

“ANNEX-L” - SCHEDULE OF MINIMUM TEST REQUIREMENTS FOR CONSTRUCTION

For the information of the Bidders and the Winning Bidder, below is the schedule of minimum test requirements of the DPWH Bureau of Research and Standards based on the DPWH Standard Specifications for Highways, Bridges and Airports, Volume II, 2013, otherwise known as the Blue Book. These test requirements will be used for the applicable items of work and materials in the Winning Bidder's Construction Works for the **Four (4) Storey DSWD Office Building with Roof Deck**.

POST CONSTRUCTION and DURING CONSTRUCTION

Minimum testing activity to be perform by the Contractor

Mechanical and Fire Protection:

1. Leak test for refrigerant piping installed.
2. Hydrotest for fire Protection system as per National Fire Protection Association Standard Test.
3. Fogging Test for all duct work including air balancing as per design.
4. Testing and Commissioning of all Air-conditioning and FanBlowers.
5. Gravity Test for Air-conditioning Waste Stock.

Plumbing/Sanitary:

6. Gravity Leak Test for Sanitary and Storm Drain
7. Flow Test Sanitary for Sanitary and Storm Drain
8. Hydro Pressure Test for Waterline

Electrical:

9. Visual Inspection Report
10. Earth Continuity Test (Grounding Test)
11. Insulation Resistance test (Megger Test)
12. Leakage Current Test
13. Load Balancing Report

If any Construction items of work or materials proposed by the Winning Bidder are not covered by the Blue Book, these items of work or materials, together with the corresponding technical test requirements, must first be certified and approved by the DSWD before they are used in the Project.

PRE CONSTRUCTION and DURING CONSTRUCTION

EARTH WORKS

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 100 - Clearing & Grubbing	None
Item 101 - Removal of Structures & Obstruction	None
Item 103 - Structure Excavation If excavated materials are wasted, the volume involved shall be reported so that Quality Control requirements may be adjusted accordingly. Submit Project Engineer Certificate of Waste	If excavated materials are incorporated into the work: For every 1500 cu.m. or fraction thereof: 1 Grading Test 1 Plasticity Test 1 Laboratory Compaction Test For every 150 mm layer in uncompacted depth: 1 Field Density
Item 104 - Embankment	Same test as specified in item 103
Item 105 - Sub-grade Preparation	Same tests as for Item 104
Item 106 - Compaction Equipment and Density Control Strips	Same tests as for Items 104, 105, 200, 201, 202, 203, 204, 205, 206 and 300.
Item 107 - Overhaul	None

SUB BASE AND BASE COURSE

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 200 - Aggregate Subbase Course	For every 1,500 cu.m. or fraction thereof: 1-Quality Test for Grading, Plasticity and Abrasion For every 300 cu.m. or fraction thereof: 1 Grading Test
	1 Plasticity Test For every 1500 cu.m. or fraction thereof: 1 Laboratory Compaction Test For every 2500 cu.m. or fraction thereof: 1 California Bearing Ratio Test (CBR) For every layer of 150 mm of compacted depth/based on the results of compaction trials:

	At least one group of three in-situ density tests for each 500 sq. m. of fraction thereof.
Item 201 - Aggregate Base Course	<p>For every 300 cu.m. or fraction thereof: 1 Grading Test 1 Plasticity Test (LL, PL, PI)</p> <p>For every 1,500 cu.m. or fraction thereof: 1 Quality Test for Grading, Plasticity and Abrasion 1 Laboratory Compaction Test</p> <p>For every 2,500 cu.m. or fraction thereof: 1-CBR, California Bearing Ration Test</p> <p>For every layer of 150mm of compacted depth/based on the results of compaction trials:</p> <p>At least one group of three in-situ density tests from each 500 sq.m. or fraction thereof.</p>
Item 202 - Crushed Aggregate Base Course	<p>Same tests as for Item 201</p> <p>For every 1,500 cu.m. or fraction thereof: 1 Fractured Face Test</p>
Item 203 - Lime Stabilized Road Mix Base Course	<p>A. Soil Aggregate For every 300 cu.m. or fraction thereof: 1 Grading Test 1 Plasticity Test (LL, PL, PI)</p> <p>For every 1,500 cu.m. or fraction thereof: 1 Quality Test for Grading, Plasticity and abrasion</p> <p>B. Mix For every 300 cu.m. or fraction thereof: 1 Laboratory Compaction Test</p>
	<p>1 Unconfined Compression Test 1 CBR, California Bearing Ratio Test</p> <p>C. Compacted Base Course For every layer of 150 mm of compacted depth:</p>

	<p>1 Field Density Test for every 150m or fraction thereof</p> <p>D. Hydrated Lime For every 100 tons or fraction thereof: 1 Quality Test</p>
<p>Item 204 - Portland Cement Stabilized Road Mix Base Course Amount of Cement to be added: 6 to 10 mass % of dry soil aggregate</p>	<p>A. Soil Aggregate Same tests as for Item 203</p> <p>B. Cement 1 Quality Test for every 2,000 bags of fraction thereof</p> <p>C. Water 1 Quality Test / Project Engineer's Certificate</p> <p>D. Mix For every 300 cu.m. or fraction thereof: 1 Laboratory Compaction Test 1 UC, Unconfined Compression Test 1 CBR, California Bearing Ratio Test</p> <p>E. Compacted Base Course For every layer of 150 mm compacted depth 1 Field density Test for every 150m or fraction thereof 1 thickness determination for every 150m or fraction thereof</p>
<p>Item 205 - Asphalt Stabilized Road Mix Base Course</p>	<p>A. Soil Aggregate Same tests as for Item 203</p> <p>B. Emulsified Asphalt 1 Quality Test for every 40 to 200 drums or fraction thereof</p> <p>C. Mix Same tests as for Item 203</p> <p>D. Compacted Base Course Same tests as for Item 203</p>
<p>Item 206 - Portland Cement Treated Plant Mix Base Course</p>	<p>A. Soil Aggregate Same tests as for Item 203</p> <p>B. Cement For every 2000 bags of thereof: 1 Quality Test fraction</p> <p>C. Water</p>

	<p>1 Quality Test / Project Engineer's Certificate</p> <p>D. Mix: Same tests as for Item 204</p> <p>E. Compacted Base Course For every layer of 150 mm compacted depth: 1 Field Density Test for every 150 m or fraction thereof 1 Thickness determination for every 150m or fraction thereof</p>
Item 207 - Aggregate Stockpile	Same tests as specified in Item No. 207

SURFACE COURSE

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 300 - Aggregate Surface Course	<p>For every 1500 cu.m. or fraction thereof: 1 Quality Test for Grading, Plasticity and Abrasion</p> <p>For every 300 cu.m. or fraction thereof: 1 Grading Test 1 Plasticity Test (PI, LL, PI)</p> <p>For every 1500 cu.m. Or fraction thereof: 1 Compaction Test</p> <p>For every layer of 150 mm of compacted depth/based on the results of compaction trials. At least on group of three in-situ density tests for each 500 sq. m. or fraction thereof.</p> <p>For Crushed Gravel or Crushed Stone, 1,500cu.m. or fraction thereof: 1 Fractured face</p>
Item 301- Bituminous Prime Coat	Quantity: 1 to 2 liters /sq. m. 1 Quality Test for every 40 tons or 200 drums
Item 302 - Bituminous Tack Coat	Quantity: 0.2 to 0.7 liters / sq. m. 1 Quality Test for every 40 tons or 200 drums
Item 303 - Bituminous Seal Coat	<p>A. Bituminous Materials Quantity: 0.2 to 1.5 liters / sq. m. 1 Quality Test for every 40 tons or 200 drums</p> <p>B. Cover Aggregates Quantity: From 5 to 14 kg/ sq. m. For every 75 cu. m. /200 kg. or fraction thereof: 1 Grading Test</p>
Item 304 - Bituminous Surface Treatment	<p>A. Aggregates Quantity: Using Cut-Back Asphalt or Asphalt Cement 13.6 to 38.0 kg/sq. m. Using Emulsified Asphalt-13.6 to 19.04 Kg/sq. m.</p> <p>For every 75 cu. m. /200 kg. or fraction thereof: 1 Grading Test 1 Plasticity Test (PL, LL, PI)</p> <p>For every 1,500 cu. m. or fraction thereof: 1- Quality Test for: (Grading, Plasticity, Abrasion, Stripping and Bulk specific Gravity) 1 Fractured Face</p> <p>B. Bituminous Materials Quantity:</p>

	Using Cut-back Asphalt or Asphalt Cement 1.58 to 2.04 kg/sq. m. Using Emulsified asphalt-1.58 to 2.04 kg/sq. m. Same test as for Item301
Item 305 - Bituminous Penetration Macadam Pavement	A. Aggregates Quantity: 1. Using Asphalt Cement or Rapid Curing Course (Crushed)----- 90 Kg/sq. m. Key (Crushed), (13 & 11) 24 kg/sq. m. Cover (Crushed & Screened) 8 kg/sq. m. 2. Using Emulsified Asphalt Course (Crushed) 90 kg/sq. m. Choker (Crushed) 10 kg/sq. m. Key (Crushed) (13 & 11) - 18 kg/sq. m. Cover (Crushed or Screened) 8 kg/sq. m. Same test as for Item 304 B. Bituminous Materials
	Quantity: 7.2 to 11 liters/sq.m.
Item 306 - Bituminous Road Mix Surface Course	A. Aggregates Same tests as for Item 304
	B. Bituminous Materials Quantity: 1. Using Cut-Back Asphalt-4.5 to 7.0 mass % of total dry aggregate 2. Using Emulsified Asphalt-6.0 to 10.0 mass % of total dry aggregate Same test as for Item 301
	C. Mix Tests: For every 75 cu. m./130 tons or fraction thereof: 1 Grading Test 1 Extraction Test 1 Stability Test 1 Laboratory Compaction
	D. Hydrated Lime For every 100 tons or fraction thereof: Tests: 1 Quality Test
	E. Compacted pavement For every full day's operation: Tests: D&T, Density and Thickness Test at least one (1) but not more than (3) samples shall be taken.
Item 307 - Bituminous Plant-Mix Surface Course General	A. Aggregates For every 75 cu. m./200 tons or fraction thereof: 1 Grading and Plasticity Tests For every 1500 cu.m. of fraction thereof: 1 Quality Test for Grading, Plasticity, Abrasion, Stripping and Bulk Specific Gravity 1 Fractured Face
	B. Bituminous Materials Quantity:5.0 to 8.0 mass % of total dry

	<p>aggregate Tests:1 Quality Test for each 40 tons of fraction thereof</p>
	<p>C. Mix</p>
	<p>For every 75 cu.m. /130 tons of fraction thereof: 1 Grading Test 1 Extraction 1 Stability 1 Laboratory Compaction</p> <p>D. Hydrated Lime For every 100 tons or fraction thereof; Test:1 Quality Test</p> <p>E. Mineral filler For every 75 cu. m. or fraction thereof: 1 Grading and Plasticity Tests (LL, PL, PI) For each full day's operation: D&T (Density and Thickness Tests) at least one (1) but not more than three (3) samples shall be taken.</p>
<p>Item 308 - Bituminous Plant Mix, Surface Course, Cold laid</p>	<p>A. Aggregate Same tests as for Item 307</p> <p>B. Bituminous Material Quantity: Using Cut-Back Asphalt-4.5 to 7.0 mass % of total dry aggregate Using Emulsified Asphalt 6.0 to 10.0 mass % of total dry aggregate Tests: 1 Quality Test for every 40 tons or 200 drums or fraction thereof.</p> <p>C. Mix Same tests as for Item 307</p> <p>D. Hydrated Lime Same tests as for Item 307</p> <p>E. Mineral Filler For every 75 cu. m. or fraction thereof: 1 Grading and Plasticity Tests (LL, PL, PI)</p> <p>F. Compacted Pavement Same tests as for Item 307</p>
<p>Item 309 - Bituminous Plant Mix (Stockpile Maintenance Mixture)</p>	<p>A. Aggregate Same tests as for Item 307</p> <p>B. Bituminous Materials</p>
	<p>Quantity:4 to 10 Mass % of total mix Test: 1 Quality Test for every 40 tons or 200 drums or fraction thereof.</p>

	<p>C. Mix Same tests as for Item 307</p> <p>D. Hydrated Lime Same tests as for Item 307</p> <p>E. Mineral Filler Same tests as for Item 307</p> <p>F. Compacted Pavement Same tests as for Item 307</p>
Item 310 - Bituminous Concrete Surface Course, Hot-Laid	<p>A. Aggregate Same tests as for Item 307</p> <p>B. Bituminous Materials Quantity: 5 to 8 Mass % of total dry aggregates Test: 1 Quality Test for each 40 tons or 200 drums or fraction thereof.</p> <p>C. Mix Same tests as for Item 307</p> <p>D. Hydrated Lime Same tests as for Item 307</p> <p>E. Mineral Filler Same tests as for Item 307</p> <p>F. Compacted Pavement Same tests as for Item 307</p>
Item 311- Portland Cement Concrete Pavement	<p>A. Cement Quality: 9.00 bags cu. m. (40Kg/bag) Tests: For every 2000 bags or fraction thereof: 1 Quality Test</p> <p>B. Fine Aggregate Quantity: 1 0.05 cu.m./cu. m. concrete (if rounded coarse aggregate is used) 2 0.54 cu.m./cu.m. concrete (if angular coarse aggregate is used)</p>
	<p>Tests: For every 1500 cu. m. or fraction thereof:</p> <p>a. For a source not yet tested, or that failed in previous quality test: 1 Quality Test For: Grading, Elutriation (Wash), Bulk Specific Gravity, Absorption Mortar Strength, Soundness, Organic Impurities, Unit Weight, % Clay Lumps and Shale.</p>

	<p>b. For a source previously tested and passed Quality Test: 1 Quality Test for: Grading, Elutriation (Wash), Bulk Specific Gravity, Absorption Mortar Strength.</p> <p>For every 75cu.m. or fraction thereof: 1 Grading Test</p> <p>C. Coarse Aggregate Quantity: 1. 0.77 cu.m / cu.m concrete if rounded coarse aggregate is used 2. 0.68 cu.m/cu.m concrete if angular coarse aggregate is used</p> <p>Tests: For every 1500 cu.m. or fraction thereof a. For a source not yet tested or that failed in previous quality test: 1 Quality Test for Grading, Bulk Specific Gravity, Absorption, Abrasion and Unit Weight.</p> <p>b. For a source previously tested and that passed quality test: 1 Quality Test for Grading, Absorption, Bulk Specific Gravity and Abrasion.</p> <p>For every 75 cu.m or fraction thereof: 1 Grading Test</p> <p>D. Water Tests: 1-Certificate from Project Engineer 1 Quality Test, if source is questionable</p>
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	<p><u>E. Joint Filler</u> 1. Poured Joint Filler 1 Quality Test on each type of ingredient for each shipment</p> <p>2. Premolded Joint Filler 1 Quality Test on each thickness of filler for each shipment</p> <p><u>F. Special Curing Agents</u> 1 Quality Test for each shipment</p> <p><u>G. Steel Bars</u> For every 10,000 kg. or fraction thereof of reach size: 1 Quality Test for Bending, Tension and Chemical Analysis</p> <p><u>H. Concrete</u> Flexural Strength Test on Concrete Beam Sample 1-set consisting of 3 beam samples shall represent a 330 sq.m. of pavement, 230 mm depth or fraction thereof placed each day. Volume of concrete not more than 75 cu.m.</p> <p><u>I. Completed Pavement</u> Thickness determination by concrete core drilling on a lot basis Five (5) holes per km. Per lane or five (5) holes per 500 m. when 2 lanes are poured concurrently.</p>
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DRAINAGE AND SLOPE PROTECTION

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 500 - Pipe Culverts and StormDrains	<p>A. <u>Pipes</u> Pipe for every 50 pieces: Strength, Absorption and Dimension Alternative Requirements: 1-set consisting of 3 concrete cylinder samples for not more than 25 pipes cast in the field, and 1- Inspection Report for each size for not more than 25 pipes cast in the field</p> <p>B. <u>Mortar for Joint</u> Cement, Fine Aggregates and Water-Same tests as for Item 405</p>
Item 501- Underdrains	<p>A. <u>Concrete Pipe (Non-Reinforced)</u> 0.5% of the number of pipes of each size but not less than 2, for strength, absorption and dimension Alternative Requirements: 1-set consisting of 3 concrete cylinder samples for not more than 25 pipes cast in the field, and 1- Inspection Report for each size for not more than 25 pipes cast in the field.</p> <p>B. <u>Clay Pipe</u> 1-Pipe for every 200 pieces each size, with a minimum of 2 specimens for strength, absorption and dimension.</p>
Item 502 - Manholes, inlets and CatchBasins	<p>A. <u>Concrete</u> Same tests as for Item 405, Class A</p> <p>B. <u>Lids, Cast Iron Frames and Grating</u> Inspection Report</p>
Item 503 - Cleaning and Reconditioning Existing Drainage Structures	Inspection Report
Item 504 - Riprap and Grouted Riprap	Same tests as for Item 505
Item 505 - Stone Masonry	<p>A. Cement Quantity: 2 bags/cu.m. of concrete Tests: For every 2,000 bags or fraction thereof 1 Quality Test</p> <p>B. Fine Aggregate Quantity: 0.17 cu.m./cu.m. of concrete Tests: for every 2,000 bags or fraction thereof 1 Quality Test for: (Same as for Item 405) For every 75 cu.m. or fraction thereof</p> <p>C. Stone Inspection</p>

	Report D. Water 1 Certificate from Project Engineer or 1 Quality Test, if source is questionable
Item 506 - Hand-Laid Embankment	Inspection Report
Item 507 - Sheet Piles	A. Concrete Sheet Piles Same tests as for Item 400 B. Steel Sheet Piles Same tests as for Item 403
Item 508 - Concrete Slope Protection	A. Bed Course Same tests as for Item 200 B. Steel Reinforcement Same tests as for Item 404 C. Concrete Same tests as for Item 405
Item 509 - Gabions	1 Quality Test for each shipment
ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 600 - Curb and/or Gutter	A. Concrete Quantity: 0.078 cu.m./m (Curb only) 0.092 cu.m./m (Curb and Gutter, type A) 0.149 cu.m./m (Curb and Gutter Type B) 0.074 cu.m./m (Curb and Gutter Type C) Same tests as for Item 405 B. Joint Filler
	Same tests as for Item 311
Item 601 - Sidewalk	A. Concrete Same tests as for Item 405, Class A B. Pre-molded Expansion Joint Filler Same tests as item 311
Item 602 - Monuments, Markers and Guideposts	A. Concrete Same as for Item 405 B. Reinforcing Steel Same tests as for Item 404 C. Paint Same tests as for Item 411
Item 604 - Fencing	A. Barbed Wire, Chain Link Fabric 1 Quality Test B. Concrete Post Same tests as for Item 405

	Steel Reinforcement: Same test as for Item 404
Item 605 - Road Sign (Reflective Sheets)	Quantity: 6 pieces of 1 inch x 6 inch reflective sheets Test Perform: 1 – Adhesion Test 1 – Solvent Resistant Test Resistance to Heat Thickness of Sheeting Reflectivity
Item 606 - Pavement Markings (Thermoplastic Paint)	Quantity: 1 Quality Test per 100 bags or fraction thereof: A. Physical Properties 1. Condition in Container 2. Specific Gravity 3. Drying Time (min.) 4. Softening Point B. Paint Composition 1. Total Dry Solids, % 2. Titanium Dioxide, % 3. Extenders (Fillers), % 4. Binders, % 5. Glass Beads, % 6. Grading, % Passing
Item 607 - Reflective Pavement Studs	Quantity: 3 samples per 10,000 pcs. Test: 1 Compression Test
Item 608 - Topsoil	Inspection Report
Item 609 - Sprigging	Inspection Report
Item 610 - Sodding	Inspection Report
Item 611- Tree Planting	Inspection Report
Item SPL 614 Street Lighting including Footing, Steel poles, wires, conduits and etc.	A. Wires and Cables 1. Perform Continuity Test; 2. Perform Insulation Resistance Test. B. Molded Case Circuit Breakers Visual and Mechanical Inspection: 1. Compare nameplate data with specifications and approved shop drawings; 2. Inspect circuit breaker for correct mounting; 3. Operate circuit breaker to ensure smooth operation; 4. Inspect case for cracks or other defects; 5. Inspect all bolted electrical connections for high resistance using low resistance ohmmeter, verifying tightness of accessible bolted connections and/or cable connections by calibrated torque wrench method, or performing thermo graphic survey; 6. Inspect mechanism contacts. Electrical Tests: 1. Perform contact-resistance tests; 2. Perform insulation-resistance tests C. Time Switch and Contactors

	<p>D. Lighting Fixtures Field Testing: Demonstrate that all lighting fixtures and their accessories operate satisfactorily in the presence of the Owner. Perform operational tests in accordance with referenced standards in this specification.</p> <p>E. Project Engineers Inspection Report.</p>
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MATERIAL DETAILS

ITEMS OF WORK	MINIMUM TEST REQUIREMENTS
Item 700 - Hydraulic Cement	Same tests as for Item 405
Item 701 - Construction Lime (Hydrated)	1 Quality test for every 100 t or fraction thereof
Item 702 - Bituminous Materials	Same tests as for Items 301, 302, 303, 306, 307, 308, 309 and 310
Item 703 - Aggregates	Same tests as for Item of Work specified in the Bill of Quantities
Item 703A - Mineral filler	Same tests as for Item 307
Item 704 - Masonry Units	1 Quality Test for every 10,000 units or fraction Thereof
Item 705- Joint Materials	Same tests as for Item 311 and 500
Item 706 - Concrete, Clay, Plastic and Fiber Pipes	<p>A. Concrete Pipes Same tests as for Item 500</p> <p>B. Clay and other types of pipes Refer to the applicable requirements of AASHTO Test and Specification</p>
Item 707- Metal Pipe	Same tests as for Item 400
Item 708 - Concrete Curing Materials & Admixtures	1 Quality Test for each shipment
Item 709 - Paints	Same tests as for Item 411
Item 711- Fence and Guardrail	<p>A. Reinforcing Steel Same tests as for Item 404</p> <p>B. Wire Rope Same tests as for item 406</p> <p>C. Fence Same tests as for Item 604</p>

	D. Guardrail Same tests as for Item 603
Item 712 - Structural Metal	Same tests as for Items 403 and 409
Item 713 - Water	1-Certificate from Project Engineer 1 Quality Test, if source is questionable