

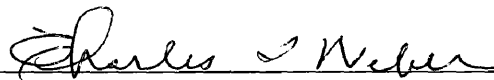
AN EXAMINATION OF THE JOB ELEMENT
APPROACH USED FOR THE TECHNICIAN WORK CLASS
WITHIN THE MICHIGAN DEPARTMENT
OF TRANSPORTATION'S CONSTRUCTION DIVISION

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ABSTRACT

This thesis examines the job element approach to job analysis used by the Michigan Department of Transportation (MDOT) for the construction technician work class. This examination is appropriate based on the hypothesis that the responsibilities and duties of MDOT's Construction Division have changed and that the job elements are no longer reflective of work performed.

Twenty-eight MDOT construction contracts are reviewed to determine which of the approximately 100 job elements are required. These contracts represent all of the construction work for one of the nine MDOT districts in calendar year 1991. The results of the research can be extended to reflect all of the nine districts.

This thesis proves that 49% of the current elements are no longer reflective of work performed by MDOT construction technicians. Furthermore, this thesis proves that the basis of the job elements are types of contracts which MDOT will no longer be involved in. Some new skills and abilities are identified from the twenty-eight contracts to provide a starting point to modify the current job element system.

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AN EXAMINATION OF THE JOB ELEMENT
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Job analysis is defined as a means for identifying the human behaviors necessary for adequate job performance. Schneider and Schmitt have identified the following five methods of accomplishing job analysis:

1. Functional Job Analysis
2. Job Element Approach
3. Position Analysis Questionnaire
4. Task Inventories
5. Critical Incidents Methodology 1

What my research design proposes is an examination of the job element approach to job analysis used by the Michigan Department of Transportation (MDOT) for the technician work class.

THE TECHNICIAN WORK CLASS

MDOT is comprised mostly of two work classes. The first of these is the professional engineering class which is responsible for the design and construction of the large highway projects. Assisting the engineering class is the technician class.

Those in the technician class usually possess an Associates Degree in Construction Technology or acceptable related work experience. They perform a wide range of activities such as drafting, surveying and inspection

necessary to complete a highway construction project.

WHY AN EXAMINATION IS APPROPRIATE

I believe an examination of the job element approach is appropriate based on my hypothesis that the function of MDOT has significantly changed and, therefore, the current identified job elements for those in the technician class are not reflective of the nature of work being performed.

To support my hypothesis, a review of the history of federal aid for roads and the corresponding role of Michigan Department of Transportation is needed.

In 1956, the national government passed the Federal Aid Highway Act which authorized construction of a 41,000 mile interstate road system. Michigan's portion of this system is 1181 miles ("I" routes such as I-75 as well as routes I-475, I-696).² The proposed completion date of 1972 was extended numerous times with a current proposed completion date of 1992. The Michigan Department of Transportation was selected as the controlling agency for construction of this system, and since 1956, has actively pursued completion of the Michigan interstate network. Two projects involving a 14 mile stretch of I-69 from Lansing to Charlotte and a 10 mile stretch of I-69 from Perry to Lansing are all that is needed to complete the network. The completion date for both of these projects is 1992. Most of the construction of the interstates, however, was done in the 21 year period from 1959 to 1980. The main function of MDOT during this period was original

construction, and identified technician tasks were based around survey and inspection skills related to the demands of original construction. Since 1980, MDOT has increasingly moved away from original construction, and now is engaged almost entirely in maintenance or reconstruction operations. This shift has significantly changed the focus of MDOT engineering and scientific efforts. Examples of the new knowledge and skills required include recycling construction materials, environmental analysis, nighttime construction, and research on new maintenance materials and techniques. Despite the new requirements however, the skills identified by MDOT as being necessary for the technician class have not significantly changed from those demanded during the period of original construction. This can be illustrated with an example of an identified skill.

Taking a section of I-75 from Bay City northward, technicians involved in original construction would have dealt with issues of locating the proposed roadway through woods and swamps, and building bridges over rivers. The same technician involved twenty-five years later in the resurfacing project would not have to deal with these issues since the road was already built. Instead, he would deal with issues of traffic congestion, guardrail and safety upgrading, and environmental impact of contaminated soils (lead based paint from bridges and contamination from lead based fuels). It is my contention that although the responsibilities of MDOT have changed,

skills identified as being necessary for technicians have not.

THE TECHNICIAN WORK ELEMENT SYSTEM

The work element system consists of approximately one hundred defined inspection, surveying, office and supervisory tasks essential to construction. A technician can advance from an entry level (Construction Technician II) to a supervisory level (Construction Technician VI), by demonstrating proficiency in associated tasks. A Civil Service examination is required for the entry level position as well as the Construction Technician V and Construction Technician VI levels.

The determination of proficiency in tasks is done by a panel of technicians and engineers in each district (MDOT is divided into nine geographical districts, all reporting to a central office in Lansing). This panel reviews each application and interviews each applicant before certification in a work element is granted. 3

Progression from the Construction Tech (CT) II position to CT IV is contingent upon both completion of required tasks and supervisory recommendation. Promotions to the CT V and CT VI is contingent upon completion of required tasks, civil service examination, and recommendation by an interview panel comprised of three engineers. A booklet which details the one hundred work elements is included in the appendix for review.

HISTORICAL DEVELOPMENT OF THE WORK ELEMENT SYSTEM

The work element system was developed jointly by MDOT personnel and Roy Jorgensen Associates, Consultant in 1971. The purpose of the system was to develop technicians with diversified skills rather than utilize a "specialized technician" concept used previously. It was believed that diversification would permit the use of a smaller work force while still obtaining satisfactory quality control. The original contract between MDOT and Roy Jorgensen Associates called for various Construction Management Research Services with the following objectives:

1. To develop and test a project and multiple project management system applicable to inspection, surveying, construction supervision and documentation of rural freeway construction, as hereinafter set forth and as described in the research proposal entitled, 'Construction Management Research Services,' attached hereto and made a part hereof.
2. To make the research techniques, principal findings and management system available for use by state highway departments." 4

The scope outlined in the contract states in part the following:

"This project is limited to that part of the construction management function of the Department having to do with rural freeway projects, not including district office or central office management." 5

At this point, I think it is important to note that both the objective and scope of the contract indicate an emphasis on rural freeway construction. This provides supporting evidence that the work element system currently in place is no longer reflective of the reconstruction or maintenance role performed by MDOT.

Further supporting evidence that the primary research focus was on rural interstate projects can be found in the contract's work plan. This states in part:

"The consultant will, through a separate engineering agreement, be responsible for the inspection, surveying, construction supervision and documentation work connected with a contiguous series of rural interstate construction projects..." These construction projects will be used by the Consultant as a "research laboratory" for detailed work analyses and for testing sub-systems of the construction management system." 6

The work plan further outlines that work performed by MDOT technicians would be identified by activity and task with a complete inventory of all work being a base for research. Each task and ability identified in the base research would then be analyzed in terms of knowledge, skills, and abilities combinations (KSA's) to form a second base for research.

MDOT BIDDING PROCESS AS ASSOCIATED WITH MDOT JOB PLANS AND PROPOSAL

When MDOT lets a contract for construction work, private contractors examine a set of job plans along with a job proposal. This proposal outlines the different items of work included in the contract as well as estimated quantities to complete the work. Additionally, traffic restrictions, project completion dates, and special considerations are found in the proposal. The job plans are the actual blueprints of the road or bridge being built or reconstructed. The plans will also have quantities and units of work which match those found in the job proposal. To bid on the project, the private contractor fills in his unit price for each item of work. (An example of a unit could be 2500 lineal feet (lft) of curb and gutter - The contractor might bid \$6.00/lft. for a total unit cost of \$15,000.00). After totalling all unit costs, the project is awarded to the low bidder. After a contract between a private contractor and MDOT has been established, the project is assigned to one of fifty-three MDOT construction offices. The role of the MDOT construction office is to monitor the contractor's work for conformance to MDOT specifications (this is where most of the "inspection work elements" derive) as well as provide all necessary survey work (hence "survey work elements").

THESIS RESEARCH

The design of this thesis basically seeks to answer three questions. One is, "Does the current work element system represent the necessary skills to complete modern highway contracts?". In order to answer the question, the base research of this thesis examines the job proposal and job plans of twenty-eight MDOT projects to determine what percentage of the approximately 100 work elements can be identified as being required to complete the contract. If a significant number of work elements can be identified as being encompassed, one can conclude that the system is representative. The second question answered by this thesis is "Are there any trends or tasks found in the construction contracts which are not reflected in the current work element system?". This involves a deeper understanding of the work involved as well as close scrutiny of the project plans and proposals. If such trends can be identified, additional elements could be designed and incorporated into the work element system to make it more representative of modern contracts. The last question answered is "Has the role of MDOT moved away from one of rural interstate construction?". This involves reviewing the twenty-eight contracts to determine if similarities exist as compared to the traditional rural interstate contract. Therefore, for all twenty-eight projects, three separate research paths are followed.

STATEWIDE APPLICABILITY OF RESEARCH

As stated previously, the basis of this research is an examination of twenty-eight construction projects as administered within one of nine MDOT districts. These projects represent the entire amount of work placed under contract by MDOT for the 1990 calendar year. In order to establish that this research is applicable to the entire state, a brief description of the nine MDOT districts is necessary:

Districts 1 and 2 are responsible for all contracts in the upper peninsula. A high percentage of the work involves rural state trunkline reconstruction and resurfacing or bridge reconstruction. It is important to note that the only portion of the interstate system in the upper peninsula is I-75 from St. Ignace to Sault Ste. Marie in District 2.

Districts 3 and 4 are responsible for all contracts in roughly the top one-third of the lower peninsula. Work concentration is still mostly rural trunkline and bridge reconstruction. These districts do cover a significant interstate stretch of I-75 and US-23.

Districts 5, 6, 7 and 8 are responsible for all contracts in the remainder of the state exclusive of Wayne, Oakland, Macomb and St. Clair Counties. These districts blend responsibilities in bridge reconstruction, interstate resurfacing, and state trunkline maintenance. What distinguishes these districts from districts one through four

is the necessity to accomplish these responsibilities in both and urban and rural setting.

Metro district is responsible for all contracts in Wayne, Oakland, Macomb and St. Clair County. Most work is performed in a highly urban setting with high traffic volumes.

In examining the contracts from District 6, a true cross-section of statewide work performed can be expected. Part of this district encompasses the Michigan "Thumb" section which is comprised of mostly rural state trunklines. This area mirrors conditions found in District 1 and 2. District 6 also contains a significant portion of the interstate system in both a rural and urban setting. The rural portion is similar to conditions found in Districts 3 through 8. In an urban setting, conditions found in Flint, Saginaw and Midland can be classified closely to those found in Metropolitan Detroit. Additionally, many types of bridges of varying length and complexity are contained within the District 6 boundaries.

In summarizing, the presence of rural state trunklines, interstates in both rural and urban settings, and a wide variety of bridges give District 6 a representative blend of conditions found in the entire state. Therefore, by studying and drawing conclusion about contracts found in this district, one can extend those conclusion to the whole state.

THESIS RESEARCH PROCEDURE

The purpose of this section is to outline the actual mechanics of completing the research on the twenty-eight

contracts. After completing the research proposal, one of the conclusions was that work element numbers 94 through 100 are supervisory elements and would have been present in every contract. Therefore, it was decided to eliminate them from this research. Consequently, for part one("Does the current work element system represent the necessary skills to complete modern highway contracts?) 98 work elements are examined. Some elements are numbered 35A, 35B, hence 98 elements studied with the highest number being 93. The twenty-eight projects are identified by a MDOT job number as well as a research project number. The determination of whether or not a work element was included in the contract was done as follows:

1. The work element was examined for a description of work and number of tasks included. For example, Work Element #85(Bridge Beam Elevations) requires completing three distinct tasks for full credit. These tasks are:

1. Determine and layout bridge beam increments.
2. Take and record beam elevations.
3. Prepare field books for deck grades.

The description of work for this element is "In charge of Instrument crew performing duties for taking and recording final beam elevations. Includes determining and laying out beam increments". A complete description of each work element and the corresponding task list can be found in the appendix.

2. With this information, each of the twenty-eight projects

was examined to determine what number of tasks for each element could be reasonably expected to be required. For example for Work Element #85 within research project number four, it was determined that none of the tasks would be required. A percent coverage was then determined by dividing the number of tasks required in the contract by the number of tasks required for work element credit. In the example above, zero tasks were required divided by three tasks required for work element credit. This yields a percent coverage of zero.

3. Each elements description also includes an experience guideline for helping the raters determine if sufficient work was done to receive credit. As an example for work element #85, the experience guideline is one 2-span vehicular structure. This experience guideline was also examined for each element. If the experience guideline could not be met, an appropriate comment is included.

For part two of the research(Are there any missing trends or tasks found in construction contracts which are not reflected in the current work element system?) each of the twenty-eight projects was examined in an attempt to identify tasks not found in the work element system. These identified tasks for each project are found at the end of part one.

The complete base research to answer these two parts of this thesis is located in the appendix. The twenty-eight

projects are listed in ascending order with each project requiring nine sheets of research. Part three (Has the role of MDOT moved away from one of rural interstate construction?) is completed in the conclusions portion of this thesis.

CONCLUSIONS OVERVIEW

To determine what conclusions should be drawn from the research, it is important to remember what this thesis intends to do. In the section titled "Why an Examination is Appropriate", it was stated that there was a belief that the role of MDOT had significantly changed from one of original interstate construction to one of maintenance or reconstruction. Supporting evidence that the work element system was based on rural interstate construction was found in the examination of the Design Consultant's contract scope. Correspondingly, the section titled "Thesis Research" outlines a method for first determining if the work element system is reflective of work performed and secondly seeks to identify missing trends or tasks. Therefore, in determining conclusions from the research done, these questions will be answered.

CONCLUSIONS PROCEDURE

In order to determine if there is movement away from rural interstate construction, a review of the twenty-eight projects was done to see if similarities exist with traditional rural interstate projects. This review is

completed in Part A of the Conclusions. Part B of the Conclusions examines the question of whether the current work element system is reflective of work being performed. This is done by establishing the possibility of obtaining each of the work elements in twenty-eight MDOT contracts. More specifically:

1. Each element's task list was compared against the required tasks in an MDOT contract as the base research for this thesis. Notation was done to show how many of the tasks were required. Part B of the conclusions examines the base research and develops a percentage which indicates what percent of the contracts require the full task list of the examined element. If the full element is not obtainable, a percentage is also developed which indicates what percent of the contracts require partial completion of the examined elements task list. After developing these percentages, the question of the work element system being applicable is answered.

Part C of the conclusions outlines missing tasks and trends which were determined to be part of current MDOT contracts as determined in the base research. These tasks are not part of the current work element system and are reflective of MDOT's movement away from rural interstate contracts.

CONCLUSIONS PART A

Has the role of MDOT moved away from one of rural interstate construction?

A preliminary review of the twenty-eight contracts indicates that only eight contracts, or 28 percent, involve work on the interstate system. Of the remainder, nineteen, or 68 percent, involve work on the state trunkline system, and one, or 4, percent involves work on the railroad lines. This would give some indication that the role of MDOT has changed from rural interstate construction.

However, a logical question follows concerning the twenty contracts not involving interstate work: "Are any of the skills required to complete these contracts similar to the skills required to complete the interstate system?". To answer this question, one must list the basic steps taken to construct a rural interstate. A comparison can then be done against the twenty non-interstate contracts to determine if any similarities are present.

To list the steps taken in constructing a rural interstate in the 1950's through the 1970's, one can compare the remaining sections of I-69 in the Lansing area which will be completed in 1992. An examination of these contracts shows distinct skill requirements in the following areas.

1. Original Survey - Involves initial location and construction of survey control points in a wooded or open field. Also requires identification of right-of-way limits

and areas to be cleared for construction of the roadway.

2. Construction of Earth Grade - Involves building the roadway to the point before concrete or bituminous topping. Involves excavation and removal of unsuitable soils, and controlling placement of suitable material in preparation for the riding surface. Includes skills associated with ditch and sewer construction for drainage.

3. Roadway Construction - Involves skills required to control a fast moving, continuous concrete or bituminous operation.

4. Office and Recordkeeping - Involves completion of documentation and standards for review for the Federal Highway Administration final acceptance of the project.

What follows are twenty eight MDOT contracts with notation indicating if the contract is interstate/non-interstate and the comparison process of required skills.

1. **MSS 73033-26871A**

0.07 mile of constructing right turn lane on M-84 at the intersection of Tittabawassee Rd. in Saginaw County.

Relevance- State trunkline work only.

Rural Interstate Similarities? Minor similarities only. Survey control points have already been established although one or two may have to be reestablished. Project is located in a urban setting and is very short in length. Most similarities are in recordkeeping but on a much smaller scale. (Moderate similarities)

2. **AO 6109-900132**

Railroad Chemical weed spray on main line trackage in numerous counties.

Relevance- No work on interstate system or state trunkline system.

Rural Interstate Similarities? No similarities. This contract involves working on rail lines only.

3. **HES 25072-28312A**

0.29 miles of bituminous base course widening on M-54 in Genesee county.

Relevance- State trunkline work only.

Rural Interstate Similarities? Minor similarities only.

Contract is located in a urban area, is of short length and requires widening an existing roadway. Recordkeeping requirements are moderately similar except on a smaller scale.

4. **IR 73111-28240A**

7.64 miles of freeway concrete pavement repair on I-75 in Saginaw county.

Relevance- Reconstruction work on interstate system.

Rural Interstate Similarities? Even though this contract involves work on the interstate system, there are few similarities. This project involves rehabilitation of the existing interstate by repairing concrete joints and

overlaying with asphalt. There is very little survey work, and no construction of earth grade. The roadway construction procedure is moderately similar due to the fast moving asphalt operation, but the resurfacing is over existing pavement and not original earth grade. Recordkeeping has moderate similarities.

5. **AFRR 79011-26071A**

5.4 miles of bituminous base course widening on M-24 in Tuscola County.

Relevance- State trunkline work only.

Rural Interstate Similarities? No similarities concerning original survey. This contract involves widening an existing trunkline with minor similarities in construction of earth grade. The asphalt operation would be slow due to working in a confined widening area (minor). Recordkeeping has moderate similarities but not as complex as that of rural interstate.

6. **I 76024-23756A**

Freeway signing on I-69 in Shiawassee county.

Relevance- Interstate system work.

Rural Interstate Similarities? Very minor recordkeeping similarities only. No earth grade or roadway construction on this project.

7. **MR OWS 6-M00118**

Weed spraying at various locations in District Six.

Relevance- Some interstate work, primarily state trunkline work.

Rural Interstate Similarities? Very minor recordkeeping similarities only. No earth grade or roadway construction on this project.

8. **M 84906-30658A**

Pavement Markings at various locations in District Six.

Relevance- state trunkline work only.

Rural Interstate Similarities? Very minor recordkeeping similarities only. This contract is for pavement marking only.

9. **IR 25131-29597A**

Pin and hanger replacement, deck overlay and coating structural steel on Grand Blanc Road over I-75.

Relevance- Interstate reconstruction work.

Rural Interstate Similarities? Very minor similarities to an original interstate bridge. Project involves repainting an existing bridge and overlaying the existing bridge deck. Recordkeeping involves substantially different work items.

10. **RRP 79031-28415A**

Remove and Replace approach pavement to railroad crossing on M-15 in the City of Vassar.

Relevance- State trunkline work only.

Rural Interstate Similarities? Very minor similarities in recordkeeping only. No construction of earth grade required and a very small amount of asphalt paving

11. **M 84906-30659A**

Pavement Markings at various locations in District 6.

Relevance- Primarily State trunkline work

Rural Interstate Similarities? Very minor recordkeeping similarities only. This contract is for pavement marking only.

12. **FUR 09042-28170A**

1.2 miles of concrete pavement overlay on I-75 in Bay county.

Relevance- Interstate system reconstruction.

Rural Interstate similarities? No construction of earth grade required. However, overlaying the existing pavement would come close to matching the high production asphalt operation on a rural interstate(Moderate). No original survey similarities. Moderate similarities in recordkeeping.

13. **AFUR 25072-15197A**

1.14 miles of bituminous resurfacing on M-54 in Flint.

Relevance- State trunkline work only.

Rural Interstate Similarities? No construction of earth grade required. Resurfacing the existing pavement would be moderately similar to a fast moving asphalt operation on rural interstate. Moderate similarities in recordkeeping.

14. **JFU 76041-26709A**

Reconstruct Railroad crossing in Owosso on M-71.

Relevance- State trunkline work only.

Rural Interstate Similarities? Very minor recordkeeping similarities only. No original earth construction and very little asphalt production. No original surveying.

15. **IR 09035-24257A**

Freeway Sign Upgrading on I-75 in Arenac and Bay counties.

Relevance- Interstate system work.

Rural Interstate Similarities? Minor recordkeeping similarities only. No construction of earth grade, asphalt or concrete work, or original survey work required.

16. **MSH 44031-30587A**

4.25 miles of bituminous shoulder reconstruction on M-

53 in Lapeer county.

Relevance- State trunkline work only.

Rural Interstate Similarities? Moderate similarities in fast moving asphalt production. No original survey or construction of earth grade. Minor similarities only in recordkeeping.

17. IR 73171-28239A

8.55 miles of bituminous resurfacing on I-75 in Saginaw County.

Relevance- Interstate system work.

Rural Interstate Similarities? High similarities in fast moving asphalt production. Minor similarities in drainage areas of earth grade construction. Moderate similarities in recordkeeping. No original survey work.

18. FRR 56021-28668A

Non freeway sign upgrading on M-20 in Midland county.

Relevance- State trunkline work.

Rural Interstate Similarities? Very minor recordkeeping similarities only. No earth grade construction, asphalt or concrete overlay or original survey work required.

19. RRP 73033 28411A

Remove and replace railroad crossing on M-84 in Saginaw county.

Relevance- State Trunkline work only.

Rural Interstate Similarities? No earth grade

similarities or original survey work. Very small amount of asphalt work and minor recordkeeping similarities.

20. **HES 73062-24290A**

0.49 miles of bituminous resurfacing on M-46 in Saginaw county.

Relevance- State Trunkline work only.

Rural Interstate Similarities? Minor similarities in recordkeeping and asphalt production. No earth grade or original survey work required.

21. **FUG 84906-31156A**

Traffic signal work at various locations in District Six.

Relevance- State Trunkline work only.

Rural Interstate Similarities? Minor similarities in recordkeeping only. No earth grade, original survey, or bituminous or concrete work on this contract.

22. **JFUR 25072-26868A**

0.17 miles of bituminous resurfacing on M-54 in Genesee county.

Relevance- State trunkline work only.

Rural Interstate Similarities? Minor similarities in recordkeeping and asphalt production. No earth grade construction or original survey work required.

23. **M 25081-26303A**

0.45 miles of bituminous resurfacing on M-21 in Genesee county.

Relevance- State trunkline work.

Rural Interstate Similarities? Minor similarities in recordkeeping and asphalt production. No earth grade construction or original survey work required.

24. **HES 73062-26872A**

0.20 miles of pavement widening on M-46 in Saginaw county.

Relevance- State trunkline work.

Rural Interstate Similarities? Minor similarities in recordkeeping only. No original survey work or construction of earth grade required. Minor similarities in asphalt production.

25. **JFUR 76061-24294A**

Intersection improvements on M-21 and Chipman St.

Relevance- State trunkline work.

Rural Interstate Similarities? Minor similarities in recordkeeping only. Project is located in an urban setting with slow moving asphalt production.

26. **FRR 73021-29648A**

0.16 miles of pavement widening on M-57 in Saginaw county.

Relevance- State trunkline work.

Rural Interstate Similarities? Minor similarities in recordkeeping. No original survey or earth grade construction required. Minor similarities in asphalt production.

27. IR 25032-25887A

Freeway sign upgrading on I-75 in Saginaw and Bay counties.

Relevance- Interstate system work.

Rural Interstate Similarities? Very minor similarities in recordkeeping only. No original survey, earth grade or concrete or asphalt work.

28. IR 25132-24261A

Freeway signing on I-475 in Genesee county.

Relevance- Interstate system work.

Rural Interstate Similarities? Very minor similarities in recordkeeping only. No original survey, earth grade or concrete or asphalt work.

TABLE NUMBER 1

SUMMARY OF RURAL INTERSTATE SIMILARITIES
 IN INTERSTATE CONTRACTS
 (EIGHT CONTRACTS OUT OF TWENTY-EIGHT IN 1990)

	NUMBER OF CONTRACTS SHOWING		
	MINOR SIMILARITIES	MODERATE SIMILARITIES	HIGH SIMILARITIES
ORIGINAL SURVEY	0	0	0
CONSTRUCTION OF EARTH GRADE	1	0	0
ROADWAY CONSTRUCTION	1	2	1
RECORD KEEPING	4	3	0

Table Number 1 provides a summary of similarities found between the typical rural interstate tasks used for comparison and the eight contracts involving interstate work let in 1990. A primary conclusion drawn is that even though these contracts involve work on the interstates, they have little similarity to the rural interstate contracts on which the Work Element System is based. A review of Table 1 indicates that none of the eight contracts require any type of original survey work required for rural interstate work. In the area of constructing earth grade, only one contract had minor similarities to rural interstate construction. In the area of actual roadway construction, one contract had high similarities, two contracts had moderate similarities, and one contract had minor similarities. Only in the area of recordkeeping, where seven contracts possessed minor or moderate similarities is there any indication that modern interstate contracts mirror rural interstate contracts. This is quite likely caused by the standard construction forms used by MDOT. In summarizing, this review provides further proof that modern interstate contracts are not reflective of rural interstate contracts let from 1950 to 1980.

TABLE NUMBER 2

SUMMARY OF RURAL INTERSTATE SIMILARITIES IN STATE TRUNKLINE CONTRACTS (NINETEEN CONTRACTS OUT OF TWENTY-EIGHT IN 1990)

	NUMBER OF CONTRACTS SHOWING		
	MINOR SIMILARITIES	MODERATE SIMILARITIES	HIGH SIMILARITIES
ORIGINAL SURVEY	0	0	0
CONSTRUCTION OF EARTH GRADE	1	0	0
ROADWAY CONSTRUCTION	6	3	0
RECORD KEEPING	14	5	0

Table Number 2 provides a summary of similarities found between the typical rural interstate tasks used for comparison and the nineteen contracts involving state trunkline work let in 1990. A review of this table indicates that none of the contracts require original survey skills required for rural interstate construction. Only one contract has minor similarities in the area of constructing earth grade. For actual roadway construction, six contracts have minor similarities and three have moderate similarities to rural interstate contracts. In the area of recordkeeping, fourteen have minor similarities, and five have moderate similarities. This review indicates that modern state trunkline contracts also are not reflective of rural interstate contracts let from 1950 through 1980.

The last contract reviewed involves work on state owned rail lines and obviously does not possess any similarities to rural interstate contracts of past.

In completing this portion of the conclusions, evidence shows that modern MDOT contracts are not similar to past MDOT rural interstate contracts which were one of the primary missions of MDOT from 1950 to 1980. It is interesting to note, that none of the twenty-eight MDOT contracts examined could be classified as original rural interstate contracts. And with the completion of the last two remaining portions of interstate described earlier in this thesis, this type of contract will be extinct. From these observations it can be concluded that the role of MDOT has significantly changed and is no longer rural interstate construction.

CONCLUSIONS PART B

Is the current work element system applicable to current work being performed.

To answer this question, a standard must be established which dictates whether a work element is applicable or not. This thesis will be based on the possibility of an individual's meeting a work element requirement within a five-year cycle. In other words, a MDOT technician who wishes to receive credit for an element, should not have to wait longer than five years. Therefore, based on a five year cycle, every work element should be required in twenty percent or more of the twenty-eight MDOT contracts let in 1990.

To determine if an element meets this standard, Tables

5 through 24 relate the elements availability to the twenty-eight contracts. The data indicate the number of tasks required to earn credit for the element and the number of tasks present in each of the twenty-eight contracts. The summary of each table indicates both the percentage of the twenty-eight contracts where full credit of the element could be received and also the percentage of the twenty-eight contracts where partial credit could be received. Tables 3 and 4 provide a summary of Tables 5 through 24. Tables 5 through 24 are located in the appendix behind the research data.

**TABLE NUMBER 3
SUMMARY OF WORK ELEMENT SYSTEM
MEETING 20% REQUIREMENT OF RELEVANCY**

PERCENT OF 1990 CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	ELEMENT NUMBER 98 ELEMENTS EXAMINED	PERCENT OF 98 ELEMENTS IN 20% OR GREATER OF 1990 MDOT CONTRACTS	PERCENT OF 98 ELEMENTS IN LESS THAN 20% OF 1990 MDOT CONTRACTS
70-100	30 31 33 37 47 50 89 91 93	9.2%	
60-69	9 14 26 38 53 92	6.1%	
50-59	12 13 17 28 36 45 54 55	8.2%	
40-49	1 15 35A 64	4.1%	
30-39	7 16 18 21 22 63 78	7.1%	
20-29	8 10 11 23 29 35B 40 46 65 66 67 71 73 77 87 90	16.3%	
15-19	5 29A 41 42 49 57 59 72 82		9.2%
10-14	3 35 39 51 52 68 76 80 81 86 88		11.2%
5-9	2 20 61A 70 75 84		6.1%
0-4	4 19 24 25 27 32 34 43 44 48 56 58 60 61 61B 62 69 74 79 83 85 91A		22.4%
TOTALS	98	51.0%	48.9%

SUMMARY: FOR THIS THESIS, AN ELEMENT IS CONSIDERED RELEVANT IF GREATER THAN 20% OF THE 1990 CONTRACTS REQUIRE FULL USE OF THE ELEMENTS TASK LIST. A TECHNICIAN COULD THEREFORE EXPECT TO GAIN CREDIT FOR AN ELEMENT WITHIN FIVE YEARS.

PERCENT OF WORK ELEMENT SYSTEM MEETING 20% CRITERIA=51.0%
PERCENT OF WORK ELEMENT SYSTEM NOT MEETING 20% CRITERIA=48.9%

Table 3 summarizes the entire work element system as compared to percent of the twenty-eight contracts where full credit could be received. An examination of this table indicates that 48.9% of the work elements could not be fully obtainable in 20% or more of the MDOT contracts let in 1990. This offers substantial proof that the work element system is not representative of current work being performed.

TABLE NUMBER 4
SUMMARY OF WORK ELEMENT SYSTEM
MEETING 20% REQUIREMENT FOR RELEVANCY
(PARTIAL CREDIT OF ELEMENT ONLY)

PERCENT OF 1990 CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED	ELEMENT NUMBERS 98 ELEMENTS EXAMINED	PERCENT OF 98 ELEMENTS IN 20% OR GREATER OF 1990 MDOT CONTRACTS	PERCENT OF 98 ELEMENTS IN LESS THAN 20% OF 1990 MDOT CONTRACTS
70-100	49	1.0%	
60-69		0.0%	
50-59	2	1.0%	
40-49		0.0%	
30-39		0.0%	
20-29	18 77	2.0%	
15-19	59		1.0%
10-14	26 71		2.0%
5-9			0.0%
0-4	ALL REMAINING ELEMENTS		92.9%
TOTALS	98	4.0%	95.9%

SUMMARY: FOR THIS THESIS, AN ELEMENT IS CONSIDERED RELEVANT IF GREATER THAN 20% OF THE 1990 CONTRACTS REQUIRE FULL USE OF THE ELEMENTS TASK LIST. A TECHNICIAN COULD THEREFORE EXPECT TO GAIN CREDIT FOR AN ELEMENT WITHIN FIVE YEARS.

PERCENT OF WORK ELEMENT SYSTEM (PARTIAL CREDIT ONLY) MEETING 20% CRITERIA=4.0%
PERCENT OF WORK ELEMENT SYSTEM (PARTIAL CREDIT ONLY) NOT MEETING 20% CRITERIA=95.9%
TOTAL=99.9%

Table 4 summarizes the entire work element system as compared to the percent of the twenty-eight contracts under

which if full credit could not be received at least partial credit could be received. An examination of this table indicates that the required experience for 95.9% of the work elements were not even partially obtainable under these contracts. This indicates an "all or nothing" syndrome of obtaining a work element, and provides further proof that the work element system is not reflective of current work being performed.

In summary, to answer the question of "Is the work element system applicable to current work being performed", twenty-eight contracts representing one calendar year were examined. 48.9% of the work element system was determined to be unobtainable in 20 percent or more of these contracts. Additionally, if full credit of an element could not be received, 92.9% of the work elements could not even be partially obtained in 20 percent or more of the contracts. This is substantial evidence that an MDOT technician could not meet the requirements of an element within five years, and that the current work element system is not representative of current work being performed.

CONCLUSIONS PART C

What missing trends or tasks have been identified?

This section identifies missing tasks outlined from part 2 research. After each missing task, a comment is made as to the frequency repeated.

1. Understanding Special Provisions/Supplemental Specifications. This task represents a thorough reading of the job proposal to identify special considerations in many different areas such as traffic restrictions, completion dates, and material usage. This task was identified as being not being included in any of the twenty-eight projects.

2. Environmental Impact/Environmental Permits. Today's construction atmosphere includes stringent environmental compliance, appropriate environmental permits and the ability to interact with environmental compliance agencies. This task was identified in 12 of 28 research projects.

3. Public Relations/Cooperation with Business Owners/Cooperation with other Agencies. Transportation resources strongly affect business success as well as public mobility. The maintenance of this transportation infrastructure needs to be accomplished in a time of budget restraint and competition for available funds. Approval of business owners, the public in general, and other agencies can provide broad support for possible tax increases or special assessments. The need for special cooperation with "MDOT

customers" was identified in 16 of 28 projects.

4. Administration of Incentive/Disincentive Contracts/Fast Track Paving. Many MDOT contracts now place a premium on completing projects quickly with efficiency and quality. The administration of these contracts with its correlating problems was identified in 6 of 28 projects.

Additionally, other areas involving tort litigation reduction, urban paving, and new construction practices(Hydrodemolition) were identified. Although none of these tasks met the 20% factor, it is believed that these areas will continue to grow in importance.

CONCLUSIONS SUMMARY

In general, the hypothesis of this thesis was that MDOT's role has changed from "original construction" to "maintenance and reconstruction". Correspondingly, the work element system in-place was theorized to be based on rural interstate construction. This basis clashed with MDOT's change to maintenance and reconstruction activities. Lastly, this thesis theorized that there were missing tasks and trends which were being completed on modern MDOT contracts but were not part of the work element system. Part A of the conclusions proved that MDOT's mission has changed from the original construction of interstate highways. None of the twenty-eight contracts examined could be categorized as original rural interstate construction, and nearly all of the

contracts examined possessed few similarities to original rural interstate construction.

Part B of the conclusions proved that 48.9% of the work elements were unobtainable in 20% or more of the twenty-eight contracts. Additionally, neither does the current work element system accommodate partial credit for a work element. This was shown by 95.9% of the elements not being obtainable if full credit could not be received. This leads to an "all or nothing" syndrome of obtaining work elements. Based on this data, an MDOT technician could not obtain desired work elements within a 5 year time span. This proves that serious revision to the work element system is required.

Lastly, part C of the conclusions identified some missing tasks or trends found in modern construction contracts. Although these missing tasks are not all inclusive, they provide a starting point for revising the work element system.

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FOOTNOTES

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6. Agreement for Construction Management Research Services #71-0667 between the Michigan State Highway Commission and Roy Jorgensen Associates, Inc. Engineering and Management Consultants. Contract entered into on November 12, 1971.

APPENDIX

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Required for Sewer Backfill
2. Materials Weighing	9	1	11	Task 3 Applies. Automatic Scales for Bituminous Work
3. Inspect Protective Treatment	2	0	0	No Bridge Work in this Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	No Bridge Work in this contract
5. Inspect Fence	7	0	0	No Fence Work in this contract
7. Inspect Depth of Aggregate Base Course	4	0	0	No aggregate base in this contract
8. Inspect Tree and/or Stump Removal	5	5	100	Not Enough Units to Meet Experience Guideline, Partial Credit Only
9. Beginning Level Rodman	3	3	100	Not Enough Workdays to Meet Experience Guideline, Partial Credit Only
10. Reduce and Check Field Books	2	0	0	No Sections Required in This Contract
11. Plot Cross Sections	2	0	0	No Sections Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Weigh Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough lineal feet of Sewer to meet Experience guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Concrete Curb and Gutter and Concrete Driveways
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Bituminous Removal, Bituminous Approaches, and Bituminous Surfacing, all in this contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	No Concrete Paving in this Contract

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Workdays For Experience Guideline, Partial Credit Only
18. Density Testing	12	9	75	Tasks 1, 2, 3, 7, 8, 9, 10, 11 and 12 Apply
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in this Contract
20. Inspect Structure Joints and Cleanup	5	0	0	No Bridge Work in this Contract
21. Inspect Guardrail	14	0	0	No Guardrail Work in this Contract
22. Inspect Sodding	7	7	100	Not Enough Workdays For Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	4	100	Traffic Maintained For Length of Contract
24. Fabricated Materials Control and Testing for Structures	4	0	0	No Bridge Work in this Contract
25. Inspect Pile Driving - Production	19	0	0	No Bridge Work in this Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	All Tasks Apply
27. Inspect Selective Clearing	5	0	0	No Selective Clearing in this Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Not Enough Workdays For Experience Guideline, Partial Credit Only
29. Erosion Control	5	0	0	No Erosion Control in Contract
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Flag Control, Barricades, Arrow Bars are all in this Contract

**CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common to All Contracts
34. Inspect Landscaping	8	0	0	No Landscape Work in this Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	No Concrete Paving in this Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Lineal Feet to Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders In Contract
36. Fully competent Rodman and Chainman	2	2	100	Not Enough Survey Work to Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Final Measuring to Meet Experience Guidelines, Partial Credit Only
38. Setting Grades	4	4	100	Not Enough Survey Work to Meet Experience Guidelines, Partial Credit Only

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence Work in this Contract
40. Staking Guardrail	6	0	0	No Guardrail Work in this Contract
41. Staking Line for Surfacing	3	0	0	Automatic Screed on Bituminous Paver
42. Taking Cross Sections	3	0	0	No Cross-Sections Required in This Contract
43. Stake Centerline	4	0	0	No Centerline Work Required
44. Stake Clearing Limits	4	0	0	No Clearing in this Contract
45. Compute areas and Volumes	3	3	100	Not Enough Items To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	None Required
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing in this Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Included in Contract But No O.J.T. in this Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete placement, Pumphouse or Retaining Wall Construction	16	0	0	None of these Items in Contract

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None In Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Experience Guideline Not Met, Partial Credit Only
54. Inspect Bituminous Surfacing	10	10	100	Experience Guideline Not Met, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Experience Guideline Not Met, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	No Clearing
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	No Utility Work in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not A Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	No Permanent Signs
60. Inspect Structural Steel Erection	6	0	0	No Bridge Work in Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	No Bridge Work in Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	No Bridge Work in Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	No Bridge Work in Contract

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	No Bridge Work In Contract
63. Staking Curb and Gutter	9	9	100	Insufficient Lineal Feet To Meet Experience Guideline, Partial Credit Only
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Lineal Feet to Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	No Culvert Work in this Contract
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	None Required in Contract
68. Staking Right-Of-Way	6	0	0	Right-Of-Way Already Defined
69. Staking Building and Rest Area Facilities	7	0	0	Not A Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	No Bridge Work in Contract
71. Staking Sign Locations	8	0	0	Not Part of This Contract, Done By State Forces
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Automatic Ski on Bituminous Paver
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Automatic Ski Would Match Existing Pavement or Curb and Gutter
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not A Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	No Bridge Work in Contract

CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
 RESEARCH PROJECT NUMBER 1

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Some Utility Relocation Necessary but None Requiring Staking
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	4	57	Tasks 1, 5, 6 and 7 Apply
78. Compute and Check Aggregate Base Course or Concrete Pavement	3	0	0	No Concrete Paving in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	No Bridge Work In Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	No Concrete Work in Contract
82. Inspect Grading	12	0	0	No Original Grading Work in Contract
83. Inspect Test Pile Driving	13	0	0	No Bridge Work in Contract
84. Structure Reference Points and Lines	8	0	0	No Bridge Work in Contract
85. Beam Elevations	3	0	0	No Bridge Work in Contract
86. Layout Deck Lines and Grades	5	0	0	No Bridge Work in Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in This Contract
88. Compare and Adjust Deck Grades	3	0	0	No Bridge Work in Contract

**CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT NUMBER 1**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	10	83	Tasks 1, 2, 3, 6, 7, 8, 9, 10, 11 and 12 Apply
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	Not Related To Contract
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	211	27.87%	

**CONTROL SECTION AND JOB NUMBER MSS 73033-26871A
RESEARCH PROJECT 1**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This Contract is an excellent example of a typical reconstruction contract. The contract's major emphasis is on widening an existing roadway to accommodate a left turn lane. Original surveying is not required. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications.**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Environmental Impact.**
With a road widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.
3. **Public Relations.**
High Traffic Volumes with corresponding curbside business is interrupted by on-going construction. Is it possible that Public Relations can be a work element?

CONTROL SECTION AND JOB NUMBER AO 6109-900132
RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Chemical Weed and Brush Spray Job
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Some coordination of railroad required
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	0	0	
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	
33. Inspect Final Project Cleanup After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	2	33	Tasks 1 and 2 Apply
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, major Headwalls, Major sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	0	0	
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-900132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking U t i l i t y Relocation or New U t i l i t y Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, D r a i n a g e Structures, S t r u c t u r e s Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. B e a m Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER AO 6109-9000132
 RESEARCH PROJECT NUMBER 2

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	33	4.36%	

**CONTROL SECTION AND JOB NUMBER AO 6109-900132
RESEARCH PROJECT 2**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is for railroad chemical weed and brush spray of mainline trackage. Only three items of work are proposed. All of which involve the application of chemical sprays. For this contract and MDOT Inspector would need to have skills in the following areas:

1. Understanding of Special Provisions and Supplemental Specifications to the contract which detail environmental safety.
2. Understanding of the operation of large spraying equipment.
3. Understanding of appropriate spray mixing techniques.

This contract is non-standard for MDOT Construction Division Technicians and Civil Engineers.

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Required for Subgrade Undercutting, Type II and Sewer Backfill
2. Materials Weighing	9	1	11	Task 3 Applies. Automatic Scales for Bituminous Work
3. Inspect Protective Treatment	2	0	0	No Bridge Work in this Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	No Bridge Work in this contract
5. Inspect Fence	7	0	0	No Fence Work in this contract
7. Inspect Depth of Aggregate Base Course	4	0	0	No aggregate base in this contract
8. Inspect Tree and/or Stump Removal	5	0	0	No Tree Removal in this Contract
9. Beginning Level Rodman	3	3	100	Tasks 1, 2 and 3 Apply
10. Reduce and Check Field Books	2	2	100	Not Enough sections to meet experience Guideline, Partial Credit Only
11. Plot Cross Sections	2	2	100	Not Enough sections to meet experience Guideline, Partial Credit Only
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Weigh Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough lineal feet of Sewer to meet Experience guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Concrete Curb and Gutter and Concrete Driveways
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Bituminous Removal, Bituminous Approaches, and Bituminous Surfacing, all in this contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	No Concrete Paving in this Contract

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
 RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Widening Both Sides in Preparation for Bituminous Base
18. Density Testing	12	9	75	Tasks 1, 2, 3, 7, 8, 9, 10, 11 and 12 Apply
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in this Contract
20. Inspect Structure Joints and Cleanup	5	0	0	No Bridge Work in this Contract
21. Inspect Guardrail	14	0	0	No Guardrail Work in this Contract
22. Inspect Sodding	7	0	0	No Sodding in this Contract
23. Inspect Maintenance of Roadways on Detours, or Temporary Roads	4	4	100	Traffic Maintained For Length of Contract
24. Fabricated Materials Control and Testing for Structures	4	0	0	No Bridge Work in this Contract
25. Inspect Pile Driving - Production	19	0	0	No Bridge Work in this Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	All Tasks Apply
27. Inspect Selective Clearing	5	0	0	No Selective Clearing in this Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	3600 Square Yards of Slope Restoration
29. Erosion Control	5	5	100	Hay Bales Required. This is a small part of the Contract, Partial Credit Only
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Flag Control, Barricades, Arrow Bars are all in this Contract

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common to All Contracts
34. Inspect Landscaping	8	0	0	No Landscape Work in this Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	No Concrete Paving in this Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Lineal Feet to meet experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	6	100	Not Enough Tonnage to Meet Experience Guideline, Partial Credit Only
36. Fully competent Rodman and Chairman	2	2	100	Not Enough Survey Work to Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Final Measuring to Meet Experience Guidelines, Partial Credit Only
38. Setting Grades	4	4	100	Not Enough Survey Work to Meet Experience Guidelines, Partial Credit Only

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence Work in this Contract
40. Staking Guardrail	6	0	0	No Guardrail Work in this Contract
41. Staking Line for Surfacing	3	0	0	Automatic Screed on Bituminous Paver
42. Taking Cross Sections	3	2	66	Tasks 2 and 3 Apply
43. Stake Centerline	4	0	0	No Centerline Work Required
44. Stake Clearing Limits	4	0	0	No Clearing in this Contract
45. Compute areas and Volumes	3	3	100	
46. Prepare Volume Sheets	2	2	100	Embankment Item. Experience Guideline not Met, Partial Credit Only
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing in this Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Included in Contract But No O.J.T. in this Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete placement, Pumphouse or Retaining Wall Construction	16	0	0	None of these Items in Contract

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None In Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Experience Guideline Not Met, Partial Credit Only
54. Inspect Bituminous Surfacing	10	10	100	Experience Guideline Not Met, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Experience Guideline Not Met, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	No Clearing
57. Inspect Utilities Relocation of New Utility Construction	3	3	100	Utility Relocation Necessary
58. Inspect Rest Area Sewage Facilities	19	0	0	Not A Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	No Permanent Signs
60. Inspect Structural Steel Erection	6	0	0	No Bridge Work in Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	No Bridge Work in Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	No Bridge Work in Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	No Bridge Work in Contract

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	No Bridge Work In Contract
63. Staking Curb and Gutter	9	9	100	All Tasks Applicable
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Lineal Feet to Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	No Culvert Work in this Contract
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	5	100	Very Limited Amount of This Task in Contract, Partial Credit Only
68. Staking Right-Of-Way	6	0	0	Right-Of-Way Already Defined
69. Staking Building and Rest Area Facilities	7	0	0	Not A Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	No Bridge Work in Contract
71. Staking Sign Locations	8	0	0	No Permanent Signing in this Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Automatic Ski on Bituminous Paver
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Automatic Ski Would Match Existing Pavement or Curb and Gutter
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not A Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0.00	No Bridge Work in Contract

CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Some Utility Relocation Necessary but None Requiring Staking
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	3	43	Tasks 1, 6 and 7 Apply
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	No Concrete Paving in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	No Bridge Work In Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	No Concrete Work in Contract
82. Inspect Grading	12	0	0	No Original Grading Work in Contract
83. Inspect Test Pile Driving	13	0	0	No Bridge Work in Contract
84. Structure Reference Points and Lines	8	0	0	No Bridge Work in Contract
85. Beam Elevations	3	0	0	No Bridge Work in Contract
86. Layout Deck Lines and Grades	5	0	0	No Bridge Work in Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in Contract
88. Compare and Adjust Deck Grades	3	0	0	No Bridge Work in Contract

**CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT NUMBER 3**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	10	83	Tasks 1, 2, 3, 6, 7, 8, 9, 10, 11 and 12 Apply
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Cpntracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	Not Related To Contract
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	225	29.72%	

**CONTROL SECTION AND JOB NUMBER HES 25072-28312A
RESEARCH PROJECT 3**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This Contract is an excellent example of a typical reconstruction contract. The contract's major emphasis is on widening an existing roadway to accommodate a left turn lane. Original surveying is not required. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications.**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Environmental Impact.**
With a road widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.
3. **Public Relations.**
High Traffic Volumes with corresponding curbside business is interrupted by on-going construction. Is it possible that Public Relations can be a work element?

CONTRACT DOLLAR VALUE \$149,932.85

**CONTROL SECTION AND JOB NUMBER IR 73111-28240A
RESEARCH PROJECT NUMBER 4**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Subbase Undercutting, Subbase (CIP)
2. Materials Weighing	9	2	22	Tasks 1 and 3 Apply
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	7	100	High Tensile Fence
7. Inspect Depth of Aggregate Base Course	4	4	100	Aggregate Base for Bituminous and Concrete
8. Inspect Tree and/or Stump Removal	5	0	0	None In Contract
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required in Contract
10. Reduce and Check Field Books	2	2	100	Used in Constructing Barrier Wall at M-46
11. Plot Cross Sections	2	2	100	Used in Constructing Barrier Wall at M-46
12. Check Weight Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets and Aggregate Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Some Drainage Corrections Required, Not Enough to Meet experience Guidelines, Partial Credit Only.
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Concrete Testing Required
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	This is a Major Bituminous Resurfacing Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	8000+ Square Yards of Concrete Base Course at Widening and at M-46

CONTROL SECTION AND JOB NUMBER IR 73111-28240A
 RESEARCH PROJECT NUMBER 4

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Aggregate Base in Contract
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	Included in Other Items
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	14	100	Large Amount of Guardrail Reconstruction in Contract
22. Inspect Sodding	7	7	100	8000 Square Yards of Sodding
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained on Existing Freeway
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not A Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Large Number of Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None In Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Slope Restoration in Contract
29. Erosion Control	5	5	100	Silt Fence, Sediment Traps, Hay or Straw Bales in Contract
29A. Inspect Pavement Patching	19	19	100	Large Amount in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Large Number of Barricades, Lighted Arrows and Temporary Signs

**CONTROL SECTION AND JOB NUMBER IR 73111-28240A
RESEARCH PROJECT NUMBER 4**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not A Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	13	100	Junction of M-46 and I-75
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Large Amount of Concrete Barrier and Valley Gutter
35B. Inspect Construction of Bituminous Shoulders	6	6	100	This is a Major Bituminous Resurfacing Contract
36. Fully Competent Rodman and Chainman	2	2	100	Survey Knowledge Required in Contract
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Complex Contract with Large Amount of Final Measurements Needed.
38. Setting Grades	4	4	100	Survey Knowledge Required on Contract

**CONTROL SECTION AND JOB NUMBER IR 73111-28240A
RESEARCH PROJECT NUMBER 4**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	1	25	Large Amount of Fence But All Along R.O.W. Line.
40. Staking Guardrail	6	6	100	Large Amount of Guardrail in Contract
41. Staking Line for Surfacing	3	3	100	Survey Knowledge Required in Contract
42. Taking Cross Sections	3	3	100	Survey Knowledge Required in Contract
43. Stake Centerline	4	0	0	Centerline Already Established
44. Stake Clearing Limits	4	0	0	Clearing Limits Already Defined
45. Compute areas and Volumes	3	3	100	Large Amount of Dirtwork in Contract
46. Prepare Volume Sheets	2	2	100	Large Amount of Dirtwork in Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Clearing Limits Already Defined
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	6	100	O.J.T. and E.E.O. both in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER IR 73111-28240A
 RESEARCH PROJECT NUMBER 4

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	14	100	Sign Bases in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Amount of Concrete Plant Control Required
54. Inspect Bituminous Surfacing	10	10	100	Large Amount of Bituminous Resurfacing
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	This is a Major Bituminous Resurfacing Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Clearing Already Defined
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	None Required
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	16	100	Some Permanent Signing in Contract
60. Inspect Structural Steel Erection	6	0	0	Not A Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER IR 73111-28240A
RESEARCH PROJECT NUMBER 4

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not A Bridge Contract
63. Staking Curb and Gutter	9	0	0	None In Contract
64. Staking Sewers and Drainage Structures	6	6	100	Drainage Items in Contract, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Not Enough Culverts To Meet Experience Guideline, Partial Credit Only
66. Staking Excavation and Embankment Grades	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
67. Cross Section and Slope Staking	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
68. Staking Right-Of-Way	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not A Bridge Contract
71. Staking Sign Locations	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER IR 73111-28240A
RESEARCH PROJECT NUMBER 4

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	5	100	None Required
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	23	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
82. Inspect Grading	12	12	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER IR 73111-28240A
 RESEARCH PROJECT NUMBER 4

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	427	56.41%	

**CONTROL SECTION AND JOB NUMBER IR 72111-28240A
RESEARCH PROJECT 4**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This Contract is a large, expensive concrete widening and bituminous resurfacing project. Most of the work elements apply. Some missing tasks are as follows:

1. **Operation of Changeable Message Signs.**
MDOT has recently started use these portable signs to present current driver information in high exposure areas. The operation of these signs involves computer programming, hydraulic operation, and detailed maintenance.
2. **Administration of Incentive/Disincentive Projects**
This contract involves a fairly new concept of contractor reward/penalty for completing stages of the project on/not on time. An understanding of the contract staging as well as to what work needs to be completed for these incentive/disincentive payments is essential.
3. **Interagency Cooperation**
Effective Interaction with the Michigan State Police, Emergency Motor Patrol and the Transportation Hotline were all required in this contract.
4. **Maintenance of Traffic**
This element is included in the work element system. However, this contract involves extensive lane shifting and traffic control Maneuvering, This elements importance should be increased

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Many Items of Work in This Contract Require This Testing
2. Materials Weighing	9	9	100	Many Items Paid By the Ton
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	7	100	Woven Wire Fence with Steel Posts
7. Inspect Depth of Aggregate Base Course	4	4	100	Class A Shoulders, Aggregate Base Bituminous
8. Inspect Tree and/or Stump Removal	5	5	100	34 Trees and 13 Stumps
9. Beginning Level Rodman	3	3	100	This Contract Closely resembles a Rural Freeway Project
10. Reduce and Check Field Books	2	2	100	
11. Plot Cross Sections	2	2	100	See Note Part 2
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Large Amount of Culvert, Sewer and Manhole Work
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Concrete Curb and Gutter and Concrete Driveway
15. Inspect Preparation for Bituminous Resurfacing	4	4	100	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	No Concrete Paving in This Contract

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	See Special Provision for Grading-Special
18. Density Testing	12	12	100	Large Amount of Density Testing in This Contract
19. Inspect Topsoil Removal	4	0	0	Included in Grading-Special
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	14	100	Large Amount of Guardrail in This Contract
22. Inspect Sodding	7	7	100	Experience Guideline Not Met, Partial Credit Only
23. Inspect Maintenance of Roadways on Detours, or Temporary Roads	4	4	100	Traffic Detour in Effect
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not A Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Large Number of Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	No Selective Clearing
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Experience Guideline Not Met, Partial Credit Only
29. Erosion Control	5	5	100	Check Dams, Sediment Traps, and Silt Fence
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrows, Barricades (Type II and Type III) and Flag Control

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not A Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	No Concrete Paving in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Large Amount of Curb and Gutter
35B. Inspect Construction of Bituminous Shoulders	6	6	100	Bituminous Shoulders in Contract
36. Fully Competent Rodman and Chainman	2	2	100	High Degree of Survey Knowledge Required for This Contract
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	
38. Setting Grades	4	4	100	High Degree of Survey Knowledge Required for This Contract

**CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	4	100	
40. Staking Guardrail	6	6	100	
41. Staking Line for Surfacing	3	3	100	May Have Been Necessary
42. Taking Cross Sections	3	4	100	
43. Stake Centerline	4	4	100	
44. Stake Clearing Limits	4	0	0	Clearing Not Really Necessary in This Contract
45. Compute areas and Volumes	3	3	100	
46. Prepare Volume Sheets	2	2	100	See Not In Section 2
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Clearing Not Really Necessary in This Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	6	100	E.E.O. and O.J.T. in This Contract
50. Set-Up file System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	All Pre-Cast Structures in This Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Amount of Concrete Work in Contract
54. Inspect Bituminous Surfacing	10	10	100	Large Amount of Bituminous Surfacing in Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Large Amount of Bituminous Surfacing in Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	3	100	Utility Relocation Necessary
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	13	81	Tasks 1, 2, 5, 7, and 8-16 Apply
60. Inspect Structural Steel Erection	6	0	0	Not A Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not A Bridge contract
63. Staking Curb and Gutter	9	9	100	Large Amount of Concrete Work in This Contract
64. Staking Sewers and Drainage Structures	6	6	100	Large Amount of Sewer Work in This Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Large Number of Culverts in This Contract
66. Staking Excavation and Embankment Grades	6	6	100	High Degree of Survey Knowledge Needed for This Contract
67. Cross Section and Slope Staking	5	5	100	High Degree of Survey Knowledge Needed for This Contract
68. Staking Right-Of-Way	6	6	100	High Degree of Survey Knowledge Needed for This Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not A Bridge Contract
71. Staking Sign Locations	8	0	0	No Overhead Signs
72. Staking Line and Grade for Portland Cement Concrete or Bituminous Paving	6	6	100	High Degree of Survey Knowledge Needed for This Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	High Degree of Survey Knowledge Needed for This Contract
74. Staking Sewage Facilities for Rest Areas	4	4	100	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND AFRR 79011-26071A
RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	5	100	High Degree of Survey Knowledge Needed For This Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	High Degree of Survey Knowledge Needed for This Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Some Aggregate Base Course, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	No Concrete Paving in Contract
82. Inspect Grading	12	12	100	Not A Bridge Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	High Degree of Survey Knowledge Needed for This Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND AFRR 79011-26071A
 RESEARCH PROJECT NUMBER 5

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	High Degree of Survey Knowledge Needed for This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	375	49.54%	

CONTROL SECTION AND JOB NUMBER AFRR 79011-26071A
RESEARCH PROJECT 5

PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM

This contract can be loosely categorized as an original rural freeway construction. Therefore, a large part of the work element system is applicable. Certain observations, however, can be made concerning this contract.

1. **Understanding Special Provisions/Supplemental Specifications.**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Computer Use (Survey III)**
Computer use (Survey III) for developing grades and generating earthwork volumes would be very useful in a contract of this nature. Greater emphasis should be placed on improving computer knowledge not only for surveying but for computer posting as well.
3. **Bituminous vs. Concrete**
A greater emphasis on bituminous construction as opposed to concrete road construction is observed in the review of the construction contracts to date. Maybe a greater emphasis should be placed on tasks such as bituminous paving, coldmilling or bituminous plant control.
4. **Environmental Issues**
This contract incorporates a number of environmental controls. However, hazardous waste management and control is an increasingly important issue in road construction and possibly should require greater attention.
5. **Public Relations**
Positive Interaction with the public and local government officials can lead to political support for increased or maintained funding. Possibly, a greater emphasis on courteous interaction with business owners and a greater effort to understand their needs could lead to a better image of MDOT. The point here is that maybe the work element system should not only address technical skills but social and business skills as well.
6. **Interagency Cooperation**
Today's construction contracts quite often require interaction with Michigan Department of Natural Resources, Federal Highway Administration, local drain commissioners, Department of Commerce, and local zoning restriction. Maybe, a technician in today's MDOT needs to have a more global understanding of the interaction of Regulatory Agencies.
7. **Construction Litigation**
In 1989, MDOT lost TORT liability cases amounting to approximately \$25 Million in lost revenue. Do construction Technicians need to be trained in recognizing a potential TORT situation?

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Freeway Signing Contract
2. Materials Weighing	9	0	0	Not A Bridge Contract
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Road Contract
5. Inspect Fence	7	0	0	Not A Road Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	Not A Road Contract
8. Inspect Tree and/or Stump Removal	5	0	0	Not A Road Contract
9. Beginning Level Rodman	3	2	66	Tasks 2 and 3 Apply for Building Cantilever Foundation
10. Reduce and Check Field Books	2	0	0	Not A Road Contract
11. Plot Cross Sections	2	0	0	Not A Road Contract
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	Not A Road Contract
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	Not A Road Contract
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Cantilever Foundation. Experience Guideline Not Met, Partial Credit Only
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	Not A Road Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	Not A Road Contract

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	Not A Road Contract
18. Density Testing	12	0	0	No Density Testing Required
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal Required
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	No Guardrail in Contract
22. Inspect Sodding	7	0	0	Not A Road Contract
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic maintained, No Detour or Temporary Roads
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not A Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	0	0	None in Contract
27. Inspect Selective Clearing	5	0	0	Not A Road Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None in Contract
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	3	75	Tasks 1, 3 and 4 Apply. Lane Closures During the Daytime Only

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not A Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	Not A Road Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	Not A Road Contract
35B. Inspect Construction of Bituminous Shoulders	6	0	0	Not a Road Contract
36. Fully Competent Rodman and Chainman	2	2	100	Minimal Requirements, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Minimal Requirements, Partial Credit Only
38. Setting Grades	4	4	100	Minimal Requirements for Cantilever Foundation, Partial Credit Only

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	Not A Road Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not A Road Contract
42. Taking Cross Sections	3	0	0	None Required
43. Stake Centerline	4	0	0	None Required
44. Stake Clearing Limits	4	0	0	Not A Road Contract
45. Compute areas and Volumes	3	0	0	None Required
46. Prepare Volume Sheets	2	0	0	None Required
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	None Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	Tasks 1, 2, 3 and 4 Apply. No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER I 76024-23756A
 RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	14	100	Minimal Requirements for Cantilever Foundation, Partial Credit Only
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Minimal Requirements for Cantilever Foundation, Partial Credit Only
54. Inspect Bituminous Surfacing	10	0	0	Not A Road Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	Not A Road Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	None Required
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	None Required
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	16	100	This Element Represents the Entire Contract
60. Inspect Structural Steel Erection	6	0	0	Not A Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	None Required
63. Staking Curb and Gutter	9	0	0	None Required
64. Staking Sewers and Drainage Structures	6	0	0	None Required
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	None Required
66. Staking Excavation and Embankment Grades	6	0	0	None Required
67. Cross Section and Slope Staking	5	0	0	None Required
68. Staking Right-Of-Way	6	0	0	None Required
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not A Bridge Contract
71. Staking Sign Locations	8	8	100	This Element Represents the Entire Contract
72. Staking Line and Grade for Portland Cement Concrete or Bituminous Paving	6	0	0	Not A Road Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not A Road Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	None Required
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	None Required
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	Not A Road Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Not A Road Contract
82. Inspect Grading	12	0	0	None Required
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not A Road Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT NUMBER 6

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not A Road Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	Minimal Requirements
93. Supervision-Inspection Personnel	1	1	100	Minimal Requirements
TOTALS	757	107	14.13%	

CONTROL SECTION AND JOB NUMBER I 76024-23756A
RESEARCH PROJECT 6

PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM

This contract is relatively simple to administer. It is difficult to determine any tasks that are missing. Possibly the following:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Chemical Weed Spray Contract Involving Two Pay Items
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
 RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	0	0	
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse on Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
 RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	0	0	
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	00	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

**CONTROL SECTION AND JOB NUMBER MR OWS 6-M00118
RESEARCH PROJECT NUMBER 7**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	35	4.62%	

**CONTROL SECTION AND JOB NUMBER MR OWS-6A-M00118
RESEARCH PROJECT 7**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is non-standard and consists of furnishing and applying herbicide to control broad-leaved weeds on specified highway routes. Missing tasks are as follows:

1. **Checking herbicides for Conformance to EPA Standards.**
2. **Checking Mix Procedures and Monitoring Herbicide Application.**
3. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	District Wide Pavement Marking Contract
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

**CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	5	63	Tasks 1, 4, 5, 6 and 8 Apply
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	0	0	None in Contract Except Minor Traffic Control Devices

**CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chairman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

**CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30658A
 RESEARCH PROJECT NUMBER 8

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	0	0	
72. Staking Line and Grade for Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30658A
 RESEARCH PROJECT NUMBER 8

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

**CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT NUMBER 8**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	40	5.28%	

**CONTROL SECTION AND JOB NUMBER M 84906-30658A
RESEARCH PROJECT 8**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a non-typical MDOT contract. The entire emphasis of this contract is the removal and replacement of pavement marking. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Coldplastic Pavement Marking**
The process for installing pavement markings is covered by a special provision. However, the installation process is not included in the work element system.

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
2. Materials Weighing	9	0	0	None In Contract
3. Inspect Protective Treatment	2	2	100	Included in Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	6	100	Included in Contract
5. Inspect Fence	7	0	0	None in Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None in Contract
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	0	0	None in Contract
10. Reduce and Check Field Books	2	0	0	None in Contract
11. Plot Cross Sections	2	0	0	None in Contract
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	None in Contract
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	None in Contract
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Replacement of Bridge Deck
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	None in Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	None in Contract

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	None In Contract
18. Density Testing	12	8	66	Tasks 1, 2, 7, 8, 9, 10, 11 and 12 Apply, Partial Credit Only
19. Inspect Topsoil Removal	4	0	0	None In Contract
20. Inspect Structure Joints and Cleanup	5	5	100	Included in Bridge Work
21. Inspect Guardrail	14	14	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
22. Inspect Sodding	7	0	0	None in Contract
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
25. Inspect Pile Driving - Production	19	0	0	None in Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None in Contract
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Items Required

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not A Landscape Project
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None In Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	None in Contract
35B. Inspect Construction of Bituminous Shoulders	6	0	0	None in Contract
36. Fully Competent Rodman and Chainman	2	0	0	Not Required in This Contract
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	0	0	Not Required in This Contract

**CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	None in Contract
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	0	0	Not Required in This Contract
42. Taking Cross Sections	3	0	0	Not Required in This Contract
43. Stake Centerline	4	0	0	Not Required in This Contract
44. Stake Clearing Limits	4	0	0	Not Required in This Contract
45. Compute areas and Volumes	3	0	0	Not Required in This Contract
46. Prepare Volume Sheets	2	0	0	Not Required in This Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Not Required in This Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	No Substructure Work in Contract

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Several Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	0	0	None in Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	None in Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	None in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	None in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None in Contract
60. Inspect Structural Steel Erection	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
61. Inspect Dewatering Operations and Cofferdams	7	0	0	None in Contract
61A. Inspect Bridge Deck Repair Overlays	22	22	100	This Project Involves Deck Overlays
61B. Inspect Field Painting of Structural Steel	8	8	100	This Project Involves Field Painting

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not Required in This Contract
63. Staking Curb and Gutter	9	0	0	Not Required in This Contract
64. Staking Sewers and Drainage Structures	6	0	0	Not Required in This Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required in This Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in This Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in This Contract
68. Staking Right-Of-Way	6	0	0	Not Required in This Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not Required in This Contract
71. Staking Sign Locations	8	0	0	Not Required in This Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Not Required in This Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in This Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not Required in This Contract

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in This Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	Not Required in This Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	Not Required in This Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Not Required in This Contract
82. Inspect Grading	12	0	0	Not Required in This Contract
83. Inspect Test Pile Driving	13	0	0	Not Required in This Contract
84. Structure Reference Points and Lines	8	0	0	Not Required in This Contract
85. Beam Elevations	3	0	0	Not Required in This Contract
86. Layout Deck Lines and Grades	5	0	0	Not Required in This Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in This Contract
88. Compare and Adjust Deck Grades	3	3	100	Required for Latex Resurfacing

CONTROL SECTION AND IR 25131-29597A
RESEARCH PROJECT NUMBER 9

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required in This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	163	21.53%	

**CONTROL SECTION AND JOB NUMBER IR 25131-29597A
RESEARCH PROJECT 9**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is a fairly sophisticated bridge contract involving some new techniques. Missing Tasks are as follows:

1. **Environmental Compliance**
The proper sandblasting and disposal of spent material is of extreme importance. This and other environmental issues need to be emphasized.
2. **Hydrodemolition**
This process involves the use of high pressure water to remove deteriorated concrete from the bridge deck. This is a new concept which is considered very successful.
3. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

**CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
RESEARCH PROJECT NUMBER 10**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Remove and Replace Railroad Crossing Job
2. Materials Weighing	9	0	0	Not A Bridge Contract
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	None in Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Minimal Work, Partial Credit Only
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	51 Square Yards of Concrete Base Course, Partial Credit Only.
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
 RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Some Coordination with Railroad Required
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Some Slope Restoration, Partial Credit Only
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Type II and III Barricades, Partial Credit Only

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
 RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
 RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	67	E.E.O. in Contract, But no O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Not Enough Work to Meet Experience Guideline, Partial Credit Only.
54. Inspect Bituminous Surfacing	10	0	0	Visual Inspection of Bituminous Work
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	Visual Inspection of Bituminous Work
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	0	0	
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
 RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
 RESEARCH PROJECT NUMBER 10

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	87	11.49%	

**CONTROL SECTION AND JOB NUMBER RRP 79031-28415A
RESEARCH PROJECT 10**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This Contract is for a railroad upgrade and required minimal inspection and surveying knowledge. Possible Missing tasks are as follows:

1. **Coordination with Railroad Workforce**
The installation of the railroad crossing was done by railroad personnel. This installation had to be coordinated with the MDOT approach work.
2. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	District Wide Pavement Marking Contract
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation for Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	5	63	Tasks 1, 4, 5, 6 and 8 Apply
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	0	0	None in Contract Except Minor Traffic Control Devices

CONTROL SECTION AND JOB NUMBER M 84906-30659A
RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and Q.J.T.	6	4	66	E.E.O. in This Contract But No Q.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	0	0	
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course or Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER M 84906-30659A
 RESEARCH PROJECT NUMBER 11

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	40	5.28%	

**CONTROL SECTION AND JOB NUMBER M 84906-30659A
RESEARCH PROJECT 11**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a non-typical MDOT contract. The entire emphasis of this contract is the removal and replacement of pavement marking. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

2. **Coldplastic Pavement Marking**
The process for installing pavement markings is covered by a special provision. However, the installation process is not included in the work element system.

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	This is a Major Rubblizing and Concrete Paving Contract
2. Materials Weighing	9	1	11	Task 3 Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge contract
5. Inspect Fence	7	7	100	Large Amount of Fence Work in Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Large Amount of Aggregate Base in Contract
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	3	100	Extensive Survey Knowledge Required
10. Reduce and Check Field Books	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
11. Plot Cross Sections	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets and Aggregate Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Very Large Amount of Concrete Work in Contract
15. Inspect Preparation for Bituminous Resurfacing	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	This is a Major Concrete Paving Contract

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Shaping of Aggregate Base Required
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	None In Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	14	100	Large Amount of Guardrail Work In Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	4	100	Temporary Roads Required
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not A Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Slope Restoration
29. Erosion Control	5	5	100	Geotextile Silt Fence and Sediment Traps
29A. Inspect Pavement Patching	19	0	0	Complete Rubblization Instead of Joint Repair
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Extensive Use of Traffic Control Devices

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	13	100	This is a Major Portland Cement Concrete Project
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	None In Contract
35B. Inspect Construction of Bituminous Shoulders	6	0	0	None In Contract
36. Fully Competent Rodman and Chairman	2	2	100	Extensive Survey Knowledge Required
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Required Full Measurement
38. Setting Grades	4	4	100	Needed For Numerous Items

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	4	100	Required in Contract
40. Staking Guardrail	6	6	100	Required in Contract
41. Staking Line for Surfacing	3	3	100	Portland Cement Concrete Paving
42. Taking Cross Sections	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Numerous Areas and Volumes Required
46. Prepare Volume Sheets	2	0	0	Not Required in contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Not Required in Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	6	100	O.J.T. and E.E.O. Required
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	16	100	Very Minor Amount of Work, Partial Credit Only

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	14	100	Minor Amount of Work, Partial Credit Only
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Amount of Concrete Work in Contract
54. Inspect Bituminous Surfacing	10	10	100	Some Bituminous Work, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Some Bituminous Work, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	3	100	Minor Amount of Work, Partial Credit Only
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None in Contract
60. Inspect Structural Steel Erection	6	0	0	Not A Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not Required in Contract
63. Staking Curb and Gutter	9	0	0	Not Required in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Required in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	6	100	Some R.O.W. Staking May Have Been Required, Partial Credit Only
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not A Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	6	100	Required for Portland Cement Concrete Paving
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Aggregate Base and Bituminous Base in Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in This Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Many Culverts and Some Drainage Structures, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Aggregate Base Course
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	23	100	This is a Large Resurfacing Contract
82. Inspect Grading	12	0	0	Not Any Original Grade Work
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Some Reestablishment May Have Been Necessary, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT NUMBER 12

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Some Field Book Layout, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	Not Required In This Contract
92. Supervision-Staking Crews	1	1	100	Required in Contract
93. Supervision-Inspection Personnel	1	1	100	Required In Contract
TOTALS	757	341	45.05%	

**CONTROL SECTION AND JOB NUMBER FUR 09042-28170A
RESEARCH PROJECT 12**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

1. Special Provisions/Supplemental Specifications
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. Pavement Ride Quality and Bump Grinding
This Contract involves a Pavement Ride Index which is tied to a cash incentive for the contractor. The observation and computation of results for this item is of significant importance to this contract.
3. Fast-Track Concrete Paving
This contract employs a relatively new procedure for concrete paving. This procedure seeks to accelerate the paving operation in order to reduce lane closure time.
4. Operation of Changeable/Portable Message Sign
MDOT has recently started to use these portable signs to present current driver information in high traffic exposure areas. The operation of these signs includes computer programming, hydraulic operation and detailed maintenance.
5. SHARP Program Implementation
The Strategic Highway Research Program partially funded this contract. This program involved some test strip installation in order to study concrete pavement.
6. Coordination with Agencies Other Than MDOT
This Contract Was of Significant dollar value and involved work on a major section of Highway. Successful interaction with County Drain Commissioners, Various Press Agencies and The Michigan Department of Natural Resources was of significant importance to this contract.

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Subgrade Undercutting and Sewer Backfill
2. Materials Weighing	9	1	11	Task 3 Only
3. Inspect Protective Treatment	2	2	100	Bridge Widening
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not Required in This Contract
5. Inspect Fence	7	0	0	None In Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None In Contract
8. Inspect Tree and/or Stump Removal	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required
10. Reduce and Check Field Books	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
11. Plot Cross Sections	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Large Amount of This Type of Work in Contract
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items in Contract
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Large Amount of Bituminous Work in Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Widening On Both Sides
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	None Required
20. Inspect Structure Joints and Cleanup	5	0	0	None Required
21. Inspect Guardrail	14	14	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
22. Inspect Sodding	7	0	0	None Required
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	4	100	May Have Required Dust Control on Maintained Road, Partial Credit Only
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not Required in this Contract
25. Inspect Pile Driving - Production	19	0	0	None In Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items
27. Inspect Selective Clearing	5	5	100	Small Amount of Clearing in Contract, Partial Credit Only
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Slope Restoration
29. Erosion Control	5	5	100	Sediment Traps and Hay Bales
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Items in Contract

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
 RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscaping Project
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None In Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Large Amount of this Type of Work in Contract
35B. Inspect Construction of Bituminous Shoulders	6	0	0	None in Contract
36. Fully Competent Rodman and Chainman	2	2	100	Survey Knowledge Required
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Numerous Grades Required

**CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT NUMBER 13**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	None in Contract
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
45. Compute areas and Volumes	3	3	100	Numerous Areas and Volumes Need To Be Computed
46. Prepare Volume Sheets	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	6	100	E.E.O. and O.J.T. Both in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	16	100	Required for Bridge Widening

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
 RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Number of Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Bituminous Resurfacing Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Bituminous Resurfacing in Contract
56. Identify, Measure, and Compute Clearing Limits	5	5	100	Minor Amount of Clearing in Contract, Partial Credit Only
57. Inspect Utilities Relocation of New Utility Construction	3	3	100	Utility Relocation Necessary
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None In Contract
60. Inspect Structural Steel Erection	6	0	0	None in Contract
61. Inspect Dewatering Operations and Cofferdams	7	7	100	Cofferdam Included in Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Bridge Widening Only
61B. Inspect Field Painting of Structural Steel	8	0	0	None in Contract

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	9	82	Tasks 1, 2, 3, 4, 5, 6, 9, 10 and 11 Apply. No Piling in Contract
63. Staking Curb and Gutter	9	9	100	Large Amount in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Large Amount in Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required on Contract
66. Staking Excavation and Embankment Grades	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
67. Cross Section and Slope Staking	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	5	100	Sheet Piling in Contract
71. Staking Sign Locations	8	0	0	None in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Not Required in Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	7	100	Necessary for Bridge Widening

CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
 RESEARCH PROJECT NUMBER 13

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Required in Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	Not Required in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	29	100	Required for Bridge Widening
81. Inspect Portland Cement Concrete Paving	23	23	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not Required in Contract
84. Structure Reference Points and Lines	8	8	100	Bridge Widening
85. Beam Elevations	3	0	0	Not Required in Contract
86. Layout Deck Lines and Grades	5	5	100	Bridge Widening
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Some Reestablishment Needed, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Bridge Widening

**CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT NUMBER 13**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	409	54.03%	

**CONTROL SECTION AND JOB NUMBER AFUR 25072-15197A
RESEARCH PROJECT 13**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract combines bridge widening with a road widening into one contract. Therefore, a large portion of the work element system applies. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Interagency Cooperation**
Cooperation with city of Flint personnel is essential to administering this contract. This contract is 22.66% funded by the city of Flint.
3. **Coordination with Industrial Complexes**
This project passes through and industrial corridor. Possibly cooperating with those industries for traffic management should be emphasized.

CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Sand Backfill in Sewer Trenches
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Aggregate Base Bituminous and Aggregate Base Concrete
8. Inspect Tree and/or Stump Removal	5	5	100	39 Trees Scheduled For Removal
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Sewer and Drainage Structures in Contract
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Large Amount of Bituminous Work in Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	5000 Square Yards of Concrete Base Course

CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Widening Project Involves Grading and Shaping
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	0	0	None in Contract
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
29. Erosion Control	5	5	100	Hay Bales only, Partial Credit
29A. Inspect Pavement Patching	19	19	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrows, Type II and Type III Barricades

CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCO Paving	13	0	0	Concrete Base Course Only
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Large Amount of Curb and Gutter in Contract
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Automatic Ski on Bituminous Paver
42. Taking Cross Sections	3	0	0	None Required
43. Stake Centerline	4	0	0	Centerline Already Established
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Sufficient Areas and Volumes Required
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Fairly Large Amount of Bituminous Surfacing in Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Fairly Large Amount of Bituminous Surfacing in Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	3	100	Railroad Crossing Improvements Required, Partial Credit Only
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	13	81	Tasks 1, 2, 5, 7 through 16 Apply
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Large Amount of Curb and Gutter in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Large Amount of Sewer Work in Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	5	63	Tasks 1, 4, 5, 7 and 8 Apply
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Automatic Ski on Bituminous Paver
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Aggregate Base and Concrete Base in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Concrete Base Course Only
82. Inspect Grading	12	12	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT NUMBER 14**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required For This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	298	39.37%	

**CONTROL SECTION AND JOB NUMBER JFU 76041-26709A
RESEARCH PROJECT 14**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a medium scale urban widening project involving average road construction complexity. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Interagency Planning**
Cooperation and Joint planning with a railroad company is of importance to this contract. Also cooperation and interaction with the public is necessary.
3. **Machine Grading/Trenching/Slope Restoration**
These are fairly new items of work which combine numerous old pay items. They are usually covered by Special Provisions. Possibly, they should be identified as elements individually.
4. **Urban Bituminous Resurfacing**
Bituminous resurfacing in an urban setting requires a high degree of knowledge. Possibly the importance of these element should be enhanced.
5. **Cold Plastic and Painted Pavement Markings**
These items are not specifically covered by the work element system.

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments	
1. Gradation Testing	6	0	0	Freeway Sign Upgrading	
2. Materials Weighing	9	0	0		
3. Inspect Protective Treatment	2	0	0		
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0		
5. Inspect Fence	7	0	0		
7. Inspect Depth of Aggregate Base Course	4	0	0		
8. Inspect Tree and/or Stump Removal	5	0	0		
9. Beginning Level Rodman	3	3	100		May Be a Minor Amount of Grade Work For Breakaway Columns, Partial Credit Only
10. Reduce and Check Field Books	2	0	0		
11. Plot Cross Sections	2	0	0		
12. Check Weigh Tickets and Accumulation Sheets	2	0	0		
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0		
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0		
15. Inspect Preparation For Bituminous Resurfacing	4	0	0		
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0		

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
 RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Temporary Lane Closures Only
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	5	63	Tasks 1, 4, 5, 6 and 8 Apply.
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrow Boards, Type II Barricades and Temporary Signs

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chairman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
 RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	16	100	All Tasks Apply. Column Work Included in Contract.
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	8	100	All Tasks Apply
72. Staking Line and Grade for Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER IR 09035-24257A
 RESEARCH PROJECT NUMBER 15

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

**CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT NUMBER 15**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	Minor Amount Required, Partial Credit Only
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	74	9.78%	

**CONTROL SECTION AND JOB NUMBER IR 09035-24257A
RESEARCH PROJECT 15**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a small non-typical MDOT contract involving the replacement of existing permanent signs. The construction management and technical knowledge needed to complete this contract is minimal. Missing tasks are as follows:

1. Understanding Special Provisions/Supplemental Specifications

This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

**CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT NUMBER 16**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Bituminous Shoulder Reconstruction Contract
2. Materials Weighing	9	2	22	Task 3 and 7 Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None Required in Contract
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	0	0	No Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Class A Shoulders and Bituminous Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	None in Contract
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	None Required For This Contract
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Very Minor Amount, Partial Credit Only
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	None Required in Contract

CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT NUMBER 16

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	None Required in Contract
18. Density Testing	12	6	50	Tasks 1 and 8 Through 12 Only
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	0	0	None in Contract
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	0	0	None Required on Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None Required in Contract
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
 RESEARCH PROJECT NUMBER 16

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCP Paving	13	0	0	None in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	Not Required in Contract
35B. Inspect Construction of Bituminous Shoulders	6	6	100	This Element Represents The Entire Job
36. Fully Competent Rodman and Chainman	2	0	0	Not Required in Contract
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	Not Required in Contract Only
38. Setting Grades	4	0	0	Not Required in Contract

**CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT NUMBER 16**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	0	0	Not Required in Contract
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
 RESEARCH PROJECT NUMBER 16

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	Not Required in This Contract
54. Inspect Bituminous Surfacing	10	0	0	No Surfacing Work, All Bituminous Shoulders
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Required For Bituminous Shoulders
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None in Contract
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
 RESEARCH PROJECT NUMBER 16

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades, Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	0	0	Not Required in This Contract
64. Staking Sewers and Drainage Structures	6	0	0	Not Required For This Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	None in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required For This Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Not Required in Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in this Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT NUMBER 16**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	Not Required in This Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	Not Required in This Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	None in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in This Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT NUMBER 16**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required For This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	70	8.09%	

**CONTROL SECTION AND JOB NUMBER MSH 44031-30587A
RESEARCH PROJECT 16**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is relatively easy to administer. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Maintaining Traffic**
This contract includes language which provides some limitations as to the contractors work hours. Possibly, understanding traffic restrictions should be a work element.

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Major Joint Repair, Bituminous Resurfacing and Structure Painting Contract
2. Materials Weighing	9	9	100	Aggregate Base and Class A Shoulders
3. Inspect Protective Treatment	2	2	100	Very Small Amount, Partial Credit Only
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not Required in This Contract
5. Inspect Fence	7	7	100	Large Amount of Fence Work in Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Aggregate Base Concrete and Aggregate Base Bituminous
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	3	100	Extensive Survey Knowledge Required
10. Reduce and Check Field Books	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
11. Plot Cross Sections	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
12. Check Weight Tickets and Accumulation Sheets	2	2	100	Aggregate Base and Bituminous Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items in Contract
15. Inspect Preparation for Bituminous Resurfacing	4	4	100	This is a Major Bituminous Resurfacing Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Large Amount of Concrete Paving in Contract

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	None Required
20. Inspect Structure Joints and Cleanup	5	0	0	None Required
21. Inspect Guardrail	14	14	100	Large Amount of Guardrail Work in Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not Required in this Contract
25. Inspect Pile Driving - Production	19	0	0	None In Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items
27. Inspect Selective Clearing	5	0	0	Not Required in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Large Amount of Slope Restoration in Contract
29. Erosion Control	5	5	100	Sediment Traps and Hay Bales
29A. Inspect Pavement Patching	19	19	100	Large Amount of Patching in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Items in Contract

**CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscaping Project
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None In Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	None Required in Contract
35B. Inspect Construction of Bituminous Shoulders	6	6	100	Large Amount of Bituminous Shoulders in Contract
36. Fully Competent Rodman and Chainman	2	2	100	Extensive Survey Knowledge Required
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Numerous Grades Required

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	4	100	May Be Required
40. Staking Guardrail	6	6	100	Required in Contract
41. Staking Line for Surfacing	3	3	100	Required in Contract
42. Taking Cross Sections	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Not Required in Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	6	100	E.E.O. and O.J.T. Both in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not Required in Contract

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
 RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Number of Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Major Bituminous Resurfacing Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Major Bituminous Resurfacing Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None In Contract
60. Inspect Structural Steel Erection	6	0	0	None in Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not Required in Contract
61A. Inspect Bridge Deck Repair Overlays	22	22	100	Major Deck Overlay Included in Contract
61B. Inspect Field Painting of Structural Steel	8	8	100	Bridge Painting Included in Contract

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades, Foundation Piles, and Structure Excavation Limits	11	0	0	Not Required in Contract
63. Staking Curb and Gutter	9	0	0	Not Required in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
66. Staking Excavation and Embankment Grades	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
67. Cross Section and Slope Staking	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not Required in Contract
71. Staking Sign Locations	8	0	0	None in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not Required in Contract

CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	29	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
81. Inspect Portland Cement Concrete Paving	23	0	0	Not Required in Contract
82. Inspect Grading	12	12	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
83. Inspect Test Pile Driving	13	0	0	Not Required in Contract
84. Structure Reference Points and Lines	8	0	0	Not Required in Contract
85. Beam Elevations	3	0	0	Not Required in Contract
86. Layout Deck Lines and Grades	5	5	100	Deck Resurfacing Included in Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in Contract
88. Compare and Adjust Deck Grades	3	3	100	Deck Resurfacing Included in Contract

**CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT NUMBER 17**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	383	50.59%	

**CONTROL SECTION AND JOB NUMBER IR 73171-28239A
RESEARCH PROJECT 17**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a high priority MDOT contract. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Hydrodemolition**
This process involves the use of high pressure water to remove deteriorated concrete from the bridge deck. This is a new concept which is considered very successful.
3. **Environmental Compliance**
The proper sandblasting and disposal of spent material is of extreme importance. This and other environmental issues need to be emphasized.
4. **Incentive/Disincentive Contract Administration**
This contract is a high priority contract which either allocates a bonus or penalty depending on the contractors speed in completing the work. This concept has been in use for about two years.
5. **Portable Message Sign Operation and Programming**
This contract utilizes these large portable message signs to display driver information. The proper operation and programming of these signs is essential.

CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
 RESEARCH PROJECT NUMBER 18

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Non-Freeway Sign Upgrading
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

**CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Temporary Lane Closures Only
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	5	63	Tasks 1, 4, 5, 6 and 8 Apply. Insufficient Types of Measurements to Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Temporary Signs and Lighted Arrow Boards But No Barricades, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Insufficient Items To Meet Experience Guidelines, Partial Credit Only
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
 RESEARCH PROJECT NUMBER 18

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	0	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	Tasks 1, 2, 3 and 4 Apply, Only E.E.O. on this Job
50. Set-Up File System Within Prescribed Guidelines	3	3	100	
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, major Headwalls, Major sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	
59. Inspect Permanent Traffic Control Signs and Devices	16	13	81	Tasks 1, 2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 Apply. No Column or Truss Work in this Contract
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

**CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	4	50	Tasks 4, 5, 7 and 8 Apply. No New Signs That Require Trusses in this Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking U t i l i t y Relocation or New U t i l i t y Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, D r a i n a g e Structures, S t r u c t u r e s Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. B e a m Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT NUMBER 18

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	63	8.32%	

**CONTROL SECTION AND JOB NUMBER FRR 56021-28668A
RESEARCH PROJECT 18**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a small non-standard MDOT contract involving the replacement of existing permanent signs. The construction management and inspection knowledge needed to complete this contract is minimal. Missing tasks identified are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract contains numerous special provisions and supplemental specifications. The understanding of these items are essential to the successful construction management of this contract.

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Remove and Replace Approach Pavement to Railroad Crossing
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	0	0	No Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	None in Contract
14. Test Concrete Quality Control- Air, Slump, Temperature and Test Beams	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	None in Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Minimal Concrete Base Course, Partial Credit Only

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
 RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	12	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	0	0	None in Contract
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Part of Slope Restoration, Partial Credit Only
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrows, Type II and Type III Barricades and Flag Control

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	0	0	Not Required in Contract
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	0	0	Not Required in Contract

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	0	0	Not Required in Contract
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
54. Inspect Bituminous Surfacing	10	10	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None in Contract
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
64. Staking Sewers and Drainage Structures	6	0	0	Not Required For This Contract
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	None in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required For This Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Not Required in Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in this Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking U t i l i t y Relocation or New U t i l i t y Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, D r a i n a g e Structures, S t r u c t u r e s Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	Not Required in This Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	None in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. B e a m Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in This Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT NUMBER 19**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required For This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	177	23.38%	

**CONTROL SECTION AND JOB NUMBER RRP 73033-28411A
RESEARCH PROJECT 19**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a typical railroad approach reconstruction contract. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Coordination with Railroad Company**
CSX will improve this crossing. Coordinating MDOT approach work with CSX upgrading work would be highly important.

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Subbase Loose Measure
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
8. Inspect Tree and/or Stump Removal	5	0	0	None in Contract
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Bituminous Resurfacing Part of This Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	None in Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	0	0	None in Contract
23. Inspect Maintenance of Roadways on Detours, on Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Part of Slope Restoration, Partial Credit Only
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	19	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrows, Type II and Type III Barricades and Flag Control

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
 RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	2	100	Survey Knowledge Required
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Required in Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Numerous Areas and Volumes
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Bituminous Resurfacing Part of Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Bituminous Resurfacing Part of Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	13	81	Tasks 1, 2, 5, 7 through 16 Apply
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Curb and Gutter in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	None in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	5	63	Tasks 1, 4, 5, 7 and 8 Apply
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Not Required in Contract
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	4	57	Tasks 1, 5, 6 and 7 Apply
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	None in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT NUMBER 20

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required For This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	257	33.95%	

**CONTROL SECTION AND JOB NUMBER HES 73062-24290A
RESEARCH PROJECT 20**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a typical widening and resurfacing contract. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Coordination With Business Owners**
A contract of this type can cause roadside owners to lose business. Cooperating and understanding owners concerns could be considered a work element.

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Traffic Signal Upgrade Contract
2. Materials Weighing	9	0	0	
3. Inspect Protective Treatment	2	0	0	
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	
5. Inspect Fence	7	0	0	
7. Inspect Depth of Aggregate Base Course	4	0	0	
8. Inspect Tree and/or Stump Removal	5	0	0	
9. Beginning Level Rodman	3	0	0	
10. Reduce and Check Field Books	2	0	0	
11. Plot Cross Sections	2	0	0	
12. Check Weigh Tickets and Accumulation Sheets	2	0	0	
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0	
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0	
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
 RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	0	0	
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	0	0	

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
 RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	12	75	Tasks 1, 2, 5, 7 and 9 through 16 Apply
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

**CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT NUMBER 21**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
 RESEARCH PROJECT NUMBER 21

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	0	0	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	59	7.79%	

**CONTROL SECTION AND JOB NUMBER FUG 84906-31156A
RESEARCH PROJECT 21**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract involves extensive traffic signal upgrading with some permanent signing upgrading. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Traffic Signal Installation**
This task would involve basic electrical and traffic signal operation skills.

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
 RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	None Required in Contract
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None Required in Contract
8. Inspect Tree and/or Stump Removal	5	0	0	None Required in Contract
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weight Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	This is a Bituminous Resurfacing Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Some Concrete Base Course, Partial Credit Only

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	6	50	Tasks 1 and 8 through 12 for Bituminous Testing
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None Required in Contract
29. Erosion Control	5	0	0	None Required in Contract
29A. Inspect Pavement Patching	19	0	0	None Required in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Devices in Contract

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	Concrete Base Course Only
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chairman	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Automatic Ski on Bituminous Paver
42. Taking Cross Sections	3	0	0	None Required
43. Stake Centerline	4	0	0	Centerline Already Established
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT NUMBER 22**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Fairly Large Amount of Bituminous Surfacing in Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Fairly Large Amount of Bituminous Surfacing in Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	Not Required in Contract
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
 RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
64. Staking Sewers and Drainage Structures	6	4	66	Tasks 1, 2, 3 and 6 May Have Been Required
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Automatic Ski on Bituminous Paver
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT NUMBER 22**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	Not Required in Contract
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	Not Required in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Not Required in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
 RESEARCH PROJECT NUMBER 22

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	196	25.89%	

**CONTROL SECTION AND JOB NUMBER JFUR 25072-26868A
RESEARCH PROJECT 22**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is a typical widening and resurfacing contract. One notable exception is that the contract is 61.05% funded by the city of Flint. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Interagency Cooperation**
Cooperation with city of Flint personnel is essential to administering this contract. This contract is 61.05% funded by the city of Flint.
3. **Environmental Impact**
With an Urban widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.

CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None Required in Contract
8. Inspect Tree and/or Stump Removal	5	0	0	None Required in Contract
9. Beginning Level Rodman	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	This is a Bituminous Resurfacing Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Some Concrete Base Course, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	Not Required in Contract
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
29. Erosion Control	5	0	0	None Required in Contract
29A. Inspect Pavement Patching	19	19	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Devices in Contract

CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	Not Required in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	4000 LFT of Curb and Gutter
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Automatic Ski on Bituminous Paver
42. Taking Cross Sections	3	0	0	None Required
43. Stake Centerline	4	0	0	Centerline Already Established
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Sufficient Area and Volume Computations
46. Prepare Volume Sheets	2	0	0	No Earthwork in Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Fairly Large Amount of Bituminous Surfacing in Contract
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Fairly Large Amount of Bituminous Surfacing in Contract
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	Very Minor Amount of Sign Work
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Large Amount of Curb and Gutter in Project
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	1	13	Task 7 Only
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Automatic Ski on Bituminous Paver
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Controlled by Curb and Gutter
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking U t i l i t y Relocation or New U t i l i t y Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, D r a i n a g e Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	Not Required in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Re steel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Not Required in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. B e a m Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT NUMBER 23**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required in Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	233	30.78%	

**CONTROL SECTION AND JOB NUMBER M 25081-26303A
RESEARCH PROJECT 23**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a typical urban widening and resurfacing contract. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Interagency Cooperation**
Cooperation with city of Flint personnel is essential to administering this contract. This contract is 9.11% funded by the city of Flint.
3. **Environmental Impact**
With an Urban widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.
4. **Cooperation With Business Owners**
A Road widening project has an impact on local businesses.

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
 RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	None Required in Contract
8. Inspect Tree and/or Stump Removal	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	Not a Bituminous Resurfacing Contract
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Some Concrete Base Course, Partial Credit Only

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
 RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	6	50	Tasks 1 and 8 through 12 for Bituminous Testing
19. Inspect Topsoil Removal	4	0	0	Included in Trenching
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None Required in Contract
29. Erosion Control	5	0	0	None Required in Contract
29A. Inspect Pavement Patching	19	0	0	None Required in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Devices in Contract

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
 RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	13	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER HES 73062-26872A
RESEARCH PROJECT NUMBER 24**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Automatic Ski on Bituminous Paver
42. Taking Cross Sections	3	0	0	None Required
43. Stake Centerline	4	0	0	Centerline Already Established
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up file System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
 RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Very Limited Bituminous Work, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Very Limited Bituminous Work, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	Not Required in Contract
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	Not Required in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Grade Controlled By Existing Roadway
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Not Required in Contract
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	4	57	Tasks 1, 5, 6 and 7 Apply
78. Compute and Check Aggregate Base Course or Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	Not Required in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER HES 73062-26872A
RESEARCH PROJECT NUMBER 24

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required in Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	215	28.40%	

**CONTROL SECTION AND JOB NUMBER HES 73062-26872A
RESEARCH PROJECT 24**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is a relatively simple widening job. It is doubtful that any element would receive full credit. Missing Tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Interagency Cooperation**
Cooperation with city of Saginaw personnel is essential to administering this contract. This contract is 1.19% funded by the city of Saginaw.
3. **Environmental Impact**
With an Urban widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.
4. **Cooperation With Business Owners**
A Road widening project has an impact on local businesses.

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	0	0	Not Required in Contract
2. Materials Weighing	9	1	11	Task 3 Applies Only
3. Inspect Protective Treatment	2	0	0	Not A Bridge Contract
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Not A Bridge Contract
5. Inspect Fence	7	0	0	Not Required in This Contract
7. Inspect Depth of Aggregate Base Course	4	0	0	Not Required in This Contract
8. Inspect Tree and/or Stump Removal	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required For This Contract
10. Reduce and Check Field Books	2	0	0	None Required in This Contract
11. Plot Cross Sections	2	0	0	None Required in This Contract
12. Check Weigh Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets Only
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items
15. Inspect Preparation For Bituminous Resurfacing	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0	None in Contract

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	12	100	Full Range of Density Tests Required
19. Inspect Topsoil Removal	4	0	0	No Topsoil Removal in Contract
20. Inspect Structure Joints and Cleanup	5	0	0	Not A Bridge Contract
21. Inspect Guardrail	14	0	0	None in Contract
22. Inspect Sodding	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Traffic Maintained With No Detours
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not a Bridge Contract
25. Inspect Pile Driving - Production	19	0	0	Not A Bridge Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items in Contract
27. Inspect Selective Clearing	5	0	0	None in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	None Required in Contract
29. Erosion Control	5	0	0	None in Contract
29A. Inspect Pavement Patching	19	0	0	Not Required in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrows, Type II and Type III Barricades and Flag Control

CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
 RESEARCH PROJECT NUMBER 25

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscape Contract
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	None in Contract
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Large Amount of Concrete Curb and Gutter
35B. Inspect Construction of Bituminous Shoulders	6	0	0	No Bituminous Shoulders
36. Fully Competent Rodman and Chainman	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	A Few Areas Only, Partial Credit
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	No Fence in Contract
40. Staking Guardrail	6	0	0	None in Contract
41. Staking Line for Surfacing	3	0	0	Not Required in Contract
42. Taking Cross Sections	3	0	0	Not Required in Contract
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in Contract
45. Compute areas and Volumes	3	3	100	A Few Areas Only, Partial Credit
46. Prepare Volume Sheets	2	0	0	No Earthwork In Contract
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	No Clearing Required
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
 RESEARCH PROJECT NUMBER 25

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Numerous Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	10	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	Not Required in Contract
60. Inspect Structural Steel Erection	6	0	0	Not a Bridge Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not A Bridge Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not A Bridge Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	Not a Bridge Contract
63. Staking Curb and Gutter	9	9	100	Curb and Gutter in Contract
64. Staking Sewers and Drainage Structures	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	None in Contract
66. Staking Excavation and Embankment Grades	6	0	0	Not Required in Contract
67. Cross Section and Slope Staking	5	0	0	Not Required in Contract
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	Not a Bridge Contract
71. Staking Sign Locations	8	0	0	Not Required in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	Grade Controlled by Existing Roadway
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	Grade Controlled by Existing Roadway
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	Not A Bridge Contract

CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	4	57	Tasks 1, 5, 6 and 7 Apply
78. Compute and Check Aggregate Base Course or Concrete Pavement	3	0	0	Not Required in Contract
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	Not A Bridge Contract
81. Inspect Portland Cement Concrete Paving	23	0	0	None in Contract
82. Inspect Grading	12	0	0	Not Required in Contract
83. Inspect Test Pile Driving	13	0	0	Not A Bridge Contract
84. Structure Reference Points and Lines	8	0	0	Not A Bridge Contract
85. Beam Elevations	3	0	0	Not A Bridge Contract
86. Layout Deck Lines and Grades	5	0	0	Not A Bridge Contract
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	Not Required in Contract
88. Compare and Adjust Deck Grades	3	0	0	Not A Bridge Contract

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT NUMBER 25**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	Not Required For This Contract
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	195	25.76%	

**CONTROL SECTION AND JOB NUMBER JFUR 76061-24294A
RESEARCH PROJECT 25**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This contract is a intersection improvement job. Missing Tasks are as follows:

- 1. Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
- 2. Interagency Cooperation**
Cooperation with city of Owosso personnel is essential to administering this contract. This contract is 11.91% funded by the city of Owosso.
- 3. Environmental Impact**
With an Urban widening project of this nature, it is possible that hazardous material may be encountered in the form of leakage from gas stations, gas lines or some other source. The correct procedure for handling and disposing of such material is highly important.

**CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT NUMBER 26**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
1. Gradation Testing	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
2. Materials Weighing	9	1	11	Task 3 Only
3. Inspect Protective Treatment	2	2	100	Required For Bridge Portion
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0	Prestressed Concrete I-Beams
5. Inspect Fence	7	0	0	None In Contract
7. Inspect Depth of Aggregate Base Course	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
8. Inspect Tree and/or Stump Removal	5	0	0	None Required in Contract
9. Beginning Level Rodman	3	3	100	Survey Knowledge Required
10. Reduce and Check Field Books	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
11. Plot Cross Sections	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
12. Check Weight Tickets and Accumulation Sheets	2	2	100	Bituminous Tickets
13. Inspect Culverts, Sewers and Drainage Structures	5	5	100	Some Minor Culvert and Sewer Work, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	3	100	Numerous Concrete Items in Contract
15. Inspect Preparation For Bituminous Resurfacing	4	0	0	Some Minor Bituminous Shoulder Work Only
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

**CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT NUMBER 26**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
18. Density Testing	12	8	66	Tasks 1, 2, 5 and 8 through 12 Apply Only
19. Inspect Topsoil Removal	4	0	0	None Required
20. Inspect Structure Joints and Cleanup	5	5	100	Required for Bridge Portion
21. Inspect Guardrail	14	14	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
22. Inspect Sodding	7	0	0	None Required
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	4	100	Traffic Detoured
24. Fabricated Materials Control and Testing for Structures	4	0	0	Not Required in this Contract
25. Inspect Pile Driving - Production	19	0	0	None In Contract
26. Inspect Demolition or Removal Items of Work	8	8	100	Numerous Removal Items
27. Inspect Selective Clearing	5	0	0	Not Required in Contract
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Slope Restoration
29. Erosion Control	5	5	100	Geotextile Silt Fence and Hay Bales
29A. Inspect Pavement Patching	19	0	0	None in Contract
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Numerous Traffic Control Items in Contract

CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
 RESEARCH PROJECT NUMBER 26

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	Not a Landscaping Project
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	13	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	32	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
35B. Inspect Construction of Bituminous Shoulders	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
36. Fully Competent Rodman and Chairman	2	2	100	Survey Knowledge Required
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Numerous Items Require Final Measurement
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT NUMBER 26

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	None in Contract
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
42. Taking Cross Sections	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
43. Stake Centerline	4	0	0	Not Required in Contract
44. Stake Clearing Limits	4	0	0	Not Required in This Contract
45. Compute areas and Volumes	3	3	100	Numerous Areas and Volumes Need To Be Computed
46. Prepare Volume Sheets	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	Not Required in This Contract
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. Only, No O.J.T. in Contract
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	16	100	Required for Bridge Portion

CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
 RESEARCH PROJECT NUMBER 26

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	None in Contract
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	17	100	Large Number of Concrete Items in Contract
54. Inspect Bituminous Surfacing	10	0	0	Bituminous Shoulder Work Only
55. Inspect Bituminous Plants and Maintain Materials Control	11	11	100	Some Minor Bituminous Work, Partial Credit Only
56. Identify, Measure, and Compute Clearing Limits	5	0	0	Not Required in This Contract
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	Not Required in This Contract
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	0	0	None In Contract
60. Inspect Structural Steel Erection	6	0	0	None in Contract
61. Inspect Dewatering Operations and Cofferdams	7	0	0	Not Required in This Contract
61A. Inspect Bridge Deck Repair Overlays	22	0	0	Not Required in This Contract
61B. Inspect Field Painting of Structural Steel	8	0	0	None in Contract

CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
 RESEARCH PROJECT NUMBER 26

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades, Foundation Piles, and Structure Excavation Limits	11	11	100	Required for Bridge Portion
63. Staking Curb and Gutter	9	9	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
64. Staking Sewers and Drainage Structures	6	4	66	Tasks 1, 2, 3 and 6 for Drainage Structures
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
66. Staking Excavation and Embankment Grades	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
67. Cross Section and Slope Staking	5	5	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
68. Staking Right-Of-Way	6	0	0	Not Required in Contract
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	5	100	Required For Bridge Portion
71. Staking Sign Locations	8	0	0	None in Contract
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	7	100	Required For Bridge Portion

**CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT NUMBER 26**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	Not Required in Contract
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Structures Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	6	86	Tasks 1 and 2 through 7 Apply, No Sewer Work
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	29	100	Required for Bridge Portion
81. Inspect Portland Cement Concrete Paving	23	23	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
82. Inspect Grading	12	12	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
83. Inspect Test Pile Driving	13	0	0	Not Required in Contract
84. Structure Reference Points and Lines	8	8	100	Required For Bridge Portion
85. Beam Elevations	3	3	100	Required For Bridge Portion
86. Layout Deck Lines and Grades	5	5	100	Required For Bridge Portion
87. Locating or Reestablishing Control Points for Roadway Layout	6	6	100	Some Reestablishment Needed, Partial Credit Only
88. Compare and Adjust Deck Grades	3	3	100	Required For Bridge Portion

**CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT NUMBER 26**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	427	56.41%	

**CONTROL SECTION AND JOB NUMBER FRR 73021-29648A
RESEARCH PROJECT 26**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is actually a fairly small contract with both a bridge and road portion. Quite a few of the elements are identifiable. However most of the elements experience guidelines are not met resulting in a large amount of partial credit. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.
2. **Environmental Compliance**
The possibility of asbestos and other hazardous materials requires clear safety procedures.
3. **Plan Interpretation**
This is not something previously considered. Possibly, demonstration of competency in plan reading should be included in the work element system.

**CONTROL SECTION AND JOB NUMBER IR 25032-25887A
RESEARCH PROJECT NUMBER 27**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments	
1. Gradation Testing	6	0	0	Freeway Sign Upgrading	
2. Materials Weighing	9	0	0		
3. Inspect Protective Treatment	2	0	0		
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0		
5. Inspect Fence	7	0	0		
7. Inspect Depth of Aggregate Base Course	4	0	0		
8. Inspect Tree and/or Stump Removal	5	0	0		
9. Beginning Level Rodman	3	3	100		May Be a Minor Amount of Survey Work Partial Credit Only
10. Reduce and Check Field Books	2	0	0		
11. Plot Cross Sections	2	0	0		
12. Check Weigh Tickets and Accumulation Sheets	2	0	0		
13. Inspect Culverts, Sewers and Drainage Structures	5	4	80		Tasks 1, 2, 4 and 5 Apply For Small Amount of Culvert Work, Partial Credit Only
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0		
15. Inspect Preparation For Bituminous Resurfacing	4	0	0		
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0		

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	14	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Temporary Lane Closures Only
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	11	100	Slope Restoration in Contract
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrow Boards, Type II Barricades and Temporary Signs

**CONTROL SECTION AND JOB NUMBER IR 25032-25887A
RESEARCH PROJECT NUMBER 27**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	2	100	Some Grade Work Required, Partial Credit Only
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	2	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
38. Setting Grades	4	4	100	Some Grade Work Required, Partial Credit Only

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	3	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and O.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	16	100	All Tasks Apply. Column Work Included in Contract.
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

**CONTROL SECTION AND JOB NUMBER IR 25032-25887A
RESEARCH PROJECT NUMBER 27**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
66. Staking Excavation and Embankment Grades	6	6	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	8	100	All Tasks Apply
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	7	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

CONTROL SECTION AND JOB NUMBER IR 25032-25887A
 RESEARCH PROJECT NUMBER 27

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	Minor Amount Required, Partial Credit Only
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	141	18.63%	

**CONTROL SECTION AND JOB NUMBER IR 25032-25887A
RESEARCH PROJECT 27**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a small non-typical MDOT contract involving sign upgrading. Several of the work elements are exactly representative of the work involved. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

**CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT NUMBER 28**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments	
1. Gradation Testing	6	0	0	Freeway Sign Upgrading	
2. Materials Weighing	9	0	0		
3. Inspect Protective Treatment	2	0	0		
4. Field Repair of Shop Coated Structural Steel (Type III)	6	0	0		
5. Inspect Fence	7	0	0		
7. Inspect Depth of Aggregate Base Course	4	0	0		
8. Inspect Tree and/or Stump Removal	5	0	0		
9. Beginning Level Rodman	3	3	100		Not Enough Work To Meet Experience Guideline, Partial Credit Only
10. Reduce and Check Field Books	2	0	0		
11. Plot Cross Sections	2	0	0		
12. Check Weigh Tickets and Accumulation Sheets	2	0	0		
13. Inspect Culverts, Sewers and Drainage Structures	5	0	0		
14. Test Concrete Quality Control-Air, Slump, Temperature and Test Beams	3	0	0		
15. Inspect Preparation For Bituminous Resurfacing	4	0	0		
16. Inspect Base, Grade Control and/or Form Setting, and Installation of Load Transfer Devices Prior to Placement of Portland Cement Concrete Paving	8	0	0		

**CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT NUMBER 28**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
17. Inspect Shaping of Clay, Sand or Aggregate Base for Surface Courses	5	0	0	
18. Density Testing	12	0	0	
19. Inspect Topsoil Removal	4	0	0	
20. Inspect Structure Joints and Cleanup	5	0	0	
21. Inspect Guardrail	14	0	0	
22. Inspect Sodding	7	0	0	
23. Inspect Maintenance of Roadways or Detours, or Temporary Roads	4	0	0	Temporary Lane Closures Only
24. Fabricated Materials Control and Testing for Structures	4	0	0	
25. Inspect Pile Driving - Production	19	0	0	
26. Inspect Demolition or Removal Items of Work	8	8	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only
27. Inspect Selective Clearing	5	0	0	
28. Inspect Seeding, Mulching, and Fertilizing	11	0	0	
29. Erosion Control	5	0	0	
29A. Inspect Pavement Patching	19	0	0	
30. Identify Construction and Right-Of-Way Limits	2	2	100	Common To All Contracts
31. Inspect Installation and Maintenance of Traffic Control Devices	4	4	100	Lighted Arrow Boards, Type II Barricades and Temporary Signs

CONTROL SECTION AND JOB NUMBER IR 25132-24261A
 RESEARCH PROJECT NUMBER 28

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
32. Inspect Rest Area Materials-Certification, Documentation and Storage: Check Equipment Against Shop Drawings for Proper Type	6	0	0	Not a Rest Area Contract
33. Inspect Final Project Cleanup-After Punch List	3	3	100	Common To All Contracts
34. Inspect Landscaping	8	0	0	
35. Inspect Edging, Texturing, and Curing of Portland Cement Concrete Pavement. Check Pavement with Straightedge. Inspect Sawing, Epoxy Patching, and Sealing Joints for PCC Paving	13	0	0	
35A. Inspect Construction of Concrete Curb and Gutter, Concrete Valley Gutter, Concrete Barrier, or Concrete Shoulders	32	0	0	
35B. Inspect Construction of Bituminous Shoulders	6	0	0	
36. Fully Competent Rodman and Chainman	2	0	0	
37. Final Measurement of Miscellaneous Construction Items such as Fence, Portland Cement Concrete Paving, Culverts, Sewers, and Drainage Structures, Aggregate Base Course	2	0	0	None Required in Contract
38. Setting Grades	4	4	100	Not Enough Work To Meet Experience Guideline, Partial Credit Only

CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT NUMBER 28

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
39. Staking Fence From Previously Established Control Points	4	0	0	
40. Staking Guardrail	6	0	0	
41. Staking Line for Surfacing	3	0	0	
42. Taking Cross Sections	3	0	0	
43. Stake Centerline	4	0	0	
44. Stake Clearing Limits	4	0	0	
45. Compute areas and Volumes	3	0	0	
46. Prepare Volume Sheets	2	0	0	
47. Check and Post Pay Quantities and Tested Material	4	4	100	Common To All Contracts
48. Prepare Field Books and Sketches for Clearing Limits	2	0	0	
49. Review Requirements for Special Programs and Reports Such as E.E.O. and D.J.T.	6	4	66	E.E.O. in This Contract But No O.J.T.
50. Set-Up File System Within Prescribed Guidelines	3	3	100	Common To All Contracts
51. Inspect Substructure Forming, Substructure Steel Placement, and Substructure Concrete Placement, Pumphouse or Retaining Wall Construction	16	0	0	

CONTROL SECTION AND JOB NUMBER IR 25132-24261A
 RESEARCH PROJECT NUMBER 28

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
52. Inspect Box of Slab Culverts, Major Headwalls, Major Sign Bases, Cast-In-Place Tunnel Sewer, Reinforced Concrete Drainage Chambers Other Special Reinforced Structures	14	0	0	
53. Inspect Portland Cement Concrete Plants and Maintain Materials Control	17	0	0	
54. Inspect Bituminous Surfacing	10	0	0	
55. Inspect Bituminous Plants and Maintain Materials Control	11	0	0	
56. Identify, Measure, and Compute Clearing Limits	5	0	0	
57. Inspect Utilities Relocation of New Utility Construction	3	0	0	
58. Inspect Rest Area Sewage Facilities	19	0	0	Not a Rest Area Contract
59. Inspect Permanent Traffic Control Signs and Devices	16	16	100	All Tasks Apply. Column Work Included in Contract.
60. Inspect Structural Steel Erection	6	0	0	
61. Inspect Dewatering Operations and Cofferdams	7	0	0	
61A. Inspect Bridge Deck Repair Overlays	22	0	0	
61B. Inspect Field Painting of Structural Steel	8	0	0	

**CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT NUMBER 28**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
62. Staking Substructure Lines and Grades, Foundation Piles, and Structure Excavation Limits	11	0	0	
63. Staking Curb and Gutter	9	0	0	
64. Staking Sewers and Drainage Structures	6	0	0	
65. Staking Culverts or Box Culverts of Slab Culverts or Multiplates, or Concrete Elliptical Culverts	7	0	0	
66. Staking Excavation and Embankment Grades	6	0	0	
67. Cross Section and Slope Staking	5	0	0	
68. Staking Right-Of-Way	6	0	0	
69. Staking Building and Rest Area Facilities	7	0	0	Not a Rest Area Contract
70. Staking Sheet Pile Layout	5	0	0	
71. Staking Sign Locations	8	8	100	All Tasks Apply
72. Staking Line and Grade For Portland Cement Concrete or Bituminous Paving	6	0	0	
73. Staking Line and Grade for Aggregate or Bituminous Base Course	7	0	0	
74. Staking Sewage Facilities for Rest Areas	4	0	0	Not a Rest Area Contract
75. Staking Bridges for Construction Control	7	0	0	

CONTROL SECTION AND JOB NUMBER IR 25132-24261A
 RESEARCH PROJECT NUMBER 28

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
76. Staking Utility Relocation or New Utility Construction	5	0	0	
77. Prepare Field Book Data and Sketches for Culverts, Drainage Structures, Earthwork and Grades, Curb and Gutter, Sewage Facilities	7	0	0	
78. Compute and Check Aggregate Base Course on Concrete Pavement	3	0	0	
79. Inspect Foundations, Buildings and Related Rest Area Facilities	42	0	0	Not a Rest Area Contract
80. Inspect Superstructure Forming, Resteel and Concrete Placement	29	0	0	
81. Inspect Portland Cement Concrete Paving	23	0	0	
82. Inspect Grading	12	0	0	
83. Inspect Test Pile Driving	13	0	0	
84. Structure Reference Points and Lines	8	0	0	
85. Beam Elevations	3	0	0	
86. Layout Deck Lines and Grades	5	0	0	
87. Locating or Reestablishing Control Points for Roadway Layout	6	0	0	
88. Compare and Adjust Deck Grades	3	0	0	

**CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT NUMBER 28**

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	Minor Amount Required, Partial Credit Only
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	79	10.44%	

CONTROL SECTION AND JOB NUMBER IR 25132-24261A
 RESEARCH PROJECT NUMBER 28

Element Number and Description	Number of Tasks	Number of Tasks Applicable to Contract	Percent Coverage	Comments
89. Determining Final Pay Quantities	12	12	100	Common To All Contracts
90. Prepare Field Books and Sketches for Horizontal and Vertical Control and Right-Of-Way	4	0	0	
91. Prepare Construction Reports-Biweekly Progress Reports, Estimates, Recommendations, Record of Days Charged, Etc.	6	6	100	Common To All Contracts
91A. Serve as Instructor for a Formal Technician Course or as a Member on a District Certification Panel	1	0	0	
92. Supervision-Staking Crews	1	1	100	Minor Amount Required, Partial Credit Only
93. Supervision-Inspection Personnel	1	1	100	
TOTALS	757	79	10.44%	

**CONTROL SECTION AND JOB NUMBER IR 25132-24261A
RESEARCH PROJECT 28**

**PART 2 RESEARCH
IDENTIFIED TASKS NOT COVERED BY WORK ELEMENT SYSTEM**

This is a small non-typical MDOT contract involving sign upgrading. Several of the work elements are exactly representative of the work involved. Missing tasks are as follows:

1. **Understanding Special Provisions/Supplemental Specifications**
This contract has numerous items which require special attention and are described fully in the contract. Understanding of these provisions is essential to managing this contract.

TABLE NUMBER 5
SUMMARY OF WORK ELEMENTS 1 THROUGH 5

MDOT CONTRACT NUMBER	1	2	3	4	5	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
	6	9	2	6	7	
1	6	1	0	0	0	
2	0	0	0	0	0	
3	6	1	0	0	0	
4	6	2	0	0	7	
5	6	9	0	0	7	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	6	0	2	6	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	6	1	0	2	7	
13	6	1	2	2	7	
14	6	1	0	0	0	
15	0	0	0	0	0	
16	0	2	0	0	0	
17	6	9	2	0	7	
18	0	0	0	0	0	
19	0	1	0	0	0	
20	6	1	0	0	0	
21	0	0	0	0	0	
22	0	1	0	0	0	
23	6	1	0	0	0	
24	6	1	0	0	0	
25	0	1	0	0	0	
26	6	1	2	0	0	
27	0	0	0	0	0	
28	0	0	0	0	0	
<p>PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED</p>						
	46%	7%	14%	4%	18%	
<p>PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)</p>						
	0%	50%	0%	0%	0%	
<p>SUMMARY: WORK ELEMENT NUMBER 1 MEETS 20% REQUIREMENT</p>						

TABLE NUMBER 6
SUMMARY OF WORK ELEMENTS 7 THROUGH 11

MDOT CONTRACT NUMBER	7	8	9	10	11	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	5	3	0	0	
2	0	0	0	0	0	
3	0	0	3	2	2	
4	4	0	3	2	2	
5	4	5	3	2	2	
6	0	0	2	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	4	0	0	0	0	
11	0	0	0	0	0	
12	4	0	3	2	2	
13	0	5	3	2	2	
14	4	5	3	0	0	
15	0	0	3	0	0	
16	0	0	0	0	0	
17	4	0	3	2	2	
18	0	0	0	0	0	
19	4	0	0	0	0	
20	4	0	3	0	0	
21	0	0	0	0	0	
22	0	0	3	0	0	
23	0	0	3	0	0	
24	0	5	3	0	0	
25	0	5	3	0	0	
26	4	0	3	2	2	
27	0	0	3	0	0	
28	0	0	3	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	32%	21%	61%	25%	25%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	4%	0%	0%	
SUMMARY: WORK ELEMENT NUMBER 7, 8 9, 10 AND 11 MEETS 20% REQUIREMENT						

TABLE NUMBER 7
SUMMARY OF WORK ELEMENTS 12 THROUGH 16

MDOT CONTRACT NUMBER	12	13	14	15	16	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	2	5	3	4	0	
2	0	0	0	0	0	
3	2	5	3	4	0	
4	2	5	3	4	8	
5	2	5	3	4	0	
6	0	0	3	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	3	0	0	
10	0	0	3	0	0	
11	0	0	0	0	0	
12	2	5	3	4	8	
13	2	5	3	4	8	
14	2	5	3	4	8	
15	0	0	0	0	0	
16	2	0	0	4	0	
17	2	5	3	4	8	
18	0	0	0	0	0	
19	2	0	3	0	8	
20	2	5	3	4	0	
21	0	0	0	0	0	
22	2	5	3	4	8	
23	2	5	3	4	8	
24	2	5	3	0	8	
25	2	5	3	4	0	
26	2	5	3	0	8	
27	0	4	0	0	0	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED						
	57%	50%	64%	46%	36%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)						
	0%	4%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBER 12, 13, 14, 15 AND 16 MEETS 20% REQUIREMENT						

TABLE NUMBER 8
SUMMARY OF WORK ELEMENTS 17 THROUGH 21

MDOT CONTRACT NUMBER	17	18	19	20	21	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	5	9	0	0	0	
2	0	0	0	0	0	
3	5	9	0	0	0	
4	5	12	0	0	14	
5	5	12	0	0	14	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	8	0	5	14	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	5	12	0	0	14	
13	5	12	0	0	14	
14	5	12	0	0	14	
15	0	0	0	0	0	
16	0	6	0	0	0	
17	5	12	0	0	14	
18	0	0	0	0	0	
19	5	12	0	0	0	
20	5	12	0	0	0	
21	0	0	0	0	0	
22	5	6	0	0	0	
23	0	12	0	0	0	
24	5	6	0	0	0	
25	5	12	0	0	0	
26	5	8	0	5	14	
27	0	0	0	0	14	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED						
	50%	36%	0%	7%	32%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)						
	0%	25%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBER 17, 18, AND 21 MEETS 20% REQUIREMENT						

TABLE NUMBER 9
SUMMARY OF WORK ELEMENTS 22 THROUGH 26

MDOT CONTRACT NUMBER	22	23	24	25	26	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	7	4	0	0	8	
2	0	0	0	0	0	
3	0	4	0	0	8	
4	7	0	0	0	8	
5	7	4	0	0	8	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	5	
9	0	0	4	0	8	
10	0	0	0	0	8	
11	0	0	0	0	5	
12	7	4	0	0	8	
13	0	4	0	0	8	
14	0	0	0	0	8	
15	0	0	0	0	5	
16	0	0	0	0	0	
17	7	0	0	0	8	
18	0	0	0	0	5	
19	0	0	0	0	8	
20	0	0	0	0	8	
21	0	0	0	0	0	
22	7	0	0	0	8	
23	7	0	0	0	8	
24	7	0	0	0	8	
25	7	0	0	0	8	
26	0	4	0	0	8	
27	0	0	0	0	8	
28	0	0	0	0	8	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	32%	21%	4%	0%	68%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	14%	
SUMMARY: WORK ELEMENT NUMBER 22, 23, AND 26 MEETS 20% REQUIREMENT						

TABLE NUMBER 10
SUMMARY OF WORK ELEMENTS 27 THROUGH 30

MDOT CONTRACT NUMBER	27	28	29	29A	30	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	11	0	0	2	
2	0	0	0	0	2	
3	0	11	5	0	2	
4	0	11	5	19	2	
5	0	11	5	0	2	
6	0	0	0	0	2	
7	0	0	0	0	2	
8	0	0	0	0	2	
9	0	0	0	0	2	
10	0	11	0	0	2	
11	0	0	0	0	2	
12	0	11	5	0	2	
13	5	11	5	0	2	
14	0	11	5	19	2	
15	0	0	0	0	2	
16	0	0	0	0	2	
17	0	11	5	19	2	
18	0	0	0	0	2	
19	0	11	0	0	2	
20	0	11	0	19	2	
21	0	0	0	0	2	
22	0	0	0	0	2	
23	0	11	0	19	2	
24	0	0	0	0	2	
25	0	0	0	0	2	
26	0	11	5	0	2	
27	0	11	0	0	2	
28	0	0	0	0	2	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	4%	50%	29%	18%	100%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY:	WORK ELEMENT NUMBER 28, 29, AND 30 MEETS 20% REQUIREMENT					

TABLE NUMBER 11
SUMMARY OF WORK ELEMENTS 31 THROUGH 35

MDOT CONTRACT NUMBER	31	32	33	34	35	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	4	0	3	0	0	
2	0	0	3	0	0	
3	4	0	3	0	0	
4	4	0	3	0	13	
5	4	0	3	0	0	
6	3	0	3	0	0	
7	0	0	3	0	0	
8	0	0	3	0	0	
9	4	0	3	0	0	
10	4	0	3	0	0	
11	0	0	3	0	0	
12	4	0	3	0	13	
13	4	0	3	0	0	
14	4	0	3	0	0	
15	4	0	3	0	0	
16	4	0	3	0	0	
17	4	0	3	0	0	
18	4	0	3	0	0	
19	4	0	3	0	0	
20	4	0	3	0	0	
21	4	0	3	0	0	
22	4	0	3	0	0	
23	4	0	3	0	0	
24	4	0	3	0	13	
25	4	0	3	0	0	
26	4	0	3	0	13	
27	4	0	3	0	0	
28	4	0	3	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	82%	0%	100%	0%	14%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	4%	0%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBER 31 AND 33 MEETS 20% REQUIREMENT						

TABLE NUMBER 12
SUMMARY OF WORK ELEMENTS 35A THROUGH 38

MDOT CONTRACT NUMBER	35A	35B	36	37	38	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	32	0	2	2	4	
2	0	0	0	0	0	
3	32	6	2	2	4	
4	32	6	2	2	4	
5	32	6	2	2	4	
6	0	0	2	2	4	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	2	0	
10	0	0	0	2	0	
11	0	0	0	0	0	
12	0	0	2	2	4	
13	32	0	2	2	4	
14	32	0	2	2	4	
15	0	0	0	2	0	
16	0	6	0	0	0	
17	0	6	2	2	4	
18	0	0	0	2	0	
19	32	0	0	2	0	
20	32	0	2	2	4	
21	0	0	0	2	0	
22	32	0	2	2	4	
23	32	0	2	2	4	
24	32	0	2	2	4	
25	32	0	2	2	4	
26	32	6	2	2	4	
27	0	0	2	2	4	
28	0	0	0	0	4	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	46%	21%	57%	79%	61%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY:	WORK ELEMENT NUMBER 35A, 35B, 36, 37 AND 38 MEETS 20% REQUIREMENT					

TABLE NUMBER 13
SUMMARY OF WORK ELEMENTS 39 THROUGH 43

MDOT CONTRACT NUMBER	39	40	41	42	43	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	2	0	
4	1	6	3	3	0	
5	4	6	3	3	4	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	6	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	4	6	3	3	0	
13	0	6	0	0	0	
14	0	0	0	0	0	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	4	6	3	3	0	
18	0	0	0	0	0	
19	0	0	0	0	0	
20	0	0	0	0	0	
21	0	0	0	0	0	
22	0	0	0	0	0	
23	0	0	0	0	0	
24	0	0	0	0	0	
25	0	0	0	0	0	
26	0	6	3	3	0	
27	0	6	0	0	0	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	11%	29%	18%	18%	4%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	4%	0%	0%	4%	0%	
SUMMARY: WORK ELEMENT NUMBER 40 MEETS 20% REQUIREMENT						

TABLE NUMBER 14
SUMMARY OF WORK ELEMENTS 44 THROUGH 48

MDOT CONTRACT NUMBER	44	45	46	47	48	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	3	0	4	0	
2	0	0	0	4	0	
3	0	3	2	4	0	
4	0	3	2	4	0	
5	0	3	2	4	0	
6	0	0	0	4	0	
7	0	0	0	4	0	
8	0	0	0	4	0	
9	0	0	0	4	0	
10	0	0	0	4	0	
11	0	0	0	4	0	
12	0	3	0	4	0	
13	4	3	2	4	2	
14	0	3	0	4	0	
15	0	0	0	4	0	
16	0	0	0	4	0	
17	0	3	2	4	0	
18	0	0	0	4	0	
19	0	0	0	4	0	
20	0	3	0	4	0	
21	0	0	0	4	0	
22	0	3	0	4	0	
23	0	3	0	4	0	
24	0	3	0	4	0	
25	0	3	0	4	0	
26	0	3	2	4	0	
27	0	3	0	4	0	
28	0	0	0	4	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	4%	54%	21%	100%	4%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY:	WORK ELEMENT NUMBERS 45, 46 AND 47 MEETS 20% REQUIREMENT					

TABLE NUMBER 15
SUMMARY OF WORK ELEMENTS 49 THROUGH 53

MDOT CONTRACT NUMBER	49	50	51	52	53	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	4	3	0	0	17	
2	2	3	0	0	0	
3	4	3	0	0	17	
4	6	3	0	14	17	
5	6	3	0	0	17	
6	4	3	0	14	17	
7	4	3	0	0	0	
8	4	3	0	0	0	
9	4	3	0	0	17	
10	4	3	0	0	17	
11	4	3	0	0	0	
12	6	3	16	14	17	
13	6	3	16	0	17	
14	4	3	0	0	17	
15	4	3	0	0	0	
16	4	3	0	0	0	
17	6	3	0	0	17	
18	4	3	0	0	0	
19	4	3	0	0	17	
20	4	3	0	0	17	
21	4	3	0	0	0	
22	4	3	0	0	17	
23	4	3	0	0	17	
24	4	3	0	0	17	
25	4	3	0	0	17	
26	4	3	16	0	17	
27	4	3	0	0	0	
28	4	3	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	18%	100%	11%	11%	64%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	82%	0%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBERS 50 AND 53 MEETS 20% REQUIREMENT						

TABLE NUMBER 16
SUMMARY OF WORK ELEMENTS 54 THROUGH 58

MDOT CONTRACT NUMBER	54	55	56	57	58	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	10	11	0	0	0	
2	0	0	0	0	0	
3	10	11	0	3	0	
4	10	11	0	0	0	
5	10	11	0	3	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	10	11	0	3	0	
13	10	11	5	3	0	
14	10	11	0	3	0	
15	0	0	0	0	0	
16	0	11	0	0	0	
17	10	11	0	0	0	
18	0	0	0	0	0	
19	10	11	0	0	0	
20	10	11	0	0	0	
21	0	0	0	0	0	
22	10	11	0	0	0	
23	10	11	0	0	0	
24	10	11	0	0	0	
25	10	11	0	0	0	
26	0	11	0	0	0	
27	0	0	0	0	0	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	50%	57%	4%	18%	0%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBERS 54 AND 55 MEETS 20% REQUIREMENT						

TABLE NUMBER 17
SUMMARY OF WORK ELEMENTS 59 THROUGH 61B

MDOT CONTRACT NUMBER	59	60	61	61A	61B	WORK NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT	ELEMENT				
1	0	0	0	0	0						
2	0	0	0	0	0						
3	0	0	0	0	0						
4	16	0	0	0	0						
5	13	0	0	0	0						
6	16	0	0	0	0						
7	0	0	0	0	0						
8	0	0	0	0	0						
9	0	6	0	22	8						
10	0	0	0	0	0						
11	0	0	0	0	0						
12	0	0	0	0	0						
13	0	0	7	0	0						
14	13	0	0	0	0						
15	16	0	0	0	0						
16	0	0	0	0	0						
17	0	0	0	22	0						
18	13	0	0	0	0						
19	0	0	0	0	0						
20	13	0	0	0	0						
21	12	0	0	0	0						
22	0	0	0	0	0						
23	0	0	0	0	0						
24	0	0	0	0	0						
25	0	0	0	0	0						
26	0	0	0	0	0						
27	16	0	0	0	0						
28	16	0	0	0	0						
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED							18%	4%	4%	7%	4%
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)							18%	0%	0%	0%	0%
SUMMARY: NONE OF THE WORK ELEMENTS MEET THE 20% REQUIREMENT											

TABLE NUMBER 18
SUMMARY OF WORK ELEMENTS 62 THROUGH 66

MDOT CONTRACT NUMBER	62	63	64	65	66	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	9	6	0	0	
2	0	0	0	0	0	
3	0	9	6	0	0	
4	0	0	6	7	6	
5	0	9	6	7	6	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	0	0	6	7	0	
13	9	9	6	0	6	
14	0	9	6	0	0	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	0	0	6	7	6	
18	0	0	0	0	0	
19	0	9	0	0	0	
20	0	9	6	0	0	
21	0	0	0	0	0	
22	0	0	0	0	0	
23	0	9	6	0	0	
24	0	9	6	0	0	
25	0	0	6	0	0	
26	11	9	4	7	6	
27	0	0	0	7	6	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	4%	36%	43%	21%	21%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	4%	0%	4%	0%	0%	
SUMMARY: WORK ELEMENTS NUMBERS 63, 64, 65 AND 66 MEET 20% REQUIREMENT						

TABLE NUMBER 19
SUMMARY OF WORK ELEMENTS 67 THROUGH 71

MDOT CONTRACT NUMBER	67	68	69	70	71	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	0	0	0	0	
2	0	0	0	0	0	
3	5	0	0	0	0	
4	5	6	0	0	8	
5	5	6	0	0	0	
6	0	0	0	0	8	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	0	6	0	0	0	
13	5	0	0	5	0	
14	0	0	0	0	5	
15	0	0	0	0	8	
16	0	0	0	0	0	
17	5	0	0	0	4	
18	0	0	0	0	0	
19	0	0	0	0	5	
20	0	0	0	0	8	
21	0	0	0	0	0	
22	0	0	0	0	1	
23	0	0	0	0	0	
24	0	0	0	0	0	
25	0	0	0	0	0	
26	5	0	0	5	0	
27	0	0	0	0	8	
28	0	0	0	0	8	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	21%	11%	0%	7%	21%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	14%	
SUMMARY: NONE OF THE WORK ELEMENTS MEET THE 20% REQUIREMENT						

TABLE NUMBER 20
SUMMARY OF WORK ELEMENTS 72 THROUGH 76

MDOT CONTRACT NUMBER	72	73	74	75	76	WORK ELEMENT NUMBER	ELEMENT NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	0	0	0	0		
2	0	0	0	0	0		
3	0	0	0	0	0		
4	6	7	0	0	0		
5	6	7	0	0	5		
6	0	0	0	0	0		
7	0	0	0	0	0		
8	0	0	0	0	0		
9	0	0	0	0	0		
10	0	0	0	0	0		
11	0	0	0	0	0		
12	6	7	0	0	0		
13	0	0	0	7	5		
14	0	0	0	0	5		
15	0	0	0	0	0		
16	0	0	0	0	0		
17	6	7	0	0	0		
18	0	0	0	0	0		
19	0	0	0	0	0		
20	0	7	0	0	0		
21	0	0	0	0	0		
22	0	0	0	0	0		
23	0	0	0	0	0		
24	0	0	0	0	0		
25	0	0	0	0	0		
26	6	7	0	7	0		
27	0	0	0	0	0		
28	0	0	0	0	0		
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	18%	21%	0%	7%	11%		
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%		
SUMMARY: WORK ELEMENT NUMBER 73 MEETS THE 20% REQUIREMENT							

TABLE NUMBER 21
SUMMARY OF WORK ELEMENTS 77 THROUGH 81

MDOT CONTRACT NUMBER	77	78	79	80	81	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	4	0	0	0	0	
2	0	0	0	0	0	
3	3	0	0	0	0	
4	7	3	0	0	23	
5	7	3	0	0	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	3	0	0	0	
10	0	3	0	0	0	
11	0	0	0	0	0	
12	7	3	0	0	23	
13	7	0	0	29	23	
14	7	3	0	0	0	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	7	3	0	29	0	
18	0	0	0	0	0	
19	0	3	0	0	0	
20	4	3	0	0	0	
21	0	0	0	0	0	
22	0	0	0	0	0	
23	7	0	0	0	0	
24	4	3	0	0	0	
25	4	0	0	0	0	
26	6	3	0	29	23	
27	7	0	0	0	0	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	29%	39%	0%	11%	14%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	21%	0%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBERS 77 AND 78 MEET THE 20% REQUIREMENT						

TABLE NUMBER 22
SUMMARY OF WORK ELEMENTS 82 THROUGH 86

MDOT CONTRACT NUMBER	82	83	84	85	86	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	0	0	0	0	
2	0	0	0	0	0	
3	12	0	0	0	0	
4	12	0	0	0	0	
5	0	0	0	0	0	
6	0	0	0	0	0	
7	0	0	0	0	0	
8	0	0	0	0	0	
9	0	0	0	0	0	
10	0	0	0	0	0	
11	0	0	0	0	0	
12	0	0	0	0	0	
13	0	0	0	0	5	
14	12	0	8	0	0	
15	0	0	0	0	0	
16	0	0	0	0	0	
17	12	0	0	0	5	
18	0	0	0	0	0	
19	0	0	0	0	0	
20	0	0	0	0	0	
21	0	0	0	0	0	
22	0	0	0	0	0	
23	0	0	0	0	0	
24	0	0	0	0	0	
25	0	0	0	0	0	
26	12	0	8	3	5	
27	0	0	0	0	0	
28	0	0	0	0	0	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	18%	0%	7%	4%	11%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY: NONE OF THE WORK ELEMENTS MEET THE 20% REQUIREMENT						

TABLE NUMBER 23
SUMMARY OF WORK ELEMENTS 87 THROUGH 91

MDOT CONTRACT NUMBER	87	88	89	90	91	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	0	12	0	6	
2	0	0	12	0	6	
3	0	0	12	0	6	
4	6	0 ₄	12	4	6	
5	6	0	12	4	6	
6	0	0	12	0	6	
7	0	0	12	0	6	
8	0	0	12	0	6	
9	0	3	12	0	6	
10	0	0	12	0	6	
11	0	0	12	0	6	
12	6	0	12	4	6	
13	6	0	12	4	6	
14	6	0	12	0	6	
15	0	0	12	0	6	
16	0	0	12	0	6	
17	0	3	12	0	6	
18	0	0	12	0	6	
19	0	0	12	0	6	
20	6	0	12	0	6	
21	0	0	12	0	6	
22	6	0	12	4	6	
23	0	0	12	0	6	
24	0	0	12	0	6	
25	0	0	12	0	6	
26	6	3	12	4	6	
27	0	0	12	0	6	
28	0	0	12	0	6	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	29%	11%	100%	21%	100%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBERS 87, 89, 90 AND 91 MEET 20% REQUIREMENT						

TABLE NUMBER 24
SUMMARY OF WORK ELEMENTS 91A THROUGH 93

MDOT CONTRACT NUMBER	91A 1	92 1	93 1	WORK ELEMENT NUMBER NUMBER OF TASKS REQUIRED FOR ELEMENT CREDIT
1	0	1	1	
2	0	0	1	
3	0	1	1	
4	0	1	1	
5	0	1	1	
6	0	1	1	
7	0	0	1	
8	0	0	1	
9	0	1	1	
10	0	0	1	
11	0	0	1	
12	0	1	1	
13	0	1	1	
14	0	1	1	
15	0	1	1	
16	0	0	1	
17	0	1	1	
18	0	0	1	
19	0	0	1	
20	0	1	1	
21	0	0	1	
22	0	1	1	
23	0	1	1	
24	0	1	1	
25	0	1	1	
26	0	1	1	
27	0	1	1	
28	0	1	1	
PERCENT OF CONTRACTS WHERE FULL CREDIT OF ELEMENT COULD BE RECEIVED	0%	68%	100%	
PERCENT OF CONTRACTS WHERE PARTIAL CREDIT OF ELEMENT COULD BE RECEIVED (NOT ALL TASKS PRESENT)	0%	0%	0%	
SUMMARY: WORK ELEMENT NUMBERS 92 AND 93 MEET THE 20% REQUIREMENT				