

IOWA ENGINEERING JOB APPROVAL AUTHORITY

Name	Title	Grade
Determined By	Title	Date
Concurrence By	Title	Date

Code	Job Type	Controlling Factors	Units	Job Class					Maximum Approval Limits		
				I	II	III	IV	V	I&E	Design	Constr.
350	Sediment Basin	Requires construction or water storage permit from IDNR 2/	-----	No	No	No	Yes	Yes			
378	Pond	Hazard Classification		Low	Low	Low	Low	Low			
402	Dam	Embankment over an Active Fault		No	No	No	No	No			
410	Grade Stabilization Structure	Storage x Height		<3000	<3000	<3000	<3000	≥3000			
436	Irrigation Reservoir	Effective Height 1/ 2/	Feet	8	12	25	30	35			
587	Structure for Water Control	Conduit Spillway - Inside Diameter	Inches	6	12	24	42	All			
		Drainage Area 2/	Acres	20	80	250	640	12,800			
		Drop Spillway 3/									
		Net Drop	Feet	2*	4*	4*	6*	All			
		Weir Depth	Feet	2*	2*	3*	4*	All			
		Weir Capacity	CFS	50	150	300	400	All			
		Steel or Aluminum Drop Spillway (Toe wall)									
		Net Drop	Feet	2*	3*	4*	6*	All			
		Weir Capacity	CFS	50	150	300	600	All			
		Steel Sheet Pile									
		Net Drop	Feet	2*	4*	6*	8	All			
		Weir Capacity	CFS	0	0	400	600	All			
		Rock Chute									
		Net Drop	Feet	0	4*	8*	10	All			
		Weir Capacity	CFS	0	50	150	300	All			
		Gabion Chute									
		Net Drop	Feet	0	4	8	10	All			
		Capacity	CFS	0	50	200	300	All			
		Concrete Block Chute									
		Net Drop	Feet	0	4*	8*	10*	All			
		Capacity	CFS	0	50	150	300	All			
		Reinforced Concrete Chute									
		Net Drop	Feet	0	0	0	8*	All			
		Weir Depth	Feet	0	0	0	3	All			
		Weir Capacity	CFS	0	0	0	300	All			
		Reinforced Vegetated Chute Spillway									
		Net Drop	Feet	0	4*	8*	10	All			
		Capacity	CFS	0	50	100	100	All			
		Box Inlet Drop Spillway									
		Net Drop	Feet	0	0	0	0	All			
		Box Inlet to Existing Culvert									
		Weir Capacity	CFS	0	0	0	0	All			
		Low Head Dry Dam - Conduit Diameter (Drop through conduit equal to or less than 15 feet.)	Inches	12	24	36	60	All			
		Concrete Sediment Basin									
		* Standard Designs and Drawings	-----	No	No	Yes*	Yes*	Yes*			

All with relatively impervious cutoff, simple foundation needs, and standard or proven designs.

Notes:

1/ The effective height of the dam is the difference in elevation in feet between the auxiliary spillway crest and the lowest point in the cross section taken along the centerline of the dam.

2/ These limits apply to all practices which store water including terraces, water and sediment control basins, diversions, and waste storage facilities.

3/ These limits also apply to gabion drop spillways except that standard designs and drawings are not required.

* Standard designs and standard detail drawings. These include all designs and drawings that have been approved for use in Iowa by the State Conservation Engineer.

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				I	II	III	IV	V	I&E	Design	Constr.
560	Access Road	Length	Miles	0	0.5	1	2	All			
		Circular Culvert	Inches	24	36	48	60	All			
		Monolithic Concrete Culvert	Sq. Feet	0	0	0	0	All			
		Bridge	Feet	0	0	0	0	All			
309	Agrichemical Handling Facility		No.	0	0	0	0	All			
371	Air Filtration and Scrubbing			0	0	0	0	All			
591	Amendments for Treatment of Agricultural Wastes	----	--	0	0	0	0	All			
366	Anaerobic Digester	----	No.	0	0	0	0	All			
316	Animal Mortality Facility	Incinerator - Capacity	Lbs.	0	0	0	400	1,000			
		Freezer	No.	0	0	0	0	All			
		Composting - Standard Design	No.	0	0	All	All	All			
310	Bedding	Area Treated	Acres	40	160	320	480	All			
672	Building Envelope Improvement			0	0	0	0	All			
326	Clearing and Snagging	Drainage Area	Sq. Miles	0	0	1	4	All			
372	Combustion System Improvement			0	0	0	0	All			
317	Composting Facility	IDNR Permit Required for Livestock Operation		No	No	No	Yes	Yes			
		Forced Aeration Standard Design	No. No.	0 0	0 0	0 All	All All	All All			
656	Constructed Wetland	Animal Waste Treatment	No.	0	0	0	300	All			
		Field Runoff Treatment	Acres	0	0	300	1000	All			
348	Dam, Diversion	Streamflow	CFS	0	0	100	500	2,000			
		Flow Diverted	CFS	0	0	10	50	200			
		Height of Drop	Feet	0	0	4*	6*	8			
605	Denitrifying Bioreactor	Tile Main Diameter	Inches	6	8	10	12	All			
		Bioreactor Width	Feet	10	15	20	25	All			
356	Dike	Water Height	Feet	0	0	4	10	All			
		Class	-----	0	0	III	III	III			
362	Diversion (Also refer to Controlling Factors for Ponds)	Design Capacity	CFS	40	100	200	500	All			
432	Dry Hydrant	Pump Lift	Feet	0	8	10	15	All			
		Pipe Diameter	Inches	0	6	8	12	All			
375	Dust Control from Animal Activity on Open Lot Surfaces	Area Treated	Acres	0	0.5	1	5	All			
368	Emergency Animal Mortality Management			0	0	0	0	All			
374	Farmstead Energy Improvement	On farm energy audit recommendations	No.	0	0	0	All	All			
412	Grassed Waterway	Drainage Area	Acres	80	250	500	2,000	All			
355	Groundwater Testing	Number	Each	0	0	All	All	All			
561	Heavy Use Area Protection	Vegetative & Mulch Surface Protection	Sq. Feet	1000	2500	All	All	All			
		Aggregate Surface Protection	Sq. Feet	1000	2500	All	All	All			
		Concrete & Bituminous Cementitious Surface Protection	Sq. Feet	0	750	1600	All	All			
428	Irrigation Ditch Lining	Design Capacity		2	5	10	50	All			

IA210-501-M, 4th Ed., Amend. 3, Mar 2019)

IA501-A.6

Title 210 - National Engineering Manual

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				I	II	III	IV	V	I&E	Design	Constr.		
430	Irrigation Pipeline	Pipeline Capacity	GPM	0	0	1,000	2,000	3,500					
		Greater than 50 psi Less than 50 psi	GPM	0	0	1,000	3,500	5,000					
441	Irrigation System, Microirrigation	Design Capacity	GPM	0	100	300	750	All					
		Individual Lateral Line length	Feet	0	400	750	1,000	All					
443	Irrigation System, Surface and Subsurface Sprinkler System	Area Irrigated	Acres	0	0	80	160	All					
442													
527	Karst Sinkhole Treatment	Area Treated	Acres	0	0	0	All	All					
460	Land Clearing	Area Cleared	Acres	5	10	20	All	All					
466	Land Smoothing	Other Land	Acres	20	80	200	400	All					
		Area Treated Maximum Cut	Feet	1	2	3	5	All					
670	Lighting System Improvement			0	0	0	0	All					
468	Lined Waterway or Outlet	Capacity	CFS	0	50	100	100	All					
		Net Drop	Feet	0	4	8	10	All					
516	Livestock Pipeline	Length - Maximum distance from source	Feet	1,000	2,500	5,000	10,000	All					
		Diameter	Inches	1.25	1.5	2	4	All					
		Pressure - Maximum operating pressure plus water hammer	PSI	100	125	160	200	300					
353	Monitoring Well	Diameter	Inches	0	0	0	2	All					
500	Obstruction Removal	No Public Safety Hazard During Removal	Each	0	0	0	All	All					
319	On-farm Secondary Containment Facility			0	0	0	0	All					
582	Open Channel	Design Capacity	CFS	0	25	50	250	1,000					
584	Channel Bed Stabilization	Design Velocity	FPS	0	8	10	10	10					
608	Surface Drain, Main or Lateral												
520	Pond Sealing or Lining - Compacted Soil Treatment	Surface Area	Acres	0	0	0	5	All					
521	Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner												
522	Pond Sealing or Lining - Concrete												
462	Precision Land Forming	Area Treated	Acres	20	80	160	320	All					
464	Irrigation Land Leveling	Maximum Cut	Feet	1	2	3	5	All					
533	Pumping Plant	Irrigation Systems	Propeller Pump	Design Capacity	GPM	0	0	450	1,000	50,000			
				Static Head	Feet	0	0	8	10	All			
			Centrifugal Pump	Design Capacity	GPM	0	0	0	500	3,500			
				Static Head	Feet	0	0	0	50	350			
			Turbine Pump	Design Capacity	GPM	0	0	0	500	3,500			
				Static Head	Feet	0	0	0	50	500			
			Manure Transfer	Design Capacity	GPM	50	100	250	500	All			
Total Dynamic Head	Feet	10		20	40	80	All						
Livestock Water	Design Capacity	GPM	10	20	50	100	All						
566	Recreation Land Grading and Shaping	Area Treated	Acres	0	5	20	40	All					
558	Roof Runoff Structure	Area of Roof	Sq. Feet	0	0	10,000	45,000	All					
367	Roofs and Covers	Cover Surface Area	Sq. Feet	0	0	10,000	45,000	All					
604	Saturated Buffer	Tile Main Diameter	Inches	6	8	12	18	All					

IA210-501-M, 4th Ed., Amend. 3, Mar 2019)

IA501-A.7

Title 210 - National Engineering Manual

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				I	II	III	IV	V	I&E	Design	Constr.	
318	Short Term Storage of Animal Waste and Byproducts	Volume	Cu.Yd.	0	0	5,000	10,000	All				
572	Spoil Spreading	Area receiving spoil	Acres	0.5	1	3	All	All				
574	Spring Development	Discharge	GPM	1	5	10	All	All				
570	Stormwater Runoff Control	Drainage Area	Acres	0	2	5	20	All				
578	Stream Crossing	Design Velocity	FPS	0	4	6	9	All				
580	Streambank and Shoreline Protection	Vegetative Protection	----	0	0	All	All	All				
		Mechanical Protection	Bankfull Capacity	CFS	0	250	500	2,500	5,000			
			Bankfull Velocity	FPS	0	6	8	10	10			
			Water Height above Shoreline	Feet	0	0	0	3	3			
606 620 554	Subsurface Drain Underground Outlet Drainage Water Management	Pipe Diameter	Inches	6	12	18	30	All				
607	Surface Drain, Field Ditch	Design Capacity	CFS	10	20	50	80	All				
		Drainage Area	Acres	60	120	320	640	All				
		Circular Culvert, Inside Diameter	Inches	24	36	48	60	72				
600 638	Terrace Water and Sediment Control Basin (Also refer to Controlling Factors for Ponds)	Fill Height - Distance from top of ridge to ground surface at ridge line	Feet	6	10	15	All	All				
575	Trails and Walkways	Length	Feet	1000	5000	All	All	All				
635	Vegetated Treatment Area	Design Capacity - 1,000 lb. Live Animal Weight	No.	0	0	0	300	All				
360	Waste Facility Closure	Surface Area - Full Operation Level	Acres	0	0.5	1.0	4.0	All				
633	Waste Recycling			0	0	0	0	All				
632	Waste Separation Facility	Mechanical Separator	No.	0	0	0	0	All				
		Sediment Basin - Livestock										
		Effective Height of Dam	Feet	8	10	15	30	35				
		Concrete Basin	--	No	No	Yes*	Yes*	Yes				
	Design Capacity - 1,000 lb. Live Animal Weight	No.	20	50	100	500	All					
313	Waste Storage Facility (Also refer to Controlling Factors for Ponds)	Design Capacity - 1,000 lb. Live Animal Weight	No.	0	0	300	1,000	All				
		IDNR or EPA Permit Required	No	No	No	Yes	Yes					
		Storage Capacity	Cu. Feet	0	0	500,000	1,000,000	2,000,000				
		Earthen Waste Storage Structure										
		Effective Height of Dam	Feet	0	0	20	30	35				
		Other Structures										
		* standard designs and standard detail drawings										
		Below Ground - Wall Height	Feet	0	0	8*	14*	All				
		Span	Feet	0	0	6*	12*	All				
		Above Ground - Wall Height	Feet	0	0	8*	14*	All				
Span	Feet	0	0	40*	60*	All						
	Round Structures - Diameter	Feet	0	0	0	120*	All					

IA210-501-M, 4th Ed., Amend. 3, Mar 2019)

IA501-A.8

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				I	II	III	IV	V	I&E	Design	Constr.	
634	Waste Transfer	Gravity Flow - Diameter	Inches	0	0	24	30	All				
		Pressurized System - Diameter	Inches	0	0	6	10	All				
		Reception Tank	No.	0	0	All	All	All				
629	Waste Treatment	Design Capacity - 1,000 lb. Live Animal Weight	No.	0	0	0	0	All				
		Milking Center Waste Water Produced	Gpd	0	0	0	0	All				
359	Waste Treatment Lagoon (Controlling Factors for Ponds also apply)	Anerobic - Volume	Cu. Feet	0	0	250,000	500,000	2,000,000				
		Aerobic - Surface Area	Acres	0	0	1	5	25				
		Effective Height of Dam	Feet	0	0	25	30	35				
642	Water Well	Design and Construction to be completed by a well driller certified in Iowa		0	0	0	All	All				
614	Watering Facility			All	All	All	All	All				
351	Well Decommissioning	Diameter	Inches	0	0	6	16	All				
658 659 657	Wetland Creation Wetland Enhancement Wetland Restoration * A disturbed area includes any area disturbed by earthfill, shallow water excavation(s) and the associated spoil placement area(s) Also refer to other applicable standards	Requires construction or water storage permit from IDNR			No	No	No	Yes	Yes			
		Impacts T&E species			No	No	Yes	Yes	Yes			
		Disturbed Area*	Earthfill, excavation and spoil placement area	Acres	2	10	25	100	640			
			Spoil placement height	feet	2	2	4	6	8			
		Subsurface drains present, including subsurface drains disabled	Pipe size	Inches	6	12	18	30	48			
	All Practices	Hazard Potential as defined in NEM 501.7C		Class	Low	Low	Low	Low	Low			

DEFINITIONS OF MAXIMUM APPROVAL LIMITS COLUMNS

Inventory and Evaluation (I&E) - On-site observations of an exploratory nature and preparation of sound alternative solutions of sufficient intensity for the cooperators to make treatment decisions.

Design - Designing and checking all aspects of the supporting data, drawings, and specifications to insure that the planned practice will meet the purpose for which it is installed.

Construction - Surveys, layout, staking, inspection of materials and work, and making tests to determine that the job meets specifications.

Inventory of Engineering Skills
 (For use in determining the level of design and construction approval authority)
 Yes or No

Surveying Skills

	Laser level or Self-leveling level
	Adjustment of Laser or Self-leveling levels
	Digital Transit
	Total Station
	Total Station – multiple setups with turns
	Survey Grade GPS
	Construction Staking using Total Station or GPS

CADD Skills

	Survey Import & Adjustment
	Contour Development
	Storage Volume computations
	Design layout & surface creation of planned construction
	Profiles & cross-sections
	Earthwork quantities
	Prepare final construction drawings
	Export of staking information to data collector
	LiDAR importing / GPS ground truth checks

Design Skills

	Meets all Core Course Requirements for the Position
	Can develop a stage storage table
	Can balance Cuts and Fills
	Can develop a cost estimate
	Can develop data input for Engineering Plan Development Software
	Can use Engineering Plan Development Software
	Can customize IA construction and material specifications for specific jobs
	Knows where to use and how to complete standard base drawing sheets
	Can assemble non-complex Plans and Contract information
	Can assemble complex Plans and Contract information

Construction Skills

	Concrete and Steel placement (inspection only)
	Concrete and Steel placement (inspection and concrete testing)
	Conduit installation (smooth steel pipe)
	Conduit installation (plastic pipe)
	Conduit installation (concrete pipe)
	Conduit installation (corrugated metal pipe)
	Conduit installation (pipe with cathodic protection)
	Construction Surveys (Non-complex Plans, elevation/baseline/cross section surveys)
	Construction Surveys (Complex Plans, radial layout and curves)
	Drainfill (Proper Placement)
	Drainfill (Gradation Testing)
	Can judge if IA construction and material specifications are being followed
	Can judge if NEH 20 construction and material specifications are being followed
	Can judge if Standard Drawings are being followed
	Can judge if construction complies with the terms of a non-complex contract
	Can judge if construction complies with the terms of a complex contract
	Can determine if Class C (method) compaction requirements are met
	Can do the testing associated with Class A compaction requirements
	Can judge if backfill adjacent to structures is adequate
	Can do a field identification using the United Soil Classification System