

## JOB TASK ANALYSIS - PHYSICAL DEMANDS



**JOB TITLE:** Land Surveyor/Civil Engineer Technician II

**Company Name:** Ramsey County

**Site:** Public Works

**Date:** 04.03.12

**Employees observed, interviewed or who completed questionnaires pertinent to job physical demands:**  
Gregg Gund and Dan Baar.

**Prepared by:** Susan Unger OTR/L, CEAS     [sunger@summitortho.com](mailto:sunger@summitortho.com)     Phone: 651-968-5260

### JOB OVERVIEW from the Dictionary of Occupational Titles (DOT)

**CODE:** 018.167-018     **TITLE(s):** LAND SURVEYOR     **STRENGTH:** LIGHT

Plans, organizes, and directs work of one or more survey parties engaged in surveying earth's surface to determine precise location and measurements of points, elevations, lines, areas, and contours for construction, mapmaking, land division, titles, mining or other purposes: Researches previous survey evidence, maps, deeds, physical evidence, and other records to obtain data needed for surveys. Develops new data from photogrammetric records. Determines methods and procedures for establishing or reestablishing survey control. Keeps accurate notes, records, and sketches to describe and certify work performed. Coordinates findings with work of engineering and architectural personnel, clients, and others concerned with project. Assumes legal responsibility for work and is licensed by state.

For Ramsey County Public works, about 50% of the work is outside. Workers load the truck, drive to the jobsite and once there they spend a majority of the outside time locating monuments and surveying the site. They must be able to walk on uneven ground and terrain in all sorts of weather conditions. Land Surveyors supervise and Civil Engineer Tech II don't supervise. They do work in teams, and assistance is encouraged for heavier lifting tasks.

### **Physical Demand Level: LIGHT ♦ CRT BODY INDEX INIMUM SCORE=127**

**\* Comments:** The United States Department of Labor defines the **LIGHT work** as a exerting up to 16 to 24 pounds of force occasionally (occasionally: activity or conditions that exist up to one-third of the time) and/or 10-12 pounds of force frequently (frequently: activity or conditions that exist between one-third and two-thirds of the time), and/or greater than negligible up to 7-10 pounds of force constantly (constantly: activity or condition exists more than two-thirds of the time) to move objects.

There are rare times in this job where a Ramsey County Public Works surveyor/civil engineer tech II worker will exceed these levels and will lift/move/carry weights from 25-100 lbs. The situations where this occurs is in jack hammering, moving cement (bags weigh about 45 lbs., monuments, and lifting and moving tubs filled with materials. Team lifts are encouraged and employees should ask for a team lift with heavier monuments or heavy tubs filled with materials, especially if weights are 75-100 lbs.

**Work Hours:** 7am-3:30 pm

**Breaks:** 1-30 minute & 2-15 minute

**Overtime:** Very rare

**Personal Protective Equipment:** Safety vest, glasses, gloves and steel toe boots.

**Special Training Requirements:** Traffic control training.

**Tools:** Total Station/case (25 lbs), laser tracking device, jack hammer (60 lb), survey instrument (27 lb), stakes (bundle = 25 lb), rotary hammer drill (22 lb), jack hammer on cart (83 lb), GPS antennae and case (25 lb), monuments 28 – 200 lbs (lighter = 28 lb and are cast iron monument ), 200 lbs (granite monuments are older and weigh the most), sign base (18 lb), cement bags (45 lb), manhole frame (80 lb), spec mix (80 lb).



## JOB TASK ANALYSIS – PHYSICAL DEMANDS CHECKLIST

Company Name: Ramsey County Public Works

Job Title: Land Surveyor/Civil Engineering Tech II

Date: 4/3/12

Never (N) = Not at all • Rarely (R) = 0-24 min/day or 0-5 reps per 8hr day • Occasionally (O) = 25 min-2.5 hrs or 6-100 reps in 8hr day  
 Frequently (F) = 2.51-5 hours/day or 100-300 reps per 8hr day • Continuously (C) = 5.01 hours and over or 301-500+ reps per 8hr day

Posture, Movement:	N 0%	R 1-10%	O 11-33%	F 34-66%	C 67-100%	Comments
Sitting			✓			Driving to and from jobsite.
Standing			✓			Operating survey equipment and survey job tasks.
Walking			✓			To and from truck to survey site. Over even and uneven ground and roadway surfaces.
Bending / Stooping			✓			Loading and unloading truck, retrieve & place survey equipment, mixing cement. To navigate terrain.
Twisting			✓			Same as above.
Low Level Position*		✓				*kneel/squat/half-kneel
Crawling		✓				Under barbwire fence, to set survey monument.
Crouching		✓				Going thru woods, under or around brush, etc.
Climbing- Stairs			✓			In and out of truck.
Climbing- Ladder		✓				Fence crossing ladder.
Balancing			✓			Same as above and on uneven ground while using survey equipment and tools.
Reaching -Forward				✓		Driving, surveying land areas. Desk and computer.
Reaching – Overhead			✓			Brushing line, setting site line.
Reaching – Low Level		✓				During monument install. digging, measuring, etc.
Push / Pull*		✓				*including force Tote, 2-wheeler, mixing cement, loading and unloading materials for jobsite.
Static Force Weights:						
Other:						
Other:						

Additional Comments:

Never (N) = Not at all • Rarely (R) = 0-24 min/day or 0-5 reps per 8hr day • Occasionally (O) = 25 min-2.5 hrs or 6-100 reps in 8hr day  
 Frequently (F) = 2.51-5 hours/day or 100-300 reps per 8hr day • Continuously (C) = 5.01 hours and over or 301-500+ reps per 8hr day

<b>Lifting &amp; Carrying</b>	<b>N 0%</b>	<b>R 1-10%</b>	<b>O 11-33%</b>	<b>F 34-66%</b>	<b>C 67-100%</b>	<b>Comments:</b>
Up to 10 pounds			✓			Tripods, hammer, 8 lb sledge hammer, traffic cones, tools, etc.
11 – 24 pounds			✓			Roadwork signs, total station (laser transit). Manhole lid = 12 lb, sign base = 18 lb, sledge hammer = 15 lb, rotary hammer drill = 22 lb.
25 – 34 pounds		✓				Cast iron monuments, survey instrument = 27 lb, bundle of stakes for jobsite = 25 lb, GPS antenna + case = 25 lb.
35 – 50 pounds		✓				Cement bags 45 lb, stack of cones, cast iron monuments.
51 – 74 pounds		✓				Tote tub with sand, gravel and road material. jack hammer = 60 lb,
75 – 100 pounds		✓				Manhole frame = 80 lb. Two person lift is encouraged at 75 lbs and above. Usually they are team lifting tub filled with materials.
Over 100 pounds		✓				Granite monuments can weigh up to 200 lbs. Employees should use /are instructed to mechanical assist such as a forklift or other machine to move this.
<b>Repetitive use: hands</b>	<b>N 0%</b>	<b>R 1-10%</b>	<b>O 11-33%</b>	<b>F 34-66%</b>	<b>C 67-100%</b>	<b>Comments:</b>
Bend/twist arm				✓		Setup, take down of survey equipment, digging, tightening large nut.
Simple grasping:				✓		Holding, using survey equipment. Mousing and computer work.
Firm grasping:			✓			Loading and unloading heavier equipment, (jack hammer), 60 lb. cement bags, monument.
Other:						
Other:						
<b>Repetitive use: feet</b>	<b>Check Yes or No</b>				<b>Comments:</b>	
Right:	✓	Yes		No		
Left:		Yes		✓ No		
Both:		Yes		No	Note: For walking and other tasks; refer to previous page.	
Other:		Yes		No		
<b>Posture: Head</b>	<b>Check Yes or No</b>				<b>Comments:</b>	
Static Position	✓	Yes		No	Computer, to look thru transit instrument for siting & aiming survey instrument.	
Frequent Flexing	✓	Yes		No	Survey tasks at jobsite.	
Frequent Rotating	✓	Yes		No	Driving.	
Other:		Yes		✓ No		

**Additional Comments:**



### JOB TASK ANALYSIS – ENVIRONMENTAL EXPOSURE CHECKLIST

Company Name: Ramsey County Public Works

Job Title: Land Surveyor/Civil Engineering Tech II

Date: 4/3/12

Environmental Exposures	Check Yes or No		Comments				
Working around moving machinery	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Construction equipment - occasionally. Traffic = daily.				
Working outside	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	About 50%.				
Exposure to heat and humidity	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No					
Using powered equipment	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Jack hammer, electric drill.				
Vibration	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	See above.				
Slippery floors surfaces	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Rains, snow, ice, sand, mud, etc.				
Chemical Exposure	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cement lime mixture (dry form-before water is added).				
Noise – Interfering w/ communication	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Jackhammer, construction equipment, traffic.				
Radiation (ionizing/non-ionizing)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Hazardous Waste	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Airborne Infectious Agents	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Blood and/or bodily fluids	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Risk-Physical violence/aggression	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Working at heights	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
Congested Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Traffic conditions.				
Glare	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No					
Adequate Lighting	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No					
Sharp Edges	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Utility knife, roadside exposures to glass and other materials. Machete blade may be used to clear brush.				
Other: Dust-cement	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No					
Other:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No					
<b>Sensory Demands</b>			<b>Check Yes or No</b>				
<input checked="" type="checkbox"/> Hearing	<input checked="" type="checkbox"/> Speech	<input type="checkbox"/> Smell/Taste	<input checked="" type="checkbox"/> Near Vision	<input checked="" type="checkbox"/> Far Vision	<input type="checkbox"/> Color Vision	<input type="checkbox"/> Tactile	<input checked="" type="checkbox"/> Spatial Perception

Additional Comments:

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Craig Hangman, Gregg Gund and Dan Baar.

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**1. Job Task Analysis - Environmental Exposure Checklist**

*The environmental exposure information was reviewed or completed by the human resources department of this company.*

**2. Job Task Analysis – Physical Demands Checklist Validation**

Additional Comments:

The physical and environmental demands of this job position were reviewed by these individuals for accuracy. It is recommended that at least two employees who perform the job and a supervisor (per facility) review this document.

This document was reviewed by:

Name & Title	Date
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

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	Name & Title	Date
1.	<u>Craig Hanna - County Surveyor</u>	<u>5-22-2012</u>
2.	_____	_____
3.	<u>DAN BAAR - LAND SURVEYOR</u>	_____
4.	<u>GREGG GUND - CIV. TECH II</u>	_____

JTA PHOTOS OF SURVEYOR/CIVIL ENG TECH II RAMSEY COUNTY PUBLIC WORKS 4.3.12



Surveyor stands by truck at jobsite with a variety of tools used for the job.



Survey crew setting up at jobsite. Tub of materials can be moved by 2 employees and can weigh between 50-100 lbs.



Occasional forward bending, stooping or low level activity reaching with survey tasks is required.



Digging is occasional. Here workers are digging to remove monument. Low squat or kneeling is needed as these are buried in the ground.





Jack hammer use is rare. Weight is 60 lbs. Firm grip is needed for its operation.



Lids of manhole removed and replaced= 12 lb, manhole frame = 80 lb.  
Bags of cement = 60 lb.