STATE OF MONTANA
JOB PROFILE AND EVALUATION

The job profile is a streamlined position description and may serve as the core document for all human resource functions such as recruitment, selection, performance management and career and succession planning. It was developed, initially, for use in classifying positions in Pay Plan 020.

If you are converting a position to Pay Plan 020 and the position has not changed simply cut and paste the information needed from the current position description. The position description contains sections that are no longer used to classify the position, such as: Working Conditions and Physical Demands; Management and Supervision of Others; Supervision Received; Scope and Effect; and Personal Contacts. These may still be important to the position and may be included in **Section IV** – **Other Important Job Information.**

When working with a new position, classification request or change to a position in Pay Plan 020, complete the information below to provide the required documentation for classification.

SECTION I – Identification

Working Title Engineering Project Technician I (Old Gr. 10)	Job Code Number 005903	Job Code Title Engineering Technician
Pay Band 3	Position Number 92418	Check ONE box : ☐ FLSA Exempt ☒ FLSA Non-Exempt
Department Montana Department of Transportation		Division and Bureau Billings Construction
Section and Unit *Construction*		Work Address and Phone 424 Morey, Billings, MT
Profile Produced By Perry Bergen, EPM		Work Phone 406-657-0259

Work Unit Mission Statement or Functional Description - This section should include a complete statement of the mission or function as it relates to the work unit.

Personnel in the construction program are responsible for supervising highway and bridge construction from the time a construction contract is awarded to a private contractor until the project is completed and the work approved. They perform preliminary survey work and ensure roads and bridges are built or reconstructed to established standards. During highway construction projects, district personnel work closely with the contractor, conducting construction surveys, inspecting the work, and monitoring traffic control.

Describe the Job's Overall Purpose:

This position is the second level of Engineering Project Technician responsible for performing survey, inspection and office work related to highway and bridge construction projects. Duties include inspecting contractor work and testing materials; technical construction staking and surveying to prepare locations for project construction; performing location survey work to set control and reference points and to gather preliminary site and survey information; construction staking and surveying work to prepare the location for project construction; and a variety of clerical and administrative tasks in support of construction activities. The position reports to a higher-level Engineering Project Technician (Crew Chief), and provides lead worker supervision of lower-level technicians and temporary survey aides.

SECTION II - Major Duties or Responsibilities	**% of Time**
This section should be a clear concise statement of the position's duties. Well written thorough task/duty statements are required here to accurately evaluate the position. 1. What are the major duties or responsibilities assigned to this position? What are the specific tasks involved in accomplishing those duties. Group duties in order of importance and estimate the percent of time needed to perform each duty (estimates are not required for individual tasks). **NOTE:** Because you are identifying **major** duties usually 3-5, the quantity of time probably will not be less than **20%.** If a duty is essential but not performed routinely you should list it. For example, lobbying during the legislative session may not take up a large percent of total work time, but can be an essential duty.	
A. <u>Inspection and testing</u> Inspect contractor work and test materials to determine the acceptability of materials, ensure compliance with contract specifications and construction standards, and to provide information for the Project Manager used to determine change orders, incentives, pay quantities, etc. This involves inspecting the placement and installation of materials, performing or monitoring material sampling and testing, calculating and summarizing test results, and ensuring samples and related documentation are collected and labeled according to MDT guidelines. Positions at this level and above are responsible for inspecting multiple aspects of construction projects at different locations. This work requires knowledge of inspection, survey, sampling and laboratory testing protocols and procedures; state, federal, AASHTO, FHWA, and ASTM standards; project specifications; the Montana Materials Manual, Montana Construction Manual, Montana Survey Manual, and Standard Specifications for Road and Bridge Construction; highway construction methods and techniques; and the properties and characteristics of materials components and the impacts of site specific circumstances. The work also requires skill in adapting inspection, sampling and testing methods and techniques to meet various site circumstances, skill in operating sampling and testing equipment (Gilson shaker, nuclear gauge, sieves, survey equipment, other lab test equipment, etc.), and skill in operating office equipment used to calculate and record data (PCs, calculator, laptop computers, VAX system, etc.). 1. Review project plans and specifications to gain a familiarity with project requirements and to identify required inspection, sampling and testing	50%

tasks. Provide interpretation and clarification to the contractor on a variety of project specifications (e.g., depth of surfacing and embankment, moisture, compaction, signing and guardrail placement, etc.).

2. Inspect backfill, embankments and road surface, to ensure placement, materials, moisture content, lift depths and compaction methods are in compliance with specifications by taking depth measurements and collecting samples for testing using a variety of testing and measuring instruments. Prepare and maintain field notes including documentation of quantities by recordation of ticket collection, depth checks and measurements.

3. Inspect installation of structures such as embankments, drainage and hydraulic installations, signing, and guardrails for conformance to appropriate standards such as alignment, grade, size, and slope by using measurement and survey methods and techniques and applying established construction standards.

4. Inspect guardrail, signing, compaction testing (PMS), electrical, concrete (curbs, sidewalks, gutters, structures, etc.), chip seals, seeding, fencing, striping and other project aspects. This involves assessing material types and certifications, reviewing placement and installation through taking measurements and taking and testing samples of materials to ensure compliance with department standards and contract requirements.

5. Monitor and inspect construction processes to ensure the appropriate placement and installation of materials. Ensure compliance with appropriate construction processes (e.g., ensuring concrete is not being allowed to dry too fast and that a curing compound is used) At this level, the position focuses on sampling and testing, with higher level technicians responsible for assessment of processes and methods. Positions at this level are required to interpret contract specifications in order to make compliance determinations.

6. Monitor traffic control operations on rural and secondary road projects by monitoring activities, interpreting standards, and coordinating with contractor regarding on-site traffic control circumstances and problems. Review traffic control plans and detailed drawings for compliance with MUTCD standards as necessary.

7. Review material certifications provided by the contractor to ensure the actual materials on-site are covered by certifications by comparing identification numbers on materials (e.g., milling stamps) to certifications. Determine sample collection needs and methods by reviewing specific instructions with the Crew Chief. Determine procedure to follow based on the type of material sampled, and its intended use by reviewing plans and specifications, reviewing data collected at the site during sampling, and referring to procedures and acceptable limits in the Montana Materials Manual of Test Procedures.

8. Collect samples, or oversee sample collection by contractors, by applying a variety of technical sampling methods and techniques, operating a variety of sampling equipment, and considering the type of material to be sampled and unique site characteristics. The work involves solving problems related to collecting a sample (e.g., unique site characteristics which require adapting prescribed collection methods, observation of site circumstances which may warrant further sampling and testing) using judgment, experience, and materials. Judgment is required to visually discern color, texture, rock content, and break at different soil horizons. Samples must be collected or observed by MDT personnel in order to be considered official.

9. Prepare samples for testing based on the type of material, and procedures outlined in the manual. This involves technical processes such as preparing molds, pouring concrete cylinders, weighing, washing, shaking, crushing, and splitting samples. This involves observations as to the height, width, volume, dryness and other physical properties of the sample, and making adjustments as needed (e.g., extending drying times, reshaking, etc.).

10. Conduct a wide variety of specialized testing procedures on materials. This work involves following detailed procedures outlined in the materials manual for tests such as sieve analysis, specific gravity, compaction, moisture content, density, liquid limit, plastic limit, plasticity index, slump of concrete, etc. The work at this level also involves making many judgments in the application of procedures. For example, if material test results are out of specifications, the position will be required to determine if the result was due to poor materials, improperly functioning equipment, or operator error. The position may provide recommendations as to whether further sampling and testing are required, or may determine that additional split sampling (beyond that mandated by IA/QA standards) is required.

11. Calculate and summarize test results, compares final results to specifications, and creates a record of testing results by entering information on appropriate forms or into the computer. This work involves the application of conversion factors and tables, algebraic equations, noting deviations from standard specifications, and providing explanations of failing test results.

12. Ensure work is completed according to project plans and specifications and inform the contractor of work not in compliance (e.g., improper materials or placement, incorrect installation or construction processes, safety concerns, hot plant operations, etc.). Clarify project requirements with contractors and determine necessary measures to attain compliance.

13. Make minor alterations to designs to fit field conditions while maintaining compliance with project specifications and construction standards. For

example, the position will determine if it is necessary to dig out unsuitable material and determine of the use of construction fabric and/or geo-textiles is necessary in areas with poor sub-grade materials.

14. Layout and interpret for the contractor, the stakes and markings used to locate construction limits and locations for items being inspected (e.g., signs, guardrail, striping, earthwork, paving, fencing and utilities).

15. Document all aspects of construction inspection including quantities; locations; explanation of changes; conversations with contractors, MDT personnel and the public; contract equipment, personnel and shift worked; and problems encountered; and any instructions received. 15%

B. Location Surveying

Perform location survey work to set control and reference points and to gather preliminary site and survey information used for project design. This involves representing and documenting topographic, hydraulic, property and other survey data; and collecting and documenting related site information (e.g., soil and gravel pit surveys). This work requires knowledge of highway construction methods and techniques; topographical, hydraulic, and property surveying; the Montana Construction Manual, the Montana Survey Manual, and Standard Specifications for Road and Bridge Construction. The work requires skill and ability in interpreting site conditions (elevation, features, etc.); in the operation of conventional and radial stake out surveying equipment; survey methods and techniques; and in communicating with landowners.

1. Perform field searches, establish survey reference points and install monuments by measuring distance, direction and elevation from pre-existing monuments, including reference points for aerial surveys.

2. Establish survey reference points and install monuments by measuring distance, direction and elevation from pre-existing monuments, including reference points for aerial surveys.

3. Conduct topographic surveys of proposed project sites by measuring and recording distances, directions, and elevations from established reference points.

4. Determine where to place rod or picket based on topographic features and surrounding terrain (e.g. looking at the bottom of a ditch) by observing breaks in elevation and other visual assessment. Communicate with the Crew Chief through verbal or hand signals to coordinate placement and measurements.

5. Identify the topographic, hydraulic or other feature surveyed, and relay the information to the Crew Chief for the proper assignment and recording of feature codes.

6. Locates and marks property boundaries and utility right-of-ways by

	reviewing pre-construction surveys with the Crew Chief and identifying points based on distance from established references.	15%
C.	Construction staking and surveying Perform technical construction staking and surveying work to prepare the location for project construction. This involves slope staking, culvert staking, channel change staking, reestablishing centerline from reference points, blue topping sub-grade and gravel courses, and related staking and surveying work. This work requires knowledge of construction surveying and highway construction methods and operations, project design and construction criteria and standards, ASHTO and FHWA standards; project specifications; the Montana Construction Manual, the Montana Survey Manual, and Standard Specifications for Road and Bridge Construction. The work also requires the ability to use plans and specifications to determine locations and inspection information, follow instructions, and interpret field conditions.	
	1. Review, interpret and apply design plans and specifications to site circumstances by acquiring and documenting field data and constructing sets of field notes.	
	2. Determine the exact location of highway centerline, traverse points, property boundaries and design feature layouts such as horizontal and vertical curves, culverts, embankments and guardrails by surveying distances and elevations from reference points established in the pre-construction survey.	
	3. Serve as chainman or rodman for construction survey activities by holding the picket, pogo rod, and/or tape and placing them in the proper location as directed by the Crew Chief. Use pins or tacks to ensure placement on the exact location on established hubs or caps.	
	4. Determine correct location of stakes in order to correlate design plan to site terrain, marking stakes with letters and number codes to provide a description of the point (e.g., placement and slope of an embankment, property corners or boundaries, hydraulic features, etc.), point name or number, distance from centerline, etc.	5%
D.	Supervision Train project technicians and aides in survey, inspection, sampling, testing and safety methods and techniques. Exercise lead worker supervision over assigned aides and technicians by determining duty assignments on the site, providing oversight, and reporting on performance to the supervisor on a daily basis and as part of the formal evaluation process. This work requires an extensive knowledge of survey, inspection, sampling and safety methods and techniques, on the job training methods and techniques, formal training plan/agenda preparation, and supervisory practices.	
	1. Determine required survey, inspection, sampling and testing activities on construction sites through discussion with the Project Manager, and compare these requirements to available staff and their related	

expertise/abilities to determine how to complete projects.

2. Observe construction crews, contractors, and other staff at the site to determine compliance with established methods and techniques, and survey, inspection, sampling testing and recording requirements. Notify staff or appropriate supervisor of improper practices or safety concerns.

3. Develop specific on the job training plans or classroom type instruction for field construction staff on proper survey and materials sampling and testing methods and techniques and safe operation and maintenance of equipment. Attend, participate in, and conduct safety meetings.

4. Evaluate performance of staff assigned to specific projects (number and type of staff supervised varies depending on the district and the project), and relay this information to the crew supervisor to be used in the formal performance evaluation process. 10%

E. Office work

Perform a variety of clerical and administrative tasks in support of construction activities. This involves compiling notes and reports, maintaining electronic databases, and performing mathematical calculations. This work requires knowledge of highway construction terminology; business English, spelling, grammar and punctuation; mathematics including algebra and geometry; and skill in the operation of general office equipment including a programmable calculator and personal computer including typical business applications (e.g., word processing, spreadsheets, data entry screens, etc.).

1. Compute grade notes, quantities and other information for project summaries and estimates by working off plans to identify elevations of specific points. Compute grades between specific points and calculate horizontal and vertical curve data where needed using algebraic equations and general mathematics. Uses proper punctuation, vocabulary, spelling and sentence structure in making diary entries and basic written communications.

2. Enter control points from plans, field survey notes, pay quantities, locations, etc. into the computer system using proper formats and coding. Ensure accuracy of data entry by checking system data against plans.

3. Check field survey notes and construction field notes documenting pay quantities for accuracy and completeness by checking mathematical calculations, ensuring all notes and forms are complete, etc.

5%

4. Calculate fill volumes by drawing a picture of the ramp and figuring the square area of fill needed using trigonometry, algebra and geometry to calculate volumes.

F. Other duties as assigned

Perform a variety of other technical and administrative work in support of district

activities as assigned by the supervisor. This includes assisting other MDT programs on special projects, providing training and guidance to other employees and attending training and education as required.

2. Give specific examples of the types of problems solved, decisions made or procedures followed when performing the most frequent duties.

Inspection and testing of aggregate requires the inspector to make sure that the equipment be set up properly before the use it ex. Gilsons need to be leveled, if the Gilson is not leveled before a test is run they could possibly blow tests before they realize where the error is coming from. Nuclear gauges need to be calibrated and set to the proper material being tested. Also while testing densities for aggregate the inspector need to be able to read the material and tell if compaction is going well or is there a problem with the material, and if there is a problem how to fix it. Example if the nuclear gauge is not calibrated and set for soil testing before they test, the reading will not be accurate. Reading compaction is important, if they can't recognize a soft spot or if the gravel is to dry and need water then achieving compaction is very difficult and could lead to problems with the road later. While doing fill inspection they need to know how to read cut or fill stakes to be able to know if the contractor is placing the right amount of dirt. For concrete testing it's the same, they need to know how to look at the product and their testing equipment and tell if there's something wrong and how to fix it. If the concrete test shows that the air is low or the slump is to high they need to be able to adjust the load on the job site or be able to reject it.

3. What do you consider the most complicated part of the job?

Making sure all the proper documentation gets done and turned in for pay quantities and QA values, that notes are completed and nothing is forgotten or left out. When transferring of notes from different people, it's key to make sure that all your work is easy to follow, legible, and completed before handing it over to someone else. Dealing with contractors and consultants about plans and problems is also very tasking. If the contractor doesn't want to do the work properly and by the specs designed for it, getting them to do it and with a decent attitude is extremely difficult.

4. What laws, regulations, guidelines, manuals or other written established procedures are available to the incumbent?

Project specifications, Standard Specifications for Road and Bridge Construction, state, federal, AASHTO, FHWA, and ASTM standards; the Montana Materials Manual, Montana Construction Manual, Montana Survey Manual, and the Manual on Uniform Traffic Control Devices; Asphalt Institute (MS-6) guidelines, ACI Guidelines.

5. Which of the duties and/or specific tasks listed under 1. (above) are considered "essential functions" which must be performed by this position (with or without accommodations)? (If you need information or training on the identification of essential functions, please contact MDT Human Resources Division.)

NOTE: FILL IN THIS SECTION

- **Construction inspection and materials testing**
- **Construction staking and surveying**
- **Location Surveying**

6. If this position supervises other positions, complete the following information.

The number of FTE employees directly supervised is Variable.

List the complexity levels/pay bands of each those subordinates Varies.

Please list the Position Numbers for those directly supervised .

Is this position responsible for (please check ONLY those boxes which apply to the position and for which the position has "signatory" authority.)

☐ Hiring ☐ Layoffs/termination of temporary or seasonal workers
☐ Performance Management (conducting and signing performance appraisals as the direct supervisor or the reviewing manager) ☐ Promotions
Direct /Line Supervision X Leadworker ☐ Discipline
☐ Other:

7. Please attach an up-to-date Organizational Chart (or copy from a Power Point document into space below).

SECTION III - Minimum Qualifications - List the minimum requirements for **first day** of work. (These will be the minimum qualifications utilized for **recruitment and performance management purposes**; this information is not used for classification purposes.)

Please list the main knowledge and skill areas required for the job:

The position requires knowledge of topographical, hydraulic, and property surveying and highway construction methods and operations; project design and construction criteria and standards; AASHTO, FHWA, and ASTM standards; project specifications; the Montana Materials Manual, Montana Construction Manual, Montana Survey Manual, and Standard Specifications for Road and Bridge Construction; sampling and laboratory testing protocols and procedures; the properties and characteristics of materials components and the impacts of site specific circumstances (soils, temperature, weather conditions, gradations, segregation, stability, flows, additives, absorption rates, etc.); highway construction terminology; business English, spelling, grammar and punctuation; mathematics including algebra and geometry; and on the job training methods and techniques, formal training plan/agenda preparation, and supervisory practices

The position requires skill in interpreting site conditions (elevation, features, etc.); in the operation of conventional and radial stake out surveying equipment; survey methods and techniques; and in communicating with landowners. The position also requires skill in operating sampling and testing equipment (Gilson shaker, nuclear gauge, sieves, survey equipment, other lab test equipment, etc.), and skill in operating office equipment used to calculate and record data (PCs, calculator, laptop computers, VAX system, etc.).

What behaviors are required to perform the duties? **NOTE:** Identifying behaviors used for recruitment and selection and other HR functions are part of building a competency model (see **Creating Competency Models** in Guide). A position description will provide helpful information if a model has not been developed. Often "abilities" from the current PD can be stated as desired and observable behaviors. For example, "the ability to communicate clearly in writing" can be restated "writes clearly and concisely".

Gives contractor clear interpretations of contract documents, writes clearly and concisely; accurately determines locations and inspection information using engineering plans and specifications; follows instructions; appropriately adapts surveying, sampling and testing methods and techniques to meet various site circumstances; maintains effective working relationships.

Education and experience: Please indicate the **minimum educational** requirements for this job, as it relates to a new employee on the **first day** of work (not the educational background of the person now in the position), the specific fields of study that are acceptable, and whether a Master's degree (in which fields) will substitute for any of the required job related experience.

Graduation from high school with coursework in algebra, geometry or trigonometry

Other training (e.g., software, specific machinery, etc.), certification (e.g., CPA, Professional Engineer, etc.), or licensing (e.g., commercial driver's, pilot, psychologist, etc.) required (please specify):

Level I Certification under the agency's Engineering Project Technician and Engineering Project Manager Advancement Policy

Please indicate the minimum, amount of **job-related work experience** needed as a new employee on the first day of work (not the experience of the person now in the position). Please indicate the specific types of experience that will be considered job-related.

2 years engineering technician related experience including surveying, material testing and construction inspection.

☒ This agency will accept alternative methods of obtaining necessary qualifications.

For recruiting purposes please list specific examples of acceptable alternative methods of obtaining those qualifications. **These examples will appear on a vacancy announcement**.

A C.E.T. or Surveyor graduate with six months engineering technician related experience will be acceptable in lieu of the 2 years of engineering technician related experience.

SECTION IV – Other Important Job Information

List any other important information associated with this position, such as working conditions or other factors which are deemed critical or non-negotiable to the position and which will need to be included on the vacancy announcement or other recruitment documents. (This information will be NOT be used for classification purposes.) For example: The position is required to travel throughout the state in excess of 12,000 miles per year and to perform duties on active construction sites in proximity to heavy equipment, hot asphalt, and high speed traffic, requiring use of hard hats and specialized safety training. OR, This position is not subject to alternative work schedules or working from home as it is required to answer the phone and receive visitors for the agency between the hours of 8am to 5pm, Monday through Friday.

Significant physical demands related to repeated lifting of up to 80 pounds (and occasionally greater weights), carrying survey equipment over rough terrain, climbing and bending to retrieve samples and operating gas, diesel, and electrically powered equipment. The position involves extensive overnight travel throughout the District in excess of 2,000 miles per month (often on short notice, weekends and holidays), and working outdoors in all types of weather.

The work environment involves harsh or caustic fumes, dust, extreme temperatures, wind, rain, and snow. Hazards associated with the work can be significant. The majority of the work is performed at construction sites or fabrication plants involving traffic passing the work site and working around heavy machinery such as front-end loaders, pavers, scrapers, rollers, and forklifts. The work also involves and risks associated with working with hazardous materials such as hot asphalt, lime, acids, and other chemicals. The risks of the work are such that extensive training in safety practices and procedures is required. Due to the nature of work elements (hot asphalt, heavy equipment, etc.) and hazardous tasks such as work around moving traffic and taking samples from hot plants, there is potential for significant injury.

SECTION V – Signatures

My signature below indicates the statements in Section I to IV are accurate and complete.

Employee: **Signature**	**Title**	**Date**
Immediate Supervisor: **Signature**	**Title**	**Date**
Name: **Signature**	**Title**	**Date**
Division/District Administrator: **Signature**	**Title**	**Date**

Departmental Designee:		
Signature	Chief, Employee Relations Bureau, Human Resources Division **Title**	**Date**

Recruitment Review: My signature below attests to my review of and determination that the minimum qualifications (education and experience) listed in this profile meet the established recruitment standards of MDT.

Signature **Date:**

Name: **Title:** Human Resource Specialist (District/Helena)
Montana Department of Transportation

Upon completion of this section the preparer, district human resource specialist, or other signing authority should forward the signed hard copy and the electronic copy of this job profile (JP), along with an Agency Classification Request (ACR) and an up-to-date Organizational Chart (if not included in the body of the JP) to the Chief of the Employee Relations Bureau, Human Resources Division, MDT in Helena.

The electronic copy naming convention for JPs sent by the District or from Helena supervisors to Human Resources in Helena should be: (Position#)JP-MDT.doc (e.g., 34015JP-MDT.doc).
G:\PosDesc\Job Profile\91218JP-MDT (Cory Shepherd).DOC