residential Zone Sidewalk at Driveway Approach	6"
Residential Zone Sidewalk where Driveway Location is Unknown	6"
Residential Zone Driveway within Park Strip	6"
Commercial & Industrial Zone (Typical)	6"
Commercial & Industrial Zone Sidewalk at Driveway Approach	8"



TYPICAL SIDEWALK

Not to scale

Notes

Subgrade preparation

1. Grub roots to 12" below subgrade
2. Cut/fill to line and grade (allow for 3" base material)
3. Scarify 6" deep and re-compact to 97% max dry density
4. Compact fill to minimum of 97% max dry density

Base Preparation

1. 3' minimum depth class A1 or C1 fill (Ref Spec 02200-3.02)
2. Compact class A1 fill to minimum of 97% max dry density
3. Compact class C1 fill with minimum of 3 passes with vibrating plate compactor
4. Finish base surface at or below concrete line

Sidewalk Gutter Requirements

1. Minimum cross-slope 2.0% (1-inch for 4-foot wide sidewalk)
2. Contraction joints at 5'-0" O.C. maximum, depth ¼ of concrete depth minimum
3. Expansion joints at 30'-0" O.C. maximum and at points of curvature for street corners
4. Match expansion joints in sidewalk with expansion joints in curb gutter
5. ½-inch wide expansion joint filler, full depth of concrete, flush with surface
6. Longitudinal joint required at center (or 10'-0" O.C. maximum) where total slab width exceeds 15-feet
7. Expansion joints at back of sidewalk at driveways
8. ½-inch radius corners at edges of sidewalk and other locations exposed to view

Concrete

1. Minimum cement content 6.5 bags per cubic yard
2. Design 28-day compressive strength 4000 PSI, minimum 28-day compressive strength 3500 PSI
3. Air content 6% ± 1.0%
4. Slump 4 ½ inch maximum
5. Testing

Total pour less than 5 cubic yards or less – no test required

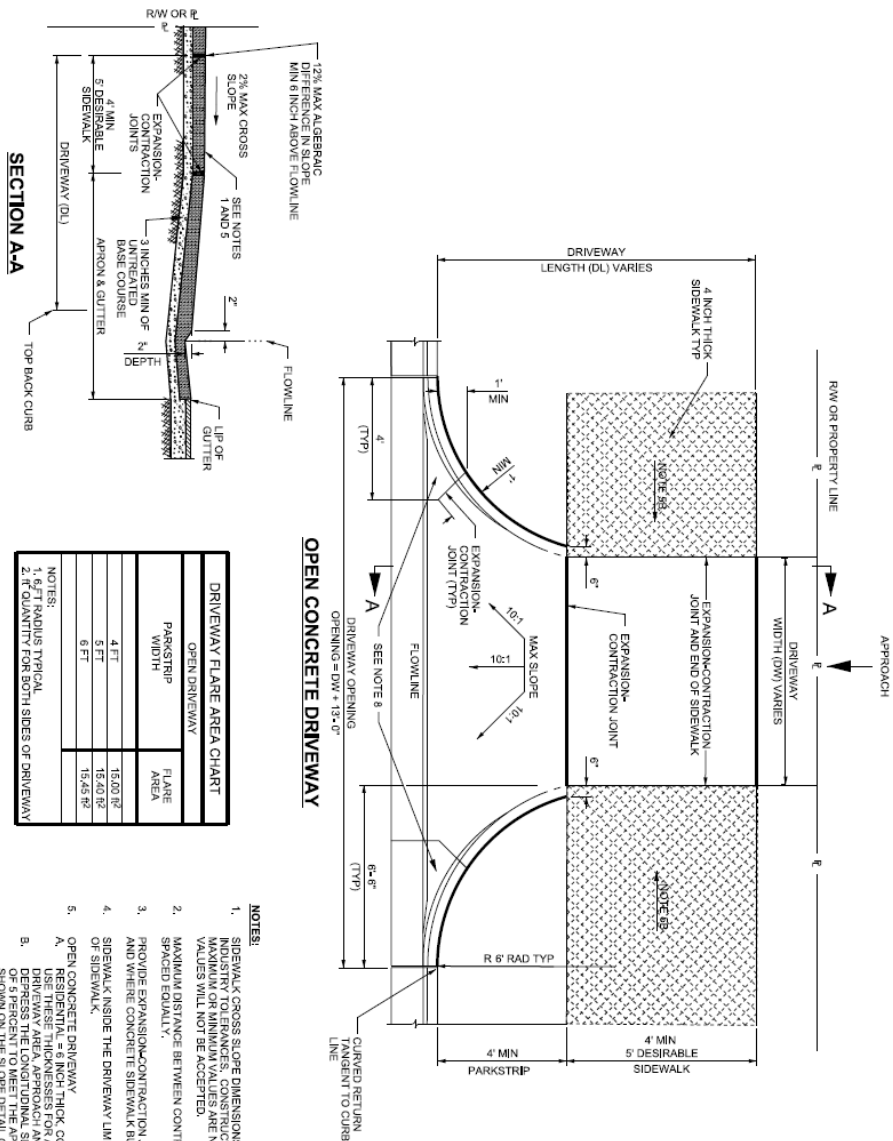
Total pour 5 cubic yards or more – 1 test per 50 cubic yards (or fraction thereof)

Compressive strength (3 cylinders per test)

Air

Slump

6. Broom finish transverse to sidewalk centerline
7. Cure with Aquaron 2000™ Sealing Solution per manufacturer's application instructions (no substitution)

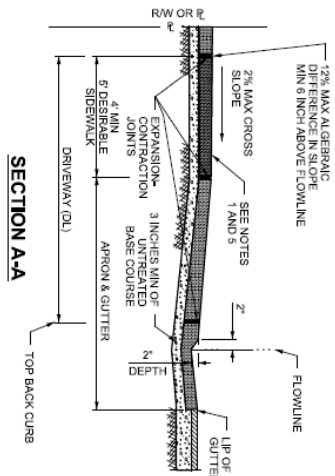
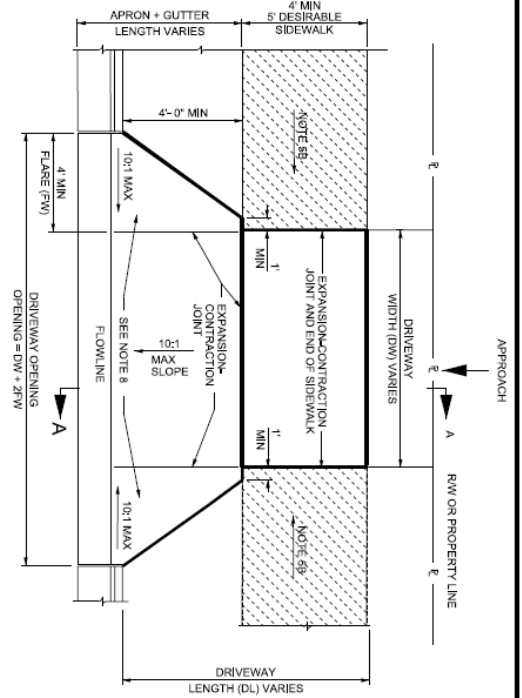
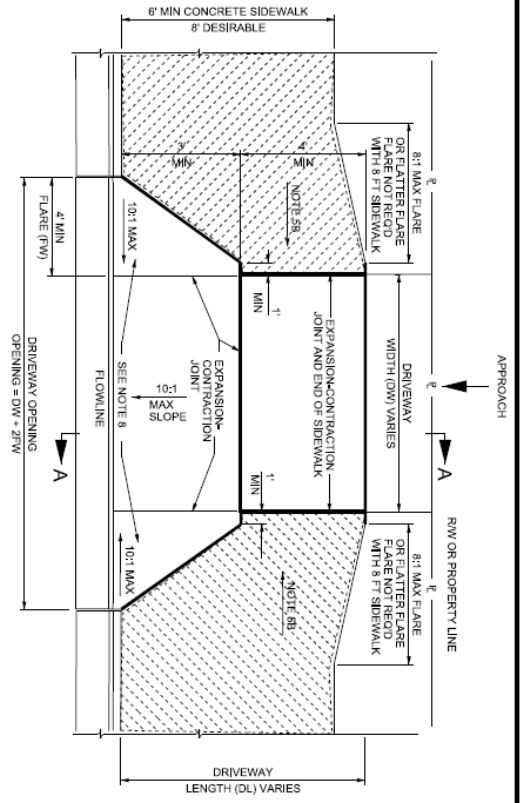


DRIVEWAY FLARE AREA CHART	
DRIVEWAY WIDTH	FLARE AREA
10 FT	15.00 SF
12 FT	18.00 SF
14 FT	21.00 SF
16 FT	24.00 SF
18 FT	27.00 SF
20 FT	30.00 SF
22 FT	33.00 SF
24 FT	36.00 SF
26 FT	39.00 SF
28 FT	42.00 SF
30 FT	45.00 SF

EXPANSION-CONTRACTION JOINT DETAIL

- NOTES:**
- SIDEWALK GROSS SLOPE DIMENSIONS SHOWN ARE NOT SUBJECT TO CONVENTIONAL ADJUSTMENT FOR FINISHES. CONSTRUCT SIDEWALKS AND DRIVEWAYS SUCH THAT THE VALUES WILL NOT BE ACCEPTED.
 - MAXIMUM DISTANCE BETWEEN CONTROL JOINTS IS 30 FT LATERALLY AND LONGITUDINALLY SPACED EQUALLY.
 - PROVIDE EXPANSION-CONTRACTION JOINTS IN CONCRETE SIDEWALK AT 30 FT INTERVALS AND WHERE CONCRETE SIDEWALK BUTTS AGAINST DRIVEWAY.
 - SIDEWALK INSIDE THE DRIVEWAY LIMITS IS PAID AS PART OF DRIVEWAY, NOT AS PART OF SIDEWALK.
 - OPEN CONCRETE DRIVEWAY
 - A. RESIDENTIAL = 6 INCH THICK COMMERCIAL = 7 INCH THICK.
 - B. USE THREE THICKNESSES FOR DRIVEWAY AND SIDEWALK WITHIN DRIVEWAY. DRIVEWAY AND SIDEWALK SHALL BE 6 INCH THICK AND SIDEWALK SHALL BE 4 INCH THICK.
 - C. DEPRESS THE LONGITUDINAL SLOPE OF THE SIDEWALK AT A MAXIMUM RATE OF 5 PERCENT TO MEET THE APRON. APPROACH ELEVATION IN THE GRADES SHALL BE TO BE A MINIMUM 6 INCHES ABOVE THE FLOWLINE OF CURB AND GUTTER AT ALL TIMES.
 - USE CLASS (A)(M)(E) CONCRETE FOR SIDEWALK AND DRIVEWAYS.
 - USE UNTREATED BASE COURSE UNDER ALL SIDEWALKS AND DRIVEWAYS.
 - QUANTITIES FOR DRIVEWAYS INCLUDE FLARES TO TOP BACK OF CURB.
 - CURB AND GUTTER PAID SEPARATELY THROUGH DRIVEWAY LOCATIONS.
 - REMOVE EXISTING SIDEWALK AND REPLACE BACK TO NEAREST EXPANSION-CONTRACTION JOINT.
 - APPROACH IS FROM EXISTING DRIVEWAY TO TOP-BACK-CURB AND IS PART OF DRIVEWAY QUANTITIES.
- DESIGN ONLY NOTES:**
- DRIVEWAY DIMENSIONS (MAX & MIN.) ARE LOCATED IN UDOT "ADMINISTRATIVE RULE REBID ACCOMMODATION OF UTILITIES AND THE CONTROL AND PROTECTION OF STATE HIGHWAY RIGHTS OF WAY."

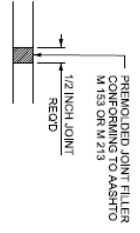
UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE CITY, UTAH		REVISIONS	
RECOMMENDED FOR APPROVAL <i>Randy L. Park</i>		DATE JAN. 01, 2017	
CHAIRMAN STANDARDS COMMITTEE APPROVED		DATE JAN. 01, 2017	
DEPUTY DIRECTOR		NO.	DATE
STANDARD DRAWING TITLE CONCRETE DRIVEWAYS AND SIDEWALKS		DATE	APPROVAL
STANDARD DRAWING NO. GW 3B		DATE	REMARKS



FLARED DRIVEWAY WITH ADJACENT SIDEWALK

FLARED DRIVEWAY WITH PARKSTRIP

DRIVEWAY FLARE AREA CHART	
FLARED DRIVEWAY	
DISTANCE FROM BACK OF CURB TO SIDEWALK	FLARE AREA
3 FT	18.87
4 FT	24.87
6 FT	36.87
8 FT	48.87
10 FT	60.87
ADD (DL)(DW) FOR TOTAL QUANTITY	
QUANTITY CALCULATED USING A 6 INCH CURB	



EXPANSION-CONTRACTION JOINT DETAIL

- NOTES:**
- SIDEWALK CROSS SLOPE DIMENSIONS SHOWN ARE NOT SUBJECT TO CONVENTIONAL MAXIMUM OR MINIMUM VALUES ARE NOT EXCEEDED. WORK THAT EXCEEDS THOSE VALUES WILL NOT BE ACCEPTED.
 - MAXIMUM DISTANCE BETWEEN CONTROL JOINTS 10 FT LATERALLY AND LONGITUDINALLY SPACED EQUALLY.
 - PROVIDE EXPANSION-CONTRACTION JOINTS IN CONCRETE SIDEWALK AT 30 FT INTERVALS AND WHERE CONCRETE SIDEWALK BUTS AGAINST DRIVEWAY.
 - SIDEWALK INSIDE THE DRIVEWAY LIMITS IS PAID AS PART OF DRIVEWAY, NOT AS PART OF SIDEWALK.
 - FLARED CONCRETE DRIVEWAY
 - RESIDENTIAL = 6 INCH THICK, COMMERCIAL = 7 INCH THICK.
 - USE THESE THICKNESSES FOR APRON, SIDEWALK WITHIN DRIVEWAY.
 - DEPRESS THE LONGITUDINAL SLOPE OF THE SIDEWALK AT A MAXIMUM RATE OF 5 PERCENT TO MEET THE APRON. APPROACH ELEVATION IF THE GRADES SHOWN ON THE SLOPE DETAIL CANNOT BE MET, THE TOP BACK OF SIDEWALK IS TO BE A MINIMUM 6 INCHES ABOVE THE FLOWLINE OF CURB AND GUTTER AT ALL TIMES.
 - DRIVEWAY DIMENSIONS MAX. & MIN. ARE LOCATED IN DOT ADMINISTRATIVE RULE 17.1. APPROACH ELEVATION OF UTILITIES AND THE CONTROL AND PROTECTION OF STATE HIGHWAY RIGHTS OF WAY.
 - USE CLASS (AA)B CONCRETE FOR SIDEWALK AND DRIVEWAYS.
 - USE UNTREATED BASE COURSE UNDER ALL SIDEWALKS AND DRIVEWAYS.
 - QUANTITIES FOR DRIVEWAYS INCLUDE FLARES TO TOP BACK OF CURB. CURB AND GUTTER PAID SEPARATELY THROUGH DRIVEWAY LOCATIONS.
 - REMOVE EXISTING SIDEWALK AND REPLACE BACK TO NEAREST EXPANSION-CONTRACTION JOINT.
 - APPROACH IS FROM EXISTING DRIVEWAY TIE-IN TO TOP-BACK-CURB AND IS PART OF DRIVEWAY QUANTITIES.
- DESIGNER'S NOTES:**
- DRIVEWAY DIMENSIONS MAX. & MIN. ARE LOCATED IN DOT ADMINISTRATIVE RULE 17.1. APPROACH ELEVATION OF UTILITIES AND THE CONTROL AND PROTECTION OF STATE HIGHWAY RIGHTS OF WAY.

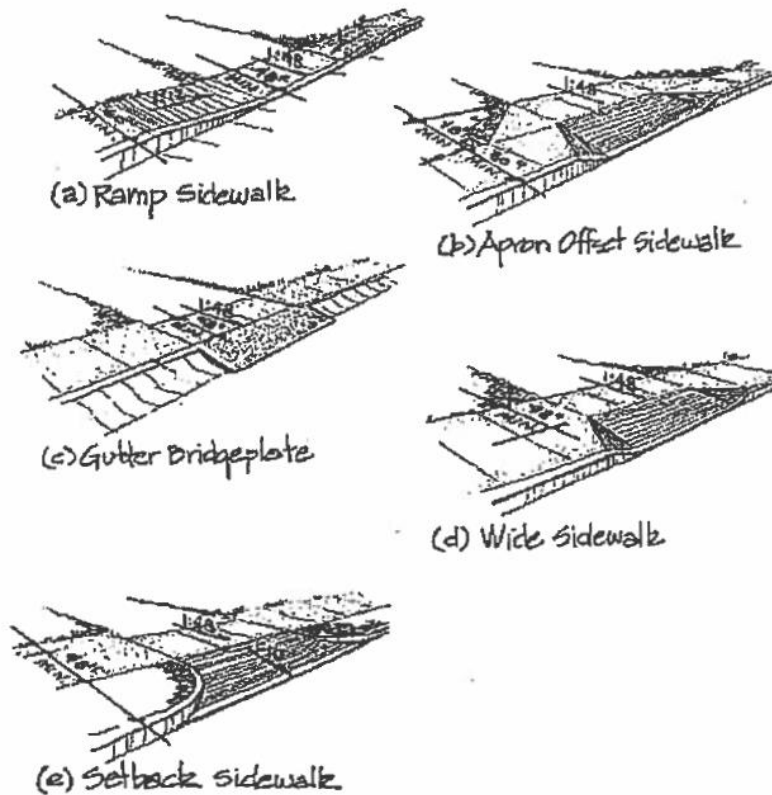
<p>UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE CITY, UTAH</p> <p>RECOMMENDED FOR APPROVAL <i>Russell R. Park</i> DATE: JAN. 01, 2017</p> <p>CHAIRMAN STANDARDS COMMITTEE APPROVED DATE: JAN. 01, 2017</p> <p>DEPUTY DIRECTOR</p>		<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>APPR.</th> <th>REMARKS</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>				NO.	DATE	APPR.	REMARKS												
		NO.	DATE	APPR.	REMARKS																
<p>CONCRETE DRIVEWAYS AND SIDEWALKS</p> <p>STANDARD DRAWING TITLE</p>		<p>ST'D. DWG. NO. GW 3A</p>																			

EXCEPTIONS:

1. Driveways and alleyways. Where public sidewalks intersect driveways or alleyways, the width of the pedestrian access route may be reduced to 48 inches (1220 mm) across the driveway.

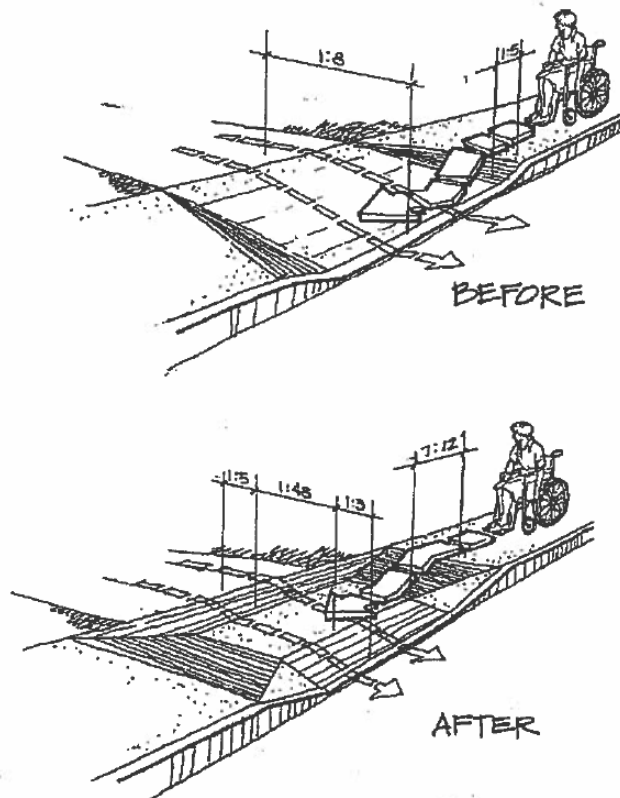
Advisory: Excessive cross slope or change in cross slope on driveway aprons can be a significant barrier to public sidewalk use. Even with narrow public sidewalks along the curb, it is possible to design a public sidewalk to pass across the driveway apron without exceeding the 1:48 cross slope limitation. Existing non-complying aprons can be reconstructed to achieve a usable cross slope for a width of 48 inches. By breaking the driveway apron into three parts *D* the apron on the roadway side, the sidewalk, and the apron on the property side vehicles must slow to negotiate the two steeper ramps on either side of the sidewalk crossing. When properly designed and constructed, these driveways will not cause vehicles to “bottom out”.

Figure X02.1 A Sidewalk/Alley or Driveway Connections



Isometric views of five sidewalk and driveway or alleyway connections. Illustrations show minimum PAR width of 48 inches (1220mm) at the driving area and indicate maximum allowable cross slopes.

Figure X02.1 B Reconstruction of Driveway Aprons

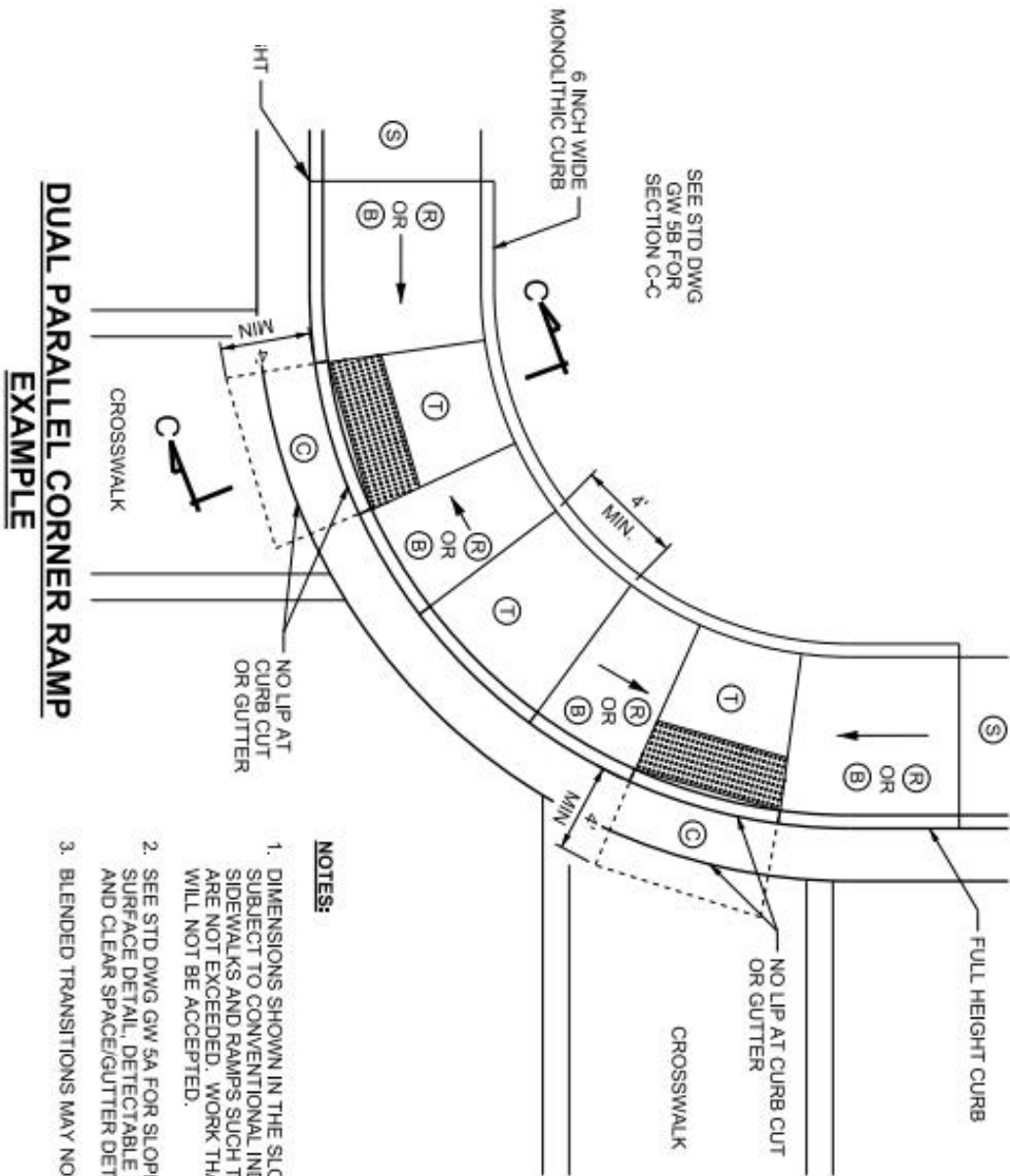


Isometric views of a public sidewalk and driveway showing before and after conditions. The before view shows a driveway crossing a public sidewalk and a typical steep cross slope condition. The after view shows transition ramps approaching a lowered driveway apron which allows a 48-inch wide PAR with 1:48 cross slope to complete the connection.

(EXCEPTIONS to X02.1.3.1, continued)

2. Parallel parking. Where parallel parking spaces are provided adjacent to existing public sidewalks, and site constraints do not allow full compliance with the requirements of this section, the width of the pedestrian access route may be reduced to 48 inches (1220mm).

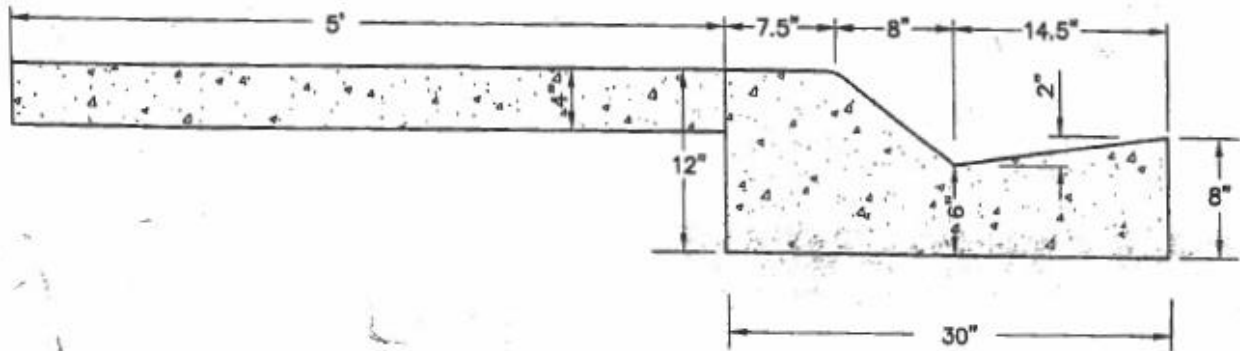
3. Accessible building entrances. Where construction is permitted in the sidewalk to provide an accessible entrance to an existing adjoining property, and site constraints do not allow full compliance with the requirements of this section, the width of the pedestrian access route may be reduced to 48 inches (1220mm).



**DUAL PARALLEL CORNER RAMP
EXAMPLE**

- NOTES:**
1. DIMENSIONS SHOWN IN THE SLOPE TABLE ON STD DWG GW 5A ARE NOT SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES. CONSTRUCT SIDEWALKS AND RAMPS SUCH THAT THE MAXIMUM OR MINIMUM VALUES ARE NOT EXCEEDED. WORK THAT EXCEEDS THOSE VALUES WILL NOT BE ACCEPTED.
 2. SEE STD DWG GW 5A FOR SLOPE TABLE. DETECTABLE WARNING SURFACE DETAIL, DETECTABLE WARNING SURFACE PANEL GAP DETAIL, AND CLEAR SPACE/GUTTER DETAIL.
 3. BLENDED TRANSITIONS MAY NOT REQUIRE RAMP AND TURNING SPACE.

MOD. CURB IS TO BE USED IN THE INDUSTRIAL ZONE ONLY



CURB, GUTTER & SIDEWALK DETAIL

Scale: Not to scale

NOTES:

1. Concrete shall be 4000 PSI, 28 day strength.
2. Provide contraction joints @ 5' - 0" O.C.
3. Provide expansion joints @ 30' - 0" O.C.

SECTION 32 12 16
HOT-MIX NATIVE SAND ASPHALT PAVEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

This section specifies hot-mix native sand asphalt pavement for roadways, parking areas, and trench surface repair in roadways.

1.2 REFERENCES

This section contains references to the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and the listed documents, the requirements of this section shall prevail.

<u>Reference</u>	<u>Title</u>
ASTM C 136	Standard Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 977	Specifications for Emulsified Asphalt
ASTM D 2027	Specification for Cutback Asphalt (Medium Curing Type)

1.3 SUBMITTALS

Reports of the mix design shall be submitted in accordance with Section 01 33 00.

1.4 ENVIROMENTAL CONDITIONS

Paving shall not be performed when ambient air temperature is below 50° F, when free surface water is present, or when the base materials are saturated.

PART 2 – PRODUCTS

2.1 MATERIALS

A. ASPHALT IC CEMENT PRIME COAT

Asphaltic cement prime coat shall be MC-70, plus or minus one grade, meeting the requirements of ASTM D2027

B. ASPHALTIC CEMENT TACK COAT

Asphaltic cement tack coat shall be emulsified asphalt meeting the requirements of either ASTM D977 Grade SS-IH, or ASTM D 2397 Grade CSS-IH

C. NATIVE SAND ASPHALT

Native sand asphalt shall consist of naturally occurring mixtures of silica sand and natural asphalts. The native sand asphalt shall be free of overburden soils and shall have no rock or lumps in excess of 2 inches in dimension before heating.

D. AGGREGATES

1. GENERAL

Aggregates used in the pavement shall be clean, hard, durable, and sound mineral particles, free from organic matter or other detrimental substances. The aggregate will be retained on the No. 4 sieve and shall be 100 percent crushed material (all manufactured).

2. GRADATION

Aggregates shall meet the following gradation requirements when tested in accordance with ASTM C136.

<u>U.S. Standard Sieve Size</u>	<u>Percent by Weight Passing</u>
3/4 inch	100
3/8 inch	40-50
No. 4	0-10

All material larger than 3/4" shall be removed from the mix prior to placement on the roadway and the Engineer reserves the right to adjust the plus No. 4 Aggregate to 60 percent \pm five percent and/or the natural sand asphalt mix to 40 percent \pm five percent.

2.2 MIX CHARACTERISTICS

A. MIX PROPORTIONING

Hot-mix native sand pavement shall be composed of native sand asphalt and aggregates to produce a dense, smooth, and durable travel surface. The native sand asphalt and the aggregates shall be mixed in such proportions to produce a total mix asphalt content of 6.0% to 7.5% by weight.

B. CONTROL TESTS

1. MIX DESIGN

Before beginning paving works, the Contractor's supplier shall determine the proper proportions of materials to produce the specified asphalt content.

2. LABORATORY REPORTS

Laboratory reports for the mix design shall be submitted which state whether the ingredients and mix comply with the specifications and shall show, (1) results of gradation tests, (2) results of extraction tests, and (3) other tests and information necessary to check the mix design.

Copies of the Laboratory reports shall be submitted in accordance with Paragraph 31 12 16 – 1.3.

PART 3 – EXECUTION

3.1 GENERAL

Hot mix native sand asphalt shall be mixed at the central batching plant. The batch plant shall accurately control temperature, mix ingredient proportions, mix rate, and mix time. The aggregate shall be thoroughly and uniformly coated with the natural asphalt. The asphalt mix at the plant shall not exceed 210°F unless directed in writing by the Engineer.

3.2 BASE PREPARATION

Granular backfill and untreated base course materials shall be placed and compacted to the lines and grades shown on the plans in accordance with Section 32 11 23. The base material shall be free of surface moisture and shall not be saturated. The base shall be uniform and firm.

3.3 PAVEMENT PLACEMENT

A. TEMPERATURE

The asphalt mix shall be placed on the roadway and the compaction completed with a minimum temperature of 130°F.

B. PAVER

The paver shall be a self-propelled screed unit which applies a smooth steady pull on screen arms. The screed shall strike off, partially compact and iron the surface of the mat. The screed shall control the depth of the pavement mat. Paver width shall be at least 8 feet wide and adjustable.

The mix shall be hand raked into areas inaccessible to the paver. Longitudinal seams between successive passes of the paver shall be hand raked to ensure a smooth joint.

C. MAT DEPTH

The thickness of the un-compacted mat after screeding shall be of such depth that the compactor rolled layer is at least that specified or shown on the drawings. Mat depth shall be checked behind the screed at intervals not exceeding 100 feet.

D. COMPACTION

The screeded mat shall be compacted immediately, when the mix temperature is maximum. Vibratory, pneumatic-tire, and steel wheel rollers of sufficient size to obtain the specified density shall be utilized in proper combination to achieve a smooth, uniform surface. The surface shall be free of marks left by the rollers. The finished mat shall not be rolled after the mix temperature falls below 130°F, as specified in Paragraph 3.4.A.

3.4 FIELD QUALITY TEST

A. MIX PROPORTIONS AND GRADATION

The Engineer shall perform field sampling and testing to determine compliance with materials specifications.

B. SMOOTHNESS

The surface shall not have irregularities in excess of ¼ inch when tested with a 10 foot straight edge. Irregularities in excess of ¼ inch shall be removed and corrected by the Contractor as determined by the Engineer.

****END OF SECTION****

**SECTION
HOT MIX ASPALT (HMA)**

PART 1 GENERAL

1.1 GENERAL

- A. Includes the production of 3/4" hot asphalt mix, transportation to the project, placement on the roadway and compaction of the mix.
- B. HMA comprised of aggregate, asphalt binder, lime and other additives.
- C. Mix material at a central mixing plant.
- D. Asphalt mix design to be provided by the contractor.

PART 2 PRODUCTS

2.1 MIX DESIGN

- 1. The HMA mix design will be for 3/4" maximum aggregate.
- 2. The asphalt binder will be PG 64-34 or an approved equivalent.
- 3. The Marshall Stability design capacity will be 1600 pounds (minimum). ASTM D-1559
- 4. The design flow (0.01 inch) for the mixture will be 10-18. ASTM D-1559
- 5. The design mixture void content will be 2% to 4%. ASTM D-1559
- 6. The asphalt binder content will be 5.25 percent (minimum).
- 7. The asphalt mix design will have a minimum of 100 percent passing the 3/4" sieve.
- 8. The asphalt mix design will have a maximum of 55 percent passing the No. 4 sieve and 7 percent passing the No. 200 sieve.
- 9. The contractor will submit the asphalt mix design a minimum of 10 working days prior to production to allow for review and approval by the project engineer.
- 10. The contractor will submit the target gradation a minimum of 5 working days prior to production to allow for review and approval by the project engineer.

2.1 ACCEPTANCE

- 1. The mix will be accepted when the daily average of test results fall above the minimum requirements.
 - 1. Compaction – 92 percent of rice density,
 - 2. Asphalt Binder Content – 5.25 percent of mix (minimum).
 - 3. Gradation – Target gradation approved by project engineer.

2. When the daily average of test results do not fall above the minimum requirements, the following price reductions will be imposed to the daily item cost.
 1. Compaction:
 - 92 to 100 percent – 1.00 pay factor
 - 91 to 91.9 percent – 0.95 pay factor
 - 90 to 90.9 percent – 0.85 pay factor
 - 89 to 89.9 percent – 0.70 pay factor
 - 88 to 88.9 percent – 0.50 pay factor
 - 87.9 and below – 0 pay factor (contractor to remove and replace at no additional cost to project).
 2. Asphalt Binder Content:
 - 5.25 to 6.50 percent – 1.00 pay factor
 - 5.00 to 5.24 percent – 0.95 pay factor
 - 4.75 to 4.99 percent – 0.85 pay factor
 - 4.50 to 4.74 percent – 0.70 pay factor
 - 4.49 and below – 0 pay factor (contractor to remove and replace at no additional cost to project).
 3. Gradation:

Pay factor will be based on single worst screen size deviation and not compounded by multiple screen deviations.

Sieve Sizes No. 4 to 3/4":

 - 0 to 10 percent deviation – 1.00 pay factor
 - 10.1 to 20.0 percent deviation – 0.80 pay factor
 - 20.1 to 30.0 percent deviation – 0.50 pay factor
 - 30.1 and above – 0 pay factor (contractor to remove and replace at no additional cost to project).

Sieve Sizes No. 200 to No. 8:

 - 0.20 percent deviation – 1.00 pay factor
 - 20.1 to 35.0 percent deviation – 0.80 pay factor
 - 35.1 to 50.0 percent deviation – 0.50 pay factor
 - 50.1 and above – 0 pay factor (contractor to remove and replace at no additional cost to project).

PART 3 EXECUTION

3.1 PLACEMENT

1. Mix at central mixing plant.
2. Transport to project.
3. Place mixture on road using standard lay down machine.
4. Compact mixture in place.
5. Accept product from engineer's test results.
6. Should a discrepancy from the test results take place, the contractor may challenge the results and a second series of test from cores be made. If the results show the product passes. The test results will be accepted. Should the test results not pass, the contractor will pay the additional testing and the results of the first testing will be final.