AIRPORT CIVIL ENGINEERING
STANDARD DRAWINGS

ASG-23

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Review and update
required before use

Public Works Canada
Architectural and Engineering Services
Air Transportation

Travaux Publics Canada
Services d'architecture et de génie
Transports aériens

JULY/JUILLET 1993
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from the use of said publication or the programs or the information contained therein.
1.0 INTRODUCTION

This manual presents Public Works Canada's airport civil engineering standard drawings and supersedes part of subsection 401 "Standard Drawing - Civil" in AK-70-06-400. These Standard Drawings are prepared and distributed by the Architectural and Engineering Services - Air Transportation. A complete list of drawings included in this manual is shown in Table 1.

The CAD files for these drawings are available in Microstation format and can be downloaded using a modem from the A&ES Air Transportation Electronic Bulletin Board by calling (613) 990-3776.

A print of each drawing is included for reference purposes.

2.0 APPLICATION

The Airport Civil Engineering Standard Drawings are used as guidance material for the designer. They should be used on Transport Canada airport projects in order to maintain national standards.

These Standard Drawings are mainly used for insertion in construction contract documents.

3.0 MODIFICATIONS

Modifications to these standard drawings shall only be made upon review and approval by Architectural and Engineering Services Headquarters. Modified drawings shall bear its own regional number and not the officially published Standard Drawing number.

Should necessary modifications be made to these drawings to better suit local needs advise A&ES-Air Transportation of those modifications.

The Standard Drawings will be reviewed and updated annually by A&ES-Air Transportation every month of July. A listing of approved drawings will be compiled, updated and distributed at the same time. Amended listings will include only prints of those drawings prepared or amended since the previous issue.
Forward any questions or comments regarding this document to:

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Airport Engineering Division
Place du Portage, Phase III, 8B3-1
11 Laurier St.
Hull, Quebec
K1A 0S5
CANADA
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<td>SURVEY MARKERS</td>
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</table>
CONSTRUCTION JOINTS

TO BE SLIGHTLY UNDERFILLED WITH AN APPROVED SEALING COMPOUND

19mm FOR 7.5 METRE SPACING
15mm FOR 6.0 METRE SPACING

FORMED SAWED SAWED

CONTRACTION JOINTS

× PREFORMED NEOPRENE SEAL, LUBRICANT ADHESIVE AND
METHED OF INSTALLATION SUBJECT TO PRIOR APPROVAL OF
THE ENGINEER.

××× A MALE OR FEMALE KEYWAY SHALL BE FORMED
ALONG THE OUTSIDE OF ALL EXTERIOR SLABS.

×××× SUITABLE BACK-UP TAPE TO BE APPROVED BY
ENGINEER PRIOR TO USE
NOTE: ALL DIMENSIONS IN MILLIMETRES
CASE 1 MISMATCHED JOINTS

For mismatched joints, the reinforcing requirements are:
1. 100mm wide, with reinforcing bars 75mm thick,
2. at least 100mm of rebar or mesh, or
3. 75mm of clearance to the slab edge.

Note: 1. All dimensions in millimetres.
2. Use 2-20mm bars for slab thickness 30cm or less.

CONSTRUCTION DETAILS

CASE 2 SMALL EXTERIOR SLABS

For all exterior slabs less than half of a full slab in area, the reinforcing requirement is 20mm deformed tie bars, 750mm long, 500mm c.c. spacing, and located at mid-depth of the slab.

CASE 3 SMALL INTERIOR SLABS

For all interior slabs less than 1/4 full slab in area, the reinforcing requirement is as outlined in case 1. For bar or mesh, joints will not be formed or cut to create undersirable small slabs.
CONSTRUCT 300mm DIA REINFORCED CONCRETE FOOTING

INSTALL STANDARD PIPE FLANGE (SUPPLIED BY OWNER) (SEE NOTE 2)

25mm OF GROUT UNDER PIPE FLANGE

50mm

50mm

SUPPLY & INSTALL 4 GALVANIZED 10mm DIAMETER ANCHOR BOLTS TO SECURE PIPE FLANGE. MIN LENGTH 300mm

300mm DIAMETER PERMUTUBE FOR CONCRETE

4-15mm VERTICAL BARS

10mm HORIZONTAL TIE BARS AT 600mm C.C.

NOTES:
1. ALL DIMENSIONS ARE IN METRES.
2. PIPE FLANGE MUST BE INSTALLED LEVEL ON GROUT.

THEODOLITE ANCHOR BASE

NO. INIT. DATE: REVISIONS
DRAWN: DESIGNED: APPROVED:

CHIEF, AIRPORT CIVIL ENGINEERING DATE: 93/07/07

SHEET 1 OF 1 FILE: 2080004.DCN

0000H208C004
GLIDE PATH ANTENNA BASE

NOTE:
All dimensions are in millimetres
AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

SECTION A-A

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. THIS DETAIL APPLIES WHEN LOCATING OF MANHOLES
   AVOIDED. PREFERRED LOCATION AT SLAB CORNER.
3. USE 2-20MM BARS FOR SLAB THICKNESS 300MM OR LESS.

CONCRETE SLAB REINFORCEMENT
AROUND INTERIOR MANHOLES
AND CATCH BASINS

CHIEF, AIRPORT CIVIL ENGINEERING DATE: 93/07/07
AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

END OR GATE POST

TYPICAL FOOTING FOR FROST SUSCEPTIBLE SOIL

FROST LINE

CONCRETE

LINE POST

FROST DEPTH

FROST LINE

CONCRETE

WELL COMPACTED SOIL

GATE DETAIL

BARBED WIRES

STAPLE

DETAILS

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. SIZES OF POSTS, BRACES AND GATE FRAMES ARE NOMINAL.

WOODEN POST FENCING DETAILS

CHIEF, AIRPORT CIVIL ENGINEERING DATE: 93/07/07

WOODEN POST

FENCING DETAILS

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DRAWN: DESIGNED: APPROVED:

FILE: 2100005.DCN

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July 1993
AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

GATE DETAIL

WIRE CLIP DETAIL

CORNER POST

INTERMEDIATE POST

PROJECTION ARM DETAIL

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. SIZES OF POSTS, BRACES AND GATE FRAMES ARE NOMINAL.

AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

INTERMEDIATE POST

PROJECTION ARM DETAIL

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. SIZES OF POSTS, BRACES AND GATE FRAMES ARE NOMINAL.

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FENCING LAYOUT

LINE POST DETAIL

FENCING DETAILS

NOTES:
1. For main ground bus use 2/0 copper conductor buried not more than 457mm outside the fence and parallel with the entire fence. The fence shall be anchored at every corner post, all gate posts, and posts on each side of all removable sections using 2/0 stranded copper wire.
2. Flexible copper wire shall be mounted so that it will not be subjected to damage from when gate is fully open in either direction.
3. The 2/0 ground wire riser from ground rod shall be connected to the reinforcing wire fabric, fence post, top rail, and barred wire by mechanical connectors.
4. A 76mm layer of crushed stone shall be provided inside the security fence.
5. Dimensions L1 and H1 may vary for individual structures.
6. Clearance of chain link fabric to grade shall not be more than 25mm.
7. Height of fence 457mm, height of fabric 254mm, unless specified in site specification.
8. Line post spacing for cast in situ curb to be 3048mm C/C.
9. Post spacing for precast curbs to match length of curb with allowance for width of footing, and not greater than 3048mm C/C.
10. Precast curb to be spaced in place.

Chief, Airport Civil Engineering Date: 93/07/07

STANDARD FENCING LAYOUT FOR POWER STRUCTURES
NOTES:
1. RUNWAYS SHALL BE NUMBERED WITH A TWO-
DIGIT NUMBER ASSOCIATED WITH EACH THRESHOLD.
2. RUNWAY CENTRELINES IN CENTRE OF LUMBER BLOCK
   (omit tip on the one for centering calculations)
3. ALL DIMENSIONS SHOWN ARE IN METRES AND TENTHS OF
   METRES.
   * PAINT AREA SHOWN IN SQUARE METRES.
THRESHOLD MARKINGS:

BLOCKS OF LINES, CONSISTING OF 8 LINES, 100mm WIDE, AT 300mm CENTRES. WIDTH OF EACH BLOCK 100MM, GAP BETWEEN BLOCKS 100MM, LENGTH 300MM.

NOTE:

ALL DIMENSIONS SHOWN IN METRES UNLESS OTHERWISE INDICATED.
Rapid Exit

For runway lengths:

1. **100m and greater (radius) < 550m**
2. **Less than 100m, R (radius) > 275m**

<table>
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<th>Minimum distance from centreline of runway to</th>
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<tr>
<td>Category I</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
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**NOTES:**

1. Taxiway marking turning radius shall be located to provide safe clearance between the pavement edge and the main gear of large jet aircraft.
2. Runway exit holding and taxiway markings to be painted yellow.
3. Where more than one taxi-holding position are provided, use pattern A for the closest to the runway.
4. All dimensions shown are in metres unless otherwise indicated.
AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

PUBLIC WORKS CANADA
ARCHITECTURAL & ENGINEERING SERVICES
AIR TRANSPORTATION

**Threshold Markings:**

See drawing 0000H212C002

**Centreline Markings:**

Blocks of lines, consisting of 8 or 4 lines for runways less than 30m in width 150m wide at 300m centres marking at 30.0m intervals, length 30.0m and width 2.25m (or 1.05m for R/W less than 30m in width).

**Amber Point Markings:**

See Table

**Touchdown Zone Markings:**

Table: Location and Dimensions of the Amming Point Marking

<table>
<thead>
<tr>
<th>LOCATION AND DIMENSIONS</th>
<th>CODE NUMBER</th>
<th>RUNWAY WIDTH</th>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Distance from threshold to beginning of marking</td>
<td>150m</td>
<td>250m</td>
</tr>
<tr>
<td>Length of stripe</td>
<td>45m</td>
<td>45m</td>
</tr>
<tr>
<td>Width of stripe</td>
<td>6m</td>
<td>6m</td>
</tr>
<tr>
<td>Lateral spacing between inner sides of stripes</td>
<td>6m</td>
<td>9m</td>
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**NOTE:** All dimensions shown in metres unless otherwise indicated.

**Runway Markings**

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AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

PERMANENT

ALL MARKING PRIOR TO THE TEMPORARY DISPLACED THRESHOLD SHALL BE OBSCURED.

EXISTING CENTRE LINE MARKING CONVERTED TO ARROW

SHIFTS:
SHIFTS OF ARROWS TO CONSIST OF 4 LINES, 150mm WIDE AT 350mm CENTRES.

NOTE:
ALL DIMENSIONS SHOWN IN METRES UNLESS OTHERWISE INDICATED.

TEMPORARY

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CHIEF: AIRPORT CIVIL ENGINEERING DATE: 93/07/07
DISPLACED RUNWAY THRESHOLD MARKINGS

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0000H212CO06
NOTES:

CENTERLINE MARKINGS: BLOCKS OF LINES CONSISTING OF 8 LINES, 150mm. WIDE AT 300mm CENTRES, 90TH 2250mm LENGTH AT 150mm INTERVALS, 750mm BORDERS ALONG BOTH SIDES OF STOL RUNWAY, 1500mm AT THRESHOLDS.

FUSED DISTANCE MARKINGS: SOLID BLOCKS 60.0mm LONG 150mm WIDE. FOR RUNWAY DESIGNATION NUMBERS REFER TO DRAWING 00004122001. ALL DIMENSIONS SHOWN IN METRES UNLESS OTHERWISE INDICATED.
NOTES:

1. THE TRIANGLE, LETTER "H", AND BOUNDARY MARKINGS ARE WHITE AND MAY BE EDGED WITH A 15cm BLACK BORDER TO IMPROVE CONTRAST.

2. DIMENSIONS SHOWN ARE APPROPRIATE FOR TAKE-OFF AND LANDING AREAS 18m OR LARGER. DIMENSIONS SHOULD BE REDUCED PROPORTIONALLY FOR SMALLER TAKE-OFF AND LANDING AREAS.

3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE INDICATED.
TYPE 2

TYPE 3

TYPE 4

NOTE:
ALL DIMENSIONS IN METRES UNLESS OTHERWISE INDICATED
NOTE:
1-ALL DIMENSIONS IN METERS UNLESS OTHERWISE INDICATED

TYPICAL STOP BAR

Air Transportation

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NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF MANHOLE 5500mm.
3. IN TURF AREAS, PLACE TOP OF MANHOLE 150mm BELOW FINISHED GRADE FROM THE EDGE OF MANHOLE UP TO FINISHED GRADE SLOPE TURF AT 3:1.
4. FOR GRATING AND FASTENING DETAILS SEE DRAWING 0000H223C007.
5. FOR PIPE CONNECTION AND RUNG DETAILS SEE DRAWING 0000H223C008.

STORM SEWER MANHOLE
TYPE D (900mm x 1800mm)

Air Transportation
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NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF MANHOLE 5500mm, BELOW 3500mm INCREASE WALL THICKNESS TO 300mm.
3. FOR GRATING AND FASTENING DETAILS SEE DRAWING 0000H223C007.
4. FOR PIPE CONNECTION AND RUNG DETAILS SEE DRAWING 0000H223C008.
5. SLOPE TO MATCH SHOULDER GRADATIONS.
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. FOR GRATING AND FASTENING DETAILS SEE DRAWING 0000H223C011.
3. FOR PIPE CONNECTION AND RUNG DETAILS SEE DRAWING 0000H223C018.

STORM SEWER MANHOLE
TYPE L (900mm X 900mm)
Notes:
1. All dimensions are in millimetres.
2. For grating and fastening details see drawing O000H23C001.
3. For pipe connection and rung details see drawing O000H23C009.

STORM SEWER MANHOLE
TYPE P (900mm x 1800mm)
NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF MANHOLE 5500mm, BELOW 3500mm
   INCREASE WALL THICKNESS TO 300mm.
3. FOR GRATING CURB AND GUTTER DETAILS SEE DRAWING OOH223C010.
4. FOR PIPING CONNECTION SEE DRAWING OOH223C018.

STORM SEWER MANHOLE
TYPE R (900mm X 900mm)
BANDING BARS 75 X 10
RIVETS 10mm DIA
RETICULNE BARS 50 X 5

STRAIGHT BARS 75 X 10

14 BARS EQUALLY SPACED

4 B(TYPICAL)

200 125 125 100
197

730

10

50 X 5

75 X 10

PLAN VIEW

STRaight BARS

MANHOLE TYPE B & F

BLOCKOUT

BANDING BAR

RETICULNE BAR

BLOCKOUT (65 X 65 X 75)

STRaight BARS

MANHOLE TYPE D & E

UNIVERSAL FASTENER

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF CATCH BASIN 3500MM.
3. FOR GRATING, CURB AND GUTTER DETAILS SEE DRAWING OMH223C010.
4. FOR PIPING CONNECTION SEE DRAWING OMH223C215.

STORM SEWER CATCH BASIN
TYPE A (600mm X 600mm)
NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF CATCH BASIN 3500mm.
3. FOR GRATING AND FASTENING DETAILS SEE DRAWING D000H223C007.
4. FOR PIPING CONNECTION SEE DRAWING D000H223C01B.
5. SLOPE TO MATCH SHOULDER GRADES.

STORM SEWER CATCH BASIN
TYPE B (470mm X 620mm)
GRATING AND FASTENING DEVICE FOR TYPE ‘L’ AND TYPE ‘B’ MANHOLES

NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. MAXIMUM DEPTH OF MANHOLE: 5500 mm.
3. IN TYPICAL AREAS, PLACE TOP OF MANHOLE 150 mm BELOW FINISHED GRADE.
4. FROM THE EDGE OF MANHOLE TO UNTIL FINISHED GRADE SLOPE TURF AT 3:1.
5. FOR TRAP AND FASTENING DETAILS SEE DRAWING 0000H223C007.
6. FOR PIPE CONNECTION AND RUNG DETAILS SEE DRAWING 0000H223C018.
7. SLOPE TO MATCH SHOULDER GRADE.

STORM SEWER MANHOLE
TYPE E (1500 mm x 1800 mm)
NOTES:
1. All dimensions are in millimetres.
2. In locations other than inlets and outlets where rip rap is specified, the thickness shall be a minimum of 300mm and the length, width and distance as directed by the engineer.
3. Apply cement mortar as required to produce a tight finished surface.

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BATTER = 76 PER FOOT

**NOTE:**

METRIC VALUES, SHOWN IN MILLIMETERS, ARE AN APPROXIMATE CONVERSION OF IMPERIAL MEASUREMENT SHOWN IN BRACKETS.

CONCRETE HEADWALL DETAILS

CHIEF, AIRPORT CIVIL ENGINEERING DATE: 93/07/07

CONCRETE FOOTING

CUT-OFF WALL 152 x 300

APRON

5 OVALS 457
LONG AT 229 O/C

5 OVALS 457
LONG AT 229 O/C

PIPE SIZE NOT TO EXCEED 89 mm

PLANE

ELEVATION

SECTION A-A

FRONT ELEVATION

SIDE ELEVATION

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STORM SEWER CONNECTION TO DRAINAGE STRUCTURE

CONCRETE BEDDING

NOTE:
ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.
Typical Subgrade Drainage

Granular Sub-base as specified
100-150mm above subgrade
Fine Filter Material as specified

Subgrade to be graded toward side drains
9.5mm coarse filter material as specified
Perforated pipe as required

75mm min
25mm min

Using two stage filter

Granular sub-base as specified
100-150mm above subgrade
Fine filter material as specified

Subgrade to be graded toward side drains
9.5-15mm coarse filter material as specified
Filter fabric
Perforated pipe as required

75mm min
25mm min

Using filter fabric around stone backfill

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July 1993
NOTES:
1-METRIC VALUES SHOWN IN MILLIMETRES ARE IN APPROXIMATE CONVERSION OF IMPERIAL UNITS.
2-PROVIDE CONCRETE THRUST BLOCKS AT ELBOWS AND CHANGES OF DIRECTION.
AIRPORT CIVIL ENGINEERING STANDARD DRAWINGS

P.C. CONCRETE  GRAVEL  SAND  SILT  CLAY  ORGANIC SOIL  ASPHALT

BOULDERS  >200mm
COBLES  <200mm  >75mm
GRAVEL  <100mm  >75mm
SAND  <4.75mm  >0.075mm
SILT  <0.075mm  >0.005mm
NON-PLASTIC
(PARTIALLY PLASTIC)
CLAY  <0.005mm
(PLASTIC)
(PARTIALLY PLASTIC)

SANDY GRAVEL

SANDY-SILTY

Silty Sand

Sandy Silt

Clayey Silt

CLAY

COMPOSITE SOILS

(DENSITY OF SYMBOLS INDICATES PREDOMINANT SOIL TYPE)

NOTE: GROUP SYMBOLS DP, SM, CL ETC USED IN TEST HOLE
LOG DESCRIPTIONS REFER TO THE UNIFIED SOIL CLASSIFICATION SYSTEM.

SPECIAL SYMBOLS

BED ROCK LINE

FINISHED GRADE

WATER TABLE

ORIGINAL GROUND

BASIC TEST HOLE SYMBOLS

NO. INIT. DATE: REVISIONS
DRAWN: DESIGNED: APPROVED:

CHIEF, AIRPORT CIVIL ENGINEERING DATE: 93/07/07

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Air Transportation ASG-23 July 1993
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.

Air Transportation
Asg-23
July 1993
CAST IRON RIM AND COVER

STAINLESS STEEL BALL WELDED TO COUPLING

250mm CONCRETE TUBE FILLED WITH CRUSHED STONES

ANNUAL SPACE BETWEEN PIPES FILLED WITH SAE 80 OIL

DRIVING SHOULDER

25mm GALV. STEEL PIPE CASING (COUPLED IN SECTIONS)

10mm GALV. STEEL PIPE CASING (COUPLED IN SECTIONS)

COMPRRESSIBLE SOIL

CASING, LIFTED 300mm

REFUSAL OR BEDROCK

FOOT (SEE DETAIL)

*NATIONAL RESEARCH COUNCIL

NOTE: ALL DIMENSIONS ARE IN MILLIMETRES.