Syllabus of Mason in NDMC

Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1. Familiarization with Institute, administrative setup of Institute. 2. Rules & resolutions of attendance with leave facility. 3. Importance of Trade training, instruments & equipment's used. 4. Importance of trade training, List of tools & Machinery used in the trade. 5. Safety attitude development of the trainee by educating them to use Personal Protective Equipment (PPE). 6. First Aid Method and basic training. 7. Safe disposal of waste materials like Pieces of wood, rod, stone, mud, etc. 8. Hazard identification and avoidance. 9. Safety signs for Danger, Warning, caution & personal safety message. 10. Preventive measures for electrical accidents & steps to be taken in such accidents. 11. Use of Fire extinguishers. 12. Practice and understand precautions to be followed while working in mason jobs. 13. Safe use of tools and equipments used in the trade.	• Importance of safety and general precautions required for the trade. • Importance of the trade. • Types of work to be done by trainees in the institute. • Scope of a mason work. • Types of services has to plan. • Role of a mason, nature of job done by masons

Carpentry works :- 14. Demonstrate uses of Carpenter'shand tools. 15. Perform operations such as marking, sawing, planning chiselling, drilling etc. grinding oftools. 16. Perform simple carpentry joints and make simple wooden object like, box, stool, etc. 17. Centering work. Uses of nails, screws, nuts & bolts, hinges etc. 18. Perform centering & form work.	• Common types of wood- their description and use. • Carpenter's hand tools, their names and uses. Grinding of tools &precautions to be taken • Carpentry joints and their uses. Use of nails, screws, dowels, etc.
19. Handling of brick, turning of brick for stretcher & header faces. 20. Cutting of brick with brick hammer as desire shape & size. 21. Shaping mortar, spreading on the bed joining bricks. 22. Preparation of various types of mortars according to the ratio of ingredients. 23. Building 4 " straight wall about 6 courses high with one end stepped and the other racked back. 24. Building 4 " quoin wall with one end stepped and the other racked back. Use of plumb rule. 25. Construct of 1 &1 ½ brick wall junctions in English & Flemish bonds. Racking out the joints & finishing it flush. 26. Construction of 1 brick thick walls inEnglish & Flemish garden bonds. 27. Construct of detached brickpillars with footings square & rectangular types.	• Technical terms used in brick masonry. Necessity of bonding bricks. Types of bond Types of mortars, different grades of sand for brick work & plastering. Grades of cement. • Brickwork-racking back & toothing. Differences between English & Flemish bonds. Details of English & Flemish bond for 1 and 1_2 brick walls. Precautions at quoins. • Cross wall-method of construction. Grouting of mortar, jointing and finishing of brickwork. Types of pointing & tools used. Details of bonding & special precautions at 'T', 'L' and cross junctions. Types of copings-weathering & throating. Pillars: Necessity, types, relation between cross section & height. Details ofreinforcement for square & rectangularpillars. • Types of cement, sand & lime. English & Flemish garden wall bonds. PWD specification on brickwork. • Foundation: Definition, purpose, types,important terms, causes of failure offoundations. • Hollow blocks: Glazed, sand, lime bricks.Uses, merits & demerits

28. Form a door opening in a wallofEnglish bond. Bonding of jambs & reveals. 29. Form a window opening in a wall in English bond. 30. Construction of sill with over Sailing courses. Use of gauge rod Fixing door & window frames.	• Purpose of arch centering& form work. Different types of bricks &their sizes.Characteristics of good bricks Sizes of mortar joints for different works. Stretcher & header • Construction of sill with oversailing courses-gauge rod-its purpose. Method offixing door & window frames. Hold fasts &dowels-purpose and method of fixing. PWDspecification on the above.
31. Demonstrate R.C.C, re- enforcement of different dia. With unit weight. Cutting, bending & binding of bar. 32. Perform Pre-casting a lintel- compacting, curing & setting the same in position. Check for equal bearing. 33. Spanning of opening by casting alintel in site. 34. Making of shuttering &supports with uprights and wedges. 35. Cutting, bending & placing of reinforcement.. 36. Mixing, placing & compacting concrete.	• RCC lintels: Materials required, • method of construction, precast lintels, • method of construction of formwork, • details of reinforcement. • Arches: Purpose, technical terms & types. Setting out an arch. • Tummel & template for preparing voussoirs & keybricks. • Method of constructing centering for an arch.

37. Spanning of opening with a semi- circular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch &removing centering.	
38. Construct cavity walls, setting out both leaves, provision of wall ties and use of cavity rods.	• Cavity wall: Technical terms, advantages, • constructional details, precautions to be taken at the bottom of cavity. • provision of weep holes & ties, special care at junctions & openings.
39. Setting out a building: Obtaining first, second, third & fourth lines, marking diagonals, setting out cross walls & offsets. 40. Marking excavation lines & fixing of plinth & floor levels.	• Steps in setting out & marking centre line, excavation line & other lines-use of deadman- checking accuracy & precautions. Windows & ventilators: Including steel windows & ventilators, fixtures &fastenings used.
41. Plastering of walls-setting of spots-applying mortar-use of screeds &floats. 42. Fixing of screeds to soffits of door & window openings-reversing the screeds & squaring. 43. Plastering of ceiling: Application of mortar, strengthening and finishing (Improvise a roof with stone or concrete slab for the purpose of demonstration).	• Plastering: Tools used, necessity of screeds& their fixing, • Steps in plastering. • Concrete: Ingredients, selection of materials, various ratios of mix, their uses, measuring of materials for mixing. • Moulding: Types, purposes, making & using a mould. • Architectural terms used in connection with classical mouldings such as architrave, apex, etc. Hand & machine mixing of concrete-laying and curing of concrete. Water-cement ratio. PWD specifications.
44. Flooring practice: Determination and formation of slope application of slurry for finishing, setting out of skirting, formation of spots for skirting	• Floors: Types, constructional details such as consolidation of bed, sand filling, concrete base

45. Use of screeds, formation of curve atthe junction of skirting & floor.	& finishing. Granolithic flooring. Local Municipal byelaws. • Tiles for roofing & flooring. Purpose of wetting bricks & tiles before use.
46. Drainage: Set out a drainage line including position of manhole & gully trap. 47. Practice in setting up and reading of dumpy level. 48. Lay out drainage to required gradients with the help of dumpy level and/or boning rod and laying its surface with bricks. 49. Laying of concrete foundation for drainage pipes and jointing. Checking of alignment. Cutting the pipe to the required length. 50. Covering of drain pipe with concrete as per PWD specification. 51. Laying out foundation concrete and construction of manhole. 52. Method of providing footrests, Forming of drain and benching.	• Purpose of drainage, different systems, their advantages & disadvantages, method of collection, carriage & final disposal of wastage, various types of constructions required. Roofs: Classification, parts, trussed roof, covering materials. • House drainage system- normal layout of drainage. • Traps-gully, nahani, etc.-their description. • Purpose & method of fixing sanitary fittings such as WC, urinal, washbasin, kitchen sink, etc. • Construction of surface drains and laying its surface with bricks. • Drainage pipes: Types, materials, sizes, gradient for different diameters, method of laying & jointing, importance of water tightness, concrete base and covering. • Manhole: Standard sizes, necessity, details of construction and benching. Provisions of footrests, drops & cover.

56. Stonework - method of cutting stone in required size from a block. 57. Selection of face & bed. 58. Construct stone wall: Ashlar masonry. Types of joint used in ashlar such as chamfered, beveled, etc. through stones & bond stones. 59. Construct a rubble masonry wall. 60. Construct compound wall with attached piers and coping.	• Stone masonry: Importance of stone, conversion & dressing. • Types of dressing as per ISI specification. Types of stone. • Ashlar masonry. Types of joint used in ashlar such as chamfered, beveled, etc. through stones & bond stones.
61. Marble work: Method of cutting and setting on stair, floor, wall & pillar.	• Marble floor: types, constructional details. Construction of attached piers & buttresses.
62. Construct a 4½" dia. X 9" thick circular brick wall 4 layers. 63. Construct circular gate pillars with brick/ stone/ tile/ concrete. 64. Construct hollow block walls.	• Circular walls: Details of construction. Purpose-made bricks. • Setting out and construction of circular gate pillars with brick/stone/tile/concrete. • Hollow block masonry: Laying of hollow blocks for walls & columns. • Use of structural clay tile for partition. • Precast concrete partition, metal lathe partition and concrete block partition.
65. Construct roof with prefabricated hollow blocks of beams and slabs.	• Introduction to RCC: Uses, materials, properties and formwork, bending of bars &

	construction. • Reference to ISI code. Reinforced brickwork. • Brief description of slabs, beams, lintels, stairs, columns, etc. • RCC work: Mixing of concrete. • Laying, compacting &Curing of concrete. • Thumb rule for percentage of reinforcement for lintels, slabs, beams & columns. • Necessity hook & cranking. Shear reinforcement.
Finishing works : 66. External/ internal wall finishing practice by plastering or Pointing. 67. Fixing cement concrete jelly. 68. Laying of glazed tiles. (18 hrs.) 69. Fixing the thread, filling between ends, plumbing, setting out a jamb,bonding.(6 hrs.) 70. Marking & cutting tiles.(3 hrs.)	• Types of external & internal finishes such as rough cast, pebble, dash and stucco- materials used. • Method of finishing-factors to be kept in mind, PWD specification on the above. • Use of glazed tiles for wall facing, steps in fixing, precautions. • Construction & expansion joints-method of filling-repair of cracks.
71. Flooring: Mosaic, terrazzo, and tileflooring. (30 hrs.) 72. Laying out a stair on the ground.(20 hrs.)	• Stairs: Technical terms, relation between tread & rise, • Types of stairs, construction details of brick, stone & RCC stairs. • Spiral stairs with precast concrete steps. • Formwork & shuttering-their removal-precautions-PWD specifications.

S No.	Workshop Calculation and Science	Engineering Drawing
1.	Site problems involving multiplication & division of whole numbers.	Sketching of tools.
2.	Addition, subtraction multiplication & division of fractions.	Sketching of various carpentry joints.
3.	Application of fractions to site problems	Sketching of jointing devices and the joints made with them. Sketching of arch centering, door frames with joints, etc.
4.	Decimals: Addition, subtraction, multiplication & division. Conversion of decimal to fraction and vice-versa. Site problems.	Drawing: a language of communication. Properties of lines, angles, triangles & circles. Drawing practice of these geometrical figures including pictorial views.
5.	Square root of perfect squares-whole numbers & decimals.	Freehand sketching of simple solids such as cubes, cuboids, cylinders and views of these objects when viewed perpendicular to their surfaces or axes.
6.	Metric System: Measurement of length, breadth & height in metric units.	Freehand sketching of bricks, queen closers, king closers and bats.
7.	Measurement of weight in metric system. Unit conversion. Problems.	Preparation of freehand sketches in plan & elevation of $4\frac{1}{2}$" wall-Quoins & Junctions.
8.	Ratio and proportion: Problems to find out quantities of materials for various mortar & concrete mixes.	Preparation of freehand sketches of rat trap bond and other ornamental panels.
9.	Mensuration: Areas & perimeters of rectangles, squares and triangles.	Use of drawing instruments-'T' square, drawing board, etc. Printing of letters & numbers.
10.	Areas & perimeters of circles, sectors, segments, quadrilaterals, trapezium, parallelogram & rhombus.	Drawing of simple geometrical problems involving lines, squares & polygons.
11.	Problems on areas & perimeters of polygons such as pentagons, hexagons & octagons	Construction & reading of plain scales. Reading of tapes & foot rules.
12.	Volume & surface area of simple geometrical solids such as cubes & prisms	Drawing architectural drawings such as ovolo, cavetto, bolten, scotia, cyma recta, cyma reversa, astragal, etc.
13.	Mensuration applied to area & volume of brickwork. Calculation of cement & sand required.	Different types of lines & symbols used in building drawings.
14.		Simple isometric scaled drawings, isometric views of simple objects such as cubes,

		cuboids, square & rectangular prisms and pyramids.
15.	Simple cost comparison between facing bricks & common bricks. Cost comparison between walls built in English/Flemish/garden wall bonds/cavity walls.	Isometric views of simple objects such as cubes, cuboids, square & rectangular prisms and pyramids.
16.	Problems on areas. Allowances for simple rectangular window & other openings.	Projections of solids.
17.	Weight of walling supported by lintels and arches-simple problems.	Code of practice for general engineering drawing as per ISI.
18.	Calculation of rise & span for arches.	Drawing to scale: a) $4\frac{1}{2}$" stepped wall, b) $4\frac{1}{2}$" wall racked back, c) 9" walls in English & Flemish bonds showing stepped end, racking back & toothing.
19.	Volume of brickwork in mass retaining walls.	Drawing to scale: a) $4\frac{1}{2}$" quoin wall with stepped end & racking back, b) $4\frac{1}{2}$" junction wall, c) 9" quoin wall in English & Flemish bonds, d) 9" Flemish bonded wall junction, e) 9" wall in garden wall bond, f) $13\frac{1}{2}$" main wall in garden wall bond & 9" cross wall in English/Flemish bond.
20.	Volume of stonework or concrete work required for a given piece of work.	Drawing to scale: 18" wall in English garden wall bond.
21.	Mensuration applied to area of marble works	Hexagonal & octagonal pillars showing bonds and cavities.
22.	Calculation of length & weight of steel reinforcement from detailed RCC drawings.	Preparation of drawing showing timbering in trenches.
23.	Calculation of quantities of cement, sand, aggregate & reinforcement for a given RCC work.	Preparation of drawings showing methods of setting out simple segmental, circular & elliptical arches.
24.	Calculation of quantities of various materials for brick/tile/cement concrete/terrazzo flooring. Quantities of materials required for skirting.	Drawing of setting out a building showing the centre line, width of excavation, foundation concrete, footings 7 superstructure. Checking of accuracy.
25.	Calculation of length of drainage pipe & materials for foundation & covering concrete.	Interpretation of building drawing. Preparation of plan, elevation & section of a simple building.
26.	Calculation of materials required for a manhole from given drawing.	Reading of a building plan showing drainage line, position of manhole, etc.
27.		Constructional details of hollow block roof with precast RCC joints.
28.		Drawing of manhole and inspection chamber with details.
29.		Stonework: Drawing of random rubble,

		coursed rubble & ashlar masonry. Layout of stairs.
30.		Drawing of stone pillar showing architectural moulding.