Michigan Department
Of Transportation
5100B (03/12)

CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

	REQUISITION NUMBER	DUE DATE	TIME DUE
	999	10/8/2012	noon EST

MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)
Olukayode Adefeso, P.E.	108198	63201, 63151

DESCRIPTION
Metro Region - Culvert Inspection

MDOT PROJECT MANAGER: Check all items to be included in RFP WHITE = REQUIRED GRAY SHADING = OPTIONAL Check the appropriate Tier in the box below			**CONSULTANT:** Provide only checked items below in proposal
☑ **TIER 1 ($25,000-$99,999)**	☐ **TIER II ($100,000-$250,000)**	☐ **TIER III (>$250,000)**	
☑	☐	☐	Understanding of Service
☑	☐	☐	*Innovations*
☑	☐	☐	Organizational Chart
☑	☐	☐	Qualifications of Team
Not required as part of Official RFP	Not required as part of Official RFP	☐	Quality Assurance/Quality Control
☑	☐	☐	**Location:** The percentage of work performed in Michigan will be used for all selections unless the project is for on-site p=inspection or survey activities, then location should be scored using the distance from the consultant office to the on-site inspection or survey activity.
N/A	N/A	☐	Presentation
N/A	N/A	☐	Technical Proposal (if Presentation is required)
3 pages (MDOT Forms not counted) **(No Resumes)**	7 pages (MDOT Forms not counted)	14 pages (MDOT forms not counted)	Total maximum pages for RFP **not including key personnel resumes.** Resumes limited to 2 pages per key staff personnel.

PROPOSAL AND BID SHEET EMAIL ADDRESS – mdot-rfp-response@michigan.gov

GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least five (5) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

5100D – Request for Proposal Cover Sheet
5100J – Consultant Data and Signature Sheet (Required only for firms not currently prequalified with MDOT)

(These forms are not included in the proposal maximum page count.)

REQUEST FOR PROPOSAL

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest (Consultant/Vendor Selection Guidelines for Services Contracts" and "Guideline for Completing a Low Bid Sheet(S)*, if a low bid is involved as part of the selection process. **Reference Guidelines are available on MDOT's website under Doing Business > Vendor/Consultant Services >Vendor/Consultant Selections.**

RFP SPECIFIC INFORMATION

☑ BUREAU OF HIGHWAYS ☐ BUREAU OF TRANSPORTATION PLANNING ☐ OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

☐ NO ☐ YES DATED_____ THROUGH _____

☑ **Prequalified Services** – See page 1 of the attached Scope of Services for required Prequalification Classifications.

☐ **Non-Prequalified Services** – If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, if overhead is not audited, is on file with MDOT's Office of commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed. **Form 5100J is required with Proposal for firms not currently prequalified with MDOT**

☑ **Qualifications Based Selection** – Use Consultant/Vendor Selection Guidelines

For all Qualifications Based Selections, the section team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

☐ **Qualification Review / Low Bid** – Use Consultant/Vendor Selection Guidelines. See Bid Sheet instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted. The vendor that has met established qualification threshold and with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

☐ **Best Value** – Use Consultant/Vendor Selection Guidelines, See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

☐ **Low Bid** (no qualifications review required – no proposal required.) See Bid Sheet Instructions below for additional instructions.

BID SHEET INSTRUCTIONS

Bid Sheet(s) must be submitted in accordance with the "Guidelines for Completing a Low Bid Sheet(s)* (available on MDOT's website). Bid Sheet(s) are located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the email address: mdot-rfp-response@michigan.gov. Failure to comply with this procedure may result in your bid being rejected from consideration.

NOTIFICATION
MANDATORY ELECTRONIC SUBMITTAL

Proposals submitted for this project must be submitted electronically.

The following are changes to the Proposal Submittal Requirements:

- Eliminated the Following Requirements:
  - Safety Program
  - Communication Plan
  - Past Performance as *a separate section*
  - Separate section for DBE Statement of goals. Include information in Qualification of Team section

- Implemented the Following Changes:
  - All proposals require an Organization Chart
  - Resumes must be a maximum of two pages
  - Only Key (lead) staff resumes may be submitted
  - Tier III proposal reduced from 19 to 14 pages
  - Forms 5100D, 5100I, and 5100G combined – 5100D
  - Forms 5100B and 5100H combined – 5100B
  - RFP's will be posted on a weekly basis -- on Mondays

The following are Requirements for Electronic Submittals:

- Proposals must be prepared using the most current guidelines
- The proposal must be bookmarked to clearly identify the proposal sections (See Below)
- For any section not required per the RFP, the bookmark must be edited to include "N/A" after the bookmark title.
  Example: Understanding of Service – N/A
- Proposals must be assembled and saved as a single PDF file
- PDF file must be 5 megabytes or smaller
- PDF file must be submitted via e-mail to MDOT-RFP-Response@michigan.gov
- MDOT's requisition number and company name must be included in the subject line of the e-mail. The PDF shall be named using the following format:
  - Requisition#XXX_Company Name.PDF
- MDOT will not accept multiple submittals
- Proposals must be *received* by MDOT on or before the due date and time specified in each RFP

If the submittals do not comply with the requirements, they may be determined unresponsive.

The Consultant's will receive an e-mail reply/notification from MDOT when the proposal is received. Please retain a copy of this e-mail as proof that the proposal was received on time. **Consultants are responsible for ensuring the MDOT receives the proposal on time.**

****Contact Contract Services Division immediately at 517-373-4680 if you do not get an auto response****

Required Bookmarking Format:

I. Request for Proposal Cover Sheet Form 5100D
   A. Consultant Data and Signature Sheet, Form 5100J (if applicable)
II. Understanding of Service
   A. Innovations
III. Qualifications of Team
   A. Structure of Project Team
      1. Role of Firms
      2. Role of Key Personnel
   B. Organization Chart
   C. Location
IV. Quality Assurance / Quality Control Plan
V. Resumes of Key Staff
VI. Pricing Documents/Bid Sheet (if applicable)

2/14/12

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MICHIGAN DEPARTMENT OF TRANSPORTATION

SCOPE OF SERVICE
FOR
SPECIALTY SERVICES
"In-Service Safety" and "In-Depth" Culvert Inspection and Reporting

CONTROL SECTION(S): 63201, 63151

JOB NUMBER(S): 108198

PROJECT LOCATION(S):
Culverts to be inspected are in various locations within the City of Pontiac, Oakland County, of the Metro Region.

PROJECT DESCRIPTION:
To perform "In-Service Safety" and "In-Depth" inspections of culverts crossing MDOT trunkline roads in accordance with the National Bridge Inspection Standards (NBIS).

One CONSULTANT will be selected for this project.

ANTICIPATED START DATE: November 1, 2012

ANTICIPATED COMPLETION DATE: April 30, 2013

PRIMARY PREQUALIFICATION CLASSIFICATION:
Bridge Safety Inspections

SECONDARY PREQUALIFICATION CLASSIFICATION:
Bridge Project Scoping

DBE REQUIREMENT: None

MDOT PROJECT MANAGER
Any question regarding the Scope of Service may be directed to the MDOT Project Manager.

Olukayode Adefeso, P.E.
Metro Region Bridge Engineer
18101 W. Nine Mile Road
Southfield, Michigan 48075
PM Office: (248) 483-5214
Fax: (248) 569-7718
E-mail adefesoo@michigan.gov

GENERAL INFORMATION

The Bridge Management Section of the Metro Region, Michigan Department of Transportation (MDOT) is seeking a proposal from a "Pre-Qualified" Consulting Engineering Firm (CONSULTANT) to perform In-service and In-depth inspections of the identified culverts in accordance with the most recent version of the National Highway Institute Bridge Inspection Reference Manual.

The deliverables are the In-Service Culvert Safety Inspection Reports (CSIR) which will be submitted through the internet to the Michigan Bridge Inspection System (MBIS). Accompanying each CSIR should be a Detailed Inspection Report. The information contained in the Detailed Inspection Reports will be used by the Region and/or Bridge Design Support Area to detail and schedule rehabilitation plans with the culvert owners.

The content of the reports will need to be sufficient to adequately convey the general physical condition of each structure and the specific areas in need of repair. Current design standards and minimum requirement criteria must be taken into account when recommending repairs. The reports must be complete and accurate to reflect the current condition the culvert and reviewed by a professional engineer registered in the State of Michigan.

DURATION & SCHEDULE

A. Work Plan & Schedule

By submitting a proposal, the CONSULTANT confirmed the review of the Scope of Service and can meet the schedule identified in this scope. The CONSULTANT is to develop a Work Plan that details the process of inspecting each of the identified culverts. Submittal of the Work Plan is required as part of the Priced Proposal. Submit changes to the Work Plan to the MDOT's Project Manager for approval.

The CONSULTANT must be prepared to begin the field inspection work within one week of receiving Notice to Proceed (NTP). The CSIR for all culverts must be completed and submitted in MBIS within a month of receiving the Notice to Proceed.

B. Meeting Dates

The consultant is required to attend a Project Initiation Meeting and Progress Meetings held at the MDOT Metro Region Office or at a mutually agreed location.

Project Initiation Meeting: Within a week of the NTP (prior to any fieldwork)

Progress Meetings: Biweekly during the Field Inspection Phase

The intent of the Project Initiation Meeting is to exchange information regarding the general procedures for communication, review the schedule, discuss emergency procedures and communication, and discuss questions that remain. Additional MDOT region and statewide staff may attend the meeting.

The consultant will keep notes of these meetings and provide minutes to the MDOT PM within one week after the meeting.

ADDITIONAL WORK DESCRIPTION

Culvert inspection shall be performed accordance to the National Bridge Inspection Reference Standards, AASHTO manual for Condition Evaluation of the Bridges, and the FHWA Culvert Inspection Manual (Supplement to the Bridge Inspector's Training Manual).

The work required for each culvert in this authorization is separated into three main components:

A) Site Inspection
B) Culvert Safety Inspection Report Preparation including supporting documents.
C) Detailed Inspection Report with engineering analysis of finding with prepared supporting documents

The CONSULTANT will provide a thorough structural inspection for each culvert element as required per the contract. The report phase will identify current conditions of the culvert elements, the significance of the findings, and make repair recommendations.

The following provisions are the minimum for this contract. The CONSULTANT may elect to suggest activities that will improve the inspection or save costs:

A. SITE INSPECTION

Each culvert must be visited by the CONSULTANT PM and/or Inspection Team Leader. The purpose of this visit is to locate all areas of element deterioration, determine feasible repair recommendations, review the anticipated traffic control measures, and to ascertain quantities. Ladders and/or confined space equipment may be necessary to get close enough to adequately inspect and evaluate the structural element (see EQUIPMENT and SAFETY sections below).

The information collected in the field must be sufficient to determine quantities to document deterioration and location of repairs and improvements. Detail this information in field notes, forms, sketches, and photographs, as appropriate to be included in the report.

During the site inspection, the consultant shall immediately notify the MDOT PM of any structural condition that may affect the above roadway or may require other immediate action such as lane closures, emergency repairs, temporary supports/shorings, etc.

The CONSULTANT must render a professional judgment as to the need for structural analysis of the given structure and recommend any temporary load restrictions and /or changes to the inspection frequency. Areas of concern that require additional maintaining of traffic or special inspection/testing, the CONSULTANT must notify the MDOT PM with a Request for Action (RFA) form.

During the site review of the culvert, the following will be done, at a minimum:

1. Culverts should be inspected for sign of movement (vertical, lateral, rotational), exfiltration or infiltration through the joints, joint movement, or slabbing. Observe for debris and settlement build up, high water marks, changes in drainage areas, and

settlement of the roadway.

2. Sound all concrete elements (wing walls, head wall, curtain wall, top slab, interior lining, etc.) for delaminations and unsound areas. All delaminated areas are to be marked with chalk, crayon, or kiel, that will be evident in the photographs. All delamination surveys are part of the site review work (not part of testing). Sketches of the interior walls and mapping the areas of delamination and cracking are to be included in the report. Percent of total surface area delaminations shall be calculated and shown on the sketches.

3. The interior walls of the culvert shape must be visually inspected for wet areas, efflorescence, transverse cracking, longitudinal cracking, map cracking, delaminations, spalling, joint sealant leakages, broken rubber gaskets, or any other evidence of deterioration. The type of cracking and severity must be described in detail in the report.

4. Collect accurate baseline measurements that will serve as benchmarks for future culvert inspections such as size of culvert, pipe diameter or span and rise dimensions, angle of intersection between culvert and roadway, culvert elevation with invert elevation at both ends and at stations along culvert length, roadway elevation, length of culvert, type and configuration of end treatments, descriptions of any end protection present, build-up of debris at ends of culvert affecting flow, alignment changes, culvert shape, or material changes along culvert length, characteristics of stream channel upstream and downstream of culvert, etc.

5. Non Destructive Testing
   The CONSULTANT is to determine if non-destructive testing, beyond what is included in the Scope of Service, is required for a more accurate assessment of the extent of bridge element deterioration. However, such testing (ultrasonic, magnetic particle testing, acoustic emission, etc.) must be approved by the MDOT PM. If the Project Manager approves the test, the CONSULTANT is required to submit a testing proposal. The testing proposal must include proposed testing method, the reason(s) additional testing is required, the output data of the testing, and details of data analysis. The MDOT PM will deny testing proposals submitted with insufficient information.

B. CULVERT SAFETY INSPECTION REPORT PREPARATION INCLUDING SUPPORTING DOCUMENTS (CSIR)

The deliverable shall include the Bridge Safety Inspection Report (BSIR), MDOT form 2502 and all applicable components. The components are but not limited to Culvert Safety Inspection Report (CSIR), CoRe Element Report and Work Recommendation Report. This information must be detailed in the field notes, forms, sketches, and photographs as appropriate. The documents stated are to be completed and the data saved online in Michigan Bridge Inspection System (MBIS). Information for accessing MBIS is on MDOT

website. The report must include description and observation of the inspection procedure and condition found during inspection.

The following documents are typical for each culvert. Other reports may be necessary as conditions warrant.

1. *Culvert Safety Inspection Report, MDOT FORM 2502*
   This is the primary inspection report form and is incorporated into MBIS. The CONSULTANT QTL must complete this form in the field for each structure. This is usually done by red- lining a copy of the previous report. MBIS has a " Field Copy" print option that creates white space on the previous report for noting changed conditions at the site. It is recommended that the CONSULTANT retain this copy in their records as backup in case of failure of the electronic copy. A new inspection record is created in MBIS using the information from the site visit. This can be done in the field using the field application with downloaded data or entered in the office using the on-line application.

2. *CoRe Element Report & Work Recommendations Report.*
   The CoRe Element Report and Work Recommendations Report are key elements of the NBI program for Bridge Management. The key to the Work Recommendations Report is the communication of the inspector's judgment of the need for maintenance or rehabilitation work necessary to keep the structure in service. The CoRe Element Report is a tool for tracking the bridge deterioration rates to produce a reliable and predictable future network condition. The CoRe Element Report and Work Recommendations Report shall be completed in MBIS.

3. *Photographs*
   Photographs must be taken and submitted as part of the Inspection Report to document the current condition of the structure. The photographs must be digital images printed paper and captioned with a description of what the photo is showing. Photos that are over or under exposed so the details in question cannot be seen will be returned to the CONSULTANT, and will have to be taken again until the photos are legible. A copy of the electronic files will also be submitted in jpeg format on CD with the Inspection Report.

C. DETAILED INSPECTION REPORT WITH ENGINEERING ANALYSIS OF FINDING WITH PREPARED SUPPORTING DOCUMENTS

The deliverable shall include the detailed inspection reports and shall include but not limited to the following:

1. Repair recommendations - type, location, quantities, cost, and level of urgency
2. Photo log - photos of surrounding area printed on 8 ½" x 11 media with labeled description, maximum two photos per sheet.

3. Video-log on the interior condition of the culverts.
4. General Plan - elevated and plan views with GPS coordinated of access points and GPS coordinates of the limits within MDOT's ROW. The general plans should include baseline measurements that was collected during the site inspection.
5. Culvert Safety Inspection Report (CSIR), CoRe Element Report and Work Recommendation Report, field notes, forms, sketches.
6. RFA- A printed copy shall be provided as part of the package

Two (2) draft copies for each structure shall be provided to the MDOT Project Manager for review. A progress meeting will be held to address the comments. The CONSULTANT will then incorporate revisions and provide the final report.

MDOT reserves the right to request additional drafts if the changes required are extensive. The contract will be deemed unsatisfactory if the Consultant fails to make changes requested by MDOT's Project Manager.

For the final submittal, the CONSULTANT shall submit two (2) printed copies of the final report for each culvert. A Compact Disk (CD) with a copy in PDF of the report and digital photographs.

STAFF QUALIFICATION REQUIREMENTS

These "In-Depth" inspections will require an experienced team of structural engineers. The consultant must provide personnel with qualifications that meet or exceed the requirements stated below. The consultant must staff the project with the number of personnel necessary to complete the project in the allotted time.

Each bridge must be inspected by a CONSULTANT team composed of a Qualified Team Leader (QTL) and a staff person. The CONSULTANT must have these two individuals present on site during the inspection to fulfill the requirements of the contract. The CONSULTANT may utilize additional personnel on any given team, but MDOT will not pay for the additional staff.

Following are the minimum qualifications necessary for the required personnel. This must be documented with resumes and submitted with the Proposal.

CONSULTANT Project Manager

1. Administrative manager with authoritative control over the inspection teams and demonstrated project management experience.
2. Primary contact between the MDOT PM and the CONSULTANT. One of the inspection QTLs may be delegated Project Manager responsibility.

CONSULTANT Qualified Team Leader, QTL(s):

1. Must meet the requirements of NBIS for a QTL. See Code of Federal Regulations, 23-CFR-650 §650-309.
2. Professional registration as an engineer, licensed to practice in the State of Michigan.

3. Minimum of three years of documented experience in the in-service safety inspections of bridges.
4. Completed the NHI # 130055 "Safety Inspection of In-Service Bridges" class within the last five years. If the QTL(s) has attended this class more than five years ago, he / she must have taken the NHI #130053. A three day Bridge Inspection Refresher course within the preceding five years.

Field Staff assisting the CONSULTANT QTL(s):

1. A technical staff person with three years experience in inspection, design, or construction of bridges or:
2. Recent graduate engineer working at the staff engineer or entry level position.
3. The above listed classes for the QTL(s) are encouraged, but not required for the field staff.

If the QTL(s) that is approved under this authorization is unable to finish the work of the entire project, the authorization may be terminated. The CONSULTANT shall submit a backup QTL(s) for approval with the initial submission of the proposal. However, if any one person identified in the proposal is rejected by MDOT, the entire proposal will be considered non-responsive and rejected.

EQUIPMENT

The CONSULTANT will be responsible for obtaining and operating all equipment for inspection of the culverts.

The CONSULTANT must provide equipment not limited to the following as suitable for the inspection of the culverts. The cost of the use of this equipment during the inspection is considered included in the Not to Exceed price.

1. Inspection Vehicle

The Consultant will provide a vehicle with high visibility marking and lighting for use during inspection. This vehicle will provide transportation for the inspection staff and necessary equipment.

2. Computer

The Consultant is required to have a computer with internet connection. The computer must have access to a printer to print report documents and final report. A laptop computer for use in the field is recommended but not required.

3. Non- Destructive Testing (NDT)

The inspection process require sounding of concrete for delaminations, checking for suspected cracks in steel, and measuring for section loss in areas of heavy corrosion. The following is necessary to perform the these tests:

- Calipers and thickness gauges
- Dye penetrant test kit

- Chain drag or sounding rod hammer

4. Cell Phone

While in the field, the QTL must have a cellular telephone. These numbers must be provided to the MDOT PM at the Project Initiation Meeting.

5. Camera

The Consultant must have a digital camera that can clearly record the images necessary to convey the condition of the bridge.

6. Hand Tools

The Consultant must provide the hand tools necessary to complete the inspection. Some of these are ladder, waders, hammers, lighting, marking paint, measuring tapes, etc.

7. Global Positioning Satellite (GPS)

The Consultant must have a handheld GPS locator to determine or verify the latitude and longitude requested as part of the contract.

8. Specialized Equipment

The following specialized equipment may be necessary for the completion of inspection or for insuring safety; ropes for use as safety harness, transit or level surveying equipment, and water testing meters or kits.

TRAFFIC CONTROL

The traffic control during the site review will be the responsibility of the CONSULTANT. Permits for the traffic control and for working in the MDOT Right of Way must be obtained from the Region prior to the start of work. Traffic control will follow standard MDOT Maintenance Work Zone Traffic Control Guidelines. The CONSULTANT will be responsible for obtaining all permits and notifying the MDOT PM of the time and location of the work. The CONSULTANT shall obtain necessary permits from all necessary controlling jurisdictional agency prior to the site inspection.

The work package with GPS coordinates provided can be used as access point for various locations. Alternate access point can be used if the ones provided is deemed unsafe or not accessible. The CONSULTANT shall notify the MDOT PM if the use of an alternate access point is necessary.

LOCATION	Description	Manhole Locations
1	C03 of 63151 US-24 BR over Pontiac Creek	42º 39’ 19” N, 83º 18’ 52” W
2	C02-2 of 63151 US-24 BR over Pontiac Creek	42º 38’ 31” N, 83º 17’ 55” W
3	C02 of 63201 US-24 over Pontiac Creek	42º 38’ 31” N, 83º 17’ 55” W
4	Unknown-Woodward over Pontiac Creek	42º 38’ 03” N, 83º 17’ 35” W
5	C01 of 63201 US- 24 BR over Pontiac Creek	42º 38’ 23” N, 83º 17’ 22” W

6	Unknown- M59 over Pontiac Creek	42º 38’ 23” N, 83º 17’ 20” W
7	B02-63201 US-24 BR over Clinton River	42º 36’ 13.8” N, 83º 17’ 14.7” W

SAFETY

MDOT requires safe working operations. The CONSULTANT shall perform field operations in accordance with Michigan Occupational Safety and health Administration (MIOSHA) regulations and accepted safety practices. The CONSULTANT must provide all personal safety equipment to field employees. All equipment must be in sound condition, meeting MIOSHA standards..

It is not the responsibility of MDOT to verify the CONSULTANT’s safety practices. However, the MDOT PM has the authority to remove individual who is found working unsafely from MDOT Right of Way. If the CONSULTANT is found to be working unsafely, the MDOT PM can stop all operations and terminate the contract.

Air testing is required prior to entry into culverts. Continuous mechanical ventilation may be necessary during inspection. The use of a safety harness and life line may also be necessary. It is recommended that one person to remain outside the confined space.

Other potential hazards that could be encountered includes; flash floods, toxic chemicals and animals. Prior to the start of inspection the CONSULTANT should have reviewed and/ or completed the following:

- Have an emergency and evacuation plan
- MDOT Confined Space Entry Procedure
- Confined Space Flowchart
- Confined Space Entry Summary
- MDOT Guidelines for working in culverts

Questions regarding MDOT’s safety procedure can be directed to MDOT’s occupation safety specialist through the following contact information Jim Guas at 517- 241- 4188 or Email: gausj@michigan.gov.

EXISTING RECORDS AND DATA

MDOT will furnish the CONSULTANT access to any available pertinent information related to the culvert(s) being inspected.

Information furnished to the CONSULTANT is not be released or distributed to any outside agency without written permission from MDOT’s Project Manager.

NOTIFICATION

The CONSULTANT is responsible for notifying property owners prior to accessing the culverts. Notification should include description of work, date and time of work, traffic control, and any activity generate by inspection that will affect the premise.

GENERAL

Release of information: The CONSULTANT may not release any information regarding the culvert or inspection to anyone outside of MDOT. The CONSULTANT is not allowed to make copies of the information pertaining to structure unless given written approval from MDOT PM. Failure to abide this stipulation could result in penalties in accordance to the Homeland Security Act.

References: The CONSULTANT is to have the following reference material and be familiar with their contents.

1. National Bridge Inspection Standards (NBIS) Federal Code of Regulations, 23 CFR 650.

2. AASHTO Manual for Condition Evaluation of Bridges, 1994, and subsequent interim changes or the most recent version.

3. Michigan Structure Inventory and Appraisal Coding Guide, latest edition.

4. Pontis Bridge Inspection Manual, latest edition.

5. FHWA Publications:

    a. Bridge Inspector's Reference Manual (BIRM), latest edition.
    b. Culvert Inspection Manual, Report No. FHWA-IP-86-2.
    c. Inspection of Fracture Critical Bridge Members, Report No. FHWA-IP-86-26.
    d. Recording and Coding Guide for the Structure Inventory and Appraisal of Nation's Bridges, Report No. FHWA-PD-96-001, December 95.

Forms: The following web links are provided for the convenience of the CONSULTANT, other forms can be obtained through the MDOT's website.

- **MDOT 0592 : Culvert Scope Inspection Form**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/0592.pdf

- **MDOT 0477A: Air Monitoring Form**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/0477A.pdf
- **MDOT 0477B: Confined Space Permit Form**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/0477B.pdf
- **MDOT 0477C: Reclassification to a Non- Permit Confined Space Certification**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/0477C.pdf
- **MDOT 0477E: List of Confined Spaces**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/0477F.pdf
- **MDOT 0477F: Confined Space Self- Assessment**
  http://apps.mdot.state.mi.us/interchange/forms/pdfforms/1887.pdf

CONSULTANT PAYMENT – Actual Cost Plus Fixed Fee:

Compensation for this project shall be on an **actual cost plus fixed fee** basis. This basis of payment typically includes an estimate of labor hours by classification or employee, hourly labor rates, applied overhead, other direct costs, subconsultant costs, and applied fixed fee.

All billings for services must be directed to the Department and follow the current guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's website. This document contains instructions and forms that must be followed and used for billing. Payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Consultant. Typically, billings must be submitted within 60 days after the completion of services for the current billing. The final billing must be received within 60 days of the completion of services. Refer to your contract for your specific contract terms.

Direct expenses, if applicable, will not be paid in excess of that allowed by the Department for its own employees in accordance with the State of Michigan's Standardized Travel Regulations. Supporting documentation must be submitted with the billing for all eligible expenses on the project in accordance with the Reimbursement Guidelines. The only hours that will be considered allowable charges for this scope are those that are directly attributable to the activities of this project.

The use of overtime hours is not acceptable unless prior written approval is granted by the MDOT Region Engineer and the MDOT Project Manager. Reimbursement for overtime hours that are allowed will be limited to time spent on this project in excess of forty hours per person per week. Any variation to this rule should be included in the price proposal submitted by the CONSULTANT and must have prior written approval by the MDOT Project Manager.

The fixed fee for profit allowed for this project will be 11.0% of the cost of direct labor and overhead.

PONTIAC TOWNSHIP
T. 3 N., R. 10 E.
OAKLAND COUNTY, MICHIGAN

REVISION BLOCK

Data Source / Source Date: County Data / 11/14/96

Rev. No.:	Rev. By:	Rev. Date:	Description:
1	lz	12-4-03	EDIT HYDRO LAYERS
2	lz	03/23/05	CORRECTED SUNKEN BRIDGE AND BROOKLYN DRAINS PER PLANS
3	DS	4-27-09	REVISED INDEX MAP PER INSPECTION AND GIS INFORMATION
4	DS	5-14-10	REVISED VINEWOOD DRAIN PER GIS INFORMATION

ORIG. DATE: 11

SCALE: 1"

DESIGNED BY:

DRAWN BY: OCDC MAPPING

OAKLAND COUNTY DRAIN COMMISSIONER
John P. McCulloch

PUBLIC WORKS DRIVE
BUILDING 95 WEST
TERFORD, MICHIGAN
48328-1907

T NO.: 17

FOR INFORMATION ONLY

Plotfile Name: DrnTwp2k.ctb
File Location: J:\Drain\Mapping\Unit\DRAINS\IndexMaps\potdrns.dwg

DRAIN LEGEND

- ENCLOSED DRAIN
- OPEN DITCH DRAIN
- ORIGINAL DRAIN
- LOWER TERMINUS DIRECTION OF FLOW
- RAIN GAUGE MAINTAINED BY O.C. DRAIN COMMISSIONER
- RAIN GAUGE MAINTAINED BY SEMCOG
- LAKE LEVEL CONTROL STRUCTURE
- 952.30 LAKE LEVEL ELEVATION
- PCR PONTIAC CLINTON RIVER DRAINS NO. 1,2,&3

BASEMAP LEGEND

- RAILROAD TRACKS
- HYDROGRAPHY LINE
- MUNICIPAL BOUNDARY LINES
- PRIMARY ROADS & HIGHWAYS
- LOCAL & SECONDARY ROADS

OAKLAND COUNTY DEVELOPMENT & PLANNING DIVISION
Basemap: March, 1997

NOTES:

* THE UPPER SILVER LAKE LEVEL IS CONTROLLED BY THE LOON LAKE CONTROL STRUCTURE.

** THE DAWSON MILL POND LEVEL IS CONTROLLED BY THE PRICE DAM.

*** THE CRYSTAL LAKE LEVEL IS CONTROLLED BY THE WALTER MOORE DAM.

Location 1
C03- 63151

Location 2
C02-2- 63151

Location 3
C02-63201

Location 4

Location 5
C01-63201

Location 6

Location 7
B02- 63201

*949.30

**928.60

***917.50

812

950.00

Michigan Department
Of Transportation
1887 (04/03)

BRIDGE INSPECTION – REQUEST FOR ACTION

STRUCTURE NUMBER – CONTROL SECTION		
DESCRIPTION OF STRUCTURE		
REQUIRES IMMEDIATE ACTION	DATE	INSPECTOR

ACTION REQUESTED

LOAD CAPACITY EVALUATION ☐	SCOUR ☐	HIGH LOAD HIT ☑
DETAILED INSPECTION ☐	EMERGENCY REPAIR ☐	OTHER ☑

PROBLEMS/COMMENTS/EXPLANATION

DESCRIPTION OF PHOTOS

PHOTOS TAKEN? ☐ YES ☐ NO	PHOTOS ATTACHED? ☑ YES ☐ NO
1	8
2	9
3	10
4	11
5	12
6	13
7	14

RECORD OF ACTIONA REQUESTED

RECOMMENDED ACTION	**SUPERVISOR'S COMMENTS**
REACH-ALL/DETAILED INSPECTION ☐	
CONTACT DESIGN ☐	
CONTACT HYDRAULICS ☑	
CONTACT REGION SPECIAL CREW ☐	
CONTACT REGION MAINTENANCE ☐	
CONTACT CONST. & TECH. – BOU ☐	

Clear Form

CONFINED SPACE ENTRY Procedure

Michigan Department of Transportation

DEVELOPED: JUNE 1994
REVISED: DECEMBER 2003
Document # 01.01

Revised by Jim Gaus,
Occupational Safety Advisor,
MDOT

CONFINED SPACE ENTRY
Michigan Department of Transportation

Developed June 1994
Revised December 2003

PURPOSE

The purpose of this procedure is to ensure that Michigan Department of Transportation (MDOT) employees and contractors are protected when entering and working in confined spaces.

BACKGROUND

Per the National Institute for Occupational Safety and Health (NIOSH), an average of 67 workers die each year in Confined Space related incidents.

SCOPE

This plan covers all Michigan Department of Transportation (MDOT) activities which involve entry into a confined space. At this time, MIOSHA regulations exclude construction activities until the new construction has been completed. It is MDOT's intention to conduct confined space entries to follow MIOSHA's General Industry Standard.

A Confined space is defined as an area which:

1. Has adequate size and configuration for employee entry.
2. Has limited means of entry or exit.
3. Is not designed for continuous employee occupancy.

DEFINITIONS

Acceptable Entry Conditions - conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit required confined space entry can safely enter into and work within the space.

Alternate Confined Space – A confined space where the only hazard is an actual or potential hazardous atmosphere and it has been demonstrated that the use of continuous forced air ventilation alone is sufficient to maintain that the permit space is safe for entry.

Attendant - an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in this procedure.

Authorized entrant - means an employee who is authorized by the employer to enter a permit space.

Blanking or blinding – The absolute closure of a pipe, line or duct by fastening a solid plate which completely covers the bore and that is capable of withstanding the pressure of the pipe, line or duct with no leakage beyond the plate.

Combustible Dust – An airborne combustible particulate at a concentration that obscures vision at a distance of five feet or less.

Confined Space - a space that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work.

2. Has limited or restricted means for entry or exit.

3. Is not designed for continuous employee (human) occupancy.

Designed for Continuous Human (employee) Occupancy – A person can occupy the space under normal operating conditions. The space is designed for employees to enter and work for prolonged periods of time without any additional considerations for safety and health.

Double Block and Bleed – The closure of a pipe, line, or air duct by closing and tagging two inline valves and by opening and tagging a drain or vent valve which is open to the atmosphere between the two tagged-closed valves.

Emergency - any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entrant – An employee authorized to enter a confined space.

Entry - the action by which a person passes through the opening into a confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as <u>any part of the entrant's body breaks the plane of an opening into the space.</u>

Entry Permit (permit) - a written or printed document that is provided by MDOT to allow and control entry into a permit space and that contains the information specified in MDOT Form 0477B.

Entry Supervisor - the person responsible for determining if acceptable entry conditions are present at the permit space where entry is planned, for authorizing entry and overseeing entry

operations, and for terminating entry as required. Entry supervisor may also serve as an attendant or authorized entrant as long as that person is trained and equipped.

Gas (Air) Monitor - the person responsible for testing and recording the atmosphere of the confined space.

Hazardous Atmosphere - an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, to escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL).

2. Airborne combustible dust at a concentration that meets or exceeds its LFL (LEL). Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.

3. Atmosphere oxygen concentration below 19.5 percent or above 23.5 percent.

4. Atmosphere concentration of any substance for which a dose or a permissible exposure limit, as published in OSHA 1910 Subpart G, "Occupational Health and Environmental Control", or in OSHA 1910 Subpart Z, "Toxic and Hazardous Substances", which could result in employee exposure in excess of its dose or permissible exposure limit.

5. Any other atmospheric condition that is immediately dangerous to life or health. Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information such as Material Safety Data Sheets that comply with the OSHA 1910.1200 Hazard Communication Standard, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot Work - any work that produces a possible source of ignition including but not limited to welding, torch cutting, flame heating, and brazing. Refer to Hot Work Permit (MDOT Form 0477D) and welding and burning procedure (to be developed) for reference.

Hot Work Permit (MDOT Form 0477D) – An employer's written authorization to perform operations (for example: riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH) – Any condition that poses an immediate threat or loss of life.

Isolation - the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking; misaligning or removing sections of lines, pipes or ducts; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line Breaking – means the intentional opening of a pipe, line or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Lower Explosive Limit (LEL) - the lowest concentration of gas or vapor that burns or explodes if an ignitable source is present (as a percentage of volume of air).

Lower Flammable Limit (LFL) - the lowest concentration (air-fuel mixture) at which a material can ignite.

Material Safety Data Sheets (MSDS) - written or printed material concerning hazardous chemicals or materials with the following information: identification, physical/chemical characteristics, physical hazards, health hazards, primary routes of entry, permissible explosive limit, precautions for safe handling, emergency first aid, name, address and telephone number of manufacturer, engineering controls, whether the chemical is a carcinogen, and date of the sheet.

Non-Permit Confined Space - a confined space that does not contain or, with respect to the atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen Deficient Atmosphere - an atmosphere containing less than 19.5% oxygen by volume.

Oxygen Enriched Atmosphere - an atmosphere containing more than 23.5% oxygen by volume.

Permit Required Confined Space (permit space) - a confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere.

2. Contains a material that has the potential for engulfing an entrant.

3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section.

4. Contains any other recognized serious safety or health hazard.

Potential - a space which due to the surrounding environment is capable of developing into a hazardous situation.

Rescue Service - the personnel designated to rescue employees from permit required confined space.

Retrieval System - equipment (including a retrieval line, full-body harness, and a lifting device or anchor) used for non-entry rescue of persons from a permit required confined space.

RESPONSIBLITIES

Location Management

A. Ensure location(s) have identified all confined spaces.
B. Ensure procedure for Confined Space work is followed.
C. Ensure those involved with Confined Space work are trained.
D. Ensure appropriate equipment available for safe work in confined spaces.
E. Ensure rescue services available, if needed.

Entry Supervisor (may also include duties of Air (Gas) Monitor listed below).

A. Entry Supervisor is required to know and perform the following:
    a. Must be trained in confined space entry.
    b. Know the hazards of confined space.
    c. Verify that all pre-entry tests have been conducted and all procedures and equipment are in place before signing permit.
    d. Ensure properly maintained equipment available for entry and work.
    e. Complete and sign entry permit.
    f. Orientate the attendant and each entrant on the contents of the entry permit prior to entry (see additional information below).
    g. Verify that rescue services are available and the means to summon them are operable.
    h. Verify, and record on permit, atmospheric conditions every ½ hour.
    i. Require removal of unauthorized entrants who enter confined space.
    j. Determine when shifts end to coordinate transfer of responsibilities to ensure that acceptable conditions (as specified on the permit) continue to exist.
    k. Terminate entry when required (unacceptable atmosphere, etc.) and cancel permits.

B. Orientation of Personnel Prior to Entry
    a. The entry supervisor shall review the following with the entrants prior to their entry into the confined space:
        i. Listing of Hazards.
            1. The entry supervisor will check or list all possible hazards involved in the entry on the permit and will advise all employees. Hazards may include:
                a. Atmospheric conditions
                b. Asphyxiation
                c. Flammable atmospheres
                d. Toxic conditions
                e. Burn hazards
                f. Heat stress hazards
                g. Mechanical hazards
                h. Engulfment hazards
                i. Physical hazards (fall, slip/trip, debris)
                j. Electrical hazards

k. Noise hazards

b. Work Assignments

The entry supervisor will cover all work assignments with the employees prior to entry and answer any questions regarding same.

c. Check for Safety Gear

The entry supervisor will review required safety equipment with personnel and check the permit list against the equipment on hand.

d. Emergency and Evacuation

The entry supervisor will review the procedure which appears on the entry permit with employees to ensure that all entrants understand their role.

Attendants

Attendants (may also include duties of Air (Gas) Monitor listed below). Note: There must be at least one attendant outside the permit space into which entry is authorized for the duration of entry operations.

A. Must know and be able to:
   a. Must be trained in confined space entry.
   b. Identify hazards of confined spaces.
   c. Be aware of behavioral effects of potential exposure.
   d. Maintain continuous account by name of authorized entrant.
   e. Monitor activities inside and outside of confined space to determine if it is safe for entrants to remain in the space and order evacuation should a problem arise.
   f. Remain outside the space until relieved by another attendant. Attendants must not enter confined space.
   g. Communicate with the entrants as necessary to monitor entrant status and alert entrants of the need to evacuate the space.
   h. Order an exit if required.
   i. Summon rescuers if necessary.
   j. Prevent unauthorized entry into confined space.
   k. Perform non-entry rescues if required.

B. May not perform other duties that interfere or distract with their primary duty to monitor and protect the safety of authorized entrants.

Authorized Entrants

A. Must know:
   a. Must be trained in confined space entry.
   b. The confined space procedure.

c. The hazards they may face, both inside and outside of the confined space.
d. The signs or symptoms of exposure.
e. The consequences of exposure hazards.
f. How to communicate with attendants as necessary and alert attendants when a warning symptom or other hazardous conditions exist.
g. How to exit as quickly as possible whenever ordered or alerted.
h. The use of any and all needed equipment including, but not limited to:
    i. Testing and monitoring equipment
    ii. Ventilation equipment
    iii. Communication equipment
    iv. Personal Protective equipment
    v. Lighting
    vi. Barriers
    vii. Ladders, etc.
    viii. Rescue equipment

B. All equipment must be inspected prior to use.

C. Must wear, where required, body harness and retrieval equipment.

Air (Gas) Monitor

Duties may be included with Attendant or Entry Supervisor as listed above.

A. Testing shall be performed by an employee who has successfully completed the gas detector training and certified for the instrument being used. Testing shall be performed in 4 foot intervals preceding the entry.
    a. Know minimum parameters to monitor.
    b. Keep written pre-entry test results at work site.
    c. Immediately advise entry supervisor of results if critical.
    d. Continuously test the atmosphere quality in the vicinity of entrants.
    e. Record results on permit every ½ hour.

PROCEDURE

Warning: Only authorized (entrants) employees may enter a permit required confined space.

I. There are two types of confined space, permit and non-permit. Permit space requires a permit to be completed prior to entry into the confined space, while non-permit space does not.

A. Identify and Evaluate Hazards and the Classification of Spaces

a. Each MDOT facility or work location supervisor will initially evaluate all working spaces under their jurisdiction to accumulate a list of all possible confined spaces. A list will be maintained by each facility at their location (see MDOT Form 0477E).

b. Hazards of each entry and precautions to be taken to eliminate the hazards will be identified by the location for each confined space and again by the entry supervisor in writing on the entry permit prior to access. Hazards may include, but not limited to:

i. Atmospheric hazards, including oxygen deficient or oxygen rich environment, and flammable gases present
ii. Electrical hazards
iii. Mechanical hazards
iv. Heat
v. Engulfment
vi. Entrapment
vii. Fall, slip and trip

c. Confined spaces may include, but are not limited to the following:

Tunnels and Sewers	Culverts
Manholes-Catch basins	Vaults
Segmental Bridges	Surge Chambers
Wells & Sump Pits	Mechanical Rooms
Pump Houses & Stations	Storage tanks
Silos	Boilers
Fan Housings	Vents and ducts

Manholes, catch basins, and culverts that are generic in nature and do not have specific hazards do not need to be individually identified.

B. Prevention of Unauthorized Entry Into Permit Required Confined Space

a. Inform employees through signs, barricades, and other equally effective means to prevent unauthorized entry. Entry is allowed only if authorized by the Confined

Space Entry permit. Adequate measures shall be taken to prevent public access to confined spaces when unattended.

b. If the location contains permit spaces, then each confined space must be identified at the entry point with a warning sign similar to the following: "DANGER – Permit Required Confined Space, Do Not Enter."

C. Prior to working in a confined space, the location must obtain the equipment necessary to do the job. This may include, but not limited to:

a. *Testing and monitoring equipment*.
b. *Ventilating equipment* needed to obtain acceptable entry conditions.
c. *Communications equipment*. The attendant and entrants shall be in contact at all times either verbally, physically, or with communication equipment to transmit changing conditions or emergency information. When required to evacuate the confined space, a continuous blast of a horn will be sounded. To summon outside rescue units to the confined space, a phone or radio will be available to the attendant.
d. *Personal protective equipment*. The equipment to be used must include use of a harness and lifeline for all entrants in permit required confined space. Also, for manhole type entries, a tripod retrieval system must be set-up over the manhole. Other required personal protective equipment should be listed on the permit such as hard hats, eye protection, protective clothing, etc.
e. *Lighting equipment* in order to see well enough to work safely and to exit the space quickly in an emergency. Lighting shall be illuminated with explosive proof bulbs in the confined space when there is a potential for flammable materials being ignited.
f. Barriers and shields.
g. Equipment, such as *ladders*, needed for safe ingress and egress by authorized entrants.
h. *Rescue and emergency equipment* except to the extent that the equipment is provided by rescue services.
i. Any other equipment necessary for safe entry into and rescue from permit spaces.

D. Designate the employees who are to have the active roles for the entry: authorized entrant, attendants, entry supervisors, air monitors (if in addition to attendant or supervisor), and review all duties of each.

E. Openings into confined spaces may need to be guarded with temporary barriers to prevent exposure to hazards.

F. A pre-entry briefing, conducted by the Entry Supervisor, must be conducted prior to entry. Briefing should include:
a. Review of completed permit.
b. Review all hazards or potential hazards.
c. Review emergency procedures.

G. Determine Permit, Non-permit Entry, or Alternate Entry (See Confined Space: Appendix A for a flow chart to facilitate determination).

   a. Prior to entry, the team shall evaluate the existing and potential physical and atmospheric hazards associated with the task to be performed and the proper means and actions for eliminating and controlling those hazards.

   b. Prior to entry of a confined space, an atmospheric test must be made with an air (gas) detector to test for oxygen content, flammable gases and vapors, and for potential toxic air contaminants *in that order*. Re-testing must be done should there be any re-entry after breaks and lunch.

      i. The result of the readings will be given to the entry supervisor who will complete the "Pre-entry Atmospheric Testing" section on the permit form (see MDOT Form 0477B).

      ii. The entry supervisor will evaluate the readings of the air monitoring. Entry supervisor must review all other possible hazards of the space. He will then determine if the confined space is permit or non-permit.

         1. A confined space which does not indicate any hazardous atmosphere when tested and does not have potential for same, and does not contain any other physical hazard is a non-permit confined space. A confined space can also be classified as an alternate entry if the space can be properly ventilated to eliminate any potential hazardous atmosphere and no other hazards are present. Refer to Section III for explanation on alternate entry. If it is at all possible, attempt to use this entry as opposed to the permit entry procedure.

   c. All other hazards must be identified for the confined space and actions taken to eliminate those hazards prior to entry if possible. Actions taken may include lock out/tag out, machine guarding, blocking, draining, flushing, ventilating, etc.

H. If a hazardous atmosphere is detected during entry:
   a. Each employee shall leave the space immediately.
   b. The space shall be evaluated to determine how the hazardous atmosphere developed.
   c. Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

I. At the completion of work within a confined space:
   a. The Entry Supervisor will conduct a de-briefing of all employees involved in the confined space work to review any potential issues, changes in procedure, improvements, etc. for any future confined space work.

b. The permit will be canceled and the permit signed by the Entry Supervisor. All records will be retained by the location as identified in the Recordkeeping section of this procedure.

II. Procedures and Practices for Safe Entry – Pre-Entry Testing

A. Verifying Air Quality

a. A person testing or monitoring, must test from the outside of the confined space.

b. An air monitor shall be calibrated, as recommended by the manufacturer, to display correct direct readings and to give audible and visual alarms when the air quality limits are exceeded. Calibration records must be retained by the location.

c. Periodic testing must be continued as long as the space is occupied.

d. Oxygen level must be between 19.5% and 23.5%.

e. Flammable/explosive gases must not be over 10% of lower flammable limit (LFL)/lower explosive limit (LEL).

f. Toxic concentrations must not be over permissible exposure limit (PEL) for the gas being tested.

g. Airborne combustible dust: Visibility 5 feet or more.

B. All tests must be complete, accurate and documented before entry.

C. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmosphere's envelope should be tested at a distance of approximately four feet in the direction of travel and to each side. If a sample probe is used, the entrant's rate of progress should be slowed to accommodate the air sampling speed of the air monitor and its detector response time.

D. Recording Readings

a. All test results shall be entered on the Pre Entry Atmospheric Testing section (MDOT Form 0477B) and the Log of Atmospheric Test Readings (MDOT Form 0477A) maintained for that location.

b. If a hazardous atmosphere is detected, continuous forced air ventilation shall be used, as follows:

i. An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.

ii. The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space.
iii. The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
iv. The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing.

III. Preparing for Entry

A. Permit Entry (MDOT Form 0477B).

a. Check for the completeness of the permit.

b. Verify that conditions in the permit space are acceptable for entry.

c. Provide pedestrian, vehicular, or other barricades to protect entrances from external hazards and to prevent accidental fall into the opening once entrance cover is removed.

d. Continuous monitoring of the atmosphere will be conducted while the entrants are in the confined space.

e. Do not enter space if hazardous atmosphere is detected. Call your immediate supervisor (first-line supervisor) to report incident.

f. Permits must be present at the work site and available to all employees. Each permit will extend only for the duration of the task but no more than one shift. Permits must be retained for one-year to facilitate review of the confined space regulations.

B. Permit Preparation

a. A Confined Space Entry permit found in MDOT Form 0477B will be used for all permit entries. The location, reason, date, and time that the permit was issued will be entered accurately. When the expiration date and time arrives, it will be entered on the permit and no further occupancy can be made until a new permit is prepared and authorized. The entry supervisor is required to:

i. Authorize Entry.

ii. Prepare and sign permits.

iii. Order corrective measures by changing the requirements of the permit.

iv. Complete all spaces on the permit form.

v. Sign the form before authorizing entry.

vi. Ensure an entry permit is made available at the time of entry to all authorized entrants by posting it at the entry portal or by other effective means. The entrants can then confirm that pre-entry preparations have been completed.

b. Alternate Entry

i. Depending on the results of pre-entry atmospheric testing, a confined space may be reclassified as an Alternate Entry.

ii. Employees who enter a confined space need not comply with the procedures set forth in the permit program provided all of the following conditions exist:

1. It can be demonstrated that the only hazard posed by the permit space is an actual or potential hazardous atmosphere.

2. It can be demonstrated that continuous forced air ventilation alone is sufficient to maintain the permit space for safe entry.

3. Monitoring and inspection data are developed that support the previous conclusions. Atmospheric monitoring, per MDOT Form 0477A is still required.

4. If an initial entry of the permit space is necessary to obtain the data required, the entry is performed according to the procedures set forth in this document concerning the entry of a permit required confined space.

5. The determination and supporting data required are documented and made available to each employee who enters the space.

See MDOT Form 0477C for alternate entry procedures certification form.

NOTE: Control of atmosphere hazards through forced air ventilation does not constitute an elimination of hazards.

c. Reclassification to a Non-Permit Confined Space

i. If a permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards, and all other hazards, remain eliminated.

ii. If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed according to the permit process (MDOT Form 0477B). If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

iii. The location shall document the basis for determining that all hazards in a permit space have been eliminated per MDOT Form 0477C. The certification shall be made available to each employee entering the space.

iv. If hazards rise within a permit space that has been reclassified to a non-permit confined space, each employee in this space shall exit the space. The location shall then reevaluate the space and determine whether it must be reclassified as a permit space.

Refer to MDOT Form 0477C for Reclassification Certification Form.

d. Hot Work Permit.

If any welding, burning, cutting or brazing is required in a confined space, a Hot Work Permit (MDOT Form 0477D) must be completed prior to the work being initiated. Local ventilation shall be used to remove the fumes. No gas cylinders or other flammable substances should be in the space while hot work is being performed. (Refer to separate procedure on Welding and Burning which contains the Hot Work Permit – note: procedure not yet in place December 2003).

IV. Rescue Services

A. It is recommended that locations use outside rescue services for confined space rescues due to the amount of equipment and training required per the standards below. If they wish to have inside rescue services, they must meet the requirements shown below.

a. Inside Rescue Services: A location whose employees have been designated to provide permit space rescue and emergency services shall take the following measures:

i. Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely.

ii. Train affected employees so they are proficient in the use of that PPE, at no cost to those employees.
iii. Train affected employees to perform assigned rescue duties.
iv. The location shall ensure that at least one member of the rescue team or service holds a current certification in first aid and CPR is available.
v. Ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces.
    1. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescues may be performed.

b. Outside Services: If the location uses an outside rescue service, they shall evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified. In particular, per OSHA 1910.134, for IDLH atmospheres, the location must provide a standby person or persons capable of immediate action to rescue employee(s) wearing respiratory protection.

    i. The location must select a rescue team or service from those evaluated that has the capability to reach the victim(s) within a time frame that is appropriate for the permit space hazard(s) identified and is equipped for and proficient in performing the needed rescue services.

    ii. The location shall inform each rescue team or service of the hazards they may confront when called on to perform rescue at the site.

    iii. The location shall provide the rescue team or service selected with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

B. Retrieval systems: To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

    a. Retrieval systems shall meet the following requirements.

        i. Each authorized entrant shall use a full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the employer can establish presents a profile small enough for the successful removal of the entrant.

ii. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.

iii. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep.

C. The employer must make available to rescue teams, hospitals or treatment facilities, the appropriate Material Safety Data Sheet (MSDS) or other information relative to a permit space hazard exposure that may aid in rescue and treatment of rescued employees.

V. Prevention of Unauthorized Rescuers

a. Entry supervisor and attendants must ensure that only authorized rescuers are permitted to enter the confined space. The attendant will take the names of the rescuers and enter them on the permit. Upon arrival of the outside rescue service, they will assume control of the confined space. All efforts will be made to cooperate with the rescue service.

VI. Coordination of Entry Operations with Contractors

a. All contractors working in confined spaces must have their own plan/procedure for Confined Spaces that meets MIOSHA's standards. MDOT confined space entry permit must be completed for contractors to work in MDOT confined spaces.

b. All outside contractors performing work in confined space entry permit area shall be informed of any fire, explosion, health, or other safety hazards of that confined space. The location shall inform contractors of MDOT's safety rules and emergency plans which may be applicable to the contractor's employees. Contractors and their employees must not be allowed to enter a confined space until the provisions of this program have been satisfied. When both MDOT and the contractor personnel are working in or near permit spaces, their entry operations must be coordinated to avoid endangering any personnel.

c. At the conclusion of the entry operations, the contractor must be debriefed regarding the permit space program concerning any hazards confronted or created in permit spaces during entry operations to determine if any changes to the procedure are required.

TRAINING

Each effected MDOT location will provide training to their employees whose work is in areas covered under this plan.

A. Training shall be provided to each affected employee:

a. Initial confined space training is required for employees prior to the assignment of duties. Refresher training for employees involved in confined space entries is required when duties change, hazards change, or when performance shows inadequate knowledge to perform duties.

b. The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.

B. No MDOT Employee or contractor is permitted to enter a confined space without being certified in the duties they will perform while working in the confined space.

C. Each MDOT location shall certify that the training required has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

RECORDKEEPING

A. Signed confined space permits must be retained, by the location, for 1 year (MDOT Form 0477B).

B. Any permits that require air (atmospheric) monitoring (testing) are considered personal exposure records and must be retained for 30 years (MDOT Form 0477A).

C. Calibration of air monitoring equipment will be retained for 30 years.

REFERENCES & APPENDICES

MIOSHA, General Industry Standards, Part 90 "Confined Space Entry"

MIOSHA, Occupational Health Standards Part 490 "Permit-Required Confined Spaces"

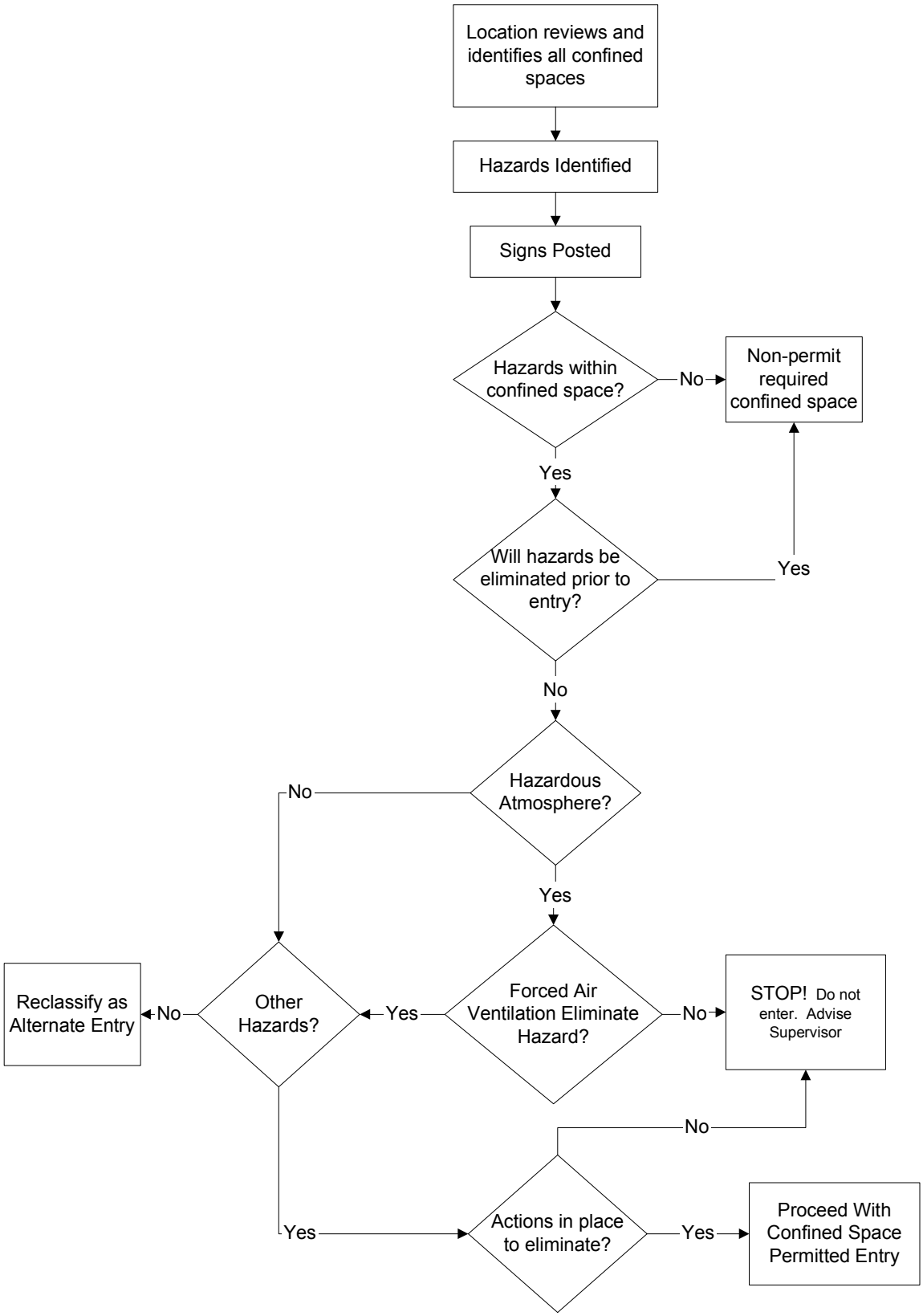
OSHA 1910 Subpart G

OSHA 1910 Subpart Z

OSHA 1910.146 Confined Space

NIOSH Publication 94-103 Worker Deaths in Confined Spaces

Appendix A
Simple Flowchart for Confined Spaces



SUMMARY: CONFINED SPACE ENTRY
Michigan Department of Transportation

Developed June 1994
Revised December 2003

Summary of Procedure for Confined Space Entry

- Each location is to identify and list all possible confined spaces and identify all potential hazards for each.
- Signs must be posted identifying all confined spaces.
- Review procedures and practices for safe entry with all employees involved with confined space work.
- Entry Supervisor, Attendant, and Entrant must know their responsibilities and understand the potential hazards of confined spaces.
- Conduct a pre-entry briefing.
- Provide, maintain, and ensure proper use of equipment required for entry and work.
- Isolate and guard confined spaces.
- Confined Space Entry permits must be completed prior to employee or contractor entering confined space.
    - For permit required confined spaces, air quality monitoring must be conducted.
        - Air monitoring must be continuous and recorded every ½ hour.
    - If required, ensure that the confined space is ventilated before and during entry.
    - Ensure all other hazards are identified and conditions are acceptable for entry.
- Based on review of all hazards and/or potential hazards, the confined space can then be classified as:
    - Permit Required Confined Space – Confined space that has hazards, or the potential for hazards.

    - Alternate Entry Confined Space – Confined space in which the only hazard or potential hazard is atmospheric and forced ventilation is used to make the confined space safe for entry.
        - Air monitoring still required for Alternate Entry.
    - Non-Permit Required Confined Space – Confined space in which there are no hazards, or the potential for hazards.

- If the confined space is a permit required confined space:
    - Ensure that the space is isolated from other systems.
    - Provide one or more attendants outside the permit space.
    - Provide continuous communication between attendant and entrant(s).
    - Exit confined space and cancel permit should hazards occur.
- Ensure rescue teams are available if required.
    - Ensure rescue teams have appropriate equipment.
    - Have appropriate MSDS's available.
- Ensure proper training has been provided to employees who are involved with confined spaces.
- Completed confined space permits must be retained by the location for review.