



# Maryland

## Department of the Environment

Larry Hogan, Governor  
Boyd K. Rutherford, Lt. Governor

Ben Grumbles, Secretary  
Horacio Tablada, Deputy Secretary

### MDE DAM SAFETY PERMITS DIVISION

### POND CODE 378 CHECKLIST FOR SMALL POND APPROVAL

MDE Permit Number \_\_\_\_\_ Date \_\_\_\_\_

SHA Number (if SHA pond) \_\_\_\_\_

Applicant \_\_\_\_\_

Project Name \_\_\_\_\_

Design Firm \_\_\_\_\_

PLEASE NOTE THAT PLANS SUBMITTED WITHOUT A COMPLETED CHECKLIST  
MAY BE RETURNED WITHOUT REVIEW

| Designer<br>(check off) |    |     | MDE<br>Reviewer      |                     | Submission Item                                                                                                          |
|-------------------------|----|-----|----------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------|
| YES                     | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                                                          |
| SUBMISSION DOCUMENTS    |    |     |                      |                     |                                                                                                                          |
|                         |    |     |                      |                     | Point by point responses to comment letter (if applicable)                                                               |
|                         |    |     |                      |                     | Pond 378 construction plan set with Professional Engineer’s certification, seal, signature, and date                     |
|                         |    |     |                      |                     | Stormwater management design report with Professional Engineer’s certification, seal, signature, and date                |
|                         |    |     |                      |                     | Geotechnical report for stormwater management pond with Professional Engineer’s certification, seal, signature, and date |
|                         |    |     |                      |                     | Dam breach analysis for small ponds with Professional Engineer’s certification, seal, signature, and date                |
|                         |    |     |                      |                     | Pond Summary Sheet (MD-ENG-14)                                                                                           |
|                         |    |     |                      |                     | Approved erosion and sediment control plans from local soil conservation district                                        |
|                         |    |     |                      |                     | Stormwater Management (SWM) approval from the local approval authority as required.                                      |
|                         |    |     |                      |                     |                                                                                                                          |

| Designer<br>(check off)   |    |     | MDE<br>Reviewer      |                     | Submission Item                                                                                                                  |
|---------------------------|----|-----|----------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------|
| YES                       | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                                                                  |
| <b>CONSTRUCTION PLANS</b> |    |     |                      |                     |                                                                                                                                  |
|                           |    |     |                      |                     | <b>TITLE SHEET(S)</b>                                                                                                            |
|                           |    |     |                      |                     | Project name, street address, zoning, tax map, election district, parcel no., latitude, longitude                                |
|                           |    |     |                      |                     | Owner/Developer name, address and phone number                                                                                   |
|                           |    |     |                      |                     | Design Professional name, address and phone number                                                                               |
|                           |    |     |                      |                     | MDE Permit No.                                                                                                                   |
|                           |    |     |                      |                     | MDE Tracking No.                                                                                                                 |
|                           |    |     |                      |                     | MDE Agency Interest No.                                                                                                          |
|                           |    |     |                      |                     | Vicinity map to scale (1"=2000') with major roads identified and site delineated                                                 |
|                           |    |     |                      |                     | Legend                                                                                                                           |
|                           |    |     |                      |                     | Sheet index                                                                                                                      |
|                           |    |     |                      |                     | Professional Engineer's certification, seal, signature, and date                                                                 |
|                           |    |     |                      |                     | <b>OTHER</b>                                                                                                                     |
|                           |    |     |                      |                     | Construction specifications per MD Code 378 (Site Prep, Earth Fill, Structural Backfill, Pipe Conduits, Concrete, Stabilization) |
|                           |    |     |                      |                     | As-built tables                                                                                                                  |
|                           |    |     |                      |                     | As-built certification block                                                                                                     |
|                           |    |     |                      |                     | Construction inspection schedule                                                                                                 |
|                           |    |     |                      |                     | Maintenance schedule                                                                                                             |
|                           |    |     |                      |                     | <b>GENERAL INFORMATION (ALL SHEETS)</b>                                                                                          |
|                           |    |     |                      |                     | Plan scale range: 1" = 10' to 1" = 50'                                                                                           |
|                           |    |     |                      |                     | Profile scale: 1" - 5' vertical, to 1" = 50' horizontal                                                                          |
|                           |    |     |                      |                     | Maximum Drawing Size: 24" x 36"                                                                                                  |
|                           |    |     |                      |                     | Minimum 3 grid ticks with lat/long on plan sheets                                                                                |
|                           |    |     |                      |                     | North arrow                                                                                                                      |
|                           |    |     |                      |                     | Match lines labeled and referenced                                                                                               |
|                           |    |     |                      |                     | Profiles, details, and cross-sections drawn to scale                                                                             |
|                           |    |     |                      |                     | Sheets numbered, consecutively; revisions noted with date                                                                        |

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|                         |    |     |                      |                     | MDE Permit No.                                                                                     |
|                         |    |     |                      |                     | Professional Engineer's certification, seal, signature, and date                                   |
|                         |    |     |                      |                     |                                                                                                    |
|                         |    |     |                      |                     | <b>PLAN VIEW OF POND AT SCALE OF 1" = 50' OR LESS<br/>show and label the following:</b>            |
|                         |    |     |                      |                     | Existing and final contours (2' interval maximum) with index contours clearly labeled              |
|                         |    |     |                      |                     | Locations of test borings and bench mark (1 in dam centerline (min); 1 in emergency spillway(min)) |
|                         |    |     |                      |                     | Inflow channel or pipe; erosion protection                                                         |
|                         |    |     |                      |                     | Outflow pipe, outlet protection, outfall channel                                                   |
|                         |    |     |                      |                     | Property lines and easements with owners information                                               |
|                         |    |     |                      |                     | Low flow channel (if applicable)                                                                   |
|                         |    |     |                      |                     | Emergency spillway and outlet channel                                                              |
|                         |    |     |                      |                     | Stationing of embankment centerline; location of other section details                             |
|                         |    |     |                      |                     | Site features and existing/proposed grading to 200 ft beyond pond limits                           |
|                         |    |     |                      |                     | "No woody vegetation" zone delineated                                                              |
|                         |    |     |                      |                     | Storm drainage system, size, material (existing and proposed) with easements clearly identified    |
|                         |    |     |                      |                     | Downstream conveyance system (existing and proposed) with easements clearly identified             |
|                         |    |     |                      |                     | Utilities (existing and proposed) with easements clearly identified                                |
|                         |    |     |                      |                     | Floodplain limits with sections and water surface elevations                                       |
|                         |    |     |                      |                     | Wetland boundary and wetland buffer labeled                                                        |
|                         |    |     |                      |                     | CBCA Boundary labeled                                                                              |
|                         |    |     |                      |                     | Waters of the U.S. labeled                                                                         |
|                         |    |     |                      |                     | Forest conservation easements labeled                                                              |
|                         |    |     |                      |                     | Sinkholes and rock outcrops labeled                                                                |
|                         |    |     |                      |                     | Forebays and internal berms (reference berm detail)                                                |
|                         |    |     |                      |                     | Control structure (reference detail)                                                               |

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|-------------------------|----|-----|----------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| YES                     | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                                                                                |
|                         |    |     |                      |                     | Principal spillway                                                                                                                             |
|                         |    |     |                      |                     | Seepage control (reference detail)                                                                                                             |
|                         |    |     |                      |                     | Limits of clay core trench                                                                                                                     |
|                         |    |     |                      |                     | Pond maintenance access                                                                                                                        |
|                         |    |     |                      |                     | Fencing (if applicable)                                                                                                                        |
|                         |    |     |                      |                     | Trash rack/low flow trash rack (reference detail)                                                                                              |
|                         |    |     |                      |                     | Limits of pond liner (if applicable)                                                                                                           |
|                         |    |     |                      |                     | Benching for ponds deeper than 4 feet                                                                                                          |
|                         |    |     |                      |                     | <b>CROSS-SECTION OF DAM ALONG PRINCIPAL SPILLWAY<br/>(i.e. profile of principal spillway) – show and label the following:</b>                  |
|                         |    |     |                      |                     | Existing and proposed ground surface                                                                                                           |
|                         |    |     |                      |                     | Slope of embankment sides (2:1 max)/(5:1 max combined for top width ≤ 26 ft)                                                                   |
|                         |    |     |                      |                     | Embankment top width (6' minimum; 10-26' for road); top elevation                                                                              |
|                         |    |     |                      |                     | Cutoff trench (dimensioned); bottom width 4' minimum; side slopes 1:1 maximum; depth 4' minimum below concrete cradle                          |
|                         |    |     |                      |                     | Impervious Core (up to 10 year WSEL); side slopes; top width; top elevation                                                                    |
|                         |    |     |                      |                     | Control structure (and reference detail location)                                                                                              |
|                         |    |     |                      |                     | Trash rack (all openings in control structure; reference detail)                                                                               |
|                         |    |     |                      |                     | SWM Design WSEL (Design High Water (DHW))                                                                                                      |
|                         |    |     |                      |                     | Permanent pool WSEL                                                                                                                            |
|                         |    |     |                      |                     | 100-yr WSEL                                                                                                                                    |
|                         |    |     |                      |                     | Control structure openings: diameter or dimensions                                                                                             |
|                         |    |     |                      |                     | Principal spillway pipe (barrel): inside diameter or dimensions; length; slope; invert in and out                                              |
|                         |    |     |                      |                     | Material: for concrete pipe, ASTM C-361; for PVC pipe, ASTM D-1785 or D-2241; for HDPE, AASHTO M294 Type S; for HDPE ≤ 10", AASHTO M252 Type S |
|                         |    |     |                      |                     | Specify water tight joints                                                                                                                     |
|                         |    |     |                      |                     |                                                                                                                                                |

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|                         |    |     |                      |                     | <b>CROSS-SECTION OF DAM ALONG PRINCIPAL SPILLWAY<br/>(i.e. profile of principal spillway) – show and label the following:</b>                  |
|                         |    |     |                      |                     | Existing and proposed ground surface                                                                                                           |
|                         |    |     |                      |                     | Slope of embankment sides (2:1 max)/(5:1 max combined for top width ≤ 26 ft)                                                                   |
|                         |    |     |                      |                     | Embankment top width (6' minimum; 10-26' for road); top elevation                                                                              |
|                         |    |     |                      |                     | Cutoff trench (dimensioned); bottom width 4' minimum; side slopes 1:1 maximum; depth 4' minimum below concrete cradle                          |
|                         |    |     |                      |                     | Impervious Core (up to 10 year WSEL); side slopes; top width; top elevation                                                                    |
|                         |    |     |                      |                     | Control structure (and reference detail location)                                                                                              |
|                         |    |     |                      |                     | Trash rack (all openings in control structure; reference detail)                                                                               |
|                         |    |     |                      |                     | SWM Design WSEL (Design High Water (DHW))                                                                                                      |
|                         |    |     |                      |                     | Permanent pool WSEL                                                                                                                            |
|                         |    |     |                      |                     | 100-yr WSEL                                                                                                                                    |
|                         |    |     |                      |                     | Control structure openings: diameter or dimensions                                                                                             |
|                         |    |     |                      |                     | Principal spillway pipe (barrel): inside diameter or dimensions; length; slope; invert in and out                                              |
|                         |    |     |                      |                     | Material: for concrete pipe, ASTM C-361; for PVC pipe, ASTM D-1785 or D-2241; for HDPE, AASHTO M294 Type S; for HDPE ≤ 10", AASHTO M252 Type S |
|                         |    |     |                      |                     | Specify water tight joints                                                                                                                     |
|                         |    |     |                      |                     | Phreatic line (4:1 slope from 10 year WSEL); saturated length                                                                                  |
|                         |    |     |                      |                     | Filter diaphragm (reference detail location);                                                                                                  |
|                         |    |     |                      |                     | Bedding (if pipe is concrete) (detail required)                                                                                                |
|                         |    |     |                      |                     | Outlet protection: median riprap size (d <sub>50</sub> ); thickness; length, width; cross-section detail (reference location); filter cloth    |
|                         |    |     |                      |                     | Design Qs and velocities                                                                                                                       |
|                         |    |     |                      |                     | Specification of construction height and <u>settled</u> height for dam construction elevations                                                 |
|                         |    |     |                      |                     | Freeboard (min 1ft above DHW, or min 2 ft without emergency spillway)                                                                          |

| Designer<br>(check off) |    |     | MDE<br>Reviewer      |                     | Submission Item                                                                                                                                                   |
|-------------------------|----|-----|----------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| YES                     | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                                                                                                   |
|                         |    |     |                      |                     | <b>PROFILE OF EMERGENCY SPILLWAY</b><br><b>detail drawn to scale to show and label the following:</b>                                                             |
|                         |    |     |                      |                     | Existing and proposed ground surface. Locate on natural ground or in cut. Otherwise, use weir or pass through principal spillway.                                 |
|                         |    |     |                      |                     | Invert elevations - inlet, control and outlet sections                                                                                                            |
|                         |    |     |                      |                     | Length of inlet, control, and outlet sections                                                                                                                     |
|                         |    |     |                      |                     | Slopes of inlet, control and outlet sections                                                                                                                      |
|                         |    |     |                      |                     | Design Q and velocity                                                                                                                                             |
|                         |    |     |                      |                     | Cross-section detail of emergency spillway with invert (crest) elevation, 100 year WSEL, bottom width, existing and proposed ground surface, side slopes labeled. |
|                         |    |     |                      |                     | Proper protection of spillway                                                                                                                                     |
|                         |    |     |                      |                     | Protection of channel including material type and size                                                                                                            |
|                         |    |     |                      |                     | <b>CROSS-SECTION OF DAM ALONG CENTERLINE</b><br><b>drawn to scale and stationed to show the following:</b>                                                        |
|                         |    |     |                      |                     | Top of dam and elevation                                                                                                                                          |
|                         |    |     |                      |                     | Location of principal spillway with concrete cradle                                                                                                               |
|                         |    |     |                      |                     | Existing ground                                                                                                                                                   |
|                         |    |     |                      |                     | Proposed ground                                                                                                                                                   |
|                         |    |     |                      |                     | Top of core and elevations; limits shaded                                                                                                                         |
|                         |    |     |                      |                     | Bottom of cutoff trench and elevation; limits shaded                                                                                                              |
|                         |    |     |                      |                     | Location and crest elevation of emergency spillway (shown in cut)                                                                                                 |
|                         |    |     |                      |                     | 100 year and 10 year WSELs denoted                                                                                                                                |
|                         |    |     |                      |                     | <b>CONTROL STRUCTURE DETAIL</b>                                                                                                                                   |
|                         |    |     |                      |                     | Material specified (same as principal spillway pipe); thickness or gage (if metal)                                                                                |
|                         |    |     |                      |                     | Riser crest elevation and invert elevations of all openings                                                                                                       |
|                         |    |     |                      |                     | All openings dimensioned                                                                                                                                          |
|                         |    |     |                      |                     | Inside dimensions (diameter or width, length, height)                                                                                                             |
|                         |    |     |                      |                     | Concrete collar shown and labeled                                                                                                                                 |
|                         |    |     |                      |                     | Key joint detail                                                                                                                                                  |

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|-------------------------|----|-----|----------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| YES                     | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                                                                                                                          |
|                         |    |     |                      |                     | Riser base: length, width, thickness or gage (if metal)                                                                                                                                  |
|                         |    |     |                      |                     | Key joint detail                                                                                                                                                                         |
|                         |    |     |                      |                     | Depth of embedding                                                                                                                                                                       |
|                         |    |     |                      |                     | Low flow orifice anchor and support labeled                                                                                                                                              |
|                         |    |     |                      |                     | Dewatering device shown and labeled (reference detail)                                                                                                                                   |
|                         |    |     |                      |                     | Show and label trash rack – all openings. (reference detail)                                                                                                                             |
|                         |    |     |                      |                     | <b>TRASH RACK DETAIL(S)</b>                                                                                                                                                              |
|                         |    |     |                      |                     | Material specified; galvanized and removable                                                                                                                                             |
|                         |    |     |                      |                     | Opening sizes dimensioned                                                                                                                                                                |
|                         |    |     |                      |                     | Extension required on top flow inlet structures (no flat trash racks)                                                                                                                    |
|                         |    |     |                      |                     | Anti-vortex device (for cylindrical trash racks)                                                                                                                                         |
|                         |    |     |                      |                     | <b>FILTER DIAPHRAGM DETAIL</b>                                                                                                                                                           |
|                         |    |     |                      |                     | Drain material noted; ASTM C-33 sand                                                                                                                                                     |
|                         |    |     |                      |                     | Extend to normal pool WSEL                                                                                                                                                               |
|                         |    |     |                      |                     | Dimensions – width (minimum 3D from outer principal spillway pipe); height (minimum 3D above outer diameter of pipe and 18 inches below outer diameter of pipe); thickness (2 feet min.) |
|                         |    |     |                      |                     | Minimum 2 ft. cover                                                                                                                                                                      |
|                         |    |     |                      |                     | Pressure relief drain pipe diameter, material, perforations                                                                                                                              |
|                         |    |     |                      |                     | <b>GATE VALVE DETAIL</b>                                                                                                                                                                 |
|                         |    |     |                      |                     | Valve stem to top of structure and accessible                                                                                                                                            |
|                         |    |     |                      |                     | Valve stem anchored                                                                                                                                                                      |
|                         |    |     |                      |                     | Specify material                                                                                                                                                                         |
|                         |    |     |                      |                     | <b>STORM DRAINAGE PROFILES<br/>(inflow systems, systems through pond, systems adjacent to pond)</b>                                                                                      |
|                         |    |     |                      |                     | Structures numbered and stationed                                                                                                                                                        |
|                         |    |     |                      |                     | Size and inverts of all pipes at the structure                                                                                                                                           |
|                         |    |     |                      |                     | Structure inverts labeled upstream and downstream at each structure                                                                                                                      |
|                         |    |     |                      |                     | 10 year hydraulic grading shown and labeled                                                                                                                                              |

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|---------------------------------|----|-----|----------------------|---------------------|--------------------------------------------------------------------------------------|
| YES                             | NO | N/A | received<br>(yes/no) | correct<br>(yes/no) |                                                                                      |
|                                 |    |     |                      |                     | Label limits of road, pavement, right-of-way above profile                           |
|                                 |    |     |                      |                     | Existing and finished ground line at centerline of storm drain shown                 |
|                                 |    |     |                      |                     | Structure and pipe schedules                                                         |
| <b>LANDSCAPING PLAN</b>         |    |     |                      |                     |                                                                                      |
|                                 |    |     |                      |                     | Include plant material, number, spacing, location, and size.                         |
|                                 |    |     |                      |                     | "No woody vegetation" zone delineated                                                |
| <b>REPORTS AND CALCULATIONS</b> |    |     |                      |                     |                                                                                      |
|                                 |    |     |                      |                     | <b>SOILS INVESTIGATION REPORT</b>                                                    |
|                                 |    |     |                      |                     | Borings along centerline of dam and in the borrow area                               |
|                                 |    |     |                      |                     | Use of Unified Soil Classification System                                            |
|                                 |    |     |                      |                     | Determination of seepage potential                                                   |
|                                 |    |     |                      |                     | Determination of bearing strength, if soil is an unstable clay                       |
|                                 |    |     |                      |                     | Log on dam profile and plan view                                                     |
|                                 |    |     |                      |                     | Blow counts, elevations, and location of ground water                                |
|                                 |    |     |                      |                     | <b>HYDROLOGY</b>                                                                     |
|                                 |    |     |                      |                     | Existing and <b>ultimate conditions</b> drainage area map (1" = 200' scale or less): |
|                                 |    |     |                      |                     | Existing and ultimate drainage area (DA) limits delineated                           |
|                                 |    |     |                      |                     | Existing and ultimate land uses delineated                                           |
|                                 |    |     |                      |                     | Existing and ultimate time of concentration paths shown                              |
|                                 |    |     |                      |                     | USDA Soils map (site and DA delineated)                                              |
|                                 |    |     |                      |                     | Runoff computations                                                                  |
|                                 |    |     |                      |                     | Hydrologic Soil Groups                                                               |
|                                 |    |     |                      |                     | Existing RCN and ultimate RCN                                                        |
|                                 |    |     |                      |                     | Time of concentration (existing and ultimate)                                        |
|                                 |    |     |                      |                     | Existing and ultimate development hydrographs for 10 and 100 year storms             |
|                                 |    |     |                      |                     | <b>POND HYDRAULICS/ROUTINGS</b>                                                      |
|                                 |    |     |                      |                     | Basin routing using short cut method or storage indication                           |



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|-------------------------|----|-----|----------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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|                         |    |     |                      |                     | Stage - storage table and curve for pond to top of embankment                                                                                                                                                                                                                                                   |
|                         |    |     |                      |                     | HY8 or culvert capacity analysis                                                                                                                                                                                                                                                                                |
|                         |    |     |                      |                     | Stage (elevation) - discharge table for pond                                                                                                                                                                                                                                                                    |
|                         |    |     |                      |                     | Inflow hydrograph NOAA Atlas 14                                                                                                                                                                                                                                                                                 |
|                         |    |     |                      |                     | Routed discharges for 10-yr and 100-yr storms                                                                                                                                                                                                                                                                   |
|                         |    |     |                      |                     | Discharge velocities and outfall channel protection sizing (10-yr storm)                                                                                                                                                                                                                                        |
|                         |    |     |                      |                     | Anti-flotation computations for riser, FOS $\geq 1.2$                                                                                                                                                                                                                                                           |
|                         |    |     |                      |                     | <b>EMERGENCY SPILLWAY</b>                                                                                                                                                                                                                                                                                       |
|                         |    |     |                      |                     | Capacity of principal spillway and emergency spillway sized by Code 378                                                                                                                                                                                                                                         |
|                         |    |     |                      |                     | Reference ESC handbook Design by Engineering Field Manual, pps 11-34.1 through 11-54.11                                                                                                                                                                                                                         |
|                         |    |     |                      |                     | <b>OUTFALL STUDY</b>                                                                                                                                                                                                                                                                                            |
|                         |    |     |                      |                     | Existing vegetation and condition                                                                                                                                                                                                                                                                               |
|                         |    |     |                      |                     | Flow rates and velocities, after development, for 10-yr and 100-yr storms                                                                                                                                                                                                                                       |
|                         |    |     |                      |                     | Elevation at end of outlet protection                                                                                                                                                                                                                                                                           |
|                         |    |     |                      |                     | Property lines, easements, utility crossings, floodplain limits, waters of US, wetlands and wetland buffers, location and first floor elevation of critical structures.                                                                                                                                         |
|                         |    |     |                      |                     | <b>DAM BREACH ANALYSIS</b>                                                                                                                                                                                                                                                                                      |
|                         |    |     |                      |                     | Danger reach study per the following guidance:<br><a href="https://mde.maryland.gov/programs/water/DamSafety/Documents/Dam-Breach-Analysis/2018-05-15-Breach-Analysis-Guidance.pdf">https://mde.maryland.gov/programs/water/DamSafety/Documents/Dam-Breach-Analysis/2018-05-15-Breach-Analysis-Guidance.pdf</a> |
|                         |    |     |                      |                     | Cross sections at critical points (in improved and existing channel)                                                                                                                                                                                                                                            |
|                         |    |     |                      |                     | Check mapping for additional ponds or embankments in flow path and hazard creep                                                                                                                                                                                                                                 |
|                         |    |     |                      |                     | $d \leq 1.5$ feet, Class "a" structure                                                                                                                                                                                                                                                                          |

**ADDITIONAL NOTES:** \_\_\_\_\_

[illegible]