Proceedings of

The 28th Symposium on Development in Prestressed Concrete

Contents

General Paper

♦(1)	Study on the Durability Improvement for the Renewal Slab of Road Bridges by Adopting FRP	SAKAI Hideaki	1
♦(2)	Development of Precast PC Slab Using Continuous Fiber Reinforcement	ISHII Tomohiro WATASE Hiroshi KOUDA Eiji TANAKA Toru	7
♦(3)	Fatigue Durability of Precast PC Deck Slab with the Improved Loop Joint	HATAKEYAMA Shigetada MASAKI Mamoru HINO Shinichi HAMADA Hidenori	13
♦(4)	Experimental Study on an Interface Shape of a Joint Using Ceramic Head Anchor	TAKAHASHI Shuto ARAI Takahiro SAITO Kimio FURUICHI Kosuke	19
(5)	Rapid Concrete Slab Replacement with New PCa Panels Connection Method	TOMINAGA Takayuki AMANO Hironori HIZUKURI Masato IKEHATA Shinya	25
(6)	Kamitagawa River Bridge Concrete Slab Replacement - Application of PCa Panels and Link Slabs to PC Composite Girders-	NAKADA Takafumi MITAMURA Kenji HIZUKURI Masato IKEHATA Shinya	29
(7)	Renewal Work Report of PC I-Girder Bridge at Chugoku Expressway (FukusakiIC~YamasakiIC)	FUKUSHIMA Natsuki HAYASHI Masanao NAKANISHI Masato	33
(8)	Removal in a Gerber Beam Bridge Using a Double Girder and Mobile Erection Machine (Karasu Bridge Removal Construction)	OKABAYASHI Hidekatsu SASAKI Nobuyuki	37
(9)	Bearing Replacement for Seismic Reinforcement of Long-Span Railway PC Bridge	OHNO Shunpei FUJINOKI Tsutomu KIKUCHI Yoshitaka SASAOKA Ryoji	41
(10)	Construction Report of Kumura Second Viaduct	KAJIYA Masahumi TSUJII Takeshi HAYASHI Kuninori	45

(11)	Construction Report of CIM Utilization in Toyooka Minami Inter OFF Ramp Bridge	JIN Mitsuaki YAMANAKA Kazunori NAKAYASU Yoshiaki KOMATSU Jun	49
(12)	Construction of Amagi North Road Yugashima Second Viaduct	TAKADA Kenji	53
(13)	Effective Utilization of CIM in Construction of Bridge	KOJIMA Daisuke MAEDA Tsuyoshi INADA Chizuru NISHIMURA Kazuki	57
(14)	Application of CIM to Taki PC-bridge Construction	HATAKENAKA Daichi ATARASHI Hideki WAKABAYASHI Yoshiyuki WATANABE Makoto	61
(15)	Applicability Verification Report to PC Tank of Maintenance Management System Using MR Technology	KOTABE Takanori MIYAJIMA Akira ISHII Tsuyoshi KONNO Kouji	65
(16)	Construction of Shinhurano No.A Bridge -Cantilever Overhanging Erection in a Rigorous Winter and Productivity Improvement-	MARUTA Masaharu KIKUCHI Kazuhiko YAMAZAKI Isao TSUBOKURA Tatsuo	69
(17)	Construction Report of "Yunoyama Kamoshika Bridge" Superstructure	KITADE Taku SAWADA Ryoji YAMASAKI Takayoshi OICHI Tomomi	73
(18)	Development of Automatic Measurement System for Structures and Application to Constructed Bridge	TAKAOKA Rei FUJIOKA Taisuke UCHIBORI Hiroyuki	77
(19)	Development of Robot Arm Rebar Assembly System	TAKENOI Isamu MURATA Nobuyuki MIZUTA Taketoshi	81
♦(20)	Nonlinear Moment-curvature Characteristics and Elastic Energy Balance Concept for the Seismic Evaluation of Prestressed Concrete Structures	IKEDA Shoji KUROSAWA Ryohei HIRAI Kei YAMAGUCHI Takahiro	85
♦(21)	An Idea on Shear Resisting Mechanism of PC Beams Based on Beam and Arch Actions	GUNAWAN Devin OKUBO Kazumasa NAKAMURA Takuro NIWA Junichiro	91
♦(22)	Experimental Study on Bending Behavior and Shear Strength of PC Beam using Ultra Low Shrinkage High Strength Fiber Reinforced Concrete	SANGA Takashi NONAMI Yuuji MATSUDA Taku SHINOZAKI Hiroo	97
♦(23)	Residual Load Carrying Capacity of Pre-tensioned Girders after a Fire	KOSHINO Mayaka INOUE Susumu	103

♦(24)	Numerical Evaluation of the Load Bearing Capacity of PC Beam Considering the Influence of Bonding Condition of PC Tendon	MATSUBARA Satsuki KUSUMI Masashi TAKEDA Kenta	109
♦(25)	Analytical Study on the Influence of Corrosion Area and Bonding Condition of PC Strand on Structural Performance of PC Beam	MURATA Akihiro TAKEDA Kenta	115
♦(26)	Investigation of Transfer Length of PC Steel in UFC Slab by Optical Fiber	NAGAI Yusuke ICHINOMIYA Toshimichi SUZUKI Hideyuki FUJIWARA Rie	121
♦(27)	Research of Jointing Technology using PC Strand Extended from Pre-tension Member	AMAYA Kimihiko TSUNODA Takaya TAKAYA Satoshi YAMAMOTO Takashi	125
(28)	Influence of Relative Humidity Difference for Long-term Deflection of PC Girder	MIYAMOTO Yusuke WATANABE Ken	131
(29)	Behavior Measurements of Continuous PC-Box-Girder Bridge and Horse Girder with Different Support Conditions	TOMONAGA Hikaru NISHI Takahiko	135
♦(30)	Examination of the Limit Value of the Crack Width Based on Numerical Analysis of Penetration of Water into Concrete Member	KUDO Mei SHIMOMURA Takumi	139
♦(31)	Evaluation of the Influence of Differences in Axial Corrosion Distribution and Cover Thickness on Corrosion Cracking Behavior	KIYAMA Naomichi NAKAMURA Hikaru MIURA Taito YAMAMOTO Yoshihito	145
♦(32)	Development of Numerical Method to Evaluate Delamination Strength of Cover Concrete due to Rebar Corrosion	OSHIMA Naoki NAKAMURA Hikaru MIURA Taito YAMAMOTO Yoshihito	151
♦(33)	Evaluation of Structural Performance of PC Members Considering Bond Deterioration due to Corrosion	WATANABE Yuki NAKAMURA Hikaru MIURA Taito YAMAMOTO Yoshihito	157
♦(34)	Experimental Study on Chloride Permeability Resistance of Concrete with Static and Cyclic Prestressing	SAITOU Junpei AZAMI Kimihito TESHIMA Toshifumi WATABE Takuhiro	163
♦(35)	Study on the Long Term Improvement Effect to Chloride Attack Deterioration by Re-vibration	SATO Yushiro FUKAMI Sakura HAZEHARA Hirotaka SOEDA Masashi	169
♦(36)	Examination of Corrosion Protection Effect of Rebar by Surface Treatment Method to RC Containing Salt	NOMURA Yuta KONDO Takuya YOKOI Katsunori	175

(37)	Study on the Chloride Ions Removal Method of Concrete Structure	JINNAI Mao KITANO Yuichi ONOE Kaoru UTSUMI Hideyuki	181
♦(38)	Basic Research on Concrete Using Admixture to Improve Freezing and Thawing Resistance	ICHIYAMA Daiki HASHIMOTO Shinichiro TOKUMITSU Suguru SUGIE Masaki	185
♦(39)	Analytical Investigation on Damage Mechanism of RC Beams without Stirrups under Fatigue Loading	TAKEDA Kyoko SATO Yasuhiko	191
◇(40)	Experimental Study on Effect of Bond Performance of Prestressing Steel on Shear Resistance Mechanism of Prestressed Concrete Beams	ISHII Seiji FUKUI Tsuyoshi HAMAHARA Masayuki	197
♦(41)	Shear Performance of Prestressed Concrete Perforated Beams Reinforced Using Prefabricated Hardware	TSUKINARI Masataka NAGANUMA Kazuhiro MARUTA Makoto	203
♦(42)	Application of Induction-Heated Steel Bar Damper to Unbonded PCaPC Structure Wall	NAGAYA Shogo LIU Yuan NISHIYAMA Minehiro TANI Masanori	209
♦(43)	Seismic Behavior and Performance Evaluation of Precast Prestressed Concrete Columns under High Axial Compression Load	TANI Masanori YAMADA Ryo NISHIYAMA Minehiro	215
(44)	Construction of Resort Hotel by PCaPC Method	YOSHIMURA Makoto DAIDA Tsukasa ANDO Kosaku TSUJI Kazuhiko	221
♦(45)	Application Example of New Analysis Method that Can Reproduce Tension of PC Steel-case of Concrete Structures for Containment of Refrigerated Gases	KONO Masahiro ISHIKAWA Yasuaki KATADA Shigemasa ITO Tomoki	225
(46)	Knowledge Gained from Design and Construction of PC Tank in Sri Lanka	ITO Tomoki KATADA Shigemasa	231
(47)	Approach of CIM Utilization in Tarusaka Distribution Reservoir	FURUKAWA Shogo ANDOU Ken SAKAGUCHI Kouta KITASE Akihira	235
(48)	Construction Report of Mashiki Distribution Reservoir Construction Work	MATSUO Yuta NAKAHARA Susumu HIROSE Kaoru	239
(49)	Construction Report of Kesennuma Fuel Tank	UTSUMI Yoshinori SEGAWA Mutsuo	243

(50)	Construction Report of Hokkaido Expressway Shimamatsugawa Bridge Concrete Slab Replacement Work	SAITO Tsuyoki MIURA Teruhumi IKEZOI Masaki TAKAHASHI Hiroaki	247
(51)	Bridge Deck Replacement of the Tohoku Expressway Iwazeki Bridge	SASAKI Shinichi IGARASHI Ryo SAITO Kazuya KINOSHITA Hajime	251
(52)	Replacement of Concrete Slab at Tohoku Expressway Omorigawa Bridge and Matsuzukagawa Bridge	ZHANG Wen KORI Motoaki YOSHIHARA Naoki SUZUKI Hiroyuki	255
(53)	Replacement of Concrete Slab Considering Social Influence -Chuo Expressway Hiraide Viaduct-	YOSHIKAWA Taku TAJIRI Takeharu MASTUMURA Kento ANAYAMA Katsutoshi	259
(54)	Replacing Construction of Deck Slab using High Strength Lightweight Precast PC Slab - tamadeirirokyou -	TANAKA Shinya OONISHI Kazuyuki IDE Kazuhiro YAMASHITA Ryou	263
(55)	Design Report of Slab Replacement on Chugoku Expressway Tsunekuni Bridge	KIRIKAWA Kiyoshi YAMASHITA Yasuhiro KAWABATA Tomoaki MURAKAMI Kouhei	267
(56)	Construction Report of Slab Replacement on Chugoku Expressway Tsunekuni Bridge	TERASHIMA Koji MUNEYASU Takaharu TAGUTI Yasuo TANAKA Hironori	271
(57)	Replacement of concrete slab of Chugoku Expressway Osakabe River Bridge (Up Line)	FUJIKAWA Ryuta ANNO Katsuhiko TANAKA Hiroki FUKANOKI Hirofumi	275
(58)	Design and Construction of Durable Girder End with Skew Angles in Replacement of Floor Slab of Nishikawa Bridge in Chugoku Expressway	NAKAJIMA Daiki MATSUSHIMA Yasuhiro TSURUTA Yoshitaka NAKATSUMI Kenichi	279
(59)	Replacement of Concrete Slab at HONMYOGAWA BRIDGE (Down Line) in the KYUSHU EXPRESSWAY	SUYAMA Akane HAMASAKI Tsutomu ISHIHARA Shotaro KUDO Shinichi	283
(60)	Construction of HOKURIKU SUPEREXPRESS FUKUI TAKAYANAGI BRIDGE by Push Erection	SUGAWARA Toshio YAMANE Hidenori ONAGA Kouji YANAGISAWA Yoshiki	287

(61)	Design and Construction of The 2nd Honmyo River Bridge on Kyusyu Shinkansen (West Kyusyu Route)	KATO Tsumiki KITAMURA Hikaru GOTO Koichi WATANABE Shinkichi	291
(62)	Manufacturing and Erection Method of PC Track Beam in the Extension Construction of the Okinawa Monorail	YUTANI Isao MAJI Tatsuya TAKEZAKI Takatoshi	295
(63)	Design and Construction of Tokai Hokuriku Expressway FUTAKOE BRIDGE	KONDO Kaoru IRIE Tomoki IMASHIOYA Masaru IWATA Naochika	299
(64)	Design and Construction of SHIN-SHIMIZU JUNCTION CONSTRUCTION	EJIMA Kenichi YOKOTA Takao ISOBE Yoshitaka AOI Hiroki	303
(65)	Design and Construction of KOMONO No.1 VIADUCT	NAGASHIMA Kazuhiro HASHIBA Yukihiko MAKITA Tohru KOGA Hiroshi	307
(66)	Construction Report of Kumamoto North Bypass Hayama Bridge	NAKAI Taiki KAWAHARA Takatsugu	311
(67)	The Girder Construction Method for a Curved Horizontal-Plane Bridge	SUMOTO Kota UTO Chikara KAWASAKI Wataru	315
(68)	Construction of INAN BYPASS 4GOUKYOU NAKATAKIRI PC JOUBUKOUJI	KATOU Hirokazu MATSUI Yukinari KUNIEDA Kuniyoshi	319
(69)	Crossover of the First Intersection in Tanzania -Mufgale Flyover-	ARIKAWA Naoki ISHII Akiharu MARUNI Nobuhiko	323
♦(70)	Development of Mortar Injection Material Using Ground Granulated Blast Furnace Slag of Single Micron Particle and Applicable to Construction of an Actual Member	FUJIWARA Satoshi KITAGAWA Yousuke EBINA Takayuki FUJIWARA Hiromi	327
(71)	Static Bending Test of RC Slab Using Precast Form for Concrete Wall	TAKAGI Yusuke KOBAYASHI Shu WAKABAYASHI Yoshiyuki AKAMATSU Teruo	333
(72)	Development of Precast Wall Built on PC Slab before Installation	KAWANAKA Ryoichi UENJOU Yoshifumi TANAKA Hironori SHIJI Akio	337

(73)	Design and Construction for Replacement of RC Slab at Yuufutsu River Bridge	SAITOH Hirotoshi YOKOYAMA Takashi MIZUMASA Shinji SASAKI Kiyoto	341
♦(74)	Punching Shear Strength of Floor Slabs with Joints with Various Crimp Bolt Connections	ITOH Takaaki MIURA Taito NAKAMURA Hikaru TAKEDA Yasunori	345
◇(75)	Study on Joint of UFC Slab and Steel Girder with Compacted High Strength Fiber Reinforced Mortar	KOJIMA Shintaro KOSAKA Takashi NAGASAWA Mitsuya ICHINOMIYA Toshimichi	351
(76)	Experimental Report of Reverse T-type Prestressed Concrete Composite Slab	MIMURA Kiyotaka HAMAMOTO Tetsuji TAKESHITA Osamu	357
(77)	Rationalization of U-SHAPED GIRDER LIFTING ERECTION at Long-Length Viaducts	OZAWA Hiroshi YAMAGUCHI Takeshi TAKAGI Hiroyuki ITO Atsushi	361
◇(78)	The Influence of PCaPC Column Joints on Column Damage Under Reversed Cyclic Loading	IKUTA Ami MIKI Tomohiro	365
♦(79)	Influence of Corrosion Crack of Compression Rebar on Bending Resistance of RC Beams	KUNIMOTO Rikuto KUWANO Jinsei KONDO Takuya YOKOI Katsunori	371
♦(80)	Performance Evaluation of Aged PC Sleepers That Do Not Use AE Concrete in Cold Regions	WATANABE Tsutomu GOTO Keiichi IIJIMA Toru MORITA Kei	377
♦(81)	Changes of Natural Frequencies of a 55-Year-Old 5-Span Simply-Supported PC Bridge Due to Aging and Loading to Flexural Failure	MORI Shinichiro KOBAYASHI Takumi	383
(82)	Measurement Using Neutron Diffraction for Reinforcing Bar of Strain Distribution at Fiber Reinforced Concrete Member	TAKEYAMA Tadaomi SASAKI Wataru SUZUKI Hiroshi UCHIDA Yuichi	389
♦(83)	Study on Performance Evaluation of Damaged PC Bridges by Non-Destructive Testing	SAKURAI Yoshiyuki KUNITOMI Yasushi YAMAMOTO Susumu OSHIMA Yoshinobu	393
(84)	The Investigation for PC Steel Fracture of Box Girder Bridge by Magnetic Flux Leakage Method Using Strong Magnet Unit	KANAEDA Shunsuke AMAYA Kimihiko IWASE Ayumi ONOYAMA Toshiyuki	399

♦(85)	Nondestructive Investigation of Fracture of PC Steel in Various PC Structures by Magnetic Flux Leakage Method	HIROSE Makoto KIMURA Miki MIYAGAWA Toyoaki	403
(86)	Examination of Strain Distribution Measurement in PCT Girder Bridge for Soundness Evaluation	KOBAYASHI Kenji KATO Yoshitaka ISHIZUKA Kenichi MURANISHI Nobuya	407
♦(87)	Proposal of Efficient Maintenance Method of PCI Girder using Distribution Investigation Method	ITO Hitoshi MIZOBUCHI Toshiaki	411
(88)	Present Conditions of Salt Damage of CORRUGATED STEEL WEB BRIDGE	YAMAUCHI Taketoshi TAWARA Tsukasa YASUI Takeo SAWAI Kenji	417
(89)	Restoration of OTOME BRIDGE Damaged by the 2016 Kumamoto Earthquake	MORI Shohgo ONO Hideo ICHINOSE Hiroyuki SHIMIZU Ryouta	421
(90)	Consideration of Jack-up Method for Higashimuta-bashi Damaged be the Kumamoto Earthquake	TSURU Kazuto TAGAMI Ken IMOKAWA Toshihide NAGATA Ryouji	425
(91)	Construction of Shinkawa Bridge Damaged by Kumamoto Earthquake	HIGA Aoi MIGITA Masato FUKUSHIMA Kuniharu	429
(92)	Peeling Prevention Measures for Concrete Using Movable Hanging Scaffold System (HAYASHI VIADUCT and 4 Other Bridges on TAKAMATSU EXPRESSWAY)	SAKA Tatsuya FUJIMOTO Kimio TAKEBAYASHI Yasuhiro NISHIMURA Kazunori	433
(93)	Efforts of Widening Construction Method for Existing Prestressed Concrete Box Girder Bridge - Shin-Meishin Expressway Kirigataki Bridge -	KITA Yushi MORI Keisuke TERADA Kohei KAMINAGA Yuki	437
(94)	Design and Construction of a Floor Slab for Bridge Widening on an In-Service Bridge -Shin-Meishin Expressway Kirigataki Bridge-	KAWANE Masaya HUKUMOTO Tatsuya KITA Yushi MURO Michiru	441
(95)	Reinforcement in a Pretension H Bridge Using Carbon Fiber Plate Tendon Material in SHINKARAKO Bridge	HASEGAWA Teruaki UENO Tokumasa GOTOU Teruhisa INOUE Noriaki	445
(96)	Large-scaled Repair Work of an Urban Expressway -Hanshin Expressway Ikeda Route-	KOHARA Syogo KUBO Kinya SUGIURA Kazuki OTANI Tomoya	449

(97)	Aseismic Reinforcement Using Aramid Fiber Reinforced Plastic	DAIGO Junichi	453
	Rod -HIRAKI BRIDGE-	WATANABE Osami ANDOU Naofumi SATOU Nobuo	
(98)	Thermal Crack Control Method of Yoshikawa B Bridge in the Kyushu Shinkansen Fukushige Viaduct et al. Construction	TERASAKI Masanao FUCHIDA Kazuki YOSHIMURA Toru KAWAI Hiroyuki	457
(99)	Method for Preventing Thermal Stress Cracking of Kumura Second Viaduct	ANDOU Ken HAYASHI Kuninori YOKOHATA Katsuhiko FURUKAWA Shogo	461
(100)	Construction Report of Yanagisawa River Bridge	ITOU Teturou HARAKO Kazuo	465
(101)	Crack Control Measure of Portal Rigid-Frame Bridge (DAIBUKOUYA IC Bridge)	NYEIN CHAN Linn KAWABE Shusaku NAKAHARA Hidefumi NAGAISHI Tetsuya	469
(102)	Design and Construction of Wide One Room Box Girder Bridge (UTSUBEGAWA BRIDGE)	TOYOTA Tadashi KAWAYOKE Tatsuya TAIRA Yoshio YATO Shogo	473
(103)	East Kyushu Road (Kiyotake - Kitago) Akagi Bridge Construction Report of the Superstructure Construction Work	KIMURA Go MIZUTA Kouji MOTOMATSU Kouji ANDOU Yoshiaki	477
(104)	Execution Report of KAKUTOBRIDGE	SIRAISHI Hideki KAWANABE Youhei MITSUSHIO Fumitaka ADACHI Kenta	481
(105)	Construction Report of the Hiroshima Highway Route 5 Yaga Bo (PC Superstructure)	KOMETANI Kenji SATOU Masayoshi KAWABATA Makoto KOMINATO Yuuki	485
(106)	Quality Improvement Measures of Concrete under Cylindrical Frame and Concrete Joint in PC Hollow Slab Bridge	YOSHIZAKI Tadayuki TAKAHASHI Mitsushige HAYASHI Asuka	489
(107)	(Tentative Name) Construction Report of the Miharashibashi	MIYAKOSHI Ryo NAKAMURA Masaki ISHIGOOKA Ren SUZUKI Atsuro	493
(108)	Design and Construction of Tokai Hokuriku Expressway SOBECHI BRIDGE	KANZAKI Jun ISHIKAWA Syouichi KUNIEDA Kuniyoshi	497

(109)	Detailed Design Report of the Akiyama Viaduct in Consideration for Shortening of the Construction Processes	KIKUCHI Akiko IMAI Hirayoshi SHINOZAKI Eiji KITAMURA Hajime	501
(110)	Wind Resistant Study of Parallel PC Extradosed Bridge	KOMURA Yutaka SUGIYAMA Sadato UENO Kiyoshi MIYANAGA Kenichi	505
(111)	Design and Construction Planning of Mitanigawa Bridge, Hokuriku Shinkansen	NISHI Takahiko TOBINA Koji MIYAZAKI Toshihiko NISHIZAWA Tomotaka	509
(112)	Plan and Design of the 2nd Takeda River Bridge on Hokuriku Shinkansen	TSUTSUI Kohei FUJIMURA Takuji YAMAMOTO Naofumi ABE Masashi	513
(113)	Design and Structural Planning of Hokuriku Shinkansen Hosotsubo Viaduct Bridge, With the Longest Span of All the Shinkansen PC Extradosed Bridges	ISHIKAWA Taro SAITO Masahide IMABAYASHI Yasufumi NISHIZAWA Tomotaka	517
(114)	Design of Waffle-shaped UHPFRC Deck Slab Featuring Super Light Weight and Excellent Fatigue Durability	FUKUOKA Junichi TANIGUCHI Yoshiki SAITO Kimio FUJISHIRO Masaru	521
(115)	Installation of Two Spans Bridge Girder in Single Operation by Upper Erection Girder Method (OOKUMA VIADUCT)	NAITOU Taishi MITSUTA Shinichi TOYOSHIMA Shingo	525
(116)	The PC Deck Slab Structure Which Considered Removal in the Future	YAMAGUCHI Takeshi WAKABAYASHI Dai HIROKADO Koji UENO Keita	529
(117)	Plan and Design of Daidogawa Bridge of Shinmeishin Expressway	OKADA Toshihiko SHIOTA Ryoichi MATSUSHITA Shigeki	533
(118)	Collapse of Morandi Bridge	KOSA Kenji SASAKI Tatsuo	537
(119)	Experimental Investigation of Nondestructive Testing Methods for Condition Evaluation of Stay Cables	MAKITA Tohru KUMAGAI Shinichiro TATEMATSU Hideyuki KITAGAWA Hirokazu	541
♦(120)	Experimental Research on the Decrement Factors in Tension Behavior of Fractured Diagonal Stay Cables with Grout in the Protecting Tube	ONO Kiyohisa HATTORI Masafumi NOJIMA Shoji OSADA Koji	545

♦(121)	Stay Cable Force Measurement of an Extradosed Bridge Using a Vibration-based Method	HATTORI Masafumi MAKITA Tohru YATO Shogo NOJIMA Shoji	551
♦(122)	Study on Tension Force Change of Corroded Prestressed Concrete Steel Wires	WATANABE Shinya MURANISHI Nobuya NAGATANI Toshihiko ONO Syuichi	557
♦(123)	Applicability Examination of PC Grout Reinjection Method According to the Situation of PC Grout Insufficient Filling	MURANISHI Nobuya NAGATANI Toshihiko WATANABE Shinya FUKAGAWA Naotoshi	563
(124)	Re-grouting of PC Bar with Coupling within the Cross Beam of Pretension PCT Bridge	KAMOTANI Tomoshige UEDA Daiki FUJIWARA Norio IWAMOTO Akihisa	569
♦(125)	Breaking Experiment of PC Tendon by Promoting Corrosion with the Difference of Grout Filling Condition	KURIHARA Yuki HINOUE Tomohiko KAWADA Naoki FUKUDA Masato	573
(126)	Investigation of External Cable Used for 21 Years on PC Bridge	KITANO Yuichi MIMOTO Tatsuhiko YAMAMOTO Susumu ISHIDA Masahiro	579
(127)	Long-term Tension Measurement on External Cable of PC Box-girder Bridge	KUNITOMI Yasushi NAKAUE Shinji WATANABE Shinya SHIBASAKI Akira	583
♦(128)	Investigation on the Amount of Silicate Type Surface Penetrants Affected by Deterioration Factor Penetration Prevention	TAKAHASHI Yukina KONDO Takuya MIYAZATO Shinichi NISHINO Hideki	587
♦(129)	Application of Corrosion Mitigation Method Using Galvanic Anode Material to Pretensioned PC Bridge	KAMEDA Hiroaki AOYAMA Toshiyuki ISHII Kouji TORII Kazuyuki	593
♦(130)	Influence of Environmental Conditions that Affect the Anticorrosion Effect by Applying Sacrificial Anode Material to Corroded RC Member	MORIOKA Kaisei KONDO Takuya YOKOI Katsunori MATSUKUBO Hironori	599
♦(131)	Study on Reinforcing Effect by External Cable of Damaged PC Girder	WATANABE Ryo SHIMIZU Kouichirou YAMAMOTO Susumu ISHIDA Masahiro	605

(132)	Loading Test of Concrete Anchor Blocks for the Reinforced Method with External Cables Using Removed PC Bridge	ONOZUKA Toyoaki KITANO Yuichi FUJIWARA Yasuhisa MURAI Hiroyasu	611
(133)	Performance Confirmation Test of Vertical Joint with Fail-Safe Function of PC Slab in Half Cross Section Construction	OOTANI Satoshi SAITOU Kouji URANO Satoru	615
(134)	Scale-Up Test for Upgrading Existing Bridges Using UHPFRC	WATANABE Yuji YANAI Shuji MAKITA Tohru KITAGAWA Hirokazu	619
(135)	Fatigue Strength of Headed Studs Used for Connect Lightweight Concrete Slabs and Steel Girders	KOBAYASHI Shu BANBA Satoshi ISHIHARA Ryoto OHYAMA Osamu	623
(136)	About Widening Examination of Old Road Bridge with Traffic Increase	NOMURA Hajime HIGASHIYAMA Miyoshi	627
♦(137)	Study on Mix Proportion and Material Properties of High Fluidity Concrete for PC Pre-cast Products	NAKAMURA Toshiyuki MUNAKATA Eiji NAKAMURA Norio MAETA Michitaka	631
(138)	Summary of Design and Construction of Box Culvert in Samezu Reclaimed Area, the Haneda Line Route 1 Renewal Project	TANIGUCHI Hirotsugu TOMIYAMA Shigeki KOJIMA Naoyuki OHNISHI Takanori	637
(139)	Construction of the PRC Double Girder Bridge with Continuous 27 Spans, Using Unitized Formwork Support	ASADA Yoshihiro SHINJO Kouhei KANEISHI Yoshinori	641
(140)	Design of T-Girder Bridge Using a Precast Cross Beam, Fukuzaki New Viaduct	NAGAYOSHI Yuta KATO Hiroki SAITOU Kouji KAMEZAKI Seiji	645
(141)	Reinforcement of Prestressed Concrete Box Girder for Bending Moment, during Using for Erection Backyard	KUTOMI Osamu ISHITAKA Yoshihiko SUZUKI Hirotaka	649
(142)	Construction of Double Girder Bridge, Which Was Improved Workability Using Erection Girder	MIYAZONO Takahiro KAWASAKI Wataru HAYASHIDA Kazunori	653
(143)	Execution Report of Maedagawa Bridge	UEDA Kazuhito HAMADA Makoto KATAHIRA Maki KOSEDO Hiroki	657

(144)	Construction Report of HIMIYUME Bridge (Phase II Line)	KUBOTA Masato MORIYA Shinsuke TANAKA Yasuhito UENO Kiyoshi	661
(145)	Development of Fiber Reinforced Polymer Cementitious Composite with High Ductility and Low Elasticity	TAWARA Michikazu ISHIDA Manabu NAKANISHI Masato KATO Hiroki	665
♦(146)	Material Properties of Cast-in-Place Ultra High-Performance Fiber-Reinforced Concrete	NAGAMATSU Makiko KOHSAKA Yasuo MATSUDA Hiroshi KAIBE Takahiro	669
♦(147)	Development of Ultra-low Shrinkage and High Strength Fiber Reinforced Concrete Applicable to Pretensioned Prestressed Concrete Member	SASAKI Wataru MATSUDA Taku ONDA Yousuke DAI Akiyoshi	673
(148)	Development and Application of Fiber Reinforced Porosity Free Concrete	KONO Katsuya YASUDA Eiki HYODO Hikotsugu KOGAME Daisuke	679
(149)	Construction Report of the Facilities Functional Enhancement Construction of SHIMANOKOSHI FISHING PORT	FUKUCHI Hiromoto OOBUCHI Kouki KIKUCHI Atsushi NODA Issei	683
(150)	Technical Development on Intermediate PC Fixing System	WATANABE Hirofumi MORIISHI Yoshihisa SEGAWA Satoshi	687
(151)	Development of PC Wire Anchorage for Cylindrical Concrete Structure	TAKEICHI Tomohiro HOSOI Kiyotaka YOSHINO Hiroshi ARAKI Shigeru	691
♦(152)	The Effect of the Type of Grout Hose and Its Cutting Surface Treatment Method on the Salt Water Leakage	TOKUMITSU Suguru OKADA Shigeyuki FUJIWARA Yasuhisa TANI Shintaro	695
(153)	Influence on Durability of Early-strength Concrete by Chemical Admixture Having Holding Component over Time	ONDA Yousuke DAI Akiyoshi SASAKI Wataru MATSUDA Taku	701
(154)	Study on Steam Curing Method of PC Girder Using High Strength Concrete Containing Fly Ash	KAWAKANE Hajime WAKE Kasumi UJIKE Isao	705
♦(155)	Effects of Replacement Rate and Curing Period of Ground Granulated Blast Furnace Slag Powder on Durability of Concrete	DAI Akiyoshi HIGUCHI Masanori SASAKI Wataru KAJI Kouichi	709

♦(156)	Study on the Salt Damage Resistance of Concrete Using Blast Furnace Slag and Early Strength Cement in Various Marine Environment	FUKAMI Sakura SATO Yushiro HAZEHARA Hirotaka SOEDA Masashi	715
♦(157)	Influence of a Small Amount of Latex on Wet Curing Period and Durability	AZUMA Yosuke ISHII Tomohiro	721
♦(158)	Porosity of Confined Expansive Mortar by Backscattered Electron Image Analysis	DOMON Hiroyuki WATANABE Akio KONDO Takashi	727
◇(159)	Study of the Application to the Precast PC Slab of Fly Ash	KIMURA Shohei SAKURADA Michihiro SHINZATO Ryosuke NAKASE Hirokazu	731
(160)	Application of High Alite Fly Ash Cement to Reaction Floor Mass Concrete	NAKAMURA Fumika MAEHORI Shinpei TOKUMITSU Suguru	737
♦(161)	Mechanical Behaviors of CPC Beams and RC Beams with Different Arrangement of Reinforcement	LI Chunhe TSUJI Yukikazu SUHARA Kentaro	741