NCIDQ Examination
Practice Design Problem

Section 3

Design Practicum - Part B
(Two Hours)

NCIDQ
Examination

PDP 2012-01
Published June, 2012

This booklet is to be used for the afternoon portion of the test. Please use this booklet in conjunction with the set of drawings labeled Design Practicum – Part B. There are four sheets in Part B.

The Section 3, Practicum examination is administered in three parts, Part A, Part B and Part C. At the end of the morning portion of the test, you will turn in Part A. You will not have access to Part A in the afternoon. **You will have a maximum of four hours to finish the afternoon portions of the test, Part B and Part C (two hours for each).** You may work at your own pace within the maximum time allowed.

We recommend you take this PDP under the same conditions as the exam. During the exam, work must be completed directly on the drawing sheets to be scored. Work done on tracing paper is not scored. You should use standard drafting equipment to complete the examination. The practicum section is not designed to require the use of a drafting table, but you will be permitted to use a portable drafting board or flat illustration board, within specified size requirements, during the examination. For more information on permitted supplies for the practicum section, visit our Web site at www.ncidq.org.

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THE PROBLEM BOOKLET FOR PART B CONTAINS

NCIDQ BUILDING CODE REQUIREMENTS 1
EGRESS Exercise 5
LIFE SAFETY Exercise 7
RESTROOM [WASHROOM] Exercise 8

THE SET OF DRAWINGS CONTAINS

COVER SHEET C-2
EGRESS EXERCISE ID-4
LIFE SAFETY EXERCISE ID-5
RESTROOM [WASHROOM] EXERCISE ID-6

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4.1.4 **ALL** objects located on a wall between 27" [685 mm] and 80" [2115 mm] AFF **MUST NOT** protrude more than 4" [100 mm] into an egress path of travel.

4.2 Exit Signs

4.2.1 Exit signs with a directional indicator (illuminated) showing the direction of travel shall be placed in every location where the direction of travel to reach the nearest exit is not apparent.

4.3 Illumination

4.3.1 Emergency illumination shall be provided for a minimum of 1½ hours in the event of failure of normal lighting. Emergency lighting facilities shall be arranged to provide initial illumination along the path of egress.

4.4 Travel Distance

4.4.1 **ALL** paths of travel **MUST** be accessible (barrier-free) and provide at minimum a 60" [1500 mm] turning radius at changes of travel direction.

4.4.2 The path of egress travel **MUST NOT** pass through a secondary space that is subject to closure by doors or that contains storage materials or has items that project into the path of travel.

4.4.3 The common path of egress travel distance **MUST NOT** exceed 100'-0" [30.5 m].

4.4.4 The travel distance to an exit **MUST** be measured on the floor along the centerline of the natural path of travel, starting from the most remote point to the centerline of the exit.

4.4.5 The travel distance **MUST NOT** exceed 250'-0" [76.2 m] measured along the path of travel.

4.5 Exit Access Doors, Doorways, Door Hardware and Windows

4.5.1 The height of doors **MUST NOT** be less than 7'-0" [2.1 m].

4.5.2 **ALL** door openings shall be a **MINIMUM** of 36" [900 mm] wide with an 18" [450 mm] clear space on the pull side of the door and a 12" [300 mm] clear space on the push side of the door.

4.5.3 Where a pair of doors is provided, one of the doors **MUST** be not less than 36" [900 mm] wide.

4.5.4 Locks, if provided, **MUST NOT** require the use of a key, special knowledge, or effort for operation from the egress side.

4.5.5 Doors opening from occupied spaces into the path of egress travel shall not project more than 7" [180 mm] into the required width.

4.5.6 Exit access doorways **MUST** open in the direction of exit travel.

4.5.7 Exit access doorways **MUST** be placed at a distance that is equal to or greater than:

4.5.7.1 When the building is **NOT** sprinklered, one-half the length of the maximum overall diagonal dimension of the area being served, measured in a straight line between exit doors or exit access doorways.

4.5.7.2 When the building is sprinklered, one-third the length of the maximum overall diagonal dimension of the area being served, measured in a straight line between exit doors or exit access doorways.

4.5.8 Two (2) exit access doorways **MUST** be provided from any space where the Occupancy Load exceeds 49 in Occupancy Groups A (Assembly), B (Business) and M (Mercantile) or exceeds 29 in Occupancy Group S (Storage).

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4.6 Corridors

4.6.1 The **MINIMUM** interior corridor width **MUST** be 44" [1100 mm].

4.6.2 Dead end corridors **MUST NOT** exceed 20'-0" [6 m] in length.

5.0 ACCESSIBILITY

5.1 Service (reception/transaction) counters over 8'-0" [2.4 m] in length **MUST** have an accessible height service counter, a minimum of 36" [900mm] in length.

5.2 **ALL** accessible (barrier-free) countertops, sinks, reception/transaction surfaces, and other horizontal work surfaces **MUST NOT** exceed 34" [865 mm] AFF with a 27"H [685 mm] clear knee space below.

5.3 **ALL** accessible (barrier-free) counters **MUST** have clear knee space of at least 30"W x 17"D [760 mm x 430 mm].

5.4 **ALL** exposed hot water pipes and drains **MUST** be insulated or otherwise protect wheelchair users from burns on the legs.

5.5 **ALL** accessible (barrier-free) wall-mounted controls **MUST** be located between 15" [380 mm] and 44" [1100 mm] AFF for a Forward Reach and between 9" [230 mm] and 48" [1200 mm] AFF for a Side Reach.

5.6 **ALL** accessible (barrier-free) lower cabinets **MUST** have a 6" D maximum x 9" H minimum [150mm x 230 mm] toe-kick.

5.7 **ALL** accessible (barrier-free) upper cabinets or shelves located above a work surface **MUST NOT** exceed 44" [1100 mm] AFF.

5.8 Restrooms [Washrooms]

5.8.1 **ALL** accessible toilets **MUST** have an unobstructed 60" [1500 mm] turning circle.

5.8.2 Centerline of accessible toilets **MUST** be 16"-18" [400 mm - 450 mm] from side wall or partition.

5.8.3 Clearance around accessible toilets **MUST** be 60" [1500 mm] along the rear wall and 56" [1420 mm] along the side wall.

5.8.4 Accessible toilets **MUST** be mounted at 17"-19" [430 mm – 480 mm] AFF to the top of the toilet seat.

5.8.5 **ALL** grab bars at toilets **MUST** be 36" [900 mm] long at the rear and 42" [1060 mm] long at the side, mounted between 33" [840 mm] and 36" [900 mm] AFF.

5.8.6 **ALL** accessible showers **MUST** have horizontal grab bars on three (3) sides mounted at a height between 33" [840 mm] and 36" [900 mm] AFF.

5.8.7 Accessible showers **MUST** be a minimum of 30" [760 mm] x 60" [1500 mm].

5.8.8 Accessible urinals **MUST** have an elongated rim at a maximum height of 17" [430 mm] AFF.

5.8.9 A clear floor space of 30" [760 mm] x 48" [1200 mm] **MUST** be provided in front of accessible lavatories, urinals, showers, and bathtubs.

5.8.10 Accessible mirrors **MUST** be mounted with the edge of the reflective surface no higher than 40" [1000 mm] AFF.

6.0 STRUCTURAL

6.1 Core drills **MUST NOT** be within 18" [450 mm] of any structural element.

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7.0 ELECTRICAL

7.1 **ALL** electrical receptacles **MUST** be 18" [450 mm] AFF unless otherwise noted.

7.2 **ALL** electrical receptacles located within 36" [900 mm] of a water source **MUST** be GFI.

7.3 Clearance of 36" [900 mm] deep **MUST** be provided in front of power panels.

8.0 OCCUPANCY LOAD TABLE

FUNCTION OF SPACE	FLOOR AREA IN SQ. FT. [m^2] PER OCCUPANT
Accessory storage areas, mechanical equipment room	300 [28 m^2] gross
Assembly without fixed seats Concentrated (chairs only—not fixed) Standing space Unconcentrated (tables and chairs)	 7 [.7 m^2] net 5 [.5 m^2] net 15 [1.4 m^2] net
Business areas	100 [9.3 m^2] gross
Education Classroom area Shops and other vocational room areas	 20 [1.9 m^2] net 50 [4.6 m^2] net
Exercise rooms	50 [4.6 m^2] gross
Kitchens, commercial	200 [18.6 m^2] gross
Mercantile Areas on other floors Basement and grade floor areas Storage, stock, shipping areas	 60 [5.6 m^2] gross 30 [2.8 m^2] gross 300 [28 m^2] gross
Residential	200 [18.6 m^2] gross

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EGRESS Exercise

Time: One (1) part of three (3) parts in a two (2) hour problem. One (1) hour is recommended for this exercise.
Scale: 1/8" = 1'-0" [1:100]

I. PROJECT DESCRIPTION:

The apartment shown on Sheet ID-4 is the first demised space that is planned for the third floor of an eight (8) story apartment building of a 55+ active living community. The building is classified primarily as a Residential occupancy with secondary Assembly occupancy, is fully sprinklered and is made of masonry with punched openings. The third floor is a mixed occupancy.

II. PROJECT REQUIREMENTS:

Divide the remaining floor area into six (6) additional usable suites with public circulation and egress spaces, to include:

- Common egress corridor(s),
- One (1) **minimum** 2,000 sq. ft. [185.8 m^2] Club Room (This is a gathering area that will be set up with tables and chairs),
- One (1) **minimum** 1,900 sq. ft. [176.5 m^2] 3-bedroom apartment,
- Two (2) **minimum** 1,200 sq. ft. [111.5 m^2] 2-bedroom apartments,
- One (1) **minimum** 950 sq. ft. [88.6 m^2] 1-bedroom apartment, and
- One (1) **minimum** 300 sq. ft. [27.9 m^2] storage room.

III. REQUIRED DESIGN SOLUTION:

For this exercise, use information given on Sheet ID-4.

Instructions to candidate:

A. **Subdivide space** for a total of six (6) additional areas using the square footages [m^2] listed in the Project Requirements.
   - **Show** demising walls and **label** actual square footage [m^2] for each suite. **Measure** square footages [m^2] centerline to centerline.
   - **Calculate and label** occupant load for each suite, including the existing suite, using the Occupancy Load Table in the NCIDQ Building Code Requirements.

B. **Create a common egress corridor.**
   - **Dimension** egress corridor width(s).
   - **Show** egress doors from all suites.
   - **Draw** barrier-free turning circles at changes in direction along all egress routes.

C. Where two (2) means of egress are required in an area:
   - **Draw** the proper method for determining door locations.
   - **Dimension the required distances** to show compliance with NCIDQ Building Code Requirements.

D. **Draw and dimension:**
   - The farthest common path of travel **for the existing suite.**
   - Travel distance from the **existing suite** to both exit stairs.

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E. In the **Notes/Calculations** area:
- **Calculate** occupant load per exit stair. Assume equal distribution between stairs.
- **Fill in** the occupant load per exit stair.
- **Fill in** the farthest common path of egress travel **for the existing suite**.
- **Fill in** the travel distance from the **existing suite** to both exit stairs.

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LIFE SAFETY Exercise

Time: One (1) part of three (3) parts in a two (2) hour problem. One-half (0.5) hour is recommended for this exercise.
Scale: 1/8" = 1'-0" [1:100]

I. PROJECT DESCRIPTION:

As shown on Sheet ID-5, Property Management has decided to add a conference center with two (2) large conference rooms adjacent to the property management offices. Tenants in the building can rent out the space for large meetings and training sessions. The property management offices include private offices, a conference room and support spaces. The space is located on the 10th floor of an existing twelve (12) story office building. The space is fully sprinklered, and the building is made of protected concrete construction with glass curtain walls. The finished ceiling height on the entire floor is 9'-4" [2.8m] AFF.

II. PROJECT REQUIREMENTS:

- Card readers and associated hardware at each egress door of tenant suite.
- Audible privacy for conference and training rooms.
- Secure and controlled access only to the rooms open to the common corridor including the conference rooms, catering, and table/ chair storage.
- Secure and controlled access for storage rooms.

III. REQUIRED DESIGN SOLUTION:

For this exercise, use information given on Sheet ID-5.

Instructions to candidate:

A. **Complete the Door/Frame/Hardware Schedule** for the four (4) doors tagged on the Floor Plan using the most appropriate solutions.

B. **Complete the Partition Schedule** for the five (5) partitions tagged on the Floor Plan using the most appropriate and cost-effective solutions.

C. **Draw the following life safety equipment** within the tenant suites, elevator lobby, public restrooms [washrooms], and public corridors on the Floor Plan:
   - Exit signs
   - Emergency lights with battery backup
   - Audible/visible fire alarms
   - Fire extinguishers (not required in restrooms [washrooms])
   - Smoke detectors

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RESTROOM [WASHROOM] Exercise

Time: One (1) part of three (3) parts in a two (2) hour problem. One-half (0.5) hour is recommended for this exercise.
Scale: 1/4" = 1'-0" [1:50]

I. PROJECT DESCRIPTION:

Following all applicable code requirements, **draw a layout of a men's restroom [washroom]** in the space given on the Restroom [Washroom] Plan, Sheet ID-6.

II. PROJECT REQUIREMENTS:

Accommodate the following requirements:

- Consideration of sight lines from entrance into restroom [washroom] so that fixtures, if seen from entrance, are obscured by partitions.
- Plumbing fixtures can only be located on walls having a plumbing chase.
- Two (2) lavatories, one (1) of which is accessible.
- Two (2) wall hung toilets, one (1) of which is accessible.
- Two (2) urinals, one (1) of which is accessible.
- Grab bars as required by code.
- Mirror at each lavatory; mirror at accessible lavatory must be accessible.
- Soap dispenser(s), 4" w x 12" h x 4" d [100 mm x 300 mm x 100 mm], dispenser at accessible sink must be accessible.
- One (1) accessible hand dryer, 12" w x 12" h x 8" d [300 mm x 300 mm x 200 mm].
- One (1) accessible trash receptacle.

III. REQUIRED DESIGN SOLUTION:

For this exercise, use information given on Sheet ID-6.

Instructions to candidate:

A. **Draw a plan view** on the Restroom [Washroom] Plan.
   - Dimension center lines of toilets and urinals.
   - Dimension stalls.
   - Dimension all grab bars.
   - Draw barrier-free clearances at accessible fixtures and changes in direction.

B. **Graphically tag** the following fixtures & accessories on the Restroom [Washroom] Plan:
   - Lavatories
   - Toilets
   - Urinal(s)
   - Grab bars
   - Mirror(s)
   - Soap dispenser(s)
   - Hand dryer
   - Trash receptacle

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C. **Complete the Restroom [Washroom] Fixture & Accessory Schedule**, indicating the appropriate accessible mounting heights of:
- Lavatory, counter height
- Toilet, top of seat
- Urinal, top of rim
- Grab bars, top of horizontal bar and centerline of verticals
- Mirror, bottom edge
- Soap dispenser, operable control
- Hand dryer, operable control
- Trash receptacle, opening

and indicating appropriate standard mounting heights of:
- Lavatory(s), counter height
- Toilet(s), top of seat
- Urinal(s), top of rim

D. **Complete the Notes area** indicating substrate and finish at the wet wall.

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