

CONSTRUCTION AND MATERIAL SPECIFICATIONS

SECTION IV CONCRETE CURBS AND SIDEWALKS

1. Scope

The work covered by this specifications consists of furnishing all plant, labor, equipment, appliances and materials, and in performing all operations in connection with the furnishing and installing of concrete curbs and sidewalks.

2. Materials

- A. Concrete shall be pre-mixed certified concrete having a 28-day compressive strength of not less than 3000 psi.
- B. Forms may be either steel or a good straight timber, planed on the side adjacent to the concrete and oiled. Timber forms shall be not less than two (2) inches in thickness, except curb radius forms, which shall be pre-fabricated or plywood to the proper radius. Forms shall be straight, free from warp, and of sufficient strength, when staked to resist the pressure of the concrete without springing.

3. Construction Methods

- A. Excavation shall be made to the required depth, and through whatever material encountered, and the material upon which the work is to be constructed shall be compacted to a firm, even surface. All topsoil and soft yielding material shall be removed and replaced with suitable material. Wherever it is necessary to remove old concrete work, care shall be taken not to damage adjacent concrete work, which is to remain, and all broken concrete and excess material shall be removed and disposed of by the Contractor.
- B. Curbs shall be either slant curb or straight curb as specified, of the cross section and dimensions shown on Exhibits 1 and 2 herein. Concrete shall be placed in the form in horizontal layers not to exceed five (5) inches, and spaded sufficiently to eliminate all voids. An approved vibrator may be used when permitted by the Township Engineer. Where necessary or directed, drainage openings shall be made through the curb line at the elevation and of the size required. Straight curb shall be depressed as indicated or directed. The top surface of the curb shall be finished true to line and grade in a smooth, neat, and even manner by means of wood floats, and the edges of the face and back shall be rounded to a radius of not more than 1/2 of an inch while the concrete is still plastic.

The curb shall be constructed in continuous lengths not to exceed 30 feet, with contraction joints scored at the ten-foot intervals, and templates shall be pulled

while the concrete is still plastic so that there shall not be a complete separation between sections. Pre-molded ASPHALT expansion joints 1/2 of an inch in thickness shall be placed at the end of each pour, but in no case at intervals exceeding 30 feet.

Two. #4 deformed reinforcing bar dowels 24" in length shall be provided at all expansion joints. These bars shall be placed as shown on Exhibits 1 and 2, and shall exceed 12 inches on each side of the joint. One end of the bars shall be rendered bondless with an approved material, and enclosed, in part, in approved tubes or caps, which will provide positive clearance of at least 1/2 of an inch. Bar dowels shall be provided at all expansion joints as well as where tangent curb meets radii curb.

Expansion joints shall be provided at the beginning and end of all curb radii. 1/2 of an inch pre-molded ASPHALT expansion joint material shall separate all curb from sidewalk poured directly back of curb, and shall separate all curb and/or sidewalk from utility poles, fire hydrants, walls, steps, and other permanent structures abutting the work.

All slant curb shall be stamped during installation indicating the location of the water and sewer service. The stamp shall be between 2 and 3 inches high and shall be placed on the top of the curb.

4. Sidewalks shall be plain concrete four (4) inches in thickness, with 6 x 6 W2.1 x W2.1 welded wire fabric, except under driveways, where the thickness shall be six (6) inches and industrial drives where the thickness shall be eight (8) inches. The subgrade for the sidewalk shall be 2B stone (4" thick), and it shall be carefully graded, and where necessary tamped, to provide an even, solid support. Sidewalks shall be constructed in separate slabs 30 feet in length, separated by pre-molded ASPHALT expansion joints 1/2 of an inch in thickness for the full depth of the concrete. Between expansion joints, the slabs shall be scored every 5 feet. Pre-molded ASPHALT expansion joints shall separate the sidewalk from the curb, and from any existing building, stairs, other pavement, utility poles, fire hydrants, or other permanent structure.

Normally sidewalk shall slope 1/4 of an inch per foot toward the street, and where a grass plot is provided, sidewalk, grade shall permit 1/4 of an inch per foot slope across the grass plot to the top of straight curb of 1/2 to 3/4 of an inch per foot slope across grass plot to the top of rolled or slant curb.

5. Removal of Forms. The forms shall not be removed within twelve (12) hours after the concrete has been placed. No rubbing to correct irregularities will be permitted until the full curing period has elapsed. Any irregular surface shall be corrected by rubbing with a carborundum stone. Brush finishing or plastering will not be permitted and all rejected curb shall be promptly removed and replaced. All joints in the curb shall be opened from top to bottom immediately

after the forms are removed and the edges adjacent to the joints shall be sharp and clean-cut. After the forms are removed, minor defects shall be filled with mortar composed of one part cement and two parts fine aggregate.

6. Driveways. Straight curb across existing driveways, whether paved or not, shall be depressed approximately six (6) inches in depth. Where unusual grade conditions exist, such that the established curb and sidewalk grade may not meet the existing driveway grade, the Contractor shall call the condition to the attention of the Inspector prior to placing forms so that any adjustment of grade may be made at the direction of the Inspector.
7. Street Inspections. Where curb or sidewalk is constructed at a street intersection, particularly where either street grade is in excess of 5 percent, it may be necessary to adjust the grade, particularly the sidewalk grade, to properly fit the grade of the intersecting streets. Generally, it will be necessary to depart from the normal 1/4 of inch per foot fall on the sidewalk, either raising or lowering the back edge of sidewalk, in order to make a smooth grade transition in the vicinity of the street intersection.
8. Curb Cut Ramps. All curbs and sidewalks at intersection of streets or avenues being constructed, reconstructed or altered for any reason shall provide curb cut ramps for the physically handicapped except as noted below in paragraph (d).
 - a. The curb cut ramps should be as close to the intersection as possible to keep the widths of crosswalks to a minimum.
 - b. The ramps at intersections shall be constructed as illustrated in Exhibit 3 by depressing the curbs and sidewalks to the height necessary to achieve the necessary ramp slopes and provide safe pedestrian and wheelchair movement.
 - c. Existing driveway ramps near street intersections should be considered for use as wheelchair ramps where curbs are being constructed or reconstructed.
 - d. On very narrow sidewalks, where curb cuts cannot be constructed in accordance with Exhibit 3 curb cut ramps should be placed at locations where a need exists. Where such need cannot be demonstrated, curb cut ramps should not be installed. Also, where a need does not exist, curb cuts need not be constructed at locations such as very steep sidewalks, where unavoidable trees or other obstructions exist and where safe operation or a wheelchair cannot be ensured at the point of gradient intersection of the pavement and the ramp.
9. Curing. All concrete work shall be cured in strict accordance with Penn DOT Form 408, latest revision. Either membrane curing or water curing will be

permitted. For water curing, the curing period shall be not less than seven (7) days.

10. Backfilling and Fine Grading. After concrete has retained the required strength, the work shall be promptly backfilled with clean earth or other approved material in layers of not less than four (4) inches in depth, and shall be thoroughly compacted mechanically to the required elevation and cross section. Curbing shall be backfilled on the street side to street subgrade either with clean earth or crushed stone. Grass plot areas and areas to the rear of sidewalk shall be backfilled with clean earth to within four (4) inches of finished grade; at least four (4) inches of clean topsoil shall be spread as the last layer, to the proper grade to meet the finished curb and sidewalk grade. To the rear of the sidewalk, in fill areas, the backfill shall be carried level for a distance of 12 inches behind the rear line of the sidewalk, and then sloped down on two horizontal to one vertical slope to meet the existing grade. If water pockets are formed, the Contractor shall call this to the attention of the Inspector, so that an adjustment in backfill can be made. In cut areas, the area to rear of sidewalk will be sloped 1-1/2 horizontal to one vertical to meet the existing grade. The topsoil areas shall be hand raked to an even grade without water pockets.

11. Cold Weather Concreting. The following limitation shall apply when the mean daily temperature is below 50° F.
 - a. No concrete pours shall be permitted from December 1st to March 1st unless prior approval is received from East Manchester Township.
 - b. No concrete pours shall be permitted from December 1st to March 1st unless prior approval is received from East Manchester Township.
 - c. No concrete pours shall be allowed when the mean daily temperature will fall below 32° F within five (5) days of the pour. All concrete materials and all reinforcement, forms, fillers, and ground with which the concrete is to come in contact with, shall be free from frost.
 - d. When the mean daily temperature is between 32° F and 50° F, all concrete place in the forms shall have a temperature of between 70° F and 80° F, and adequate means shall be provided for maintaining a temperature of not less than 70° F for two (2) days or 50° F for three (3) days or for as much more time as is necessary to insure proper curing of the concrete. The housing, covering or other protection used in connection with curing shall remain in place in intact at least 24 hours after the artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for the prevention of freezing.
 - e. Adequate equipment shall be provided for heating the concrete materials and protecting the concrete during freezing or near-freezing weather. No frozen materials or materials containing ice shall be used.

12. Concrete Slabs

- a. Where directed by the Township or the Township Engineer, a 6-inch concrete slab in conjunction with the curb and sidewalk shall be placed across an access drive, private/public street, driveways, etc., all to be constructed within the public right-of-way.

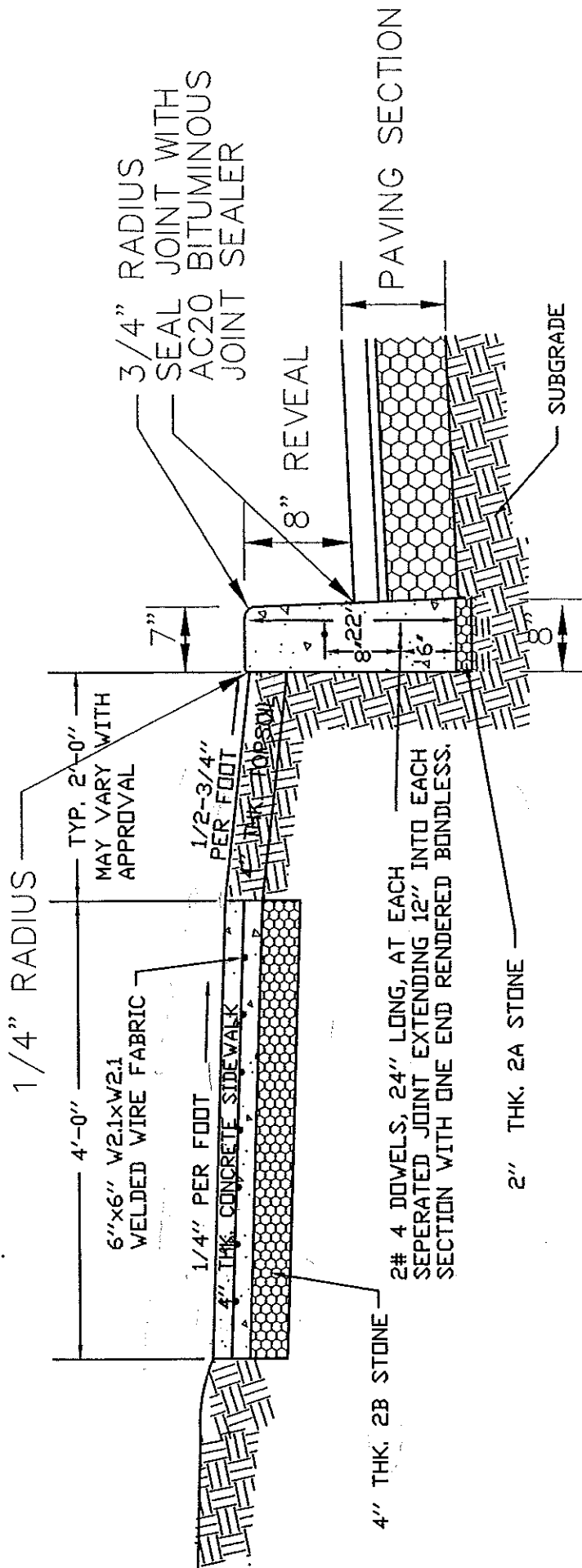


EXHIBIT NO. 1
 NOT TO SCALE
 DATE: 1/2/01

VERTICAL CONCRETE CURB AND SIDEWALK DETAIL
 - CROSS SECTION -

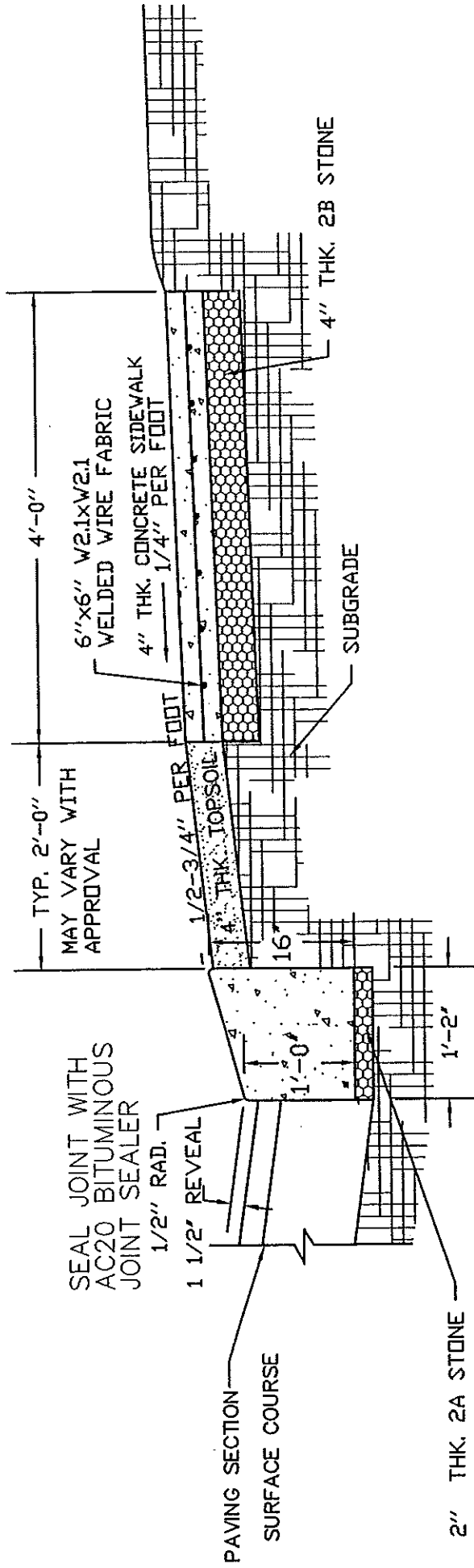



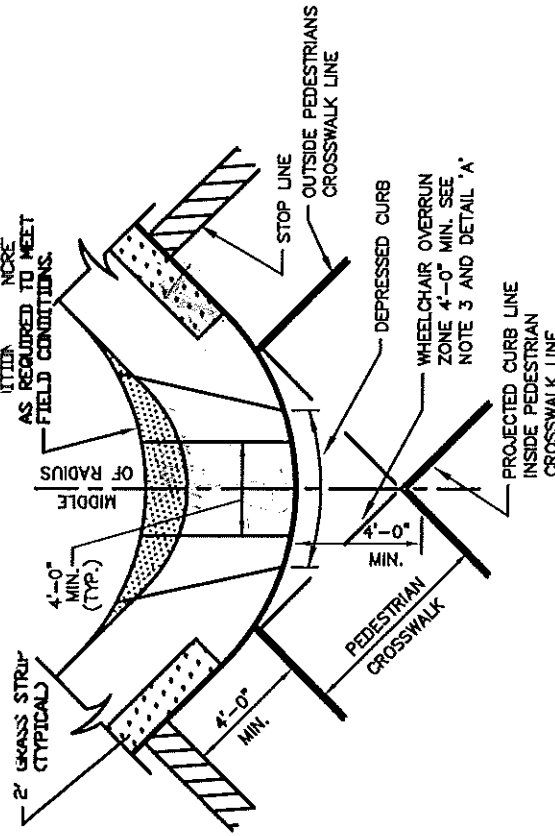
EXHIBIT NO. 2
 NOT TO SCALE
 DATE: 1/2/01

SLANT CONCRETE CURB AND SIDEWALK DETAIL
 -CROSS SECTION-

Gordon L. Brown & Associates, Inc.
 Civil Engineers & Surveyors
 717-741-4621
 2238 South Queen Street
 York, Pa. 17402-4631

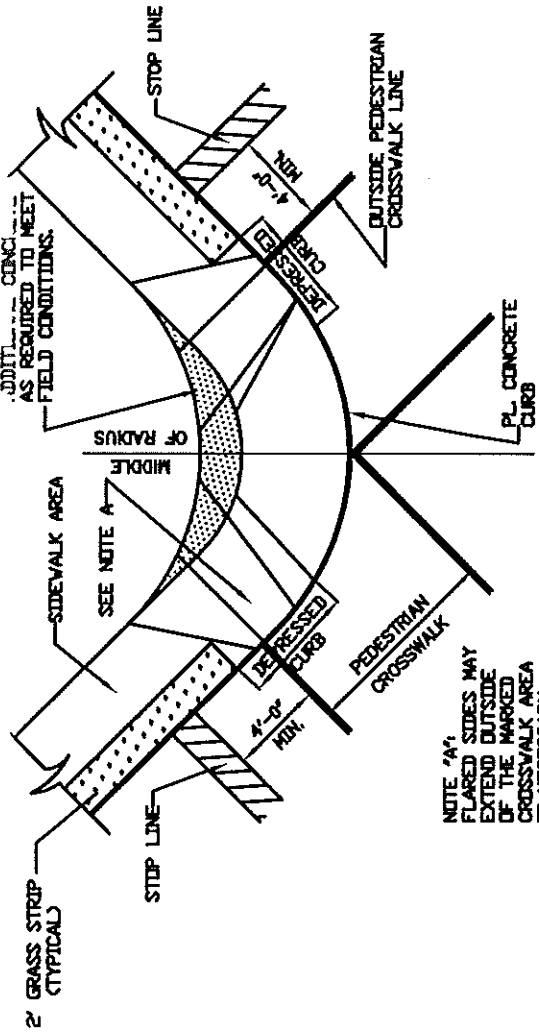


GLB&A

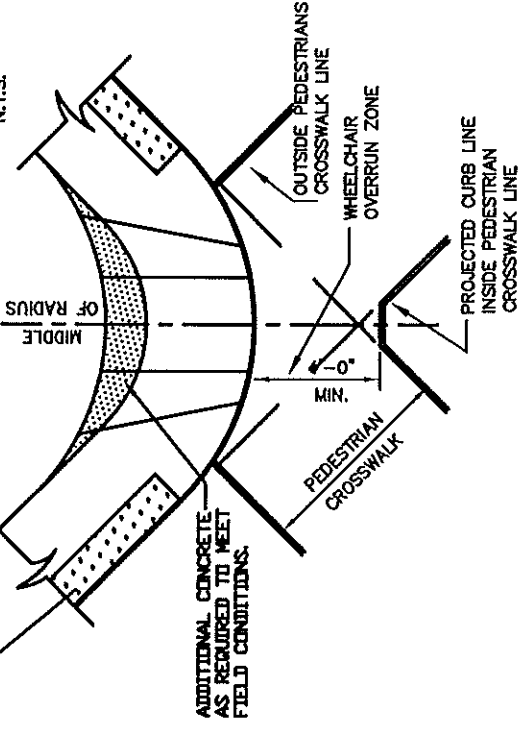


TYPE 1' SINGLE CURB RAMP
AT CORNER WITH
CROSSWALK MARKINGS PLAN
N.T.S.

- NOTES:
1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PUBLICATION 408 SPECIFICATIONS, SECTION 630, 676, 420, 421, 422.
 2. PROVIDE 1/2" EXPANSION JOINT MATERIAL WHERE CURB RAMP ADJOINS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE WITH THE TOP OF JOINT FILLER FLUSH WITH ADJACENT CONCRETE SURFACE.
 3. IF PEDESTRIAN CROSSWALKS ARE NOT WIDE ENOUGH TO PROVIDE A MINIMUM 4'-0" WIDE WHEELCHAIR OVERRUN ZONE AT THE BOTTOM OF THE RAMP, POSITION CROSSWALKS AS INDICATED IN DETAIL 'A'.
 4. SEAL JOINTS WITH AN APPROVED SEALING MATERIAL.
 5. PROVIDE SLIP RESISTANT TEXTURE ON CURB RAMP BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP. EXTEND TEXTURE THE FULL WIDTH AND LENGTH OF THE CURB RAMP INCLUDING FLARED SIDE RAMPS.
 6. CONSTRUCTION DETAILS SHALL BE MODIFIED TO ADAPT DIMENSIONS TO EXISTING CURB ALTERATIONS WHERE THE CURB IS LESS THAN THE STANDARD 8-INCH HEIGHT.
 7. CURB RAMP AND SIDE FLARE LENGTHS ARE VARIABLE AND BASED ON CURB HEIGHT AND THE SIDEWALK PITCH. SEE TABLE A SHEET 2 OF 2 FOR TYPICAL RAMP DIMENSIONS.
 8. DEPRESSED CURB WILL BE MEASURED AND PAID FOR IN ACCORDANCE WITH SECTION 630.4.
 9. WHENEVER POSSIBLE, CONSTRUCT THE TRANSITION SLOPE FROM THE CURB RAMP AND FLARE SIDES TO ADJOINING SURFACES WITH A GRADUAL CURVE RATHER THAN AN ABRUPT ANGLE.
 10. BUILT-UP CURB RAMP TO BE CONSTRUCTED TO BITUMINOUS MATERIAL AS INDICATED, INCLUDING SURFACE PREPARATION AND TACK COAT, AS REQUIRED.



TYPE 1' DOUBLE CURB RAMP
AT CORNER WITH
CROSSWALK MARKINGS PLAN
N.T.S.

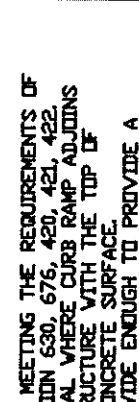
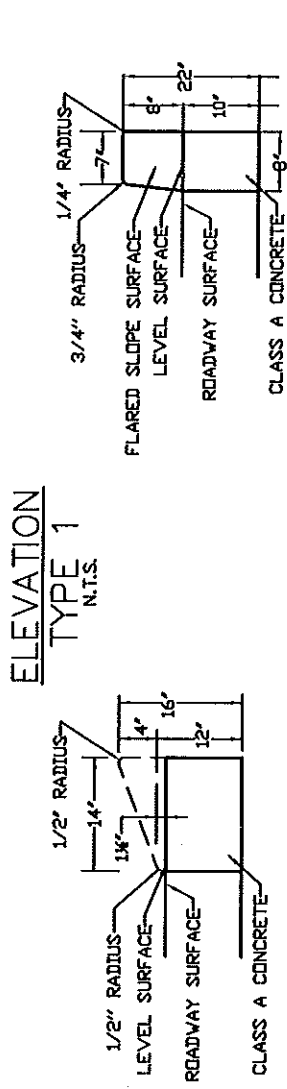
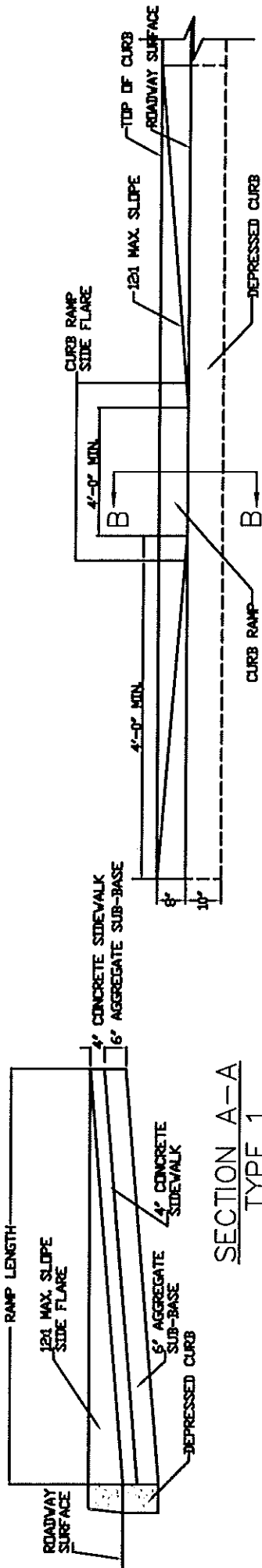


DETAIL 'A'
OVERRUN ZONE CROSSWALK
MARKINGS PLAN
N.T.S.

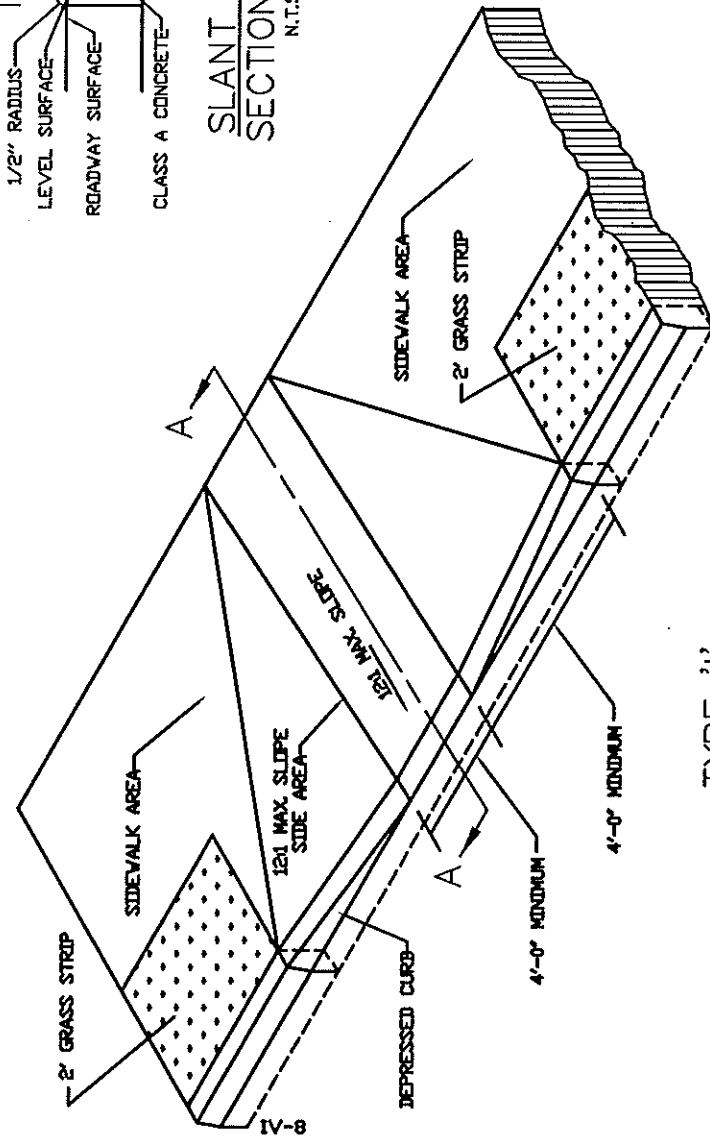
EXHIBIT NO. 3
NOT TO SCALE
DATE: 1/9/07

HANDICAPPED SIDEWALK
RAMP DETAIL

Gordon L. Brown & Associates, Inc.
Civil Engineers & Surveyors
717-741-4621
2238 South Queen Street
York, Pa. 17402-4631



- NOTES:
1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PUBLICATION 408 SPECIFICATIONS, SECTION 630, 676, 420, 421, 422.
 2. PROVIDE 1/2" EXPANSION JOINT MATERIAL WHERE CURB RAMP ADJOINS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE WITH THE TOP OF JOINT FILLER FLUSH WITH ADJACENT CONCRETE SURFACE.
 3. IF PEDESTRIAN CROSSWALKS ARE NOT WIDE ENOUGH TO PROVIDE A MINIMUM 4'-0" WIDE WHEELCHAIR INVERSION ZONE AT THE BOTTOM OF THE RAMP, POSITION CROSSWALKS AS INDICATED IN DETAIL A.
 4. SEAL JOINTS WITH AN APPROVED SEALING MATERIAL.
 5. PROVIDE SLIP RESISTANT TEXTURE ON CURB RAMP BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP. EXTEND TEXTURE THE FULL WIDTH AND LENGTH OF THE CURB RAMP INCLUDING FLARED SIDE RAMPS.
 6. CONSTRUCTION DETAILS SHALL BE MODIFIED TO ADAPT DIMENSIONS TO EXISTING CURB ALTERATIONS WHERE THE CURB IS LESS THAN THE STANDARD 8-INCH HEIGHT.
 7. CURB RAMP AND SIDE FLARE LENGTHS ARE VARIABLE AND BASED ON CURB HEIGHT AND THE SIDEWALK PITCH. SEE TABLE A SHEET 2 OF 2 FOR TYPICAL RAMP DIMENSIONS.
 8. DEPRESSED CURB WILL BE MEASURED AND PAID FOR IN ACCORDANCE WITH SECTION 630.4.
 9. WHENEVER POSSIBLE, CONSTRUCT THE TRANSITION SLOPE FROM THE CURB RAMP AND FLARE SIDES TO ADJOINING SURFACES WITH A GRADUAL CURVE RATHER THAN AN ABRUPT ANGLE.
 10. BUILT-UP CURB RAMP TO BE CONSTRUCTED TO BITUMINOUS MATERIAL AS INDICATED, INCLUDING SURFACE PREPARATION AND TACK COAT, AS REQUIRED.



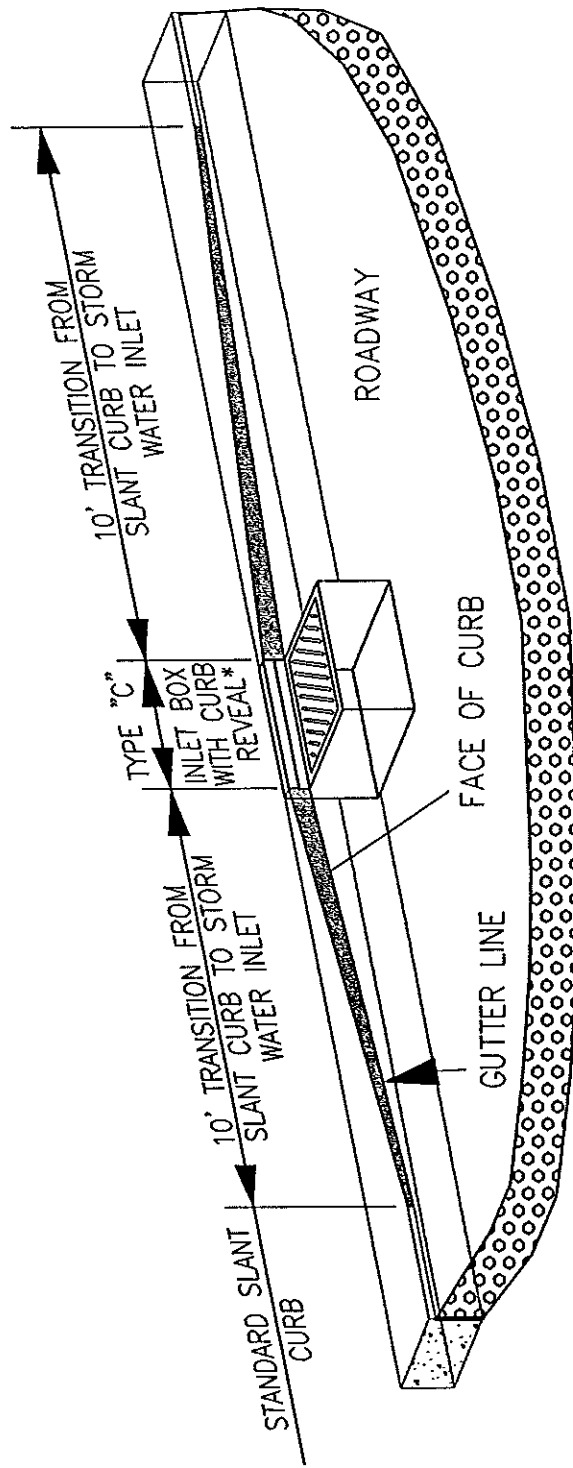
TYPE '1'
CURB RAMP
NEW CONSTRUCTION
N.T.S.

HANDICAPPED SIDEWALK
RAMP DETAIL

Gordon L Brown & Associates, Inc.
Civil Engineers & Surveyors
717-741-4621
2238 South Queen Street
York, Pa. 17402-4631

GLB&A

EXHIBIT NO. 3
NOT TO SCALE
DATE: 1/9/07




CURBING TRANSITION INTO INLET

*NOTE: USE 7 INCH CURB REVEAL
 EXHIBIT NO. 4
 NOT TO SCALE
 DATE: 1/2/01

CURBING TRANSITION INTO TYPE "C" INLET

Gordon L. Brown & Associates, Inc.
 Civil Engineers & Surveyors
 717-741-4621
 2238 South Queen Street
 York, Pa. 17402-4631



GLB&A